UPLAND AND RIVER OPERABLE UNITS REMEDIAL INVESTIGATION REPORT

Bradford Island
Cascade Locks, Oregon

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ACRONYMS

%	percent
AOPC	area of potential concern
ARAR	applicable or relevant and appropriate requirement
AST	aboveground storage tank
ATL	Acceptable Tissue Level
ATSDR	Agency for Toxic Substances and Disease Registry
AWQC	ambient water quality criteria
B2EHP	bis(2-ethyl hexyl)phthalate
BAF	bioaccumulation factor
BHHRA	baseline human health risk assessment
BCF	bioconcentration factor
BERA	baseline ecological risk assessment
bgs	below ground surface
BSAF	biota-sediment accumulation factor
C	concentration
CB-1	catch basin #1
CB-2	catch basin #2
CEC	contaminant of ecological concern
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CEM	conceptual exposure model
CFR	Code of Federal Regulations
cfs	cubic feet per second
CIC	community involvement committee
C_{ij}	concentration of contaminant *i* in medium *j*
COC	chemicals of concern
COI	contaminant of interest
COPC	contaminant of potential concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CPEC	contaminant of potential ecological concern
CRITFC	Columbia River Inter-Tribal Fish Commission
CSM	conceptual site model
CTL	Critical Tissue Level
cy	cubic yards
DART	Data Access in Real Time
DEQ	(Oregon) Department of Environmental Quality
DCA	dichloroethane
DCE	dichloroethene
DHS	(Oregon) Department of Human Services
DNOP	di-n-octyl phthalate
DoD	Department of Defense
DQO	data quality objective
DRO	diesel range organics
DSR	data sufficiency report
DTSC	Department of Toxic Substances Control
Ecology	Washington State Department of Ecology

EcoSSLs	Ecological Soil Screening Levels
ECSI	Environmental Cleanup Site Information
EDQW	Environmental Data Quality Workgroup
EE/CA	engineering evaluation/cost analysis
ELCR	excess lifetime cancer risk
EMPC	estimated maximum potential concentration
EPC	exposure point concentration
ERA	ecological risk assessment
ESA	Endangered Species Act
ESU	evolutionarily significant unit
ºF	degree(s) Fahrenheit
FS	feasibility study
GRO	gasoline range organics
HAI	Huang and Associates, Inc
HEAST	Health Effects Assessment Summary Tables
HHRA	human health risk assessment
HI	hazard index
HMSA	hazardous material storage area
HPAH	high molecular weight polycyclic aromatic hydrocarbon
HQ	hazard quotient
HTRW	hazardous, toxic, and radiological waste
IRIS	Integrated Risk Information System
ITR	independent technical review
kg	kilogram(s)
km	kilometer
K-M	Kaplan–Meier
L	liter(s)
LCFRB	Lower Columbia Fish Recovery Board
log K_{ow}	octanol-water partition coefficient
LOQ	Limit of Quantitation
LPAH	low molecular weight polycyclic aromatic hydrocarbon
LWG	Lower Willamette Group
µg	microgram(s)
µm	micrometer
MCL	Maximum Contaminant Levels
MDD	minimum detectable differences
MDL	method detection limit
mg	milligram(s)
mm	millimeter
MP	Management Plan
MRL	method reporting limit
msl	mean sea level
NCP	National Contingency Plan
ND	not detected
NFA	No Further Action
NHPA	National Historic Preservation Act

N_{ij}	total number of *i* contaminants in medium *j* for which an SLV is available
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPCC	Northwest Power and Conservation Council
NPL	National Priorities List
NRWQC	National Recommended Water Quality Criteria
OAR	Oregon Administrative Rules
ODFW	Oregon Department of Fish and Wildlife
ORNL	Oak Ridge National Laboratory
OSWER	Office of Solid Waste and Emergency Response
OU	operable unit
PA	preliminary assessment
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethylene
PDT	project delivery team
pg	picogram(s)
PM	project manager
PRG	Preliminary Remediation Goal
Q	receptor designator
QAPP	Quality Assurance Project Plan
RAO	remedial action objective
R_{BAC}	bioaccumulation index for chemical
RBC	Risk-Based Concentrations
RCRA	Resource Conservation and Recovery Act
RDL	reported detection limit
RI	remedial investigation
RI/FS	remedial investigation/ feasibility study
RM	river mile
RME	Reasonable Maximum Exposure
ROD	Record of Decision
RRO	residual range organics
RSL	Regional Screening Levels
RTC	Response to Comments
SI	site inspection
SLV	screening level value
SLV_{ij}	screening level value for contaminant *i* in medium *j*
SPLP	Synthetic Precipitation Leaching Procedure
SPMD	Semi permeable membrane device
SSI	supplemental site inspection
SVOC	semivolatile organic compound
SWDIV	Southwest Division
TAG	technical advisory group
TBD	to be determined
TCE	trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure

TDS	total dissolved solids
TEQ	toxicity equivalence quotient
T_{ij}	toxicity ratio for contaminant *i* in medium *j*
T_j	summation of toxicity ratios for *i* contaminants in medium *j*
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TRV	Toxicity Reference Value
TSCA	Toxic Substances Control Act
TRW	Technical Review Workgroup
UCL	upper confidence limit
UPL	upper prediction limit
URS	URS Corporation
USACE	United States Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VCP	Voluntary Cleanup Program
VOC	volatile organic compound
WDF	Washington Department of Fisheries
WDOH	Washington Department of Health
WQC	Water Quality Criteria

Bradford Island is part of the Bonneville Dam complex, located on the Columbia River at river mile (RM) 146.1, approximately 40 miles east of Portland, Oregon. The site is a multipurpose facility that consists of the First and Second Powerhouses, the old and new navigation locks, and a spillway. Numerous investigations have been performed by the United States Army Corps of Engineers (USACE) and their contractors since 1997, focusing on two operable units (OUs), the Upland OU and the River OU. The Upland OU includes four areas of potential concern (AOPCs): the Landfill AOPC, Sandblast Area AOPC, Pistol Range AOPC, and Bulb Slope AOPC.

This Remedial Investigation (RI) Report documents the investigation activities that have taken place over the past ten years, and uses the data to identify source areas at Bradford Island, defines the nature and extent of the environmental contamination, and identifies the contaminants of potential concern (COPCs) for human health and contaminants of potential ecological concern (CPECs) in the media from the Upland and River OUs.

Landfill AOPC Summary of Contamination The Landfill AOPC is a former waste disposal site at the tip of Bradford Island that was used from the early 1940s until the early 1980s. Waste disposed of in the Landfill included: household waste, project-related wastes (grease, light bulbs, sandblast grit), electrical debris, up to 50 ballasts, broken glass, rubber tires, metal debris, wood debris, metal cables, asbestos containing building materials, burned debris, ceramic insulators, and mercury vapor lamps. Pesticide/herbicide mixing and rinsing of pesticide/herbicide application equipment also occurred near the Landfill. By 1982, the surface of the Landfill AOPC had been capped with soil, and another layer of soil was added in 1989.

Disposal and handling practices at the Landfill AOPC have impacted soil and/or groundwater with low levels of polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), metals, polychlorinated biphenyls (PCBs), pesticides, and herbicides.

Groundwater seeps discharge to the river along the northern boundary of the AOPC. The majority of the Landfill AOPC is flat and well vegetated, with no evidence of runoff or erosion. While there is no visual evidence of current sloughing along the northern perimeter of the Landfill AOPC, however, if mass wasting were to occur on the steep slopes, the soils may reach the river.

Sandblast Area AOPC Summary of Contamination The Sandblast Area AOPC includes the area surrounding the former sandblast building on the eastern end of the site and consists of the following subareas:

- Former disposal area for spent sandblast blast grit
- Former transformer maintenance area east of the former sandblast building
- Former Hazardous Material Storage Area (HMSA) located east of the equipment building
- An inferred release of tetrachloroethylene (PCE) from an aboveground storage tank (AST) historically located in the vicinity of the current HMSA
- Laydown area used for current storage of industrial equipment and materials located along the north and south sides of the landfill access road

Spent sandblast grit was disposed of onsite in the area immediately east of the former sandblast building for an unknown period prior to 1994, and has resulted in the release of metals and butyltins into the soil. In November 1995, PCB-containing transformers were disassembled by the USACE at the paved parking area on the east side of the former sandblast building and

approximately 1 quart of PCB-containing oil was inadvertently released. Prior to 1993/1994, hazardous waste generated at the Bonneville Dam complex was stored at the former HMSA, which did not have a secondary containment system or berms. Historical waste handling in this area resulted in the release of metals, pesticides, TPH, and PAHs to nearby soils. The current HMSA does not appear to be a source of contamination, but prior to its construction, an approximately 300-gallon AST was formerly located in the vicinity. Several volatile organic compounds (VOCs) have been detected in soil, groundwater, and soil gas in the area. From these results, it has been inferred that there was a historical release from the AST formerly located in the vicinity of the current HMSA. The USACE stores industrial equipment and materials in the laydown area along the northern and southern portions of the Landfill access road. Soils in this area have become contaminated with metals, pesticides, PCBs, PAHs, TPH, and potentially other contaminants.

Stormwater runoff from impervious surfaces in the Sandblast Area AOPC drains to four catch basins that discharge to the Columbia River through two outfalls. It appears, however, that the majority of the runoff from asphalt immediately southeast of the former sandblast building flows northeast and discharges onto a short, steep, forested hill slope, where it causes rills to develop on the hill slope. This runoff travels down the slope to the equipment laydown area and adjacent Landfill access road, and onto a vegetated area between the Landfill road and the river. Evidence of surface runoff or erosion is absent in this vegetated area, suggesting that runoff flowing onto this area infiltrates before reaching the river

Pistol Range AOPC Summary of Contamination The Pistol Range AOPC is located on the south side of Bradford Island and was used for small arms target practice from approximately 1950 through 1970. Surface soils became contaminated with low concentrations of lead and zinc. The topography of the area consists of a sequence of vegetated slopes and flat areas. Erosion and transport of soil from the Pistol Range AOPC to the river is currently unlikely. However, when the Pistol Range AOPC was in use as a firing range, the ground surface may have been less vegetated and there may have been historical runoff to the Columbia River.

Bulb Slope AOPC Summary of Contamination The Bulb Slope AOPC consists of a fan-shaped accumulation of glass and electrical light bulb debris that extends across approximately 1,900 square feet of a steep slope between the Columbia River and the Landfill access road. A thin layer of soil, up to 1 foot thick, overlies bedrock and became contaminated with low concentrations of PCBs, mercury, and lead. The well-vegetated slope exhibits no evidence of surface runoff, and mass wasting appears to be the only potential mechanism for transport of contaminated soil into the river.

River OU Summary of Contamination The River OU was identified in 2000, when numerous pieces of electrical equipment and other solid waste were discovered in the Columbia River along the north shore of Bradford Island. The removal of equipment and debris took place in December 2000 and in February and March 2002. Following delineation of the extent of sediment contamination, impacted sediments along the north shore of Bradford Island were dredged in October 2007. Residual contamination (including PCBs, PAHs, and possibly metals) in the sediment, as well as historically contaminated biota (e.g., fish and shellfish) may currently be sources of contamination. Transport of contaminants from the Upland OU, discussed above, may also be a current and/or historical source of contamination to the River OU.

Downstream sediment sampling appears to confirm that contaminated sediments are limited to the Bonneville Dam Forebay. Site-specific reference area soils and sediments were analyzed to determine naturally-occurring concentrations of inorganic constituents. Sediment and tissue samples from an upstream River Reference Area were analyzed to help distinguish site-related from non-site-related contributions of both inorganic and organic chemicals. The only significant limitation identified for the available data set is the fact that the Forebay smallmouth bass samples were collected in 2006, prior to the sediment removal action, and are therefore not representative of current Forebay conditions. Similarly, the lifespan of crayfish and sculpin is also long enough that the concentrations measured in these samples probably also incorporate exposure to pre-sediment removal conditions

Receptors and Exposure Pathways Potential on-site human receptors include outdoor workers who may be exposed to contaminated surface soils at the Upland AOPCs. Construction workers and excavation workers may be exposed to contaminated subsurface soils if they were to engage in soil-intrusive activities. Exposure routes related to soil include incidental ingestion, dermal contact, and outdoor inhalation of dusts and vapors. In the unlikely event that new wells are installed and untreated and unfiltered groundwater in the vicinity of either the Landfill AOPC or Sandblast Area AOPC is used for potable uses, the on-site workers may be exposed to contaminated groundwater by ingestion, dermal contact, and inhalation of vapors. At the Sandblast Area AOPC, the potential exists for intrusion of vapors from the subsurface (from soil gas and groundwater) into indoor environments, if enclosed structures were to be constructed here in the future. Upland OU contamination may be transported to the River OU via erosion, mass wasting, or groundwater discharge.

In the River OU, the primary human receptors are subsistence fishers, recreational fishers, and hypothetical consumers of unfiltered, untreated river water. The area where human receptors may potentially come in direct contact with contaminated sediments is near the mouth of Eagle Creek. Bioaccumulative chemicals in the River OU water and sediments may enter the food web when taken up into the tissues of edible species such as the crayfish and smallmouth bass. Recreational and subsistence anglers (adults and children) may then consume these edible species. Incidental ingestion of, or dermal contact with, river water is also considered.

Potential Upland OU ecological receptors include terrestrial plants, soil invertebrates, birds, and mammals. Exposure pathways include root uptake from, direct contact with, or ingestion of surface or subsurface soils. In the River OU, potential ecological receptors include benthic organisms, fish, and aquatic-dependent birds and mammals. Exposure pathways include ingestion of and dermal contact with surface water or sediments and the consumption of contaminated prey items.

Upland OU Risk Assessments Human health risk assessments (HHRAs) were completed through the problem formulation phase and ecological risk assessments (ERAs) were completed through Levels I and II (screening level) for each of the Upland AOPCs

At the Landfill AOPC, COPCs for human receptors in soil and groundwater included several metals, semivolatile organic compounds (SVOCs) including carcinogenic PAHs (cPAHs), chlorinated VOCs and TPH. Arsenic, cPAHs and chlorinated VOCs emerged as the primary carcinogenic COPCs. Only soil was identified as a medium of concern for ecological receptors at the Landfill AOPC. CPECs for terrestrial ecological receptors included antimony, chromium, lead, mercury, nickel, and high molecular weight PAHs (HPAHs). The areas with the highest

concentrations of these COPCs and CPECs included the mercury vapor-lamp test pit, lead hot-spot test pits #1 and #2, gully test pit, and pesticide/herbicide wash area.

At the Sandblast Area AOPC, the COPCs in soil were primarily a few metals, chlorinated VOCs, and cPAHs. The COPCs in groundwater were metals, VOCs, cPAHs, and some TPH fractions. The COPCs in soil gas were primarily chlorinated compounds. Lead may be a minor contributor to non-cancer hazards at the Sandblast Area AOPC. Arsenic, chlorinated VOCs, and cPAHs were the primary carcinogenic COPCs. CPECs in soil at the Sandblast Area AOPC included antimony, cadmium, chromium, lead, mercury, nickel, bis(2-ethyl hexyl) phthalate (B2EHP), and HPAHs. Areas with soil concentrations exceeding human health and ecological screening values occurred throughout the Sandblast Area AOPC, including the spent sandblast grit disposal area, around CB-1, the equipment laydown area, south of the current HMSA, and within the area where soils were identified as erodible in 2009.

The HHRA concluded that neither the Pistol Range AOPC nor the Bulb Slope AOPCs pose a threat to human health. For ecological receptors at the Pistol Range AOPC, lead in soil was the only CPEC. Areas with soil lead concentrations exceeding ecological screening values at the Pistol Range AOPC occurred behind the backstop and at the eastern corner of the former firing shed. CPECs at the Bulb Slope AOPC were limited to lead and mercury in soil.

In addition to the COPCs and CPECs identified in the screening evaluation and listed above, additional COPCs and CPECs were identified during the uncertainty evaluation (Appendix O), for reasons including, but not limited to, retention of degradation products, lack of SLVs, lack of SLVs that take into account bioaccumulation, and potential overland transport to the River (e.g., mass wasting/erosion).

River OU Risk Assessments Similar to the Upland OU, the HHRA and ERA for the River OU were completed through the problem formulation phase and through Levels I and II, respectively.

PCBs were identified as the primary COPCs in the River OU. In addition, a few metals, cPAHs and phthalates were retained as COPCs for sediment, crayfish tissue, and/or smallmouth bass tissue, although their contribution to risk is likely to be minor. They may contribute to human health risk through the pathway of crayfish and smallmouth bass consumption for both subsistence and recreational fish consumers. Although concentrations of metals in sediment were found to be less than Reference Area sediment, arsenic (in crayfish tissue) and mercury (in bass tissue) were identified in Forebay tissue that may be of concern for human health. PCBs were present in sediments, crayfish and smallmouth bass tissues at concentrations that may be of concern for human health. Five cPAH compounds were present in smallmouth bass tissues at concentrations that may be of concern to human health. PCBs, PAHs (both carcinogenic and non-carcinogenic), SVOCs, and TPH were detected in sediments at the mouth of Eagle Creek. Although direct contact with shallow sediments may occur in the vicinity of Eagle Creek, the human health risks at the River OU are associated primarily with consumption of smallmouth bass tissue, and secondarily crayfish tissue, although the observed concentrations are likely the result of historical body burden.

PCBs and a few metals were the only CPECs identified for ecological receptors in the River OU. PCBs in sediment were present at concentrations that may pose a risk to the benthic community exposed through direct contact. Cadmium, lead, mercury, and PCBs in sediment and sculpin tissue; cadmium in clam tissue; and mercury and PCBs in bass tissue were present at

concentrations that may pose a risk to upper trophic level fish and shellfish. Mercury and PCBs in sediment and sculpin and bass tissue, and PCBs in crayfish tissue were present at concentrations that may pose a risk to aquatic-dependent birds. Mercury and PCBs in sediment and tissue (sculpin and bass) were present at concentrations that may pose a risk to aquatic-dependent mammals. Although PCBs were present in crayfish tissue at concentrations identified as potentially a risk to aquatic-dependent birds, crayfish are not a driver species for birds due to the much higher concentrations of PCBs detected in sculpin and bass tissue (likely the result of historical body burden). PCBs in sediment were identified as an ecological concern at only three locations: stations P4 on the north shore of Bradford Island, P09 on the south side of the island (for birds only), and P43 at the mouth of Eagle Creek.

Given the low risk levels estimated for targeted Goose Island sediments samples relative to the risk levels estimated for the random Forebay for PCBs, and the absence of elevated PCB concentrations in Goose Island tissues, PCB concentrations in the targeted Goose Island samples are likely to have contributed minimally to the elevated concentrations of PCBs measured in smallmouth bass tissue from the Forebay. Concentrations of PCBs in Goose Island sediment may be of concern to human receptors although crayfish tissues did not show similar elevated risk levels. Although the Aroclor data for Goose Island demonstrated elevated ecological risk estimates for sediment, the available congener data, which are expected to provide a more accurate measure of total PCB concentrations, demonstrate acceptable risk levels for ecological receptors. Overall, although COPC and CPEC concentrations in media collected from the targeted Goose Island samples indicate low or acceptable risk levels, Goose Island will be maintained as part of the Forebay evaluation in the forthcoming FS in response to DEQ's request.

Recommendations Based on the screening level risk assessments at the Landfill and Sandblast Area AOPCs, implementation of one of two options is recommended for each of these AOPCs:

1. Perform a Feasibility Study (FS) to identify targeted soil removal or other remedial actions which will decrease residual concentrations to acceptable risk levels or
2. Perform a site-specific baseline human health risk assessment (BHHRA) and Level III baseline ecological risk assessment (BERA) to determine if risks to human and ecological receptors are unacceptable. If this option is selected, site-specific factors would be considered (i.e., absence of special-status species, AOPC size, contribution of background levels of inorganics, etc.).

No additional evaluation of potential human health risk is recommended for either the Pistol Range or Bulb Slope AOPCs. However, further action addressing potential ecological risk is recommended at both AOPCs - either in the form of a Level III BERA or remediation of the soils with elevated CPEC concentrations. If a Level III BERA is performed, site-specific factors would be considered (i.e., absence of special-status species, AOPC size, contribution of background levels of inorganics, etc.).

Neither a Level III BERA nor a BHHRA is recommended for the River OU. Instead, progression to a FS is recommended. Although a few other COPCs and CPECs were also identified, PCBs (through the consumption pathway) were identified as the primary risk drivers for both humans and wildlife. However, the PCB concentrations remaining in Forebay sediment (after the 2002 and 2007 removal actions) are inconsistent with PCB concentrations measured in Forebay tissue (most notably in smallmouth bass which were collected prior to the sediment removal action).

Monitoring of PCB concentrations in Forebay tissue may be recommended, to confirm that tissue concentrations are decreasing with time and that residual sediment concentrations are at acceptable levels.

Post-RI Activities As part of the pre-FS work for the River OU, additional bass, clam, and sediment samples were collected from the Forebay in September and October 2011, while additional bass were collected from the Reference Area in August 2011. In the Forebay, the bass were collected from areas north of Bradford Island, north of Goose Island, and south of Cascade Island. Bass were successfully collected at twenty-three locations in each of the areas; however, only nineteen samples from the Reference Area and twenty samples from the Forebay were analyzed based on project needs and goals. The co-located sediment and clam samples were collected at seven locations along the north-shore of Bradford Island in the areas suggested by DEQ as most likely to be influenced by Upland sources. Sediment and clam samples were successfully collected at all seven proposed sample locations; however, only six of the locations yielded enough clam tissue for the planned analysis. Sediment and tissue samples were analyzed for PCBs (Aroclors and 209 congeners), metals, PAHs, pesticides, butyltins, and SVOCs. This data will be presented in a subsequent document and will be used to verify the COPCs identified in the RI/RA for the River OU, as well as the COPCs originating from erosion or mass wasting evaluation of soils from the Upland OU. If the results indicate a potential source of contamination was overlooked, the list of sediment and tissue COPCs may be modified to reflect the new information. A more thorough evaluation of the potential for erosion and mass wasting of Upland soils will be conducted during the FS phase to support conclusions made regarding the likelihood and magnitude of the overland transport pathway.

1.0 INTRODUCTION

The Portland District of the United States Army Corps of Engineers (USACE) has conducted a multi-year effort to characterize and evaluate the contamination arising from historical USACE activities at Bradford Island in Oregon. Bradford Island is part of the Bonneville Dam complex, which is located on the Columbia River at river mile (RM) 146.1, approximately 40 miles east of Portland, Oregon.

The investigation around Bradford Island began as part of the evaluation of the former Bradford Island Landfill (the Landfill), which was used from the early 1940s to the early 1980s. In the course of numerous investigations that USACE and its contractors performed on Bradford Island and offshore since 1997, it became apparent that past upland and shoreline disposal activities had resulted in contamination of the site soil and groundwater, as well as the sediments of the adjacent river. Since 1996, USACE has been working with the Oregon Department of Environmental Quality (DEQ) to address the state's concerns regarding the site investigations and any associated cleanup activities.

In 2000 and 2001, discarded electrical equipment and debris were discovered in the river immediately north of Bradford Island. Three piles of debris were identified, which were removed in 2000 and 2002 (Appendix E of URS Corporation [URS] 2002a, URS 2002b). Following the equipment removal, sediments along the north shore of the island were characterized and the most highly impacted sediments were removed in October 2007 (Huang and Associates, Inc [HAI] 2007).

In 2007, the USACE submitted a Remedial Investigation/Feasibility Study (RI/FS) Management Plan (MP) (URS 2007a), which defined the objectives of the remedial investigation (RI) and described the work to be performed to meet the project objectives. Using the Data Quality Objectives (DQO) approach (United States Environmental Protection Agency [USEPA] 2006), the RI/FS MP identified data gaps and described plans for extensive data collection to fill the identified data gaps for the site soils and groundwater (Upland operable unit [OU]) and for the offshore sediments, surface water, and tissues of various aquatic species (River OU). The RI/FS MP also described how the collected data would be used to delineate the nature and extent of contamination, evaluate the potential risks to human and ecological receptors, and support decision-making needs. The USACE and the external stakeholders for the project, which are collectively referred to as the Technical Advisory Group (TAG) and include the DEQ, conducted extensive internal and external review of the RI/FS MP, and the document was finalized in September 2007.

The collection of additional data was completed by April 2009 in accordance with the requirements of the Upland OU Quality Assurance Project Plan (QAPP; URS 2008a), Upland QAPP Addendum (URS 2009a), River OU QAPP (URS 2007b), Revised Sculpin Analysis Strategy Technical Memorandum (URS 2009b), and In Water QAPP Addendum (URS 2009c). The suite of media sampled included upland soils, groundwater, soil gas, sediments, surface water, and tissue samples from multiple species, including clams (co-located with sediment samples), sculpin, smallmouth bass, and crayfish.

Two interim deliverables, the River OU Data Sufficiency Report (DSR) and the Upland OU DSR, were completed in November 2009 (URS 2009d,e). The DSRs evaluated the quality and quantity of the data available. The DSRs determined that the data gaps and data needs identified

in the RI/FS MP (URS 2007a) were filled and that the data to be sufficient and usable to complete the RI and associated human health risk assessment (HHRA) and ecological risk assessment (ERA).

This RI Report documents the investigation activities that have taken place over the past ten years, and uses the data to identify source areas at Bradford Island, defines the nature and extent of the environmental contamination, and identifies the contaminants of potential concern (COPCs) for human health and contaminants of potential ecological concern (CPECs) in the media from the River OU and Upland OU.

1.1 Report Objectives and Organization

The objectives of this RI report include:

- Identify source areas
- Identify current on-site upland source contribution to river sediment contamination
- Identify nature and extent of contamination in the upland and river areas
- Evaluate fate and transport of contaminants
- Perform a screening level (Problem Formulation) HHRA to identify COPCs which pose potentially unacceptable risk to human health.
- Perform a screening level (Phase I and II) ERA to identify CPECs which pose potentially unacceptable risk to ecological receptors.
- Determine which COPCs/CPECs in which portions of the site require additional risk assessment via a Baseline HHRA (BHHRA) and/or Level III Baseline ERA (BERA) to determine whether or not they need to be addressed in the subsequent feasibility study (FS).
- Determine which COPCs/CPECs in which portions of the site require no additional risk assessment and will be carried forward to the FS.

This report will provide the basis for the FS studies to be reported under separate cover, the objective of which will include:

- Evaluate whether source controls are necessary to address upland sources to sediment contamination
- Evaluate potential cleanup alternatives, both in the uplands and for sediment
- Determine Remedial Action Objectives (RAOs)
- Evaluate cleanup alternatives
- Recommend proposed cleanup remedies

This RI report is organized as follows:

Executive Summary

Section 1 – Introduction

Section 2 – Reviews Project Organization and Responsibilities

Section 3 – Reviews Site Background and Physical Characteristics

Section 4 – Presents Conceptual Site Model

Section 5 – Reviews the Historical Site Operations, Environmental Investigations, and Remedial Actions

Section 6 – Reviews Recent Site Investigations

Section 7 – Evaluates the Quality of the Data

Section 8 – Compares Site data to Reference Areas

Section 9 – Discusses Nature and Extent of Contamination

Section 10 – Discusses the Fate and Transport of Contaminants of Further Interest

Section 11 – Presents the Human Health Risk Assessment

Section 12 – Presents the Ecological Risk Assessment

Section 13 – Summary and Conclusions

Section 13 – References

Appendix A contains the project analytical database, Appendix B contains the field boring logs, Appendix C contains a photographic summary of the site, and Appendix D contains groundwater elevations (table and plots). Appendix E contains the analytical laboratory reports and Appendix F contains the data validation reports. Appendix G contains the historical data not included in the RI. Appendix H provides the individual polychlorinated biphenyl (PCB) congener data, and describes the calculation of total PCBs (as Arcolors and as congeners) and total polycyclic aromatic hydrocarbons (PAHs). Appendix I provides data summaries and statistics for each of the OUs and areas of potential concern (AOPCs). The screening level values (SLVs) are provided in Appendix J. Appendix K analyzes data sensitivity relative to the SLVs and Appendix L compare site data to reference area data. M and N present the HHRA and ERA screening tables, respectively. Appendix O presents the uncertainties in the HHRA and ERA. Appendix P provides the Responses to DEQ Comments on the Draft RI Report.

1.2 Site Description

Bradford Island is part of the Bonneville Dam complex, located on the Columbia River at RM 146.1, approximately 40 miles east of Portland, Oregon (Figure 1-1). The site is a multipurpose facility that consists of the First and Second Powerhouses, the old and new navigation locks, and a spillway with a capacity of 1.6 million cubic feet per second (cfs) (USACE 2000). Features of the Bonneville Dam complex are shown on Figure 1-2.

1.2.1 Site Overview

Site investigations on Bradford Island began with evaluation of the Landfill. The Landfill was used from the early 1940s until the early 1980s. The USACE informed the USEPA and the DEQ of the presence of the Landfill in 1996. The Landfill was added to the DEQ Environmental Cleanup Site Information (ECSI) database in April 1997, and the Bonneville Dam Project Manager (PM) signed a DEQ Voluntary Cleanup Agreement letter for the Landfill in February 18, 1998 under the DEQ Voluntary Cleanup Program (VCP). In 2004, USACE elected to

continue the Bradford Island project under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The USACE is currently working with the DEQ to address the state's concerns regarding this investigation and any associated cleanup activities.

Numerous investigations have been performed by the USACE and their contractors since 1997, focusing on two OUs, the Upland OU and the River OU (Figure 1-3). A review of site records for the Upland OU, including employee interviews, site environmental audits, and environmental investigations resulted in the identification of four AOPCs: the Landfill AOPC, Sandblast Area AOPC, Pistol Range AOPC and Bulb Slope AOPC (Figure 1-4). Contaminant source areas within the AOPCs are discussed in Section 4.0. The primary contaminants of interest (COIs) that have been identified in soil and/or groundwater in the four AOPCs include selected metals; PCBs; semivolatile organic compounds (SVOCs), including PAHs; butyltins; volatile organic compounds (VOCs); and a few pesticides/herbicides. A detailed description of the historical and recent soil and groundwater investigations and remedial activities is included in Sections 5.0 and 6.0, respectively. The COIs identified in offshore sediments include selected metals, PCBs, and PAHs.

Numerous dredge evaluations and other sediment studies/investigations were conducted in the Bonneville Dam Forebay since 1991. During the investigation of the Landfill, hydrographic and underwater dive surveys were conducted in October and November 2000 along the north shore of Bradford Island and numerous pieces of electrical equipment and other solid waste were discovered in the Columbia River adjacent to the Landfill. The removal of equipment and debris from the Columbia River along the north shore of Bradford Island took place in December 2000 and in February and March 2002 (Appendix E of URS 2002a, 2002b). Approximately 32 tons of solid waste was removed and disposed of off-site. Following delineation of the extent of sediment contamination, impacted sediment along the north shore of Bradford Island were dredged in October 2007 (HAI 2007). A description of the historical studies/investigations and dredging/removal actions is included in Section 5.0. In areas where historical data is representative of current conditions (i.e., in upland soils) it is used in this RI. In areas where historical data no longer represents currents conditions (i.e., river sediments) it is not used in this RI. Post-removal sampling that has filled upland data gaps and characterized conditions in the River OU after the sediment removal is discussed in Section 6.0. With the exception of few samples collected from areas that were subsequently dredged, all of this recent data is included in the RI data set.

1.3 Regulatory Initiative

Through Executive Order 12580, authorities under the CERCLA (42 United States Code [USC] 9601 et seq.) have been delegated from the President of the United States down to the Director of Civil Works of the Army. These authorities include the authority provided in CERCLA Section 104 to conduct removal and remedial actions in response to releases or threatened releases of a CERCLA hazardous substance or pollutant or contaminant, the authority provided in CERCLA Section 121 to select remedial actions to respond to such releases, and the authority to carry out response actions on federal facilities under CERCLA Section 120 as the lead federal agency. This authority to select and carry out response actions as the lead federal agency in accordance with CERCLA has been delegated to the Commander of the USACE Northwestern Division with respect to releases or threatened releases at Bradford Island. This includes the authority to sign decision documents or records of decision (RODs) for removal or remedial actions in accordance

with CERCLA and the National Contingency Plan (NCP; 40 Code of Federal Regulations [CFR] Part 300) at Bradford Island.

The USACE is conducting the RI/FS at the Bonneville Lock and Dam Project, and therefore the authority the USACE has to fund the project is through its operations and maintenance funds for the Project.

The DEQ and CERCLA have the same objectives regarding protection of human health and the environment, and it is the goal of the USACE and the project delivery team (PDT) to meet these broad objectives. The PDT is working directly with DEQ to ensure that appropriate Oregon cleanup regulations and DEQ guidance documents are being followed. However, in attempting to follow both DEQ and CERCLA, specific methodologies and guidance may not completely concur. The PDT, in conjunction with the independent technical review (ITR) team, will use the most current, scientifically defensible methods as required by USACE guidance (Department of Defense [DoD] Environmental Data Quality Workgroup [EDQW] 2009) throughout this project to develop investigation and cleanup strategies. These methods will meet all Federal requirements, and to the extent possible also conform to DEQ guidance.

USEPA has elected not to be directly involved with this project; however, the PDT will keep USEPA informed of project progress as needed.

1.4 Project Schedule

The following table presents the current and potential future project milestones with expected completion dates. Depending upon the evaluation of FS data needs, further investigations may be necessary, which would affect the estimated completion dates for subsequent project milestones.

Project Milestones	Estimated Date
RI Report, incl. Level I and II ERA and HHRA Reports	November 2010
Level III BERA and BHHRA Report for Selected Upland AOPCs	2011
FS Data Needs – QAPP and Data Collection	2011 & 2012
FS Report	TBD
Proposed Plan	TBD
ROD	TBD

Notes:
TBD – To Be Determined

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

This section describes key USACE roles on this project, as well the roles of other federal agencies, state agencies, Indian Tribes, and contractors.

2.1 USACE Project Manager

The USACE PM, Joseph M. Dasso, will have project management authority throughout the life of the project and is responsible for overall management and execution of the project, including project quality, cost, and schedule. Specific tasks include:

- Manage overall project and project funding.
- Communicate and coordinate with Tribal governments, agencies, and stakeholders, including the TAG, public, DEQ, USEPA, United States Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), Columbia River Inter-Tribal Fish Commission (CRITFC), Oregon Department of Human Services (DHS), Oregon Department of Fish and Wildlife (ODFW), Washington State Department of Ecology (Ecology), and Washington Department of Health (WDOH).
- Document all communication with stakeholders and tribal governments.
- Initiate and participate in TAG, public, community involvement committee (CIC), and stakeholder meetings.
- Communicate with media, including reporters.
- Lead communication and coordination with Division and Headquarters.
- Convene and coordinate with hazardous, toxic, and radiological waste (HTRW) committee as necessary.
- Make decisions affecting project after consulting with PDT.
- Participate in weekly PDT coordination meetings.
- Ensure that actions satisfy and conform to regulatory requirements.

2.2 USACE Technical Lead

The USACE Technical Lead, Mike Gross, will assist the PM as needed throughout the life of the project. Specific tasks include the following:

- Manage the PDT.
- Act as a main point of contact for contractors, and initiate and manage contractor task orders.
- Initiate and participate, as necessary, in weekly team coordination meetings, as well as in technical, TAG, and other meetings.
- Assist the PM as necessary.
- Act as the PM as needed.

2.3 USACE Technical Team

The USACE Technical Team is composed of technical experts from both the Portland and Seattle Districts. In addition to the USACE PM and USACE Technical Lead, the Technical Team includes John Wakeman, Catherine Martin, and Kenneth Duncan. Disciplines include risk assessment, biology, hydrogeology, chemistry, and environmental engineering. The USACE Technical Team is led by designated task leaders who are assigned on a task-by-task basis. The task leaders direct the PDT. The USACE Technical Team are supplemented with additional USACE resources as needed.

The Technical Team will work closely with all contractors. The task leads will coordinate with the PDT, the PM, and/or the Assistant PM to help resolve all technical issues.

2.4 USACE Independent Technical Review

ITR is the process that confirms the proper selection and application of established criteria, regulations, laws, codes, principles, and professional procedures to ensure a quality product. Technical review confirms the effectiveness of the product and the use of clearly justified and valid assumptions and methodologies. Technical review also includes a comprehensive interdisciplinary review consistent with the established review budget. For this project, the ITR shall consist of discipline-specific review and interdisciplinary coordination review by senior staff or appropriate peer review by those who were not primary designers. All documents produced for this project will undergo ITR.

The ITR team consists of senior technical staff at the Portland District, the Seattle District, and Environmental and Munitions Center of Expertise in Omaha, Nebraska. Specific reviewers include Terry Walker, Sam Bass, Thomas Georgian, Chung –Rei Mao, and Sandy Fry. Other reviewers may be assigned on a task-by-task basis by the task leads.

2.5 Contractors

The prime contractor performing this work is URS. Mike Powell, of the Portland, Oregon office, is the URS PM. He is assisted by specialists from multiple disciplines, including risk assessment, biology, geology, hydrogeology, chemistry, and engineering. The URS team is led by designated task leaders who are assigned on a task-by-task basis. The task leaders report to the URS PM who works closely with the USACE Technical Team. The URS PM will coordinate with the PDT, the USACE PM, and/or the Assistant USACE PM to help resolve all technical issues.

2.6 Technical Advisory Group

Natural resource trustees are federal, state, or Tribal officials who may act on behalf of the public as trustees for natural resources. Natural resources are land, fish, wildlife, biota, air, water, groundwater, drinking water supplies, and other such resources controlled by the United States, any state or local government, or any Indian Tribe (40 CFR 300.5 and CERCLA §107[f][1]). The federal trustees actively participating in this project include the USACE, USFWS, and NOAA. The state trustees include DEQ, ODFW, DHS, and Ecology. The federal and state trustees are invited to participate in regularly scheduled TAG meetings and given the opportunity to review and provide detailed comments on all technical work completed for this project. Comments provided by the federal and state trustees will be evaluated and addressed by the PDT.

Several Indian Tribes have interests in the Columbia River and the Bradford Island site, including the Yakama Nation, the Warm Springs Tribe, the Cowlitz Tribe, the Chinook Nation, the Nez Perce Tribe, and the Confederated Tribes of the Umatilla Reservation. Tribal interests include potential sites with cultural significance (National Historic Preservation Act [NHPA] Section 106) as well as treaty fishing rights in "usual and accustomed" areas. These areas may extend beyond a Tribe's reservation land and apply to landless Tribes.

The federal trust responsibility involves recognizing trust obligations and trust resources. In order to exercise trust responsibility it is important to obtain Indian Tribal views of trust and treaty responsibilities related to USACE actions. These responsibilities are exercised in accordance with provisions of treaties, laws, executive orders, and the Constitution of the United States when the USACE implements or takes an action that may affect a Tribal interest. In order to effectively develop a relationship with the Tribes, the PDT will consult with each Tribe as a sovereign nation on matters related to trust and treaty responsibilities. The Tribes are invited to participate in regularly scheduled TAG meetings and given the opportunity to review and provide detailed comments on all technical work completed for this project. Comments provided by the Tribes will be evaluated and addressed by the PDT. Specifically, the USACE will:

- Operate within a government-to-government relationship with federally recognized Indian Tribes
- Consult, to the greatest extent practicable and permitted by law, with Indian Tribal governments before taking actions that affect federally recognized Indian Tribes
- Assess the impact of agency activities on Tribal trust resources and assure that Tribal interests are considered before the activities are undertaken
- Remove procedural impediments to working directly with Tribal governments on activities that affect trust property or governmental rights of the Tribes
- Work cooperatively with other agencies to accomplish these goals

Consultation efforts will be coordinated through the USACE Portland District Tribal Liaison.

3.0 SITE BACKGROUND AND PHYSICAL CHARACTERISTICS

The Portland District of the USACE has conducted a multi-year effort to characterize and evaluate the potential environmental contamination arising from historical USACE activities at Bradford Island in Oregon. Bradford Island is part of the Bonneville Dam complex, which is located on the Columbia River RM 146.1, approximately 40 miles east of Portland, Oregon. This section describes the Bonneville Dam complex, its general location, history, facility operations, and regulatory status, as well as a brief description of the each of the OUs and AOPCs which are the subject of this RI.

3.1 General Location and Description

The Bonneville Dam and Lock Project (the Project) is the most downstream dam within the Columbia-Snake River navigation system that consists of eight locks and dams (Figure 3-1). The Bonneville Dam is at the upper limit of tidal influence from the Pacific Ocean, about 145 miles upstream from the mouth of the Columbia River and 40 miles east of Portland-Vancouver.

The dam is located at 45° 38’ 27’’ N - 121° 56’ 31’’ W. Bonneville Lock and Dam create a 48-mile-long reservoir from the Bonneville Dam upstream to the Dalles Dam, called the Bonneville Pool. The Columbia River at the Bonneville Dam is divided into three channels by two islands: Bradford Island and Cascade Island. The tailrace for the First Powerhouse forms one channel, the spillway forms the middle channel, and the tailrace channel for the Second Powerhouse forms the third channel (Figure 1-2). The spillway, consisting of 18 gates, each 50 feet wide, is located between Bradford and Cascade Islands, spanning the middle channel. The spill gates are raised to allow excess river flow to pass under them at a depth of about 50 feet below the upstream water surface.

The major features of the Project include the spillway, two powerhouses, two navigation locks (one lock is no longer in use), and a fish hatchery (Figure 1-2). The fish hatchery, main office, and navigation lock visitor center are located on the Oregon shore of the Columbia River. A warehouse and automotive garage facility, and navigation lock support facilities are located on Robins Island, located between the Oregon shore and Bradford Island. The major features on Bradford Island are the Bradford Island visitor center, fish ladders, the service center building, and the equipment building. Although the sandblast building is shown in Figure 1-2, it was structurally damaged in a storm a couple years ago and was demolished within the last year. Another fish ladder is located on Cascade Island, and a third visitor center is located on the north shore of the Columbia River in Washington State.

The old navigation lock is adjacent to the First Powerhouse and is no longer in use. The upstream side of the old navigation lock consists of an end sill (where the lock doors are located) that extends from the riverbed to an elevation of 40 feet above mean sea level (msl). The current navigation lock (Figure 1-2) is located immediately south of the old navigation lock and has an end sill that extends to an elevation of 51 feet above msl.

An authorized federal navigation channel in this reach of the river is 300 feet wide and 27 feet deep, although the depth is currently maintained at 17 feet (USACE 1991). Limited dredging is necessary to keep the channel to the maintained depth near the dam. Bathymetric surveys conducted by USACE indicate that the pool near the Bonneville Dam (within the spillway forebay) is up to 100 feet deep.

3.1.1 Regional Geology

The Project is located in the Columbia River Gorge, a 50-mile canyon that cuts through the Cascade Range physiographic province (Orr and Orr 1999). The canyon has formed through time as the Columbia River incised through various geologic formations, including the Western Cascade Group, the Columbia River Basalt Group, and the High Cascade Group, in response to the uplift of the Cascades over the last 2 million years (Beeson and Tolan 1987).

Three bedrock formations are present near Bonneville project: the Ohanapecosh Formation (also referred to as the Weigle Formation), the Eagle Creek Formation, and the Columbia River Basalt Group (Holdredge 1937; Wise 1970). The Ohanapecosh Formation consists of late Oligocene-aged volcaniclastic siltstones and sandstones with minor conglomerates. As much as two-thirds of the clasts in this formation consist of glass fragments. The fragments have subsequently altered to a dominantly clay mineral assemblage, greatly weakening the formation.

Folding and faulting have significantly disturbed the Ohanapecosh Formation. Bedding generally strikes northeast and north, with a dip of 5 to 20 degrees to the east and southeast. Two predominant fault/shear zone orientations have been identified in association with the development and construction of Bonneville Dam. They include northwest-striking features dipping moderately to steeply to the northeast and northeast-striking features dipping gently to moderately to the northwest. These features do not continue into the overlying Eagle Creek Formation, indicating that fault movement ceased before the Eagle Creek sediments were deposited. No outcrops of the Ohanapecosh formation are found at the site.

The Eagle Creek Formation overlies the Ohanapecosh Formation, and is differentiated primarily by larger clast size and lack of alteration. The Eagle Creek Formation consists primarily of sandstones and conglomerates, with individual units of sedimentary tuffs. Bedding in the unit is near horizontal. The Eagle Creek Formation crops out near river level near the site.

The Columbia River Basalt Group disconformably overlies the Eagle Creek Formation. Flood basalts of this group are Miocene in age and originated from a series of fissures in eastern Washington, Oregon, and Idaho. In the vicinity of Bonneville Dam, the basalts have been uplifted several hundred feet above the current river level.

Two landslides have significantly modified the topography in the vicinity of the site (Sager 1989). Those slides are believed to have been at least partly the result of catastrophic floods during the late Pleistocene that scoured away the talus slopes from the Columbia Gorge. That action over steepened the walls of the Gorge and effectively removed the buttressing effect of the talus slopes. Scouring also exposed the clay-rich Ohanapecosh Formation, which may have contributed to the landslides. The Tooth Rock Landslide is a large rotational block failure that originated on the Oregon side of the Gorge, south of Bradford Island. The slide is reported to have incurred only rotational movement, without lateral expansion. Large slide blocks of the Eagle Creek Formation contributed to the formation of Bradford Island. Because of the slide's rotational nature, the blocks are relatively undisturbed and form a local, but variable, bedrock surface beneath the Bradford Island. Portions of the Tooth Rock slide block extend into the Columbia River and are submerged. Therefore, the river bottom in the immediate vicinity of Bradford Island consists of Eagle Creek Formation overlain by a thin layer of sands and silts that have been deposited in lower velocity areas.

A second large-scale landslide in the area is known as the Bonneville (Cascade) slide. The slide originated on the Washington side of the Gorge between 400 and 800 years ago. The toe of the landslide forms the northern abutment of the Second Powerhouse. Debris from the slide have been observed to overlie the Tooth Rock slide on portions of Bradford Island.

The Tooth Rock slide blocks at the site are also overlain by up to 30 feet of alluvium associated with Holocene to recent flooding of the Columbia River. The alluvium consists of silty sands and gravels that contain increasing amounts of Eagle Creek Formation clasts with depth.

3.1.2 Climate

A meteorological observation station has been in operation at the Project since July 1, 1948. During a 57-year period of meteorological records (1948 through 2005), the station recorded average summer daytime maximum temperatures of 65.8 degrees Fahrenheit (°F) and average winter daytime maximum temperatures of 35.4°F (Western Regional Climate Center 2002). Temperature extremes at the Bonneville Dam have varied from a low of (-5°F) on January 31, 1950, to a high of (107°F) on August 18, 1977.

The average annual precipitation at the Project for the period of record is 77.05 inches. December and January are the months with the highest precipitation rates, and July is the month with the lowest (Western Regional Climate Center 2002). Recorded daily maximum precipitation rates have exceeded 1 inch for every month, with the maximum daily rate of 5.05 inches recorded on November 25, 1999. Average annual snowfall at the dam is 17.7 inches, normally occurring from November through March.

3.1.3 Groundwater/Hydrogeology

Occurrences of shallow groundwater have been evaluated as part of the previous environmental investigations near the former Landfill and the former sandblast building (eastern tip of Bradford Island). Additional groundwater information was generated as part of this RI. Based on these investigations, two shallow stratigraphic units exist on the eastern tip of Bradford Island:

1. **Fill/alluvium.** This unit consists of silty to clayey sands and ranges from 15 to 30 feet in thickness. At depth, there are increasing bedrock clasts. This unit occurs beneath the upland portion of the site and pinches out near the northern shore of Bradford Island.

2. **Bedrock.** The bedrock unit consists of a slide block emplaced from the Oregon side of the river. The block is composed of the Eagle Creek Formation, which consists primarily of sandstones and conglomerates. The uppermost 2 to 5 feet of this unit is fractured.

Groundwater on the eastern tip of Bradford Island appears to be perched in the alluvium above the less-permeable Eagle Creek slide block. Where the fractured bedrock crops out on the north shore of the island, seeps form in the winter months. The slide block forms the base of the river near the island, with no to little sediment thickness found on top of the slideblock.

Appendix D summarizes hydrologic information collected from the on-site monitoring wells. Based on the horizontal hydraulic gradient measured in the fill/alluvium, the direction of groundwater flow beneath the Landfill AOPC is to the north (Appendix D, Figures D-1 through D-4). Horizontal hydraulic gradients between MW-2 and MW-5 in the Landfill AOPC range from 0.10 to 0.13 foot per foot (Appendix D, Table D-2). Measured hydraulic conductivities in

the fill/alluvium beneath the Landfill AOPC based on slug tests range from 14 to 320 feet per day (URS 2004b). Based on a water balance calculated for the former Landfill, approximately 61 percent (%) of the precipitation that falls on the Landfill AOPC footprint percolates to groundwater and discharges either along the north shore of Bradford Island as seeps or offshore of Bradford Island (URS 2004b). One of the monitoring wells (MW-8) is completed in the bedrock beneath the Landfill AOPC and groundwater elevations measured in this well in April 2008 and May 2002 are lower that the adjacent pool elevation (Appendix D, Table D-1). This suggests that in Spring, the direction of groundwater flow in the bedrock aquifer is downward (although it is upward at other times of year).

At the Sandblast Area AOPC, groundwater flow is to the north and northwest (Appendix D, Figure D-5 through D-8). Horizontal hydraulic gradients between MW-11 and MW-115 (to the north) range from 0.10 to 0.11 foot per foot and between MW-11 and MW-14 (to the northwest) range from 0.07 to 0.08 foot per foot (Appendix D, Table D-2). Measured hydraulic conductivities beneath the Sandblast Area AOPC based on slug tests range from 0.02 to 285 feet per day, indicating significant heterogeneity in this area.

3.1.3.1 Drinking Water - Bonneville Lock and Dam Project

No active drinking water wells are located on Bradford Island. Water supply well DW2, which is located on the eastern side of Bradford Island (Figure 3-2), was used for drinking water until 2000 (Perletti, pers. comm. 2010). The USACE decommissioned well DW2 in 2008.

Hatchery Wells H1, H2a, H3, H4, H5, H6 and H7 are located on the eastern end of Robins Island (Figure 3-2). The hatchery wells were installed between 1986 and 1991 to replace wells that were abandoned during the construction of the new navigation lock. The groundwater is extracted from a former alluvial unit that was buried by the Tooth Rock landslide. The alluvium overlies the Ohanapecosh Formation in this location and is up to 100 feet thick (Scofield 1998). These wells provide water to the hatchery and, either individually or combined, also provide drinking water to the Project (Perletti, pers. comm. 2010).

Water supply wells DW1 (also referred to as PW1 and WW-1794) and DW5 (also referred to as PW2 and WW-1800) are located on the eastern end of Robins Island (Figure 3-2). Both DW1 and DW5 historically provided drinking water to the Project (McCavitt, pers. comm. 2001). The USACE stopped using wells DW1 and DW5 several years ago for drinking water use as the wells were going dry; however, the USACE has not yet decommissioned the wells (Perletti, pers. comm. 2010).

Water supply wells DW3 and DW4, which are located on Cascade Island and the Washington shore, respectively, are currently supplying drinking water to the Project (Perletti, pers. comm. 2010). Potential releases to groundwater from Bradford Island should not pose a threat to these populations due to the lack of hydraulic connection to the perched water-bearing unit beneath the island.

3.1.3.2 Drinking Water – Project Vicinity

The population within a 4-mile radius relies on municipal water supplies taken from groundwater supply wells (Leland, pers. comm. 2001). The Columbia River hydraulically separates these populations from Bradford, Cascade, and Robins Islands. Potential releases to groundwater from Bradford Island should not pose a threat to these populations due to the lack of hydraulic connection to the perched water-bearing unit beneath the island.

3.1.4 River Hydrology

Flow within the Columbia River is modified by the operations of several federal and non-federal dams. Bonneville Dam at RM 146.1 is the dam farthest downstream on the Columbia River. Hydrologic conditions immediately upstream and downstream of the dam are the primary focus of this section; however, regional hydrology is addressed given its influence on local hydrologic processes and the Columbia River's evolution.

3.1.4.1 Regional Hydrology

The Columbia River drains an area of 259,000 square miles and is ranked seventh in length and fourth in stream flow among United States rivers. It flows 1,243 miles from its headwaters in the Canadian Rockies of British Columbia, across Washington State, and along the border of Washington and Oregon to the Pacific Ocean (Figure 3-1). There are 11 dams on the Columbia River's mainstem in the United States and 162 dams that form reservoirs with capacities greater than 5,000 acre-feet in the United States and Canadian parts of the basin (United States Geological Survey [USGS] 1996).

Climate in the Columbia River Basin varies considerably, but river hydrology is dominated by snowmelt from high-elevation areas, with the majority of annual flow occurring between April and July. High flows also occur between November and March, caused by heavy winter precipitation (Northwest Power and Conservation Council [NPCC] 2004).

All of the major dams and reservoirs within the basin operate in coordination with each other to manage floods, control fish migration, and produce power. The general operating year for the dams and reservoirs within the basin is divided into three periods:

- September through December – A fixed reservoir drawdown occurs, since a forecasted volume of runoff that will occur in the spring is not yet available. Flows are managed to enhance the spawning of chum salmon below Bonneville Dam.
- January through mid-March to April – A variable drawdown occurs to meet the forecasted volume of the spring runoff based on snow pack measurements. Water must be present in April for juvenile fish migration.
- April through August – Refill season; the reservoirs are managed in an effort to fill the reservoirs and allow fish migration.

3.1.4.2 Local Hydrology

Most technical publications concerning the Columbia River focus on the basin and subbasins, specifically as they relate to water quality and specific habitats. Publications addressing details of individual hydrologic inputs in the immediate vicinity of Bonneville Dam do not appear to be readily available. The position of the Columbia River as a border between Oregon and Washington may contribute to the disjunction of available information. A series of subbasin plans and water quality reports were reviewed to obtain general information about the Columbia River Basin within the area of interest, which runs approximately from RM 142 (Pierce and Ives Islands) to RM 148 (Bridge of the Gods).

Bonneville Dam is considered a run-of-river project. Run-of-river projects, by definition, have limited storage and were developed primarily for navigation and hydropower. These types of

projects pass water at the dam at nearly the same rate it enters the reservoir, with an average variance of water level behind the dam of 3 to 5 feet.

The tailwater elevation below Bonneville Dam varies in direct relationship to the river discharges, and ranges from about 7.0 feet above msl at a river flow of 70,000 cfs to 36.3 feet above msl at a river flow of 660,000 cfs (USACE 1998). From Bonneville Dam to the ocean, the slope of the Columbia River is very flat and subject to tidal action. The daily tidal influence on water level during low water periods ranges from 1 to 2 feet at the dam (Washington Department of Fisheries [WDF] et al. 1990).

Within the Columbia River Basin are numerous subbasins formed by tributaries of the mainstem river. Although the layouts of the subbasins in their entirety extend beyond the area of interest, they each contain tributaries of the Columbia, as identified below, within the area of interest.

Hydrologic inputs immediately upstream of the dam include Ruckel and Eagle Creeks on the Oregon side. Washington maps do not indicate any named creeks immediately above the dam, although drainage features are presumed to exist. Hydrologic inputs immediately downstream of the dam include Tanner and Moffett Creeks on the Oregon side with Greenleaf and Hamilton Creeks contributing on the Washington side.

Streams draining the Oregon side of the Columbia River Basin (within the area of interest) originate and flow through the Hatfield Wilderness, a 39,000-acre portion of land managed by the United States Forest Service (USFS). Although streams discharging to the Columbia originate and primarily flow through the protected wilderness, they also pass through the privately held and often developed properties located along the waterfront. Development such as roadways and railroads with riprap bisect the lower reaches of the tributaries and are presumed to have the greatest influence on the flow rate and water quality at the point where the tributaries join the Columbia.

Urbanization of the land along the Columbia on the Washington side has substantially altered original drainage and subsequent hydrologic inputs. A major highway, railroad, and associated riprap also bisect tributaries along the riverfront on the Washington side.

Forestry is a major industry upstream and downstream of the dam, especially in Washington. Timber practices are typically clear-cut and slash-and-burn, subject to Forest Practices Act regulations of both states (WDF et al. 1990). The significance of this industry, and to a lesser degree agriculture, is its effect on runoff and subsequent water quality. A damaged or destroyed riparian buffer, due to deforestation and agriculture, can substantially alter the morphology of streambeds and, in some cases, whole drainage basins. An example would be increased flow rates, which can result in aggressive streambed scour, increased turbidity, elevated concentrations of dissolved minerals, and habitat destruction. Not only is the tributary being affected but also subsequent discharge can potentially influence water quality, habitat, and flow in the mainstem.

3.1.5 Site Ecology

This section describes the habitats present at Bradford Island and identifies Endangered Species Act (ESA)-listed species and other important non-listed fish that may occur or have the potential to occur in the area.

3.1.5.1 Habitats

A description of the habitat at each Upland OU AOPC and a description of the aquatic habitat of the River OU are provided below. Appendix C contains a photographic summary of each Upland OU AOPC and the River OU.

Landfill AOPC – Upland meadow and shrub/forest fringe communities occupy the Landfill AOPC. This area once served as a temporary nursery for landscape plants used at Bonneville Dam and adjacent facilities. Not all of these ornamental plants were removed and some have survived. Adjacent to the Landfill AOPC is a larger area of conifer-dominated forest. The upland meadow habitat that occupies the surface of the Landfill AOPC has been disturbed by various field investigative activities (i.e., test pits, drilling operations) but has since been recolonized by the invasion of surrounding herbaceous vegetation.

The shrub and forest fringe area is characterized by rocky outcrops at the edges of the island and at the margin of the flat meadow area adjacent to the forested habitat. The substrate consists of a mixture of soils, rock that may have been placed in some areas, and what appear to be natural rock outcrops. The Landfill AOPC terrain is flat at the top and slopes steeply to the north and east into the Columbia River. The slopes are more densely vegetated with shrubs and trees than the flatter areas adjacent to the meadow.

The upland conifer forest in the Upland OU Reference Area appears to be the least disturbed habitat on the island, as it is composed of mostly native species. This forest is apparently relatively young; USACE photographs from the 1930s show much smaller trees. It is likely that this forest was naturally seeded rather than planted. No stumps are present, indicating that past logging either did not occur, or was followed by recontouring the land that included removal of stumps. The larger trees are up to 1.5 feet in diameter at 4.5 feet above the ground, and form a closed canopy. The substrate in the forest area consists of relatively thin topsoil and rocky outcrops. Dead and downed woody material is common.

At the eastern tip of the island, a small (less than 0.25 acre) opening is located at the top of the cliffs that form the shoreline. A thin veneer of soil covers bedrock in this area. A smattering of the shrubs similar to the forest habitat described above are present, but the area is mostly open.

Sandblast Area AOPC – The Sandblast Area AOPC generally consists of a north facing slope with numerous topographic/habitat complexities. Upslope of the former sandblast building is a relatively undisturbed and densely herbaceously vegetated hill slope. Below the upper hill slope is a relatively flat and paved area around the former sandblast building. Downslope (to the north-northeast) of the former sandblast building and the adjacent paved area is a short, steep hill with a shrub/forest community leading to the flat, unvegetated equipment laydown area and the paved road leading east to the Landfill AOPC. Downslope (to the northwest) of the former sandblast building is a relatively flat, herbaceously vegetated area, followed by a recently disturbed slope, then a paved road. Excavation and filling activities on the northwest slope in 2009 removed vegetation and exposed bare, erodible soils at the ground surface. During the following year, the disturbed area has naturally revegetated and is currently vegetated with a dense scrub/shrub community (see the photos in Appendix C).

Pistol Range AOPC – Once the Pistol Range AOPC ceased being used for small arms practice in the late 1960s or early 1970s, the firing range was recolonized by the invasion of surrounding herbaceous vegetation. The topography of the area consists of a series of cuts and fills, resulting

in a sequence of slopes and flat areas. Currently, the ground surface is vegetated with a mix of scrub-shrub and herbaceous vegetation. An upland meadow community, similar to the Landfill AOPC meadow community, covers the firing range. The hillside behind the backstop is moderately steep (15 to 30 degree slopes) and is densely vegetated with herbaceous vegetation and shrub/forest fringe communities. Along the southern portion of the firing range and south of the access road, a densely vegetated scrub/shrub community is present.

Bulb Slope AOPC - The Bulb Slope AOPC consists of a steeply sloped area between the Landfill access road and the Columbia River on the north side of Bradford Island. The substrate consists of a mixture of soils, rock that may have been placed in some areas, and what appear to be natural rock outcrops, all of which is underlain by underlain by siltstone bedrock. The majority of the Bulb Slope AOPC is herbaceously vegetated and/or covered with organic debris.

Aquatic Habitat – Bradford Island (Upland OU) does not contain any wetlands, lakes, or ponds that would have the potential to be considered sensitive environments. However, aquatic habitats include a portion of the Columbia River adjacent to Bradford Island, consisting of the pooled area behind the Bonneville Dam complex, known as the Bonneville Dam Forebay (River OU). The area of this portion of the River is approximately 230 acres.

Water depth behind Bonneville Dam is variable. The area between Bradford Island and Cascade Island extends to a depth of approximately 100 feet. Based on historic photographs and USACE hydroacoustic sounding data, a submerged shelf appears to be adjacent to the north side of Bradford Island at a depth of about 30 feet below pool level. This shelf appears to be about 50 feet wide, parallel to the north shore of the island. The shelf could be critical habitat for ESA-listed salmonids. Shallow water (20 feet deep or less) also occupies a band approximately 50 feet wide along the south shoreline of Bradford Island.

Hydraulic modeling of the waters near Bradford Island was conducted by the USACE (Langsley 1999). This modeling indicates that a large eddy forms behind the dam and creates a reverse current flow next to Bradford Island. This reverse flow appears to attract adult salmonids exiting the fish ladder on their way upstream and may result in the fish being swept back over the dam (Langsley 1999). Introduced fish species may be present in the Forebay for prolonged periods throughout the year and are popular recreational species with a recognized societal value.

3.1.5.2 ESA-Listed Species & Other Important Fish

The list of sensitive species with potential to occur at the Bonneville Dam Forebay is provided in Table 3-1. The table is an updated summary of the more detailed information presented in the Biological Characterization (Appendix F) of the Draft Supplemental Site Inspection (SSI) (URS 2000). The list of species was originally derived from Oregon Natural Heritage Program (1999) data for species recorded within 5 miles of the Landfill, correspondence from USFWS (1999) and National Marine Fisheries Service (NMFS; 2000), information from USACE personnel, reference books, and reports of studies focused on protected species in the Bonneville Dam vicinity. The status of the species in the list was updated based on the Threatened, Endangered, and Candidate Fish and Wildlife Species in Oregon (USFWS 2009) and the Oregon Natural Heritage Program Rare, Threatened and Endangered Species of Oregon list (Oregon Natural Heritage Program 2007).

The special-status (federally and state-listed threatened) fish and wildlife species that are known to occur or could potentially occur at the site are described below. In addition, this section also presents a brief discussion of non-listed important fish species that may occur in the Forebay.

3.1.5.3 Fish Species

The Lower Columbia River is characterized by warmer, slower waters than the upper reaches, and this region consequently supports a larger diversity of native resident fish species such as the following non-listed fish: white sturgeon (*Acipescer transmontanus*), longnose suckers (*Catostomus catostomus*), and minnows (i.e., chiselmouth [*Acrocheilus alutaceus*]). Other native species that are found throughout the Columbia River include special-status trout (i.e., steelhead [*Oncorhynchus* spp.] and bull trout [*Salvelinus confluentus*]), non-listed trout (i.e., cutthroat trout [*Oncorhynchus clarki clarki*]), non-listed whitefish (i.e., mountain whitefish [*Prosopium williamsoni*]), and a variety of non-listed sculpins (*Cottidae*) (Troffe 1999; USACE 2001).

Special-status anadromous fish species that have the potential to be present in the Bonneville Forebay are listed Table 3-2. Ten of the 12 evolutionarily significant units (ESUs) shown in Table 3-2 have the potential to be present near Bradford Island as juveniles, adults or both. The Columbia River near Bradford Island is used by these species primarily as a migratory route between upstream spawning areas and the Pacific Ocean. The listed ESUs fall into two juvenile life-history strategies: "ocean-type" that rear in freshwater for only a few weeks to a few months before migrating to the estuary/ocean during their first year of life, and "stream-type" that spend at least a year rearing in freshwater prior to their downstream migration to the ocean. The Biological Assessment for Anadromous Fish Species and Steller Sea Lion Essential Fish Habitat (USACE 2007) provides additional information as well as a general overview of the life history and status of each ESU and describes when adults and juveniles would be expected to occur near Bradford Island.

Adult salmon typically nearly cease feeding once leaving the Columbia River estuary on their upstream migration. Adult steelhead migrating upstream feed to a limited extent. Juvenile salmon and steelhead feed on their downstream migration. Juveniles feed on aquatic invertebrates and small fish. As noted above, several listed and candidate anadromous fish pass through the lower Columbia River on their journeys between spawning areas and the ocean. The residence time for anadromous fish near Bradford Island is expected to be minimal, but native and introduced resident species may forage at the Bonneville Dam Forebay and many of these fish are popular recreational species.

Popular recreational fish species such as largemouth (*Micropterus salmoides*) and smallmouth (*M. dolomieui*) bass are common to the lower Columbia River and could reside in the Bradford Island vicinity. Other introduced fish species such as catfish (*Ameiurus* spp.), yellow perch (*Perca flavescens)*, and walleye (*Stizostedion vitreum*) are also important sport fish that may be present near the landfill for prolonged periods throughout the year.

3.1.5.4 Wildlife Species

The following wildlife species that are indigenous to this area of the Columbia River Gorge are federally (USFWS) and/or state (ODFW) listed as endangered or threatened (USFWS 2009):

- Northern spotted owl *(Strix occidentalis caurina)* – Federally and state-listed threatened
- Bald eagle *(Haliaeetus leucocephalus)* – State-listed threatened

- Columbia white-tailed deer *(Odocoileus virginianus leucurus)* – Federally listed endangered

The northern spotted owl lives in old-growth forests of the nearby Mount Hood and Gifford Pinchot National Forests. No old-growth forest exists on Bradford or Cascade Islands, and it is unlikely that adult spotted owls occur there due to lack of suitable nesting habitat. However, juvenile spotted owls might pass through the area.

The bald eagle is the only special-status piscivorous species that has the potential to occur in the upland habitats of Bradford Island. Bald eagles occur as nesting and wintering residents of the Columbia River Gorge/Bonneville Dam area. Eagles primarily feed on fish, waterfowl, and waterbirds that occupy the Bonneville Dam Forebay. Several bald eagles were observed during Landfill investigations by USACE and URS personnel during 2001.

Columbia white-tailed deer are very unlikely to occur on Bradford or Cascade Islands. Habitat for this species most frequently consists of riparian zones and bottomland hardwood forests and agricultural areas, including islands within the Columbia River downstream of Portland, Oregon (between RM 32 and RM 50), approximately 100 miles downriver from Bonneville Dam.

3.1.6 Land Use and Population

3.1.6.1 Land Use

3.1.6.1.1 Project-Related Land Use

The Bonneville Project is a multiuse project, managed for hydropower, navigation, recreation, and natural resource and wildlife preservation. The Bonneville Master Plan (USACE 1997a) describes the land use details for the Project. Specific Project uses are described below.

Areas of Bradford Island are specifically managed for wildlife use. Thirteen acres of wooded and open areas on the eastern tip of Bradford Island are for multiple resource wildlife management, primarily goose nesting and pasture areas. The open area immediately south of the service building is managed for goose pasture. Geese also use lawn areas associated with the visitor's facilities for feeding. The downstream western end of the island has 34 acres used for low-density recreational fishing. Eighteen acres on Bradford Island are used for visitor facilities, and the remaining acreage is used for project operations, including office, storage, and equipment maintenance facilities.

Approximately half of Cascade Island (34 acres) is managed for goose pasture, with small areas set aside for goose nesting. The remainder of Cascade Island is used for project operations, including equipment storage and powerhouse management.

All of Goose Island is set aside for goose nesting or pasture. A portion of the north bank of the Columbia River (Washington State) between the Second Powerhouse and an upstream Tribal treaty fishing site is also goose pasture.

Hamilton Island is located two river miles downstream of the Bonneville Project and is a 221-acre multiple resource management area providing habitat for resident wildlife species. Three acres are managed specifically for goose foraging, and 27 acres are managed for low-density recreation, primarily fishing from the bank and a boat launch.

Lawn areas of Robins Island and the fish hatchery are used for goose foraging. The fish hatchery on the Oregon shore is a 22-acre cooperative use site with ODFW. The hatchery is mitigation for

resource damage caused by the dam construction. Portions of Hamilton Island also are managed for goose pasture. Fort Cascade is a 56-acre cultural resource area on the downstream Washington shore preserved because of Native American and early European American settlement. Approximately 46 acres of the north shore of the river within the Project are used for low-density recreation, and 2 acres are specifically for goose foraging.

Other visitor facilities include the Navigation Lock visitor area (6 acres) and the north shore visitor complex (22 acres). Other areas for recreation on the project include Robins Island (21 acres), the south shore area near the fish hatchery (24 acres), and the Pacific Crest Trailhead (4 acres). The remaining Project areas (more than 100 acres) are used for Project operations. There is no public access to the portion of Bradford Island involved in this RI.

There are no plans to change the above land uses at the Project, therefore these appear to be the likely future land uses.

3.1.6.1.1 Surrounding Area Land Use

The Bonneville Dam complex lands set aside specifically for project operations include 97 acres of land that is owned and operated by USACE, and occupied by the main facilities at the Project.

The dam complex is located within the Columbia River Gorge National Scenic Area. The Mount Hood National Forest is located south of the dam and south of Interstate 84. Gifford Pinchot National Forest is located on the Washington side of the river, approximately 6.5 miles north of the dam. Beacon Rock State Park is located approximately 2.5 miles to the west, on the Washington side of the river. All of these areas are used for various forms of recreational activities including fishing, boating, hiking, biking, and camping.

The vast majority of land near Bonneville Dam is dedicated to forestry activities, with agriculture a distant second. Timber resources in the region support large, integrated timber processing industries in the major population centers (WDF et al. 1990).

Pierce and Ives Islands are located downstream of the dam at RM 142. Pierce Island is a 200-acre nature conservancy preserve dedicated to protecting native riverine flora and fauna. Ives Island is part of the Gifford Pinchot National Forest and is managed by the Columbia River Gorge National Scenic Area.

Population densities along subbasin tributaries are low, and uses of the streams are not as significant as those along the Columbia River. Habitat alteration and loss due to logging or agriculture are more common threats on these small streams (WDF et al. 1990).

3.1.6.2 Population Profiles

The three distinct human populations in the general site area are the site staff, site visitors, and the nearby residents.

3.1.6.1.2 Site Staff

The USACE currently employs approximately 154 full-time-equivalent positions at the Bonneville Dam complex. Staff duties include a wide range of occupations, including maintenance, construction, office staff, visitor services, and natural resource management.

Approximately 10 additional staff from the Portland District headquarters are stationed at the dam. Approximately 300 fisheries-related personnel (contractors/researchers from state and federal agencies) work at the dam from April through September. The number of construction

and service contractors at the project varies depending on workloads but can number approximately 175 people (McCavitt, pers. comm. 2006).

3.1.6.1.3 Site Visitors

A road from Interstate 84 provides access to the Bonneville Dam complex. The access road is gated, and visitors are allowed to access several dam facilities (visitor centers, fish ladders, etc.). The site and general vicinity on Bradford Island is gated and off limits to the public. Only USACE personnel and authorized visitors are allowed into these areas.

3.1.6.1.4 Nearby Residents

No permanent residential dwellings are located on the Project. The primary population center in proximity to the dam is the town of North Bonneville, situated on the Columbia River just west of the dam on the Washington side of the river. The current population is estimated at approximately 950 persons.

Major population centers to the west include Portland, Astoria, and St. Helens in Oregon, and Vancouver, Longview-Kelso, and Camas-Washougal in Washington. The cities of Cascade Locks, Hood River, and The Dalles in Oregon and Stevenson, Carson, and White Salmon in Washington lie upstream of the dam. Municipal and industrial pollution from these urban areas are expected to have affected the water quality of the mainstem Columbia River. Population growth is anticipated to result in the conversion of forest, rural residential and agricultural land uses to high-density residential uses, with potential impacts to habitat conditions (Lower Columbia Fish Recovery Board [LCFRB] 2004).

3.1.6.3 Beneficial Uses

According to DEQ guidance for determining beneficial water uses (DEQ 1998a), groundwater may be classified as unlikely to be suitable for potable water uses if it meets the criteria of greater than 10,000 milligrams per liter (mg/L) of total dissolved solids (TDS) and yield less than 0.5 gallons per minute (720 gallons per day). Neither the shallow perched groundwater nor the deeper groundwater at Bradford Island appears to meet the yield criterion. A water supply well originally drilled at Bradford Island to supply potable water to on-site workers was left inactive due to inadequate yield (McCavitt, pers. comm. 2001). The well was formally abandoned in 2008. Therefore, potable water supply use is a highly unlikely potential beneficial use for groundwater.

Designated beneficial uses for surface water in the mainstem of the Columbia River are described in Oregon Administrative Rules (OAR) 340-41-0101 (DEQ 2009a). They include a variety of high-quality uses such as public and private domestic water supply, fishing, water contact recreation and protection of fish and aquatic life (Table 3-3). Beneficial use designations for fish uses include salmon and steelhead migration corridors as well as shad and sturgeon spawning and rearing (Table 3-4).

3.2 Site History

Construction of the First Powerhouse and navigation lock, spillway, fish passage facilities, fish hatchery, and office and maintenance buildings began in 1933. Operations at the Bonneville Dam complex began in 1938. During World War II, in addition to enlarging the first powerhouse and installing additional generators, the military installed anti-aircraft batteries and a rifle/pistol range near the present day location of the service center (USACE 2005).

Between 1974 and 1981, the Second Powerhouse was constructed adjacent to the Washington State shore, to aid in supplying the electrical power needs of the Northwest. The construction of the Second Powerhouse required the relocation of the former town site of North Bonneville, which was relocated approximately 1.5 miles downstream, 4 miles of Washington Highway 14, and 3 miles of Burlington Northern railroad track. During the roadway/railway construction activities, a significant archeological site was excavated. First noted in the Lewis and Clark journals, the site is the only known relatively undisturbed archeological site along the lower Columbia River and provided evidence of 500 years of occupation from the time of Native American occupation to the time of historic settlement in the mid-1800s. This site is on the National Register of Historic Places. Retrieval of cultural material necessary for site interpretation began when it was realized that construction activities would affect the archeological site. Retrieval of cultural material was completed in the summer of 1979 (USACE 2005).

A second navigation lock was constructed at the Bonneville Power Complex on the Oregon side between 1989 and 1993. Associated with construction of the new lock, the southeastern edge of Bradford Island was excavated to improve the approach channel. Soils from that excavation were placed to create Goose Island, 0.5 mile upstream near the Oregon shore.

3.3 Current Facility Operations

The USACE operates and maintains Bonneville Lock and Dam for hydropower, fish and wildlife protection, recreation, and navigation. The major features of the dam complex include a spillway, two powerhouses, two navigation locks, and a fish hatchery. The fish hatchery, main office, and navigation lock visitor center are located on the Oregon shore of the Columbia River. A warehouse and garage facility and navigation lock support facilities are located on Robins Island. The major features on Bradford Island include the Bradford Island visitor center, fish ladders, the service center building, the equipment building, and the former sandblast building. A fish ladder is located on Cascade Island, and the Washington Shore visitor center is located on the north shore of the Columbia River.

3.4 Bonneville Project Regulatory History

The Bonneville Lock and Dam was initially placed on the Federal Facilities Compliance Docket after the 1986 explosive failure of a bushing on an oil circuit breaker in the switchyard on the roof of the First Powerhouse. The bushing failure released approximately one pound of PCBs in tar from the core of the bushing. The bulk of the tar fell on the powerhouse roof, but an unknown quantity reached the river. A second bushing failed in 1991 with similar results. Both spills were cleaned up in accordance with the Toxic Substances Control Act (TSCA) and documented in a preliminary assessment (PA) in 1992. In 1994, the USEPA declared No Further Action (NFA) was necessary with respect to these accidental releases. All PCB-containing bushings and circuit breakers on the powerhouse roof were replaced in the 1995 rehabilitation of the powerhouse.

In 1987, Hamilton Island, a former construction landfill on project lands 1.5 miles downstream from the Second Powerhouse in Washington State, was placed on the Federal Facilities Compliance Docket. The site was investigated for wastes from the construction of the Second Powerhouse at Bonneville Dam, possible PCB waste from the Bonneville project, and wastes from the demolition of the town of North Bonneville. In 1991 the site was placed on the National

Priorities List (NPL) under CERCLA. USACE completed a RI/FS in 1994 and the site was delisted by USEPA in 1995 after a NFA ROD.

USACE maintains a point source discharge permit for discharges from the facility's wastewater treatment plant. The plant services all sanitary waste facilities on the project. The ODFW-managed fish hatchery discharges are not treated by this facility but have a separate discharge in Tanner Creek.

The investigation around Bradford Island began as part of the evaluation of the former Bradford Island Landfill. The Landfill is a former waste disposal site at the Bonneville Lock and Dam Project on the Oregon side of the river. The Landfill was used from the early 1940s until the early 1980s. On June 13, 1996, the USACE submitted a letter to USEPA Region 10 and DEQ, informing them of the presence of the Bradford Island Landfill. In response to the letter, the USEPA requested that sediment samples be collected in the Columbia River around the Landfill perimeter, and that groundwater seep samples be collected if seeps were identified. These issues were considered during the first investigation (the 1998 SI) at the site.

The Bradford Island Landfill was added to the DEQ ECSI database on April 1, 1997. On April 24, 1997, the Bonneville Lock and Dam Project signed a Letter of Intent to participate in DEQ's VCP for the investigation and remediation of the Landfill site. On February 18, 1998, the Portland District Engineer signed a DEQ Voluntary Cleanup Agreement letter for the Landfill site. In 2004, USACE elected to continue the Bradford Island project under the CERCLA.

The USACE will complete the RI/FS in accordance with CERCLA principles, with DEQ requirements as applicable, or with relevant and appropriate requirements (ARARs). Both USEPA and Ecology have been provided the opportunity to comment and participate in the USACE investigations. Neither of these two agencies have committed resources to the project, but support the USACE efforts and have informally deferred to DEQ. The USACE is currently working with the DEQ to address the state's concerns regarding this investigation and any associated cleanup activities.

3.5 Investigation Operable Units

The investigations on Bradford Island began as part of the evaluation of the Landfill, which was used from the early 1940s to the early 1980s. In the course of numerous investigations, it became apparent that past upland and in-water disposal, as well as other operational activities, had resulted in contamination of the site soil and groundwater, as well as the sediments of the adjacent river.

The areas requiring additional evaluation and possible response actions were divided into the Upland OU and the River OU (Figure 1-3). The Upland OU includes four separate AOPCs (Figure 1-4):

- Landfill AOPC
- Sandblast Area AOPC
- Pistol Range AOPC
- Bulb Slope AOPC

Sections 5.0 and 6.0 detail the historical and recent investigations that have been conducted at the Upland and River OUs. The following presents a brief description of the each of the Upland OU AOPCs and of the River OU.

3.5.1 Upland OU

3.5.1.1 Landfill AOPC

Historical investigations at the Landfill AOPC began in 1998. In general, the investigations found that for approximately 40 years, the USACE managed, stored and disposed of waste materials at the landfill in excavated pits or existing depressions on the eastern end of Bradford Island (Figure 1-4). Some additional wastes were disposed of over the northern and eastern edges of the island. Pesticide/herbicide mixing and rinsing of pesticide/herbicide application equipment also occurred near the Landfill, Figure 3-3. The Landfill AOPC boundary shown on this Figure was defined based on known historical use at the site, physical parameters (e.g., the river), and site observations and investigations, including geophysical surveys of the Landfill.

Landfill Waste Characterization and Extent

On February 24, 1997, the Portland District USACE performed a review of available historical aerial photographs of the Landfill AOPC between the years 1936 and 1982. Information derived from the aerial photograph review indicated that use of the Landfill began around 1942, and by 1952, the Landfill appeared to be in its heaviest use. The photographs indicated that deposition of trash occurred intermittently until the early 1980s, and materials and equipment stored in the Landfill AOPC included drums, aboveground storage tanks, vehicles, lumber, and scrap metal. By 1982, the surface of the Landfill AOPC had been capped with soil cover. Neither the overall geographic extent, the estimated depth of landfilled materials, nor the volume of materials disposed within the Landfill could be determined from the review of the aerial photographs (URS 2000).

Based on information from site investigations including electrical resistivity data, seismic refraction data, and boring logs, the volume of landfilled material was estimated to be between 7,500 cubic yards (cy) and 9,900 cy, with a maximum depth of 15-feet below ground surface (bgs). The waste was buried in separate pits, rather than one continuous pit. Waste either observed onsite or known to have been disposed of in the Landfill includes: household waste, project-related wastes (grease, light bulbs, sandblast grit), electrical debris, up to 50 ballasts, broken glass, rubber tires, metal debris, wood debris, metal cables, asbestos containing building materials, burned debris, ceramic insulators, and mercury vapor lamps. Some exposed wastes have been observed on the northern edge and the surface of the Landfill itself, including concrete rubble, steel cables, a few empty buckets and drums, plastic planter buckets, empty cans and paint solids, and metallic slag and partially-burned construction debris, and miscellaneous trash items (Tetra Tech 1998, URS 2004a). PCB-containing light ballasts were discovered in the river north of the Landfill AOPC in March 2000 and March 2001 (see Section 3.5.2).

Landfill Management and Assessment

The Bradford Island Landfill and the equipment storage area in the vicinity of the Landfill AOPC are no longer in use by the Bonneville Dam operation. In 1989, approximately 8-inches of additional soil cover was placed on the Landfill site by the USACE (Hibbs, personnel comm. 2001). Although this portion of Bradford Island is managed as wildlife for geese according to the

Bonneville Master Plan (USACE, 1997a), active management (periodic mowing) of the habitat ceased in the middle to late 1990s to prevent geese from laying eggs in areas that are under investigation (Hibbs, personnel comm. 2001).

The Bradford Island Landfill was added to the DEQ ECSI database on April 1, 1997. On April 24, 1997, the Bonneville Lock and Dam Project signed a Letter of Intent to participate in DEQ's VCP for the investigation and remediation of the landfill site. On November 6, 1997, the Bonneville Lock and Dam PM signed a DEQ Voluntary Cleanup Agreement letter for the landfill site. The USACE started an engineering evaluation/cost analysis (EE/CA) in 2005 to assess the value of conducting a non-time critical removal action at the Landfill AOPC. The Landfill EE/CA work was suspended pending completion of this RI/FS.

Overall, disposal and handling practices in the vicinity of the Landfill AOPC have impacted soil and groundwater with low levels of petroleum products, metals, PCBs, pesticides, and herbicides. Disposal of materials in the Columbia River have impacted near shore sediments with petroleum products, metals, and PCBs (addressed in the River OU). Debris disposed of in the river have been removed.

No evidence of runoff or erosion was observed or predicted through modeling for the Landfill surface (URS 2009f). Minor runoff was observed on the Landfill access road. The source of the Landfill road runoff was a groundwater seep at the base of the steep slope along the southern margin of the Landfill. The water flows west along the road and then infiltrates along the northern margin of the road to the west of the Landfill. The runoff water was clear at the time of the field survey, indicating that the flow of seep water along the road is not causing soil erosion. Runoff from the road appeared to infiltrate and evidence of direct discharge of road runoff to the river was not observed (URS 2009f).

While there is no visual evidence of current sloughing along the northern perimeter of the Landfill AOPC, undercutting was observed along the waterline at the north slope indicating that historical mass wasting likely occurred. Although the potential for bedrock failure is low, if mass wasting were to occur on the steep slopes, the soils may reach the river.

3.5.1.2 Sandblast Area AOPC

The Sandblast Area AOPC includes the area surrounding the former sandblast building on the eastern end of the site (Figure 1-4). The Sandblast Area AOPC consists of the following subareas that are associated with different sources of contamination (Figure 3-4):

- Former disposal area for spent sandblast blast grit
- Former transformer maintenance area east of the former sandblast building
- Former Hazardous Material Storage Area (HMSA) located east of the equipment building
- An inferred release of tetrachloroethylene (PCE) from an aboveground storage tank (AST) historically located in the vicinity of the current HMSA
- Laydown area used for current storage of industrial equipment and materials located along the north and south sides of the landfill access road

The Sandblast Area AOPC boundary, shown on Figure 3-4, was defined based on known historical use at the site, physical parameters, and site observations and investigations.

Within the Sandblast Area AOPC, a portion of the stormwater runoff from impervious surfaces (asphalt) drains to four catch basins (designated #1, #2, #3, and #4 in this report) that discharge

to the Columbia River through two outfalls. In October 2001, the USACE cleaned the sediment from the stormwater system, and replaced the filter fabric socks that line each catch basin (URS 2002e). USACE Bonneville Dam project employees replace the socks on a periodic basis.

It appears, however, that the majority of the runoff from asphalt immediately southeast of the former sandblast building flows northeast and discharges onto a short, steep, forested hill slope, where it causes rills to develop on the hill slope. Eroded soil from the rills combined with sandblast grit from further upslope has been observed accumulated at the base of the slope and behind one of two concrete curbs that run along the base of the slope at the equipment laydown area (URS 2009f).

In 2009, evidence of runoff was observed along the Landfill access road and the adjacent equipment laydown area. These areas are flat and evidence of erosion is generally lacking. Runoff from the road appears to flow north onto a vegetated area between the road and the river. Evidence of surface runoff or erosion is absent in this vegetated area, suggesting that runoff flowing onto this area infiltrates before reaching the river (URS 2009f). Within the remainder of the Sandblast Area AOPC, in particular vegetated areas, no evidence of surface runoff, soil erosion, or sediment deposition was observed.

Former Sandblast Building and Sandblast Grit Disposal Area

A variety of equipment associated with the Bonneville Dam complex has historically been painted with materials that contained metallic (including lead and zinc chromate systems) and organometallic compounds. This equipment was periodically stripped with blast material and repainted in the former sandblast building. The former sandblast building was used for sandblasting operations and painting from approximately 1958 to 1988. After 1988, the sandblasting and painting operations moved to the service center building. No records of disposal activities for sandblast grit were kept from 1958 to 1994. Application of lead-based paints has reportedly not occurred at the dam complex since the early 1980s. A record of disposal from 1994 shows 215,680 pounds of sandblast grit were disposed of as Resource Conservation and Recovery Act (RCRA) hazardous waste, and after 1997 waste disposal records indicate that on average, approximately 70 tons of spent blast media were generated per year from sandblasting operations (URS 2006a).

Based on the presence of sandblast grit adjacent to the former sandblast building (Figure 3-4), spent sandblast grit was historically spread onsite for an unknown period prior to 1994. Previous investigations concluded that the primary source of soil contamination in the Sandblast Area is from the open disposal of sandblast grit (URS 2006a). The disposal of spent sandblast grit in the area immediately east of the former sandblast building has resulted in the release of metallic and organometallic constituents, which were used in historical painting operations, into the surface and subsurface soil. This material has subsequently been transported across the site by surface water runoff into the stormwater drainage features (Figure 3-4).

Former Sandblast Building Septic System

A septic system formerly serviced a bathroom located in the painting (western) portion of the former sandblast building. Floor drains in the former sandblast building may have also discharged into the septic system. The system reportedly includes a tank and drain field. The septic tank and the drain field are located near the north-central side of the former sandblast building (Figure 3-4). The system is not currently in use (the sandblast building recently

demolished). Because a septic tank located on Robbins Island had been backfilled with sandblast grit, the former sandblast building septic tank was investigated to determine if it had been similarly backfilled with sandblast grit. Investigation of the septic tank determined that it had not been backfilled with sandblast grit and was not a source of contamination at the Sandblast Area AOPC (URS 2006a).

The remnants of a small (estimated at less than 100 square feet) burn pit was located at the eastern end of the sandblast disposal area (URS 2006a). The former burn pit is bermed with wood timbers and earthen materials, and the pit contains approximately 2 cy of solid waste consisting of charred wood (mostly), electrical wire, scrap metal, small electrical components, and broken glass. The burn pit is no longer used and the last date of use is not known. Based on analytical data, the burn pit itself does not appear to be a source of contamination. Instead, the sandblast grit located across the sandblast disposal area, including the burn pit, appears to be the source of contamination.

Transformer Disassembly Area

In 1995, PCB-containing transformers were disassembled by the USACE at the paved parking area on the east side of the former sandblast building. On November 22, 1995, approximately 1 quart of PCB-containing oil was released. The release was spread northward by stormwater runoff and into the stormwater drainage system (previously described), which has two outfalls to the river. At the time of the release, a sheen of oil was observed on the Columbia River below the outfall. The release was contained using booms and absorbent pads placed on the upland areas of the release and below the storm drain outfall in the river. At the time of the release, samples were not collected from the stormwater system. Figure 3-4 depicts the transformer disassembly area and the storm drain system.

Former Hazardous Material Storage Area

Prior to 1993/1994, hazardous waste generated at the Bonneville Dam complex was stored at the former HMSA (Figure 3-4). The former HMSA was located approximately 200 feet to the south of the former sandblast building and is sometimes also referred to as the 'former drum storage area.' The former HMSA pad was constructed of wood and metal and did not have a secondary containment system or berms (URS 2002c). Based on investigations in the vicinity of the former HMSA, there have been limited releases of contaminants.

AST Release in the Vicinity of the Current HMSA

Since approximately 1993 or 1994, hazardous waste is stored at the current HMSA, located 50 feet southeast of the former sandblast building (Figure 3-4). The current HMSA was constructed in 1993 or 1994 and consists of a 2,300 square feet (51.5 feet long by 45 feet wide) concrete pad with berms that is partially covered with a steel-framed canopy. A 75 to 100 square foot enclosed flammable materials storage shed is located on the western edge of the storage pad. The excavation for the concrete pad foundation was approximately 2 feet deep (over an area of 51.5 feet long by 45 feet wide), meaning 150 to 200 cy were excavated for the construction. The excavated material was transported to the Bradford Island Landfill for disposal. No record of the type of material (e.g., percent of sandblast grit) that was excavated is available (URS 2006a). The current HMSA does not appear to be a source of contamination.

Prior to the construction of the current HMSA, an approximately 300-gallon AST was formerly located the vicinity. Waste paints were temporarily stored in this AST until the late 1990s at

which time the tank was removed. The tank and the waste within it were appropriately disposed of offsite. During an investigation, a solvent odor was noted in a soil sample collected adjacent to the current HMSA (URS 2002c). Analytical chemistry results for the soil sample identified the presence of several VOCs. From these results, it has been inferred that there was a historical release from the AST formerly located in the vicinity of the current HMSA.

Equipment Laydown Area

The USACE stores industrial equipment and materials along the northern and southern portions of the Landfill access road (Figure 3-4). Periodic grading of the laydown area has been performed to expand storage capacity. Soils may have become contaminated with oil, metallic debris, or other contaminants due to this equipment storage.

3.5.1.3 Pistol Range AOPC

The Pistol Range AOPC is located on the south side of Bradford Island (Figure 1-4). The pistol range was used for small arms target practice from sometime between the early 1940s and the late 1950s to the late 1960s or early 1970s. No other land use associated with the pistol range is known. The pistol range consisted of an approximately 20-foot by 20-foot firing shed and a 30-foot long, 7-foot tall heavy timber backstop constructed of treated lumber. The firing shed, located 80 feet southwest of the backstop, fell into disrepair and was knocked down in the 1990s by the USACE. The building materials from wood-framed and wood-sided structure were not removed following demolition. Due to the historical land use of the Pistol Range AOPC, the soils immediately adjacent to the firing shed, backstop, and areas down gradient of the shed and backstop have been impacted with metals associated with firing range activities.

The overall slope of the Pistol Range AOPC is to the southeast toward the Columbia River. The topography of the area consists of a series of cuts and fills, resulting in a sequence of slopes and flat areas. Currently, the ground surface is vegetated with a mix of scrub-shrub and herbaceous vegetation and does not show evidence of surface runoff, soil erosion, or sediment deposition, indicating that the ground surface is stable. Erosion and transport of soil from the Pistol Range AOPC to the river is currently unlikely. When the Pistol Range AOPC was in use as a firing range the ground surface may have been less vegetated and there may have been historical runoff to the Columbia River.

3.5.1.4 Bulb Slope AOPC

The Bulb Slope AOPC was identified during the removal of equipment offshore of Bradford Island in February and March of 2002. The Bulb Slope AOPC is a fan-shaped accumulation of glass and electrical light bulb debris that extends across approximately 1,900 square feet of a steep slope between the Columbia River and the Landfill access road (Figure 1-4). The vegetated disposal area slopes steeply from the Landfill access road (approximate elevation of 95 to 100 feet above msl) down to the Columbia River (approximate elevation of 75 feet msl; University of Washington 2003). The slope angle is near vertical at the base of the slope for a height of approximately 4 feet above the river level. The normal operating range for the Bonneville pool is between 71.5 feet msl elevation and 76.6 feet msl as measured at the dam (USACE 1998). Based on this information, the base of the bulb slope may be partially submerged during some periods.

The debris is concentrated in the center of the slope and the types of glass observed included internal/external light bulbs, fluorescent light bulbs, automobile light bulbs, 1- to 1.5-inch-diameter glass tubes, clear window pane glass, white-colored molded glass (possibly lamppost

light covers), and miscellaneous glass beverage containers. Based on the analytical results of soil sampling collected in 2002, surface soils at the Bulb Slope AOPC are impacted with metals (lead and mercury), PCBs, and total petroleum hydrocarbons (TPH).

The majority of the Bulb Slope AOPC is well vegetated, covered with organic debris, and exhibits no evidence of surface runoff or overland flow to the river. At the base of the slope, however, wave erosion has resulted in mass wasting (small slope failures) of material into the river. Mass wasting appears to be the only potential mechanism for transport of debris and/or contaminated soil into the river.

3.5.2 River OU

Historically, electrical equipment debris was disposed of directly in the River on the north side of the Landfill AOPC. Figure 3-5 depicts the in-water historical source locations, identified as Former Debris Piles (#1 through #3). The electrical equipment debris included light ballasts, electrical insulators, lightning arresters, electrical switches, rocker switches, a breaker box, and electrical capacitors. The electrical debris contaminated the surrounding sediment with PCBs, PAHs, and metals. The electrical equipment debris were removed in 2000 and 2002 (Appendix E of URS 2002a,b) and the majority of the associated PCB-contaminated sediment was removed in 2007 (HAI 2007). Residual contamination in the sediment includes PCBs, PAHs, and selected metals.

4.0 CONCEPTUAL SITE MODEL

The purpose of this conceptual site model (CSM) is to identify the physical setting and potential sources of contamination, including their transport media and release pathways. The CSM was developed with information gathered from historical investigations and recent investigations (see Sections 5.0 and 6.0). Because the CSM is 'conceptual', it is not dependent on the quantification of the chemical nature and extent and fate and transport.

The site consists of two OUs: the Upland OU and River OU (Figure 1-3). The potential sources of contamination for each of these units are discussed in the following sections. The conceptual exposure models (CEMs), included in Sections 11.0 and 12.0, determine which receptor exposure pathways are complete, potentially complete and incomplete.

4.1 Upland Operable Unit

The physical setting and potential or known sources of contamination in the Upland OU (Figure 1-4) are summarized in this section. Appendix C includes photographs showing each of these AOPCs. Sections 5.0 and 6.0 provide the historical and recent investigation information from which Site sources were identified.

4.1.1 Physical Setting

Physical characteristics of Bradford Island, which are relevant to the discussion of site transport mechanisms, are summarized below.

- There are two areas of higher elevation in the center of the island that range from 170 feet to 195 feet above msl. For reference, the Landfill AOPC is at elevation 120, the Sandblast Area AOPC is at elevation 98, and the Pistol Range AOPC is at elevation 94 feet above msl.
- River stage elevation upstream of the dam at the island averages approximately 74 feet above msl.
- North of the Landfill AOPC, the land surface drops steeply by approximately 30 to 35 feet to the Columbia River. The topography east of the Landfill AOPC also drops steeply to the Columbia River. West of the Landfill AOPC, the topography slopes gently to the west. Topography in the Sandblast Area AOPC slopes to the north with areas of varying steepness. The riverbank is a rip-rapped north of the Sandblast Area AOPC. The Bulb Slope AOPC is situated entirely on the steeply sloping north edge of the island. The land rises moderately south of the Landfill, Sandblast Area, and Bulb Slope AOPCs, and southwest of the Landfill AOPC. The Pistol Range AOPC consists of a pair of vegetated topographic benches stepping down toward the Columbia River to the South. The shoreline is very gently sloped into the adjacent lagoon.
- Bedrock outcrops of conglomerate, sandstone, and limited siltstone are exposed along the north slope of the island. The potential for bedrock failure is low.
- Surface water drainage generally follows sloping topography as sheet flow, before infiltrating into the porous soils, particularly in vegetated areas.
- Precipitation that infiltrates the soil at the island may percolate to groundwater. Under both wet season and dry season conditions, shallow groundwater at the island likely flows to the

north on the north half of the island and to the south on the south half of the island. Groundwater discharge to surface water occurs as diffuse flow in the high permeability materials in the steep slopes on the northern edge of the island as well as in seeps located in vertical fractures in the underlying low-permeability materials. Groundwater may enter the river through bottom sediments or above-water surface seeps.

4.1.2 Landfill AOPC

The primary sources of COIs released at the Landfill AOPC are trash pits, Landfill mixed-waste disposal areas, and the pesticide mixing area. Based on information from previous site investigations including electrical resistivity data, seismic refraction data, and boring logs, the Landfill volume is estimated to be between 7,500 cy and 9,900 cy, with a maximum depth of 15-feet bgs (Tetra Tech 1998, URS 2004a). The waste was buried in separate pits within the Landfill, rather than one large pit. Pesticide/herbicide mixing and rinsing activities historically occurred just south of the Landfill. Stained soils have been observed in the center of the Landfill AOPC (potentially indicating a historical burn area).

COIs have been released from these primary sources into the soil and groundwater (secondary sources). During wet portions of the year, the groundwater elevation can potential rise high enough to encounter waste materials in a small portion of the Landfill AOPC. Analytical data demonstrate that soils and/or groundwater are impacted by metals, herbicides, pesticides, PCBs, VOCs, SVOCs (including PAHs), and/or TPH. While there is no visual evidence of current sloughing along the northern perimeter of the Landfill AOPC, undercutting was observed along the waterline at the north slope indicating that historical mass wasting likely occurred. Although the potential for bedrock failure is low, if mass wasting were to occur on the steep slopes, the soils may reach the river.

4.1.3 Sandblast Area AOPC

The Sandblast Area AOPC includes the area surrounding the former sandblast building on the eastern end of the site (Figure 3-4). The Sandblast Area AOPC consists of the following subareas that are associated with different sources of contamination:

- The former disposal area for spent sandblast blast grit, which resulted in the release of metals and potentially butyltins into the soil (secondary source) and to the river via the stormwater drainage system.
- The former HMSA located east of the equipment building, which has potentially resulted in limited soil contamination of metals, pesticides, and PAHs.
- The paved former transformer maintenance area east of the former sandblast building, at which approximately 1 quart of PCB-containing oil was released on November 22, 1995, and which may have been transported to adjacent soils (secondary source) and possibly the river via the stormwater drainage system.
- An inferred release from an AST historically located in the vicinity of the current HMSA, which resulted in the contamination of soil, and subsequently groundwater, with VOCs.
- The equipment laydown area used for historical and current storage of industrial equipment and materials located along the north and south sides of the Landfill access road, which appears to have resulted in the contamination of soil with metals, pesticides, PCBs, and SVOCs (including PAHs).

Contaminants have been released from these primary sources (i.e., sandblast grit, PCB-containing oil, hazardous material storage, and equipment storage) to soil and/or groundwater (secondary sources). In addition, during a site visit in 2009 an area northeast of the former sandblast building was observed to have been recently disturbed and was identified as erodible, whereby contaminated surface soil is transported to the river via stormwater drainage and surface water runoff (URS 2009f). During the past year, this area has become revegetated (see the photo in Appendix C) and the soils are no longer considered erodible.

4.1.4 Pistol Range AOPC

The Pistol Range AOPC is located approximately 75 feet southeast of the equipment building and north of the Columbia River (Figure 1-4). The pistol range was used for small arms target practice from sometime between the early 1940s and the late 1950s to the late 1960s or early 1970s. No other land use associated with the Pistol Range AOPC is known. As a result of the historical land use of the Pistol Range AOPC, the soils immediately adjacent to the firing shed, backstop, and areas down gradient of the shed and backstop are impacted with selected metals associated with firing range activities.

Currently, the ground surface is vegetated with a mix of scrub-shrub and herbaceous vegetation and does not show evidence of surface runoff, soil erosion, or sediment deposition, indicating that the ground surface is stable. Erosion and transport of soil from the Pistol Range AOPC to the river is currently unlikely. When the Pistol Range AOPC was in use as a firing range the ground surface may have been less vegetated and there may have been historical runoff to the Columbia River (e.g., the adjacent lagoon).

4.1.5 Bulb Slope AOPC

The Bulb Slope AOPC is a fan-shaped accumulation of glass and electrical light bulb debris that extends across approximately 1,900 square feet of a steep slope between the Columbia River and the Landfill access road (Figure 1-2). The Bulb Slope AOPC surface soil is impacted with metals (lead and mercury), PCBs, and TPH from the discarded light bulbs.

The majority of the Bulb Slope AOPC is well vegetated, covered with organic debris, and exhibits no evidence of surface runoff or overland flow to the river. At the base of the slope, however, wave erosion has resulted in mass wasting (small slope failures) of material into the river. Mass wasting appears to be the only potential mechanism for transport of debris and/or contaminated soil into the river.

4.2 River Operable Unit

The physical setting and potential or known sources of contamination in the River OU are summarized in this section. Sections 5.0 and 6.0 provide the historical and recent investigation information from which Site sources were identified. Sources of contamination from both in-water placement of debris and overland transport from the Upland OU have likely impacted sediments and surface water in the River OU.

4.2.1 Physical Setting

Physical characteristics of the River OU, which are relevant to the discussion of site transport and exposure mechanisms, are summarized below.

- The average annual variation of water level within the River OU is 3 to 5 ft. River stage elevation of the River OU at the island averages approximately 74 feet above msl.
- Based on historic photographs and USACE hydroacoustic sounding data, a submerged shelf appears to be adjacent to the north side of Bradford Island at a depth of about 30 ft below pool level. This shelf appears to be about 50 ft wide, parallel to the north shore of the island. Shallow water (20 ft deep or less) also occupies a band approximately 50 ft wide along the south shoreline of Bradford Island.
- Hydraulic modeling of the waters near Bradford Island was conducted by the USACE (Langsley 1999). This modeling indicates that a large eddy forms behind the dam and creates a reverse current flow next to Bradford Island. This reverse flow appears to attract adult slamonoids exiting the fish ladder on their way upstream and results in the fish being swept back over the dam (Langsley 1999). Introduced fish species may be present in the River OU for prolonged periods through the year and are popular recreational species with a recognized societal value.

4.2.2 Sources of Contamination

Historically, electrical equipment debris was disposed of directly in the River on the north side of the Landfill AOPC. Figure 3-5 depicts the in-water historical source locations, identified as Former Debris Piles (#1 through #3). The electrical equipment debris included light ballasts, electrical insulators, lightning arresters, electrical switches, rocker switches, a breaker box, and electrical capacitors. The electrical debris contaminated the surrounding sediment with PCBs, PAHs, and metals. The electrical equipment debris were removed in 2000 and 2002 (Appendix E of URS 2002a,b) and the majority of the associated PCB-contaminated sediment was removed in 2007 (HAI 2007). Residual contaminated sediment, as well as historically contaminated biota (e.g., fish and shellfish) may currently be sources of contamination.

In addition, the Upland OU sources identified in Section 4.1 may also be sources of contamination for the River OU through overland transport (Figure 4-1) or groundwater discharge to the river.

4.3 Release Mechanisms and Transport Media

Given the physical characteristics of the site and the current potential sources described above, the following mechanisms may transport site contaminants from one or more of the AOPCs to others areas within the Upland OU and/or to the River OU:

1. Volatilization of contaminants in soil to air, or dust generation and release of contaminants in particulate form to air.
2. Leaching and infiltration of contaminants from buried debris and/or contaminated soil to groundwater.
3. Discharge of contaminants in the perched groundwater zone to surface water (via seeps).
4. Overland transport of spent sandblast grit and surface water runoff of contaminants in soil directly to River surface water or via the stormwater drainage system outfalls.
5. Transport of contaminants via soil erosion and/or mass wasting to surface water.

In addition, the following mechanisms may redistribute site contaminants within the River OU:

6. Sorption/dissolution of surface water contaminants to/from sediments.
7. Contaminated sediment transport within the river.
8. Potential surface water communication to the deeper groundwater zone.

The CSM (Figure 4-2) depicts these current release mechanisms and transport media. Due to the potential surface water communication with the deeper groundwater zone, contaminants in the River OU may be transported into the deeper groundwater zone. However, there are no receptors that would be exposed to this deeper groundwater and, therefore, this pathway is not investigated or evaluated further.

5.0 HISTORICAL SITE INVESTIGATIONS

This section summarizes investigations that occurred prior to the September 2007 RI/FS MP (URS 2007a). The results of investigations that were conducted following the RI/FS MP are summarized in Section 6.0

Except where data quality does not meet the standards outlined in the RI/FS MP (URS 2007a), analytical results from investigations in the Upland OU from 1999 to 2009 are included in the RI data set and were evaluated in the risk assessments (exceptions are noted). The relatively static physical environment of the Upland OU means that environmental data collected over the past decade can be considered representative of current conditions. Therefore, all historical Upland OU investigations are summarized, in chronological order, based on the date in which the investigations were conducted. Data are provided in Tables in this Chapter. Historical Upland OU data not utilized in the RI due to poor data quality are provided in Appendix G.

In contrast to the Upland OU, the physical environment of the River OU is much more dynamic. As discussed previously, the electrical equipment and debris and the majority of the contaminated sediment have been removed from the river. Water movement and human activities have redistributed sediment within the Forebay. Additionally, the sampling methods used to collect the historical data in the River OU are not comparable to the recent sampling which was conducted in accordance with the procedures outlined in the River OU QAPP (URS 2007b), Revised Sculpin Analysis Strategy Technical Memorandum (URS 2009b), and In Water QAPP Addendum (URS 2009c).

In order to focus on the current river conditions, only analytical results from investigations in the River OU after 2007, with the exception of smallmouth bass collected in 2006, are included in the RI data set and used in the risk assessments. Therefore, only a brief review of the historical investigations are presented in this report. A detailed summary of the historical investigations for the River OU is presented in the RI/FS MP (URS 2007a). Appendix G provides the historical River OU data not utilized in the RI.

5.1 Data Processing

The analytical data presented in this Section, as well as in the following Section (Section 6.0), was processed for use in this RI Report in a manner similar to the Upland and River DSRs (URS 2009d,e). Both processed and unprocessed data are provided in Appendix A. The following sections summarize the processing treatments for the Upland OU and River OU data necessary for utilization. A complete enumeration of the processing treatments for the data is provided in the metadata file in Appendix A. Appendix E provides the laboratory reports and Appendix F provides the data validation reports. Appendix H presents the results of the individual congener analyses, along with the methodology used for summing total PCBs as congeners, total PCBs as Aroclors, and total PAH, and tables with the sums for each sample.

- **Method Detection Limits (MDLs) and Method Reporting Limits (MRLs) –** There are both MDLs and MRLs associated with the majority of data. For some historical data, only MRLs were available, in which cases the MRLs were used in lieu of MDLs. MDLs and MRLs are presented in Appendix A. For simplicity, only the MDLs are shown in the data tables presented in this section (Tables 5-1 through 5-7) and in the tables presented in Section 6.0 (Tables 6-2 through 6-14).

- **Field Duplicates –** Results from field duplicates were averaged with corresponding primary sample values to create a single value, as long as the analytes was detected in both the primary and field duplicate samples. When averaging, the lower of the MDLs and the higher of the MRLs were assigned to the average. If the analyte was detected in only one of the pair, the detection result was used and the MDL/MRL associated with this detection was considered as the MDL/MRL of the result. If the analyte was undetected in both samples, the lowest MDL/MRL of the pair was used. This procedure follows DEQ's guidance for the treatment of data for primary samples and duplicates (DEQ 2009b).
- **Analyses –** Data from Synthetic Precipitation Leaching Procedure (SPLP), Toxicity Characteristic Leaching Procedure (TCLP), and NWTPH-HCID analyses were not included in this RI data set. The SPLP and TCLP analyses measures COI concentrations in simulated leachate from a soils sample, and are used to evaluate waste handling and disposal requirements. The NWTPH-HCID analysis is a screening analysis documenting the presence of hydrocarbons which is typically followed by quantitative analysis of specific COIs. Neither of these types of data are relevant to the RI, although all results are retained in the project database.
- **Summing PCB Congeners –** Total PCBs as Congeners were summed for each River OU media in which it was analyzed. Data qualified as "U" are undetected results at the laboratory-provided reported detection limit (RDL). Neither MDLs nor MRLs were provided by the laboratory. Data qualified as "EMPC" represent the estimated maximum potential concentration of analytes that were not definitively identified. Total PCBs as Congeners were summed using the Kaplan-Meir (K-M) method with Efron's bias correction, capped at the simple sum (see Appendix H, Tables H-7 through H-12). Undetected results were censored at the RDL; EMPC-qualified data were censored at the full reported value.
- **Summing PCB Aroclors –** Total PCBs as Aroclors were summed for each media. Since no more than two Aroclors were detected in a given medium, the K-M method could not be used to sum total PCBs as Aroclors. Instead, for summing total PCBs as Aroclors, the replacement value for individual Aroclors depended on whether or not that particular Aroclor had been detected in any of the other samples from the same media. If the analyte was undetected in all samples, a value of zero was used. If the Aroclor was detected in at least one sample in the media, the total was summed twice, once using the full MDL and once using the full MRL for censoring undetected values (see Appendix H, Tables H-4 through H-6 and Tables H-13 through H-17).
- **Summing PAHs –** In soil samples, total high molecular weight PAHs (HPAHs) and total low molecular weight PAHs (LPAHs) were summed for use in the ERAs. Total HPAHs, Total LPAHs, and Total PAHs were summed in sediment samples, for use in the ERA. HPAHs include benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene. LPAHs include 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, fluorine, naphthalene, and phenanthrene. Total HPAHs, Total LPAHs, and Total PAHs were summed using the K-M method with Efron's bias correction, capped at the simple sum (see Appendix H, Tables H-1 through H-3 and Tables H-18 through H-22). Total LPAHs, HPAHs, and

PAHs were summed twice, once using the full MDLs and once using the full MRLs for censoring undetected values.

5.1.1 Treatment of Data from Excavations in the Upland OU

Analytical data from composite samples of excavated soils that were replaced in test pits in the Upland OU were treated as follows:

- **Sandblast AOPC Data –** Soil samples from locations "TRA-04" and "TRA-02" (sampled in 2001) were in an area where vegetation was removed by USACE in 2004. Only vegetation and soils clinging to roots were removed from site (other soils were graded and remained on site, less than 6" of soil was disturbed). Since the soils that these samples represent were not definitively removed, these analytical results were utilized in the RI Report.
- **Landfill AOPC Test Pit Data –** In 2001, six composite soil samples, initially identified as "IDW," were collected and analyzed from the soil removed from the gully test pit (BIL01TPG, BIL02TPG, BIL03TPG, and BIL05TPG) and the mercury vapor-lamp test pit (BIL28TPM and BIL29TPM). The stockpiled soils were then used to backfill their respective excavation pits. The soil may have been placed anywhere within the 0-10 feet bgs depth of the test pits. This represents an element of uncertainty when using this data, since the risk assessment process considers three potential exposure intervals (0-1 foot bgs, 0-3 feet bgs, and 0-10 feet bgs). This uncertainty was recognized in the RI/FS MP (URS 2007a) and eight additional surface and shallow soil samples were collected from the gully test pit area in 2009 as part of the Landfill data gap sampling and analyzed for select analytes. Data from these recent samples supersedes the historical data for the 0-1 and 0-3 feet exposure intervals for this area. However, the data from the test pit soil samples were used for analytes that were not analyzed for in 2009. Specifically:
    - The data from the four gully test pit samples are included in the assessment of potential risk to ecological or human receptors exposed to surface and shallow soil intervals (0-1 and 0-3 feet bgs) except for o-xylene, toluene, PCE, and PAHs.
    - All the data from the four gully test pit samples are included in the 0-10 feet bgs interval, which is only applicable to human receptors.
    - The data from the two mercury vapor-lamp test pit samples were used in this RI Report and will be used in the RAs to assess risk to ecological and human receptors exposed to surface, shallow, and deeper soil intervals (0-1, 0-3, and 0-10 feet bgs) since there is no way to assign a depth at which the results for these samples occur.

5.2 Upland Operable Unit

Multiple investigations have been conducted by the USACE and its contractors to evaluate the environmental conditions in the Upland OU. As discussed above, the Upland OU includes four AOPCs (Figure 1-4):

- Landfill AOPC
- Sandblast Area AOPC

- Pistol Range AOPC
- Bulb Slope AOPC

Historical investigations of each are discussed below.

5.2.1 Landfill AOPC

5.2.1.1 Landfill Site Inspection – August/September 1998

The purpose of the initial Landfill Site Investigation (SI) was to assess the potential for historical disposal practices to have adversely impacted the environment and to assess whether additional investigation or remediation was necessary (Tetra Tech 1998). Specific areas of concern that were addressed during the SI included the Landfill, a pesticide/herbicide mixing area located just south of the Landfill, and the shorelines proximate to Bradford Island Landfill. The SI included:

- Summary of the USACE historical aerial photograph review of the Landfill site between 1936 to 1982.
- Summary of the findings of the USACE employee interviews, documenting historical waste disposal practices.
- Collection and analysis of four surface soil samples (three from background locations and one from downgradient of the pesticides mixing area)
- Collection and analysis of 10 subsurface samples from eight test pits (TP1 through TP8) and one soil boring (SB3) located within the Landfill footprint
- Collection and analysis of three samples of building materials (found within the Landfill test pits) for the presence of asbestos
- Installation and sampling of four groundwater monitoring wells (MW1, MW2, MW3, MW4)
- Completion of a visual survey of groundwater seeps along the north, east and south shores of Bradford Island, and the attempted collection of Columbia River sediment samples from the nearshore areas of Bradford Island

The SI report concluded that past disposal practices have impacted soil and groundwater in the Landfill with petroleum hydrocarbons, organochlorine pesticides, PCB Aroclor 1260, PCE, SVOCs, arsenic, and lead. Landfill debris encountered in the test pit excavations included mercury vapor lamps, electrical equipment, and asbestos-containing materials. None of the materials encountered in the excavations were removed. Additionally, no groundwater seeps were identified during a visual survey of the sloped banks of Bradford Island in the vicinity of the landfill during September 1998. Supplementary investigation of the Landfill was deemed necessary in order to evaluate potential remedial alternatives. The analytical results are included in Appendix A; however, the analytical results were not utilized in this RI Report for multiple reasons (i.e., sample reporting limits do not meet established data quality objectives, depth of soil samples incompatible with target depths needed for risk evaluations, etc).

5.2.1.2 Landfill Supplemental Site Inspection – 1999/2000

URS conducted an SSI of the Landfill for the USACE during 1999 and 2000. The purpose of the SSI was to augment information presented in the 1998 SI report, fill data gaps, conduct a risk

evaluation, and provide a list of alternatives for the long-term management of the Landfill. The SSI (URS 2000) included:

- Collection and analysis of 10 primary surface soil samples from Landfill AOPC (BIL01SSI, etc.)
- Installation of groundwater monitoring well (MW-5) in September 1999
- Collection and analysis of groundwater samples from the four wells (MW-1 through MW-4) in July 1999 and from five wells (MW-1 through MW-5) in November 1999, and January 2000
- Additional visual assessment for groundwater seeps, and the collection of seep soil and water samples
- Erosion potential evaluation
- A site survey to facilitate completion of a biological characterization
- A screening level human health and ERA

Analytical results from this investigation are included Table 5-1 and sample locations are shown in Figure 5-1. Results from this, and all subsequent investigations at the Landfill AOPC (discussed below) were included in this RI. The Draft SSI report (URS 2000) concluded that surface and subsurface soils contained relatively low concentrations of VOCs, SVOCs, metals, chlorinated herbicides, organochlorine pesticides, and PCBs. Groundwater contained relatively low concentrations of VOCs, SVOCs, petroleum hydrocarbons, and metals. One seep was found and results indicated that low concentrations of metals were detected in the seep water.

The SSI report (URS 2000) also included a preliminary risk screening for human health and ecological receptors based on landfill contamination. The report identified maintenance workers and on-site construction/excavation workers as human receptors that could be affected by inhalation of, incidental ingestion of, or dermal contact with surface and subsurface soil. Since groundwater is not used at the site as drinking water, it was not included in the preliminary human health screening.

The report identified three preliminary potential exposure pathways for aquatic and terrestrial ecological receptors: incidental ingestion of groundwater discharged to the Columbia River, dermal contact with groundwater discharged to the Columbia River, and incidental ingestion of on-site surface soil. Ecological and human health risk screening was conducted and concluded that soil and groundwater posed no risk to human receptors. The report also concluded that there were localized exceedances of risk-based screening levels for ecological receptors.

Based on DEQ's comments on the conclusions made in the Draft SSI report, USACE elected not to finalize the report. The DEQ and USACE agreed that additional investigation and analysis were necessary to address DEQ comments on the SSI report.

5.2.1.3 Slope Stability Assessment – 2001

The discovery of PCB-containing light ballasts along the shoreline during the SSI prompted additional investigations into the nature and extent of the debris, and into the potential for environmental impacts from these materials on ecological receptors in the Columbia River. The light ballasts found along the shoreline were thought at that time to have eroded from the

Landfill. URS conducted a slope stability assessment of the steep shoreline along the landfill in May 2001 to determine whether there were potential for landfill wastes to be transported from the landfill into the Columbia River by slope failures (URS 2001). The stability assessment findings included:

- The shoreline along the north slope of the landfill ranges from vertical to over-vertical, to a steep incline.
- Bedrock outcrops of conglomerate, sandstone, and limited siltstone (part of the slide block) are exposed along the north slope. The potential for bedrock failure is low.
- The contact between the slide block and overlying soils along the slope varies from less than 5 feet to 20 feet bgs.
- Where over-steepened, soils along the north slope are marginally stable, and have failed in the past, in one area.
- USACE personnel familiar with this area have not observed significant slope retreat over the past few years.
- There is no evidence that significant and/or multiple rock slope failures have occurred along the north slope of the island. Consequently, the possibility that slope failure transported waste from the landfill into the river is low.

In conjunction with the stability assessment, underwater surveys to locate and map the extent of all waste materials in the river were conducted in October and November of 2000, and in May 2001. All wastes identified were removed in December 2000 and March 2002 (URS 2001; URS 2002a,b,d). These activities are discussed in more detail in Section 6.2.2.

5.2.1.4 Draft Level I Ecological Scoping Assessment and Human Health Problem Formulation – 2002

A Draft Level I Ecological Scoping Assessment and Human Health Problem Formulation report was completed in 2002 for the Bradford Island Landfill (URS 2002d). This report discussed (qualitatively) potentially complete exposure pathways and identified COIs for human and ecological receptors. In conclusion, the report recommended that a Level II Ecological Screening Assessment be performed to provide a more thorough evaluation of the potentially complete and significant exposure pathways for ecological receptors based on soil, sediment, groundwater, surface water, and food-web contamination. The report also recommended that a BHHRA be performed.

5.2.1.5 Phase II Supplemental Landfill Site Investigation – 2001/2002

The objective of the additional site characterization investigation was to collect site information to assist in the characterization of known or suspected potential environmental concerns at the Landfill (Site Characterization Report, Bradford Island Landfill; URS 2004a). The additional site characterization field activities included:

- Collecting and analyzing 10 primary soil samples from a test pit in the gully area (BIL13 through BIL22)

- Removing mercury vapor lamps from a known area of disposal at the Landfill, and collection and analysis of seven primary soil samples from the mercury vapor-lamp excavation area (BIL05 through BIL11)
- Completing a geophysical evaluation of the Landfill using electrical resistivity and seismic refraction methods to estimate the extent of the Landfill
- Installing and developing four monitoring wells (MW-6, MW-7, MW-8, MW-9)
- Collecting and analyzing nine primary groundwater samples (one each) from MW-1 through MW-9
- Collecting and analyzing six primary soil samples at the Landfill (BIL24, BIL26, BIL27, BIL30, BIL31, BIL32)
- Collecting and analyzing six composite soil samples excavated from the gully test pit (BIL01TPG, BIL02TPG, BIL03TPG, BIL05TPG) and the mercury vapor-lamp test pit(BIL28TPM, BIL29TPM), which were then backfilled at their respective test pits at the Landfill

Additional tasks used to refine the CSM included:

- Developing a water budget for the Landfill area
- Determining the thickness of Landfill material and the thickness of unconsolidated material above the slide block
- Determining aquifer characteristics

The site characterization report (URS 2004a) concluded that wastes disposed of within the Landfill include household waste and project-related wastes such as grease, light bulbs, sandblast grit, and miscellaneous metal. The Landfill is located within a 0.63-acre area. Landfill materials and visually impacted soils did not appear to extend beyond 15 feet in depth. The estimated volume of the Landfill ranged from 9,900 to 7,500 cy, whereas the estimate for the actual debris may be as low as 3,758 cy plus any sandblast grit.

A minimal quantity of electrical debris were observed in the Landfill when compared to the amounts removed from within the river or on the shore of the island. There was no evidence that significant and/or multiple past slope failures have occurred along the north slope of the island. Consequently, the possibility that slope failures have transported electrical debris to the river was considered low to negligible.

The Landfill wastes were considered to have impacted soils primarily, with petroleum hydrocarbons, and select VOCs, SVOCs, metals, and PCBs. This resulted in groundwater being impacted with low levels of VOCs, SVOCs and metals. Groundwater was expected to discharge from the site into the river predominantly through diffuse flow or through fractures on the north side of the island.

Analytical results for this investigation are included Table 5-2 and the sample locations are shown in Figure 5-1.

5.2.1.6 Level II Screening Ecological Risk Assessment and Baseline Human Health Risk Assessment – 2004

A Level II Screening ERA and BHHRA report (URS 2004b) was completed for the Bradford Island Landfill. The Level II report concluded (with caveats) that risks to human health at the site were considered acceptable under current land use conditions and that risk reduction measures were not necessary to protect human health. The primary concerns identified for ecological receptors were the potential for direct exposure toxicity to birds and mammals from contact with Landfill soils. Based on some exceedances of ambient water quality criteria (AWQC) by site groundwater concentrations, additional evaluation of the potential for groundwater to impact surface water quality of the river was recommended.

The Level II report deferred a quantitative evaluation of risks posed by the aquatic habitat to after the sediment removal. Consequently, an EE/CA (URS 2005) for in-water sediment removal work was prepared in 2005 and provides an evaluation of human health and ecological risks related to the aquatic environment (primarily from contaminated sediment).

5.2.1.7 Upland Source Evaluation – January to August 2007

In 2007, an Upland Source Evaluation for the Landfill was conducted, which qualitatively evaluated the need for upland source control measures (URS 2007c,d). The focus of the evaluation was on direct transport of impacted soil to surface water, either through erosion and transport by storm water or by mass wasting. In April 2007, a limited soil sampling investigation between the Landfill and the river was conducted.

Six surface soil samples from the north slope of Bradford Island between monitoring well MW-6 and the Columbia River (BIL01USE, BIL02USE, BIL03USE, BIL07USE, BIL08USE, and BIL09USE). Three additional samples were taken on the eastern tip of the island where debris was removed in 2002, just upslope of former inwater pile #1 (BIL04USE, BIL05USE, and BIL06USE). Sample locations are shown in Figure 5-2 and analytical results are tabulated in Table 5-3. These nine samples, included in this RI report, were inadvertently omitted from the Upland DSR.

Undercutting was observed along the waterline at the north slope suggesting that historical mass wasting likely occurred. The Upland Source Evaluation for the Landfill concluded that since both slopes are covered with surface vegetation, there appears to currently be a low potential for soil migration via overland transport but that a quantitative erodibility study would be needed to further assess the potential for soil loss (URS 2007d).

5.2.2 Sandblast Area AOPC

The “Sandblast Area” is an informal name that has been used during past investigations to describe the former sandblast building and the area around the building where spent blast media (sandblast grit) has been placed on the ground surface or where other potential contamination sources may be present. Figure 3-4 depicts the Sandblast Area AOPC. As discussed in Section 3.5.1 and 4.1, potential contamination sources include:

- Former disposal area for spent sandblast blast grit
- Former HMSA located east of the equipment building
- Former transformer maintenance area east of the former sandblast building

- An inferred release of VOCs (i.e., PCE) from an AST historically located in the vicinity of the current HMSA
- Laydown area used for current storage of industrial equipment and materials located along the north and south sides of the landfill access road

5.2.2.1 Stormwater System Sampling and Cleaning–2001 to 2002

Solid materials from the catch basins and near the stormwater system outfalls on the northern perimeter of the Sandblast Area AOPC were sampled in May 2001. Based on the results of the catch basin and stormwater system outfall sampling, the stormwater system was identified as a potential pathway for conveying contaminants form the Sandblast Area AOPC to the river. In October 2001, the USACE cleaned the sediment from the stormwater system, replaced the filter fabric socks that line each catch basin, and characterized and disposed of the waste generated during the cleaning process.

Since the stormwater system was identified as a potential pathway for conveying contaminants form the Sandblast Area to the river, the USACE developed and implemented a regular inspection and maintenance program to prevent the discharge of sediment into the storm drain system (e.g., replacement of the filter socks on a periodic basis). Additional details regarding the stormwater system sampling and cleaning activities can be found in the In Water Investigation Report (URS 2002a) and the Storm Water Drain Cleaning Summary Technical Memorandum (URS 2002e). Since the stormwater system solids that were tested have been removed and disposed of, this data is not used in this RI Report.

5.2.2.2 Preliminary Assessment/Site Inspection Sandblast Area, Transformer Release Area, and Former Drum Storage Area – 2001/2002

The PA/SI of the Sandblast Area was conducted in 2001 to aid in the characterization of environmental concerns associated with the transformer maintenance area, and the former HMSA (also referred to as the former drum storage area) (URS 2002c). The SI included:

- Twenty-seven sandblast grit/soil samples collected from northeast, east, and south east of the former sandblast building (DSA01 through DSA12, SBB01, SBB03 through SBB07, SBB10 to SBB12, SBB13, SBB14, SBB17, SBB18, SBB23, and SBB24). Some of these samples were labeled as “sandblast” based on field observations to indicate samples containing higher quantities of sandblast; however, samples labeled as both “sandblast” and “soil” were treated as soil in this RI.
- Fourteen soil samples were collected near catch basin #1 (CB-1) and along the shoulders of the access road northeast of the former sandblast building (TRA01 through TRA07, TRA09, TRA11, TRA12, SBB09, SBB13, SBB15, and SBB16).

Sample locations are shown in Figure 5-2 and the associated analytical results are shown in Table 5-4. The burn pit located southeast of the former sandblast building and a septic tank northwest of the building was identified at that time as additional potential sources of contamination within the Sandblast Area AOPC. In addition, evidence of localized solvent-impacted soil was discovered south of the current HMSA. A soil sample (SBB18) collected below the grit-soil interface at approximately 2.5 feet bgs at this location exhibited a strong VOC odor and detections of VOCs and SVOCs.

The PA/SI report estimated that an area of approximately 20,000 square feet and 1 to 3 feet deep (1,500 to 2,000 cy) might be regulated as hazardous waste if excavated based on lead and chromium concentrations (URS 2002c). The total volume of sandblast grit present was estimated at between 1,410 and 2,025 cy. Figure 3-4 shows the approximate extent of the primary sandblast grit disposal area; however, evidence of sandblast grit was also observed in surface soils further to the north.

5.2.2.3 Soil Sampling – 2004

In April and May 2004, the USACE cleared the vegetation and graded an area of approximately 1,600 square feet near CB-1 (Figure 3-4). This work was performed to provide space for the storage of dam gates on several concrete piers. Less than 6 inches of topsoil were excavated by the USACE during vegetation removal. The vegetation and some soil connected to the roots were temporarily stockpiled in a roll-off dumpster.

After grading the area, USACE personnel collected 18 surface soil samples from the area that had been cleared and six soil samples from the dumpster. These samples were submitted for leachable lead and chromium analysis by TCLP. Analytical results are available in Appendix B of the SSI, Sandblast Area (URS 2006a). Based on the results, the soil in the dumpster was disposed of as hazardous waste at the chemical waste landfill in Arlington, Oregon. The TCLP results were not used in this RI Report because the TCLP analysis uses a simulated leachate sample to evaluate leachable COI concentrations for waste handling and disposal requirements.

5.2.2.4 Supplemental Site Inspection – 2004 to 2006

The SSI of the Sandblast Area was conducted in November 2004 to assist in the characterization of known or suspected potential environmental concerns at the Sandblast Area. The investigation method details and analytical results were summarized in the SSI, Sandblast Area (URS 2006a). The investigation included (Figure 5-2):

- Twenty four soil samples collected using hand augers and direct push borings near the current HMSA, adjacent to the river, outside of the sub basin captured by the former sandblast building stormwater system, from within the catch basins, around the septic tank, and beneath the former burn pit (DP1 though DP12 and HA1 through HA12).
- Twelve groundwater samples were collected from direct-push borings: four borings were drilled along the Landfill access road (DP1 through DP4), five borings were drilled in the drain field for the former sandblast building septic system (DP5 through DP9), and three were drilled in the presumed downgradient direction adjacent to the HMSA (DP10 through DP12).

The SSI concluded that in addition to the metals and butyltins, detected during the previous investigations, several other COIs were detected in the Sandblast Area AOPC. These included PCBs, SVOCs, and VOCs. The sandblast grit is not believed to be the source of contamination for these COIs. The report concluded that the four potential sources of PCB, SVOC, and VOC contamination were (URS 2006a):

- Incidental spills of hazardous materials at the southwest corner of the hazardous materials storage area.

- Storage of dam-related equipment along the Landfill access road. Oil-stained soil, metal painted with lead-based paint, and potentially PCB-containing equipment and insulators were observed in this area in 1996.
- Disposal and incineration of wastes in a former burn pit at the east end of the Sandblast Area.
- Transformer maintenance documented in the PA/SI (URS 2002c). A small release of PCB-contaminated oil occurred in 1995 at the paved area east of the former sandblast building during a transformer rehabilitation project.

Additionally, low levels of petroleum hydrocarbons, VOCs, SVOCs, butyltins, and pesticides were detected in several groundwater samples in the Sandblast Area AOPC.

During a previous investigation, air compressor blow-down water was identified as a potential source for lead and bis(2-ethyl hexyl) phthalate (B2EHP) identified in river sediments proximate to a drainage outfall north of the former sandblast building (URS 2002c). As part of the SSI, one sample of blow down water was collected from a pipe that conveys compressor blow-down water from the current sandblasting area in the service center building to the drainage ditch near the former sandblast building. The blow-down water appeared clear, did not have a sheen, and had no unusual odors. Neither B2EHP nor lead were detected in the blow-down water sample, but low levels of three SVOCs, four VOCs, and chromium were detected (URS 2006a).

5.2.3 Pistol Range AOPC

During the PA/SI for the Pistol Range, conducted in 2002, 73 soil samples were collected from 42 sample locations (in some locations samples were collected at different depths). The area investigated was approximately 200 feet long and between 20 to 30 feet wide (approximately 4,550 square feet). Figure 5-3 depicts the location of the Pistol Range and former firing shed in relationship to the sample locations. Table 5-6 tabulates the analytical results. The investigation method details were summarized in the PA/SI Report for the Former Pistol Range (URS 2003a).

Groundwater data were not collected during the PA/SI. In the preliminary screening of the data, the maximum soil analytical concentrations indicated that lead was the only metal elevated above relevant screening criteria at the time (USEPA Region 9 Preliminary Remediation Goals [PRGs]), and it was found primarily near the former firing shed and around the backstop (URS 2003a). These areas appeared to be relatively small (600 square feet around the firing shed, and 1,400 square feet of soil around the backstop) and shallow (impacts likely extend up to 2 feet bgs). The report also concluded that concentrations of both lead and zinc exceeded sediment screening values protective values for the benthic community and could cause a potential concern if the upland soils were transported to the river (URS 2003a).

5.2.4 Bulb Slope AOPC

A reconnaissance investigation of the Bulb Slope area was conducted in November 2002. The investigation and findings are described in the Draft Bulb Slope Reconnaissance Investigation and Evaluation of Potential Remedial Options (URS 2003b). The investigation included soil samples collected from eight locations. The sample locations are shown in Figure 5-4 and analytical results and provided in Table 5-7.

The investigation report concluded that PCBs as Aroclor 1260, lead, and mercury are present in soils within the area of visually observed glass debris at the Bulb Slope. The report estimated that approximately 95 to 125 cy of debris and impacted soil is present at the Bulb Slope on top of a bedrock base (URS 2003b).

5.3 River Operable Unit

The historical River OU data (samples collected prior to 2007) are not used in the risk assessments are therefore not discussed in detail in this report. The one exception is the Forebay smallmouth bass collected in 2006, are discussed in Section 6.0. The data for samples collected from the River OU from December 2000 forward are available in the project database (Appendix A) and tabulated historical data are included in Appendix G.

The USACE completed sediment evaluations associated with dredging and construction work related to the Bonneville Project in 1991 (USACE 1991), 1997 (USACE 1997b), 2001 (unpublished USACE study), and 2002 (URS 2002f).

In October and November 2000, underwater dive surveys were conducted due to the discovery of light ballasts on-shore on the north side of the island adjacent to the Landfill. The surveys identified waste-related items submerged in the Columbia River in three distinct piles, just offshore of the Landfill. As described in Appendix E of the In Water Investigation Report approximately 60 electrical items were removed from Debris Pile #1 and four sediment samples were collected during the recovery activities in December 2000 (URS 2002a).

A preliminary in-water investigation was conducted in May 2001 to evaluate sediment, clams and crayfish near the waste items in order to plan for a removal of the items (URS 2002a). Waste-related items were removed in February and March 2002 (URS 2002b). Additional investigations were completed in 2002 and 2003 to assess the extent of sediment related impacts from the waste-related items (URS 2003c and URS 2004c). Based on the results of the sediment investigations within the Forebay the EE/CA for sediment removal was completed in 2005 (URS 2005). The conclusion of the EE/CA was to perform dredging near the former debris pile areas along the tip and the northern shoreline of Bradford Island.

In April 2006, additional high volume surface water and sediment data were collected to support the EE/CA following the Surface Water and Sediment Sampling for Non-Time-Critical Sediment Removal Action QAPP (USACE and URS 2006). Analytical results were presented in the Removal Design Data Gaps Surface Water and Sediment Sampling Technical Memorandum (URS 2006b). A detailed summary of the historical investigations conducted in the River OU is presented in the RI/FS MP (URS 2007a).

5.4 Summary

This section summarized the investigations that occurred prior to the September 2007 RI/FS MP (URS 2007a). The relatively static physical environment of the Upland OU means that environmental data collected over the past decade can be considered representative of current conditions. Except where data quality does not meet the standards outlined in the RI/FS MP (URS 2007a), analytical results from investigations in the Upland OU from 1999 to 2009 were included in the RI data set and were evaluated in the risk assessments (exceptions are noted above). The results of Upland OU investigations that were conducted following the RI/FS MP are summarized in the next section (Section 6.0).

The physical environment of the River OU is much more dynamic. As discussed previously, the electrical equipment and debris and the majority of the contaminated sediment were removed from the river between 2001 and 2007, and water movement and human activities have redistributed sediment within the Forebay. Additionally, the sampling methods used to collect the historical data in the River OU are not comparable to the recent sampling which was conducted in accordance with the procedures outlined in the River OU QAPP (URS 2007b), Revised Sculpin Analysis Strategy Technical Memorandum (URS 2009b), and In Water QAPP Addendum (URS 2009c). In order to focus on the current river conditions, only analytical results from investigations in the River OU after 2007, with the exception of smallmouth bass collected in 2006, were included in the RI data set and were used in the risk assessments. The results of River OU investigations that were conducted following the RI/FS MP, as well as the Forebay smallmouth bass collected in 2006, are summarized in the next section (Section 6.0).

6.0 RECENT SITE INVESTIGATIONS

Recent site investigations are defined in this report as investigations occurring after the completion of the September 2007 RI/FS MP (URS 2007a), which described the overall site investigation management plan. The goal of the RI/FS MP was to provide a foundation for subsequent investigations to support the preparation of this RI report, the HHRAs and ERAs, and to permit evaluation of engineering alternatives to address site contamination. Section 8.0 of the RI/FS MP describes the data gaps for the Upland and River OUs. Data gaps were identified under three categories: gaps with respect to understanding nature of contamination, gaps with respect to understanding the extent of contamination, and gaps with the respect to the ability to perform risk evaluations.

Data gap sampling for the Upland and River OUs was completed in 2007 through 2009, following the guidance of the Upland OU QAPP (URS 2008a), Upland QAPP Addendum (URS 2009a), River OU QAPP (URS 2007b), Revised Sculpin Analysis Strategy Technical Memorandum (URS 2009b), and In Water QAPP Addendum (URS 2009c). Upon completion of the data gap sampling, two reports were prepared evaluating whether the objectives of the RI/FS MP were met. The Upland OU DSR (URS 2009e) and the River OU DSR (URS 2009d) concluded that the data met project objectives outlined in the RI/FS MP and the data were sufficient and usable for the completion of this RI and the risk assessments. The following sections briefly summarize the data gap sampling investigations conducted in the Upland and River OUs. The data presented in this section are used in the risk evaluations (unless otherwise noted).

The comprehensive data set used for the RI includes historical samples that meet data quality objectives (Upland OU only) and recent samples (Upland and River OUs). Appendix G provides the historical data not utilized in the RI due to poor data quality or because historical samples are no longer representative of current conditions. The historical investigations are discussed in Section 5.0, and recent investigations are described in this Section. The total number of samples included in this RI for each sample matrix are presented in Table 6-1.

Section 5.1 summarizes the processing treatments for the Upland OU and River OU data necessary for use in the RI Report. Processed and unprocessed data are provided in Appendix A, along with a complete enumeration of the processing treatments. Appendix E provides the laboratory reports and Appendix F provides the data validation reports. Appendix H presents the results of the individual congener analyses, along with the methodology used for summing total PCBs as congeners, total PCBs as Aroclors, and total PAH, and tables with the sums for each sample.

6.1 Upland OU

This section briefly summarizes the investigations and sampling that occurred after the September 2007 RI/FS MP (URS 2007a). Analytical data from these investigations is incorporated in this RI Report and used in the risk evaluations.

6.1.1 Landfill AOPC

The recent fieldwork completed in the Landfill AOPC included the sampling of four quarters of groundwater data and the collection of additional surface and near-surface soil samples from the gully area (URS 2008a).

The field activities included:

- Collection/analysis of four quarters (March 2008, July 2008, October 2008, and January 2009) of groundwater samples from the nine monitoring wells located in the Landfill AOPC
- Survey for groundwater seeps during each quarterly groundwater event. Collection/analysis of samples from each observed seep along with the surface water immediately adjacent to the seep.
- Collection/analysis of soil samples from depth intervals of 0-1 foot bgs and 1-3 feet bgs from four test pits (L1 though L4) in the gully area.

Details of the well installation of the Sandblast Area AOPC groundwater wells are included in the Groundwater Monitoring Well Installation Report (URS 2008b). The results for the groundwater sampling were reported quarterly, with each successive quarterly report incorporating data from the previous reports, therefore the fourth quarter report will be referenced here (URS 2009g). Finally, the results for the soil samples collected from the gully area were included in the Upland OU Data Gap Sampling Report (URS 2009f). Sample locations are shown in Figure 5-1 and the analytical results are tabulated in Table 6-2.

6.1.2 Sandblast Area AOPC

The data gaps identified for the Sandblast Area AOPC in the RI/FS MP (URS 2007a) included the need for additional groundwater, soil, and soil gas samples. Following the publication of the RI/FS MP, routine maintenance activities occurred in July 2008 that included scraping and stockpiling surface soils to extend the eastern portion of the laydown area. The actively exposed soils appeared to have tar-like residue (URS 2009a). The USACE elected to performed additional site investigations on the newly exposed soils, which are included in the discussion below.

The recent field activities in the Sandblast Area AOPC included:

- Installation of five groundwater monitoring wells in the Sandblast Area AOPC (MW-11 through MW-15).
- Collection/analysis of four quarters (March 2008, July 2008, October 2008 and January 2009) of groundwater samples from the five monitoring wells located in the Sandblast Area AOPC.
- Collection of surface and near surface soil samples from eight sampling stations (SB1 through SB8) within known areas of sandblast grit disposal to be sieved into two size fractions and analyzed for lead only.
- Collection/analysis of five soil gas samples (SB10 through SB14).

- Collection/analysis of five soil samples from five test pits in the newly exposed laydown area (LD1 through LD5).
- Collection/analysis of six surface soils from stockpiled soils in the laydown area (LD6 through LD11).

Details of the well installation of the Reference Area groundwater well are included in the Groundwater Monitoring Well Installation Report (URS 2008b). The results for the groundwater sampling were reported quarterly, with each successive quarterly report incorporating data from the previous reports, therefore the fourth quarter report will be referenced here (URS 2009g). The sampling activities and results are included in the Upland OU Data Gap Sampling Report (URS 2009f). Sample locations are shown in Figure 5-2 and analytical results are tabulated in Table 6-3.

6.1.3 Pistol Range AOPC

The recent fieldwork completed in the Pistol Range AOPC included the collection and analysis of grab groundwater samples and lagoon sediment samples.

The field activities included:

- Collection/analysis of two grab groundwater samples (PR1 and PR2D)
- Collection/analysis of five sediment samples from the Pistol Range Lagoon (PR4 through PR8).

The sampling techniques and results are included in the Upland OU Data Gap Sampling Report (URS 2009f). Sample locations are shown in Figure 5-3 and analytical results are tabulated in Table 6-4.

6.1.4 Bulb Slope AOPC

No data gaps were identified for the Bulb Slope AOPC in the RI/FS MP (URS 2007a); therefore, additional sampling was not performed at this AOPC.

6.1.5 Reference Area

The objective of the Reference Area was to provide site-specific background concentrations of inorganic COIs in soil and groundwater (URS 2008a). The samples were also analyzed for selected organic analytes to evaluate the potential contribution, if any, of non-site-specific sources to organic COI to site risk.

The field activities for the Reference Area included:

- Installation of the Reference Area groundwater monitoring well (MW-10)
- Collection/analysis of four quarters (March 2008, July 2008, October 2008 and January 2009) of groundwater samples from the Reference Area monitoring well.
- Collection/analysis of fourteen surface soil samples (R1 through R14)

Details of the well installation of the Reference Area groundwater well are included in the Groundwater Monitoring Well Installation Report (URS 2008b). The results for the groundwater sampling were reported quarterly, with each successive quarterly report incorporating data from

the previous reports, therefore the fourth quarter report will be referenced here (URS 2009g). The sampling techniques and results are included in the Upland OU Data Gap Sampling Report (URS 2009f). Sample locations are shown in Figure 6-1 and analytical results are tabulated in Table 6-5.

6.1.6 Upland OU Erodibility Studies

As described in the RI/FS MP (URS 2007a), the identification of erodible soils was identified as a data gap for the Upland OU. Erodibility surveys were carried out in 2009 for each of the three primary AOPCs, including the Landfill, Sandblast Area, and Pistol Range AOPCs. A visual survey was performed for the Bulb Slope AOPC because this AOPC is a steep, rocky, vegetated slope on the north shore of Bradford Island, which was not suitable for the model used in the Erodibility surveys of the other AOPCs.

The objective of these surveys was to estimate the volume of sediment, and associated mass of COIs, potentially transported from each of the AOPCs to the Columbia River. Field surveys of the site were conducted on January 26 and February 5, 2009 (URS 2009f). The erodibility study identified only a limited portion of the Sandblast Area AOPC, where soils had been temporarily exposed during construction activities, as having a potentially complete pathway associated with stormwater runoff to the river. No currently-erodible soils were identified in the Landfill, Bulb Slope, or Pistol Range AOPCs. In a follow-up sampling event in March, 2009, surface soil samples were collected from the potentially erodible soils at the Sandblast Area AOPC. This included:

- Collection/analysis of two composite soil samples from the sloped area north of the former sandblast building, near catch basin #2 (CB-2), in the Sandblast Area AOPC. Eight subsamples were composited into sample SB-EUA and sixteen subsamples were composited into sample SB-EUB. VOC analyses were conducted on eight discrete subsamples (SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, and SB-EUB-15).

For further details, see the Erodibility Study presented in Attachment E of the Upland OU Data Gap Sampling Report (URS 2009f). Sample locations are shown in Figure 5-2 and analytical results are tabulated in Table 6-3. As discussed above, since March 2009, this portion of the Sandblast Area AOPC has become revegetated and no longer contains erodible soils.

6.2 River OU

This section briefly summarizes the recent sampling activities, including:

- Sampling of smallmouth bass, sediment, and clam samples in 2006 and 2007 prior to the sediment removal,
- Monitoring during the removal action,
- Post-removal statistically-based sampling in the Forebay and Reference area,
- Sampling of downstream sediment, and
- Targeted sampling in the Forebay (Eagle Creek and Goose Island Slough).

Analytical data from these investigations were used in this RI and the risk evaluations, unless otherwise noted.

6.2.1 Pre-Removal Sampling

In June and August 2006, the USACE collected smallmouth bass (and one sucker composite sample) from the Forebay. The findings were presented in the Forebay and Reference Area Smallmouth Bass Collected June 2006 through May 2008 Summary Report (URS 2008c). Sample locations are shown in Figure 6-2 and the analytical results are included in Table 6-6. These smallmouth bass samples were archived pending collection of the Reference Area smallmouth bass (Section 6.2.3). Data from the Forebay smallmouth bass samples are included quantitatively in the risk assessments. The data from the single sucker sample are considered qualitatively in the risk assessments.

In September 2007, pre-removal sediment and clam samples, from the vicinity of the three former debris piles, were collected following the River OU QAPP (URS 2007b). The pre-removal samples were collected from within the footprint of the planned sediment removal area. Five sediment samples and four co-located clam samples were collected. Clam tissue was scarce at one of the five sediment locations (sample station 4) and therefore could not be collected. The objective of collecting these co-located clam and sediment samples was to enable the estimation of biota-sediment accumulation factors (BSAFs) and to estimate concentrations of PCBs that might be present in the removal area. Analytical results are reported in the Pre-Removal Action Sediment and Clam Sampling Analysis (URS 2008d). Sample locations are shown in Figure 6-3 and the analytical results are included in Table 6-7. These data are not representative of post-removal conditions, but, at the request of TAG members, the data are considered qualitatively in the risk assessments.

6.2.2 Sediment Removal and Monitoring

The preferred option selected during the EE/CA for sediment removal was dredging near the former debris pile areas along the tip and the northern shoreline of Bradford Island (URS 2005). Sediments were removed between October 2 and October 30, 2007 using used diver-assisted hydraulic dredging starting on. The total area dredged was approximately one acre as detailed in the Project Closure Report (HAI 2007) and shown in Figure 6-3. Sediments were dewatered onsite. The process produced dredge effluent water that was treated by gravity separation, particulate filtration and carbon filtration prior to being discharged back to the Columbia River. The sediment was contained on a barge and disposed of offsite.

To assess the potential for impacts to the Columbia River from the dredging operation and the discharge of the treated water (i.e. effluent), a water quality monitoring program was developed and implemented (URS 2007e). The program consisted of sampling the dredge effluent at the point of discharge on a weekly basis during dredging, deploying semi-permeable membrane devices (SPMDs) prior to dredging (e.g. to establish baseline conditions) and during dredging, collecting grab water samples in conjunction with the SPMD deployments, and measuring turbidity during dredging.

Turbidity monitoring results are presented in the Project Closure Report (HAI 2007). Analytical data from dredge effluent, SPMD, and surface water samples collected between August 20, 2007 and November 2, 2007 are summarized in the Water Quality Monitoring Report In-Water

Removal Action (URS 2008e) and are included in the projected database (Appendix A). The dredge effluent samples showed no detectable PCBs in either the particulate or dissolved phase in the dredging return water. The SPMD results showed the dissolved fraction of PCBs in the water column both before and during dredging the activity were at very low levels, on average approximately 30 picograms per liter (pg/L) (URS 2008e). Comparison of the SPMD results between the removal action area and the downstream station indicate that the dredging activity did not have any appreciable effect on the concentration of PCBs in the dissolved fraction of the water column. Since the analytical data collected to monitor the dredging they are not used in the risk assessment and are not discussed further.

6.2.3 Forebay and Reference Area Post-Removal Sampling

While extensive sediment data had previously been collected in the River OU, sampling was focused near the former debris piles and tissue sampling was primarily focused on lower trophic level media. Additionally, these historical samples do not represent current (port-removal) conditions in the Forebay. The RI/FS MP (URS 2007a) identified the following data needs:

- A statistically-based program of collection/analysis of sediment and tissue data from the Forebay to assess the migration of biomagnifying COIs through the food web.
- A statistically-based program of collection/analysis of sediment and tissue data from an upstream Reference Area to establish site-specific background concentrations of inorganic COIs and evaluate the contribution of ambient concentrations of organic COIs to the site-wide risk estimate.
- Collection/analysis of surface water from the Forebay and Reference Area to evaluate surface water impacts in the Forebay
- Collection/analysis of targeted sediment data from the mouth of Eagle Creek, hereafter referred to as the "Eagle Creek" samples, to assess exposure to sediments for human anglers.

In addition, after the preparation of the RI/FS MP, one additional data need was identified:

- Collection/analysis of targeted sediment and tissue (clams, crayfish, and sculpin) data from the slough on the southern side of Goose Island, hereafter referred to as the “Goose Island” samples, to further investigate the presence of PCBs detected in smallmouth bass random Forebay samples.

6.2.3.1 Statistical Sampling of Sediment, Clam, Crayfish, Sculpin and Smallmouth Bass

As described in the QAPP a minimum of 14 samples were required for each media in order to meet the sample size needed for statistical comparison. The target sample size for each media was therefore between 14 and 21 randomly selected sampling stations for sediment, clam, crayfish and sculpin in both the Forebay and Reference Area (URS 2007b).

Sediment and clam tissue were successfully collected in February/ March 2008 from 17 and 19 of the randomly selected stations in the Forebay and Reference Area, respectively (URS 2008f). Crayfish and sculpin trapping at the random stations did not result in sufficient sample mass to generate the minimum number of samples (i.e., 14 each in the Forebay and Reference Area). Therefore, the traps were set in nearby areas outside the original randomly selected sampling

stations which posed more suitable habitat. This strategy was successful for crayfish, but insufficient sculpin were obtained in during the February and March 2008 field activities (URS 2008g).

Additional sculpin collection in both the Forebay and Reference Area was carried out by the USGS between July and October 2008 and resulted in sufficient sculpin mass for analysis. A geographical-based sculpin compositing scheme was proposed by the USACE (URS 2009h). Based on comments received from the TAG during the January 28, 2009 TAG meeting, the final compositing scheme was selected as described in the Revised Sculpin Analysis Strategy Technical Memorandum (URS 2009b).

As described in Section 6.2.1, smallmouth bass were collected in the Forebay in June and August 2006, prior to sediment remediation and archived pending collection of the Reference Area smallmouth bass. Smallmouth bass were collected from the Reference Area in October and November 2007 and May 2008 (URS 2008c). Due to the relatively large home range of the smallmouth bass, sample locations were not restricted to the 21 randomly selected sampling stations. Additionally, due to a lack of suitable habitat, insufficient smallmouth bass were caught within the geographical boundary of the Reference Area, so the data set includes bass caught further upstream (Figure 6-2).

Multiple data deliverables were submitted (URS 2008c,f,g; URS 2009i,j). The number of samples in both the Forebay and Reference Area met the statistically-required minimum sample size for sediment, clams, crayfish, scuplin, and smallmouth bass (Table 6-1). Analytical results for sediment and tissue media collected in Forebay and Reference Area are presented in Tables 6-6, 6-8 through 6-11 and are included in the project database, Appendix A. Sample locations for sediment and tissue media collected in the Forebay and Reference Area are presented in Figures 6-2, 6-3, and 6-4.

Analytical data for the randomly sampled Forebay media (sediment, clam, crayfish, sculpin and smallmouth bass) are used in the risk assessments. Targeted Forebay sample stations (Eagle Creek and Goose Island) are also shown on Figure 6-3. These data are also considered in the risk assessments. Reference Area data are considered in the risk assessments when evaluating the site-related contribution to risk in the Forebay.

6.2.3.2 Surface Water

Five high volume surface water samples were collected in the Forebay and Reference Area between February and March 2008 (URS 2008f and URS 2009f). Sample locations are presented in Figures 6-3 and 6-4. Analytical results are presented in Table 6-12, and are used in the risk assessments.

6.2.3.3 Targeted Sediment Sampling at Eagle Creek

Two sediment samples were collected from the mouth of Eagle Creek in February 2008 (URS 2008f and URS 2009j). Sample locations are shown in Figure 6-3. Analytical results are presented in Table 6-13. These data are used for evaluation of the direct contact pathway in the HHRA.

6.2.4 Downstream Sediment

USACE had not collected sediment samples from depositional areas downstream of the dam prior to 2008. The objective of the 2008 downstream sediment investigation was to assess the potential for sediment impacts related to releases from the site downstream of the dam. Six downstream sediment locations were chosen from likely depositional areas based on hydrodynamic modeling (URS 2007a,b) and are shown on Figure 6-5. Sediment samples were collected in March 2008 from these sample stations (URS 2008f and URS 2009i). Analytical data are presented in Table 6-14.

6.2.5 Goose Island Slough

During the January 28, 2009 TAG meeting, the Goose Island Slough (slough) was identified as a potential data gap by Oregon DEQ and USFWS, due to the fact that many of the Forebay smallmouth bass were collected from the slough, while the other Forebay media were collected from the main channel of the Columbia River. It was suggested by Oregon DEQ and USFWS during the January TAG meeting that additional samples from the slough would aid in filling this potential data gap.

Based on these comments, an Addendum to the River OU QAPP (URS 2009c), detailing the additional slough sampling, was submitted to and reviewed by the TAG. The Goose Island Slough samples were collected in April/May 2009. The sampling locations are shown on Figure 6-3 and the analytical results are presented in Table 6-13. A report summarizing the historical and recent (2009) analytical data from samples located in the slough and in the immediate vicinity of Goose Island was submitted to the TAG (URS 2009k). This report concluded that it is highly probable the elevated PCB concentrations observed in the smallmouth bass collected from the slough were the result of historical body burden associated with the contaminated equipment and sediments that have since been removed from the northern side of Bradford Island. These data are considered in the risk assessments.

7.0 DATA QUALITY ANALYSIS

The tables included in Chapters 5 and 6 represent the comprehensive set of data used in this RI for the evaluation of nature and extent of contamination, as well as the human health and ecological RAs. This chapter discusses the quality of this comprehensive data set and its suitability for the completion of these tasks. The data quality evaluation covers the following topics:

- Sample sizes
- J-flagged Data
- Variable MDLs and MRLs
- MDLs of undetected data greater than SLVs
- MRLs of undetected and J-flagged data greater than SLVs

To assist the reader, the following definitions are provided from the DoD Quality Systems Manual for Environmental Laboratories Version 4.1 (DoD EDQW 2009) provides the following definitions for these parameters:

Method Detection Limit

The MDL is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero, and it is determined from analysis of a sample in a given matrix containing the analyte.

Method Reporting Limit

The MRL [referred to as the Limit of Quantitation (LOQ) in DoD EDQW 2009] is the minimum concentration of a substance that can be reported with a specified degree of confidence. It is the lowest concentration that produces a quantitative result within specified limits of precision and bias. For DoD projects, the MRL (or LOQ) is set at or above the concentration of the lowest initial calibration standard.

U-flagged Data

A "U" flag, or qualifier, indicates that the analyte was not detected (ND) and is reported as less than the limit of detection defined by the client. The limit of detection has been adjusted for any dilution or concentration of the sample.

J-flagged Data

A "J" flag, or qualifier, indicates that the reported result for an analyte is an estimated value. More specifically, matrix interference was observed or the analyte was detected at a concentration outside the range of values in a laboratory instrument calibration curve between the MRL and the highest successfully analyzed initial calibration standard for that instrument.

For purposes of this project, the limit of detection is defined as the MDL. Therefore, *all references to "detections" indicate that a particular analyte within a given medium was measured at a concentration greater than the MDL. Similarly, all references to "non-detect", or U-flagged, results indicate that an analyte was not detected above the MDL*, unless otherwise noted.

As described in the definition, above, data may be qualified with a J flag for multiple reasons. Although certain data for this project are J-flagged due to matrix interferences and other reasons related to data quality (e.g., holding times exceeded, surrogate failure, and peak identification), this section specifically evaluates data that are J-flagged *because the estimated result is reported between the MDL and MRL*. Evaluation of J-flagged data is important because these results were treated as detected concentrations, and this assumption introduces uncertainties in the RI and RAs, as discussed in Section 7.4.

Section 7.1 presents the data summaries, for each COI and each medium, for each of the Upland AOPCs and the River OU. This section identifies data sets with limited sample size and discusses the use of J-flagged data. Section 7.2 presents the statistics for data sets with at least two detected results and discusses the effect of censoring undetected data at the MDLs versus the MRLs on the resulting statistical parameters (i.e., upper confidence limits [UCLs]). Section 7.3 presents a brief discussion on the relevant SLVs used to screen data for the risk assessments. Section 7.4 presents the data sensitivity analysis, in which the MDLs and MRLs are compared to the SLVs to identify specific COIs and matrices for which the literature-based SLVs may be lower than the sensitivity of current analytical methods.

Since this data quality evaluation was conducted in support of the HHRA and ERA, the evaluation includes not just each of the individual AOPCs, but also the combination of the four AOPCs. This is because certain receptors have the potential to be exposed to all four Upland AOPCs. The combined data set is used for evaluating potential risk to these wide-ranging receptors. The analysis does not consider whether or not the soils in the four AOPCs have different characteristics. The combined data set characterizes the combined potential exposure.

7.1 Data Summary

In this section, the data summary tables for the Upland and River OUs presented in Appendix I are described.

In regards to sample size, any analyte/matrix with a total sample size (detections and non-detects) of fewer than eight is considered to be a limited sample size for which statistical upper-bound estimates of the mean, such as the UCL, cannot be reliably estimated (Singh et al. 2010). In these cases, the maximum detected concentration was used as the exposure point concentration (EPC) for human receptors and all mobile ecological receptors in the risk assessments.

For the population-to-population statistical comparisons to identify COIs that are above Reference concentrations (Section 8.0), a minimum number of 14 samples were required to achieve the desired level of confidence in the results. For data sets with fewer than 14, but more than eight samples, the population-to-population statistical comparisons were conducted, but the level of confidence associated with the results is lower. For these data sets with even fewer samples, the range in concentrations of the site data was compared to the range of concentrations observed in the Reference Area, and box-and-wisker plots were used to determine whether or not site data was higher than Reference Area data. More information is provided in Section 8.0.

7.1.1 Upland OU

Tables I-1, I-2, I-3, and I-4 in Appendix I present the data summaries for the Landfill, Sandblast Area, Pistol Range, and Bulb Slope AOPCs, respectively. The data summary for all four AOPCs

combined is presented in Table I-5, and the Reference Area data summary is presented in Table I-6 in Appendix I. The tables summarize the data by AOPC, medium, analyte group, preparation fraction, analyte, and depth category. The data summary tables provide the number of samples, number of detections, range of detections, and detection rate. All tables also note which data sets are considered limited because they contain fewer than eight samples (a summary of analytes with limited data sets is provided in Table 7-1). They also include the range of MDLs for non-detects, range of MRLs for non-detects and detects below the MRL (i.e., J-flagged), number of non-detects, number of detects between the MDL and MRL (J-flagged), and number of detects above the MRL.

The following text provides a brief description of the data summaries for the four AOPCs.

Landfill AOPC - Among the soil data sets available for the Landfill AOPC (0 to 1, 0 to 3, and 0 to 10 feet bgs), more than eight samples (between 9 and 44 samples) are available for most of the analytes, with the exception of butyltins, a few herbicides and pesticides, and one SVOC (Table I-1). With the exception of aluminum, cobalt, and vanadium for the 0 to 1 and 0 to 3 foot depth intervals, the minimum number of 14 samples was achieved for metals and PAHs for population-to-population statistical comparisons. For the butyltins, limited data sets (fewer than eight samples) only occur with soil from 0 to 1 foot bgs; more than eight samples are available for the other two depth intervals. For the herbicides and pesticides and the one SVOC (total benzofluoranthenes), limited data sets are associated with soil from the 0 to 1 and 0 to 3 feet bgs; and more than eight samples are available for the 0 to 10 foot depth interval. It should be noted that more than 14 samples are available for all soil data sets for both benzo(b)fluoranthene and benzofluoranthene, measured as separate analytes.

For the subset of the samples that comprise the data set for mass wasting soils (0 to 1 foot bgs), more than eight samples are available for most metals, pesticides, PCBs, SVOCs, and PAHs, but not for all herbicides, three TPH mixtures, one SVOC (aniline), and all VOCs.

For groundwater, more than 8 samples are available for all analytes (inorganics and organics) measured as total concentrations in this medium. All groundwater samples from the Landfill were collected from monitoring wells. Dissolved data are available for the 20 metals analyzed for in groundwater, and more than eight dissolved results are available for nine of these metals. Limited data sets are available for seep and surface water data associated with the Landfill for all analytes.

Sandblast Area AOPC – Among the soil data sets available for the Sandblast Area AOPC (0 to 1, 0 to 3, 0 to 10 feet bgs), more than eight samples (between eight and 81 samples) are available for all analytes, including sieved samples analyzed for lead (Table I-2). The minimum number of 14 samples was achieved for all metals and PAHs in soil from these 3 depth intervals, allowing for population-to-population statistical comparison, with the exception of benzo(b)fluoranthene and benzofluoranthene in the 0 to 1 foot bgs data set. Between five and six samples are available for soils collected deeper than 10 feet bgs. In addition, five soil gas samples were collected from the Sandblast Area.

For the subset of the samples that comprise the data set for mass wasting soils (0 to 1 foot bgs), more than eight samples are available for all VOCs, but not for the remaining analytes.

Two types of groundwater data have been collected at the Sandblast Area AOPC: monitoring well samples and direct push grab samples. For groundwater collected from monitoring wells,

more than eight samples are available for arsenic, iron, and vanadium measured as total and dissolved concentrations, and limited data sets are associated with the remaining inorganics (all essential nutrients) that were only measured as dissolved concentrations. More than eight samples are also available for monobutyltin, three TPH mixtures, and the three PAHs analyzed for in groundwater. Fewer than eight samples are available for five of the 65 VOCs analyzed for in groundwater. All monitoring well data for organics were measured as total concentrations.

For direct push groundwater, more than eight samples are available for all metals, which were measured as both total and dissolved concentrations, and for all VOCs (measured as total concentrations). Fewer than eight samples are available for butyltins, pesticides, PCBs, three TPH mixtures, which were measured as total concentrations. SVOCs and PAHs were measured as both total and dissolved concentrations in direct push samples, and fewer than eight samples are available for four of the 68 total samples and 16 of the 67 dissolved samples (none of these are PAHs).

Pistol Range AOPC - More than eight samples (between 10 and 63 samples) are available for the metals analyzed for in soil (0 to 1 foot bgs) of the Pistol Range (Table I-3), with lead having the highest number of samples. Limited data sets are associated with antimony and arsenic. With the exception of antimony, arsenic, molybdenum, and zinc, the minimum number of 14 samples was achieved for metals for the population-to-population statistical comparison.

Fewer than eight samples are available for the four metals (copper, lead, nickel, and zinc) analyzed in lagoon sediment and direct push groundwater samples (measured as both total and dissolved concentrations).

Bulb Slope AOPC - More than eight samples (between 8 and 12 samples) are available for all of the analytes measured in soil (0 to 1 foot bgs) of the Bulb Slope (Table I-4): lead, mercury, PCB Aroclors, and TPH. Population-to-population statistical comparisons were performed comparing metals concentrations in the Bulb Slope AOPC to the Reference Area; however, the level of confidence in the results was lower than desired.

All Four AOPCs Combined - Excluding the soil samples collected from deeper than 10 feet bgs, which are not included in the combined AOPC data set, more than eight samples (between 13 and 199 samples) are available for all of the analytes measured in soil (0 to 1, 0 to 3, and 0 to 10 feet bgs) (Table I-5). The minimum number of 14 samples was achieved for all metals in soil from all three depth intervals for the population-to-population statistical comparisons.

For groundwater collected from monitoring wells, more than eight samples are available for all analytes (inorganics and organics) measured as total concentrations in this medium. Dissolved data are available for the 20 metals analyzed for in groundwater from the Landfill, and fewer than eight dissolved results are available for nine of these metals. Limited data sets are available for seep and surface water data associated with the Landfill AOPC for all analytes.

For direct push groundwater, fewer than eight samples are available for butyltins, pesticides, PCBs, three TPH mixtures, which were measured as total concentrations. Fewer than eight samples are available for four of the 68 total samples and 16 of the 67 dissolved samples analyzed as SVOCs and PAHs (none of these are PAHs).

Upland Reference Area - Fourteen samples are available for the two classes of analytes measured in Reference Area soils (0 to 1 foot bgs) (Table I-6), which is sufficient for statistical comparison to site soils. Fewer than eight background groundwater samples are available for all

analytes since there is only a single monitoring well located in the Reference Area. Groundwater collected from the Reference Area was not intended for statistical comparisons, but rather a semi-quantitative comparison to groundwater from the three AOPCs with groundwater data.

Summary - The minimum number of 14 samples are available for most metals and PAHs in soil, which allows for a population-to-population statistical comparison with Reference Area data at the desired level of confidence. In addition, the minimum number of eight samples required to calculate a 95% UCL (i.e., the EPC used for human receptors and all mobile ecological receptors) was achieved for most analytes measured in media of the Upland OU. For those data sets that were intended for statistical comparisons, the EPC for analytes with fewer than eight samples will be based on the maximum concentration because a UCL cannot be estimated reliably (e.g., tributyltin in the 0 to 1 foot interval for Landfill soils, Table I-12). This is consistent with conventional risk assessment guidance (USEPA 1989). The potential for over prediction or under prediction of risk related to use of the maximum concentration is difficult to assess but does represent the most conservative use of the available data. Some of the data sets identified above with limited sample size were generally not intended for statistical calculations but rather for assessing nature and extent and for gaining a better understanding of fate and transport mechanisms (e.g., Upland to River migration patterns). This minimizes the uncertainty associated with the small data sets.

7.1.2 River OU

Tables I-7, I-8, I-9, I-10, and I-11 in Appendix I present the data summaries for the Pre-Sediment Removal Forebay, Random Forebay, Targeted Forebay, Downstream, and Reference Area, respectively. Data summaries for PCB congeners, when available for a given area, are shown separately from the other analyte groups. The tables summarize the data by area, medium, analyte group, preparation fraction, and analyte. The summary tables provide the number of samples, number of detections, range of detections, and detection rate. All tables also note which data sets are considered limited because they contain fewer than eight samples (a summary of analytes with limited data sets is provided in Table 7-2). For all analytes except PCB congeners, the tables also include the range of MDLs for non-detects, range of MRLs for non-detects and detects below the MRL (J-flagged), number of non-detects, number of detects between the MDL and MRL (J-flagged), and number of detects above the MRL.

The PCB congener tables instead include the range of RDLs for non-detects, number of non-detects below the RDL, range of reported values for EMPC-qualified data, and number of EMPC-qualified results. For PCB congeners, the limit of detection is defined as the RDL or the EMPC (both handled in the same manner), such that *all references to "detections" indicate that a particular congener within a given medium was measured at a concentration greater than the RDL or EMPC*, unless otherwise noted. Similarly, *all references to "non-detect" results indicate that a congener was not detected above the RDL or EMPC*, unless otherwise noted.

Between 15 and 19 sediment, clam, sculpin, crayfish, and smallmouth bass samples are available for the Random Forebay and Reference Area data sets, with the exception of certain chemicals (Tables I-8 and I-11). For example, several metals and all SVOCs could not be analyzed for in sculpin samples due to inadequate tissue mass. With these few exceptions, the minimum number of 14 samples to perform a population-to-population statistical comparison was achieved. In addition, the minimum number of eight samples to calculate a 95% UCL (i.e., the EPC used for human receptors and all mobile ecological receptors) was achieved.

Fewer than eight Pre-Sediment Removal Forebay samples (Table I-7), large-scale sucker samples from the Forebay (Table I-8), Targeted Forebay samples (Table I-9), Downstream samples (Table I-10), and surface water samples (Tables I-8 and I-11) were collected. This was intentional. These samples were not collected for statistical purposes, minimizing the uncertainty associated with the small sample size available. As discussed in Section 6.2, many of these samples were collected to assess presence or absence of certain chemicals in specific media for purposes of nature and extent delineation or were used qualitatively in the risk assessments.

In summary, the number of samples to perform statistical calculations with the desired level of confidence (e.g., population to population comparisons or development a 95% UCL) is available for most analytes and media in the Random Forebay and Reference Area data sets. For the analytes with limited sample sizes, the maximum detected concentrations will be used as the EPC and is subject to some potential for either under prediction or over prediction of risk. Data sets with limited sample size not intended for statistical calculations are also sufficient for assessing nature and extent or for specific qualitative evaluations in the risk assessments.

7.2 Data Statistics

The summary statistics developed for the detected analytes are described in this section.

7.2.1 Upland OU

Tables I-12, I-13, I-14, I-15, and I-16 in Appendix I present the data statistics for the Landfill AOPC, Sandblast Area AOPC, Pistol Range AOPC, Bulb Slope AOPC, and All Four AOPCs Combined, respectively. The tables provide the following statistics for data with at least two detected results: number of samples, number of detections, mean of detections, median of detections, maximum detected value, and 95% UCLs censored at both the MDL and MRL for non-detects.

Table I-17 in Appendix I presents the data statistics for the Reference Area. The table provides the following statistics for data with at least two detected results: number of samples, number of detections, mean of detections, median of detections, maximum detected value, and 95% UCL (if there are at least eight samples).

The objective of this evaluation was to determine how much the 95% UCLs differed depending on what value (the MDL or the MRL) is used to censor the undetected results. Both methods use the J-flagged data at face value. The only difference is whether the undetected data are censored at the MDL, in which case the rank-ordering of the data set puts them below the J-flagged data, or are censored at the MRL, in which case the rank ordering puts them higher than the J-flagged data. In general, censoring using the MDL is the preferred statistical method since it preserves the rank order of the data. However, censoring using the MRL is a more conservative approach.

In the Upland OU, the majority of calculated 95% UCLs are identical or differ by less than 10% for both data censored at the MDLs and those censored at the MRLs, with the following exceptions:

Landfill AOPC

- Soil
    - PCBs – MDL-censored 95% UCLs are **greater** than MRL-censored 95% UCLs by about 18% for Total PCBs as Aroclors (0-1 and 0-3 ft bgs).

  - SVOCs – MDL-censored 95% UCLs are **less** than the MDL-censored 95% UCLs by 13 to 18% for benzoic acid and butyl benzyl phthalate (0-10 ft bgs).

- Groundwater
  - Butyltins – MDL-censored 95% UCLs are **less** than the MRL-censored 95% UCLs by 22% for monobutyltin.
  - TPH – MDL-censored 95% UCL is **less** than the MRL-censored 95% UCL by about 21% for gasoline range organics (GRO).
  - SVOCs – MDL-censored 95% UCLs are **less** than the MRL-censored 95% UCLs by 14% for 2-Methylnaphthalene.
  - VOCs – MDL-censored 95% UCLs are **less** than the MDL-censored 95% UCLs by 21 to 26% for chloroform and vinyl chloride.

Sandblast Area AOPC

- Soil
  - Metals – MDL-censored 95% UCLs are **less** than the MRL-censored 95% UCLs by 16 to 25% for beryllium (0-1, 0-3, and 0-10 ft bgs), selenium (0-1, 0-3, and 0-10 ft bgs), and thallium (0-1 ft bgs).
  - Pesticides – MDL-censored 95% UCLs are **less** than the MRL-censored 95% UCLs by 10 to 55% for 4,4'-DDD, 4,4'-DDE, BHC (delta), dieldrin, endosulfan II, endosulfan sulfate, and heptachlor (0-1, 0-3, and 0-10 ft bgs).
  - PCBs – MDL-censored 95% UCLs are **greater** than MRL-censored 95% UCLs by about 23% for Total PCBs as Aroclors (0-1, 0-3, and 0-10 ft bgs).
  - TPH – MDL-censored 95% UCL is **less** than the MRL-censored 95% UCL by about 19% for GRO (0-1 ft bgs).
  - SVOCs – MDL-censored 95% UCLs are **less** than the MDL-censored 95% UCLs by 11 to 47% for butyl benzyl phthalate (0-1, 0-3, and 0-10 ft bgs), di-n-octyl phthalate (DNOP) (0-1, 0-3, and 0-10 ft bgs), and phenol (0-1 ft bgs). The MDL-censored 95% UCL is **greater** than MRL-censored 95% UCL by 432% for phenol (0-3 ft bgs).
  - VOCs – MDL-censored 95% UCLs are **less** than the MDL-censored 95% UCLs by 10 to 77% for fourteen VOCs (various depth intervals).
- Potentially Erodible Soil
  - TPH – MDL-censored 95% UCL is **less** than the MRL-censored 95% UCL by about 18% for GRO.
  - VOCs – MDL-censored 95% UCLs are **less** than the MRL-censored 95% UCLs by 14 to 41% for seven VOCs.
- Groundwater
  - Butyltin and TPH – MDL-censored 95% UCLs are **less** than the MRL-censored 95% UCLs by about 29 and 33% for monobutyltin and GRO, respectively.

- DP Groundwater
  - Metals – MDL-censored 95% UCLs are **less** than the MRL-censored 95% UCLs by 11 to 41% for five metals.
  - SVOCs – MDL-censored 95% UCLs are **less** than the MRL-censored 95% UCLs by 10 to 38% for seven SVOCs.
  - VOCs – MDL-censored 95% UCLs are **less** than the MDL-censored 95% UCLs by 16 to 44% for eight VOCs.

All Four AOPCs Combined

- Soil
  - Metals – MDL-censored 95% UCLs are **less** than the MRL-censored 95% UCLs by 10 to 17% for beryllium (0-1, 0-3, and 0-10 ft bgs), selenium (0-1, 0-3, and 0-10 ft bgs), and thallium (0-1 ft bgs).
  - Pesticides – MDL-censored 95% UCLs are **less** than the MRL-censored 95% UCLs by 10 to 38% for 4,4'-DDE, dieldrin, endosulfan I, endosulfan II, endosulfan sulfate, and heptachlor (various depth intervals). The MDL-censored 95% UCL is **greater** than MRL-censored 95% UCL by 12% for chlordane (technical) (0-10 ft bgs).
  - PCBs – The MDL-censored 95% UCL is **greater** than MRL-censored 95% UCL by about 19% for Total PCBs as Aroclors (0-3 ft bgs).
  - SVOCs – MDL-censored 95% UCLs are **less** than the MDL-censored 95% UCLs by 10 to 44% for seven SVOCs (various depth intervals).
  - VOCs – MDL-censored 95% UCLs are **less** than the MDL-censored 95% UCLs by 10 to 44% for seven VOCs (various depth intervals).
- Groundwater
  - Butyltins, TPH, and SVOCs – MDL-censored 95% UCLs are **less** than the MRL-censored 95% UCLs by about 27, 23, and 14% for monobutyltin, GRO, and 2-methylnaphthalene respectively.
  - VOCs - MDL-censored 95% UCLs are **less** than the MRL-censored 95% UCLs by about 18 to 34% for chloroform, toluene, and vinyl chloride.
- DP Groundwater
  - Metals – MDL-censored 95% UCLs are **less** than the MRL-censored 95% UCLs by 11 to 43% for five metals.
  - SVOCs – MDL-censored 95% UCLs are **less** than the MRL-censored 95% UCLs by 10 to 38% for seven SVOCs.
  - VOCs – MDL-censored 95% UCLs are **less** than the MDL-censored 95% UCLs by 16 to 44% for eight VOCs. The MDL-censored 95% UCL is **greater** than MRL-censored 95% UCL by about 25% for 1,1-dichloroethane.

These results are consistent with the expectation that, in most cases, the 95% UCL calculation is relatively insensitive to the choice of censoring level. Differences generally only occur when there is a large percentage of undetected data. In these cases, the MDL-censored 95% UCLs are generally somewhat lower than the MRL-censored 95% UCLs, but not always. Based on this review, the more statistically-robust calculation (the MDL-censored 95% UCLs) are used in the risk assessment.

7.2.2 River OU

Tables I-18 and I-19 in Appendix I present the data statistics for the Random Forebay and Downstream, respectively. For all analytes except PCB congeners, the tables are identical to those for the Upland OU, and provide the following statistics for data with at least two detected results: number of samples, number of detections, mean of detections, median of detections, maximum detected value, and 95% UCLs (if there are at least eight samples) censored at both the MDL and MRL for non-detects.

For PCB congeners, the tables provide the following statistics for data with at least two detections: number of samples, number of detections (not non-detect or EMPC-qualified), mean of detections, median of detections, maximum detected value, and 95% UCLs censoring non-detects at the RDL and EMPC-qualified data at the reported value. Since MDLs and MRLs are not available for the congener data, there is only on 95% UCL calculation.

In the River OU, the majority of calculated 95% UCLs (for non-congener data sets) are identical or differ by less than 10% for both data censored at the MDLs and those censored at the MRLs, with the following exceptions:

Random Forebay

- Sediment
  - PCBs – The MDL-censored 95% UCL is **greater** than MRL-censored 95% UCL by about 76% for Total PCBs as Aroclors.
  - SVOCs – MDL-censored 95% UCLs are **less** than the MDL-censored 95% UCLs by 10 to 74% nine SVOCs and Total HPAHs, LPAHs, and PAHs.
- Clam
  - Metals – The MDL-censored 95% UCL is **less** than the MRL-censored 95% UCL by 42% for antimony.
  - SVOCs – MDL-censored 95% UCLs are **less** than the MRL-censored 95% UCLs by 10 to 34% for seven SVOCs.
- Crayfish
  - SVOCs – MDL-censored 95% UCLs are **less** than the MDL-censored 95% UCLs by 10 to 48% for ten SVOCs.
- Smallmouth Bass
  - Metals – The MDL-censored 95% UCL is **less** than the MRL-censored 95% UCL by about 19% for beryllium.

As for the Upland OU data sets, the 95% UCL calculation is relatively insensitive to the choice of censoring level. Based on this review, the more statistically-robust calculation (the MDL-censored 95% UCLs) are used in the risk assessments.

Table I-20 in Appendix I presents the data statistics for the Reference Area. The table provides the following statistics for data with at least two detections: number of samples, number of detections, mean of detections, median of detections, maximum detected value, and 95% upper prediction limit (UPL). These 95% UPL values are used in developing the medium-specific SLVs, as discussed in the next section.

7.3 Screening Level Values and Bioaccumulative Compounds

7.3.1 Screening Level Values

For each medium, SLVs were selected for human and ecological receptors, based on a hierarchy of sources (Appendix J, Tables J-1 through J-3). Site-specific reference concentrations were used to establish SLVs for inorganic analytes in soil and sediment, only. The SLV selection hierarchy was developed based on discussions with the USACE and DEQ during the meetings held from December to February, 2010, as documented in DSR Meeting Minutes Memorandum (URS 2010a) and River OU and Upland OU DSR Response to Comments (RTC) (URS 2010b,c). Appendix J presents the agreed-upon hierarchy of Human Health and Ecological SLVs. Tables J-4 and J-5 present the SLVs for specific human health and ecological receptors, respectively, used to identify COPCs in the HHRA (Appendix M) and CPECs in the ERA (Appendix N). Appendix also presents the SLVs (generally the more conservative of the human health and ecological SLVs, unless only one is applicable) used for identifying preliminary COPCs for discussion of nature and extent of contamination (Section 9.0).

7.3.2 Identification of Bioaccumulative Compounds

In addition to selecting appropriate SLVs, bioaccumulative compounds were also identified. Bioaccumulation is a phenomenon in which concentrations of chemicals accumulate in biological tissues through exposure to environmental concentrations, which results from processes of preferential uptake and retention in adipose and organ tissues. Bioaccumulation occurs as living organisms retain and concentrate chemicals both directly from their surrounding environment (i.e., from soil or water) and indirectly from media that transfer chemicals into dietary components, such as plant or animal tissues. Biomagnification is a form of bioaccumulation in which the concentration of a chemical in a higher trophic level organism (e.g., bird, mammal, reptile, or human) is greater than the concentration in the food that this organism consumes.

Bioaccumulation and biomagnification are of primary interest in RAs because of the potential for chemical transfer through the food web, as people and top-level predatory species consume food that may have high tissue residues of bioaccumulative chemicals. Thus, even though the people or predatory biota are not directly exposed to chemicals in soil or water, they may still be adversely affected because of their indirect exposure to these chemicals through consumption of fish, shellfish, or other food items.

Hunting is prohibited on Bradford Island. Therefore, in the Upland OU only ecological receptors may be potentially exposed to bioaccumulative compounds via the consumption of prey items

that may have accumulated site COIs in their tissues. In contrast, fishing is not only allowed by commonly takes place in the River OU. Therefore, both human and ecological receptors may be potentially exposed to bioaccumulative compounds via the consumption of aquatic food items.

In support of the RAs, bioaccumulative compounds were identified for both the Upland and River OUs by examining multiple lines of evidence, as follows:

- The bioaccumulation potential of nonpolar organic compounds is generally related to their hydrophobicity or lipophilicity and is approximately estimated by their octanol-water partition coefficient (log K_{ow}). Bioaccumulative chemicals were defined as those with a log K_{ow} exceeding 3.5 (with an optimum range between 3.5 and 5.5; Suter 1993). This applies equally to organic compounds in the Upland and River OUs.
- In the River OU, inorganic compounds were identified as bioaccumulative if they had a Bioconcentration (BCF) > 300 (Suter 1993).
- In the Upland OU, inorganic compounds were identified based on bioaccumulation factors (BAFs) which are separately for earthworms, plants, or vertebrates. The Hazardous Waste Identification Rule (USEPA 1999a) recognizes compounds as having a high bioaccumulation potential if the BAF is greater than 1.0, and a medium bioaccumulation potential if the BAF is between 0.1 and 1.0. For this project, all compounds with a receptor-specific BAF > 0.1 were identified as bioaccumulative.

Compounds identified as bioaccumulative are listed in Table J-6 (Upland OU) and Table J-7 (River OU).

7.4 Data Sensitivity Analysis

In data sensitivity analysis, the goal is to evaluate the level of confidence in the low end of the reported range of concentrations with respect to its usability for the purposes of the RI. Less uncertainty is associated with the upper end of the range of reported concentrations that are well above the MDL and the MRL, i.e., well above the lowest initial calibration standard of the laboratory instrument.

Within a data set, individual data points may fall into one of three categories as they range from high to low concentrations: unqualified detections, J-flagged detections or U-flagged non-detects (Figure 7-1).

For unqualified detections, there is a high degree of confidence associated with both the identity of the analyte and its reported concentration. There is less confidence in J-flagged detections because, although the analyte has been positively identified, the reported J value is an estimated value and the true concentration may actually be as low as the MDL or as high as the MRL. The U-flagged non-detect value is understood to represent a reliable concentration limit, above which an analyte is not present.

J-flagged values represent an intermediate category of data with some associated uncertainty, in contrast to the higher level of confidence placed in unqualified detections and in U-flagged non-detects. Many analytes in the project have J-flagged data. Therefore, a data sensitivity analysis (Appendix K) was performed for analytes with a detection frequency of less than 100% (i.e., those with at least one non-detect result) and for analytes with detections below the MRL (i.e., J-flagged). The data sensitivity analysis compares the MDLs and MRLs associated with each non-

detect observation (i.e., reported below the MDL), and MRLs associated with detections below the MRL (i.e., J-flagged), with the lowest analyte-specific human health and ecological SLVs (Appendix J).

There are two objectives of this analysis:

1. The first objective is to determine whether analytes that were reported as undetected in 100% of the samples could be eliminated from any further consideration as COIs.
2. The second objective is to determine the level of confidence in the EPCs used for risk assessment (i.e., maximum concentrations or 95% UCLs) for analytes in a given medium that were not detected in all samples but were detected in at least one sample (i.e., less than 100% detection frequency, and typically greater than a 5% detection frequency).

Understanding the level of confidence in meeting these two objectives is important primarily in terms of whether the uncertainties in the data quality are likely to lead to overestimation or underestimation of risk when the data are used for risk assessment purposes. By comparing the SLVs to the MDLs and MRLs, the impact of the uncertainty regarding the J-flagged data and undetected results on the use of the data for risk assessment purposes (i.e., elimination of a COI and development of an EPC) can be evaluated.

There are three potential cases, depending on where the SLV for a given analyte falls relative to the MDL and MRL

Case 1

If the SLV is higher than both the MDL and MRL for an individual non-detect observation (Figure 7-1), then there is a high level of confidence that the analyte is not present in that sample at concentrations of potential concern. If the SLV is higher than both the MDL and MRL and 100% of the samples are non-detect for that analyte, then that analyte can be eliminated as a COI with a high level of confidence. The use of J-flagged data does not limit the ability to determine whether or not an analyte is present at a level of potential concern, because the J-flagged result is constrained to be lower than the MRL, which in turn is lower than the SLV.

Case 2

If the SLV falls between the MDL and the MRL and an individual observation is reported as a J-flagged value (Figure 7-1), some uncertainty is introduced. Pertaining to the first data use objective, if a COI is eliminated as a COPC due to comparison between a J-flagged value and the SLV, this could result in an under prediction of risk. This is because the true value of that sample may be higher than the reported J-value, up to the limit of the MRL. Under this scenario, if the J-value is actually an underestimation of the true concentration, which is higher than the SLV, the COI should really be retained as a COPC.

For the second objective, if J-flagged values are included in the estimation of the EPC, this may result in an EPC that is either an underestimate or an overestimate of the true value. This uncertainty is limited by the fact that the true value of the J-flagged data in constrained to between the MDL and the MRL. The closer the reported J-flagged value is to the MDL, the greater the potential for underestimation of risk. The closer the J-flagged

value is to the MRL, the greater the potential for overestimation of risk. Retaining the J-flagged values as detected concentrations follows accepted risk assessment protocols (USEPA 1989 et seq.) and minimizes the potential for underestimation of risk that would result from considering J-values as non-detects.

Case 3

If the SLV is lower than both the MDL and the MRL (Figure 7-1), then there is a limited ability to meet the first data use objective. U-flagged data are commonly interpreted as signifying the absence of an analyte at the MDL. If the MDL is higher than the SLV, then it is more difficult to assume that the analyte is not present at a concentration of concern and the level of confidence in eliminating the analyte is lower. Since the MDL is primarily influenced by the analytical and methodological technology, this type of uncertainty is not easily remedied unless more sensitive analytical methods are available and feasible for use.

Relative to the second objective, if J-flagged values are included in the estimation of the EPC, the same uncertainty in the calculated EPC exists as was discussed in Case 2. However, the potential exists for a greater underestimation of potential risk. This is because the upper and lower bounds of the true value of the J-flagged data remain the same (i.e., MRL and MDL), but the difference between the even lower SLV and the J-flagged value increases.

In this case (when an SLV is lower than both the MDL and MRL), the underestimation of risk related to elimination of a COI or estimation of the EPC is noted in the risk assessment and qualitatively discussed in the uncertainty section.

All three of these cases occur in the RI data set, as discussed in the sections below. The evaluation process is intentionally conservative because the lowest human health and ecological SLVs are used to evaluate data quality. In reality, multiple pathways and receptors are evaluated in the HRHA and ERA, some of which may have higher SLVs. Therefore, exceedance of the lowest SLV by the MDL or MRL does not mean that the non-detect values have the potential to overestimate or underestimate risks for all receptors and pathways, only the receptor-pathway combination with the lowest SLV. Therefore, for a given AOPC/OU, analyte, and media, if the MDL and/or MRL exceeds the lowest SLV, then the nature of the analyte and the magnitude of exceedance are further reviewed in the risk assessments to evaluate the significance of the exceedance and the possible impact on interpretation of results.

For each analyte in the entire data set, Tables K-1 to K-16 provide detailed analyses of the number of samples, lowest human health or ecological SLV, number of non-detects below the MDL (i.e., U-flagged values) and the number of detections between the MDL and the MRL (i.e., J-flagged values). The minimum and maximum MDLs and MRLs for the non-detect observations are listed, as well as the number of these MDLs and MRLs that are greater than the associated SLVs. Analytes for which a large proportion of the MDLs and MRLs for the non-detect observations exceed the SLV are associated with a higher level of uncertainty when the data are used for risk assessment purposes, as discussed above. The purpose of the tables is to allow for identification of every analyte for which some potential for underestimation or overestimation of risk may exist.

The information from Tables K-1 to K-16 is summarized in Tables 7-1 to 7-6. Data sets which have a larger degree of uncertainty, as a result of limited sample size or a high proportion of estimated data (i.e., the majority of the data is J-flagged) are summarized in Tables 7-1 and 7-2. These tables provide a summary of the detected analytes for which more than 50% of the detected concentrations consists of J-flagged results, and further highlight those analytes in the Upland and River OU data sets for which the MRL exceeded the lowest human health or ecological SLV. The inclusion of these analytes and their associated J-flagged values in the RI process indicates that there is a potential for overestimation of risk if the true value is higher than the SLV and a potential for underestimation of risk if the true value is lower than the SLV.

Table 7-3 summarizes the analytes that were never detected (100% non-detect) or sometimes detected (<100% non-detect) whose MDLs exceeded the lowest human health or ecological SLV. The elimination of the 100% non-detect analytes with elevated MDLs as COPCs is subject to an unavoidable potential for underestimation of risk since they cannot be conclusively shown to be absent at concentrations of concern. However, there is less potential for underestimation of risk related to the analytes that were sometimes detected because the estimation of the EPC for these analytes by the Kaplan-Meyer method takes the absolute value of the MDL into consideration by including these MDLs in the concentration ranking for that analyte when the UCL uses the MDL as the censoring limit.

Table 7-4 summarizes the analytes that were never detected (100% non-detect) or sometimes detected (<100% non-detect) in the Upland and River OU data sets for which either human health or ecological SLVs were not available. This represents a different type of uncertainty that is not related to analytical data quality but is relevant to the risk assessment process. The lack of SLVs indicates an absence of reliable toxicological information for the evaluation of the chemicals. Analytes that were never detected are eliminated as COPCs even if no SLVs are available and this may result in a potential for underestimation of risk. However, all analytes without SLVs (detected and non-detected) are discussed qualitatively in the Uncertainty Assessment sections of the risk assessments.

Tables 7-5 and 7-6 provide the same information as Tables 7-3 and 7-4, but for the River OU dataset.

7.4.1 Upland OU AOPCs

The following datasets were considered in the Upland OU data sensitivity analysis:

- Landfill: soil, groundwater, and seep water, and surface water
- Sandblast Area: soil, groundwater, and soil gas (human health only)
- Pistol Range: soil and groundwater (lagoon sediments were not evaluated because all of the analyzed COIs were 100% detected).
- Bulb Slope: soil

7.4.1.1 Human Health Sensitivity Analysis

Analytes with J-flagged Data with SLVs

Tables K-1, K-2, K-3, and K-4 in Attachment K present the results of the human health sensitivity analysis for the Landfill, Sandblast Area, Pistol Range, and Bulb Slope AOPCs,

respectively. As summarized in Table 7-1, more than 50% of the detected results were J-flagged for a few metals and several VOCs, SVOCs, and pesticides for the soil and water media. However, few of these analytes had MRLs that exceeded the lowest human health SLV. Thus the potential for underestimation or overestimation of risks (within the bounds of the MDL and the MRL) is limited to a few analytes (e.g., thallium and dibenz(a,h)anthracene in soil) and this uncertainty is mitigated to the extent possible by including the J-flagged data in estimating the EPCs.

Analytes with U-flagged Data with SLVs

As summarized in Table 7-3, the analytes that were never detected in upland media and also had MDLs that were higher than the lowest human health SLV included primarily several VOCs in soils, and VOCs, SVOCs and pesticides in water media. The larger number of analytes listed for groundwater is mainly due to the very low SLVs for water. Elimination of these chemicals as COPCs may have the potential to underestimate risk. Among the analytes that were sometimes detected, there are far fewer analytes whose MDLs exceed the SLVs, although again there are more exceeded analytes for water media. Use of the MDL to censor the undetected data in the EPC estimation method minimizes the potential for underestimation of risk to the extent possible.

Analytes without SLVs

As summarized in Table 7-4, analytes that were never detected in a given medium in the Upland OU and also do not have human health SLVs are primarily several VOCs in soil and water media. Elimination of these analytes as COPCs may underestimate risk, as discussed further in the Uncertainty Assessment of the HHRA. The list of analytes that were sometimes detected and do not have human health SLVs is much smaller and includes two SVOCs (n-butylbenzene and sec-butylbenzene) in soil and ethanol in soil gas. These analytes were also retained as COPCs and discussed qualitatively in the Uncertainty Assessment, as well as analytes that were detected but do not have SLVs (Section 11.0).

7.4.1.2 Ecological Sensitivity Analysis

Analytes with J-flagged Data with SLVs

Tables K-5, K-6, K-7, and K-8 in Attachment K present the results of the ecological sensitivity analysis for the Landfill, Sandblast Area, Pistol Range, and Bulb Slope AOPCs, respectively. As discussed in Section 7.4.1.1, more than 50% of the detected results were J-flagged for a few metals and several VOCs, SVOCs and pesticides for the soil and water media (Table 7-1). However, far fewer of these analytes had MRLs that exceed the lowest ecological SLV. Thus, the potential for underestimation or overestimation of risks (within the bounds of the MDL and the MRL) is limited to these analytes and the uncertainty is mitigated to the extent possible by including the J-flagged data in estimating the EPCs.

Analytes with U-flagged Data with SLVs

As summarized in Table 7-3, the analytes that were never detected in Upland soil and also had MDLs that were higher than the lowest ecological SLV primarily included one metal (antimony) several pesticides, herbicides, and VOCs, and a few SVOCs. For water, these analytes included a few dissolved metals, and several pesticides, herbicides, VOCs, and SVOCs (including PAHs). The larger number of analytes listed for groundwater is mainly due to the very low SLVs for water. Many of these non-detect analytes with MDLs above the ecological SLVs are associated

with the Landfill, due to the higher total number of samples and total number of analytes that originate from historical sampling events (older analytical methods). Elimination of these chemicals as CPECs may have the potential to underestimate risk.

Among the analytes that were sometimes detected, there are far fewer analytes whose MDLs exceed the SLV, with the exception of soils (0 to 1 and 0 to 3 feet bgs) from the Sandblast Area AOPC. Use of the MDL in the EPC estimation method minimizes the potential for underestimation of risk to the extent possible.

Analytes without SLVs

As summarized in Table 7-4, analytes that were never detected in a given medium in the Upland OU and also do not have ecological SLVs include several herbicides, VOCs, and SVOCs in soil and water media. Elimination of these analytes as CPECs may underestimate risk and is discussed further in the Uncertainty Assessment of the ERA. The list of analytes that were sometimes detected and do not have ecological SLVs is much smaller and includes TPH mixtures and one SVOC (n-butylbenzene). These analytes were retained as CPECs and discussed qualitatively in the Uncertainty Assessment of the ERA, as well as analytes that were detected but do not have SLVs (Section 12.0).

7.4.2 River OU

The following data sets were considered in the River OU data sensitivity analysis:

- Pre-Sediment Removal Forebay: sediment and clam (ecological only)
- Random Forebay: sediment, clam (ecological only), crayfish, sculpin (ecological only), large-scale sucker, and smallmouth bass
- Targeted Forebay: Eagle Creek sediment & Goose Island sediment, clam (ecological only), and crayfish
- Downstream: sediment

The major findings of the sensitivity analysis are discussed below.

7.4.2.1 Human Health Sensitivity Analysis

Analytes with J-flagged Data with SLVs

Tables K-9, K-10, K-11, and K-12 in Attachment K present the results of the human health sensitivity analysis for the Pre-Sediment Removal Forebay, Random Forebay, Targeted Forebay, and Downstream, respectively. The results are also summarized in Table 7-2. Similar to the Upland data, analytes with more than 50% J-flagged data are primarily SVOCs, TPH, a few Aroclors and a very few metals. Only a very few of these analytes, however, had SLVs that were lower than the MRLs (e.g., none in clam, Aroclor 1254 in sediment).

Analytes with U-Flagged Data with SLVs

As summarized in Table 7-5, the analytes that were never detected in River OU media and also had MDLs that were higher than the lowest human health SLV are primarily Aroclors in sediment, crayfish, large-scale sucker and smallmouth bass and a few metals in water. Although these analytes are eliminated as COPCs, PCBs are further evaluated using the more sensitive congener-based data for both COPC selection and EPC estimation. Therefore, the potential for

underestimation risk related to Aroclors is minimized. The same is true for analytes that were sometimes detected with MDLs greater than the SLVs since these are also limited primarily to Aroclors and B2EHP.

Analytes without SLVs

As summarized in Table 7-6, analytes that were never or sometimes detected in a given medium in the River OU and also do not have human health SLVs are primarily a few SVOCs such as phthalate compounds, carbazole and p-cresol. Elimination of these analytes as COPCs may underestimate risk and is discussed further in the Uncertainty Assessment of the HHRA, as well as analytes that were detected but do not have SLVs (presented in the HHRA screening tables in Section 11.0).

7.4.2.2 Ecological Sensitivity Analysis

Analytes with J-flagged Data with SLVs

Tables K-13, K-14, K-15, and K-16 in Attachment K present the results of the ecological sensitivity analysis for the Pre-Sediment Removal Forebay, Random Forebay, Targeted Forebay, and Downstream, respectively. The results are also summarized in Table 7-2. As discussed in Section 7.4.2.1, more than 50% of the detected results were J-flagged for several SVOCs, two TPH mixtures, two Aroclors (1242 and 1254) and a very few metals. Only a few of these analytes, however, had MRLs that were higher than the ecological SLVs, including a couple of PAHs and Aroclor 1254 in sediment, B2EHP in bass tissue, and dissolved cadmium in surface water.

Analytes with U-Flagged Data with SLVs

As summarized in Table 7-5, the analytes that were never detected in River OU media and also had MDLs that were higher than the lowest ecological SLVs are limited to Aroclors in sediment, clams, sculpin, and smallmouth bass. Although these analytes are eliminated as CPECs, PCBs are further evaluated using the more sensitive congener-based data for the CPEC selection process. Therefore, the potential for underestimation risk related to PCBs is minimized.

Analytes that were sometimes detected and have MDLs higher than the ecological SLV include Aroclors in sediment, clams, sculpin, and smallmouth bass (and B2EHP in bass), and dissolved cadmium and total aluminum in water. Use of the MDL in the EPC estimation method for these analytes minimizes the potential for underestimation of risk to the extent possible.

Analytes without SLVs

As summarized in Table 7-6, analytes that were never or sometimes detected in a given medium in the River OU and also do not have ecological SLVs include a few metals (antimony, beryllium, and chromium) and a couple of SVOCs (carbazole and p-cresol) in tissue, and TPH in sediment and water. Elimination of these analytes as CPECs may underestimate risk and is discussed further in the Uncertainty Assessment of the ERA, as well as analytes that were detected but do not have SLVs (Section 12.0).

7.4.3 Data Sensitivity Analysis Summary

In summary, the data quality analysis evaluated the quality of analytical data for RI use with respect to three attributes for each analyte: sample size, J-flagged data, MDLs and MRLs with respect to SLVs, and analytes without SLVs. Overall, sample sizes for each analyte are

considered to be sufficient for their intended uses since they meet the minimum required sample size for statistical evaluation or are clearly designated as targeted samples collected for non-statistical use. Eight samples is the minimum necessary to calculate a 95% UCL as the EPC, and 14 samples is the minimum desired for the population-to-population statistical comparison to identify COIs that are above Reference concentrations with the desired level of confidence. Limited sample sizes were noted for some analytes in samples intended for these statistical analyses. The maximum detected concentration was used to represent the EPC for analytes with fewer than eight samples and represents the best effort to avoid underestimation of risk. Analytes for which at least 14 samples are not available were not included in the statistical comparison, and a qualitative comparison to Reference concentrations was performed.

The use of J-flagged data and the fact that some SLVs are lower than analytical MDLs and MRLs both result in some potential for under prediction of risk but, but this uncertainty is mitigated to the extent possible by the risk assessment methodology. The treatment of analytes without SLVs may also have the potential to under predict risk, but these analytes and media are evaluated qualitatively in the risk assessments.

8.0 COMPARISON OF SITE DATA TO REFERENCE AREA DATA

This chapter, along with Appendix L, compares site data to reference area data for both the Upland and River OUs. Both organic and inorganic analytes are included. The objective is to determine which analytes measured in site media have concentrations that are elevated relative to the reference areas, and, thus, potentially attributable to the site, and which have concentrations that are indistinguishable from more widespread conditions, which are likely due to other sources not related to the site. With the exception of inorganic constituents, these results are not used for developing screening levels, or performing the screening level risk assessments.

8.1 Statistical Comparison Methods

The statistical evaluations involved the comparison of two independent data sets. In each case, statistical methods were used to compare each investigation data set to the corresponding reference data set, to determine if an analyte's concentrations were present in the site at a level significantly greater than that of the appropriate reference area. This approach is commonly known as a population-to-population comparison, and the results of this evaluation process determine whether the mean site values were statistically greater than the mean reference area values.

For this study, the hypothesis testing methods described in the USEPA guidance document *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites* (USEPA 2002a) and the Navy guidance document titled *Procedural Guidance for Statistically Analyzing Environmental Background Data* (Southwest Division [SWDIV] and EFA WEST 1998) were used.

Hypothesis testing refers to a category of statistical analysis methods that are used to choose between two competing statements or hypotheses. One is called the null hypothesis, denoted by H_0, and the other is called the alternative hypothesis, denoted by H_A. The null hypothesis is the baseline condition that is assumed to be true in the absence of any data. If the data provide sufficiently strong evidence contrary to the null hypothesis, the null hypothesis is rejected and the alternative hypothesis accepted. If the data do not provide sufficiently strong evidence, the null hypothesis is not rejected. However, this lack of strong evidence does not necessarily mean that the null hypothesis is true; it only means that the available data are not sufficient to prove the alternative hypothesis. If the null hypothesis is not rejected, it is important to check the power of the test, which is defined as the probability that the test would be able to detect a specified minimum true difference from the condition defined by the null hypothesis. If the power of the test is sufficiently large, and the null hypothesis is not rejected, one could say with a high degree of confidence that no change has occurred in the condition defined by the null hypothesis.

For the comparison between the site data and the reference area data, the hypothesis testing was set up as follows:

Null hypothesis, H_0: The mean concentration in the site data set was less than or equal to the mean concentration in the reference area data set.

Alternative hypothesis, H_A: The mean concentration in the site data set was greater than the mean concentration in the reference area data set.

The appropriate statistical test was selected based on the percentage of non-detects within a given pair of data sets and the distribution of the data in the data sets. If all values in both data sets for a given analyte were detects, the Shapiro-Wilk W test at a 5% significance level was used to evaluate the distributions of values in each data set (i.e., to determine if raw values or log-transformed values were normally distributed). If the data sets were neither (both) normal nor (both) lognormal, then a non-parametric Wilcoxon Rank Sum test was performed. If both data sets fitted a normal or lognormal distribution, then the Student's *t*-test was used for the evaluation. Depending on the calculated variances of the data sets for each analyte, either the form for equal variances or unequal variances was used to compare the two data sets.

If detectable values were present in at least one of the data sets, but not all concentrations were detectable, the Wilcoxon Rank Sum test was used to compute non-parametric estimates for the comparison with all non-detects censored at the median MDL/MRL (i.e., the median value of various different MDLs/MRLs for the combination of the site and reference area data sets). The effect of this censoring was to establish a minimum "cut-off" value or a common "bottom line," such that below which no data (detected or undetected) could fall, and thus a statistical comparison is plausible given the various data sets might have different censoring levels. In reviewing the population-to-population comparisons, it is important to remember that all detected data (in either the site or the reference area) which were below the cut-off value were "reset" to that cut-off value. In cases where a large percentage of detected data were reset to a higher cut-off value, the population-to-population comparison had limited power to reject the null hypothesis (i.e., to conclude the site data had a higher mean concentration than the reference area data). In these cases, other numerical or graphical tools, such as box-and-whisker plots, were used for additional evaluation.

All statistical comparisons were performed twice, once using the median MDL (of both populations combined) as the lower cut-off value for the population-to-population comparisons and once using the median MRL (of both populations combined) as the lower cut-off value. The results are presented in Appendix L. In each table, the selected test is listed under the column "Appropriate Statistical Test." A significance level (α) of 5% was used for all statistical tests, and the comparison result was presented in the form of a "Yes" or "No" answer to the question, "Is the mean Site concentration significantly higher than the mean Reference Area concentration?" If more than 90% non-detects were present in one or both data sets, the Contingency Table Analysis method was used in the evaluation, which is a comparison to determine significant differences between the detection frequencies in the site and the reference area data sets.

If the null hypothesis was not rejected (i.e., the answer was "No" to the question, "Is the mean site concentration significantly higher than the mean reference area concentration?"), a further assessment was made to evaluate the minimum detectable differences (MDDs) for which the statistical comparison could be achieved. In other words, the MDD was the minimum required "separation" between the true means of the site and reference area data for the statistical test to be able to conclude that a significant difference existed at a 95% confidence level (or false rejection rate, α=0.05) and 80% power of detection (or false acceptance rate, β=0.2).

If the null hypothesis was rejected (i.e., the answer was "Yes" to the question, "Is the mean site concentration significantly higher than the mean reference area concentration?"), there was no need to evaluate the power of the statistical comparison, because the sample data had provided evidence at the specified level of confidence that the mean site concentration was significantly

higher than the mean reference area concentration. The power analysis was not performed for data sets in which all samples were non-detects or for comparisons using the Contingency Table Analysis method.

The MDD depended on the pooled standard deviation of the reference area and AOPC data, and this pooled standard deviation. The calculation of the MDD for non-parametric tests is generally complicated. For simplicity, the calculation of the MDD was based on normal distribution theory, as an approximation, for all analytes in this evaluation. The calculated MDD was then expressed as a percentage of the mean of the reference area data. For example, if this percentage was 20%, one would interpret it as follows: if the true AOPC mean were 20% higher than the true reference area mean, the statistical test would be able to conclude that the AOPC concentrations were significantly higher, given the designed confidence level and power of detection.

The goal established in the RI/FS MP for statistical power associated with the background comparison power was achieved (i.e., to detect "one-standard-deviation-away"). However, for some Upland soils, this one-standard-deviation is high due to the high data variability, which could not be controlled because of the inherent heterogeneity of the Upland soils. As an artifact of this high data variability, MDDs greater than 100% of the reference mean were calculated for several metals in soil of the Landfill, Sandblast Area, and the four combined AOPCs (Table L-1 in Appendix L). Although the null hypothesis was not rejected, the statistical power to detect substantial differences between the site and Reference Area datasets for metals with MDDs greater than 100% of the reference mean might be limited. These metals are identified in Section 8.2.1, and the measures taken to address the uncertainty introduced in the background comparison for these metals are also described. Data variability for all metals in other datasets subjected to the statistical background comparison, i.e., sediment and tissue samples from the River, were low and the MDDs were generally well within acceptable range. The exception to this statement is lead in crayfish and chromium in bass, which are discussed in Section 8.3.1.

To address the limitation of the statistical methodology for data sets with large numbers of non-detects, all comparisons also included an examination of the data distributions using box-and-whisker plots. These plots are also included in Appendix L. For each population, the box-and-whisker plots used boxes to show the 25th percentile, median, and 75th percentile, along with whiskers extending to the outermost data point that falls within the distances computed as: (a) 25th percentile minus 1.5 times of interquartile range, and (b) 75th percentile plus 1.5 times of interquartile range. The actual data points were superimposed but jittered, with different symbols for detected and un-detected data. Examination of the box-and-whisker plots allowed for the identification of data sets in which the analyte concentrations in the site data were clearly higher than the reference area concentrations, even when the population-to-population comparisons were inconclusive.

8.2 Upland OU

The following data were collected from the Upland OU Reference Area:

- Metals and PAHs in soil (14 samples)
- Metals in groundwater (4 quarters of samples from one monitoring well)
- Organics in groundwater (1 sample from one monitoring well)

8.2.1 Soil

Reference Area soil samples were collected from the 0-1 ft bgs depth interval. The very rocky nature of the undeveloped areas of Bradford Island precluded the collection of deeper samples. However, the geologic setting and (geologically) recent formation of the island are consistent with a uniform composition of reference area soils. The population of Reference Area soil data was compared independently to soil data from each of the three depth intervals (0-1 ft bgs, 0-3 ft bgs, and 0-10 ft bgs) of each AOPC to be used in the RAs. It was recognized that the combined false positive rate for all three depth intervals was likely to be greater than 5%. However, since the decision rule was based on individual exposure area (e.g., whether a specific depth interval within a given AOPC was above or below background), a more conservative approach of using 95% confidence level (5% significance level) was used in the hypothesis testing.

Reference Area soils were analyzed for metals and PAHs (Table 6-5). There were sufficient reference soil data to perform a statistical evaluation to assess whether the mean COI concentrations in soil within each AOPC, as well as the mean soil COI concentrations for all four AOPCs combined, were significantly higher than the mean Reference Area concentrations.

Tables L-1 and L-2 (in Appendix L) present the statistical population-to-population comparison between the Reference Area data and the data from each of the Upland AOPCs, as well as the combined data set which included soil data from all four AOPCs. Figures L-1a through L-1u present the corresponding box-and-whisker plots for each of the comparisons.

For some of the metals (particularly antimony, mercury, and silver), a portion of historic Site data had elevated detection limits (both MDLs and MRLs), relative to the Reference Area data which were collected more recently. Because the median MDL or MRL was the cut-off value for both detected and undetected data, these elevated MDLs/MRLs limited the power of the statistical tests to reject the null hypothesis (i.e., to conclude the Site AOPC data had a higher mean concentration than the Reference Area data). In these cases, the box-and-whisker plots were examined and a conservative determination was made to retain some of these metals as having higher concentrations in the Site data. These metals were marked and footnoted in Table 8-1, which summarizes those analytes for which site soil concentrations were significantly higher than the Reference Area soil concentrations. This table lists analytes for which the statistical evaluations using the MDL, MRL, or both indicated significantly higher Site concentrations.

As discussed in Section 8.1, MDDs greater than 100% of the reference mean were assessed for several metals in soil of the Landfill, Sandblast Area, and the four combined AOPCs (Table L-1 in Appendix L). Although the results of the statistical background comparison indicated that concentrations of these metals were present below or equal to that of the Reference Area levels, and therefore these metals were not carried to the SLV comparison step, the high MDDs (greater than 100% of the reference mean) present an uncertainty with this finding. These metals include the following:

Landfill

- 0 to 1 foot bgs – arsenic, chromium, copper, and nickel
- 0 to 3 feet bgs – chromium, copper, magnesium, and nickel
- 0 to 10 feet bgs – arsenic, chromium, copper, magnesium

Sandblast Area

- 0 to 1 foot bgs, 0 to 3 feet bgs, and 0 to 10 feet bgs – copper, magnesium, and mercury

Four Combined AOPCs

- 0 to 1 foot bgs, 0 to 3 feet bgs, and 0 to 10 feet bgs – copper, and magnesium

To address the uncertainty with the results of the statistical background comparison, these metals were subjected to a risk-based screening evaluation in Appendix O. The purpose of this evaluation is to explore whether or not these metals should be included as COPCs, and ultimately advanced to the next level of risk assessment or directly to the FS. A weight-of-evidence approach similar to the one implemented in Sections 11 and 12 (screening level risk assessments) was used to evaluate these metals, as described in Appendix O.

With the exception of a single PAH (acenaphthylene) in the 0-1 ft bgs interval in the Landfill AOPC, the statistical comparisons concluded that all PAHs were detected at higher concentrations in Upland OU site soils than in Reference Area soils (Tables L-1 and L-2). Further examination of the single exception revealed that acenaphthylene was only detected in a single sample in the Reference Area, and thus, the Contingency Table Analysis was used in the statistical comparison. This method is less powerful to detect differences, especially when the MDLs and MRLs were quite different for the two data sets. Examination of the box-and-whisker plots for this analyte confirmed that there was not sufficient data to conclude that the concentrations were not statistically higher in the site data. No other organic compounds were analyzed for in the Reference Area soils.

8.2.2 Groundwater and Seep Water

There were insufficient groundwater data to perform statistical comparisons between the Site and Reference Area data. Therefore the groundwater data were evaluated by comparing the range of analyte concentrations observed in groundwater samples from monitoring wells in the Landfill and Sandblast Area AOPCs with the range of concentrations observed in the Reference Area monitoring well (MW-10).

Table L-3 shows the results of this comparison. The table also lists the range of concentrations observed in the seep samples collected along the perimeter of the Landfill AOPC, and compares those with concentrations observed in the Reference Area monitoring well. Not all analytes were measured in the Reference Area monitoring well. For those analytes that were measured, groundwater concentrations at the AOPCs, appeared to exceed Reference Area groundwater concentrations for most COIs. The results are summarized in Table 8-2.

At the Landfill AOPC, COI concentrations in seep water were generally lower than concentrations observed in groundwater, and fewer analytes exceeded the corresponding Reference Area groundwater concentrations. Arsenic, barium, copper, iron, lead, mercury, selenium, diesel range organics (DRO), residual range organics (RRO), chloroform and PCE were the only analytes for which seep water concentrations exceeded Reference Area concentrations (Table 8-2).

8.3 River OU

The following data were collected from the River OU Reference Area:

- Metals and organics in sediment (18 samples)
- Metals and organics in clams (18 samples)
- Metals and organics in crayfish (19 samples, except SVOCs which only have 18 samples)
- Selected metals and PCBs in sculpin (18 samples)
- Metals and organics in smallmouth bass (19 samples)
- Metals and organics in surface water (5 samples)

These data were compared to the random Forebay data sets, the targeted Forebay samples, and the Downstream sediment samples. In addition, soils potentially subject to mass wasting or erosion from the Upland OU (in the Landfill, Sandblast Area, and Bulb Slope AOPCs) may be transported to the River OU. Therefore, these soils were compared to both Upland Reference Area soil data and River Reference Area sediment data to evaluate the potential for these Upland OU soils to impact the River OU should they be transported into the river.

8.3.1 Forebay Random Samples

By design, sufficient sediment, clam, crayfish, sculpin, and smallmouth bass samples were collected from the upstream Reference Area to allow for a robust statistical comparison to the Forebay random data sets. The Reference Area samples were analyzed for the same suite of analytes as the Forebay samples.

Tables L-4 and L-5 (in Appendix L) present the statistical population-to-population comparisons between the Forebay random data set and the Reference Area data set for the sediment and tissue non-congener data. As with the Upland OU data, the statistical comparisons were performed twice, once censoring non-detect data at the median MDL and once censoring the non-detect data at the median MRL. Table L-6 presents the statistical population-to-population comparisons for the congener data. Since MDLs and MRLs are not available for the congener data, the statistical comparisons were performed only once, with non-detect data censored at the RDL and the EMPC-qualified data censored at the full reported value. Figures L-2 through L-6 present box-and-whisker plots for each of the statistical comparisons, for sediment, clams, crayfish, sculpin, and smallmouth bass, respectively.

The population-to-population comparisons were not conducted for every congener. Instead, the comparisons were carried out for the twelve dioxin-like congeners, and for the sum of 209 congeners. If concentrations of any of the dioxin-like congeners were found to be significantly higher in the Forebay, then concentrations of any of the other individual congeners which were not evaluated could be considered potentially higher in the Forebay. The statistical comparison of total PCBs (as sum of 209 congeners) was conducted separately, and the calculation of the sum of 209 congeners was based on the K-M method.

Table 8-3 summarizes those analytes for which Forebay sediment and tissue concentrations were significantly higher than the Reference Area concentrations. Censoring non-detect data at the MRLs (rather than the lower MDLs) generally reduced the ability of the statistical test to differentiate between the Forebay and the Reference Area data sets, and rendered it more likely that the test would conclude that concentrations in the Forebay were not significantly higher than that in the Reference Area. Therefore, the conservative approach was taken, and analytes were

listed in Table 8-3 even if only the MDL-censored data set led to the conclusion that the Forebay concentrations were significantly higher.

As discussed in Section 8.1, MDDs greater than 100% of the reference mean were assessed for lead in crayfish and chromium in bass (Table L-4 in Appendix L). Although the results of the statistical background comparison indicated that concentrations of these metals were present below or equal to that of the Reference Area levels, and therefore these metals were not carried to SLV comparison step, the high MDDs (greater than 100% of the reference mean) present an uncertainty with this finding. To address this uncertainty, lead in crayfish and chromium in bass were subjected to a risk-based screening evaluation in Appendix O. The purpose of this evaluation is to explore whether or not these metals should be included as COPCs, and ultimately advanced to the next level of risk assessment or directly to the FS. A weight-of-evidence approach similar to the one implemented in Sections 11 and 12 (screening level risk assessments) was used to evaluate these metals, as described in Appendix O.

There were insufficient surface water samples to perform statistical comparisons between the Forebay and Reference Area data. Therefore box-and-whisker plots were used to compare the surface water total concentrations (unfiltered grab samples and the sum of filter plus column for XAD samples) from the Forebay with those observed in the Reference Area. These results are presented in Figures L-7a through L-7f. Table 8-4 summarizes those analytes for which Forebay total surface water concentrations appeared to be higher than Reference Area total surface water concentrations, based on the available data set.

Each of the Forebay media are discussed individually, below.

Sediment

Population-to-population statistical comparisons showed that for all metals, concentrations observed in the 19 random Forebay sediment samples were not significantly higher than the concentrations observed in the 18 random Reference Area samples (Table 8-3). Similarly, none of the PAHs had sediment concentrations which were significantly higher in the Forebay than in the Reference Area. Neither DRO, nor Aroclor 1254 (the only Aroclor detected) concentrations were significantly higher in the Forebay than in the Reference Area. The only compounds which were shown to be higher in the Forebay, with a statistically significant level of confidence were RRO and several of the dioxin-like congeners. Interestingly, the concentration of total PCBs (as congeners) was not significantly higher in the Forebay than in the Reference Area (Table 8-3 and Figures L-2a through L-2g). These conclusions were identical, whether the non-detect data were censored at the MDLs (Table L-4) or the MRLs (Table L-5).

Clams

The results of population-to-population statistical comparisons between the random Forebay and Reference Area clam data are summarized in Table 8-3. In clams, beryllium and cadmium were the only inorganic analytes for which random Forebay concentrations were significantly higher than Reference Area concentrations. Among the organics, concentrations of acenaphthene, benzo(a)anthracene, benzo(b)fluoranthene, chrysene, pyrene, and selected dioxin-like congeners were also significantly higher in the Forebay. Concentration of total PCBs (as congeners) in clam tissue was not significantly higher in the Forebay than in the Reference Area (Table 8-3). The only difference in the conclusions when the population-to-population comparisons censored non-detect data at the MRLs, versus the MDLs, was that beryllium was no longer significantly higher

in the Forebay clam when the MRLs were used for censoring (compare Tables L-4 and L-5 and Figures L-3a through L-3g).

Crayfish

In crayfish, antimony, arsenic, chromium, mercury, methyl mercury, and nickel concentrations were significantly higher in the random Forebay samples than the River Reference Area samples, whether the undetected results were censored at the MDLs or the MRLs (Tables L-4 and L-5). Among PAHs, acenaphthene, benzo(a)anthracene, benzo(g,h,i)perylene, fluoranthene, phenanthrene, and pyrene were found to be significantly higher in the Forebay when the MDLs were used to censor the non-detect data. When MRL-censoring was used, the ability of the statistical test to differentiate between the Forebay and Reference Area populations was significantly reduced (compare Tables L-4 and L-5 and Figures L-4a through L-4g). Concentrations of individual dioxin-like congeners, as well as total PCBs (as congeners) were significantly higher in the Forebay crayfish than in the Reference Area crayfish. These results are summarized on Table 8-3.

Sculpin

Due to insufficient sample volumes, the sculpin were only analyzed for four metals and PCBs. Among those metals analyzed, cadmium, lead, and mercury concentrations were significantly higher in the Forebay sculpin than in the Reference Area sculpin (Table 8-2 and Figure L-5a). Aroclor 1254 (the only Aroclor detected) concentrations were no higher in the Forebay than in the Reference Area, but the power of this conclusion was limited by the fact that Aroclors were detected in only a few samples (Tables L-4 and L-5 and Figures L-5b). In contrast, when the more sensitive PCB congener analysis was used and the detection rate increased, the population-to-population statistical tests had sufficient power to conclude that concentrations of individual dioxin-like congeners, as well as total PCBs (as congeners) were significantly higher in the Forebay than in the Reference Area (Table L-6, and Figure L-5c). These conclusions were identical, whether the non-detect data were censored at the MDLs (Table L-4) or the MRLs (Table L-5).

Smallmouth Bass

The results of population-to-population statistical comparisons between the random Forebay and River Reference Area smallmouth bass data are also summarized in Table 8-3; the box-and-whisker plots are provided in Figures L-6a through L-6g. For smallmouth bass, aluminum, barium, copper, mercury, and zinc concentrations were significantly higher in the random Forebay than the Reference Area. Anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and pyrene were found to be significantly higher in the Forebay when the MDLs were used to censor the non-detect data. Aroclors 1242 and 1254 were detected, but the limited number of detections resulted in the conclusion that the Forebay concentrations were no higher than the Reference Area concentrations (Tables L-4 and L-5). An examination of the box-and-whisker plots (Figures L-6e) revealed that Aroclor concentrations were higher in the Forebay smallmouth bass. This was confirmed with the more robust data set afforded by the congener analysis. Concentrations of all of the dioxin-like congeners, as well as total PCBs (as congeners), were significantly higher in the Forebay than the Reference Area (Table L-6 and Figure L-6f). Additionally, B2EHP was found to have statistically higher concentrations in Forebay smallmouth bass than in Reference Area smallmouth bass – although there was no statistical

difference found for this analyte in any of the other media (Table 8-3). These conclusions were identical, whether the non-detect data is censored at the MDLs (Table L-4) or the MRLs (Table L-5).

Surface Water

The sample size (five each in the Forebay and Reference Area) was too small for statistical comparison, so the surface water was evaluated semi-quantitatively using box-and-whisker plots (Figures L-8a through L-8g). This analysis was performed using the total surface water concentrations (as opposed to dissolved). The results are summarized in Table 8-4.

Among the metals, the range of concentrations detected in Forebay surface water were less than the range detected in Reference Area surface water, with the exception of aluminum and barium (Figure L-7a). For each of these COIs, the detected concentration in one Forebay sample was higher than the maximum concentration detected in the Reference Area. Among the organic analytes, benzo(a)anthracene, benzo(b)fluoranthene, chrysene, phenanthrene, a few of the dioxin-like PCB congeners, and total PCBs (and congeners) also had maximum detected Forebay concentrations which exceed the maximum Reference Area concentrations. In all cases, the magnitude of these exceedances were small, making it hard to conclusively state that concentrations of these analytes are higher in the Forebay. However, to be conservative, all are listed on Table 8-4.

8.3.2 Forebay Targeted Samples

Since the sample size for the targeted areas of the Forebay (Eagle Creek and Goose Island) were too small to allow for statistical comparisons to Reference Area samples, the concentrations observed in these targeted samples were compared to Reference Area concentrations by evaluating whether or not the concentrations observed in the targeted samples were within the range of concentrations observed in the same media in the Reference Area, and whether they fell below the 95% UPL of the reference area data. The results are presented in Table L-7, and discussed below.

Eagle Creek

The mouth of Eagle Creek was represented by only two sediment samples. Concentrations of all metals, TPHs, and phthalates were less than the range of concentrations observed in Reference area sediments. Aroclor 1248 was detected in one sample (which exceeded the undetected results from the Reference Area); congeners were not analyzed. In addition, the concentration of carbazole, anthracene, phenanthrene, chrysene, and total LPAHs exceeded the Reference Area concentrations, but only in the sample that contained Aroclor 1248 (Table L-7).

Goose Island

The Goose Island targeted samples include two sediment samples and one sample each of clam, crayfish, and sculpin. Among the metals, concentrations of antimony, cadmium, thallium, and zinc were higher in the Goose Island sediments than in Reference Area sediments. However, this was not true for the tissues. The clam sample only had one metal (beryllium) with a concentration higher than Reference Area concentrations; the crayfish sample had a higher concentration of mercury than Reference Area concentrations, and no metals were higher in the sculpin. This does not suggest a local source of metals, but instead may be indicative of natural variability.

Regarding organic analytes, concentrations of DRO, RRO, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, Aroclor 1260, selected dioxin-like PCB congeners, and total PCBs exceeded Reference Area concentrations in one or both of the sediment samples. However, in tissue, only a few PAHs were higher in the Goose Island samples than in the Reference Area. Most significantly, none of the individual PCB Aroclors or dioxin-like congeners, and none of the total PCBs (calculated as either Aroclors or congeners) had concentrations exceeding Reference Area concentrations in any of the tissues (clams, crayfish, or sculpin) (Table L-7). Again, this does not suggest a local contamination source, but may instead reflect natural variability.

8.3.3 Downstream Sediments

The objective of the downstream sampling was to determine whether or not contaminated sediments from the Forebay may have migrated and accumulated in the Downstream area and whether further sampling might be needed to assess the potential contamination.

Unlike the Forebay and Reference areas, a non-statistical sampling approach was implemented Downstream, whereby areas of the river most conducive to sedimentation were targeted for sampling (depositional areas identified by lower river velocities) in an attempt to collect from locations most likely to be impacted by Forebay sediment transport. During the post-removal in-water sampling that occurred in March 2008, sediment was collected from six Downstream locations. These samples were collected from 1,200 feet below the dam to approximately 26,500 feet (5.0 miles) downstream of the dam.

All Downstream sediment samples were analyzed for the same chemicals that were analyzed in the Forebay and Reference areas: SVOCs (including PAHs), metals, PCBs as Aroclors, TPH, and sediment quality parameters (i.e., total organic compounds [TOC] and grain size).

COI concentrations in the downstream sediment samples were compared to concentrations in Reference Area sediments to determine whether or not site-related contamination may be present downstream of the Forebay. The sample size (six samples) is too small for statistical comparison, so the population of downstream samples were compared to the reference area population using box-and-whisker plots. The results are presented in Figures L-8a through L-8g (Appendix L).

For all analyte groups, the downstream sediments concentrations appeared to be essentially indistinguishable from the Reference Area concentrations. There were a few cases where a single concentration measurement in a downstream sample might be higher than the maximum concentration measured in the Reference Area, but the overall distributions appeared to be comparable.

See Section 9.6.1, which provides an evaluation of the Downstream sediment.

8.3.4 Upland OU Soils that may be Transported to the River OU

As described in Section 4.3, the soils on the steep slopes of the Landfill and Bulb Slope AOPCs may be subject to mass wasting in which the soils would be transported to the River OU. In addition, the surface soils in a small portion of the Sandblast Area AOPC were temporarily erodible, as a result of construction activities at the AOPC in 2009. Therefore the concentrations in these erodible/mass wasting soils were compared to sediment concentrations in the River OU

Reference Area to determine whether or not the soil concentrations are significantly higher than the Reference Area sediment concentrations. This was accomplished by comparing the maximum concentration observed in the erodible soil samples to the maximum and 95% UPL of the Reference Area sediment samples (Table L-8). In general, analyte concentrations were higher in these soils than in the Reference Area sediments. The only exceptions were aluminum, antimony, barium, beryllium, and vanadium.

These erodible/mass wasting soils were also compared to Reference Area soils from the Upland OU, again by comparing the maximum concentration observed in the erodible soil samples to the maximum and 95% UPL (Table L-9). Again, the analyte concentrations were generally higher in these soils than in the Reference Area sediments. The only exceptions were aluminum, beryllium, and manganese.

9.0 NATURE AND EXTENT OF CONTAMINATION

This section describes the nature and extent of contamination associated with releases at the Bradford Island Upland and River OUs. The AOPC boundaries for each of the Upland AOPCs were developed based on historical knowledge of usage, physical parameters (e.g., the river), and site observations and investigations, including geophysical surveys of the Landfill AOPC. This section focuses on the preliminary COPCs that were identified within each AOPC or the River OU (see Section 9.1), which are potentially associated with an unacceptable risk to human and/or ecological receptors. The following essential nutrients were excluded as potential COPCs or CPECs in soil and sediment: calcium, iron, magnesium, potassium, and sodium. However, these essential nutrients were evaluated for groundwater, seep water, and surface water.

Constituents that were undetected in all samples of a given media were not evaluated in this section of the report. Instead, these undetected constituents are addressed in the data sensitivity analysis (see Section 7.4 and Appendix K). COIs that lacked SLVs are not discussed herein, but are addressed in the uncertainty sections of the HHRA and ERA.

This section includes a number of figures showing the spatial distribution of preliminary COPCs in various media. The station symbols and preliminary COPC concentrations shown in the associated text boxes have been colored to indicate whether the concentration is above the most conservative SLV (red), less than the SLV (green), undetected (black), or not analyzed (grey). Surface (0-1 foot bgs) and shallow soil (0-3 feet bgs) data were plotted together because both of these depth intervals were screened against the lower of the ecological and human health SLVs. Deeper soil (> 3 feet bgs) data were plotted on separate figures because they were only screened against human health SLVs (this soil interval is not ecologically relevant for assessment; (URS 2007a). However, during the HHRA, data from the entire depth interval (0-10 feet bgs) was evaluated for risk to human receptors.

Throughout this section, please note that PAHs are discussed separately from other SVOCs.

9.1 Identification of Preliminary COPCs

Consistent with DEQ and USEPA guidance, COIs are chemicals that are known to be present or may be present at a site (DEQ 2000; USEPA 1989, 1997a,b, and 1998). The COIs identified in environmental media in the Upland and River OUs were subjected to a multi-step screening process to identify those chemicals potentially associated with an unacceptable risk to human and/or ecological receptors, hereafter termed “preliminary COPCs.”

The multi-step screening process included an evaluation of detection frequency, comparison to background levels for inorganics, and a preliminary screening in which COI concentrations were compared against the lowest potentially-applicable SLV for human and/or ecological receptors. The nature and extent of contamination and the fate and transport of these preliminary COPCs are discussed herein and in Section 10. The final selection of COPCs and CPECs, including an evaluation of receptor specific toxicity and multiple COI toxicity, is completed in the HHRA (see Section 11 and Appendix M) and ERA (see Section 12 and Appendix N).

Relevant media, depth intervals, and EPCs for specific human and ecological receptors are discussed in the Upland and River DSRs (URS 2009d,e), DSR Meeting Minutes Memorandum (URS 2010a), River OU and Upland OU DSR RTC (URS 2010b,c), and the Area-Weighted Average Memorandum (URS 2010d). Additional information regarding relevant media and

depth intervals for specific human health and ecological receptors is included in the HHRA (see Section 10 and Appendix I) and ERA (see Sections 11 and Appendix J). Please note that the preliminary COI screening utilizes the maximum detected concentration for the EPC, which is compared to the lowest of the human health and ecological SLVs, since the most conservative screening approach was desired at this point in the process.

The preliminary COI screening methodology utilized to identify the preliminary COPCs is similar to the methodology presented in the RI/FS MP (URS 2007a) and screening conducted in the Upland and OU DSRs (URS 2009d,e). However, this RI screening supersedes the DSR screenings because the data set is different (additional data are included in this RI report) and the SLVs have since been revised. The preliminary COI screening process steps vary depending on the OU, media, and contaminant group, as discussed below.

Section 8.0 compared inorganic soil, sediment, and tissue data from the Upland and River Reference Areas with site concentrations to differentiate site-related concentrations of inorganic COIs from are naturally occurring concentrations. A population-to-population statistical comparison for the Upland OU organic data was also performed by comparing the soil PAH concentrations within each AOPC and for all four AOPC combined to the Reference Area PAH concentrations. Similarly, a population-to-population statistical comparisons for organic data between the Forebay and Reference Areas of the River OU was performed. However, the results of these organic statistical comparisons were not used for the preliminary COPC identification or the identification of COPCs and CPECs in the risk assessments and are not discussed in this nature and extent of contamination section or the fate and transport section (Section 9.0). The results of the organic statistical comparisons are discussed in Section 8.0 and Appendix L.

9.1.1 Upland OU

The Upland OU data set evaluated in this section includes the historical and recent soil, lagoon sediment, groundwater, seep water and adjacent surface water, and/or soil gas from within each AOPC (see Tables 5-1 through 5-7 and Tables 6-2 through 6-4). For the Pistol Range and Bulb Slope AOPCs soil evaluations, only surface soil was evaluated (0 to 1.5 feet bgs and 0 to 1 foot bgs, respectively). As noted in the RI/FS MP, a review of historical activities and the source of contamination at the Pistol Range AOPC (bullets and casings from firing practice) are consistent only with surface impacts; therefore, deeper samples do not need to be evaluated for this AOPC. Since the Bulb Slope AOPC only has a thin layer of soil underlain by a bedrock base, there are no soils deeper than 1 feet bgs in this area and the existing surface soil data are sufficient to evaluate risk.

Each media was screened against the media-specific SLVs described above. In addition, selected soil samples were also screened against sediment SLVs as follows:

- While there is no visual evidence of current sloughing or erosion at the Landfill AOPC and minimal visual evidence of potential sloughing at the Bulb Slope AOPC, sloughing of soils from the steep slopes on the northern side of Bradford Island is possible. Therefore, all soil results in the Bulb Slope AOPC and those surface soil samples collected from the steep slope on the northern edge of the Landfill AOPC (BIL01USE through BIL09USE, BIL13SSI, and L-01 through L-04) were also screened against sediment SLVs.

- The erodibility assessment (Appendix E of URS 2009f) determined that there was the potential for soil to be eroded from a portion of the Sandblast Area AOPC and transported to the river that had been disturbed during construction activities. The subset of soil samples within the erodible area (SB-EUA, SB-EUB, SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, SB-EUB-15, and SB-04) was screened against sediment SLVs. Please note that this area has become revegetated during the past year and is no longer considered to be erodible (see Section 4.1.3).

Soil

1. *Frequency* – Within each AOPC and for all four AOPCs combined, COIs were not retained as preliminary COPCs if detected at a frequency of 5% or less with a sample size of 20 or more (Appendix I, Tables I-1 through I-5).

   Statistical Comparison Between the Reference Area and AOPCs for Inorganics Only – In Chapter 8, a statistical comparison of two independent data sets was performed between the Reference Area surface soil data set (Appendix I, Table I-6) and each of the Upland AOPC soil data sets (for each of the depth intervals; 0-1, 0-3, and/or 0-10 feet bgs). In addition, the comparison to Reference Area soils was performed for the combined data sets (including all four Upland AOPCs) for each depth interval.

   Inorganic COIs were not retained as preliminary COPCs within a given AOPC or for all four AOPCs combined if the statistical comparison indicated that the AOPC data were not significantly greater than the Reference Area data (Table 8-1 and Appendix L, Tables L-2 and L-3).

2. *SLV Screening* – COIs within each AOPC and for all four AOPCs combined were not retained as preliminary COPCs if they were detected at concentrations below the soil SLVs (Tables 9-1 through 9-5).

Potentially Erodible or Mass Wasting Soils

1. *Comparison to Reference Area Sediments for Inorganics Only* – Since the erodible soils (from 2009) and soils potentially susceptible to mass wasting may impact river media if the soils are transported to the river, the inorganic data were compared to Reference Area sediment data from the River OU. The objective of this comparison was to determine if the inorganic COI concentrations were elevated above the naturally occurring concentrations in the river (i.e., the Reference Area sediment concentrations) (Appendix L, Table L-8).

2. *SLV Screening* – COIs detected in the potentially erodible or mass wasting soil within the were not retained as preliminary COPCs for the erodibility and mass wasting pathway if they were detected at concentrations below the sediment SLVs (Table 9-6).

Lagoon Sediment

1. *Comparison to Reference Area Sediments for Inorganics Only* – The inorganic data from the Pistol Range AOPC lagoon sediments were compared to Reference Area sediment data from the River OU to determine if the concentrations were elevated above the naturally occurring concentrations in the river.

2. *SLV Screening* – COIs detected in the Pistol Range AOPC lagoon sediment were not retained as preliminary COPCs if they were detected at concentrations below the sediment SLVs (Table 9-3).

Groundwater, Seeps, and/or Surface Water

1. *Frequency* – Within each AOPC and for all four AOPCs combined, COIs were not retained if detected at a frequency of 5% or less with a sample size of 20 or more (Appendix I, Tables I-1 through I-5).
2. *Reference Area Groundwater Comparison for Inorganics Only* - For groundwater, the inorganic groundwater data for COIs within each AOPC and all four AOPCs combined were compared to the Reference Area groundwater data. The objective of this comparison was to determine if Upland OU inorganic COI concentrations were elevated above the site-specific naturally occurring levels (i.e., the Reference Area groundwater concentrations) (Table 8-2 and Appendix L, Table L-3). Inorganic COIs within each AOPC and within all four AOPCs combined were not retained as preliminary COPCs if they were detected at concentrations at or below the Reference Area groundwater data.
3. *SLV Screening* – Those COIs that were retained after step 2 (i.e., COIs with > 5% detections and concentrations > reference area concentrations) were then compared to the water SLVs. COIs within each AOPC and within all four AOPCs combined were not retained as preliminary COPCs if they were detected at concentrations below the water SLVs (Tables 9-1 through 9-5).

Soil Gas

1. *SLV Screening* – VOCs within the Sandblast AOPC were not retained as preliminary human health COPCs if they were detected at concentrations below the SLVs (Table 9-2).

Summary

Those Upland COIs not eliminated during the preliminary COI screening process were retained as preliminary COPCs and are summarized in Table 9-7. The nature and extent of preliminary COPC contamination at each AOPC within the Upland OU are presented in Sections 9.2 through 9.5. In addition, all potentially bioaccumulative COIs, which have a BAF > 0.1 or log K_{ow} > 3.5, detected in the Upland OU were further evaluated in the ERA. The Upland OU detected bioaccumulative COIs are listed in Appendix J, Table J-6.

9.1.2 River OU

Forebay Random Samples

The Forebay data set of samples from the randomly selected locations evaluated in this section includes the post-removal surface water, sediment, and tissue, as well as the pre-removal 2006 smallmouth bass. This data set does not include the Eagle Creek, Goose Island, Downstream, or pre-removal sediment and clam data sets, which were evaluated separately. The following summarizes the preliminary COI screening process for the random Forebay data set:

1. *Frequency* – COIs were not retained as preliminary COPCs if detected at a frequency of 5% or less with a sample size of 20 or more (Appendix I, Tables I-8a and I-8b).

   Statistical Comparison to Reference Area for Inorganics Only – Similar to the Upland OU, Chapter 8 included a statistical (population-to-population) comparison of two independent data sets for each media was performed between the Reference Area sediment and tissues (clam, crayfish, smallmouth bass, and sculpin) and the random Forebay sediment and tissues. Inorganic COIs were not retained as preliminary COPCs within the Forebay if the statistical comparison indicated that the Forebay data were not significantly greater than the Reference Area data (Tables 8-3 and 8-4; Appendix L, Tables L-4 through L-6).

2. *SLV Screening* – COIs were not retained as preliminary COPCs within the Forebay if they were detected at concentrations below their media-specific (i.e., water, sediment, and tissue) SLVs (Table 9-8).

Forebay Targeted Samples - Goose Island and Eagle Creek

1. *Comparison to Reference Area for Inorganics Only* – For the targeted Forebay sampling locations at Goose Island and Eagle Creek, which do not have enough samples to perform a statistical (population-to-population) comparison, the maximum detected inorganic concentrations in sediment and tissue (clam and crayfish) were compared to the inorganic in the Reference Area data (Appendix L, Table L-7). COIs were not retained as preliminary COPCs if detected at concentrations less than the Reference Area.
2. *SLV Screening* –COIs were not retained as preliminary COPCs at Goose Island or Eagle Creek if they were detected at concentrations below their media-specific (i.e., water, sediment, and tissue) SLVs (Tables 9-9 and 9-10, respectively).

Summary

Those River COIs not eliminated during the preliminary COI screening process were retained as preliminary COPCs and are summarized in Table 9-11. The nature and extent of preliminary COPC contamination within the River OU are presented in Section 9.6. In addition, all potentially bioaccumulative COIs, which have a BCF > 300 or log K_{ow} > 3.5, detected in the River OU were further evaluated in the HHRA and ERA. The River OU detected bioaccumulative COIs are listed in Appendix J, Table J-7.

9.2 Landfill AOPC Nature and Extent of Contamination

As previously described, the Landfill AOPC was used by the USACE to manage, store, and dispose of waste materials from approximately 1942 to 1982, with its heaviest use in 1952. The Landfill AOPC encompasses approximately 28,000 square feet on the northeast corner of Bradford Island (Figure 3-3). Based on a review of aerial photographs, the Landfill AOPC was capped by 1982. In 1989, an additional soil cover (approximately 8 inches thick) was placed on the Landfill site by the USACE and the site was managed as a wildlife habitat for geese (Hibbs, personnel comm. 2001). Although this portion of Bradford Island is managed as wildlife for geese (USACE 1997a), active management (periodic mowing) of the habitat ceased in the middle to late 1990s to prevent geese from laying eggs in areas that are under investigation (Hibbs, personnel comm. 2001).

The surface of the actual Landfill (excluding the steep slopes around the perimeter of the AOPC) slopes gently to the northwest, north, and northeast, toward the Columbia River. The Landfill road runs along the southern margin of the Landfill. The Landfill surface is densely vegetated with forest, scrub-shrub, and herbaceous vegetation. The road is more sparsely vegetated with herbaceous vegetation. No evidence of runoff or erosion was observed or predicted through modeling for the Landfill surface (URS 2009f). Minor runoff has been observed on the Landfill road. The source of the Landfill road runoff is a groundwater seep at the base of the steep slope along the southern margin of the Landfill. The water flows west along the road and then infiltrates along the northern margin of the Landfill road to the west of the Landfill. The runoff water was clear at the time of the field survey, indicating that the flow of seep water along the road is not causing soil erosion. Runoff from the road appeared to infiltrate and evidence of direct discharge of road runoff to the river was not observed (URS 2009f).

While there is no visual evidence of current sloughing along the northern perimeter of the Landfill AOPC, undercutting was observed along the waterline at the north slope indicating that historical mass wasting may have occurred. Although the potential for bedrock failure is low, if mass wasting were to occur on the steep slopes, the soils may reach the river.

Shallow groundwater flows to the north and enters the river through bottom sediments or above-water surface seeps. During the wet season, groundwater may rise shallow enough to encounter waste materials in a small portion of Landfill AOPC.

9.2.1 Soil

There have been extensive investigations of the surface/shallow soil across the Landfill AOPC, including the collection of 37 surface and shallow samples. Deeper soil samples are limited to 18 locations within two areas: the gully test pit and the mercury vapor-lamp test pit (see Figure 5-2). Soil analytical results are present on Tables 5-1a through 5-1c, 5-2a through 5-2d, 5-3a and 5-3b, and 6-2a. Appendix I, Table I-1 presents the summary statistics and detection frequency for the Landfill AOPC data.

Metals

Metals were detected in surface, shallow, and deeper soil throughout the Landfill AOPC. Concentrations of several metals (antimony, arsenic, cadmium, lead, mercury, and/or zinc) exceeded soil SLVs at most surface/shallow soil locations (Figure 9-1a). Concentrations of these metals in deeper soil are comparable to concentrations in surface/shallow soils (Figure 9-1b). However, there are only a few locations at which any of these metals (arsenic and/or lead) exceeded the less conservative human health soil SLVs that are applicable to the deeper interval.

It is also important to note that the concentrations of arsenic observed in Landfill soils are no higher (based on statistical population-to-population tests) than site-specific reference area soils (see Table 8-1 and discussion in Section 8.1). Therefore, although soil arsenic concentrations may exceed conservative SLVs, the source of the arsenic is naturally-occurring and unrelated to site activities.

Butyltins

Butyltin analyses were conducted at 22 surface, shallow, or deep sample locations, and detected in one surface, one shallow, and two deep locations. None of the butyltin concentrations exceeded their soil SLVs in surface, shallow, or deeper soil (see Table 9-1).

Herbicides & Pesticides

Herbicides were detected in a few surface and shallow sample locations across the Landfill AOPC but not in deeper soil. Pesticides were detected in several surface and shallow sample locations and a few deeper locations. Concentrations of several herbicides and pesticides (2,4,5-T, dichloroprop, MCPP, and 4,4'-DDT) only exceeded soil SLVs at a few surface/shallow soil locations, scattered across the Landfill AOPC (Figure 9-1c). In deeper soil, pesticide concentrations were lower than both less conservative deeper soil SLVs and the more conservative surface and shallow soil SLVs (see Table 9-1 and Appendix I, Table I-1).

PCBs

PCBs were detected in the majority of the surface, shallow, and deeper sample locations throughout the Landfill AOPC. However, concentrations of total PCBs (as Aroclors) exceeded soil SLVs at only three surface/shallow soil locations, all in the western portion of the Landfill AOPC (Figure 9-1d). In deeper soil, the only location where the total PCB (as Aroclors) concentration exceeded the less conservative human health soil SLV, applicable to the deeper interval, was at the gully test pit sample location BIL01TPG (which is treated as both a surface/shallow sample and deeper sample because it is unknown where it occurs in the 0-10 feet interval) (Figure 9-1e).

PAHs

PAHs were detected in all surface, shallow, and deeper sample locations except shallow location BIL13SSI. Total HPAH concentrations exceeded the soil SLV at most surface/shallow soil locations (Figure 9-1f). There is no soil SLV applicable to total HPAHs in the deeper soils. However, concentrations of most of the individual HPAHs exceeded their less conservative human health soil SLVs at most deeper locations (see Table 9-1). Total LPAH concentrations only exceeded soil SLVs at one shallow location at the gully test pit (BIL18) (Figure 9-1f). There is no soil SLV applicable to total LPAHs in the deeper soils. None of the individual LPAHs exceeded their less conservative human health soil SLVS applicable to the deeper interval (see Table 9-1).

TPH

TPHs were detected in the majority of the surface, shallow, and deeper soil samples throughout the Landfill AOPC. Concentrations of GRO exceeded the soil SLV at only a single surface/shallow soil location, within the mercury vapor-lamp test pit (BIL29TPM) (Figure 9-1g). Concentrations of DRO and RRO did not exceed their soil SLVs at any of the surface/shallow soil locations. In deeper soil, with the exception of BIL29TPM (which is treated as both a surface/shallow sample and deeper sample because it is unknown where it occurs in the 0-10 feet interval), no deeper soil locations with DRO, GRO, or RRO concentrations exceeded their soil SLVs (Figure 9-1h).

SVOCs

In addition to PAHs, other SVOCs were detected in the majority of the surface, shallow, and deeper soil samples throughout the Landfill AOPC. Concentrations of dibenzofuran exceeded its soil SLV at approximately half the surface/shallow soil locations (everywhere it was detected) (Figure 9-1g). Concentrations of a few other SVOCs (B2EHP, carbazole, and di-n-butyl phthalate) exceeded their soil SLVs at only one or two surface/shallow soil locations (different locations for each SVOC) (see Table 9-1). In deeper soil, none of the SVOCs had concentrations that exceeded the less conservative human health soil SLVs applicable to the deeper interval (Figure 9-1h and Table 9-1).

VOCs

VOCs were detected in the majority of the surface, shallow, and deeper soil samples throughout the Landfill AOPC. Concentrations of only two VOCs (ethylbenzene and PCE) exceeded their soil SLVs (see Table 9-1), both of which were in the same sample (BIL04TPG) within the gully test pit. Ethylbenzene exceeded the more conservative ecologically based surface/shallow SLV. PCE, which was only evaluated for the deeper interval in the gully test pit samples since more recent surface/shallow samples were analyzed for PCE, exceeded the human health-based SLV for the deeper interval.

9.2.1.1 Mass Wasting Soil

Soils potentially susceptible to mass wasting along the perimeter of the Landfill AOPC are represented by fourteen surface soil locations (BIL01USE through BIL09USE, BIL13SSI, and L-01 through L-04), which were evaluated for potential impacts to the river by screening the surface soil concentrations against sediment SLVs (see Table 9-6 and Figures 9-2a and 9-2b). L-01 through L-04 were only analyzed for selected PAHs.

Metals

Metals were detected at all of the perimeter soil sample locations. Many metals (arsenic, cadmium, chromium, cobalt, copper, lead, mercury, nickel, thallium, and/or zinc) were present at concentrations that exceeded sediment SLVs.

Herbicides/Pesticides

Herbicides were not detected at the single perimeter soil sample location (BIL13SSI) where herbicides were analyzed. Concentrations of the pesticides 4,4’-DDT and dieldrin exceeded their sediment SLVs at every location where they were detected (seven of 10 locations and one of 10 locations, respectively).

PCBs

PCBs were detected at nine of the 10 sample locations where PCBs were analyzed. All of the detected concentrations of total PCBs (as Aroclors) exceeded the sediment SLV.

PAHs

HPAHs and LPAHs were detected at 13 of the 14 sample locations where PAHs were analyzed. All of the detected concentrations of total HPAHs and total LPAHs exceeded their sediment SLVs

TPH

DRO, GRO, and RRO were not detected at the single location (BIL13SSI) where TPH was analyzed.

SVOCs

Other SVOCs (in addition to PAHs) were detected at the 10 sample locations where SVOCs (other than PAHs) were analyzed. Of the six SVOCs detected in the perimeter surface soil locations, two (benzoic acid and benzyl alcohol) did not have sediment SLVs, two (B2EHP and dibenzofuran) had concentrations that did not exceed their sediment SLVs, and two (and di-n-butyl phthalate and carbazole) had concentrations that only exceed their sediment SLVs at one or two locations (different for each).

VOCs

VOCs were detected at the five sample locations where VOCs were analyzed. Only three VOCs (dichloromethane, PCE, and toluene) were analyzed at four of the five locations. None of the detected concentrations exceeded the sediment SLVs.

9.2.2 Groundwater, Seep Water, and Surface Water

Nine monitoring wells (MW-1 through MW-9) were installed at the Landfill AOPC between 1998 and 2002 to evaluate potential groundwater contamination. Landfill AOPC groundwater analytical results are presented on Tables 5-1d through 5-1f, 5-2e through 5-2g, and 6-2b. Seep water analytical results are presented on Tables 5-1d through 5-1f, and 6-2b.

Metals

A variety of metals have been detected in both total and dissolved groundwater at all monitoring wells. Several metals were detected in groundwater at the Landfill AOPC at concentrations exceeding the MW-10 Reference Area concentrations (Table 8-2). Metals detected in seep water at concentrations that exceeded both Reference Area concentrations and SLVs included total arsenic, iron, lead, and manganese; and dissolved barium, iron and manganese (Table 9-7).

Several total metals concentrations (arsenic, iron, manganese, lead, and thallium) exceeded the water SLVs at all monitoring well, seep water, and surface water sampling locations (Figure 9-3a). Several dissolved metals concentrations (arsenic, barium, calcium, iron, lead, manganese, sodium, and zinc) also exceeded their water SLVs at multiple monitoring well, seep water, and surface water sampling locations (see Table 9-1), but only total concentrations were plotted on the figures. Mercury vapor lamps were identified on the surface and in the subsurface at the Landfill AOPC. However, mercury was detected in groundwater only at MW-1 and MW-3, and at concentrations below the SLVs. Mercury was not detected in seep water.

Butyltins

Butyltins were detected in groundwater at all monitoring wells except MW-9. Dibutyltin concentrations exceeded its water SLV in the majority of monitoring wells (Figure 9-3d). Monobutyltin concentrations only exceeded the water SLV in a single monitoring well (MW-2) at the southern, upgradient portion of the Landfill AOPC. In most cases, wells in which earlier samples found butyltins have subsequently been found not to contain these analytes. Butyltins were not detected in seep water or surface water.

Herbicides & Pesticides

Herbicides were detected only at MW-5 (dichloroprop) and MW-8 (4-nitrophenol and pentachlorophenol). Pesticides were detected only at MW-3 (4,4'-DDE and dieldrin). Herbicides and pesticides were not detected in seep water. Herbicides and pesticides did not exceed their water SLVs at any of the monitoring wells (see Table 9-1 and Appendix I, Table I-1).

PCBs

PCBs were not detected in groundwater or seep water at the Landfill AOPC.

PAHs

Several PAHs were detected in groundwater at MW-1, MW-4, MW-5, MW-7, MW-8, and MW-9. PAHs were not detected in seep water in 2000. Phenanthrene is the only PAH that was analyzed for in seep water or surface water in 2008, and 2009 it was not detected. Naphthalene, which was only analyzed in the 1999-2002 sampling events, had a concentration that slightly exceeded the water SLV one time at only one monitoring well (MW-1) (Figure 9-3c). Phenanthrene concentrations exceeded the water SLV at MW-4, MW-5, and MW-8 in the center of the Landfill AOPC.

TPH

DRO and RRO were detected in groundwater from all monitoring wells. GRO was detected in all monitoring wells except MW-2, MW-4, and MW-9. DRO and RRO were also detected in seep water. Only DRO was detected in surface water. DRO, GRO, and/or RRO concentrations exceeded their water SLVs at all monitoring wells (Figure 9-3b). However, concentrations of all three fractions are lower than water SLVs at the seep water and surface water locations, except DRO, which exceeded the water SLV in one of two events at S4.

SVOCs

Several SVOCs (in addition to PAHs) were detected in groundwater, at all monitoring wells except MW-7. B2EHP and DNOP concentrations exceeded water SLVs at several monitoring wells (Figure 9-3c). A single SVOC, benzoic acid, was detected in seep water in 2000 at a concentration below its SLV. Only three SVOCs (1,4-dichlorobenzene, 4-nitrophenol, and phenol) were analyzed for in seep water or surface water in 2008 and 2009; they were not detected.

VOCs

VOCs were detected in all monitoring wells except MW-1 and MW-2. Chloroform and PCE were detected in seep water but not surface water. Concentrations of chloroform, PCE, and/or vinyl chloride exceeded their water SLVs at the majority of monitoring wells (Figure 9-3d). Chloroform and PCE concentrations exceeded their water SLVs in seep water.

9.2.3 Summary

In summary, use of the Landfill AOPC to manage, store, and dispose of waste materials has resulted in contamination of soil, groundwater, and seep water with chemicals associated with the wastes. The extent of the wastes is well defined based on topography, review of historical aerial photographs, a geophysical survey, excavation of test pits, observation of wastes on the ground surface, and the analysis of soil, groundwater, seep ,and surface water samples. The type

and magnitude of contamination is variable, consistent with the variable waste management, storage, and disposal activities that occurred at the Landfill AOPC.

Soil

Metals, PAHs, and SVOCs were detected throughout the Landfill AOPC at concentrations exceeding the SLVs. Butyltins, herbicides, pesticides, PCBs, TPH, and VOCs had generally limited detections and/or few if any exceedances of SLVs (Figures 9-4a and 9-4b). The majority of the ground surface at the Landfill AOPC is relatively flat, well vegetated, and shows minimal evidence of surface runoff, soil erosion, or sediment deposition, indicating that the ground surface is stable and there is minimal potential for off-site migration of contaminated soil.

Mass Wasting Soil

The north and east sides of the Landfill AOPC include steep slopes leading down to the Columbia River. Although the potential for mass wasting appears low, a subset of the surface soil sample data (from the steep slopes) was compared to sediment SLVs to assess soil that has the potential to migrate to the river via mass wasting. Metals, pesticides, PCBs, and PAHs were detected throughout the Landfill AOPC perimeter soil samples at concentrations exceeding the SLVs. Herbicides, TPH, SVOCs, and VOCs had generally limited detections and/or few if any exceedances of SLVs.

Groundwater, Seep Water, and Surface Water

Groundwater, seep water, and surface water analytical data were compared to applicable SLVs to assess the groundwater to surface water pathway at the Landfill AOPC. Elements of this pathway include leaching of soil contaminants to groundwater and discharge of groundwater to the river either at seeps or as base flow. The direction of groundwater flow beneath the Landfill AOPC is to the north (Appendix D, Figures D-1 through D-4). Horizontal hydraulic gradients between MW-2 and MW-5 in the Landfill AOPC range from 0.10 to 0.13 foot per foot (Appendix D, Table D-2). Metals, TPHs, and VOCs were detected in groundwater throughout the Landfill AOPC, as well as in seep water, at concentrations exceeding the SLVs. Metals and DRO were also detected in surface water at concentrations exceeding the SLVs. Butyltins, herbicides, pesticides, PCBs, PAHs, and SVOCs had generally limited detections in groundwater and/or few if any exceedances of SLVs. Butyltins, herbicides, pesticides, PCBs, and PAHs were not detected in seep water.

9.3 Sandblast Area AOPC Nature and Extent of Contamination

As previously described, contamination at the Sandblast Area AOPC resulted from a variety of historical and ongoing uses that include equipment storage and management, storage, and disposal of various hazardous materials and wastes. The Sandblast Area AOPC has been divided into subareas corresponding to the different uses and associated known or potential sources of contamination: the septic tank drain field area, the spent sandblast media disposal area, two HMSAs, a transformer disassembly area, an equipment laydown area, and a former burn pit (Figure 3-4). The two HMSAs include the former HMSA, also referred to as the drum storage area, and the current HMSA located immediately southeast of the former sandblast building. The former HMSA was investigated because various hazardous and non-hazardous materials were stored there from the early 1980s to the early 1990s and the former HMSA pad did not have secondary contaminant or protective berms. The current HMSA has secondary containment and

no document releases have occurred in this area since its construction. Prior to construction of the current HMSA, a storage tank was reportedly present at this location that is inferred to have been the source of a historical release of VOCs to adjacent soils.

Several site investigations have occurred at the Sandblast Area AOPC since 2001 that focused on individual subareas within the Sandblast Area AOPC and/or the media associated with the individual subareas. Based on the results of these investigations, the three subareas that appear to be the primary sources of contamination are the sandblast grit disposal area, the equipment laydown area, and an inferred VOC release at the current HMSA (Figure 3-4).

There are only three sample locations (DP11, DP12, and HA12) that were sampled in deeper soil (3-10 feet bgs) at the Sandblast Area AOPC. Due to the limited number of samples within the 3-10 feet bgs interval, six very deep samples (DP5 through DP10 sampled at > 10 feet bgs) were also included in the evaluation of the deeper soil for nature and extent at the Sandblast Area AOPC. Note that DP10 (sampled at 9-12 feet bgs) was not included in the deeper soil interval (0-10 feet bgs) because most of the sampling interval was greater than 10 ft.

The topography of the Sandblast Area AOPC generally consists of a north facing slope with numerous topographic complexities. Upslope of the former sandblast building is a relatively undisturbed and densely vegetated hill slope. Below the upper hill slope is a relatively flat and paved area around the former sandblast building. Downslope (to the north-northeast) of the former sandblast building and the adjacent paved area is a short, steep forested hill slope leading to the flat equipment laydown area and the paved road leading east to the Landfill AOPC. Downslope (to the northwest) of the former sandblast building is a relatively flat, vegetated area, followed by a recently disturbed slope, then a paved road. Recent excavation and filling activities on the slope removed vegetation and exposed bare, erodible soils at the ground surface immediately upslope of CB-2.

Within the Sandblast Area AOPC, a portion of the stormwater runoff from impervious surfaces (asphalt) drains to four catch basins that discharge to the Columbia River through two outfalls. It appears, however, that the majority of the runoff from asphalt immediately southeast of the former sandblast building flows northeast and discharges onto a short, steep, forested hill slope, where it causes rills to develop on the hill slope. Eroded soil from the rills combined with sandblast grit from further upslope has been observed accumulated at the base of the slope and behind one of two concrete curbs that run along the base of the slope at the equipment laydown area (URS 2009f).

Evidence of runoff was observed along the Landfill access road and the adjacent equipment laydown area. These areas are flat and evidence of erosion is generally lacking. Runoff from the road appears to flow north onto a vegetated area between the Landfill road and the river. Evidence of surface runoff or erosion is absent in this vegetated area, suggesting that runoff flowing onto this area infiltrates before reaching the river (URS 2009f). Within the remainder of the Sandblast Area AOPC, in particular vegetated areas, no evidence of surface runoff, soil erosion, or sediment deposition was observed. In summary, the only complete pathway for direct discharge of surface water from the Sandblast Area AOPC to the river is via the four catch basins.

9.3.1 Soil

Extensive investigations of the surface/shallow soil have occurred throughout the Sandblast Area AOPC and its subareas, as well as along stormwater flow paths and adjacent to catch basins. One hundred and eighteen surface and shallow samples have been collected. Deeper and very deep soil samples are limited to nine locations within two subareas: the current HMSA and the septic tank drain field area (see Figure 9-5i). Soil analytical results are present on Tables 5-4a through 5-4e, 5-5a through 5-5c, and 6-3a through 6-3g. Appendix I, Table I-2 presents the summary statistics and detection frequency for the Sandblast Area AOPC data.

Metals

Metals were analyzed in surface and shallow soil samples throughout the Sandblast Area AOPC, including all subareas, as well as along the stormwater flowpath CB-1 and adjacent to CB-1. Metals were detected in surface and shallow soil throughout the Sandblast Area AOPC. Relatively elevated concentrations of metals were associated primarily with the spent sandblast media disposal subarea, the equipment laydown subarea, and to a lesser extent the former HMSA subarea, indicating these three subareas are the primary sources of metals in soil. Elevated concentrations of metals were also detected in soil samples collected at or near CB-1, indicating that transport of metals from potential source areas to the catch basin via the stormwater pathway has occurred. Concentrations of several metals (antimony, arsenic, cadmium, chromium, lead, nickel, selenium, and/or zinc) exceeded soil SLVs at most surface/shallow soil locations (Figures 9-5a through 9-5d).

Metals were only analyzed in deeper and very deep soil at five borings located at the septic tank drain field subarea and four borings at the current HMSA subarea. At the septic tank drain field subarea, concentrations in deeper soil and very deep soil (>10 feet bgs) for the eight metals listed above were generally lower than the surface and shallow concentration. The only exceptions were antimony, which had similar concentration, and arsenic, which had higher concentrations than in surface/shallow soils. At the current HMSA subarea all eight metals had lower concentrations than the corresponding surface and shallow soils (Figure 9-5e). Only arsenic and chromium concentrations exceeded the less conservative human health soil SLVs that are applicable to the deeper soil intervals.

Potential correlations among concentrations of the eight metals detected above their soil SLVs were examined. Concentrations of each metal were compared to each of the other metals (e.g., lead and chromium, lead and cadmium, chromium and cadmium, etc) by plotting the paired data for each location on scatter plots. Best-fit linear regression lines were calculated, along with the resulting r-squared values. Initially, the data set was divided into the following three data sets:

- Surface soil (0-1 foot bgs) in the southern portion of the Sandblast Area AOPC within/surrounding the former HMSA.
- Surface soil (0-1 foot bgs) in the remaining portion (northern portion) of the Sandblast Area AOPC.
- Subsurface soil (1-3 feet bgs) in the northern portion of the Sandblast Area AOPC.

Little evidence of correlation was found in any of these data sets. The surface soil (0-1 foot bgs) in the northern portion of the Sandblast Area AOPC was then divided into two subgroups based on samples that were noted for having higher soil or higher sandblast grit composition. The only

correlation that was present was for chromium and nickel (r^2=0.93) in surface soil samples. This is consistent with the historical use of a chromium-nickel based coating system for some of the equipment which likely was sandblasted at the former sandblast building. No other correlations between metals concentrations were found.

Butyltins

Butyltins were analyzed in surface and shallow soil samples from the septic tank drain field, spent sandblast media disposal, current HMSA, transformer disassembly, and the equipment laydown subareas, as well as in one sample from the former HMSA, and several samples along the stormwater flow path to CB-1, and at CB-1. Butyltins were detected at the septic tank drain field, spent sandblast media disposal, current and former HMSA, and the equipment laydown subareas. Butyltins were also detected in samples along the stormwater flowpath to CB-1, but were not detected in soil samples at CB-1.

Butyltins were only analyzed in deeper soil at five borings located at the septic tank drain field subarea. Butyltins were detected at all five borings at depths ranging from 13 to 23 feet bgs (the samples depths corresponded to the depth where groundwater was first encountered in each boring).

Some butyltins were detected in less than 5% of samples (e.g., tetrabutyltin) and all butyltins had concentrations less than their soil SLVs in surface, shallow, deeper and very deep soil (see Table 9-2 and Appendix I, Table I-2).

Herbicides & Pesticides

Herbicides analyses were conducted on 12 surface soil samples at the former HMSA. No herbicides were detected (see Appendix I, Table I-2).

Pesticides were analyzed for and detected in surface and shallow soil samples at the septic tank drain field, spent sandblast media disposal, equipment laydown, and former HMSA subareas. Concentrations of several pesticides (4,4'-DDT, endrin, endrin aldehyde, and endrin ketone) exceeded soil SLVs within the surface soil at six locations at the east end of the equipment laydown subarea, and one location at the former HMSA subarea (Figure 9-5f). In one equipment laydown subarea sample, 4,4'-DDT also slightly exceeded the soil SLV in shallow soil. Pesticides analyses in deeper and very deep soil were limited to five borings located at the septic tank drain field subarea. Pesticides were not detected at these boring locations (see Table 9-2 and Appendix I, Table I-2).

PCBs

PBCs were analyzed in surface and shallow soil samples throughout the Sandblast Area AOPC, including all subareas, as well as along the stormwater flowpath to CB-1 and at CB-1. PCBs were detected in most or all of the samples from each subarea. PCBs were also detected in all samples along the stormwater flow path to CB-1 and in all samples at CB-1, indicating that transport of PCBs from potential source areas to the catch basin via the stormwater pathway has occurred. Concentrations of total PCBs (as Aroclors) exceeded soil SLVs at only six surface soil locations, limited to the northeastern portion of the east end of the equipment laydown subarea (Figure 9-5g). PCB concentrations were lower than the soil SLV in all shallow soil samples.

PCBs were only analyzed in deeper and very deep soil at five borings located at the septic tank drain field subarea; PCBs were not detected (see Table 9-2 and Appendix I, Table I-2).

PAHs

PAHs were analyzed in surface and shallow soil samples at the septic tank drain field, spent sandblast media disposal, current HMSA, former HMSA, and equipment laydown subareas. PAHs were detected at all sample locations. Total HPAH concentrations exceeded the soil SLV at over half of the surface/shallow soil locations, including every subarea (Figure 9-5h). Total LPAH concentrations are lower than soil SLVs at all surface/shallow locations (Figure 9-5h).

PAHs were only analyzed in deeper and very deep soil at five borings located at the septic tank drain field subarea and four borings at the current HMSA subarea. PAHs were detected in three of the five septic tank drain field subarea borings and one of the four current HMSA borings. There is no soil SLV applicable to total HPAHs in the deeper or very deep soils. Concentrations of several of the individual HPAHs exceeded the human health soil SLVs applicable to deeper soil but none of the individual HPAHs exceeded the human health soil SLVs in very deep soil (see Table 9-2). There is no soil SLV applicable to total LPAHs in the deeper or very deep soils. However, none of the individual LPAHs exceeded the applicable soil SLVs in surface, shallow, deeper, or very deep soil (see Table 9-2).

TPH

TPHs were analyzed in surface and shallow soil samples throughout the Sandblast Area AOPC, including all subareas, as well as along the stormwater flowpath to CB-1 and adjacent to CB-1. TPHs were detected in most or all of the samples from each subarea. TPHs were also detected in all samples along the stormwater flow path to CB-1 and in all samples at CB-1, indicating that transport of TPHs from potential source areas to the catch basin via the stormwater pathway has occurred. DRO and RRO were the most frequent detections; detections of GRO were infrequent. However, TPH concentrations were less than their soil SLVs in all surface and shallow soil samples (see Table 9-2).

TPHs were only analyzed in deeper and very deep soil at five borings located at the septic tank drain field subarea and four borings at the current HMSA. TPHs were not detected in deeper or very deep soils (see Appendix I, Table I-2).

SVOCs

In addition to PAHs, other SVOCs were analyzed in surface and shallow soil samples at the septic tank drain field, spent sandblast media disposal, current HMSA, and former HMSA, and equipment laydown subareas. SVOCs were detected in most or all of the samples from each of these subareas. Concentrations of B2EHP and dibenzofuran exceeded their soil SLVs at approximately 1/3 and 1/2 of the surface and shallow soil locations, respectively, with exceedances for one or both chemicals in all subareas sampled (Figure 9-5h).

SVOCs were only analyzed in deeper and very deep soil at five borings located at the septic tank drain field subarea and four borings at the current HMSA subarea. SVOCs were detected at every boring (see Appendix I, Table I-2) but all detected concentrations were less than the less conservative human health soil SLVs applicable to the deeper intervals (Figure 9-5i).

VOCs

VOCs were analyzed in surface and shallow soil samples at the septic tank drain field, spent sandblast media disposal, current HMSA, former HMSA, and equipment laydown subareas. A single VOC, PCE, was detected at only one of the 12 sample location at the former HMSA

subarea. VOCs were detected at relatively low concentrations in all samples from the remaining subareas, with the exception of the current HMSA, where very high concentrations of PCE (420,000 micrograms/kilograms [µg/kg] at sample SBB18) and trichloroethene (TCE) (6,080 µg/kg at sample HA4) were found (Figure 9-5j). PCE and TCE exceeded their soil SLVs at both of these two sample locations. No other VOCs exceeded SLVs at SBB18 and HA4, and there were no other SLV exceedances elsewhere at the Sandblast Area AOPC.

VOCs were only analyzed in deeper and very deep soil at five borings located at the septic tank drain field subarea and four borings at the current HMSA subarea. VOCs were detected in every deeper and very deep soil sample (see Appendix I, Table I-2) but all detected concentrations were less than the SLVs (Figure 9-5k).

9.3.1.1 Erodible Soil

The erodible soils in the northwest portion of the Sandblast Area AOPC, identified in 2008 as a result of recent soil disturbance, are represented by two composite surface samples (SB-EUA and SB-EUB) that were analyzed for metals, PCBs, TPH, butyltins, pesticides, SVOCs, and PAHs, eight surface subsamples (SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, and SB-EUB-15) that were analyzed for VOCs, and an additional surface sample (SB-04) only analyzed for lead. Although this area has subsequently become naturally revegetated, these erodible soils were evaluated for potential impacts to the river by screening the surface soil concentrations against sediment SLVs (see Table 9-6 and Figure 9-6).

Metals

Twenty-three metals were detected in composite samples SB-EUA and SB-EUB. Lead was also detected in sample SB-04. Lead exceeded sediment SLVs at all three locations. Cadmium, chromium, copper, and nickel had concentrations that exceeded sediment SLVs in both of the two composite samples. Zinc exceeded the sediment SLV in only one of the two.

Organics

PCBs, TPH, butyltins, pesticides, SVOCs, and PAHs were detected in both composite samples. VOCs were detected in all eight subsamples. There are no sediment SLVs available for TPH, several pesticides, the majority of VOCs, and two of the three detected butyltins. Of the chemicals with available SLVs, concentrations of tributyltin, two pesticides (4,4'-DDT and 4,4'-DDE), total PCBs (as Aroclors), total HPAHs and total LPAHs, and one of two detected SVOCs (B2EHP) exceeded their sediment SLVs in both composite samples. The only VOC with a sediment SLV (naphthalene) was detected at concentrations less than the sediment SLV in all eight subsamples.

9.3.2 Groundwater

Groundwater investigations at the Sandblast Area AOPC focused on the current HMSA, spent sandblast media disposal, septic tank drain field, transformer disassembly, and equipment laydown subareas. Reconnaissance groundwater samples were collected in 2004 from 10 direct-push borings (DP1 through DP5, DP7, and DP9 through DP12; Tables 5-5d through 5-5g). Since these samples were collected from temporary borings, as opposed to properly developed monitoring wells, there is a potential for entrainment of soil particles in these groundwater samples, which can bias the results towards increased concentrations in groundwater. In 2008 and 2009 four quarterly groundwater sampling events were completed at five newly-installed

monitoring wells (MW-11 through MW-15; Tables 6-3h and 6-3i). The groundwater data from monitoring wells are more representative of actual chemicals that are present and potentially mobile in groundwater, and are therefore the focus of the discussion below.

Groundwater elevations measured at MW-11 through MW-15 indicate that the direction of groundwater flow is north-northwest (Appendix D, Figure D-5 through D-8) at a gradient of 0.08 to 0.11 ft/feet (Appendix D, Table D-2). Based on this groundwater flow direction, the distribution of soil borings and monitoring wells relative to the gradient and direction of groundwater flow at the Sandblast Area AOPC are as follows:

- DP10 through DP12 and MW-11 are located at the upgradient edge.
- DP1 through DP4, MW-14, and MW-15 are located at the downgradient edge, just prior to groundwater discharge to the river.
- DP5, DP7, DP9, MW-12, and MW13 are at intermediate locations between the upgradient and downgradient edges.

Metals

Metals were detected in samples from all 10 borings and five monitoring wells. Total metals were detected at concentrations exceeding their water SLVs at all sampling locations except DP9 (Figure 9-7a). Arsenic, iron, and vanadium had concentrations that exceeded their water SLVs at the majority of the soil borings and at one or more monitoring wells. However, only arsenic concentrations consistently exceeded the water SLV in the monitoring wells. Cobalt and manganese had concentrations that exceeded their water SLVs at one or more of the borings, but were not analyzed in the monitoring well samples. Several dissolved metals (aluminum, arsenic, barium, iron, manganese, and vanadium) also had concentrations that exceeded their water SLVs at direct push sampling locations and monitoring wells (see Table 9-2), but only total concentrations were plotted on the figures. Note that essential nutrients (e.g., iron) were not evaluated in soil, but they were evaluated for groundwater. Based on these data, including exceedances of SLVs in downgradient borings and monitoring wells, it appears that metals in soil are leaching to groundwater and groundwater with concentrations of some metals exceeding applicable SLVs may be discharging to the river.

Butyltins

Groundwater samples were analyzed for butyltins at DP1 through DP4 and all five monitoring wells. Butyltins were detected at DP2 through DP4, MW-11, and MW-13. The detections at MW-11 and MW-13 indicate butyltins may be leaching to groundwater. The detections at DP2 through DP4 suggest butyltins in groundwater may be migrating downgradient. However, butyltins were not detected at the downgradient monitoring wells MW-14 and MW-15, or at downgradient boring DP1, suggesting that the detections at DP2 through DP4 may not be representative of actual butyltin concentrations in groundwater. None of the detected concentrations of butyltins exceeded the SLVs (see Table 9-2).

Herbicides & Pesticides

Since herbicides were not detected in soil at the former HMSA, and there are no records of herbicide use or management in other areas of the Sandblast Area AOPC, herbicides were not analyzed in groundwater.

Pesticides were analyzed in groundwater samples from DP5, DP7, and DP9, and detected at all three locations. The detected concentrations were lower than the SLVs and therefore pesticides were not analyzed in samples from the monitoring wells (see Table 9-2 and Appendix I, Table I-2).

PCBs

PCBs were analyzed in groundwater samples from DP1 through DP5, DP7, and DP9. PCBs were not detected in any of these samples, and therefore were not analyzed in samples from the monitoring wells (see Appendix I, Table I-2).

PAHs

PAHs were analyzed in groundwater samples from all monitoring wells and borings except boring DP12. The boring analyses included both unfiltered (total PAH) and filtered (dissolved PAH) samples to reduce the uncertainty associated with entrainment of soil particles in groundwater samples collected from soil borings. Groundwater analyses from the monitoring wells were limited to three PAHs (benzo(b)fluoranthene, benzo(k)fluoranthene, and phenanthrene). All boring groundwater samples had detections of total or dissolved PAHs, except DP9 where total PAHs were not detected. Total and/or dissolved concentrations of the HPAHs benzo(a)pyrene, total benzofluoranthenes, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene exceeded their SLVs at DP7. Two LPAHs (dissolved naphthalene and total phenanthrene) had concentrations that exceeded their water SLVs at DP2, DP4, DP7, and DP10. PAHs were not detected in samples from the monitoring wells with the exception of benzo(b)fluoranthene, which was detected during only one of the four sampling events at MW-12 and at a concentration above its SLV. Since it was detected at a frequency of only 5% it was not retained as a preliminary COPC.

The detection of dissolved concentrations of PAHs at every direct push boring, including all four downgradient borings, suggests PAHs may be leaching to groundwater and migrating toward the river. PAHs were not detected in the two downgradient monitoring wells MW-14 and MW-15, however only a subset of the PAHs detected in the samples from the direct-push borings were analyzed for in the monitoring wells. This lack of PAH data from the monitoring wells represents a potential data gap.

TPH

TPHs were analyzed in groundwater samples from all monitoring wells and borings except the downgradient borings DP1 through DP4. TPHs were detected at the upgradient locations DP10, DP11 and MW-11, and at the intermediate locations DP7, MW-12, and MW-13. TPHs were not detected at the upgradient location DP12, intermediate locations DP5 and DP9, and downgradient locations MW-14 and MW-15. None of the detected concentrations of TPHs exceeded their water SLVs (see Table 9-2). Although TPHs appear to be leaching to groundwater, they do not appear to be migrating toward the river.

SVOCs

SVOCs, excluding PAHs, were analyzed in groundwater from every boring except DP12, and detected at each of the sampled borings. Dissolved SVOCs were analyzed at every boring except DP11 and DP12 and detected at each of the sampled borings. All detected concentrations were less than their water SLVs (see Table 9-2) and therefore SVOCs were not analyzed for in

monitoring wells. Although SVOCs appear to be leaching to groundwater, they do not appear to be migrating toward the river at concentrations of concern.

VOCs

VOCs were analyzed for, and detected, in groundwater from all 10 borings and all five monitoring wells. Concentrations of one or more VOCs exceeded their water SLVs at all borings, and at MW-12 through MW-15. Concentrations of PCE and/or TCE exceeded their water SLVs at all borings and MW-12 through MW-15. The concentration of 1,1-DCA exceeded the water SLV only at DP5 and MW-12. The concentrations of cis-1,2- dichloroethene (DCE) exceeded the water SLV only at MW-12. Vinyl chloride exceeded its water SLVs at DP11, DP5, and MW-12.

As shown on Figure 9-7b, the groundwater data from borings delineated a PCE plume in 2004 with concentrations greater than 10 times the SLV, starting at DP11 (next to the HMSA) and continuing downgradient toward the river. Similarly, the 2008/2009 monitoring well data delineated a PCE plume with concentrations greater than 10 times the SLV starting at MW-12 (north of the former sandblast building) and continuing downgradient toward the river.

As described above, prior to construction of the current HMSA, a storage tank was reportedly present at this location. Significantly elevated concentrations of VOCs are present in soil at the current HMSA subarea. The boring and monitoring well groundwater data confirm that VOCs, in particular PCE and TCE, have leached from and are likely continuing to leach from soil to groundwater from this source area and are migrating toward the river at concentrations of potential concern. However, as shown on Figure 9-7b, the extent of the plume with concentrations exceeding 10 times the SLV did not include the source area in 2008 (as it did in 2004), suggesting that the mass of VOCs available to leach to groundwater is decreasing over time. The breakdown products of PCE (1,1-dichloroethane [DCA] , cis-1,2-DCE, and vinyl chloride) were also present in groundwater but at generally lower concentrations and with fewer SLV exceedances.

9.3.3 Soil Gas

Soil gas samples were analyzed at five borings (SB-10 through SB-14). Three of the soil borings (SB-10 through SB-12) were installed at and downgradient of the VOC source area associated with the former storage tank at the current HMSA subarea. The other two soil borings (SB-13 and SB-14) were installed along the southwest edge of the Sandblast Area AOPC, adjacent to the Service Center and Equipment Buildings (the closest occupied structures).

VOCs were detected in soil gas from all five borings. However, exceedances of the soil gas SLVs were limited to TCE at soil boring SB-10 (located adjacent to the current HMSA), and PCE and TCE at SB-12 (located adjacent to the former sandblast building); both borings are within the footprint of the PCE groundwater plume (Figure 9-8). Other breakdown products of PCE (1,1-DCE, cis-1,2-DCE, trans-1,2,-DCE, and vinyl chloride) were not detected above their soil gas SLVs at these two locations). The sandblast building (recently demolished), current HMSA, and the adjacent outdoor areas are not occupied by site workers. There were no exceedances of the soil gas SLVs at soil borings SB-13 and SB-14, which are located adjacent to buildings that are occupied by site workers.

9.3.4 Summary

In summary, historical and ongoing uses of the Sandblast Area AOPC include equipment storage and management, storage, and disposal of various hazardous substances and wastes. These uses have resulted in contamination of soil, groundwater, and soil gas with chemicals associated with the equipment and wastes. The extent of the contaminated area is defined based on topography, location of former and existing site features and structures, knowledge of former and current site uses, visual observation of wastes (i.e. sandblast grit) and equipment on the ground surface, and the analysis of soil, groundwater, and soil gas samples. The type and magnitude of contamination is variable, consistent with the variable hazardous substance and waste management, storage, and disposal practices that occurred at the various subareas within the Sandblast Area AOPC. The sandblast grit disposal area, the equipment laydown area, and an inferred VOC release at the current HMSA appear to be the primary sources of contamination.

Soil

Metals, pesticides, PCBs, PAHs, SVOCs, and VOCs were detected at the Sandblast Area AOPC at concentrations exceeding the SLVs. Metals concentrations exceed soil SLVs throughout the Sandblast Area AOPC, including all subareas. Pesticide and PCB concentrations exceeded soil SLVs primarily at the east end of the equipment laydown subarea (Figure 9-9a). PAHs and other SVOCs exceeded SLVs throughout the Sandblast Area AOPC (Figures 9-9b and 9-9c). VOC concentrations exceeded SLVs only in soil immediately adjacent to the current HMSA.

TPHs and butyltins were detected in soil samples throughout the Sandblast Area AOPC, but at concentrations below the SLVs. Herbicides were not detected in soil.

Metals, butyltins, PCBs, and TPHs were detected in soil along the stormwater flow path to CB-1, and/or in soil immediately adjacent to CB-1, indicating that contaminant transport from potential source areas to the catch basin via the stormwater pathway has occurred. Since pesticides, PAHs, SVOCs, and VOCs were not analyzed in soil along the stormwater flow path or at CB-1, it is not known whether these chemicals are being transported via the stormwater pathway. However, since all other analyte groups that were detected elsewhere at the AOPC were also detected along the stormwater flow path or at CB-1, it is possible that pesticides, PAHs, SVOCs, and VOCs are also being transported along this pathway.

Erodible Soil

Potentially erodible soils were identified in March 2009, resulting from late 2008 excavation and filling activities were identified on a slope northwest of the former sandblast building. Metals, PCBs, TPH, butyltins, pesticides, SVOCs, PAHs, and VOCs were detected in samples of the erodible soil. Seven metals, tributyltin, two pesticides, total PCBs, total HPAHs, total LPAHs, and a single SVOC exceeded their sediment SLVs. As expected, the disturbed area has become naturally revegetated (see the photographs in Appendix C), and now resembles other vegetated slopes in the Sandblast Area AOPC that show no evidence of surface runoff, soil erosion, or sediment deposition.

Groundwater

Groundwater data were compared to applicable SLVs to assess the groundwater to surface water pathway at the Sandblast Area AOPC. Elements of this pathway include leaching of soil contaminants to groundwater and discharge of groundwater to the river as base flow. Seeps have

not been observed along the riverbank at the northern margin of the Sandblast Area AOPC. Metals, butyltins, pesticides, PAHs, TPHs, SVOCs, and VOCs were detected in groundwater, indicating that these contaminants are leaching from source area soils to groundwater. PCBs were not detected. Concentrations of metals, PAHs, and VOCs in groundwater exceeded their surface water SLVs, including at locations immediately adjacent to the river, indicating that these contaminants may be migrating to the river at concentrations of potential concern. Butyltin, pesticide, TPH, and SVOC concentrations did not exceed SLVs.

Soil Gas

VOCs were detected in soil gas at locations corresponding to the footprint of the VOC plume originating at the current HMSA (Figure 9-10). PCE and TCE exceeded their soil gas SLVs only in areas where there are no structures that could be occupied by site workers.

9.4 Pistol Range AOPC Nature and Extent of Contamination

As described previously, contamination at the Pistol Range AOPC resulted from historical use of the area as a firing range. Located on the south side of Bradford Island, existing structures at the Pistol Range AOPC include a collapsed wooden firing shed, a secondary firing location, and a timber backstop. Based on the location of these structures as well as observation of the area on historical aerial photographs, the Pistol Range AOPC is approximately 200 feet long, 20 to 30 feet wide, and covers an area of approximately 4,550 square feet.

The overall slope of the Pistol Range AOPC is to the southeast toward the Columbia River. The topography of the area consists of a series of cuts and fills, resulting in a sequence of slopes and flat areas. Currently, the ground surface is vegetated with a mix of scrub-shrub and herbaceous vegetation and does not show evidence of surface runoff, soil erosion, or sediment deposition, indicating that the ground surface is stable. Erosion and transport of soil from the Pistol Range AOPC to the river is currently unlikely. When the Pistol Range AOPC was in use as a firing range the ground surface may have been less vegetated and there may have been historical runoff to the Columbia River.

9.4.1 Soil

Surface (0-0.5 feet bgs) and near surface (1.0-1.5 feet bgs) soil samples were collected from within and adjacent to the Pistol Range AOPC and analyzed for lead. Subsets of the samples were analyzed for antimony, arsenic, copper, mercury, nickel, and zinc. Antimony, arsenic, and mercury were not detected. Copper and nickel were detected but at concentrations below their soil SLVs. With a few exceptions, lead and zinc concentrations in soil exceed their respective SLVs throughout the Pistol Range AOPC. The highest concentrations of lead were detected at and behind the backstop. The analytical data are summarized in Tables 5-6 and 9-3, as well as Appendix I, Table I-3. Sample locations and data for lead and zinc are shown on Figure 9-11.

9.4.2 Groundwater

Grab groundwater samples were collected from two temporary borings at the Pistol Range AOPC and analyzed for total and dissolved concentrations of copper, lead, nickel, and zinc. The analytical data are summarized in Table 6-4b; groundwater sample locations and data for lead and zinc are shown on Figure 9-11. Total concentrations of all four metals were detected in both samples, but no concentrations exceeded the water SLVs.

9.4.3 Lagoon Sediment

Five sediment samples were collected from a shallow lagoon in the Columbia River adjacent to the Pistol Range AOPC and analyzed for copper, lead, nickel, and zinc. The analytical data are summarized on Table 6-4a; sediment sample locations and data for lead and zinc are shown on Figure 9-11. All four metals were detected in all five samples. Copper, lead, and nickel did not exceed their sediment SLVs, but zinc exceeded its sediment SLV at all five sample locations. The zinc concentrations are all higher than the maximum concentration of zinc detected elsewhere in Forebay sediments (113 mg/kg), suggesting that the Pistol Range AOPC may be a historical source of zinc in the lagoon sediment.

9.4.4 Summary

In summary, use of the Pistol Range AOPC as a firing range has resulted in the contamination of surface soil with lead and zinc. Nearly all surface soil sample locations have lead and zinc present at concentrations that exceed soil SLVs. It is unlikely that significant concentrations of lead or zinc are leaching to groundwater since the groundwater SLVs are not exceeded. The Pistol Range AOPC may also be a historical source of zinc to the adjacent lagoon sediment. Currently, the area is currently well vegetated and does not show evidence of surface runoff, soil erosion, or sediment deposition.

Further investigation of the soil northeast of the backstop may be required to determine the full extent of contaminated soil in this area.

9.5 Bulb Slope AOPC Nature and Extent of Contamination

As previously described, contamination at the Bulb Slope AOPC resulted from placement of glass and electrical light bulb debris directly onto a steep slope between the Landfill access road and the Columbia River on the north side of Bradford Island. The debris include various types of light bulbs, glass tubes, clear window pane glass, white molded glass, and miscellaneous glass beverage containers that are variably intermixed with silt, sand, gravel, cobbles, and concrete rubble. The width of the deposit across the slope ranges from 30 to 65 feet, and the length of the deposit from the top of the slope to the river is about 40 feet. The deposit ranges in thickness from about 4 inches near the top of the slope to 5 feet at the base of the slope, and is underlain by siltstone bedrock. Concrete rubble and a small amount of glass debris have been observed in the Columbia River near the riverbank at the base of the Bulb Slope AOPC. The total area of the deposit is about 1,900 square feet (Figure 9-12).

The majority of the Bulb Slope AOPC is well vegetated, covered with organic debris, and exhibits no evidence of surface runoff or overland flow to the river. At the base of the slope, however, wave erosion has resulted in mass wasting (small slope failures) of material into the river. Mass wasting appears to be the only potential mechanism for transport of debris and/or contaminated soil into the river.

Twelve surface soil samples were collected from within the area visibly impacted by glass and light bulb debris and analyzed for lead, mercury, and PCBs (as Aroclors). Lead and mercury were detected in all 12 samples. PCBs were detected in eight of the 12 samples. TPH was analyzed for and detected in eight of the 12 samples. The analytical data are summarized in

Tables 5-7, 9-4, and 9-6, as well as Appendix I, Table I-4. Sample locations and data are shown on Figure 9-12.

Since mass wasting is a potential pathway for migration of contaminants to the river, the surface soil data were compared to soil SLVs as well as sediment SLVs. Eleven of the 12 detected concentrations of lead and 10 of the 12 detected concentrations of mercury exceeded soil SLVs. Sediment SLVs are not available for TPH. Eleven of the 12 detected concentrations of lead, six of the 12 detected concentrations of mercury, and all of the eight detected concentrations of PCBs exceeded the sediment SLVs (Figure 9-13).

In summary, placement of debris at the Bulb Slope AOPC has resulted in the contamination of soil with lead, mercury, PCBs, and TPH. All surface soil sample locations have one or more contaminants present at concentrations that exceed the applicable soil and/or sediment SLV. The lateral extent of contamination is well constrained by the visible presence of debris in the soil. The underlying siltstone bedrock defines the vertical extent of contamination.

9.6 River OU Nature and Extent of Contamination

As described in Section 3.5.2, electrical equipment debris was historically disposed of directly in the River on the north side of Bradford Island. Figure 3-5 depicts the in-water historical source locations, identified as Former Debris Piles (#1 through #3). The electrical equipment debris included light ballasts, electrical insulators, lightning arresters, electrical switches, rocker switches, a breaker box, and electrical capacitors. The electrical debris contaminated the surrounding sediment with PCBs and potentially other COIs. The electrical equipment debris were removed in 2000 and 2002 (URS 2002b) and the majority of the associated PCB-contaminated sediment was removed in 2007 (URS 2008f and URS 2009d). Residual contaminated sediment, as well as historically contaminated biota (e.g., fish and shellfish) may currently be sources of contamination.

The Columbia River is a dynamic environment in which sediment is constantly being redistributed through human and natural processes. As described in Section 6.0, this RI focuses on conditions in the River OU following the sediment removal effort. Immediately prior to the 2007 removal of contaminated sediments north of Bradford Island, samples of sediment and clams were collected from areas targeted for dredging. These Pre-removal data do not identify any additional preliminary COPCs (see Appendix O), and they are not representative of current Post-removal concentrations, they are not discussed further in the summary of nature and extent of COPCs in the River OU. The pre-removal data are considered further in the uncertainty sections of the HHRA and ERA (see Appendix O).

Historical sampling (discussed in Section 5.0), supported by hydrologic modeling, demonstrated that sediment from the Forebay is not transported upstream beyond Goose Island. Therefore, the upstream boundary of the River OU is the northern end of Goose Island (Figure 1-3). The other boundaries of the River OU include the Bonneville Dam and Spillway, the two powerhouses, and the riverbanks of the Columbia River. Evidence that site-related COIs have not been transported downstream of the dam is discussed in Section 9.6.1, followed by a discussion of nature and extent of COIs within the boundary of the River OU.

9.6.1 Downstream Sediments

As described in Section 8.2.3, six sediment samples were collected from likely depositional areas downstream of the dam, and analyzed to assess the potential for sediment impacts related to releases from the site. These sediment samples were analyzed for metals, TPH-Dx, PCBs, and PAHs. Table 9-12 compares the maximum COIs concentrations detected in the downstream sediments with the 95% UPLs for Reference Area sediment and the sediment SLVs. The only two COIs for which both the 95% UPL and the sediment SLV is exceeded are cadmium and vanadium. In both cases, only a single sample out of the six is higher, and only by a small amount (Table 9-12).

These data demonstrate that the contamination related to Bradford Island is restricted to the Forebay. No detectable contamination has migrated downstream. The extent of the contamination is therefore well constrained on the downstream end by the dam and spillways, and on the upstream end by the eastern end of Goose Island (the upstream limit to which numerical modeling suggests that sediment may be transported upstream).

9.6.2 Forebay – Random and Targeted Samples

The nature of the contamination in the Forebay has been characterized by both random and targeted sampling of surface water, sediment, and various tissues. Each of these media is discussed below.

9.6.2.1 Surface Water

A total of five surface water samples were collected to document conditions in the Forebay. Grab samples were analyzed for total and dissolved metals and TPH-Dx. XAD samples were analyzed for PCB Congeners and PAHs. Data are summarized in Tables 6-12 and 9-8. Since the surface water flows steadily through the Forebay, no spatial variation in surface water concentrations is expected or observed. All five samples are interpreted as representative snapshots of Forebay surface water conditions.

The only metals that exceeded SLVs were arsenic (total and dissolved) and barium (dissolved only); the only organic compounds exceeding SLVs were total PCBs as congeners (Table 9-8). No SLVs are available for total LPAHs or HPAHs; however concentrations of the individual PAH concentrations were all below the individual SLVs.

As discussed in Section 8.2.1, the range of concentrations of arsenic detected in the Forebay surface water were less than the range of concentrations detected in the River Reference Area (see Table 8-4). Therefore, although surface water concentrations of arsenic, barium, and total PCBs may pose a potential risk to ecological or human health, the arsenic does not appear to be related to site releases. These preliminary COPCs are evaluated further in the HHRA and ERA (Chapters 11 and 12).

9.6.2.2 Sediment

Sediment data from the 19 random Forebay locations are summarized in Tables 6-8a and 9-8. Sediment data from the targeted sample locations are summarized in Table 6-13b; Appendix I, Tables I-9a and I-9b; and Appendix L, Table L-7. Concentrations of selected metals and of total PCBs are plotted in Figures 9-14a through 9-14e.

Metals were detected in all of the random and targeted sediment samples. A few individual samples (random and targeted) had concentrations of cadmium (six samples, Figure 9-14b), mercury (five samples, Figure 9-14d), nickel (one sample), thallium (one sample) and zinc (one sample) above their SLVs. However, as discussed in Section 8.2.1, population-to-population statistical comparisons show that for all metals, concentrations observed in the Forebay sediment samples were not significantly higher than the concentrations observed in the Reference Area samples (Table 8-2). Therefore, although concentrations of selected metals in Forebay sediments exceeded conservative SLVs, they do not appear to be site related.

As presented in Section 8, the comparison of the targeted Eagle Creek and Goose Island sediment samples to the Reference Area data (Appendix L, Table L-7) shows that concentrations of all metals at Eagle Creek and all metals except antimony, cadmium, thallium, and zinc at Goose Island were less than the Reference Area concentrations.

None of the random or targeted sediment samples had SVOC concentrations exceeding SLVs (Tables 9-8, 9-9, and 9-10). TPH-Dx was retained as a preliminary COPC only because no SLV is available.

Concentrations of total PCBs (as congeners and as Aroclors, when detected) exceeded SLVs in all random and targeted Forebay sediment samples (Tables 9-8, 9-9, and 9-10). The highest concentrations were observed along the north shore of Bradford Island and at Eagle Creek (Figure 9-14e). The sample along the north shore (P4) of the island was adjacent to where the equipment and contaminated sediment were removed between 2000 and 2007, although the observed concentration of 28.9 µg/kg was much lower than historical samples collected in the remediated areas. There is no known PCB source near Eagle Creek, although the state–run Cascade Salmon Hatchery is in this location. In any case, the PCBs detected at station P43 reflect limited contamination in a small area since PCBs were undetected (MDL of 1.7 µg/kg) at the adjacent station (P44, Figure 9-14e). Throughout the remainder of the Forebay, PCB concentrations in sediment ranged from 0.061 to 1.69 µg/kg and no apparent spatial pattern (Figure 9-14e).

9.6.2.3 Tissue

Tissue data from the random Forebay locations are summarized in Tables 6-9a (clam), 6-10a (crayfish), 6-11a (sculpin), 6-6a (smallmouth bass) and Appendix I, Tables I-8a and I-8b. Tissue data from the single targeted goose island station are summarized in Tables 6-13a and Appendix I, Tables I-9a and I-9b.

For analytes in which one or more tissue sample(s) exceeded SLVs (Tables 9-8 and 9-9), concentrations were plotted spatially on Figures 9-14a through 9-14g and 9-15a through 9-15g. For comparison, sediment data are also plotted on these figures, even if all of the sediment data were below the applicable sediment SLV for the analyte shown.

Concentrations of arsenic in tissue exceeded the tissue SLV for all media (clam, crayfish, sculpin, and smallmouth bass) at all locations (Figures 9-14a and 9-15a). However, crayfish was the only media for which arsenic concentrations in the Forebay were significantly higher than arsenic concentrations in the Reference Area (Table 8-2). As discussed in Section 8.2, arsenic concentrations in Forebay sediments and in all other tissue types were not statistically higher than Reference Area concentrations (Table 8-2). Furthermore, arsenic concentrations in sediment

were below the sediment SLV everywhere in the Forebay. The source of the arsenic is unknown, but does not appear to be site-related.

Although the Forebay sediment cadmium concentrations were not statistically higher than Reference Area concentrations (Table 8-2), cadmium concentrations in six individual sediment samples exceeded the SLV (Figure 9-14b). Cadmium concentrations in Forebay clams were statistically higher than in Reference Area clams (Table 8-2), and the concentrations exceeded the tissue SLV in all of the Forebay clam samples (Figure 9-14b). However, with the exception of two crayfish samples, the cadmium concentration was lower than the tissue SLV in all of the higher trophic-level samples (Figure 9-15b). Thus, although cadmium exceeded SLVs in the clam tissue, cadmium does not appear to be a concern in the sediment, nor does it appear to be a risk in higher trophic-level organisms.

Lead concentrations in all Forebay sediment samples were below the SLV and not statistically higher than the Reference Area concentrations. However, unlike the case for arsenic, lead concentrations were also below SLVs in all Forebay clam and smallmouth bass samples (Figures 9-14c and 9-15c). Selected Forebay samples of crayfish and sculpin did have lead concentrations which exceeded the SLV.

Mercury showed yet a different pattern. As with all metals, the Forebay mercury concentrations in sediment were not statistically higher than Reference Area concentrations (Table 8-2), although mercury concentrations slightly exceeded the SLV in five sediment samples (Figure 9-14d). Mercury concentrations in all of the Forebay clam and crayfish tissue samples were below the SLV (Figures 9-14d and 9-15d). In contrast, all of the sculpin and smallmouth bass samples had mercury concentrations exceeding the SLV (Figure 9-15d). The mercury concentrations in Forebay crayfish, sculpin, and smallmouth bass in the Forebay were all significantly higher than in the Reference Area (Table 8-2). The source of the mercury is unknown, but does not appear to be site-related.

B2EHP was detected in five of 23 sediment samples and all clam samples collected in the Forebay, but always at concentrations below the SLVs (Figure 9-14e), and at concentrations that were not significantly higher than in the Reference Area (Table 8-2). B2EHP concentrations above the SLV were measured in two crayfish samples and seven bass (Figure 9-15e). Bass was the only media for which concentrations of B2EHP were significantly higher in the Forebay than in the Reference Area. One other phthalate (butyl benzyl phthalate) was also detected above the SLV in one bass samples (Table 9-8). These observations may be consistent with B2EHP bioaccumulating in higher trophic-level organisms.

LPAHs did not exceed SLVs in any River media. However, five HPAHs were detected in one or more bass at concentrations exceeding the corresponding SLVs (Table 9-8). Benzo(a)pyrene was the only PAH detected above SLVs in crayfish (two samples only), and no PAHs exceeded SLVs in any of the other media (Table 9-8) (sculpin were not analyzed for SVOCs due to insufficient sample volumes). Since the eight bass in which benzo(a)pyrene concentrations exceeded the SLV included all bass in which any of the other HPAH concentrations exceeded the SLVs, this compound was plotted in Figures 9-14f and 9-15f to demonstrate the spatial pattern of HPAH SLV exceedances. As was the case for B2EHP, HPAH concentrations did not exceed SLVs for any sediment or clam samples (Figure 9-14f). One HPAH (benzo(a)pyrene) exceeded the SLV in two crayfish samples, and one or more HPAHs exceeded SLVs in eight bass samples (Figure 9-15f). The three bass with the highest benzo(a)pyrene concentrations were caught along the north

shore and tip of Bradford Island. These observations may be consistent with HPAHs bioaccumulating in higher trophic-level organisms, even though concentrations of PAHs in Forebay sediment were not significantly higher than in the Reference Area (Table 8-2).

Concentrations of total PCBs (as congeners) exceeded SLVs for almost all tissue samples (Figures 9-14f and 9-15f). The highest observed total PCB (as congeners) concentration in clams (312 µg/kg) was from a sample collected at station P4 on the north shore of Bradford Island. Somewhat lower clam tissue concentrations (51.5 to 95.1 µg/kg) were measured at stations around the tip and southern shore of the island (Figure 9-14e). Throughout the remainder of the Forebay, clam total PCB concentrations were within a remarkably narrow range (21.4 to 34.0 µg/kg) – and within the range of concentrations (26.8 to 34.4 µg/kg) measured in the River Reference Area. This suggests that the clams (short-lived benthic organisms reflecting a very localized exposure area) were acquiring somewhat higher body burdens of PCBs from the small quantity of residual PCBs in sediments adjacent to the historical source area. The uniform clam tissue concentrations throughout the remainder of the Forebay and River Reference Area provides strong evidence that there are no significant residual PCB sources in other parts of the Forebay.

As would be expected via bioaccumulation, average tissue concentrations of total PCBs increased in higher trophic-level organisms. Total PCBs (as congeners) ranged from 0.54 to 42.7 µg/kg in crayfish, 8.15 to 4,780 µg/kg in sculpin, and 32.2 to 26,500 µg/kg in smallmouth bass (Figure 9-15e).

As with the clams, the crayfish and sculpin with the highest total PCB concentrations were all located along the shore of Bradford Island. The three crayfish samples with the highest PCB concentrations (P6-CF with 42.7 µg/kg, P5-CF with 16.9 µg/kg, and P4-CF with 16.8 µg/kg) were along the north shore and eastern tip of the island (Figure 9-15e). The two samples with the next highest concentrations (P7-CF with 12.4 µg/kg and P8-CF with 3.13 µg/kg) were along the south shore of the island; all other crayfish samples had total PCB concentrations less than 1.5 µg/kg.

Similarly, the highest concentration of total PCBs observed in sculpin was in sample SF-3 (4,780 µg/kg) at the tip of Bradford Island (Figure 9-15e). The next three highest total PCB concentrations measured in sculpin (915 µg/kg at SF-4, 559 µg/kg at SF-5, and 141 µg/kg at SF-6) were at progressively greater distances from the historical source area, along the southern shore of the island (Figure 9-15e). The lowest total PCB concentration in sculpin was measured in the targeted sample from Goose Island Slough.

The spatial distribution of total PCB concentrations in Smallmouth Bass (Figure 9-15e) was much more variable. Some of the bass with the highest concentrations caught adjacent to bass with the lowest concentrations. The highest total PCB concentration was measured in a bass caught off the tip of Bradford Island; the second-highest concentration was measured in a bass caught in the Goose Island Slough (Figure 9-15e). Other individual bass caught simultaneously in the slough have total PCB concentrations less than or comparable to those observed in the River Reference Area (22.3-499 µg/kg; see Appendix L, Table L-7). This lack of a spatial pattern is consistent with bass migrating into the Goose Island Slough to breed, taking with them a wide range of PCB body burdens picked up from various locations in the Forebay.

It is also important to remember that the Forebay bass were collected in 2006, before the 2007 sediment removal. Some of the older bass are estimated to have been up to 10 years old in 2006,

meaning that they were exposed to conditions before the equipment was even removed (URS 2009k) There was a huge variation in tissue PCB concentration, reflecting a great deal of variability in exposure. However, there was no correlation between PCB concentration and either length (a proxy for fish age) or the location where the fish were caught. The implications of these observations are discussed in detail in the HHRA and ERA (Chapters 11 and 12)

9.6.3 Cross-media Patterns in PCB Congener Distributions

The PCB congener analytical method used to analyze all of the recent data from the River OU provides concentrations of all 209 congeners (with the recognition that some of these congeners are coeluting so that only the total concentration of the coeluting species), it can be a valuable tool for the identification of potential PCB sources. PCBs from different sources may have different patterns of relative abundances of the various PCB congeners. However, the patterns may be altered in environmental media due to mixing of PCBs from multiple sources, preferential biological uptake or preferential bioaccumulation of certain congeners, chemical or biological degradation, or other mechanisms.

To see what information the PCB congener distribution may provide regarding PCBs observed in various media analyzed in this study, Figures 9-16a through 9-16e (Forebay) and Figures 9-17a through 9-17e (Reference Area) were prepared showing histograms of PCB congener relative abundance. Different color segments on these figures show each detected PCB congener (or set of coeluting congeners) as a percentage of total PCB congener concentration in each sample. The total height of each bar is always 100%, but the percentages of component congeners vary from sample to sample. The total PCB (as congener) concentrations is listed below each sample name and the samples within each figure or sorted from highest to lowest total PCB concentration. Forebay samples are plotted separately from Reference Area samples, and different media are shown on different figures.

The following PCB congener patterns were noted:

- Of the 209 possible PCB congeners, approximately 16 PCB congener groups constituted 60 to 70% of the total PCB congener load in sediment in both the Reference Area and the Forebay. The same 16 PCB congener groups constituted approximately 80% the PCB congener load in clams and crayfish and approximately 70% of the PCB congener load in sculpin and bass.
- The most abundant PCB congener at a majority of the stations was PCB 11. This PCB congener constituted from approximately 7 to 27% of the total PCB congener burden, and contributes a larger percentage to samples with lower total PCB concentrations. This is consistent with the results of other regional studies have noted that airborne PCBs in the Willamette airshed have contributed to the ubiquitous occurrence of PCBs in sediments and that PCB 11 is one of the indicator PCB congeners for evidence of airborne deposition (Hope 2007, 2008). PCB 11 has also been found in water and air in urban environments (Hu et al. 2008, Du et al. 2009, Rodenburg et al. 2010), the great lakes watershed (Basu et al. 2009), and even the polar regions (Choi et al. 2008). Part of the reason it is so ubiquitous may be that it is not derived by Aroclor mixtures, but is instead found in unregulated paints and pigments (Fraser 2010, Hu and Hornbuckle 2010, Rodenburg et al. 2010).
- PCB 118, another ubiquitous PCB congener in the Willamette airshed, was also observed in all river media (surface water, sediment, clam, crayfish, sculpin, and smallmouth bass).

Therefore, risk from PCBs in the River OU likely includes both site-related sources, and non-site related sources, including those from upstream as well as from the ubiquitous presence of PCBs in the Willamette airshed.

- The homologue groups showing the greatest degree of accumulation are primarily the pentachloro- and hexachlorobiphenyls, with a few additional tetrachloro- and heptachlorobiphenyls. This pattern is generally consistent with the environmental behavior of PCBs, whereby the lower chlorinated homologues are relatively more soluble and less persistent and the higher chlorinated homologues tend to be less soluble, more persistent, and more available for biological uptake.
- Four dioxin-like PCB congeners (PCB 105, 118, 156, and 157) are among the 30 most abundant PCB congener groups in sediment. The dioxin-like PCB congeners make up approximately 10 to 15% of the total PCB congener burden in sediments. Only two dioxin-like PCB congeners were relatively abundant in tissue samples (PCB 105 and 118) and constitute approximately 10 to 20% of the overall PCB congener burden in tissues.
- Relative to the Reference Area, Forebay sediments appear to contain higher concentrations of four sets of PCB congeners (93+95+98+100+102, 86+87+97+108+119+125, 52, and 61+70+74+76). Although none of these groups includes dioxin-like PCB congeners, these co-eluting groups correspond to the pentachloro- and tetrachlorobiphenyl groups.

In summary, the same sub-set of about 30 PCB congeners constituted the majority of the PCB congener load in both Forebay and Reference Area sediments and that an even smaller sub-set of PCB congeners (the 16 dominant PCB congeners of the 30 observed in sediments) was noted in the Forebay and Reference Area tissues.

9.6.4 Correlation Between PCBs, TOC, and Fine-Grained Sediment

This section describes a correlation analysis between three sediment parameters: total PCB congener concentration (represented as sum of 209 congeners' concentrations), TOC, and percent fines (represented as sum of percent clay and percent silt). Organic contaminants such as PCBs are generally expected to be associated with fine-grained sediments or the TOC present in sediments. The objective of this statistical evaluation was to confirm that this was, indeed the case at this site and explore possible trends or patterns in the data which may further support site characterization and remedial investigation.

In order to examine potential correlation over the entire range of observed PCB concentrations, the Reference Area and Forebay data sediment samples were combined into a single data set. The bivariate relationships between these three parameters were examined using the non-parametric Kendall-Theil robust line and Kendall's Tau correlation coefficient, described in Helsel and Hirsch (2002). One Forebay location, P04, initially appeared to be an outlier; however, the nonparametric methods used to calculated correlation coefficients were not sensitive to the presence of outliers, and hence, the data from this location were included in all calculations.

The Kendall-Theil robust line method was used to test for any monotonic, not just linear, dependence of each pair of variables. This method did not depend on the normality of residuals for validity of significance tests, as in ordinary linear regression. The Theil slope estimate was computed by comparing each data pair to all others in a pair wise fashion, and the median of all

possible pair wise slopes was taken as the nonparametric slope estimate. This line was closely related to Kendall's Tau correlation coefficient, in that the significance of the test for H_0: slope = 0 was identical to the test for H_0: Tau = 0.

The results of this correlation analysis are presented in Figure 9-18. The bottom panel presents TOC versus percent fines. The middle panel presents total PCB congeners versus TOC. And the top panel presents total PCB congeners versus percent fines. The Kendall-Theil robust line equation, the Kendall's Tau correlation coefficient, and the *p*-value associated with the test of significance are shown in each panel. For better scaling of the scatter plots, the aforementioned Forebay location (P04) is not shown in the middle and top panels, but this data point was used in the calculation.

As expected, for TOC versus percent fines, the Kendall's Tau correlation coefficient was 0.530, which suggested a strong monotonic relationship. For total PCB congeners versus TOC and total PCB congeners versus percent fines, the Kendall's Tau correlation coefficients were 0.318 and 0.356 respectively, an indication of a moderate monotonic relationship or positive association (i.e., the higher the TOC or percent fines, the higher the total PCB congener concentrations, or vice versa). The *p*-values associated with all three tests of significance were below 0.01, which indicated that the slope or the Tau was significantly different from (above) zero.

Thus, TOC is strongly correlated with percent fines. Higher TOC concentrations can be reliably predicted by smaller grain size distribution and therefore these two variables are not independent. Total PCBs as congeners are moderately correlated with the other two variables – sediment with higher TOC and percent fines typically have higher total PCB concentrations.

9.6.5 Trends Through Time

Figure 9-19 summarizes the sequence of removal actions and sample collection in the Forebay. Above the timeline, maximum concentrations of total PCBs measured in sediment during five different investigations are plotted on a logarithmic scale. As can be seen from this graph, the removal of the in-water sources of contamination has dramatically reduced both the maximum measured sediment concentrations along the north shore of Bradford Island.

Prior to 2007, data collection efforts in the river were focused on locating areas of potential sediment contamination, not documenting the distribution of sediment concentrations. Additionally, different sample collection and analytical methods were used. Therefore, it is not appropriate to compare the distribution of PCB concentrations measured during each sampling event. Instead, the highest observed sediment concentrations along the north shore of Bradford Island are presented to show the decrease in the "worst-case" concentrations on through time.

In 2001, the maximum total PCB concentration of 15 sediment samples was 23,900 µg/kg (URS 2002b). During February/March 2002, thirty-two tons of waste, including PCB-containing electrical equipment and collocated sediment were removed from three debris piles on the north side of Bradford Island. As part of this removal, approximately 100 sediment samples were collected to delineate the extent of impacted sediment. The highest total PCB concentration for sediments measured in 2003 was 690,000 µg/kg (URS 2003c and URS 2004c). Three years later, in 2006, divers collected sediment samples as close as possible to the locations of two of the 2003 samples with the highest total PCB concentrations. When resampled, the stations that had total PCB concentrations of 690,000 µg/kg and 2,400 µg/kg in 2003, had concentrations of only 440 µg/kg and 160-2,100 µg/kg, respectively, in 2006 (URS 2006b). The following year, five

pre-removal sediment samples collected in September 2007 from the areas that were later dredged had total PCB concentrations ranging from 13 to 133 µg/kg (URS 2008d).

Overall, total PCBs decreased by two to four orders of magnitude in the sediments on the north shore of Bradford Island between 2003 and 2007 (Figure 9-19). In October 2007, during the dredging removal action, 63 tons of sediment was removed from the north side of Bradford Island (HAI 2007). Following this removal a sample collected along the north shore of Bradford Island in an area that was not dredged (station P04) contained only 27.9 µg/kg total PCBs.

Declining total PCB concentrations were also observed in the Forebay crayfish collected from the north shore of Bradford Island. Crayfish composite samples collected during May 2001, in the vicinity of Debris Piles 1 and 2, had total PCB concentrations ranging from 2,670 to 75,600 µg/kg (URS 2002a,b). The composite crayfish sample with the highest total PCB concentration (75,600 µg/kg) was collected from former Debris Pile 1 and is the highest measured total PCB concentration for any tissue sample, including smallmouth bass, collected from the Forebay. Crayfish composite samples collected in February 2008 from the north shore of Bradford Island (stations 4 and 5) had total PCB concentrations three to four orders of magnitude lower (16.8 to 16.9 µg/kg) than those collected in 2001 (URS 2009i). The clams collected from 2001 to 2008 show a similar natural attenuation trend of decreasing total PCB concentration.

As described in the Goose Island Slough Data Gap Summary Report (URS 2009k), similar reductions in total PCB concentrations were observed in other areas of the Forebay. For example, a composite sample of three crayfish sample was collected near the western tip of Goose Island in May of 2001, prior to the removal of the contaminated equipment or sediment. The total PCB concentration in this sample was 268 µg/kg. Crayfish samples collected in 2008 and 2009, in the vicinity of Goose Island, had two to three orders of magnitude lower concentrations of PCBs (0.578 to 0.960 µg/kg).

Recognition of this observed natural attenuation, and the timing of equipment and sediment removals relative to Forebay sample collection is important for understanding the relatively high concentrations of total PCBs measured in the Forebay smallmouth bass. Based on age to length relationships for smallmouth bass captured in Lake Ontario, New York and in the Columbia River (Adams et al. 1999, Henderson and Foster 1956), the approximate ages of the 19 smallmouth bass collected from the Forebay in 2006 range from 4 to 10 years (URS 2008c). Therefore, it is reasonable to assume that all of the smallmouth bass sampled in 2006 were spawned in or before 2002 – the year that the equipment was removed from the Forebay (Figure 9-19).

Although most of the Forebay smallmouth bass were caught in the Goose Island Slough, the slough is unlikely to represent their home pool. Instead, as discussed in the Goose Island Slough Data Gap Summary Report (URS 2009k), bass are believed to have migrated into the Slough to spawn, from their home pools in other areas of the Forebay. The 0.45 kilometers (km) distance from Bradford Island to the Goose Island slough is only slightly larger than the largest weekly recorded movement of 0.37 km observed in the Huron River (Beam 1990), and is well within the observed migratory distances traveled by smallmouth bass during the spawning season. Studies of migratory patterns of smallmouth bass in the Snake River in Idaho showed that fish found outside their home pool, in spring, traveled distances up to 1.2 km (Munther 1970). Radio-tagged bass in the Columbia River have been recorded traveling distance as much as 63 km (Montgomery et al. 1980). While long distance travel for smallmouth bass is uncommon, it is

entirely reasonable to assume the smallmouth bass population living near Bradford Island would travel the short distance (0.45 km) to the slough, for the purposes of preferential spawning habitat.

It is reasonable to assume that the Forebay smallmouth bass sampled in 2006 were exposed to the sediments and were consuming lower trophic level organisms near the PCB-containing equipment on the northern side of Bradford Island prior to the equipment removal in 2002. And, since the second removal of contaminated sediments did not occur until 2007, all of the smallmouth bass caught in 2006 could have spent their entire lifespan exposed to the higher concentration sediments on the north shore of Bradford Island prior to the sediment removal (see Figure 9-19).

Therefore, it is highly probable the PCB concentrations observed in the smallmouth bass collected from the are related to a historical body burden associated with the contaminated equipment and sediments which have since been removed from the northern side of Bradford Island. Long term monitoring of the Forebay smallmouth bass population, will likely show decreases in PCB concentrations, as similar trends have already been observed for sediments and lower trophic level media.

10.0 FATE AND TRANSPORT OF CONTAMINANTS

This section describes the fate and transport of contamination associated with Bradford Island releases at the Upland OU and River OU.

10.1 Upland OU Fate and Transport of Contaminants

The fate and transport of contaminants is described below for each of the four Upland OU AOPCs. The sources and nature of releases of contaminants to the environment are summarized, followed by a description of potential or confirmed mechanisms for transport of contaminants from the AOPCs. The understanding of the fate and transport at each AOPC is based on knowledge of historical and ongoing waste management practices and activities, observations of existing site conditions that affect fate and transport, analytical data for soil, soil gas, groundwater, seep water, and surface water, and knowledge of the behavior of chemicals in the environment.

10.1.1 Landfill AOPC

The presence of contamination at the Landfill AOPC resulted from use of the area to manage, store, and dispose of waste materials. In addition to the placement of wastes within the Landfill AOPC, other historical activities included pesticide/herbicide mixing and rinsing activities, and historical storage areas. Discrete source areas have not been identified within the Landfill AOPC. Rather, the type and magnitude of contamination within the Landfill AOPC is variable, consistent with the variable waste management, storage, and disposal activities that occurred at the Landfill AOPC.

Inorganic and organic contaminants at the Landfill AOPC were initially released to surface and/or subsurface soils. Contaminants that adsorb strongly to soil (e.g., PCBs and PAHs) and are not readily soluble or volatile have likely remained at their point of release. The only potential transport mechanism for insoluble/non-volatile contaminants is to physically move the soil by surface erosion and/or mass wasting of soil. The surface of the landfill itself shows minimal evidence of surface runoff, soil erosion, or sediment deposition, indicating that the ground surface is stable and there is minimal potential for off-site migration of contaminated soil by surface erosion. Around the perimeter of the Landfill AOPC, the potential for mass wasting of soil into the Columbia River appears low. However, metals, pesticides, PCBs, PAHs, and SVOCs were detected in the Landfill AOPC perimeter soil samples at concentrations exceeding the sediment SLVs. There is an ongoing but low potential for these contaminants to be transported off site to the river via mass wasting.

Volatile soil contaminants (e.g., VOCs and SVOCs) can be released to air from surface and subsurface soils. Dust generation can also release volatile and non-volatile soil contaminants in particulate form to air. VOCs and SVOCs were present in surface and subsurface soils at the Landfill AOPC, and therefore there is a potential for volatilization of these chemicals to outdoor air at the Landfill AOPC. However, since the Landfill AOPC is not occupied by site works, and the ambient conditions are typically windy, the potential for exposure of site workers to volatile constituents in air at levels of concern is extremely low, primarily due to the dispersion of these constituents in air. Since the Landfill surface is well vegetated and vehicles or heavy equipment are not operated on the Landfill surface, the potential for contaminant migration in dust is very low.

Contaminants that may have been initially released as a liquid phase (e.g., PCB-containing oils in buried electrical equipment) can potentially infiltrate into, and migrate through soil as a liquid phase. The extent to which the liquid phase would migrate through soil is in part a function of the release volume and the tendency of the liquid to adsorb to soil. Small releases of liquids that adsorb strongly to soil (e.g., PCB-containing oils) would likely not migrate far from the point of release. Subsurface investigations at the Landfill AOPC have not identified evidence of contaminants present in a liquid phase. In addition, contaminant concentrations measured in soil, groundwater, and seep water at the Landfill AOPC were well below concentrations that would be expected if contaminants were present in a concentrated, liquid phase. Therefore, it is very unlikely that off-site transport of contaminants in soil is an ongoing process at the Landfill AOPC.

A final potential mechanism for off-site transport of contaminants at the Landfill AOPC is leaching of contaminants from buried debris and/or contaminated soil to groundwater, and potential transport to surface water. The degree to which a contaminant may leach to water is mainly a function of its solubility in water although there are other factors that also affect its solubility. Few contaminants are completely insoluble in water and most contaminants are soluble to a lesser or greater degree. Leaching of contaminants from surface soil to surface water is a potential mechanism at the Landfill AOPC. Surface runoff has been observed originating at the base of the hill south of the Landfill. However, this runoff infiltrates into the ground before reaching the river, and no other evidence of direct discharge of surface water to the river has been observed at the Landfill AOPC.

Groundwater analytical data confirm that most contaminants detected in surface and subsurface soils were also detected in groundwater. The mechanism for this leaching is likely a combination of leaching directly to infiltrating precipitation in unsaturated soil and leaching directly to groundwater where Landfill wastes are saturated by the seasonal high water table. Seep water analytical data indicate that metals, DRO, and selected VOCs have migrated in groundwater to seeps at concentrations exceeding the surface water SLVs. However, seep water is rapidly diluted upon discharge to the river, as demonstrated by the fact that DRO and VOCs were not detected in concurrent samples of adjacent surface water. SVOCs also appear to have migrated to the seeps but at concentrations below the surface water SLVs. Butyltins, herbicides, pesticides, and PAHs were detected in groundwater but not seep water, indicating that they may be leaching to groundwater but are not migrating to the river. PCBs were not detected in groundwater or seep water, consistent with the very low solubility of PCBs in water.

In summary, the primary mechanism for off-site transport of contaminants from the Landfill AOPC appears to be leaching of contaminants from buried debris and/or contaminated soil to groundwater, and discharge of contaminants in groundwater zone to the river via seeps. The COPCs to this migration pathway are metals, TPHs, and VOCs. There is also a low potential for metals, pesticides, PCBs, PAHs, and SVOCs in soil to migrate to the river via mass wasting of soil.

10.1.2 Sandblast Area AOPC

Contamination at the Sandblast Area AOPC resulted from a variety of historical and ongoing uses that include equipment storage and management, as well as storage and disposal of various hazardous materials and wastes. The type and magnitude of contamination is variable, consistent with the variable hazardous substance and waste management, storage, and disposal practices

that occurred at the various subareas within the Sandblast Area AOPC. Some contaminants are widespread in soil and groundwater and are not associated with a discrete source within the Sandblast Area AOPC. Other contaminants appear to be specifically associated with the sandblast grit disposal area, the equipment laydown area, and an inferred VOC release from a storage tank previously located where the HMSA is currently located.

Inorganic and organic contaminants at the Sandblast Area AOPC were initially released to surface and/or subsurface soils. Throughout much of the Sandblast Area AOPC, contaminants that adsorb strongly to soil and are not readily soluble or volatile have likely remained at their point of release. However, observation of the site conditions confirm that soil erosion is a historical and ongoing process that has mobilized and transported soil within portions of the Sandblast Area AOPC. Soil erosion is the result of stormwater runoff from impervious surfaces, as well as direct precipitation onto and runoff from soils recently disturbed by excavation and filling activities. Stormwater from the northwest portion of the Sandblast Area AOPC drains to four catch basins; two stormwater pipe outfalls convey runoff from the catch basins to the Columbia River. The catch basin drainage areas include areas where soil erosion and transport is documented. Metals, PCBs, TPH, butyltins, pesticides, SVOCs, PAHs, and VOCs were detected in erodible soil, and constituents of each of these analytical groups, except TPH and VOCs, exceeded sediment SLVs. Metals, butyltins, PCBs, and TPHs were detected in soil along the stormwater flow path to CB-1, and/or in soil immediately adjacent to CB-1. With the exception of the stormwater flow to CB-1, no other evidence of direct discharge of soil in stormwater to the river has been observed at the Sandblast Area AOPC.

Soil gas analytical data from soil borings confirm that VOCs were present in soil gas at, and downgradient of, the inferred PCE source area at the current HMSA. VOC concentrations exceeded soil gas SLVs but not at locations occupied by site workers. Thus, VOCs are potentially being released to air, but not likely at concentrations of concern to on-site workers. Volatile and non-volatile contaminants were present in surface soils at locations that are barren and/or experience infrequent vehicle traffic. There is a potential for transport of volatile and non-volatile soil contaminants in dust, but this transport mechanism is likely very minor. To the extent that soil adheres to vehicle tires in the Sandblast Area AOPC, there is also a potential for transport of contaminants along road ways within the Sandblast Area AOPC and elsewhere at Bonneville Dam, although this mechanism is likely minor due to the minimal vehicle traffic at the Sandblast Area AOPC.

A storage tank was reportedly present at the location of the current HMSA prior to its construction. VOC concentrations in soil, soil gas, and groundwater indicate that a PCE release occurred at this location, and the former storage tank is the inferred source of the release. Very high concentrations of PCE and TCE were reported in soil adjacent to the current HMSA; elsewhere, VOC concentrations were much lower. Evidence of liquid phase contamination was not observed in soil borings or monitoring wells downgradient of the current HMSA. Groundwater analytical data demonstrate that VOC concentrations at the inferred source area are decreasing over time. The analytical data and soil boring/monitoring well observations suggest that liquid phase contamination may have been present in soil at or in the vicinity of the former storage tank at the time of the release. But it appears unlikely that significant migration of liquid phase contamination occured. Evidence of liquid phase contamination has not been encountered elsewhere at the Sandblast Area AOPC.

Leaching of contaminants from surface soil to surface water is a potential mechanism at the Sandblast Area AOPC. As described above, metals, PCBs, TPH, butyltins, pesticides, SVOCs, PAHs, and VOCs have been detected in soil within the drainage area of the four stormwater catch basins. Since many of these contaminants are soluble in water, off-site transport of dissolved-phase contaminants in stormwater may be occurring at the Sandblast Area AOPC.

Groundwater analytical data confirm that most contaminants detected in surface and subsurface soils have leached to groundwater. Metals, butyltins, pesticides, PAHs, TPHs, SVOCs, and VOCs were detected in groundwater. PCBs were not detected in groundwater, consistent with the very low solubility of PCBs in water. Concentrations of metals, PAHs, and VOCs in groundwater exceeded their surface water SLVs, including at locations immediately adjacent to the river, indicating that these contaminants may be migrating to the river at concentrations of potential concern. Butyltin, pesticide, TPH, and SVOC concentrations did not exceed SLVs. Seeps have not been observed along the river bank at the Sandblast Area AOPC, but groundwater is assumed to discharge to the river as base flow.

In summary, the primary mechanisms for off-site transport of contaminants from the Sandblast Area AOPC appear to be soil erosion and transport in stormwater to the river, and leaching of contaminants from contaminated soil to groundwater followed by discharge of groundwater to the river via base flow. The potential contaminants of concern to one or both of these transport mechanisms include metals, butyltins, pesticides, PCBs, PAHs, TPH, SVOCs, and VOCs. There is also a potential for off-site migration of soluble contaminants in stormwater, but samples of stormwater have not been collected and analyzed to confirm this.

10.1.3 Pistol Range AOPC

Use of the Pistol Range AOPC as a firing range resulted in the contamination of soil with lead and zinc. The highest lead concentrations in soil are at and behind the backstop, and are likely associated with bullet fragments that remain in the soil. In lagoon sediment adjacent to the Pistol Range AOPC, zinc concentrations exceeded the sediment SLV, and were also higher than the maximum concentration of zinc detected elsewhere in Forebay sediments. The analytical data indicate that historically, when the pistol range was in use, off-site migration of metals to the river may have occurred as a result of soil erosion and/or soluble transport in stormwater. Currently, however, the Pistol Range AOPC is well vegetated and does not show evidence of surface runoff, soil erosion, or sediment deposition. Similarly, since the Pistol Range AOPC is well vegetated and vehicles or heavy equipment are not operated at the site, the potential for migration of metals in dust is very low.

Total concentrations of copper, lead, nickel, and zinc, and dissolved concentrations of copper, nickel, and zinc were detected in groundwater at the Pistol Range AOPC, although no detected concentrations exceeded the water SLVs. Although the soil conditions beneath the Pistol Range AOPC accommodate very little groundwater (most of the holes drilled were dry), the analytical data from the two samples collected suggest that metals have leached to groundwater to a limited extent. The discharge of this groundwater to the river as baseflow may provide a mechanism for transport of metals to the river, but not at concentrations of potential concern.

In summary, minor leaching to groundwater followed by discharge of groundwater to the river via base flow is the only (very limited) mechanism of transport of contaminants from the Pistol Range AOPC to the river.

10.1.4 Bulb Slope AOPC

Contamination at the Bulb Slope AOPC resulted from placement of glass and electrical light bulb debris directly onto a steep slope between the landfill access road and the Columbia River. Lead, mercury, PCBs, and TPH have been detected in surface soils at the Bulb Slope AOPC. The majority of the Bulb Slope AOPC is well vegetated, covered with organic debris, and exhibits no evidence of surface runoff or overland flow to the river. Wave erosion at the base of the slope has resulted in mass wasting of soil which appears to be a potential mechanism for transport of debris and/or contaminated soil into the river. Owing to the well vegetated nature of the Bulb Slope AOPC, the potential for migration of contaminants in dust is very low.

There is a low potential for metals and TPHs to leach from the soil into groundwater and discharge to the river as base flow. Given the thin soil layer and small footprint of the Bulb Slope AOPC, and the fact that it is well-vegetated with trees and shrubs, leaching to groundwater is likely an insignificant transport mechanism. PCBs have a very low solubility in water and are unlikely to leach to groundwater or surface water.

In summary, mass wasting of soil at the base of the Bulb Slope AOPC appears to be the primary mechanism for transport of contaminants to the river.

10.2 River OU Fate and Transport of Contaminants

Contamination in the River OU resulted from electrical equipment debris which were historically disposed of directly in the River on the north side of Bradford Island. The electrical debris contaminated the surrounding sediment, primarily with PCBs. The electrical equipment debris were removed in 2000 and 2002 (URS 2002b) and the majority of the associated PCB-contaminated sediment was removed in 2007 (URS 2008e,f,g). Residual contaminated sediment, as well as historically contaminated biota (e.g., fish and shellfish) may currently be sources of contamination. Transport of contaminants from the Upland OU, discussed above, may also be a current and/or historical source of contamination to the River OU.

During the post-removal sampling in 2008, PCBs, PAHs, metals, and TPH were detected in Forebay sediment. The same contaminants were also detected in Forebay surface water samples. Contaminants are exchanged between the surface water and sediment via sorption and dissolution. The partitioning of individual contaminants between the solid (sediment) and liquid (surface water) phases depends on their solubility. Generally, hydrophobic contaminants, such as PCBs, are strongly bound to the sediment, and tend to be concentrated in areas of fine-grained sediment with relatively high TOC. The Columbia River is a dynamic environment in which sediment is constantly being redistributed within the Forebay through human and natural processes. However, numerical modeling and direct sampling contain the extent of contamination to be between the upstream end of Goose Island and the Bonneville Dam.

11.0 HUMAN HEALTH RISK ASSESSMENT

This section presents the methodology and findings of the HHRA that was performed for the Upland and River OUs in support of the RI. The HHRA process is similar for the River and Upland OUs, as described in the RI/FS MP (URS 2007a).

11.1 Purpose of HHRA

The overall purpose of the HHRA is to assist the USACE with achieving the management goals for the Upland and River OUs in a manner that complies with federal USEPA and state (DEQ) regulatory guidance. Based on the results of the risk assessment, additional evaluation, risk management or response actions may be needed to meet the management goals for these OUs.

HHRA for Upland OU

As listed in the RI/FS MP (URS 2007a), the management goals for the Upland OU that are relevant to the HHRA are:

1. Continued use of Bradford Island for occupational/ industrial uses in support of operations at Bonneville Lock and Dam
2. Protection of the health of on-site workers and visitors who may be present at the Upland OU
3. Protection of the River OU from upland sources of contamination

The objectives of the HHRA for the Upland OU and AOPCs have been developed on the basis of the management goals and are to:

1. Evaluate if risks from COPCs to human receptors exceed unacceptable levels at any of the Upland AOPCs or the Upland OU overall and,
2. Evaluate if the COIs in upland soils and groundwater can migrate into the River OU at levels of potential concern for receptors in the River OU

HHRA for River OU

The USACE's management goals for the River OU that are relevant to the HHRA are:

1. Continued safe maintenance and operations of the Bonneville Lock and Dam complex
2. Support of and protection of the health and livelihood of people who may utilize the area for contact recreation, fishing recreation, or subsistence fishing purposes
3. Support of the beneficial uses of the Columbia River in this segment including the protection of anadromous and resident fish species utilizing the area

The Forebay is located downstream of several other potential sources of COIs that may overlap with the COIs for the River OU. Since one of the goals of the baseline risk assessment is to evaluate risks due to site-related COIs, the objectives of the risk assessment for the River OU are twofold:

1. Evaluate whether COIs in the Forebay should be identified as COPCs based on comparison with both risk screening values and upstream (reference) conditions
2. Evaluate whether risks to human receptors due to COPCs are at unacceptable levels

11.1.1 Scope of HHRA

According to USEPA and DEQ risk assessment guidance for human health, (DEQ 2000, 2003, 2010b; USEPA 1989), the HHRA process consists of a two-step process, the problem formulation, followed, if necessary, by the baseline risk assessment. The process begins with compiling information on the COIs. COIs are defined by DEQ as chemicals that are present or may be present at a site that have not been screened against any criteria (DEQ 2001). The COIs listed in the Appendix M tables represent chemicals detected at a frequency of 5% or more when 20 or more samples were available. When less than 20 samples were available, frequency of detection was not a consideration and this criterion was not used. Additionally, metals were also compared to Reference values and only those that were statistically greater than Reference, were included as COIs. Finally, if PCE or TCE were selected as COPCs, their degradation products were listed, even if they were not detected. The problem formulation step is used to narrow down the COIs to a smaller list of COPCs that warrant additional risk assessment or risk management actions. The baseline risk assessment is then performed to further narrow down the COPCs to a final list of chemicals of concern (COCs) for development of remedial action goals.

Problem formulation represents the first risk-based evaluation of all the relevant information and data pertaining to a site. By considering all the site information, current and likely future uses of land and water, and going through a comprehensive and exhaustive COPC selection process, the problem formulation process yields findings and conclusions that provide a solid basis for further decision-making. It provides screening-level estimates of carcinogenic risk and non-cancer hazards for the identified COPCs. The evaluation also allows for the identification and prioritization of the COPCs with regard to those which are most likely to be significant contributors to risk and will merit the most attention in terms of remedial action or further risk assessment. Similarly, if no COPCs are identified, the problem formulation process provides a strong foundation to base a decision of NFA.

The scope of the current HHRAs for the Upland and River OU is limited to the problem formulation phase of the HHRA. The problem formulation includes all four AOPCs in the Upland OU and the entire River OU. All the media that are relevant to human health exposure under current and reasonably likely future site conditions for which data have been collected (soil, soil gas, groundwater, sediment, surface water, tissue) are included in the evaluation.

11.1.2 Regulatory Framework

To achieve the objectives mentioned above, the steps that are used to conduct the problem formulation for the HHRA are based on USEPA and DEQ guidance (USEPA 1989; DEQ 2000, 2003, 2010b). Since DEQ is reviewing the RI/ FS, DEQ guidance was followed regarding the nature of the risk assessment process and the format and presentation of results. DEQ risk assessment protocols can be found in OAR Section 340-122-0084.

The guidance documents used in the performance of the HHRA include:

- Guidance for Conducting Beneficial Water Use Determinations at Environmental Cleanup Sites (DEQ 1998a)
- Final Guidance, Consideration of Land Use in Environmental Remedial Actions (DEQ 1998b)

- Guidance for Conduct of Deterministic HHRAs, Final (DEQ 2000)
- Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites (DEQ 2003, Updated 2009)
- Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment, Final (DEQ 2007)
- HHRA Guidance, Updated October 2010 (DEQ 2010b)
- Superfund Risk Assessment Guidance for Superfund, Volume I Human Health Evaluation Manual (Part A), Interim Final (USEPA 1989)
- Risk Assessment Guidance for Superfund: Volume I Human Health Evaluation Manual. Part B, Development of Risk-Based Preliminary Remediation Goals, Interim (USEPA 1991)
- Guidance for Data Usability in Risk Assessment (USEPA 1992)
- Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (USEPA 2002a)
- Calculating UCLs for Exposure Point Concentrations at Hazardous Waste Sites (USEPA 2002b)
- Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), Draft (USEPA 2002c)
- Human Health Toxicity Values in Superfund Risk Assessments (USEPA 2003a)
- User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings, Draft (USEPA 2004)
- Regional Screening Levels (RSLs) and User's Guide (USEPA 2010)

Based on the guidance listed above, the problem formulation phase for the HHRA for the Upland and River OUs includes the following elements, as defined by DEQ (2000, 2010b):

- Review of existing site information
- Land and water use determination
- Definition of data quality objectives
- Determination of the nature and extent of contamination
- Identification of potentially exposed populations
- Definition of exposure scenarios and exposure routes
- Contaminant screening procedures
- Development of a CEM
- Discussion of uncertainties

Much of the initial review of site information and identification of exposed populations, and development of preliminary CEMs were completed in the RI/FS MP (URS 2007a) for both the

Upland and River OUs. These elements are further refined in the current evaluation based on review of newly collected data and closing of previously identified data gaps.

Based on earlier discussions with DEQ and as outlined in the RI/FS MP, 95% UCL values are used to represent site concentrations of COIs when the sample size is sufficient. The 95% UCL is based on USEPA recommendations and is consistent with the USACE's desire to maintain compatibility with the CERCLA process. It is slightly different from DEQ's recommendation to use the 90% UCL. Since use of the 95% UCL will not lead to underestimation of risk when compared to the 90% UCL, the TAG agreed that representation of the 95% UCL is acceptable.

An additional difference between USEPA and DEQ guidance is the evaluation of the human milk ingestion pathway for infants for bioaccumulative chemicals. This pathway is included in DEQ's recently issued HHRA guidance (DEQ 2010b) but does not include pre-calculated risk-based screening concentrations. At the federal level, no final guidance or risk-based screening levels are available for this pathway. Therefore, this pathway is considered on a qualitative basis in this problem formulation phase of the HHRA.

11.1.3 Acceptable Risk Levels

For human health evaluations, chemicals are typically evaluated on the basis of whether they are considered to be carcinogenic or non-carcinogenic. The risks associated with carcinogenic chemicals are expressed as a probability of an exposed individual developing cancer over a lifetime of exposure for a particular receptor and pathway. The probability is expressed as excess lifetime cancer risk (ELCR). The risks associated with exposure to multiple chemicals within a single medium or multiple media are estimated by adding the individual ELCR probabilities and expressed as cumulative ELCR, typically expressed as the probability of developing one additional case of cancer per population of one million. This value may be expressed as 1×10^{-6} or 1E-06.

The risks associated with non-carcinogenic chemicals are designated as non-cancer hazard and are represented as a ratio of site-related dose to a "safe dose" for a particular receptor and pathway. A ratio (termed hazard quotient, HQ) of 1.0 or less is considered to not pose a threat to human health. A ratio greater than one indicates that the possibility exists for adverse effects and that further evaluation or action is warranted. Exposure to multiple non-carcinogens within a single medium or multiple media is estimated by adding the individual HQs and is expressed as the cumulative hazard index (HI).

For non-carcinogens, USEPA and DEQ use a HQ or HI exceeding 1.0 as the departure point for whether additional evaluation or action is necessary (USEPA 1991, DEQ 2010b). For carcinogens, USEPA and DEQ use slightly different target levels for acceptable risk levels. In determining need for remedial action, differences exist in acceptable risk levels between CERCLA and State of Oregon guidance. USEPA's (1991) Office of Solid Waste and Emergency Response (OSWER) Directive 9355.0-30, by Don Clay, entitled "Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions," is quoted below.

> "Generally, where the baseline risk assessment indicates that a cumulative site risk to an individual using reasonable maximum (RME) exposure assumptions for either current or future land use exceeds the 10^{-4} lifetime excess cancer risk end of the risk range, action under CERCLA is generally warranted at the site. For sites where the cumulative site risk to an individual based on RME for both current and future land use is less than 10^{-4}, action

generally is not warranted, but may be warranted if a chemical specific standard that defines acceptable risk is violated or unless there are non-carcinogenic effects or an adverse environmental impact that warrants action. A risk manager may also decide that a lower level of risk to human health is unacceptable and that remedial action is warranted where, for example, there are uncertainties in the risk assessment results. Records of Decision for remedial actions taken at sites posing risks within the 10^{-4} to 10^{-6} risk range must explain why remedial action is warranted."

In contrast to USEPA, DEQ uses an acceptable risk level of 1E-06 for individual carcinogens (including congeners of chemicals groups such as PCBs and carcinogenic PAHs [cPAHs]) and a level of 1E-05 for cumulative cancer risks (OAR 340-122-0115(2)(a) and (4)(a).

11.1.4 Data Management for HHRA

In Sections 5.0 and 6.0, the datasets evaluated in the Problem Formulation for the Upland and River OUs are described, including the methods used to handle data qualifiers and non-detect sample results. The approach used to calculate PCB totals from Aroclor and congener data, and toxicity equivalence quotients (TEQs) for dioxin-like PCB congeners, as well as the approach used to calculate PAH totals, are discussed in Appendix H. Finally, an evaluation of the data usability for the HHRA is provided in Section 7.4, whereby MDLs and MRLs for non-detect samples and MRLs for J-flagged data are compared to SLVs protective of human receptors to assess the quality of the data. A more detailed discussion of the implications of using MDLs for non-detect samples in exceedance of human health-based SLVs is presented in the uncertainty assessment (Appendix O).

11.2 Problem Formulation - Upland OU

The problem formulation for the Upland OU evaluated potential exposures by human receptors and selected COPCs for each of the four upland AOPCs as well as for all the AOPCs combined.

11.2.1 Exposure Setting and Potentially Exposed Populations

The current and likely future uses of land and water are the basis of identifying human receptors who may be exposed to site media. Beneficial uses of land and water have been discussed earlier in Section 3.0. As noted in Section 3.0, Bradford Island is part of the Bonneville Dam Complex. Land uses at the Island are governed by the Bonneville Master Plan (USACE 1997a) and include land uses for management of hydropower, navigation, recreation, and natural resource and wildlife preservation. Residential uses do not currently occur at the Island and are not included in the Master Plan, thus making future residential use very unlikely.

Shallow perched groundwater in the Upland OU is encountered at depths of approximately 7.5 ft bgs in the winter but may drop to depths of 30 ft bgs in the summer (Appendix D).

There are two enclosed structures in the general vicinity of the Upland OU AOPCs – the service building and the equipment building (the sandblast building was recently demolished). The service building and the equipment building are occupied structures located outside the boundaries of the Sandblast Area AOPC.

The three distinct human populations in the general site area are the site staff, site visitors, and the nearby residents. There are currently no on-site residents. Although a hypothetical future

resident is often considered in risk assessment, this scenario was not included in this HHRA because of the current and continuing industrial nature of the site and the requirements of the Master Plan.

Site Staff

As noted in Section 3.1.6.1.2, there are 162 full-time employees and approximately 475 part-time or seasonal contractors and researchers at the Bonneville Dam Complex. Among the full-time employees, 152 people may be engaged in a wide range of occupations, including maintenance, construction, office staff, visitor services, and natural resource management. An additional 10 additional staff from the Portland District headquarters are also stationed at the dam. Among the part-time personnel, approximately 300 fisheries-related staff (contractors/researchers from state and federal agencies) may work at the dam from April through September and an additional 175 construction and service contractors may also be employed at the project. Their number varies depending on workloads (McCavitt, personal communication, 2006).

The range of occupations may include soil-intrusive activities that may extend from the surface soils (e.g., mowing) to deeper soils (e.g., construction and utility services). They may also include indoor occupation of the service center building and equipment building (Figure 3-4), which are located adjacent to the Sandblast AOPC boundary but susceptible to vapor intrusion from VOCs in the soil and groundwater.

Construction workers engaged in long-term construction of new facilities (assumed exposure duration of 250 days for a year, per DEQ guidance) are not considered a reasonable scenario since major new construction is not planned for the Upland AOPC areas. However, the construction and service contractors may include excavation and trench workers engaged in utility repair or other types of soil-disturbing activities (assumed exposure duration of 9 days for a year, per DEQ 2010b) may be present. For the screening-level purposes of the problem formulation, both long-term construction workers and short-term excavation workers are included as potential receptors and are evaluated using DEQ's SLVs for each of these receptor types.

Site Visitors

Direct access by the general public or trespassers to the Upland OU areas is unlikely. Although a road from Interstate 84 provides access to the Bonneville Dam complex, the access road is gated, and visitors are only allowed to access several dam facilities (visitor centers, fish ladders, etc.). The site and general vicinity on Bradford Island is gated and off limits to the public. Only USACE personnel and authorized visitors are allowed into these areas.

Nearby Residents

As described earlier, no permanent residential dwellings are located on the Project. The primary population center in proximity to the dam is the town of North Bonneville, situated on the Columbia River just west of the dam on the Washington side of the river. The 2009 population is estimated at approximately 950 persons.

In summary, based on considerations of land use and site access, the human receptors who may be directly or indirectly exposed to COIs and COPCs at or from the upland AOPCs include:

- On-site adult outdoor workers
- On-site adult indoor workers

- On-site long-term construction workers and short-term excavation workers
- Potable Water Users - Hypothetical consumers (i.e., staff workers) of on-site groundwater
- Off-site child and adult recreationists and recreational and subsistence fishers and consumers of river water

The exposure scenarios and exposure routes associated with these receptors are described below.

11.2.1.1 Exposure Scenarios

The on-site receptors may be exposed to soils and groundwater at the Upland OU in several ways, as described below:

- Adult outdoor site maintenance worker engaged in activities that do not involve a significant degree of soil disturbance (e.g., landscape workers). These receptors at Bradford Island may be exposed to COIs in surface soil (0-3 ft bgs) by incidental ingestion, inhalation (dusts and vapors), or dermal contact with contaminants in soil.
- Adult indoor workers may be exposed to VOCs emanating from subsurface soil and entering the indoor environment by vapor intrusion if occupied enclosed structures were to be constructed in the future at the Sandblast Area.
- Construction workers and excavation workers may be exposed to COIs in surface and subsurface soil by incidental ingestion, inhalation (dusts and vapors), or dermal contact with contaminants from surface and subsurface soil combined (0-10 ft bgs) on an intermittent, short-term basis. They also may be exposed to COIs in shallow groundwater by incidental ingestion, dermal contact, and vapor inhalation during those times of the year when the perched groundwater is at shallow depths. The only exception would be at the Bulb Slope AOPC, which is too steep to support routine excavation activities. Long-term exposure such as those experienced by construction workers is unlikely since there are no plans to build extensive new structures or facilities in the Upland OU.
- Adult workers at Bradford Island hypothetically may be exposed to COIs in groundwater if it was used as a drinking water supply – although such use of groundwater does not currently exist and is not anticipated in the future. If such use were to occur, it is assumed for this evaluation that the groundwater would be used “as is”, i.e., in an untreated and unfiltered condition.

Off-site receptors who may be indirectly exposed to chemicals from the Upland OU (and evaluated for the River OU, see Section 11.3) include:

- Child and adult recreationists who wade, swim, or boat in the Bonneville Forebay may be exposed by direct contact to COIs that may be discharged from groundwater to surface water.
- Child and adult subsistence and recreational fishermen may consume fish and shellfish contaminated with bioaccumulative COIs that erode from upland soils to offshore sediments or discharge from groundwater into the offshore surface water. Clams in the vicinity of the River OU are small and not of edible size. Sculpin are small fish that are an important component of the food-web but are not directly consumed by humans. Therefore, only crayfish and smallmouth bass are considered to be the most likely edible shellfish and resident finfish at the River OU. Although large-scale sucker are not popular

with subsistence or sport fishers, they may occasionally be consumed and are further evaluated in Appendix O. Subsistence fishers are likely to have higher fish ingestion rates than recreational fishers.

11.2.1.2 Exposure Areas

For the purpose of the problem formulation, exposure areas for the Upland OU and River OU (see Section 11.3) are defined on the basis of probable exposure by the identified receptors and the nature of the site data. It was assumed that an adult worker may be exposed solely to the exposure media at a single Upland AOPC (e.g., soil and groundwater at the Landfill) or could be exposed to multiple Upland AOPCs (all four AOPCs) during the course of their working life. Therefore, the exposure areas for the Upland OU include four individual AOPCs as well as a combined larger exposure area consisting of all four AOPCs combined.

Landfill AOPC

This area includes exposure to soil and groundwater at the Landfill.

Sandblast Area AOPC

This area includes exposure to soil, groundwater and soil gas at the Sandblast Area.

Pistol Range AOPC

This area includes exposure to soil and groundwater at the Pistol Range.

Bulb Slope AOPC

This area includes exposure to soil at the Bulb Slope.

All Four AOPCs Combined

This area includes exposure to soils from all four AOPCs, and to groundwater from the Landfill, Sandblast Area and Pistol Range AOPCs.

11.2.2 Conceptual Exposure Model

The CEM is a schematic representation of the source-receptor pathway at a site. The five elements that are required to be present in order to consider an exposure pathway complete or potentially complete are:

- A source of COIs (e.g., waste material in a landfill)
- A release mechanism (e.g., spills, releases)
- An exposure medium (e.g., surface soil)
- An exposure route (e.g., dermal contact with soil)
- A receptor (e.g., outdoor worker)

An exposure pathway is considered incomplete if any one of these elements is absent. Where there is no exposure, there is no risk, and no further evaluation of the pathway is warranted. A CEM should consider current and reasonably likely future land uses and exposures at a site.

A CEM was developed for each AOPC (Figures 11-1 through 11-4) on the basis of sources and site history, potentially exposed populations, the transport pathways and the routes of exposure. Exposure pathways are indicated as incomplete or potentially complete. The CEMs are generally similar for all the four AOPCs with some minor variations.

11.2.2.1 Landfill AOPC

The CEM for the Landfill AOPC is included as Figure 11-1. Releases from the waste materials disposed of at the Landfill have resulted in on-site exposure media that include surface soil, subsurface soil, and groundwater. The groundwater may also travel offsite, may daylight as seeps, and discharge to the surface water of the Columbia River.

The potential for erosion of landfill soils to occur is considered minimal or low, as discussed in Section 10.1.1. However, a portion of the soils along the north slope of the landfill are considered to be amenable to mass wasting (mass wasting soils) from potential slope failure. Further, evaluation of this pathway is addressed in this document and will be included in the upcoming FS. Because of the uncertainty associated with whether this pathway actually occurs and its magnitude, further discussion of this pathway is presented in the Uncertainty Assessment (Appendix O).

On-site receptors include outdoor workers who may be exposed to surface soils at the Landfill AOPC in their normal course of non-intrusive activities. Long-term construction workers and short-term excavation workers may be exposed to subsurface soils if they were to engage in soil-intrusive activities at the Landfill AOPC. Exposure routes related to soil include incidental ingestion, dermal contact, and outdoor inhalation of dusts and vapors. Those related to direct exposure to groundwater include dermal contact and inhalation of vapors within a trench setting for both construction and excavation workers. There are no enclosed structures present at the Landfill AOPC and none are planned. However, if enclosed structures were to be constructed in the future (assuming that constructability concerns are addressed), indirect exposures to groundwater would include volatilization of VOCs and subsequent vapor intrusion for indoor office workers.

In the unlikely event that new wells are installed, and untreated and unfiltered groundwater in the vicinity of the Landfill is used for potable uses, the on-site workers may be exposed to COIs in groundwater by ingestion, dermal contact, and inhalation of vapors. COIs in seep water and shoreline wells at the Landfill are unlikely to become part of the potable water supply for the Island but are included in the potable use evaluation as an intentionally conservative measure. These seep and groundwater COIs are more likely to become part of the transport pathway into the river.

COIs from soil washoff or groundwater discharge entering the river may subsequently be consumed by downstream users who use river water as their potable water supply source (assumed to be untreated and unfiltered). The bioaccumulative COIs may also enter the food web when taken up into the tissues of edible species such as the crayfish and smallmouth bass. Recreational and subsistence anglers (adults and children) may then consume these edible species. The anglers may also come in contact with COIs that may be discharged from groundwater into surface water, although this is likely to be an insignificant exposure. No direct contact exposures with sediment are considered likely for the mass wasting soils that may enter the Forebay since it is too deep for wading. Therefore, only bioaccumulation exposures are

considered potentially complete and significant exposure pathways associated with the transport pathway to the River OU.

11.2.2.2 Sandblast Area AOPC

The CEM for the Sandblast Area AOPC (Figure 11-2) is similar to that for the Landfill AOPC. Transport pathways, receptors and potentially complete exposure pathways for on-site and off-site soil and groundwater are the same as for the Landfill AOPC. No seep water or shoreline surface water data were collected for this AOPC. The available groundwater data include data collected from monitoring wells and from direct-push samples. A limited portion of Pistol Range soils along the shoreline may be considered to be "erodible soils." Discussion of the soil erosion pathway is provided in the Uncertainty Assessment (Appendix O).

In addition to these pathways, the Sandblast Area AOPC includes pathways related to VOCs. The release of VOCs associated with the historical AST and painting operations at this AOPC resulted in the presence of VOCs in soil gas and groundwater. Although there are no currently occupied buildings at this AOPC, the potential for intrusion of vapors from the subsurface (from soil gas and groundwater) into indoor environments exists, if enclosed structures were to be constructed here in the future. Therefore, exposure pathways for indoor inhalation of vapors by indoor workers may be potentially complete under future conditions.

11.2.2.3 Pistol Range AOPC

The CEM for the Pistol Range AOPC (Figure 11-3) illustrates the more limited set of receptors and potentially complete exposure pathways for this AOPC. Sources at the Pistol Range AOPC are related to its former use as a firing range. The exposure media are surface soil and groundwater. The groundwater is characterized by data for direct-push samples. Off-site transport pathways include the potential for surface soil to wash off into the adjacent lagoon and settle as sediment and for groundwater to discharge into the river. However, as described in Section 10.1.3, erosion of soils into the river is not likely to occur, due to the well-vegetated nature of the AOPC and the lack of soil-intrusive activities. Therefore, further discussion of this pathway is included in the Uncertainty Assessment (Appendix O) based on the assumption that erosion may have occurred in the past (historical erosion).

Adult outdoor workers may be exposed to surface soils by direct contact pathways. Although use of groundwater as a potable water source from this shoreline AOPC area is highly unlikely, grab sample data from the direct-push samples are used to evaluate this exposure pathway.

Off-site human receptors are also limited for this AOPC. Although wash-off from surface soils into the adjacent lagoon may occur, access is unlikely for human receptors to the lagoon and direct contact pathways are considered incomplete for lagoon sediment. Groundwater discharge to the river may lead to direct contact (potable use of surface water) and bioaccumulation (consumption of fish and shellfish) pathways that are complete for recreational and subsistence fishers.

11.2.2.4 Bulb Slope AOPC

The Bulb Slope AOPC is steep, rocky, and thickly vegetated with a thin layer of soil. The CEM for this AOPC (Figure 11-4) illustrates the fact that surface soil is the only medium of exposure.

Occasional exposure to surface soil may occur on the part of adult outdoor workers who may access this area for maintenance activities. Although very unlikely, the mass wasting soils may

also wash off into the Forebay with subsequent potential for bioaccumulation of COPCs into edible aquatic species (e.g., bass and crayfish) which may then be consumed by recreational and subsistence fishers and is discussed further in the Uncertainty Assessment (Appendix O). No other on-site or off-site exposure pathways or receptors are associated with this AOPC.

11.2.3 Methodology for Identification of Chemicals of Potential Concern

DEQ's risk assessment guidance allows a screening process to be applied to site data in order to separate chemicals that warrant evaluation from those that may be eliminated from further consideration (DEQ 2000, 2010b).

11.2.3.1 Identification of Contaminants of Interest

In Sections 5 and 6, the historical and recent site investigations are described in detail, and the COIs in Upland media of the four AOPCs are identified. Based on the presence of potentially complete exposure pathways and associated analytical data, COIs in the Upland OU were identified for the following media:

- Soil, groundwater, and co-located seep and surface water of the Landfill AOPC
- Soil and groundwater of the Sandblast Area AOPC
- Soil, groundwater, and lagoon sediment of the Pistol Range AOPC
- Soil of the Bulb Slope AOPC

The categories of COIs that were detected in analytical data include metals (including butyltins), pesticides, herbicides, PCBs, TPH, PAHs, other SVOCs, and VOCs. Of these COIs, a subset is considered to be bioaccumulative in soils, groundwater or aquatic environments (for the groundwater to surface discharge scenario), as presented in Section 7.3 and Table J-6. The screening process begins with the designation of all chemicals detected at the site as COIs, as described earlier in Section 9.1. The following essential nutrients were eliminated from the COI list due to their low potential for toxicity: calcium, magnesium, iron, sodium, and potassium in soil; calcium, magnesium, sodium and potassium in groundwater. The remaining COIs are then evaluated further on the basis of three criteria: detection frequency, comparison with reference concentrations (inorganics only) and comparison with risk-based screening levels. The first two steps of the COPC selection process were performed in Section 9.1 for all media associated with each AOPC (Tables 9-1 through 9-6).

The concentrations of the chemicals retained following the first two steps of the COPC selection process are then compared with risk-based screening levels. The chemicals that fail the HHRA screening process are designated as COPCs and are carried through the risk assessment process. The screening process and the development of the list of COPCs is a critical element of the Problem Formulation phase of the HHRA. The results of each step of the screening process are described in this section.

For groundwater, the COIs are reported as "dissolved" and "total." However, more emphasis is placed on the results of the total concentrations for the HHRA since the presumed exposure pathways for consumption of groundwater and surface water assume that unfiltered, untreated water is consumed as a potable water supply.

11.2.3.2 Detection Frequency

In the first step of the COPC identification process, for each medium of exposure at each AOPC, all COIs were evaluated with respect to their frequency of detection in a given medium. COIs that were detected at a frequency of 5% or less, given a sample size of 20 or more, were eliminated as COPCs. This criterion was not applied where the sample size was less than 20. The detection frequency criterion was applied to the media at each AOPC and also for the medium-specific data for all four AOPCs combined. Soil COIs were evaluated separately for the 0-3 ft and 0-10 ft depth intervals.

The use of the 5% detection frequency criterion is based on the assumption that site characterization is adequate and representative. COIs that were detected at less than 5% frequency are discussed qualitatively with regard to their nature and occurrence and implications for the HHRA in the Uncertainty Assessment (Appendix O).

The results of the evaluation of detection frequency are presented in Tables 9-1 to 9-6 and discussed in Section 9.1.

11.2.3.3 Statistical Comparison with Reference Area Soils

In the second step, the concentrations of inorganic COIs in soil at each AOPC were compared to concentrations in reference soils from the Island on the basis of statistical tests. The results of this statistical comparison are presented in Appendix L and discussed in Section 8.0. Inorganic COIs in soil at any of the AOPCs or the combined AOPCs were eliminated as COPCs if they were not statistically higher than reference concentrations (Section 9.1). This comparison recognizes that naturally occurring chemicals generally do not need to be addressed in a remedial context if there is no site-related contribution.

Concentrations of PAHs in soil at each AOPC were also compared to concentrations in reference soils on the basis of statistical tests. All PAHs in soils at each of the AOPCs exceeded PAH concentrations in the Reference Area soils (Table 8-1). Although this comparison was not used to select organic COPCs (in accordance with DEQ guidance), the results are presented to provide perspective on the distribution of organics between AOPC and reference soils.

11.2.3.4 Concentration-Risk Screen

The third step of COPC identification for the HHRA consists of comparing COI concentrations to risk-based screening concentrations that are specific to the media, receptors and pathways that are relevant to the site. DEQ guidance (DEQ 2010b) requires this step to consider exposure to: i) individual COIs, (ii) multiple COIs simultaneously within a given medium, and (iii) individual or multiple COIs within different media.

Carcinogenic and non-carcinogenic chemicals are evaluated slightly differently in the concentration-risk screen process.

11.2.3.4.1 Selection of Screening Level Values and EPCs

The risk-based SLVs for this HHRA represent concentrations of chemicals in each medium (soil, groundwater, soil gas) that are associated with acceptable target ELCR levels of 1 E-06 or a non-cancer HQ of 1.0. The selection of human health-based SLVs is described in Section 7.3 of the RI and generally included a hierarchical source structure with highest preference given to SLVs published by DEQ followed by USEPA. A few exceptions to the hierarchy were made, to accommodate DEQ preference or to take advantage of more up-to-date values, as described

below. For each medium, SLVs were selected for human health receptors, based on a hierarchy of sources (Appendix J, Tables J-4a through J-4f). The SLVs for each medium were selected to be protective of the human receptors that are likely to be exposed to that medium. Where multiple receptors and exposure pathways may exist for a single medium, the lowest of the relevant SLVs was selected.

SLVs for potable water use represent values that are protective of human health under the residential use scenario (i.e., ingestion of 2 liters/day as well as use of water for showering and household use) because of the designated beneficial uses for groundwater and surface water in this area and also because residential potable water use SLVs are available from both DEQ and USEPA to cover the range of COIs under evaluation. Therefore, use of the residential potable water SLVs is conservative since residential land use of groundwater will not occur at the Upland OU. Even if the groundwater were ever used as a potable water supply source on the Island, the assumed ingestion rate for the employees who may consume the water would be 0.7 liter per day (DEQ 2010b, USEPA 1997c) and would not include household use. Thus the residential potable water use SLVs may thus overestimate risk or hazard for the occupational consumption scenario by a factor of 3 due to the difference in water intake rates alone.

DEQ's vapor intrusion-based SLVs for groundwater were used to evaluate vapor inhalation in outdoor and trench settings for adult outdoor workers and construction and excavation workers. DEQ's soil gas SLVs were used to evaluate vapor inhalation in indoor settings for indoor office workers.

cPAHs were individually compared against their SLVs. For the benzofluoranthenes, historic data were reported as "total benzofluoranthenes" while recent data reported individual constituents such as benzo(b)fluoranthene and benzo(k)fluoranthene. The two types of data reporting were kept separate for SLV comparisons. In the absence of an SLV for total benzofluoranthenes, the lower of the SLVs for benzo(b)fluoranthene and benzo(k)fluoranthene was used for total benzofluoranthenes.

Each PCB Aroclor was compared to the Aroclor-specific SLV. In addition, the sum of the Aroclors, designated as Total PCBs, was compared to the SLV for PCBs. The source of the PCB SLVs were the RSLs from USEPA (USEPA 2010). The RSLs were identical for all the reported Aroclors in the Upland AOPC soils and were also used for Total PCBs.

For bioaccumulation-related pathways, bioaccumulation-based SLVs were identified or developed, as necessary. COIs were retained as COPCs for the bioaccumulation pathway under three conditions: (i) if they exceeded bioaccumulation-based SLVs for sediment, surface water or tissue; (ii) if they were considered bioaccumulative but lacked a bioaccumulation-based SLV; and (iii) if they were detected in tissue even if they were not considered bioaccumulative.

COIs without bioaccumulation-based SLVs were evaluated with regard to their bioaccumulation potential (Tables J-6 and J-7) to determine if they should be retained as COPCs. The bioaccumulation pathway applies to the Subsistence and Recreational Fishers and the exposure is highly dependent on chemical migration through multiple media. For example, the bioaccumulation exposure pathway may be direct for receptors consuming fish or shellfish and the COIs in the tissue, but SLVs for sediments and groundwater, derived based on the migration of the chemical between media to the surface water and ultimately in the fish tissue, should be considered highly variable and uncertain. .

11.2.3.4.2 Application of Screening Level Values

The SLVs were applied to the COPC selection process by comparing site concentration (C) to the SLV, where C is the lower of the 95% UCL or the maximum concentration, which is consistent with risk assessment guidance (USEPA 1989). For soil gas, only the maximum concentration was used.

Individual and Cumulative Screening

Exposure to Individual COIs (Carcinogens and Non-carcinogens) - COIs were retained as COPCs if the site concentration (lower of the 95% UCL or maximum concentration per USEPA 1989, DEQ 2010b) of an individual COI in soil and groundwater or the maximum concentration in soil gas exceeded the SLV, as illustrated in the C/SLV ratio below, where C is the concentration of the COI:

$$\frac{C}{SLV} > 1.0$$

Thus, in this first step, carcinogens with concentrations exceeding a screening risk level of 1E-06 and non-carcinogens exceeding a screening level of HQ of 1.0 in a single exposure medium were retained as COPCs. For some inorganics, the SLV in soil or sediment was based on the Reference UPL. For these chemicals, C/SLV does not indicate that an acceptable risk level was exceeded, only that the site concentration is greater than the Reference UPL. These were also retained as COPCs.

There were a few exceptions to this rule:

One exception was that, in any medium in which PCE or TCE was selected as a COPC, all the potential degradation products (dichloroethenes and vinyl chloride) were also retained as COPCs regardless of whether or not they were detected and whether or not they exceeded their own SLVs (if SLVs were available). This is meant to allow for the possibility that concentrations of these degradation products may increase in the future. This approach is recommended by DEQ (2010b).

The other exception was in the selection of COPCs for the pathway of groundwater discharge to surface water and subsequent bioaccumulation. Only those COIs in groundwater that had bioaccumulation-based SLVs or had bioaccumulation potential (even if no bioaccumulation-based SLVs were available) were evaluated for this pathway. When available, total analyte concentration data were used in preference to dissolved concentration data for the HHRA.

Exposure to Multiple COIs within a Single Medium (Non-carcinogens only) - Cumulative exposure to multiple COIs was performed for non-carcinogenic chemicals per DEQ's guidance. Recently published guidance from DEQ (2010b) does not require carcinogens to be included in this screening step since it is unlikely that more than 10 carcinogens would exceed their individual screening levels.

A non-carcinogenic COI was retained as a COPC if the individual ratio exceeded 0.1 when the sum of the C/SLV ratios for all the COIs in a given medium exceeded 1.0. This relationship is expressed as follows:

$$\frac{C}{SLV} > 0.1 \text{ when Sum } \frac{C}{SLV} > 1.0$$

Thus, in this second step, if the non-carcinogenic HI exceeds 1.0, contributing chemicals were identified as COPCs if they are present at one-tenth of their SLV.

The C/SLV ratio for lead was not included in the sum. Although it is classified as a probable human carcinogen, lead is evaluated on the basis of SLVs developed from the pharmacokinetic blood lead model (USEPA 2010). Lead was compared to its SLV and evaluated separately with regard to its adverse effects. Also for inorganics COIs whose SLVs were based on Reference UPLs and were therefore not risk-based, were not included in the sum C/SLV. Any inorganic that exceeded their Reference UPL was already included as a COPC in the first step.

Exposure to Single COIs from Multiple Media (Carcinogens and Non-carcinogens) - Cumulative exposure to a single COI that occurs in multiple media (e.g., soil, groundwater and soil gas) was addressed by retaining a COI as a COPC in all media when the cumulative multi-media ratio for a single chemical exceeds 1.0.

$$\text{Sum } \frac{C}{SLV} > 1.0$$

Based on the human health risk assessment guidance (DEQ 2010), the multi-media exposure evaluation was interpreted to identify new chemicals, from the list of COPCs based on single media exposure. This applies in cases where COIs with C/SLV ratios do not exceed 1 within a single medium, but exceeds the threshold when summed with C/SLV ratios from other relevant media for the receptor. Therefore, if a chemical has already been selected as a COPC, that chemical was not further evaluated for multi-media exposure (this interpretation of the guidance was confirmed during a phone conversation with DEQ [DEQ 2012a]).

Consistent with DEQ guidance (DEQ 2010b, 2012b), all COPCs within a single group with a similar mode of action were ultimately retained as COPCs even if individual members of the group passed the screening criteria. This applied to cPAHs and PCB congeners.

For the Upland AOPCs, the multiple media evaluation also included the multiple exposure pathways that could be reasonably assumed for a single receptor. These included outdoor workers who may be exposed simultaneously to soils by direct contact while also using groundwater as a potable water supply source, consuming food that may have been exposed to bioaccumulative chemicals in groundwater (after groundwater discharges to surface water) and inhaling VOCs from soil gas in an indoor setting (Sandblast Area only). Such a combination of multi-pathway and multi-media exposure is extremely unlikely and was, therefore. not postulated in the CEMs. It was included in the COPC selection process only to allow a high degree of confidence in the intentional conservatism of the screening process. Similarly, construction and excavation workers are assumed to be exposed to 0-10 ft bgs of soils, while also encountering groundwater in a trench setting with subsequent dermal contact and vapor inhalation.

Cumulative Risks and Hazards

At the conclusion of the Concentration-Risk screening, the sum of the C/SLV ratios for individual non-carcinogenic COIs (from Step 1) were summed to provide a screening-level estimate of the non-cancer Hazard Index (HI) for that medium. Lead was not included in the HI estimate but was evaluated and discussed separately. The C/SLV ratios for the carcinogens were also summed separately and multiplied by 1E-06 to provide an estimate of the ELCR. The purpose of these HI and ELCR estimates is to provide a screening-level estimate of non-cancer hazards and cancer risks.

Interpretation of the C/SLV ratios must be performed with caution and an understanding of the assumptions and limitations. For carcinogens, a single chemical C/SLV ratio of 1.0 corresponds to a screening level ELCR estimate of 1E-06 (one in one million). A ratio of 10 would represent a risk level of 1E-05. For non-carcinogens, a C/SLV ratio of 1.0 represents a HQ of 1.0 and any higher values represent corresponding increases in the HQ. Therefore, the cumulative non-carcinogenic C/SLV ratios listed at the bottom of the screening tables can be interpreted as a cumulative HI for the non-carcinogens.

The cumulative carcinogenic C/SLV ratios were multiplied by a factor of 1 E-06 to provide a screening-level estimate of cumulative ELCR. However, it is noted that the cumulative C/SLV ratios for carcinogens does not account for the non-carcinogenic effects associated with carcinogenic chemicals. If a quantitative estimation of risk were to be performed, the non-carcinogenic hazards associated with the carcinogenic COPCs would need to be included with the HQs for the non-carcinogens to arrive at an estimate of the HI. This uncertainty did not affect the COPC selection process since the lower of the cancer and non-cancer-based endpoints was the basis of the selected SLV. It also did not affect the findings and conclusions of the problem formulation since consideration of the cancer-based endpoints for carcinogenic COPCs generally leads to estimation of higher risk levels and the need for remedial responses at lower concentrations than consideration of the non-carcinogenic effects for the same chemicals. Therefore, decisions based on protection of the cancer effects are usually also protective of the non-cancer effects.

In addition, the SLV for arsenic in soil is based on the Reference Area UPL and is not a risk-based number since the concentration of naturally-occurring arsenic is higher than the risk-based SLV, as is typical of soils in the western United States. Therefore, the C/SLV ratio for arsenic only represents magnitude of exceedance above background. It cannot be multiplied by 1E-06 to provide a screening level estimate of risk as was done for other carcinogenic COPCs. Arsenic was retained as a COPC in soil if statistical testing (as described in Section 8) showed that the site concentration of arsenic was higher than the Reference Area concentration (as described in Section 8) and if the 95% UCL (or the maximum, whichever is lower) for arsenic in soil at the AOPC had a C/SLV ratio greater than 1.0.

COIs Without SLVs

For all media and exposure pathways, COIs without SLVs were generally retained as COPCs if they were reported at greater than 5% detection frequency, in accordance with DEQ and USEPA guidance. More detailed discussion of COIs without SLVs is found in Section 7.3 and Appendix O. An exception was inorganic COIs without SLVs were eliminated as COPCs if they did not exceed reference concentrations. For the groundwater to surface water discharge pathway, COIs detected in groundwater that did not meet bioaccumulation criteria (Table J-6 and J-7) and did not have SLVs were dropped. In some cases, DEQ SLVs were not available due to the calculated value exceeding either the solubility limit or the saturation point. In these cases the COIs were also eliminated as COPCs.

Identification of List of COPCs

At the end of multi-step process described above, COIs were identified as COPCs if they met the following two criteria:

- Detected at greater than 5% frequency

- Exceeded Reference Area concentrations (inorganics only)

Along with any one of the following criteria:

- Single-chemical C/SLV ratio greater than 1.0 (i.e., ELCR greater than 1E-06 for carcinogens and HQ greater than 1.0 non-carcinogens)
- Single-chemical C/SLV ratio greater than 0.1 and multi-chemical sum C/SLV greater than 1.0 (non-carcinogens only)
- Multimedia C/SLV ratio greater than 1.0 (carcinogens and non-carcinogens)
- No SLV available, or degradation product of PCE or TCE

11.2.3.5 Risk Interpretation

In this final phase of the screening level risk characterization process, the quantitative and qualitative components of the risk screening (i.e., toxicity ratios) and uncertainty assessment are evaluated to gain a better understanding of the actual potential for human health risk. Multiple lines of evidence are considered to provide qualitative information for the chemicals listed as COPCs and to support interpretation of the estimated health hazard and ELCR.

Confidence in the SLV was a key consideration to assess overall confidence in COPC selection. If primary sources did not provide SLVs, on a case-by-case basis, surrogate values were used and/or values from a more conservative receptor or exposure pathway. For screening based on surrogate SLVs, risk may be over-or under- estimated. If a SLV from a more conservative receptor or exposure pathway (i.e., an SLV for an Outdoor Worker for an Excavation Worker [who has less overall exposure] or using a tapwater water SLV for direct contact exposure), was used, which caused the COI to be selected as a COPC, it is most likely a highly conservative selection. In this scenario, development of a more representative SLV would be recommended for the baseline HHRA.

For each AOPC and receptor, the COPCs identified with toxicity ratios greater than 1 (and greater than 0.1 for noncancerous chemicals with HI greater than 1) and determined to be significant contributors to risk, are plotted in Figures 11-5 through 11-18, and discussed in the text below. Those COPCs where only a limited number of exceedances were noted or if their exceedances were minor, were not included on the spatial distribution maps.

11.2.4 Screening Risk Characterization

This section provides the results of the COPC selection process for each AOPC. The C/SLV ratios are also used to provide a preliminary discussion of the most significant chemicals for each receptor and pathway.

11.2.4.1 Landfill AOPC

COIs detected in Landfill AOPC soil included metals, SVOCs, pesticides, herbicides, and PCBs, PAHs, TPH, and VOCs. COIs detected in groundwater included metals, herbicides, PAHs, TPH, and VOCs; while seep COIs included metals, SVOCs TPH, and VOCs; and surface water COIs included metals and TPH. The applicable receptors for the Landfill AOPC are outdoor workers, construction and excavation workers, potable groundwater user, and recreational and subsistence fishers (from groundwater and erosional soil transport pathways). Indoor workers were not

considered for this AOPC because construction of enclosed structures above the Landfill is unlikely but are discussed qualitatively below.

11.2.4.1.1 On-site Adult Outdoor Worker

The on-site adult outdoor worker is assumed to be exposed to soils 0-3 ft bgs by direct contact pathways (incidental ingestion, dermal contact, outdoor inhalation of dusts and vapors). The COIs were evaluated with reference to individual and cumulative exceedances of screening levels for the adult outdoor worker (Table M-1).

All chemicals that remained as COPCs after comparison with SLVs and the concentration-risk screen are summarized in Table M-12.

Non-carcinogenic COPCs – The overall non-cancer HI for multi-chemical exposure was 0.29 (excluding lead) and therefore below the health hazard threshold of 1 (Table M-1). All the COPCs that were evaluated as non-carcinogens have C/SLV ratios that were less than 1.0. Only lead was selected as a COPC, based on multi-media exposure to soil and groundwater. Lead concentrations exceeded their SLV at only three locations within the 0-3 ft bgs interval (BIL18, BIL22 and BIL27, Figure 11-5) but the EPC for lead (511 mg/kg) is lower than the SLV (800 mg/kg) and serves as an example of a COPC that is limited to very localized exceedances of low magnitude and unlikely to pose a significant risk to this receptor.

Carcinogenic COPCs – The cumulative screening level ELCR is 6.3E-05 (Table M-1) and falls within USEPA's risk management range. Among the identified COPCs, those with the highest chemical C/SLV ratios were the cPAHs, primarily benzo(a)pyrene and a few others. ELCR related to the cPAHs is 6.1E-05 and thus accounts for the majority of the cumulative ELCR. Total benzo(b)fluoranthenes were not included in the PAH count since the individual benzo(b)fluoranthenes were retained as COPCs. (Total benzofluoranthenes were reported in earlier data sets and have since been supplemented with more recent data reporting individual fluoranthenes). Total benzofluoranthenes, evaluated separately, had a C/SLV ratio of 11.6 (ELCR= 1.1E-05) and fell within the range of ELCRs for the other cPAHs.

Arsenic was the only other carcinogenic COPC with a C/SLV ratio greater than 1, but, was low at 1.94. The SLV for arsenic (5.4 mg/kg) was based on the reference concentration and does not represent a risk-based SLV (i.e., excluded from in the ELCR sum). The SLV exceedance occurs at four locations, but the risk ratio is primarily due to a single location (BIL05) where arsenic occurs at a concentration of 30.1 mg/kg. At all other locations, arsenic was generally reported at concentrations similar to reference concentrations.

All the detected Aroclors and total PCBs had single-medium and multi-media C/SLV ratios less than 1.0 and were, therefore, not retained as COPCs. As noted earlier, the potential non-cancer effects associated with carcinogenic COPCs are not evaluated in this COPC selection process but are unlikely to affect COPC selection.

COPCs without SLVs – SLVs were available for all the COIs listed. Therefore, no COPCs were identified on the basis of a lack of SLVs.

Summary

There were eight COIs screened in as COPCs, which consist of metals and PAHs (Table 11-1). The COPCs contributing the most to health risk for the Adult Outdoor Worker at the Landfill AOPC include arsenic and cPAHs. Typically, two different patterns of spatial distribution were seen when a COI was identified as a COPC. The exceedances may either be due to substantially

elevated concentrations at a few locations (i.e., a few locations) or moderately elevated concentrations at many locations (dispersed). In some cases, the ratios exceeded 10 (i.e., screening risk level greater than 1E-05 or HQ greater than 10). The sample locations at the Landfill where SLVs were exceeded are shown in Figure 11-5. Among these, the locations where the C/SLV ratio exceeded 10 were primarily in the north-west corner of the Landfill AOPC. They included locations within the Gully Test Pit and nearby locations and in the Mercury Vapor Lamp Test Pit. The majority of the C/SLV ratios greater than 10 were for the cPAHs (in the Gully Test Pit). The modest exceedances of arsenic above its Reference Area UPL were dispersed throughout the Landfill AOPC and therefore are not indicative of any particular source area for arsenic.

11.2.4.1.2 Onsite Construction Worker

The construction worker is assumed to be exposed to a depth of 0-10 ft bgs soils for a period of 250 days for one year. Although some aspects of the construction worker's activities may have higher exposures than outdoor workers (e.g., incidental soil ingestion rate of 330 mg/day versus 100 mg/day for the outdoor worker), their overall exposure dose is lower than the outdoor worker because of the much shorter duration of exposure (one year versus 25 years). Therefore, the SLVs developed for construction workers are generally higher (i.e., less stringent) than the SLVs for outdoor workers (except for certain non-carcinogenic chemicals which are not affected by the exposure duration difference). For COI's lacking construction worker-specific risk based concentrations (RBCs) , the outdoor occupational worker RSLs were used and represents the use of SLVs that are probably more conservative than needed (from DEQ 2009b). For the deeper soil interval, the COPC list was almost identical to that of the shallow soil depth interval but contains fewer chemicals (Table M-2). The complete list of COPCs is summarized in Table M-12.

Non-carcinogenic COPCs – No non-carcinogenic COPCs exceeded a C/SLV ratio of 1, and the overall non-cancer HI for multi-chemical exposure was 0.90 (excluding lead) and therefore below the health hazard threshold of 1. The UCL for lead (796 mg/kg) was slightly lower than its SLV of 800 mg/kg (Table M-2).

Carcinogenic COPCs –The cumulative screening level ELCR is 1.2E-05 and falls within USEPA's risk management range. This evaluation was conservative since the more stringent adult outdoor worker SLVs (based on USEPA industrial soil RSLs) were used for many COIs for which construction worker SLVs were not available.

The COPCs with the largest C/SLV ratios and major contributors to ELCR for this receptor were PCE and benzo(a)pyrene. The ELCR due to cPAH COPCs was estimated at 5.1E-06 (Table M-2). Individual Aroclors and total PCBs did not exceed a ratio of 1.0 either on a single-medium or a multi-media basis and were eliminated as COPCs.

COPCs without SLVs - SLVs were available for all the COIs listed. Therefore, no COPCs were selected solely due to a lack of SLVs.

Degradation Products Of PCE – Since PCE was selected as a COPC, its degradation products (dichloroethenes, TCE, and vinyl chloride) were also included in the list of COPCs for future consideration, but it should be noted that none of these degradation products were detected.

Summary

There were seven COIs screened in as COPCs, which consist of PAHs, SVOCs, and VOCs. The COPCs contributing the most to health risk the Construction Worker at the Landfill AOPC include benzo(a)pyrene and PCE (Table 11-1) . The locations with SLV exceedances for the construction worker risk contributing COPCs are shown in Figure 11-6. The locations with cPAHs exceeding a risk level of 1E-05 were limited to the Gully Test Pit, a few nearby locations and the Mercury Vapor Lamp Test Pit. Elevated PCE was only found at one location in the Gully Test Pit.

Onsite Excavation Worker

DEQ's RBCs (2003, updated 2009) assume that an excavation worker may be exposed to contamination for nine days during one year of exposure. Therefore, a screening evaluation for the excavation worker was also performed (Table M-3). SLVs that are specific to the excavation worker are even lower than for the construction worker due to the fewer number of days exposed in a year.

The overall non-cancer HI for multi-chemical exposure was 0.73 and therefore, less than the threshold value of 1. The cumulative ELCR was 8.0E-07, which is below the threshold risk level of 1E-06. No COPCs were identified and therefore, there are no unacceptable risks to the Excavation Worker due to exposure to soils.

11.2.4.1.3 Groundwater Exposure – Construction/Excavation Worker

During the winter, there is a possibility that construction and excavation workers may encounter shallow perched groundwater during the course of soil-intrusive activities. Preliminary COPC concentrations in groundwater were compared to DEQ's SLVs for this receptor and pathway (Table M-4).

Some metals and DNOP screened in as COPCs, but this was due to using the tapwater SLVs because DEQ did not list direct contact SLVs for these chemicals. Although the much more conservative tapwater SLVs were used, the C/SLV ratios were still very low with iron being the highest at 1.1. Upon closer evaluation, antimony, mercury, and DNOP lacked DEQ RBCs due to their calculated SLVs exceeding their respective solubility limits for this pathway. It should be noted that for metals, the listed direct contact to groundwater RBCs were four to six orders of magnitude greater than their respective tapwater RBCs. Given these reasons, the screened in COPCs should be dismissed. Therefore, there are no unacceptable risks to the Construction Worker and Excavation Worker due to direct contact exposure to groundwater.

11.2.4.1.4 Groundwater User for Potable Use

Groundwater data collected from monitoring wells over the period 1998 to 2009 were compared to the SLVs for potable water use. The targeted Landfill AOPC receptor, assumed to utilize the groundwater for potable use, is the Adult Outdoor Worker though this screen could conservatively apply to any hypothetical onsite worker who may be a potable water user. As listed in Table M-5, the COPCs identified included a number of metals, several VOCs, SVOCs, and TPH fractions. The chemical with the highest C/SLV ratio was arsenic, followed to a lesser degree, by PCE, vinyl chloride and DRO. The full list of COPCs is summarized in Table M-12.

Non-carcinogenic COPCs – The non-carcinogenic COPCs exceeded a C/SLV ratio of 1, and the overall non-cancer HI for multi-chemical exposure was 11. The primary contributor to this HI was DRO (C/SLV=4.3), followed, to a lesser degree, by manganese (C/SLV=2.2), DNOP

(C/SLV=1.1) iron (1.1) and RRO (C/SLV=1.2). None of these ratios were considered significant given the conservatism inherent in using residential potable water SLVs for this AOPC. If it were assumed that the occupational potable use of groundwater is one third that of the residential water use, then DRO would be the only one of these analytes that would exceed a C/SLV ratio of 1.0.

The remaining COPCs exceeded the potable use SLVs by relatively small margins or were included only because of multi-chemical (i.e., C/SLV greater than 0.1 when sum C/SLV exceeds 1.0) and multi-media exposures (antimony, lead, zinc, GRO, 1,2,4-trimethylbenzene). These analytes do not exceed their individual SLVs at any location. Further, even the multi-media C/SLV ratios for antimony, zinc and GRO were less than 1.0 and, therefore, health concerns related to these analytes are unlikely. Iron and zinc are essential trace elements for human nutrition and is typically not considered to be toxic at such low concentrations.

Carcinogenic COPCs – The cumulative ELCR was 3.2E-04, primarily due to arsenic. Arsenic had a C/SLV ratio of 274 (ELCR of 2.7E-04), due to its extremely low SLV of 0.000038 mg/L. It should be noted that total arsenic concentrations in the upgradient Reference Well were reported in the range of 0.00122 to 0.00168 mg/L (Table I-6) and were also above the SLV for potable water. The maximum reported concentration in Landfill AOPC groundwater (maximum reported concentration of 0.0213 mg/L (Table I-1) and a 95% UCL value of 0.010 mg/L) was about 10 times higher than the upgradient concentration. Thus, the upgradient arsenic concentrations were approximately 35 times higher than the SLV and Landfill AOPC groundwater was about 270 times higher than the SLV. Arsenic exceeded its SLV by more than a factor of 100 at several locations (Figure 11-7). The potable water SLV for arsenic is a strictly risk-based value that is routinely exceeded in groundwater just as naturally occurring arsenic in soil routinely exceeds the risk-based soil SLV. Therefore, it is common and useful to also compare arsenic to the maximum contaminant levels (MCL) of 10 µg/L (Appendix J, Human Health SLVs; DEQ 2010a) when considering potable water uses. By this standard, the 95% UCL for arsenic in landfill groundwater (10.4 µg/L, Table M-5) is essentially equal to the MCL. Therefore the ELCR of 2.7E-04 for arsenic is considered to be an artifact of the screening process and does not necessarily mean that the groundwater is unsuitable for potable use.

Other carcinogens with C/SLV ratios greater than 1 included PCE, vinyl chloride, chloroform, and B2EHP. Among these, PCE and vinyl chloride exceedances are significant because of their high potential for toxicity and they were detected in approximately 25% of the samples and their UCLs were associated with risk levels corresponding to 3E-05 and 1.2 E-05, respectively (Table M-12).

It should also be noted that potable water use SLVs for VOCs such as PCE, its degradation compounds and chloroform are influenced most by the inhalation route, i.e., inhalation of the VOCs during household uses such as showering (USEPA 2010). In the case of the Upland AOPCs, hypothetical potable use of groundwater would primarily consist of ingestion and minimal exposure by the inhalation route.

COPCs without SLVs - SLVs were available for all the detected preliminary COPCs. Therefore, no COPCs were selected solely due to a lack of SLVs.

Degradation Products Of PCE – Since PCE was selected as a COPC, its degradation products (dichloroethenes and TCE) were also included in the list of COPCs for future consideration, but

it should be noted that these degradation products were detected minimally (less than 5% detection frequency) and in most cases not detected at all.

Summary

There were 19 COIs screened in as COPCs for potable use of groundwater, which consist of metals, TPH, SVOCs, and VOCs (Table 11-1). The COPCs contributing the most to health risk for the potable water user exposed to Landfill AOPC groundwater include arsenic, manganese, chloroform, PCE, vinyl chloride and DRO. Locations with metal SLV exceedances are shown on Figure 11-7. Exceedances for several COPCs occurred at all the monitoring wells within the Landfill AOPC. Arsenic exceeded 1E-05 risk levels at all the wells. Locations with organic SLV exceedances are shown on Figure 11-8. Exceedances of PCE above 1E-05 were noted along the northern side of the Landfill AOPC.

11.2.4.1.5 Groundwater Discharge to Surface Water

A description of the migration pathway for groundwater is included in Section 10.1.1 and concludes that the pathway exists for discharge to surface water, but that the water is subject to rapid dilution as soon as it reaches the river.

To evaluate the transport pathway from a human health standpoint, the recently collected groundwater data from the Landfill AOPC were compared to data collected from the seep locations and the adjacent surface water locations (Table M-6). COIs that were detected in groundwater, seeps, and shoreline surface water were considered to be representative of how COIs act within this transport pathway. The C/SLV ratios were calculated for the maximum concentrations reported in groundwater, seep water, and shoreline surface water. For the majority of the COIs, substantial reductions in concentrations and C/SLV ratios occurred along the flow path from groundwater to seep water to shoreline surface water locations. The exceptions were iron and lead which showed little reduction or a slight increase. The only COPC with a C/SLV ratio exceeding 1.0 at the shoreline surface water was arsenic. However the maximum arsenic concentration in the surface water (0.00117 mg/L) was similar to the maximum groundwater concentration observed at the Reference Area well (0.00168 mg/L) (Table M-6). This trend appears to hold for the other metals as well where the shoreline surface water concentrations are similar to reference area groundwater concentrations.

There is evidence of a transport pathway where COPCs may move between the groundwater to seep water to surface water, but the potential for discharge of COPCs in Landfill groundwater into the river surface at levels of concern appears to be low. The human health impacts of the media within this transport pathway are potable use and bioaccumulation into fish and selfish. This is discussed in further detail below.

Groundwater Discharge and Bioaccumulation

Groundwater for potable use is discussed in Section 11.2.4.1.4. Those COIs that exceeded bioaccumulation SLVs in groundwater were retained as COPCs for the bioaccumulation pathway (Table M-7) for the Subsistence Fisher and Recreational Fisher receptors. The bioaccumulation pathway is a potentially complete exposure pathway for all the receptors evaluated for the Landfill AOPC. Onsite workers may opt to fish recreationally on their time off. For the multi-media screening, the Adult Outdoor Worker was chosen to represent onsite receptors. The COPCs retained for this pathway are listed in Table M-12

Non-carcinogenic COPCs –The HI of 5.8 exceeds the health hazard threshold of 1.0 and is primarily due to DNOP. Although the C/SLV ratios for iron and manganese were greater than 1.0, the SLVs were based on aesthetic effects related to water consumption (Oregon Water Quality Criteria [WQC], Table 33b) and are not indicative of human health effects. Since these analytes are not considered to be bioaccumulative, their C/SLV ratios are not included in the HI. Some additional metals were also selected as COPCs due to their cumulative contribution to the non-cancer hazard. Their individual C/SLV ratios were less than 1.0 except thallium which had an C/SLV ratio of 1.0. It should be noted that DNOP was not selected as a COPC for tissue in the River OU.

Carcinogenic COPCs – The cumulative ELCR was 6.0E-04, which exceeds the risk management range and was primarily due to arsenic. Arsenic concentrations exceeded the SLVs by more than a factor of 10 at all monitoring well locations including seep and shoreline surface water locations (Figure 11-9). PCE and vinyl chloride also had C/SLV ratios greater than 1, but should be noted that these volatile compounds do not meet the criteria used to identify bioaccumulation potential (Table J-7). B2EHP concentrations exceeded the SLV at three locations: MW-1, MW-2 and MW-4 in the interior but not in any of the more exterior monitoring well locations and seep water samples (Figure 11-9; Table M-8); therefore the potential for discharge to the river at levels of concern appeared to be low.

COPCs without SLVs –Lead, mercury, tributyltin, and three VOCs (1,2,4-trimethylbenzene, isopropylbenzene, and n-propylbenzene) were screened in as COPCs because bioaccumulation-based SLVs are unavailable and they may have some potential for bioaccumulation based on their BCF or octanol-water coefficients (Table J-6). Mercury was detected at extremely low concentrations with a UCL of 0.000077 mg/L (Table M-7) and had a low detection rate (17%) in four of 24 samples. Also, detections were only in wells from the interior of the Landfill but not in any of the exterior wells (MW-01, MW-03, MW-08, MW-09, Appendix A). It also did not exceed the residential potable user SLV. Therefore, the potential for discharge of mercury into the river at concentrations of concern for human health appears to be low. VOCs are unlikely to persist in the aquatic environment after discharge to surface water and would typically not be expected to bioaccumulate in tissue. Although there is no bioaccumulation-based SLV for tributyltin, the residential potable water SLV for tributyltin is available (11 µg/L) and was not exceeded at any location.

Degradation Products Of PCE – Since PCE was selected as a COPC, its degradation products (dichloroethenes and TCE) were also included in the list of COPCs for future consideration, but it should be noted that these degradation products were detected minimally (less than 5% detection frequency) and in most cases not detected at all. Again, VOCs are unlikely to persist in the aquatic environment and typically do not bioaccumulate in tissue.

Summary

There were 18 COIs screened in as COPCs, which consist of metals, SVOCs, and VOCs (Table 11-1). The COPCs contributing the most to health risk for the Landfill AOPC groundwater for the bioaccumulation pathway include arsenic, DNOP, PCE, and vinyl chloride.

Seep Water

The seep water samples represent a limited data set that was collected primarily to evaluate the groundwater transport pathway. Use of seep water and shoreline surface water for potable water

use is neither practical nor feasible due to their location. Similarly, the most robust evaluation of bioaccumulation potential is performed on the basis of River OU surface water and tissue data (see Section 11.3.4). No statistical analysis of these data was performed and the detected COIs were compared to SLVs and no inferences regarding HI or ELCR were made. Tables M-8 and M-9 list the COPCs for the two seep water sample locations that were identified for potable water use, and for discharge to surface water and subsequent bioaccumulation pathways, respectively.

COPCs identified for potable water use included metals, several VOCs, and TPH (Table M-8). Non-carcinogenic COPCs included antimony, iron, lead, manganese and DRO. Carcinogenic COPCs were arsenic, chloroform, and PCE. Degradation products of PCE were also included. Among the COPCs listed, arsenic is already retained as a COPC for the groundwater discharge pathway (Table M-6). Chloroform and PCE (and its degradation products) are unlikely to persist in the River OU since they are VOCs.

COPCs identified for the discharge and bioaccumulation pathway included arsenic, lead, mercury, and PCE (and its degradation products) (Table M-9).

Shoreline Surface Water

Tables M-10 and M-11 list the COPCs that were identified for potable use, and for discharge to surface water and subsequent bioaccumulation pathways, respectively, for the shoreline surface water samples. Arsenic was the only COPC identified for potable use and was already included as a COPC for groundwater (Table M-12). Arsenic and lead were screened in as COPCs for bioaccumulation.

11.2.4.1.6 11.2.4.1.6 Volatilization of VOCs from Groundwater

VOCs in groundwater at the landfill may volatilize to the outdoor air. In the extremely unlikely event that enclosed structures are built at the landfill, intrusion of VOCs into the indoor environment may also occur. VOC concentrations in the groundwater were compared to DEQ's RBCs for outdoor inhalation of vapors and indoor inhalation of vapors in an occupational setting. All VOC concentrations were lower than their respective SLVs by more than two orders of magnitude. These comparisons are not presented in tables due to the infeasibility of construction at the landfill and the low likelihood of this pathway ever being complete.

11.2.4.2 Sandblast Area AOPC

COIs detected in Sandblast Area soil included metals, butyltins, SVOCs, pesticides, PCBs, PAHs, TPH, and VOCs. VOCs were also detected in soil gas. COIs detected in Sandblast groundwater included metals, butyltins, PAHs, TPH, and VOCs. Although PCE, TCE and dichloroethenes were detected in all media, vinyl chloride was detected only in groundwater. The applicable receptors for the Sandblast Area AOPC are outdoor workers, construction/excavation workers, potable groundwater user, indoor workers and recreational and subsistence fishers (from groundwater and erosional soil transport pathways).

COPC selection for the Sandblast Area AOPC included evaluation of data for soil, groundwater and soil gas, as described below. An additional set of data collected for surface soils at this AOPC included analysis of lead in two different soil particle soil fractions of less than 2 millimeter (mm) and less than 250 micrometers (μm). The goal of collecting these data was for

subsequent site-specific evaluation of the lead ingestion pathway for adult workers, should lead be selected as a COPC for soil.

11.2.4.2.1 On-site Outdoor Worker

The COPCs associated with the upper 3 feet of soils for this receptor are listed in Table M-13. The COPCs in surface soils include three metals (chromium, lead and arsenic), a few VOCs (PCE and TCE), and a few PAH compounds. The potential degradation products of PCE were also retained (Table M-13). In addition, as requested by DEQ for this AOPC only, lead was also evaluated and is retained as a COPC for the 0-1 ft bgs depth interval (Table M-13).

Non-carcinogenic COPCs **-** The cumulative C/SLV ratio resulted in an HI of 0.087, well below the health hazard threshold of 1, excluding the C/SLV ratios for lead. No single non-carcinogenic chemical other than lead had a single-medium C/SLV ratio greater than 1.0.

Lead was reported and evaluated in a more detailed manner than other analytes for this AOPC because of its known source and its potential toxicity. Its evaluation is consistent with USEPA recommendations for lead (USEPA 2000). Its occurrence as part of sandblast grit means that it may occur at higher concentrations in association with finer-grained soil particles and thus, may be more available for intake as part of inhalation and incidental ingestion pathways with subsequent release into the bloodstream. In addition, the particle-size relationship may also allow higher concentrations of lead in grit to be present in the surface soils from which most of the occupational exposure may occur. Therefore, lead samples were collected and analyzed to represent 2 surface depth intervals and three size fractions at this AOPC. The two surficial depth intervals were 0-3 ft bgs and 0-1 ft bgs. The size fractions included unsieved fractions, particle size fraction less than 2 millimeter (mm) and particle size fraction less than 250 micrometers (μm). The unsieved fraction provides total lead concentrations similar to all other analytes for soil samples. The 2 mm fraction represents total soil lead (without included chunks or larger particles that would typically not enter the ingestion and inhalation pathways). The less than 250 μm fraction represents the lead fraction most likely to be deposited on hands and other exposed body parts during direct contact followed by incidental ingestion.

The lead results shown in Table M-13 indicate that higher lead concentrations were reported in the 0-1 ft bgs interval and UCLs decreased when the 0-3 ft bgs interval was considered. In the 0-3 ft bgs interval, lead UCLs did not exceed the SLV of 800 mg/kg for any of the size fractions. In the 0-1 ft bgs interval, the lead UCL was close to the SLV for the 2 mm and the 250 um fraction (C/SLV ratios of 0.96 and 1.15, respectively). The unsieved total lead UCL was higher than the SLV and resulted in a C/SLV ratio of 4.08.

Because the C/SLV ratio for the most bioavailable lead fraction exceeded 1.0, lead is recommended for additional and more rigorous evaluation for this AOPC (Table M-20).

Carcinogenic COPCs – The cumulative ELCR was 2.2E-05, which falls within the risk management range. The COPCs with the greatest contribution to cumulative ELCR (i.e., highest single chemical C/SLV ratios) were PCE, and three cPAHs (benzo(a)pyrene, benzofluoranthenes, and dibenz(a,h)anthracene). cPAH COPCs were associated with an ELCR of 9.7-06 (Table M-13). Chromium was also included as a COPC based on the use of the SLV for hexavalent chromium. In the absence of site-specific chromium speciation data, it was conservatively assumed that all the detected chromium was the more toxic hexavalent chromium rather than the more common and much less toxic trivalent chromium. Arsenic was included as a

carcinogenic COPC but had a relatively low C/SLV of 1.8. The ratio exceeded 1.0 primarily because of a single location where it was reported at 80.9 mg/kg.

The distribution of the SLV exceedances is shown in Figure 11-9. The seven locations where total lead exceeded the SLV of 800 mg/kg (concentrations range from 921 mg/kg to 3,260 mg/kg) are primarily along the northern portion of the AOPC. Concentrations of VOCs exceeded their SLVs by more than a factor of 10 at only two locations near the current HMSA. Therefore, the areas of concern for VOCs are quite limited. Locations where PAHs exceeded their SLVs were more widespread and included the eastern edge and northwestern corner of the AOPC and two other isolated locations (HA3 to the north and DSA11 to the south). Arsenic had low level exceedances (C/SLV less than 10) at numerous locations throughout the AOPC. In addition, one station (SBB18) had a concentration (80.9 mg/kg) significantly higher than the SLV (5.4 mg/kg). Arsenic, chromium, PCE and TCE were retained as carcinogenic COPCs that are recommended for further and more rigorous evaluation.

COPCs without SLVs - SLVs were available for all the preliminary COPCs. Therefore, no COPCs were selected solely due to a lack of SLVs.

Degradation Products Of PCE – Since PCE was selected as a COPC, its degradation products (dichloroethenes, TCE, and vinyl chloride) were also included in the list of COPCs for future consideration, but it should be noted that these degradation products were detected minimally (less than 5% detection frequency) and in most cases not detected at all.

Summary

There were 11 COIs screened in as COPCs, which consist of metals, PAHs, and VOCs (Table 11-2). The COPCs contributing the most to health risk at Sandblast AOPC soil for the adult outdoor worker include lead, arsenic, chromium, benzo(a)pyrene, total benzofluoranthenes, and PCE. The locations with SLV exceedances are illustrated in Figure 11-10 and are seen to be fairly widespread in distribution.

11.2.4.2.2 On-site Construction Worker and Excavation Worker

Construction Worker

COPCs for the deeper soil depth interval are similar to the shallow soils, but fewer in number as shown in Table M-14.

Non-carcinogenic COPCs - The cumulative C/SLV ratio resulted in an HI of 0.11, which is well below the health hazard threshold of 1. No single chemical had a C/SLV ratio that exceeded 1.0 either on a single-medium or multi-media basis. Lead in the 0-1 ft bgs interval was not separately evaluated for this receptor (as it was for the Adult Outdoor Worker) due to the intrusive nature of their expected activities. Lead in the 0-10 ft bgs interval had a C/SLV ratio of less than 1.0 and was not identified as a COPC.

Carcinogenic COPCs - PCE and benzo(a)pyrene had single chemical C/SLV ratios greater than 1.0 and contribute the most to the cumulative ELCR of 7E-06, which is within the risk management range. The C/SLV ratio for PCE was on the order 2E-06. The risk levels associated with PAHs were slightly higher, up to a high of approximately 1.9E-06. All other COPCs had ratios less than 1.0 (Table M-14).

COPCs without SLVs - SLVs were available for all the COIs. Therefore, no COPCs were selected solely due to a lack of SLVs.

Degradation Products Of PCE – Since PCE was selected as a COPC, its degradation products (dichloroethenes, TCE, and vinyl chloride) were also included in the list of COPCs for future consideration, but it should be noted that these degradation products were detected minimally (less than 5% detection frequency) and in most cases not detected at all.

Summary

There were seven COIs screened in as COPCs, which consist of benzo(a)pyrene, PCE, and PCE degradation products (Table 11-2). The locations where C/SLV ratios exceeded 1.0 for PCE and benzo(a)pyrene are shown in Figure 11-11. The locations with exceedances of COPCs at levels greater than a factor of 10 are similar to those noted for the outdoor worker and are related primarily to the cPAHs.

Excavation Worker

The cumulative C/SLV ratio resulted in an HI well below the threshold of 1.0 and the cumulative ELCR was 8.1E-07, which is below the risk threshold. Likewise, there were no COPCs selected for the excavation worker (Table M-20).

Construction/Excavation Worker Exposure to Groundwater

As noted earlier, there is a possibility that construction and excavation workers may encounter shallow perched groundwater during the course of soil-intrusive activities. Preliminary COPC concentrations in groundwater were compared to DEQ's SLVs for this receptor and pathway (Table M-17).

The HI of 1.0 was primarily due to the only COPC, vanadium, which had an C/SLV ratio of 0.98. A DEQ SLV for direct contact to groundwater in a trench was not available for vanadium and, therefore, the tapwater SLV was used, which is considerably more conservative. As noted earlier, the groundwater direct contact RBC for metals are typically four to six orders of magnitude more than the tapwater RBCs and therefore vanadium should be dismissed. No non-carcinogenic or carcinogenic compounds had C/SLV ratios greater than 1.0. The cumulative ELCR was 3.6E-07 and below the threshold of 1E-06.

11.2.4.2.3 Indoor Office Worker

The maximum detected concentration of COIs in soil gas were used to identify COPCs in soil gas (Table M-16).

Non-carcinogenic COPCs - No non-carcinogenic VOCs were identified as COPCs since the cumulative C/SLV ratio was less than 1.0. No single chemical had a C/SLV ratio that exceeded 1.0 either on a single-medium or multi-media basis.

Carcinogenic COPCs - PCE and TCE were the only primary COPCs with a cumulative ELCR of 2.1E-05. PCE and TCE were the only COPCs with single chemical ratios greater than 1.0. The ratios for these chemicals were approximately 16 and 4, respectively, and correspond to risk levels of approximately 2E-05 and 4E-06. These fall within USEPA's risk management range but exceed DEQ's target risk levels for individual COPCs.

COPCs without SLVs - Soil gas SLVs were available for all detected COPCs with the exception of ethanol. Ethanol was reported in two of five samples with a maximum concentration of 13 $\mu g/m^3$ (Table I-13). Although it is volatile, ethanol is not considered to be a toxic VOC (USEPA 2002c). Therefore, ethanol was not retained as a COPC.

Degradation Products Of PCE – Since PCE was selected as a COPC, its degradation products (dichloroethenes, TCE, and vinyl chloride) were also included in the list of COPCs for future consideration. cis- and trans-1,2-DCE were detected well below their soil gas SLV. Vinyl chloride and 1,1-dichloroethene were not detected in soil gas. The degradation products for the soil gas medium is pertinent because once they are released into soil gas, the exposure potential for human receptors through the inhalation pathway is higher than if they were in soil or groundwater media.

Summary

There were six volatile COIs screened in as COPCs (M-20). The COPCs contributing the most to health risk at the Sandblast AOPC soil gas for the vapor intrusion pathway for the indoor worker include PCE and TCE. The locations with exceedances of the SLVs are shown in Figure 11-12. SB-12 had a C/SLV ratio of greater than 10 for PCE. SB-10 had a ratio less than 10. Although the locations of PCE and TCE exceedance in soil gas are not co-located with the exceedances for soil (see Figure 11-10), as discussed in Section 9.3.3, they are located within the footprint of the PCE groundwater plume and downgradient from the inferred PCE source area (storage tank historically stored at the location of the current HMSA). The exceedances of the soil gas SLVs are quite localized and limited to just 2 of the 5 sample locations neither of which is close to any occupied structures. The two locations with the exceedances are near the HMSA and the former sandblast building.

11.2.4.2.4 Groundwater - Potable Water User

COPCs in groundwater data from the monitoring wells were identified for the potable use exposure pathway and include metals, PAHs, VOCs and TPH (Table M-18).

Non-carcinogenic COPCs - Vanadium, several VOCs, DRO and GRO were identified as COPCs as contributors to the cumulative HI of 3.2, which exceeds the health hazard threshold of 1.0 (Table M-18). cis-1,2-DCE (detected in 15 of 20 samples) was the most significant exceedance with a C/SLV ratio of 1.8, all other non-carcinogenic COPCs had C/SLV ratios <1, but several exceeded 0.1, which is the threshold when cumulative HI is greater than 1.

Carcinogenic COPCs - Arsenic, PAHs (direct push), and some chlorinated VOCs were selected as COPCs with a cumulative ELCR of 2.6E-04, which exceeds the risk management range. No SVOCs were identified as COPCs. The COPCs with the highest single chemical C/SLV ratios were arsenic, PCE, TCE and vinyl chloride. However, arsenic in groundwater at the Sandblast Area AOPC was reported at a maximum of 0.0136 mg/L and while this concentration is higher than the Reference Area (0.001 mg/L) (Table I-6), the C/SLV ratio is elevated primarily because of the extremely low SLV (0.000038 mg/L).

COPCs without SLVs – SLVs were available for all preliminary COPCs.

Degradation Products Of PCE – Since PCE was selected as a COPC, its degradation products (dichloroethenes) were also included in the list of COPCs for future consideration, but it should be noted that these degradation products were detected below SLVs.

Summary

There were 13 COIs screened in as COPCs, which consist of metals, PAHs, TPH, and VOCs (Table 11-2). The COPCs contributing the most to health risk at the Sandblast AOPC groundwater for the potable water user include vanadium, arsenic, cis-1,2-DCE, 1,1-DCA, PCE,

TCE and vinyl chloride. The locations where potable water SLVs were exceeded are shown in Figure 11-13. All of the five monitoring well locations had COPC concentrations with exceeding the SLVs by a factor of 10 or more. Arsenic SLVs were exceeded at all locations and the SLVs for VOCs (primarily PCE and TCE) were exceeded at four of the five locations.

11.2.4.2.5 Groundwater - Discharge to Surface Water and Bioaccumulation

Table M-19 provides the results of the comparison of COI data in groundwater against SLVs for the discharge and bioaccumulation pathway. Selected COPCs include metals, PAHs, and VOCs.

The groundwater data were evaluated in relation to the surface water and tissue data for the River OU to assess the potential for release of bioaccumulative COPCs. Results of this pathway screen should be considered along with the River OU results which incorporate tissue data and a broader dataset. Of the metal COPCs, vanadium was selected due to the lack of a bioaccumulation SLV and its bioaccumulation potential has not been evaluated. Concentrations of arsenic in the groundwater were only marginally higher than upgradient arsenic concentrations. It should be noted that the less reliable direct push groundwater data (due to the lack of monitoring well data for PAHs) was used for evaluating the PAHs, which adds to the uncertainty of the relatively low C/SLV ratios for benzo(a)pyrene and indeno(1,2,3-cd)pyrene and the multi-media exposure exceedance of dibenz(a,h)anthracene. Both PCE and vinyl chloride had significant C/SLV ratios of 3.9 and 44, respectively, but VOCs are typically not expected to persist in the water and bioaccumulate. Except for arsenic, the bioaccumulation potential for the COPCs identified was considered to be low since they were not supported by evidence of bioaccumulation in the River OU (Section 11.3.4).

Figure 11-14 shows the locations where the SLVs were exceeded for arsenic. All locations exceeded the bioaccumulation SLV for arsenic by more than a factor of 10. However, the potential for bioaccumulation is best evaluated by review of the River OU data.

11.2.4.3 Pistol Range AOPC

The media sampled at the Pistol Range include soil and groundwater collected by means of direct push sampling and sediment. Based on site history and prior site investigations, the COIs for this AOPC included copper (groundwater and sediment), lead, nickel and zinc in all media.

11.2.4.3.1 On-site Adult Outdoor Worker (0-1.5 ft bgs)

Soil data for the Pistol range were collected from the 0-1.5 ft bgs depth interval, as discussed in Section 5.2.3 and 6.1.3. Table M-21 provides the comparison of soil data for COIs to the SLVs for the Adult Outdoor Worker. For the screening of the Pistol Range AOPC for exposure to soil, the Adult Outdoor Worker is considered protective of both the Construction worker and Excavation worker receptors. The list of COPCs is summarized in Table M-26.

Non-Carcinogenic COPCs - No individual chemical exceeded the corresponding SLV. The cumulative non-carcinogenic C/SLV ratio was also less than 1.0.

The on-site exposure pathways appear to be of low significance for soils and groundwater at the Pistol Range. For on-site receptors, only one COPC, lead, was identified for soil and groundwater at the Pistol Range. The 95% UCL for lead in soil was 365 mg/kg and was lower than the selected SLV of 800 mg/kg (Table M-21). Similarly, the maximum detected concentration of total lead in grab groundwater samples was 0.0125 mg/L which is below the potable use SLV of 0.015 mg/L (Table M-23). The cumulative multi-media C/SLV (1.29) value

was marginally greater than 1.0 (Table M-21). It is highly unlikely that unfiltered groundwater from the area of the Pistol Range AOPC would be used for potable water use. Therefore, no additional consideration of lead is warranted in soil and groundwater for the Pistol Range AOPC and it recommended for no further evaluation.

Carcinogenic COPCs - No carcinogenic COPCs were identified. The cumulative ELCR was 4.2E-09 and is associated with the low concentrations of nickel in soil (Table M-21).

Summary

The only two locations at which the SLV for lead is exceeded are PFR48 and PFR50, where lead concentrations (835 mg/kg and 1,110 mg/kg) are slightly higher than the SLV of 800 mg/kg. These locations are behind the former backstop. Given that lead is not recommended for any further evaluation, these minor exceedances are of low significance and are not a concern for human health.

Construction/Excavation Worker Exposure to Groundwater

As shown in Table M-22, none of the COIs for which SLVs were available for this receptor exceed their SLVs. HI (0.014) and ELCR (4.2E-12) were well below the health hazard and risk thresholds and no COPCs were identified (Table M-26).

Table M-22 shows lead to have a multi-media exposure C/SLV ratio slightly above 1, but lead is not considered a COPC due to low confidence in the SLV used. Lead did not have a DEQ direct contact exposure SLV (exposure to groundwater in a trench) listed and therefore a tapwater SLV was used which still resulted in a C/SLV ratio less than 1.0. If this conservative screen were to be summed with the conservative Adult Outdoor Worker soil exposure (since Construction and Excavation Workers were not screened separately), the multi-media exposure would result in a C/SLV of 1.3. It should also be noted that the DEQ groundwater direct contact SLV was not listed due to the calculated value being above the solubility limit for lead. Given these compelling reasons, lead was not selected as a COPC for this receptor and pathway.

11.2.4.3.2 Groundwater – Potable Water User

In the absence of monitoring well data for the Pistol Range AOPC, groundwater data from the direct-push measurements were reviewed (Table M-23).

Non-Carcinogenic COPCs - The only COPC retained from the direct-push groundwater data was lead. Although lead in groundwater did not exceed the SLVs for potable water use, it was retained on the basis of multi-media exposure in soil and groundwater (Table M-23). No other COPCs were identified (Table M-26).

Although lead was identified as a COPC, it is unlikely that this pathway will constitute a significant health risk since the overall multi-media C/SLV ratio is only marginally higher than 1 (1.29). Use of groundwater form this area, where a very low quantity of perched groundwater is available, is as a potable water source is extremely unlikely.

Carcinogenic COPCs – No carcinogenic COPCs were retained (Table M-26). The cumulative ELCR was 6.9E-08 which is well below the threshold risk level of 1E-06.

In summary, lead is the only possible COPC and due only to multimedia exposure which includes an unlikely scenario of groundwater for potable use. Due to the significant unlikelihood of groundwater at the Pistol Range being used as an unfiltered potable water source and the

marginal exceedance based on multi-media exposure, no further evaluation of lead for this receptor and pathway is warranted.

11.2.4.3.3 Groundwater Discharge to Surface Water and Bioaccumulation

Identification of COPCs for this pathway is shown in Table M-24. Lead screened in as a COPC due to a lack of an SLV. It should be noted lead was not identified as a COPC for the River OU media (Section 11.3.4) and is typically considered to have low potential for bioaccumulation. Therefore, this pathway is unlikely to be of concern for human health and lead was not retained as a COPC that warrants further evaluation..

11.2.4.3.4 Bioaccumulation of COIs from Pistol Range Lagoon Sediments

Off-site exposure pathways are of low significance for the Pistol Range AOPC. Although soils may wash off into the adjacent lagoon, no direct contact pathways related to lagoon sediment are complete for human receptors. Therefore, only bioaccumulation pathways may be complete whereby edible sport fish or their prey may take up COIs that may have washed off into the lagoon.

The metal concentrations in sediment samples collected from the Pistol Range Lagoon were compared to sediment SLVs (Table M-25). Lead and zinc both slightly exceeded their SLV with C/SLV ratios of 2.3 and 1.6 respectively.

Of the four COIs, only lead and zinc are considered potentially bioaccumulative but with low potential (Table J-6). Concentrations of copper and nickel in the adjacent lagoon sediments were comparable to or lower than Forebay area concentrations in sediment. Lead and zinc were slightly higher than Forebay sediments (Table 9-3). None of these COIs were detected in crayfish or smallmouth bass tissue in the Forebay at concentrations that exceed reference area tissue concentrations (Section 8). Neither lead nor zinc has been identified as a COPC in the River OU (Section 11.3.4). Zinc is an essential element that organisms are able to regulate with regard to intake. Thus, there is low potential for bioaccumulation of Pistol Range COIs into aquatic species of interest to human receptors. In the absence of direct contact exposures for sediment in the lagoon, the low bioaccumulation potential for lead and zinc and their low C/SLV ratios, lead and zinc were not do not warrant any further consideration and no further evaluation of these chemicals is warranted for sediments in the Pistol Range lagoon.

11.2.4.4 Bulb Slope AOPC

Surface soil was the only medium evaluated for this AOPC.

11.2.4.4.1 Onsite Adult Outdoor Worker

Six COIs detected in surface soil were compared to their respective SLVs (Table M-27).

Non-carcinogenic COPCs - None of the non-carcinogenic COIs exceeded their SLVs on a single or multi-media basis and the cumulative HI was less than 1.0. Therefore no non-carcinogenic COPCs were identified.

Carcinogenic COPCs - No carcinogenic COPCs were identified since the cumulative ELCR was 1.4E-07 which is below the threshold level of 1E-06. Therefore, no COPCs were identified for this receptor. (Table M-27).

No COPCs were retained for this AOPC. No further evaluation is recommended.

11.2.4.5 All Four AOPCs Combined

Soil and groundwater data from all four AOPCs were pooled to identify COPCs that are relevant to receptors who may be exposed to all the AOPCs. By combining the datasets, the values affected are the frequency of detection rate and the 95% UCL used as the EPC. The primary objective was to identify any new COPCs which were not selected in the individual AOPC screenings. Tables M-28 through M-33 show the screening process. Table M-34 provides a summary of all identified COPCs. No new COPCs (when compared to the individual AOPC COPCs) were identified when considering receptors exposed to all four AOPCs combined.

11.2.4.5.1 Adult Outdoor Worker

The COPC list for this receptor for the combined AOPCs is similar to those identified for the Landfill and Sandblast Area AOPCs.

Non-carcinogenic COPCs - The HI was estimated at 0.12. The COPC list was similar to the COPCs identified for this receptor (Table M-34) for the Landfill AOPC (Table M-12) and Sandblast Area AOPCs (Table M-20).

Carcinogenic COPCs - The cumulative ELCR was estimated at 5.0E-05 (Table M-28). No new COPCs were identified other than those already identified for the individual AOPCs. Arsenic, chromium, PCE and the cPAHs were associated with individual C/SLV ratios that exceeded 1.0 and were retained as COPCs. All other COPCs were identified on the basis of multi-media ratios (lead, TCE, and DRO) or as degradation compounds of PCE and TCE (e.g., dichloroethenes).

In summary, no additional COPCs were retained as COPCs for this receptor (when compared to the COPCs retained for the individual AOPCs).

11.2.4.5.2 Construction Worker and Excavation Worker

Identification of COPCs for these receptors is shown in Table M-29 and M-30. The summary of all initial COPCs is listed in Table M-34..

Construction Worker

Non-Carcinogenic COPCs - The estimated HI was 0.25 and therefore no COI exceeded their respective SLVs. The non-carcinogenic COPCs listed were degradation products of PCE (Table M-29).

Carcinogenic COPCs - The estimated cumulative ELCR was 7.3E-06. PCE and benzo(a)pyrene were the only COPCs with individual C/SLV ratios greater than 1.0 (Table M-29) with all others retained due to degradation products of PCE.

In summary, no new COPCs (when compared to the COPCs retained for the individual AOPCs) were identified with noncancer hazard and cancer risk both below thresholds.

Excavation Worker

Non-carcinogenic COPCs - The cumulative HI is 0.20 (Table M-30) and no COPCs were identified.

Carcinogenic COPCs - The cumulative ELCR was 6.2E-07. and no COPCs were identified.

In summary, no new COPCs were identified with noncancer hazard and cancer risk both below thresholds.

Construction and Excavation Worker Exposure to Groundwater

The identification of COPCs for this pathway is shown in Table M-31. The identified COPCs are summarized in Table M-34.

Non-carcinogenic COPCs - The HI was 3.3 and, while metals and DNOP did not exceed their SLVs on a single medium basis, their C/SLVratios were greater than 0.1 (Table M-31). The elevated HI are completely due to the lack of groundwater direct contact in a trench SLVs and the subsequent use of tapwater values.

Carcinogenic COPCs - The cumulative ELCR was 1E-06 (Table M-31). None of the COIs exceeded their SLVs.

In summary, no new COPCs (when compared to the COPCs retained for the individual AOPCs) were identified.

11.2.4.5.3 Groundwater Potable Water User

The COPC screening process for this receptor is shown on Table M-32. The identified COPCs are listed on Table M-34.

Non-carcinogenic COPCs - The cumulative HI was 11.2 (Table M-32). The primary contributors were manganese and DRO. Because the HI exceeded 1.0, several other COPCs were also identified because their C/SLV ratios were higher than 0.1, per DEQ guidance (Table M-34). However, as discussed for the landfill groundwater, use of residential SLVs to evaluate occupational potable water use is conservative, in addition to the low probability of shallow perched groundwater use as a potable water supply for the Island.

Carcinogenic COPCs - The cumulative ELCR was 2.9E-04 (Table M-32). The ELCR is primarily due to arsenic, chloroform, PCE, TCE and vinyl chloride which were all retained as COPCs.

In summary, no new COPCs (when compared to the COPCs retained for the individual AOPCs) were identified on the basis of screening groundwater data from the combined AOPCs for the potable water use pathways.

11.2.4.5.4 Groundwater Discharge to Surface Water and Bioaccumulation

The evaluation of COPCs is shown in Table M-33. The identified COPCs are summarized in Table M-34. As stated earlier, the River OU better identifies COPCs for this pathway due to the inclusion of tissue data and broader datasets.

There were no new COPCs (when compared to the COPCs retained for the individual AOPCs) from the combined AOPCs for the discharge to surface water and subsequent bioaccumulation pathway.

11.2.4.6 Uncertainty Assessment for Upland OU

Uncertainties are inherent in any risk-based approach to evaluation and decision-making for potentially contaminated sites. The uncertainties may be general and systemic as well as specific to the site. The objective of the uncertainty assessment is to identify the sources of uncertainty in the risk assessment process, understand their potential to contribute to either underestimation or overestimation of risk for the selected receptors and pathways and describe how the uncertainty is addressed. By describing the nature and magnitude of the uncertainties, the findings and

conclusions of the risk assessment can be better understood and used as a tool for decision-making .

The major potential sources of uncertainty in the problem formulation process are associated with the level of confidence in the following:

- identified receptors and exposure pathways, particularly the mass wasting and soil erosion pathway,
- the adequacy of the analytical data used for site characterization,
- SLVs selected for use
- the COPC selection process
- screening-level risk and hazard estimates.

These sources of uncertainty are discussed in detail in the Uncertainty Assessment (Appendix O). In addition, an evaluation of potentially mass wasting and erodible soils at the Landfill AOPC, Sandblast Area AOPC, and Bulb Slope AOPC is presented in Appendix O. Other factors considered include uncertainties associated with COIs eliminated on the basis of frequency of detection and with the statistical background comparison screening.

11.2.5 Conclusions of Problem Formulation - Upland OU

The COPC selection process was performed in the context of the current and reasonably likely future land uses and water uses at the four AOPCs. Of the comprehensive suite of chemical analyses that were performed for soil, groundwater and soil gas samples, the detected analytes were designated as COPCs based on the COPC selection methodology. Tables 11-1 and 11-2 list the COPCs for the AOPCs recommended for risk management at the Upland OU. No additional COPCs were retained based on the all four AOPCs combined evaluation (when compared to the COPCs retained for individual AOPCs).

The evaluation of potentially mass wasting and erodible soils at the Landfill AOPC, Sandblast Area AOPC, and Bulb Slope AOPC is presented in the uncertainty assessment (Appendix O).

11.2.5.1 Landfill AOPC

The Landfill AOPC has exposure pathways that are complete or potentially complete for soil, groundwater, seep water and shoreline surface water for both on-site and off-site receptors. No further evaluation of the Excavation Worker receptor is recommended. The Excavation Worker direct contact exposure to soil (0-10 ft bgs) had acceptable non-carcinogenic hazard and carcinogenic risk and no COPCs were identified. The Construction Worker and Excavation Worker exposure pathway through direct contact to groundwater, likewise had acceptable hazard and risk estimates and no COPCs. These two exposure pathways can be deemed insignificant on the CEM. All other receptors and pathways as shown in the CEM are recommended for further evaluation for this AOPC (see also Table 11-1).

11.2.5.2 Sandblast Area AOPC

Complete or potentially complete exposure pathways related to soil, groundwater and soil gas are noted for the Sandblast Area AOPC. Similar to the Landfill AOPC, the two exposure pathways: Excavation Worker exposure to soil and Construction Worker and Excavation Worker exposure to groundwater, can be deemed insignificant on the CEM. All other pathways and receptors as

shown in the CEM are recommended for further evaluation for the Sandblast Area AOPC (see also Table 11-2).

11.2.5.3 Pistol Range AOPC

The Pistol Range AOPC had a limited number of complete or potentially complete exposure pathways related to surface soil, groundwater, and sediment. Both on-site and off-site pathways were identified. All the receptors and exposure pathways evaluated, except sediment had acceptable non-carcinogenic hazard and carcinogenic risk. Due to the low magnitude of their exceedance and the low likelihood of exposure, lead and zinc were not recommended for any further consideration in lagoon sediment. Because of a marginal multi-media exposure exceedance dependent on the unlikely use of groundwater as a potable water source (Table M-26), lead was not recommended for further consideration in soil or groundwater.. Therefore, the COPCs in the Pistol Range AOPC are not considered to pose a threat to human health. No additional evaluation of this AOPC is warranted.

11.2.5.4 Bulb Slope AOPC

Soil was the only medium of concern identified for the Bulb Slope AOPC with a limited number of potentially complete pathways. No COPCs were identified for this area. None of the COIs exceeded their SLVs at any location and no COPCs were identified. No change in land or water use is likely for this AOPC in the future.

Given the absence of COPCs, the limited number of receptors, exposure pathways and exposure media for the Bulb Slope AOPC, this area is unlikely to pose a threat to human receptors. No additional evaluation of this AOPC is warranted.

11.3 Problem Formulation – River OU

The problem formulation for the River OU focused primarily on the Bonneville Forebay and some of the peripheral areas in the vicinity of the Forebay.

11.3.1 Exposure Setting and Potentially Exposed Populations

Although this portion of the Columbia River is popular with anglers and contact water recreationists, public access to the Forebay and the immediate downstream area is limited. The nearest known fishing platform is located 0.5 mile east of the Forebay, in the Eagle Creek vicinity.

A stakeholder survey was conducted for the Bonneville Dam area (Jones and Stokes 2006). The most popular recreational activities in the area are boating and fishing. Jet-skiing, kayaking, and canoeing were also mentioned as preferred activities by respondents in the survey.

Swimming and wading were not identified as popular activities within the River OU. Anglers are known to wade while fishing near the mouth of Eagle Creek, which is within the backwater area of the dam, and so could have received sediments by current transport. It is also possible that anglers may boat across to Goose Island and fish from the shoreline of the island. Therefore, exposure by direct contact to COPCs in surface water of the Forebay may occur.

Fishing and Fish Consumption Preferences

Since fish consumption is the pathway of greatest interest for the River OU, additional information regarding this pathway is provided in this section. As described in the RI/FS MP

(URS 2007a), several sources of information were consulted to identify suitable fish species for evaluation of the fish ingestion pathway. This identification is important because fish species vary widely in their COPC concentrations as well as in their appeal for human consumption. Factors that may affect the concentrations of COPCs in fish tissue with respect to site-related contamination include resident/anadromous status, home range, trophic level, and lipid content. Surveys of anglers have also shown that different angler groups have different preferences for the species consumed. Abundant resident fish species with small home ranges and high site fidelity are more likely to be exposed to COPCs than anadromous and wide-ranging fish species. Therefore, the data collection and HHRA focused on evaluating risks from consumption of resident fish. The conservative assumptions associated with the resident fish consumption scenario are expected to be sufficient to address risks related to consumption of nonresident fish species as well.

To select the fish species of interest that may have a high degree of exposure to COPCs while at the same time being an edible species of interest to fish consumers, available sources of literature and surveys were consulted. Regional or site-specific studies are preferred since they are expected to be more relevant. For the tribal subsistence fisher, the CRITFC consumption study (CRITFC 1994) provided information on the fish species that are popular with tribal anglers and their consumption rates. The HHRA work plan for Portland Harbor (Lower Willamette Group [LWG] 2004; Agency for Toxic Substance and Disease Registry [ATSDR] 2006) also provided limited information on tribal fish consumption preferences. A recent survey of 43 stakeholders for the Bonneville area was also useful (Jones and Stokes 2006). According to the Bonneville stakeholder survey, the fish species popular with tribal respondents are salmon and sturgeon, while nontribal respondents consumed smallmouth bass and shad. Many, but not all, of the respondents consumed all of the fish caught. Respondents generally fished from a minimum of two to three locations. None of the respondents referred to consumption of shellfish or crayfish from the area.

The Bonneville area is considered to be relatively poor in habitat quality for the popular resident sportfish, due to its high steep banks and lack of vegetated areas and weedbeds (ODFW, personal communication, 2007). It is also unattractive to the general public due to its lack of access, winds and currents (Oregon Bass and Panfish Club 2006). The most popular fishing in this area is for salmon on the Oregon side and sturgeon on the Washington side (ODFW, personal communication, 2007).

Among the species listed, the smallmouth bass is a resident species that is known to occur in the Forebay. It has a small home range and high fidelity to its range and, therefore, has the potential to spend its entire lifetime in the Forebay. It is a trophic level 3/4 species feeding on smaller fish such as sculpin, peamouth, and juvenile fish, as well as crayfish and insect larvae. All these characteristics make it likely that the smallmouth bass is a fish species that may represent maximal exposure to COPCs. It is also extremely popular with sport fishers, nontribal high consumption anglers, and also, to some extent, tribal anglers.

For these reasons, the smallmouth bass was selected as the finfish species that will be used to estimate exposure doses for the fish consumption scenario for all receptors.

At the request of DEQ, an additional fish species (large-scale sucker) is also evaluated but with a higher degree of uncertainty. The large-scale sucker is a fish species belonging to the foraging guild (trophic level 2/3) rather than the carnivorous guild represented by the smallmouth bass. Its

diet consists of phytoplankton and zooplankton, clams, insect larvae, crayfish and oligochaetes. Its home range may be from 0.5 to 10 miles. As discussed in Section 6.2.1, in June and August 2006, the USACE used one sucker composite sample from the Forebay (URS 2008c). The sucker sample is the composite of the five specimens collected from two locations, the south shore of Cascade Island and the south shore of Bradford Island, by the USACE in 2006. The specimens were composited to generate enough tissue mass for analytical testing. The analytical results of the composite sample are included in Table 6-6 and are considered qualitatively in the risk assessments, in Section O (Table O.1-1).

The usefulness of large scale sucker data to evaluate site-related contributions to fish tissue concentrations is limited and subject to a high degree of uncertainty because of its much larger home range and lower site fidelity. The use of and uncertainties associated with use of large-scale sucker tissue data in the HHRA are described in Appendix O.

Although shellfish consumption appears to be relatively minor or minimal, relative to finfish consumption, crayfish were selected as the shellfish species to represent this dietary item. Crayfish are known to occur in the Forebay. They have a large home range and may be exposed to COPCs from sources other than the Forebay. However, they are included in this evaluation to provide a comprehensive estimate of the potential exposure pathways. Consumption of crayfish will be evaluated separately from the consumption of finfish due to the uncertainties involved in whether this pathway is even likely to be complete at the site as well as the home range of the crayfish themselves.

11.3.1.1 Exposure Scenarios

The following human receptors and associated exposure pathways are considered to be potentially exposed to COPCs in the Forebay:

- Adult and child Native American fish harvesters that fish above Bonneville Dam (near the Forebay), who consume potentially contaminated shellfish and finfish at a subsistence level
- Adult and child recreationists who may fish near Eagle Creek who may be exposed to COIs by direct contact with sediments there, and may also consume potentially contaminated shellfish and finfish
- Hypothetical adult or child resident downstream from the dam who could use the Columbia River as a water supply, or whose wells could be recharged from the river

11.3.1.2 Exposure Areas

For the purpose of the problem formulation, exposure areas for the Upland OU (see Section 11.2) and the River OU are defined on the basis of probable exposure by the identified receptors and the nature of the site data. The River OU consists of the Bonneville Forebay, including randomly collected data for the entire Forebay and data collected from targeted areas within the Forebay. Exposure areas are defined for the River OU based on receptor and type of activity, as follows:

Forebay (Random Forebay Samples)

Adult and child Native American fish harvesters and recreational fishers are assumed to consume fish and shellfish that may be exposed to COPCs from the Forebay. Therefore, the Forebay

(excluding Eagle Creek and Goose Island targeted areas) comprises an exposure area for fish and shellfish consumption (as represented by the bass and crayfish random samples). Direct contact with surface water may also occur over the entire Forebay since the fishers most commonly fish by boat.

Mouth of Eagle Creek (Targeted Forebay Samples)

Adult and child recreational fishers fishing from the shoreline at the mouth of Eagle Creek, located along the Oregon side of the Forebay, may be exposed to sediments and surface water by direct contact, if they were to wade in the shallow areas. Therefore, sediments at the mouth of Eagle Creek comprise an exposure area solely for direct contact exposures to sediments within this targeted area.

Goose Island (Targeted Forebay Samples)

The potential for human exposure to Goose Island Slough is limited, although it is accessible to the occasional boater. Edible shellfish and finfish from Goose Island Slough may be part of the bioaccumulation pathway for fishers if they also frequent the rest of the Forebay (Note: the bass collected around Goose Island are evaluated as part of the Random Forebay evaluation).

11.3.2 Conceptual Exposure Model

A CEM for river-related human health risks is presented as Figure 11-15. This CEM focuses on potential risks from contaminated sediments located in the Forebay and near the mouth of Eagle Creek. It also considers the consumption of fish contaminated by sediments and incidental ingestion of, or dermal contact with, river water and sediment. The contact with sediment potentially occurs near the mouth of Eagle Creek. The primary receptors are subsistence fishers, recreational fishers, and hypothetical consumers of unfiltered, untreated river water. As noted earlier, the milk ingestion pathway for infants, described in DEQ's recent Draft guidance, is qualitatively addressed in the Uncertainty Assessment (Appendix O).

11.3.3 Methodology for Identification of COPCs

The process of identification of COPCs for the River OU was similar to the process for the Upland OU and included evaluation of several media (water, sediment, crayfish and smallmouth bass tissue) that were relevant to human receptors. As explained earlier, clam and sculpin tissue were not evaluated for the HHRA since they are not directly consumed by subsistence or recreational fishers.

11.3.3.1 Identification of Contaminants of Interest

The COIs for the River OU include metals, SVOCs, and PCBs and are identified on the basis of chemicals detected in the current datasets that were used to represent the River OU. As previously discussed in Section 11.2.3.1, the COIs are then evaluated further on the basis of three criteria: detection frequency, comparison with reference concentrations (inorganics only), and comparison with risk-based screening levels. The first two steps of the COPC selection process were performed in Section 9.1 (Tables 9-8 through 9-10).

The concentrations of the chemicals retained following the first two steps of the COPC selection process are then compared with risk-based screening levels. The chemicals that fail the HHRA screening process are designated as COPCs and are carried through the risk assessment process. The screening process and the development of the list of COPCs is a critical element of the

Problem Formulation phase of the HHRA. The results of each step of the screening process are described in this section.

11.3.3.2 Detection Frequency

In the first step, COIs that are infrequently detected (less than 5% of samples) may be artifacts in the data due to sampling, analytical, or other errors and need not be selected as COPCs (DEQ 2000, 2010b). However, because none of the River OU media had at least 20 samples, no COIs were removed from COPC evaluation based on detection frequency.

11.3.3.3 Comparison with Reference Area

Similar to the Upland OU, the second step in the COPC screening process involves a statistical (population-to-population) comparison of two independent data sets for each medium was performed between the Reference Area sediment and tissues (crayfish and smallmouth bass) and the random Forebay sediment and tissues, including the 2006 smallmouth bass tissue. Large-scale sucker data were not evaluated with statistical or other quantitative comparisons since only one composite sample is available. As discussed in Section 6.2.1, in June and August 2006, the USACE used one sucker composite sample from the Forebay (URS 2008c). The sucker sample is the composite of the five specimens from two locations that were collected by USACE in 2006. The specimens were composited in order to generate enough tissue mass for analytical testing. The analytical results of the composite sample are included in Table 6-6 and were considered qualitatively in the risk assessment.

The objective of the statistical analysis was to assess whether the mean inorganic COI concentrations in the random Forebay sediment and tissue samples were significantly higher than the mean Reference Area sediment and tissue concentrations. The methodology for this statistical comparison is presented in the Upland OU DSR (URS 2009e). The results of this statistical comparison are presented in detail in Section 8 (Tables 8-3 and 8-4) and Appendix L. The comparison was also performed for organic COIs although it was not used as a factor in selection of COPCs.

For the targeted Forebay sampling locations at Goose Island and Eagle Creek, which do not have enough samples to perform a statistical (population-to-population) comparison, the maximum detected inorganic concentrations in sediment and tissue (clam and crayfish) were compared to the inorganic concentrations in the Reference Area. The results of this comparison are presented in detail in Section 8 and Table L-7 in Appendix L.

The inorganic COIs in sediment and tissue at the Forebay (random and targeted) that were found to not be elevated above the Reference Area were eliminated as COPCs (Section 9.1, Table 9-8 through Table 9-10) . This comparison recognizes that naturally occurring chemicals generally do not need to be addressed in a remedial context if there is no site-related contribution.

11.3.3.4 Concentration-Risk Screen

In the third COPC screening step, the concentration as well as the potential toxicity of the COIs is taken into account by comparing COI concentrations to risk-based screening concentrations that are specific to the media, receptors and pathways that are relevant to the site..

11.3.3.4.1 Selection of Screening Level Values

The human health SLVs used for the River OU evaluation are described in Section 7.3 and listed in Appendix J. The target risk levels and target HQs are similar to the Upland OU SLVs and

correspond to an ELCR of 1 E-06 and non-cancer HQ of 1.0. SLVs were identified for the following media: sediment, surface water, shellfish tissue (crayfish) and finfish tissue (smallmouth bass). The receptors associated with these media included subsistence and recreational fishers and fish consumers and users of river water as a source of potable water.

Some exceptions of note include:

No sediment bioaccumulation SLVs were available for cPAHs in DEQ due to the low frequency and magnitude of their detections in fish in Oregon waters (2010b). The lower of the SLVs (pyrene) for the 2 non-carcinogenic PAHs (fluoranthene and pyrene) was used to evaluate cPAHs in sediment, with the recognition that this may not be sufficiently protective of the cancer endpoint. This issue is further addressed in the uncertainties discussion (Appendix O).

SLVs for PCBs were based on both Total PCBs (as Aroclors and Sum of 209 congeners), TEQ, and the SLVs for the individual dioxin-like congeners.

11.3.3.4.2 Application of Screening Level Values

The concentration-risk screen approach for the River OU was generally similar for the River OU and the Upland AOPCs. It included the two-step process of screening a COI on the basis of exposure to single chemicals, multiple chemicals, and multiple media. However, there were some differences among media and pathways.

Exposure to Individual COIs – Carcinogens and Non-carcinogens

Single COIs that exceeded the appropriate SLVs (i.e., C/SLV > 1.0) were retained as COPCs if they met the conditions described below.

Direct Contact Pathways

Surface Water COIs in surface water for the Forebay were retained as COPCs if the C/SLV exceeded 1.0 using SLVs applicable to potable water use (e.g., drinking WQC, tap water RSLs).

Sediment There are no SLVs based upon protection of direct contact exposures to sediments. Therefore the C/SLV ratio could not be estimated. All COIs in Eagle Creek sediments were retained as COPCs for the direct contact pathway for waders, with the exception of inorganic COIs that were observed at concentrations similar to or lower than Reference Area sediments.

Bioaccumulation Pathways

Tissue COIs in crayfish and smallmouth bass from the Forebay were evaluated by comparison to SLVs for tissue consumption. Inorganics typically had detected frequencies of 100% in tissue and were retained if they exceeded reference tissue values.

Surface Water COIs in water media were first evaluated by comparison to available federal or state WQC for the consumption of organisms or organism + water and subsequently by their bioaccumulation potential. Bioaccumulative COIs without organism-based WQC were reviewed further. Non-bioaccumulative COIs without SLVs were eliminated.

Sediment Only tissue COPCs evaluated in sediment were compared to sediment bioaccumulation SLVs. Inorganics were also compared to reference sediment values. To be conservative and comprehensive, COIs that did not exceed sediment SLVs were retained as COPCs if they were already selected as tissue COPCs.

For all the single COI pathways, each form of PCB results (individual Aroclors, Total PCBs as Aroclors, Total PCBs as Sum of 209 congeners, PCBs as TEQ, and individual dioxin-like congener) was compared to an appropriate SLV.

Exposure to Multiple COIs in a Single Medium

COIs that did not exceed their individual SLVs but whose C/SLV ratios exceeded 0.1 were retained as COPCs if the sum of the individual ratios in surface water, tissue or sediment exceed 1.0, with some exceptions. The ratios were separated into the sum of the non-carcinogenic C/SLV ratios and sum of the carcinogenic C/SLV ratios. To avoid double-counting the ratios of PCBs which were reported in multiple forms, only the ratios associated with the 12 dioxin-like congeners were included in the Sum carcinogenic C/SLV value (cumulative ELCR).

Multimedia Exposure to a Single COI

The multiple media in the River OU include sediment, water, and tissue. Multimedia exposure scenarios include anglers who may wade in the sediments near Eagle Creek while consuming crayfish and smallmouth bass from the Forebay at subsistence levels of consumption and also using untreated river water as a potable water supply source.

COPCs without SLVs - COPCs without SLVs were evaluated further with respect to spatial trends and frequency of occurrence.

COPCs - The list of COPCs for each medium was further evaluated based on the process outlined above. The COPCs were then reviewed with regard to the basis of the designation, magnitude of their exceedances above SLVs, spatial distribution, and the relevant receptors and exposure pathways. Note that all tissues are evaluated on a whole body, wet weight basis.

11.3.4 Screening Level Risk Characterization

This section describes the results of the COPC identification and screening-level risk results for the River OU.

11.3.4.1 Forebay

The media evaluated for the Forebay included sediment, surface water, crayfish tissue and smallmouth bass tissue.

11.3.4.1.1 Subsistence Fishers

The media that may contribute to risk to the subsistence fisher include crayfish tissue and smallmouth bass tissue, which would be consumed directly. The tissue data were the primary line of evidence to select COPCs for the finfish and shellfish consumption pathway. The sediment data were evaluated to select bioaccumulative COPCs that might be taken up by shellfish and finfish.

Identification of COPCs for this receptor is presented in Tables M-35 for the tissue data and Table M-36 for the sediment data. Table M-46 presents a summary of the identified COPCs by medium.

Crayfish Tissue

For subsistence fishers, after the elimination of COIs based on comparison to Reference Area tissue (inorganics only) and concentration-risk screen ratios, the selected COPCs for crayfish

tissue included only carcinogenic COPCs (Table M-35). These COPCs may warrant further evaluation in shellfish consumption pathways for subsistence-level fish consumers.

Non-carcinogenic COPCs – No non-carcinogenic COPC was identified either on a single-medium or multi-media basis. The cumulative HI was 0.67 (Table M-35). Therefore, non-carcinogens are not of concern.

Carcinogenic COPCs – The cumulative ELCR was 7.5E-04, primarily due to arsenic and PCBs (Table M-35). The ELCR reported for crayfish consumption should be interpreted with caution. Crayfish may live to 5 or 6 years and often may live as long as 10 years (URS 2007a). Therefore, although the Forebay Random crayfish were collected after the sediment removal action, they are very likely to have had exposure to pre-removal concentrations of Forebay COPCs for several years prior to their sample collection. Thus this ELCR does not represent current Forebay exposures for crayfish.

As shown on Figure 11-16, exceedances of the PCB and arsenic SLVs occurred in almost all the crayfish samples. These COPCs are discussed further below.

Arsenic

Arsenic was retained as a COPC because it was higher than in the Reference Area crayfish (Table 8-3). However, this is more a measure of the precision of the data and the sensitivity of the comparison than actual differences. Although arsenic had a relatively high C/SLV ratio (683, the 95% UCL for arsenic in Forebay crayfish tissue (0.519 mg/kg; Table M-35) was actually slightly lower than the Reference Area 95% UPL of 0.535 mg/kg (Table I-20). The range also is very similar with the Forebay random crayfish concentrations ranging from 0.380 to 0.680 mg/kg (Table I-8) and the Reference crayfish ranging from 0.275 to 0.636 mg/kg (Table I-11). The mean concentration in Forebay crayfish was 0.479 mg/kg compared to 0.383 mg/kg for the Reference area (Tables I-18 and I-20). Therefore, the potential for contributions from the Forebay to arsenic in crayfish tissues is low.

The SLV for arsenic is based on the assumption that all of the arsenic is inorganic which is the most toxic form of arsenic for humans. In reality, the majority of the arsenic in fish and shellfish tissue is likely to undergo methylation into the less toxic organic form. Although estimates of inorganic arsenic as a fraction of total arsenic that are specific to freshwater crustaceans and mollusks are not available, recent reviews have estimated that inorganic arsenic may typically constitute less than 10% of total arsenic in freshwater finfish, but may range up to 30% in contaminated sites (Lorenzana et al 2009). These and other authors do not make a distinction between finfish and shellfish regarding the speciation of arsenic and they are presumed to be similar (Schoof et al 2007). Estimates of the organic portion of the arsenic body burden of shellfish tissues in the Columbia River range from 0.1 to 27% (TetraTech 1996). Using an estimate of 10 to 25% of total arsenic as inorganic arsenic would result in C/SLV values of 68 to 170 for the subsistence fisher.

The fish ingestion rates used in the development of the acceptable tissue levels (ATLs) for subsistence fishers (142 g/day) are higher than the assumed rates for recreational fishers (17.5 g/day). In the approved RI/FS MP (URS 2007a), it was noted that consumption of shellfish from the Bonneville Forebay was not known to occur, particularly for subsistence fishers, and evaluation of subsistence-level consumption of shellfish is not proposed for further evaluation.

The highest concentrations of arsenic in crayfish tissue were noted in two samples in the vicinity of the south shore of Cascades Island and north shore of Bradford Island (Figure 11-16). The highest concentration 0.680 mg/kg from location P2-CF (Table 6-10) was only marginally higher than the Reference Area 95% UPL of 0.535 mg/kg (Table I-20).

Given the low potential for shellfish consumption by subsistence fishers in the Forebay, and the fact that much of the arsenic in tissue is likely to be in the less toxic form, it is concluded that the potential is low for arsenic to pose a significant risk through the shellfish consumption pathway.

PCBs

The C/SLV ratios for total PCBs and individual congeners ranged from a low of 0.018 (Congener 81) to a high of 64.0 (Total PCBs as Congeners) (Table M-35). Of the six dioxin-like congeners, congeners 118, 126 and 156+157 have the highest C/SLV ratios. Among these, the C/SLV ratio for Congener 126 is similar to the ratio for Reference crayfish and illustrates that not all congeners are uniformly elevated in the Forebay. The highest ratio corresponds to an approximate ELCR of 6.4E-05. This falls within USEPA's risk management range although it exceeds DEQ's target risk level of 1E-05 for total risk.

The SLV for total PCBs was exceeded in almost all the crayfish samples (Figure 11-16). The highest PCB concentrations were measured in crayfish samples collected from the north shore, south shore and eastern tip of Bradford Island, where the SLV was exceeded by more than an order of magnitude. Total PCBs and several dioxin-like congeners were significantly higher in Forebay Random crayfish when compared to Reference crayfish.

COPCs without SLVs All COIs had SLVs available.

Summary

In summary, arsenic and PCBs were retained as COPCs for this receptor (Table 11-3). As illustrated in Figure 11-16, exceedances of the PCB SLV were evident in most of the crayfish samples.

Smallmouth Bass Tissue

Using a process similar to that used for crayfish, the COPCs identified for smallmouth bass tissue included barium, mercury, PCBs (Aroclor 1242, Aroclor 1254, Total PCBs and all dioxin-like congeners), B2EHP, and five cPAHs (Table M-35) and are summarized in Table M-46. The COPCs are summarized in Table 11-3.

Non-carcinogenic COPCs - Barium screened in as a COPC based on cumulative exposure, but individually, its C/SLV ratio of 0.44 was less than 1.0 and it is unlikely to contribute significantly to non-cancer hazard. Mercury was the only non-carcinogenic COPC retained based on its individual C/SLV ratio of 6.47 (Table M-35). It was detected in all Forebay bass samples and exceeded Reference Area concentrations (Table 8-3). It may be reliably assumed that almost all the mercury detected in bass tissue is likely to be present in its more toxic form as methyl mercury. Smallmouth bass are known to be consumed by subsistence and recreational fishers.

The Forebay UCL for mercury was 0.317 mg/kg (Table I-18), in comparison to the Reference Area 95% UPL of 0.268 mg/kg (Table I-20). The range of mercury concentrations in Forebay smallmouth bass was 0.0710 mg/kg to 0.512 mg/kg (Table I-8) while the range in Reference bass was 0.0548 mg/kg to 0.333 mg/kg (Table I-11). The two highest concentrations were found in a sample collected near the eastern tip of Bradford Island (18) and a sample collected in the

vicinity of Goose Island (13) (Figure 11-16). Mercury concentrations in sediment are not significantly different between the Forebay and Reference areas (Table 8-3).

Finally, the C/SLV ratio for the Reference area smallmouth bass for mercury, based on the UPL, is 5.47 compared to the Forebay C/SLV of 6.47, i.e., there is an incremental increase of a HQ unit of 1.0 between the Forebay bass and Reference area bass. This small difference may be due to variability in the data or may represent mercury from non-site-related sources since the mercury concentrations in sediments are similar.

Carcinogenic COPCs - As shown in Figure 11-16, exceedances of one or more COPCs were noted in all bass samples. B2EHP, PCBs, and some cPAHs are retained as COPCs and discussed further below (Table M-46). The cumulative ELCR was 3.4E-02, however, this value is highly uncertain and misleading due to the uncertainties in the PCB data for smallmouth bass, the major uncertainty being that the bass were collected prior to the interim removal action of 2008 and their tissue concentrations probably reflect uptake from an earlier period when PCB concentrations in the Forebay were higher. Therefore, this ELCR does not represent current conditions in the Forebay smallmouth bass to an even greater degree than the crayfish tissue data. This is discussed in more detail in Appendix O.

A wide variation in PCB concentrations (as Aroclors, total PCBs and as individual congeners) were observed in the smallmouth bass. Total PCBs as well as all the individual dioxin-like congeners are associated with elevated C/SLV ratios for all smallmouth bass samples. However, the magnitude of exceedances ranged over five orders of magnitude. Additional evaluation, monitoring or risk management of PCBs as COPCs for smallmouth bass tissue is warranted (Table 11-3).

B2EHP and five cPAHs were identified as COPCs because the single chemical C/SLV ratios exceed 1.0 (Table M-35). The magnitude of exceedance was relatively small and was generally less than a factor of 4. Consistent with DEQ guidance, all the cPAHs are retained as COPCs even if individual cPAHs did not exceed their SLVs.

The UCL for B2EHP in Forebay bass was 349 µg/kg, with concentrations ranging from 89 to an outlier sample that was reported at 1600 µg/kg (Table I-8). The UPL (based on maximum) and range for the Reference area fish was 150 µg/kg (Table I-20) with a range of concentrations of 81 µg/kg to 150 µg/kg (Table I-11). The ELCR associated with B2EHP is approximately 4E-06 (Table M-35). However, B2EHP had a relatively low detection frequency in Forebay bass tissue (37%) (Table I-8a). Of the seven detections, six samples had concentrations ranging from 89 µg/kg to 190 µg/kg which are generally similar to the Reference Area 95% UPL of 150 µg/kg. The relatively low concentrations detected in fish tissue supports the position that these compounds are readily metabolized and only weakly bioaccumulate (similar to the metabolic action noted in PAHs). At other contaminated sediment sites, including the Lower Duwamish Waterway, phthalates often occur with other compounds (e.g., PCBs) that dominate risk. The phthalates are typically overshadowed by these more potent risk-drivers (Sediment Phthalate Work Group 2007).

Among the five cPAHs selected as COPCs, benzo(a)pyrene and dibenz(a,h)anthracene had the highest ratios. However, whether any of the cPAHs are likely to pose a threat to human health is uncertain. PAH levels in fish are usually low because this group rapidly metabolizes PAHs (Lawrence and Weber 1984); furthermore, higher molecular weight PAHs, which include the largest class of chemical carcinogens, do not seem to accumulate in fish (West et al. 1984). In

general, free (unmetabolized) PAHs are detected at lower concentrations in muscle than in liver, gonads, stomach, or gall bladder (bile), although liver concentrations are probably more associated with short-term exposure and muscle concentrations are probably more associated with long-term bioaccumulation (Hellou 1996). Whether the PAHs in the smallmouth bass are present in the edible portions of the fish such as muscle, or in the portions that are discarded during cooking (e.g., viscera) is unknown since the smallmouth bass data for the Forebay are based on whole-body analyses. Although the Forebay smallmouth bass had higher concentrations of cPAHs than Reference Area bass, this trend was not observed in sediments (Table 8-3). Therefore, the occurrence of higher PAH concentrations in Forebay bass cannot be definitively attributed to sources in Forebay sediments.

COPCs without SLVs - SLVs were available for all COIs.

Summary

In summary, metals, B2EHP, cPAHs, and PCBs were retained as COPCs for this receptor (Table 11-3), with PCBs posing the greatest risk.

Sediment

COIs in Forebay sediment were evaluated only for the bioaccumulation pathway since the water depths make direct contact with these sediments highly unlikely for human receptors. Only COIs detected in tissue were retained and inorganics were also compared to reference sediment values. As described earlier, all sediment COIs were retained as sediment COPCs if the same COIs in tissue exceeded tissue ATLs for either crayfish or smallmouth bass. COPCs for sediment were also identified if the C/SLV ratio exceeded 1.0. The list of COPCs is summarized in Table M-46.

Non-carcinogenic COPCs - No non-carcinogenic COPCs were retained since both single medium and multi-media ratios were less than 1.0 for all non-carcinogenic COIs (Table M-36). However, mercury was selected as a COPC, even though it is comparable to Reference Area concentrations, because it is a bioaccumulative chemical that has been retained as a tissue COPC for smallmouth bass. But any contribution from Forebay sediments to tissue mercury levels is likely to be minor.

Carcinogenic COPCs - The cumulative ELCR was 7.5E-05 (Table M-36). The COPCs identified in sediment for bioaccumulation included PCBs (Aroclor 1254, Total PCBs as Aroclors, 6 congeners, Total PCBs as Congeners and Total PCBs as mammalian TEQ) and B2EHP, = (Table M-45). The single chemical C/SLV ratios for PCBs were far lower in sediments than in smallmouth bass. This is likely due to the fact that the sediment samples were collected after the sediment removal action and are more representative of current conditions in the Forebay. In contrast, the smallmouth bass samples were collected prior to the sediment removal and represent historical conditions. The sediment C/SLV ratios ranged from 7.45 to 598 (for Total PCBs as Aroclors), corresponding an approximate ELCR range of 7E-11 to 6E-04 for subsistence fishers. However, when the more accurate estimate of PCB sums (sum of dioxin-like congeners) was used, the cumulative ELCR was 7.5 E-05. This falls within the risk management range.

Bioaccumulation SLVs are available for two non-carcinogenic PAHs, fluoranthene, and pyrene. The lower of the two, the SLV for pyrene, was used to screen all the other individual PAHs. All C/SLV ratios were several orders of magnitude lower than 1.0.

COPCs without SLVs - B2EHP, was identified as a COPC without SLVs (Table M-35). It was also reported in only three of 19 sediment samples, at concentrations of 0.3 mg/kg or less (Table I-18).

Summary

PCBs, mercury and B2EHP are the only COPCs retained for sediment (Table 11-3) with PCBs being noteworthy based on significance of exceedance. The locations of SLV exceedances for sediments are shown in Figure 11-16. All sediment samples have SLV exceedances for total PCBs, primarily because of the extremely low SLV for subsistence fishers.

11.3.4.1.2 Recreational Fisher

The recreational fisher is assumed to consume both finfish and shellfish from the Forebay, but at lower rates of consumption than the subsistence fishers. In DEQ's assumptions, the recreational fisher's fish consumption rate is about 12% of the subsistence fisher's rate. Therefore, the C/SLV ratios for this receptor are about eight-fold lower. The comparison of COPCs to SLVs is shown in Table M-37. The identified COPCs are listed in Table M-46.

Crayfish Tissue

Non-carcinogenic COPCs - No non-carcinogenic COPCs were retained since the HI was 0.08 and no multi-media ratios exceed 1.0 (Table M-37). The locations of SLV exceedances are shown on Figure 11-17. The majority of the exceedances were for arsenic with fewer locations having significant exceedances for PCBs.

Carcinogenic COPCs – The cumulative ELCR is estimated at 9.2E-05 (Table M-37). Similar to the case of the subsistence fisher and to an even greater degree, arsenic is unlikely to contribute to significant risk for the recreational fisher. Using the arsenic ATL for recreational fishers (0.0062 mg/kg) results in C/SLV ratio of 83.7. Further, assuming 10 to 25% inorganic arsenic fraction would result in C/SLV ranges from 8.3 to 21. Finally, since the Forebay average for arsenic is comparable to the Reference Area average as discussed in the evaluation of the Subsistence Fisher, and should be considered with arsenic's selection as a COPC for the recreational fisher.

The C/SLV ratios for PCBs for recreational fishers are substantially lower than for subsistence fishers and fall within a risk range between 1E-06 and 1E-05. Using the ATL for recreational fishers (0.0047 mg/kg) results in a C/SLV ratio of 7.8 (approximate ELCR of 8E-06). DEQ applies an acceptable cumulative risk level of 1E-05 to multiple congeners as well as to total PCB measurements based on sum of congeners (DEQ 2010b). Using this standard, PCBs in Forebay crayfish tissue fall within acceptable risk levels for recreational fishers according to both USEPA and DEQ guidance. Nonetheless, PCBs were retained as COPCs.

COPCs without SLVs – All COIs had SLVs available.

Summary

Arsenic and PCBs were retained as the COPCs for this receptor (Table 11-3). The spatial distribution of concentrations is illustrated in Figure 11-17.

Smallmouth Bass Tissue

Non-carcinogenic COPCs – Similar to the subsistence fisher, barium and mercury are COPCs based on their cumulative health hazard, though they individually had C/SLV ratios less than 1.0 (Table M-37).

Carcinogenic COPCs - The Smallmouth Bass COPCs for the recreational fisher included PCBs, benzo(a)pyrene and dibenz(a,h)anthracene (Table M-37). The cumulative ELCR is 4.1E-03, a misleadingly elevated value that is dominated by the ratios for PCB congeners 118 and 126. Among these, the cPAHs are unlikely to contribute significant risk to this receptor due to their low C/SLV ratios. The ratios for the two cPAHs were less than 10, indicating that the associated risk levels are less than 1E-05. The C/SLV ratios for PCBs ranged from one to four orders of magnitude higher than the SLVs. Therefore, the primary risk contributors for recreational fishers are PCBs. The locations of SLV exceedances are shown in Figure 11-17 and include most of the bass samples.

COPCs without SLVs - All COIs had SLVs available.

Summary

The COIs retained as COPCs were metals, PCBs and cPAHs (Table 11-3).

Sediment

Sediment COPCs for the bioaccumulation pathway were identified based on comparison to bioaccumulation SLVs and detection in tissue COPCs (Table M-38).

Non-carcinogenic COPCs – No non-carcinogenic COPCs were selected. The HI was below 1.0 and no multi-media ratios exceeded 1.0.

Carcinogenic COPCs – The cumulative ELCR was estimated at 9.2E-06. As was the case for the smallmouth bass, PCBs were the primary risk-driving COPCs in sediment for the recreational fisher. The highest C/SLV ratios were associated with Aroclor 1254, Total PCBs as Aroclors, Total PCBs as Congeners, congeners 118 and 126 and Total PCBs as Mammalian TEQ. The ratio for Total PCBs as Aroclors was 73.6 , and for Total PCBs as Congeners was 9.19, corresponding to screening risk levels of 7E-05 and 9E-06, respectively. These values slightly exceed the acceptable risk level when Aroclor 1254 is considered in isolation, but fall within the acceptable risk range for Total PCBs. Greater confidence is placed in the PCB data for congeners than for Aroclors.

COPCs without SLVs – All COIs had SLVs available.

Summary

COIs that were retained are PCBs (Table 11-3). As shown in Figure 11-17, the locations with PCB C/SLV ratios greater than 10 were generally along the north shore of Bradford Island, adjacent to were the sediment removal took place. PCB concentrations in the majority of the sediment sample locations along the south shore of Bradford Island and in the vicinity of Goose Island had total PCB concentrations which exceeded the SLV by a factor of less than 10.

11.3.4.1.3 Hypothetical Potable Water Use and Water-Based Bioaccumulation

Surface water data were evaluated for a hypothetical resident who may use river water for potable water use and also consume fish from the Forebay.

Overall, only a few COPCs were retained in surface water for either the potable water use or bioaccumulation pathways (Tables M-39 and M-40, respectively).

Potable Use/ Direct Contact

Non-carcinogenic COPCs – No non-carcinogenic COPCs were retained.

Carcinogenic COPCs - The evaluation of surface water COIs for the potable water use-related pathways resulted in the selection of arsenic and PCBs and a few cPAHs as COPCs (Table M-39). The cumulative ELCR was 2.7E-05 (Table M-45). The C/SLV ratios were two to three orders of magnitude below 1.0 for all chemicals except arsenic.

The levels of total PCBs and the individual congeners and cPAHs were associated with single-medium C/SLV ratios three to four orders of magnitude lower than 1.0. They were identified as COPCs only on the basis of multi-media ratios that are influenced by the bioaccumulation pathway. PCB concentrations in Forebay surface water were very similar to Reference Area ranges (Table M-40). In practice, it is unlikely that PCBs in surface water would contribute significantly to risk.

Summary

In summary, arsenic, PCBs, and cPAHs screened in as COPCs for this pathway. As shown in Figure 11-18, all the five sample locations for surface water had SLV exceedances for arsenic and PCBs.

Bioaccumulation

Comparison of surface water data to bioaccumulation SLVs is shown in Table M-40. The summary of identified COPCs is presented in Table M-45.

Non-carcinogenic COPCs – No non-carcinogenic COPCs were retained due to exceedance to SLVs since the HI was well below 1.0.

Carcinogenic COPCs – Only arsenic and PCBs were identified as COPCs for the bioaccumulation pathway for surface water (Table M-40). Arsenic was retained as a COPC because the C/SLV ratios was greater than 1.0 (56.1). PCBs were retained because total PCBs C/SLV ratio was approximately 3.3, indicating an associated screening level risk of 3E-06.

COPCs without SLVs – Aluminum and lead did not have bioaccumulation-based SLVs.

Summary

In summary, metals and PCBs were selected as COPCs for this receptor (Table 11-3).

11.3.4.1.4 Wader at Mouth of Eagle Creek

Sediments were collected from two locations at the mouth of Eagle Creek to represent the potential for direct contact pathways for waders. There are no readily available SLVs for evaluation of direct contact pathways for sediments. As a result, with the exception of inorganic COIs that were not higher than reference area sediments, all other COIs in Eagle Creek sediments were retained as COPCs for the direct contact pathway (Table M-41). These included Aroclor 1248, Total PCBs as Aroclors, carbazole, most PAHs, and DRO.

Non-carcinogenic COPCs - All non-carcinogenic metals were lower than in the Reference Area sediments (Tables L-7 and M-41). Several non-carcinogenic PAHs were detected at low

concentrations (Table M-41). Discussion of the significance of these PAHs is included with the cPAHs below.

Carcinogenic COPCs – Of the COPCs, Aroclor 1248 Total PCBs as Aroclors, carbazole and a few PAHs had concentrations that were slightly higher in Eagle Creek sediments than in Reference sediments (Table L-7). Although there are no direct contact SLVs for PAHs in sediments, it is notable that all the PAHs, both carcinogenic and non-carcinogenic, in Eagle Creek sediments were lower than the soil SLVs for occupational worker and were even lower than the residential SLVs (DEQ 2010). For example, the DEQ SLV for benzo(a)pyrene in residential soil is 15 µg/kg. This is the most potent of the cPAHs. The maximum values of all PAHs in Eagle Creek sediments ranged from 1.1 to 17.0 µg/kg (Table M-41). Since only direct contact pathways are envisaged at Eagle Creek, the use of the soil SLVs provides a reasonable substitute for the lack of sediment SLVs. Although PAHs are not expected to significantly contribute to risks for waders in the Eagle Creek sediments, they were retained as COPCs.

COPCs without SLVs - As a proxy for sediment, soil-based screening concentrations were derived for carbazole using the standardized USEPA (2010) input values for residential (24 hrs per day, 350 days per year, 6 years as a 15 kg child and 24 years as a 70 kg adult) and commercial/industrial (8 hrs per day, 250 days per year for 25 years as a 70 kg adult) exposure scenarios. For the residential scenario, the USEPA's method of childhood-only exposure (USEPA 2010) resulted in a slightly less stringent screening concentration. Exposure was assumed to occur through incidental ingestion, dermal contact, and particulate inhalation, also using standardized Department of Toxic Substances Control (DTSC) or USEPA factors for skin surface area, skin adherence factors, the particulate emission factor, and oral and dermal absorption factors (USEPA 2010). The toxicity factor was an oral slope factor $(0.02\ mg/kg\text{-}day)^{-1}$, based on liver tumors in mice fed carbazole in the diet for 96 weeks (as cited in USEPA 1997c). The screening concentrations were derived to meet a target cancer risk level of 1E-06. Based on carcinogenic effects, the screening concentration for the residential receptor is 24 mg/kg and is 67 mg/kg for the commercial/industrial receptor. The detected concentration of carbazole (2.2 µg/kg) was orders of magnitude lower than the SLV.

Summary

All COIs were retained (except for metals below reference and carbazole) as COPCs of which PCBs as Aroclors is noteworthy based on the significance of exceedance. PCBs were also identified for Eagle Creek sediments higher than in the Reference sediments (Table 11-3).

11.3.4.2 Goose Island Slough

Collection and evaluation of sediment and tissue samples from Goose Island Slough was not included in the RI/FS MP (URS 2007a) but was conducted at DEQ's request (URS 2009k). Although there are no barriers restricting public access to Goose Island Slough, direct contact with sediments in this area for human receptors is highly unlikely due to the depth of the slough and the rocky banks. The COIs detected at Goose Island were evaluated as follows:

Crayfish tissue

Metals, PCBs, and PAHs were detected in crayfish tissue. However, all the COIs were generally detected at concentrations that were lower than in crayfish tissues from the Forebay. Inorganics were generally lower than in reference area crayfish tissue (Table L-7). Therefore, only PCBs were identified as COPCs based on Goose Island crayfish tissue (Table M-42).

Smallmouth Bass Tissue

All smallmouth bass tissue samples collected in Goose Island Slough were included in the Forebay tissue data set. Therefore, no additional COPC selection for bass for Goose Island was necessary.

Sediment

Metals, PCBs, PAHs and phthalates were detected in Goose Island sediment. However, the majority of the COIs were generally detected at concentrations that were lower than in sediment from the Forebay (Table L-7). The COPC selection results for the two targeted Goose Island sediment samples are already included in lists for the subsistence and recreational fishers (Tables M-43 and M-44). Inorganics were generally lower than in reference area sediment (Table L-7). A few PCB congeners were detected at concentrations exceeding the Reference Area (Table L-7) but were not comparable to or less than Forebay concentrations. B2EHP screened in due to the lack of an SLV. Therefore, B2EHP and PCBs were identified as COPCs based on Goose Island sediment data.

Summary

In summary, PCBs were the COPCs identified in crayfish tissue and B2EHP and PCBs were the COPCs identified in sediment from Goose Island (Table 11-3), of which PCBs are noteworthy based on significance of exceedance.

11.3.4.3 Uncertainty Assessment

The major sources of uncertainty for the problem formulation process for the River OU include the level of confidence in the following:

- Occurrence and magnitude of exposure pathways and receptors, particularly for subsistence fisher and hypothetical use of river water as potable water supply
- Quality of analytical data for analytes occurring at low concentrations
- Representativeness of tissue data
- COIs without SLVs
- Screening-level risk and hazard estimates

Each of these factors is discussed in more detail in the Uncertainty Assessment (Appendix O). Other factors considered include the uncertainties associated with COIs eliminated on the basis of frequency of detection.

11.3.5 Conclusions of Problem Formulation – River OU

11.3.5.1 Forebay

The media evaluated for COPC selection for the Forebay included surface water, crayfish tissue, smallmouth bass tissue, and sediment. Clam and sculpin tissue were not considered relevant because the species are not consumed by humans. Data from the single large-scale sucker sample was not directly evaluated, but a comparison of the data to smallmouth bass data revealed that the addition of large-scale sucker data to a quantitative evaluation (in addition to smallmouth bass) is not likely to add either precision or accuracy to the risk estimates, and will not result in underestimation risk. The receptors of concern were subsistence and recreational anglers, potable

water users and waders near the mouth of Eagle Creek. The results are discussed by receptor and then media below, and the COPCs recommended for risk management are summarized in Table 11-3.

Subsistence Fisher

Carcinogenic risks to the subsistence fisher may exceed USEPA's and DEQ's acceptable risk levels in the screening level problem formulation. The risks are associated primarily with consumption of smallmouth bass tissue, and secondarily, crayfish tissue. Fish consumption risks estimated on the basis of sediment data are lower than those estimated using tissue data. The greatest uncertainty is in the use of tissue data that include exposure to pre-removal conditions.

Recreational Fisher

The exposure pathways for the recreational fisher include ingestion of fish and exposure to sediment via direct contact. PCB risks to this receptor from sediment fall within the risk management range (Table M-38). Risks to this receptor from fish and shellfish ingestion range from unacceptable to falling within the risk management range for this receptor.

Surface Water User

The exposure pathways for surface water included potable water use and bioaccumulation (i.e., consumption of fish exposed to bioaccumulative COPCs in water). The organic COPCs, PCBs and cPAHs, are expected to be negligible contributors to risk due to the lack of exceedance of their individual SLVs. Therefore, risks associated with these COPCs in surface water are likely to be at acceptable risk and hazard levels for the potable use and bioaccumulation pathways of exposure.

11.3.5.1.1 Surface Water

Only a few COPCs were retained in surface water for either the potable water use or bioaccumulation pathways (Table 11-3). PCBs and arsenic are the main surface water COPCs that may influence tissue bioaccumulation pathways.

In summary, the detected COPCs in surface water of the Forebay is not expected to pose a significant risk for the potable user and as a transport pathway for bioaccumulation to edible fish and shellfish.. This conclusion is based on the limited number of COPCs identified in Forebay surface water, the similarity to Reference Area concentrations and the lack of exceedance of the associated SLVs.

11.3.5.1.2 Tissue

Two types of edible tissue were evaluated for the human health problem formulation: crayfish and smallmouth bass. This tissue discussion focuses on the subsistence user results.

Crayfish

The COPCs retained for crayfish tissue include arsenic and PCBs (Table 11-3). The screening-level risk estimates developed on the basis of crayfish tissue are likely to overestimate risks since the crayfish are likely to have been exposed to COPCs under pre-removal conditions in the Forebay.

Smallmouth Bass

The primary COPCs for smallmouth bass are PCBs, and secondarily mercury and cPAHs (Table 11-3). The major uncertainty associated with smallmouth bass data relates to whether the data are representative of current conditions. The samples were collected prior to the removal of PCB-contaminated sediment from the Forebay. Therefore, the data represent exposures to higher PCB concentrations in sediment and prey than are present currently. Tissue concentrations in bass hatched after the sediment removal are likely to be lower and would be more reflective of current conditions. It is likely that cPAHs may be minor contributors to risk if data regarding their distribution in the edible portions of fish tissue were available.

11.3.5.1.3 Random Forebay Sediment

The COPCs for sediment in the Forebay were selected on the basis of potential for bioaccumulation into the food-web with ultimate exposures to subsistence and recreational fishers. The COPCs were selected on the basis of two major criteria: exceedance of the bioaccumulation SLVs for sediments, and selection as tissue COPCs for either crayfish or smallmouth bass. COPCs for sediment include only PCBs (Table 11-3). B2EHP was also identified as a COPC due to the lack of a sediment bioaccumulation SLV.

11.3.5.2 Mouth of Eagle Creek

Only organic compounds were selected as COPCs for Eagle Creek sediments (Table 11-3). With the exception of Aroclor 1248, concentrations of all other COPCs such as carbazole, PAHs, and DRO were lower than or only marginally higher than concentrations in Reference Area sediments. Therefore, risks related to direct contact with sediments for waders are unlikely to be contributed from the Forebay, and are likely to be relatively low, for all the COPCs except Aroclor 1248.

11.3.5.3 Goose Island Slough

No unique COPCs were selected for Goose Island Slough (Table 11-3). All COPCs with bioaccumulation potential that were selected for Goose Island sediments were already included among the Forebay sediment COPCs. No other COPCs were selected for sediment since direct contact with sediments is not likely. All COPCs identified for crayfish tissue from Goose Island Slough were already included as COPCs for crayfish tissue for the rest of the Forebay. All smallmouth bass collected from this area were included in the 95% UCL calculations for with the Forebay bass samples.

In summary, COPCs that are unique to Goose Island Slough were not identified.

11.4 Recommendations

Following the completion of the problem formulation, the recommendations for each AOPC and OU are presented in this section.

11.4.1 Upland OU

The Upland OU COPCs recommended for Risk Management are summarized in Tables 11-1 and 11-2.

Landfill AOPC

One of two options is recommended for the Landfill AOPC.

1. Perform a Baseline HHRA since no medium could be eliminated during the problem formulation. All the receptors except Excavation Worker are also retained.

2. Evaluate targeted removal or response actions to achieve acceptable residual concentrations of COPCs. Areas for such consideration include the Gully Test Pit and the Mercury Vapor Lamp Test Pit.

Sandblast Area AOPC

One of two options is recommended for the Sandblast Area AOPC.

1. Perform a Baseline HHRA since no medium could be eliminated during the problem formulation. All the receptors except Excavation Worker are also retained.

2. Evaluate targeted removal or response action for soil, groundwater, and soil gas to achieve acceptable residual concentrations of COPCs.

Pistol Range AOPC

Due to the lack of COPCs for the exposure pathways identified in the CEM, the Pistol Range AOPC is not considered to pose a threat to human health. No additional evaluation of this AOPC is warranted and a baseline human health risk assessment (BHHRA) is not necessary.

Bulb Slope AOPC

Given the absence of COPCs, the limited number of receptors, exposure pathways and exposure media for the Bulb Slope AOPC, this area is not considered to pose a threat to human receptors. No additional evaluation is warranted and a BHHRA is not necessary.

11.4.2 River OU

The River OU COPCs recommended for Risk Management are summarized in Table 11-3.

Forebay Area

Further evaluation is recommended for the Forebay, which may include the monitoring of PCB concentrations in Forebay tissue.

Mouth of Eagle Creek

Similar to the Forebay, further risk evaluation is recommended for sediments at the mouth of Eagle Creek, which may include the monitoring of PCB concentrations in Forebay tissue.

Goose Island Slough

No further evaluation of Goose Island media is necessary for the HHRA process because all COPCs identified for Goose Island were already identified for the Forebay.

12.0 ECOLOGICAL RISK ASSESSMENT

This section presents the methodology and findings of the Level I/Level II ERA that was performed for the Upland and River OUs (Figure 1-3) in support of the RI. The ERA process is similar for the River and Upland OUs, as described in the RI/FS MP (URS 2007a).

The overall purpose of the ERAs for the Upland and River OUs is to determine whether site-related chemicals are present at concentrations that could have adverse effects on the environment and to guide future decision-making for risk management, if warranted. Due to the very different site conditions and habitat types found within these two OUs, the ERAs also answer questions specific to each OU that will assist with risk management decisions. For example, in the River OU, PCBs in sediments and tissues have been the main focus of site characterization and investigation efforts over the last several years. Although other site-related chemicals are likely present within the Forebay area of the River OU and will be evaluated, the exposure scenarios associated with this aquatic environment create an emphasis on the importance of assessing bioaccumulation and ingestion pathways. In contrast, based on historical operations in the Upland OU and associated exposure pathways, bioaccumulation is also important, but not due to the presence of PCBs (other bioaccumulative COIs are present). In addition, the potential for transport of Upland media (soil and groundwater) to the River OU was an important evaluation conducted in the ERA for the Upland OU.

The primary objectives for the ERAs for the Upland and River OUs are as follows:

Upland

- Are site-related chemicals in soil of each AOPC at levels potentially harmful to terrestrial biota?
- Is exposure to all AOPCs combined a potential concern for wide-ranging terrestrial receptors?
- Are site-related chemicals in upland groundwater entering the adjacent River OU at levels of potential concern for benthic and aquatic biota?
- Is there a potential for site-related chemicals in upland soils to erode into the River OU at levels of potential concern for benthic and aquatic biota?

River

- Are site-related chemicals in Forebay sediment and tissue at levels potentially harmful to aquatic biota?
- What is the upstream contribution to chemicals detected in Forebay media at levels of potential concern for aquatic biota?
- Do site conditions support the beneficial uses of the Columbia River in this segment including the protection of anadromous and resident fish species and wildlife preservation?

If the findings of the ERAs indicate that further investigation or risk management may be necessary to address potential concerns in either OU, then recommendations will be made as to the scope and focus of these efforts.

The following section summarizes the framework that was used to conduct the ERAs and the scope of the current risk assessments.

12.1 Overview of Level I and Level II Screening Assessments

This section describes the tiered framework that was followed for the ERA, including a summary of the evaluation that was performed during each phase of the assessment.

12.1.1 Regulatory Framework

To achieve the objectives mentioned above, the steps that were used to conduct the Level I Scoping and Level II Screening ERAs concur with federal and state guidance documents (USEPA 1997a,b, 1998, and 2005a; DEQ 2001 and 2007). Since DEQ is reviewing the RI/ FS, DEQ guidance was followed regarding the nature of the risk assessment process and the format and presentation of results. DEQ risk assessment protocols can be found in OAR Section 340-122-0084.

The guidance documents used in the performance of the ERA include:

- Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments (USEPA 1997a)
- EPA Region 10 Supplemental Ecological Risk Assessment Guidance for Superfund (USEPA 1997b)
- Guidelines for Ecological Risk Assessment (USEPA 1998)
- Guidance for Developing Ecological Soil Screening Levels, Revised Draft (USEPA 2005a)
- Ecological Soil Screening Levels, Interim Final (USEPA 2005-2008)
- Guidance for Ecological Risk Assessment, Final (DEQ 2001)
- Comments on Revised Draft Level II Ecological Risk Assessment and Baseline Human Health Risk Assessment, Bonneville Lock and Dam Project (DEQ 2004)
- Guidance for Conducting Beneficial Water Use Determinations at Environmental Cleanup Sites (DEQ 1998a)
- Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment, Final (DEQ 2007)
- Data Usability Guidelines for Risk Assessment (USEPA 1992)
- Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (USEPA 2002a)
- Calculating UCLs for Exposure Point Concentrations at Hazardous Waste Sites (USEPA 2002b)

As discussed in Appendix C of the RI/FS MP (URS 2007a), a tiered framework was implemented in accordance with USEPA and DEQ guidance (USEPA 1997a,b; DEQ 2001) and consists of the following steps: Level 1 Scoping, Level II Screening, Level III Baseline, and

Level IV Field Baseline. A brief description of the first three steps is provided below. The first two steps were conducted for both the River and Upland OU ERAs:

Level I Scoping Assessment

- Provide a conservative qualitative determination of whether ecological receptors and exposure pathways are present or potentially present at a site or in the vicinity.
- Identify sites that are obviously devoid of ecological important receptors or habitats and where exposure pathways are obviously incomplete.
- Identify sites and COIs that warrant additional risk-based evaluation.

Level II Screening Assessment

- Construct a site description based on information from site visits and/or surveys, the existing literature, any prior PAs, and site history (including past and present uses).
- Identify site-specific ecologically important receptors, and the relevant and complete exposure pathways between each source medium of concern and these receptors. Identify CPECs from among the COIs associated with the site.
- Discuss how the physicochemical and toxicological properties of each CPEC may influence exposure pathways and adverse effects.
- Define ecologically appropriate assessment endpoints.
- Establish potential links between CPECs and responses in site-specific receptors by means of a preliminary CEM.
- Make an initial evaluation of the potential for site-related risk.

Level III Baseline Assessment

- Determine whether a site, if left unremediated, would pose unacceptable current or reasonably likely future risks to endpoint species.
- Provide the basis for determining if remediation is needed.
- Provide information for developing remedial alternatives.
- Identify contaminants of ecological concern (CECs) to be addressed further.

At the end of each tier of the evaluation, stakeholders have an opportunity to discuss the best path forward for the project, whether it be supporting a decision for NFA, deciding to take a remedial action, or continuing to the next phase of the ERA process. In order to ensure all stakeholders are comfortable with the results of the first quantitative step of the ERA process in which CPECs are identified from the initial list of COIs, this combined Level I Scoping/Level II Screening ERA is being submitted for review prior to moving forward to Level III BERA).

12.1.2 Scope of ERA

Based on the extensive site characterization that has been performed in the River and Upland OUs and the biological information that has been documented near the island, the findings of the Level I Scoping ERAs are predictable (i.e., complete exposure pathways exist that should be

evaluated further in a quantitative manner). This is the reasoning behind the combined Level I Scoping/Level II Screening ERA. At the completion of the Level II Screening, the utility of a Level III BERA, which would involve a more rigorous evaluation of the site data, is considered and recommendations are made accordingly.

12.1.3 Data Management for ERA

In Sections 5.0 and 6.0, the datasets evaluated in the Level II Screening Assessments for the Upland and River OUs are described, including the methods used to handle data qualifiers and non-detect sample results. The approach used to calculate PCB totals from Aroclor and congener data, as well as the approach used to calculate PAH totals, are also discussed in Section 5.1. Finally, an evaluation of the data usability for the ERA is provided in Section 7.4, whereby MDLs and MRLs for non-detect samples and MRLs for J-flagged data are compared to SLVs protective of ecological receptors to assess the quality of the data. A more detailed description of MDLs for non-detect samples in exceedance of ecological SLVs is presented in the uncertainty assessment (Appendix O).

12.2 Level I Scoping Assessment For Upland OU

The tasks required to complete the Level I Scoping Assessment are as follows:

- Review existing data
- Perform initial site visit
- Identify COIs
- Evaluate receptor-pathway interactions

In an effort to streamline the risk assessment process, the Level I Scoping Assessment (URS 2002d) originally performed for the Landfill was expanded to the other three AOPCs. The close proximity of the Upland AOPCs to each other and the similarities in habitats and organisms present support this approach. To fulfill the requirements listed above, the ecological setting, site features (topography, structures), nature and extent of all known chemical releases, current and future uses of land and water, and any unique site-specific characteristics described in previous sections were carefully considered.

12.2.1 Identification of COIs and CPECS

COIs are defined as chemicals that are present or may be present at a site that have not been screened against any criteria (DEQ 2001). For the purposes of an ERA, COIs may be further evaluated on the basis of detection frequency, comparison with background levels, and risk-based screening. COIs that fail the evaluation, or those COIs without screening levels, are retained as CPECs and may be recommended for risk management, while COIs that pass the evaluation are dropped from further consideration.

The following steps comprise DEQ's general screening criteria used to identify CPECs. COIs for which any of these criteria are met need not be retained as CPECs (DEQ 2001):

4. COIs detected at less than a 5% detection frequency, assuming adequate nature and extent delineation and acceptable reporting limits (i.e., below benchmarks protective of ecological receptors);

5. Inorganic COIs present at concentrations below naturally occurring levels that are either site-specific or derived from regional concentrations;
6. COIs that are below toxicity-based criteria established for ecological receptors based on exposure to individual COIs, as well as cumulative exposure to all COIs and all possible media available to a given receptor.

Although these criteria may be met, a COI may still be retained as a CPEC under the following two circumstances:

1. COIs that are detected at least once and are bioaccumulative require further investigation for their potential to impact upper-trophic-level ecological receptors through the dietary pathway (if a bioaccumulation-based benchmark is not available);
2. COIs that lack toxicity-based criteria (e.g., SLVs) require further consideration, such as a qualitative assessment of risk.

All CPECs identified on the basis of exceedances of SLVs or concerns related to the bioaccumulation pathway for CPECs exceeding dietary based SLVs or lacking dietary based SLVs are retained for further evaluation or remediation. In the uncertainty assessment (Appendix O), COIs that were eliminated based on detection frequency were evaluated to ensure these COIs do not pose an unacceptable risk. Groundwater and soil of the Landfill and Sandblast Area AOPCs were the only areas where elimination of COIs based on frequency of detection occurred.

In Sections 5 and 6, the historical and recent site investigations are described in detail, and the COIs in Upland media of the four AOPCs are identified. Based on the presence of potentially complete exposure pathways and associated analytical data, COIs in the Upland OU were identified for the following media:

- Soil, groundwater, seep, and co-located surface water of the Landfill AOPC
- Soil and groundwater of the Sandblast Area AOPC
- Soil and lagoon sediment of the Pistol Range AOPC
- Soil of the Bulb Slope AOPC

To summarize, the categories of COIs that were detected in analytical data include metals (including butyltins), pesticides, herbicides, PCBs, TPH, PAHs, other SVOCs, and VOCs. Of these COIs, a subset is considered to be bioaccumulative in terrestrial soils, or aquatic environments (for the groundwater to surface discharge scenario), as presented in Section 7.3 and Table J-6. The screening tables described in Section 12.3.4 and presented in Appendix N include the bioaccumulative COIs detected at each individual AOPC.

12.2.2 Ecological Exposure Pathways

All Upland AOPCs on Bradford Island are similar with regard to land and water uses, habitats present, potentially exposed receptors, and exposure routes, but the sources of contamination and COIs vary from one AOPC to another. The affected Upland media include surface soils (0 to 1 foot bgs), subsurface soils (1 to 3 feet bgs), and groundwater. Soils are the source for uptake of bioaccumulative chemicals by terrestrial plants, soil invertebrates, and small mammals, which are consumed by upper trophic level receptors.

The following Upland-related exposure pathways are identified as potentially complete for the Upland OU, and these pathways were more thoroughly investigated to identify those that warrant a quantitative evaluation in the Level II Screening Assessment (Section 12.3.2.1):

- Root uptake of contaminants in surface and subsurface soil by terrestrial plants
- Direct contact (ingestion of and dermal contact) with surface and subsurface soil by soil invertebrates
- Dermal contact with and incidental ingestion of surface and subsurface soil by birds and mammals (although in the absence of burrowing birds at the site, ingestion of subsurface soils by birds is questionable)
- Inhalation of soil-related particulates and VOCs originating from shallow and subsurface soils by burrowing animals
- Ingestion of terrestrial dietary components (e.g., plants, soil invertebrates, and small mammals) by upper trophic level receptors
- Incidental ingestion of and direct contact with potentially contaminated sediment or surface water by aquatic life and aquatic-dependent wildlife, including aquatic prey consumption by upper trophic levels (e.g., fish and wildlife)

Rooting depths for plants and burrowing depths for invertebrates and mammals were assumed to occur within the upper 3 feet of soil, and it will be assumed that all terrestrial receptors are exposed to soils from this depth interval. This is a conservative assumption for birds, which typically do not burrow and forage on the ground surface, and mammals that burrow are more likely to consume organisms that are exposed to soils below the surface. The Landfill and Sandblast Area AOPCs were evaluated for both the surface (0-1 foot bgs) and shallow (0 to 3 feet bgs) intervals. For the Pistol Range and Bulb Slope AOPCs, only surface soil-related pathways were evaluated (0 to 1.5 feet bgs and 0 to 1 foot bgs, respectively).

As noted in Section 3.5.1.3, a review of historical activities and the source of contamination at the Pistol Range AOPC (bullets and casings from firing practice) are consistent only with surface impacts; therefore, deeper samples do not need to be evaluated for this AOPC. Since the Bulb Slope AOPC only has a thin layer of soil underlain by a bedrock base, there are no soils deeper than 1 ft bgs in this area and the existing surface soil data are sufficient to evaluate risk.

Groundwater is only a medium of concern if it has the potential to enter a surface water body; otherwise, exposure to groundwater is an incomplete pathway for most terrestrial receptors with the possible exception of plants. Groundwater levels in the Upland OU are deeper than 3 feet bgs, i.e., root depth zone for terrestrial plants. Therefore, exposure of plants to groundwater is not expected to occur. The potential for groundwater discharge to surface water and ultimate exposure by aquatic biota is discussed in the following section.

Sections 4.3 and 10.1 describe the potential Upland OU to River OU transport pathways, and the key physical migration pathways may be summarized as followed:

- Slope failure
- Mobilization of soils via erosion
- Groundwater seepage

The exposure pathways that are complete at each AOPC and their associated receptors were quantitatively evaluated in the Level II Screening Assessment.

12.3 Level II Screening Assessment for Upland

This section describes the methodology and findings of Level II Screening Assessment for the Upland OU. The comprehensive investigation of the nature and extent delineation is provided in Section 9.0. In Section 9.1.1, the first two steps of the CPEC selection process (evaluation of detection frequency and comparison to background levels for inorganics) were performed for all media associated with each AOPC (Tables 9-1 through 9-6). In addition, the lowest of the SLVs for human and ecological receptors was used for this initial screening to identify preliminary COPCs to assist in evaluating the nature and extent of contamination.

12.3.1 Receptors of Interest

A simplified model of the terrestrial food web for the Upland OU is presented on Figure 12-1. Discussion regarding the selection of avian and mammalian receptors of interest (or "target receptors") occurred in several meetings during 2005 and early 2006 with the TAG for Bradford Island and in RTC received from DEQ (2004). The following terrestrial receptors of interest were selected in the RI/FS MP (URS 2007a):

- Terrestrial plants
- Soil invertebrates
- American kestrel (*Falco sparverius*)
- American robin (*Turdus migratorius*)
- Canada goose (*Branta canadensis*)
- Vagrant shrew (*Sorex vagrans)*

In addition, the American mink (*Mustela vison*) was selected as a large mammal predator to address exposure through consumption of chemically-impacted rodents. In the Level II Screening Assessment, these organisms are evaluated as receptor groups (plants, invertebrates, terrestrial birds and mammals) through a comparison to generic SLVs for each group. During a Level III BERA, the specific receptors listed above, which represent the feeding guilds present in the Upland OU, would be assessed for exposure and risk.

12.3.2 Exposure Assessment

Exposure assessment is the process of estimating the magnitude, frequency, and duration of site-specific exposure concentrations of chemicals to a receptor. To assess whether COI concentrations at the site have the potential to cause adverse effects in the selected ecological receptors, it is first necessary to develop reasonable estimates of the concentrations to which the receptors might be exposed.

12.3.2.1 Conceptual Exposure Model for Ecological Receptors

CEMs for ecological receptors that may be present at each Upland AOPC are presented as Figures 12-2 through 12-5. An exposure pathway is considered complete when the following components are present:

- A source of COIs (e.g., waste material in a landfill)
- A release mechanism (e.g., spills and releases)
- An exposure medium (e.g., surface soil)
- A receptor (e.g., plant community, small mammals)
- An exposure route (e.g., route uptake, ingestion)

When any of these elements is missing, the pathway is considered incomplete. By definition, no risk occurs where no complete pathway exists.

In general, all Upland AOPCs on Bradford Island are similar with regard to land and water uses, habitats present, potentially exposed receptors, and exposure routes, although the sources of contamination and COIs vary from one AOPC to another. Most of the AOPCs in the Upland OU generally provide good habitat for animals that occur in the Lower Columbia River watershed, i.e., the Landfill AOPC, which is managed as wildlife habitat (primarily for Canada geese) and the Pistol Range AOPC. The Sandblast Area AOPC is more highly disturbed and is still partially occupied by the current HMSA, paved roads and areas, and an equipment lay-down area (Section 3.1.5).

The CEM for each AOPC illustrates the current understanding of potential contamination sources, receptors of interest, and routes of exposure. The ecological exposure pathways discussed in the Level I Scoping Assessment (Section 12.2.2) are shown on the CEM figures, and the ones designated as potentially complete and significant were included in the quantitative analysis:

- Root uptake of contaminants potentially present in surface and subsurface soil by terrestrial plants
- Direct contact with contaminants potentially present in surface and subsurface soil by soil invertebrates
- Incidental ingestion of surface and subsurface soil by birds and mammals (although in the absence of burrowing birds at the site, ingestion of subsurface soils by birds is questionable)
- Ingestion of terrestrial dietary components (e.g., plants, soil invertebrates, and small mammals) by birds and mammals
- Incidental ingestion of and direct contact with COIs in Upland groundwater by aquatic biota
- Consumption of aquatic prey that has been exposed to bioaccumulative COIs in Upland groundwater or erodible and mass wasting soils by upper trophic levels (e.g., fish and piscivorous wildlife)
- Direct contact with contaminants potentially present in the Pistol Range lagoon sediments by sediment-dwelling invertebrates; these upland contaminants may have been impacted by historically erodible soils that were transported to the lagoon

- Direct contact with contaminants potentially present in erodible and mass wasting soils that have or may have been transported to the River OU by sediment-dwelling invertebrates

All of these pathways are potentially complete for the Landfill and Sandblast Area AOPCs and were quantatively evaluated. For the Pistol Range and Bulb Slope AOPCs, only surface soil-related pathways were evaluated (0 to 1.5 feet bgs and 0 to 1 foot bgs, respectively). Groundwater-related pathways were also evaluated for the Pistol Range AOPC; there are no groundwater-related pathways from the Bulb Slope AOPC. Finally, sediment data collected from the lagoon adjacent to the Pistol Range AOPC were evaluated for potential exposure by benthic organisms and fish and wildlife.

12.3.2.2 Assessment Endpoints

Assessment endpoints are explicit expressions of the actual environmental value to be protected, and may be perceived as an environmental characteristic. If these endpoints are found to be significantly affected they can trigger further action. The following assessment endpoints were selected for the ecological receptors addressed in the Upland OU:

- Protection of the terrestrial plant community and soil-dwelling invertebrate populations that may be exposed to COIs in soil to maintain species diversity, abundance, and nutrient cycling
- Protection of herbivorous small birds (Trophic Level 1), such as Canada geese, with no unacceptable effects on reproduction, growth, or development at the population level due to COIs in soil and terrestrial plants
- Protection of invertivorous birds (Trophic Level 2), such as the American robin, with no unacceptable effects on reproduction, growth, or development on a population level due to COIs in soil and invertebrates
- Protection of carnivorous small mammals (Trophic Level 2-3), such as the vagrant shrew, with no unacceptable effects on reproduction, growth, or development on a population level due to COIs in soil and invertebrates
- Protection of top-level predatory birds (Trophic Level 3-4), such as the American kestrel, with no unacceptable effects on reproduction, growth, or development on a population level due to COIs in soil and small mammals
- Protection of predatory mammals (Trophic Level 3-4), such as the American mink, with no unacceptable effects on reproduction, growth, or development on a population level due to COIs in soil and small mammals
- Protection of aquatic biota (invertebrates, fish, and wildlife) that may be exposed to COIs in groundwater or erodible soils from the Upland OU that have been transported to the River OU

The disturbed nature of some of the Upland AOPCs, e.g., Sandblast Area, precludes high quality habitat and species diversity. Furthermore, no state- or federally listed threatened and endangered terrestrial species are known to occur on the island, with the exception of the bald eagle (which is evaluated for the River OU), and site-related effects on an individual basis are only of concern for this receptor. The methodology for evaluating risks to both threatened and endangered and

nonthreatened and endangered species was included in the assessment. Recommendations in support of risk-management decisions were primarily based on risks to non-threatened and endangered terrestrial species.

According to Section 3.5 of the Level I Scoping Assessment that was performed for the Landfill (URS 2002d), which included a thorough biological characterization of the Landfill and all habitats on the island, "large mammalian predators do not occur on the island." The only mammals on the island that are described in the Scoping Assessment are small mammals (rodents) and feral cats: "Although the island harbors small mammals, feral cats, Canadian geese, and other bird species, the minimal amount of available habitat (~12 acres) makes it unsuitable for supporting viable populations of wildlife species with larger home ranges" (URS 2002d). For this reason, large mammals were not included in the assessment endpoints described in the approved RI/FS MP (URS 2007a). However, because mink are present in the area and could feasibly access the island and forage there, exposure by predatory mammals that consume rodents was considered in the assessment endpoints.

12.3.2.3 Estimation of Exposure Point Concentrations

The EPC is the concentration of a chemical in an environmental medium at the point of contact for the receptor (e.g., the concentration of a chemical in soil at a sampling location that could serve as habitat for the receptor). For terrestrial plants and soil invertebrates, the EPC is estimated as a function of the COI concentration measured in soil. For higher trophic level receptors, the exposure dose may be estimated as a function of the COI concentration in relevant environmental media and several other parameters related to biological transfer through the food web and the manner in which receptors use the site (e.g., dietary composition, feeding strategy, food ingestion rate, length of time a receptor is expected to forage/nest at the site based on their home range size and seasonal behavior).

Soil EPCs were developed for surface soils (0 to 1 foot bgs) and shallow soil (surface and subsurface soils; 0 to 3 feet bgs) for all terrestrial receptors. More refined exposure depths may be considered for nonburrowing animals for COIs that fail the Level II Screening Assessment. Additionally EPCs were developed for groundwater, seep water, surface water, and lagoon sediment for semi-aquatic and/or aquatic receptors.

Plants and Invertebrates - EPCs in soil were estimated for receptors with limited or no mobility (i.e., plants and invertebrates) using the maximum detected concentration in soil and sediment. Use of the maximum concentration of each COI is a conservative approach that serves to protect stationary receptors that could conceivably be exposed to the maximum concentration throughout their entire life span. In addition, for many CPECs, point by point evaluations were performed through spatial mapping to understand the spatial distributions of SLV exceedances for these receptor groups.

Birds and Mammals - For food web-based receptors such as birds and mammals, the EPC was based on the 95% UCL on the mean concentration in soil and was estimated using statistical methods recommended by USEPA (generated from the USEPA's ProUCL software [USEPA 2011]). The lower of the 95% UCL and maximum detected concentration in soil was used as the EPC for birds and mammals. This value provides an estimate of the representative concentration more relevant to terrestrial wildlife receptors that generally are mobile and not continuously

exposed to site-related COIs in one geographic location. Soil EPCs were directly compared to DEQ's SLVs protective of birds and mammals or equivalent soil benchmarks in the screening (Sections 12.3.4.1).

Aquatic Biota of River OU - EPCs in potentially mass wasting or erodible soils and groundwater evaluated for aquatic biota, with the exception of benthic invertebrates, are represented by the lower of the 95% UCL and maximum detected concentration, as described above for birds and mammals. Since some types of benthic invertebrates in the River OU have limited mobility (i.e., clams), the maximum detected concentration in potentially mass wasting or erodible soils was used as the EPC for this receptor group. The evaluation of potentially mass wasting and erodible soils is presented in the uncertainty assessment (Appendix O).

12.3.3 Effects Analysis

The identification of toxic effects and chronic toxicity thresholds resulting from exposure to COIs comprises the effects assessment phase of the Screening Assessment. A qualitative and quantitative description of the relationships between COI concentrations or doses and the nature of possible effects elicited in exposed receptors, populations, or ecological communities is discussed in this section. The goal of this effects assessment is to identify risk-based screening levels, or SLVs, that are most relevant to the receptors and assessment endpoints identified for the Upland OU. SLVs are expressed as concentrations in media (e.g., mg/kg of soil).

Although "screening levels" are typically associated with exposure via direct contact, and are also commonly referred to as direct toxicity benchmarks, there are sources of generic media-based screening levels that address both direct contact and dietary exposure for birds and mammals. SLVs for birds and mammals are derived from diet-based toxicity reference values (TRVs) that are expressed as a daily dose normalized to body weight (mg of chemical/kg of body weight/day).

12.3.3.1 Measurement Endpoints

Measurement endpoints are measurable changes in an attribute of an assessment endpoint that allow an evaluation of whether or not the ecological resource is being sufficiently protected. Measurement endpoints are typically characterized in two parts: measures of exposure and measures of effect. Measures of exposure are measurable characteristics or attributes of an assessment endpoint or an acceptable surrogate (e.g., COI concentrations in soil or tissue). Measures of effect are measurable responses in the assessment endpoint or its surrogate associated with lowest adverse effects or acceptable no-effect thresholds (e.g., ecologically protective screening values for soil and tissue). The measures of exposure and measures of effect proposed for the assessment endpoints were provided in Table C-1 of the RI/FS MP (URS 2007a).

Measurement endpoints for the Upland ERA include measured EPCs in soil and groundwater (and seep/co-located surface water for the Landfill AOPC), modeled concentrations of CPECs in terrestrial organism tissues, and field observations (e.g., areas of distressed vegetation or bare soil, visible sandblast grit, or lack thereof).

12.3.3.2 Direct Toxicity and Bioaccumulation SLVs

The EPCs derived for soils, sediment, and water were compared to the SLVs protective of the individual receptor groups of interest (e.g., terrestrial plants, soil-dwelling invertebrates,

terrestrial wildlife, and aquatic biota). The primary literature sources of SLVs protective of ecological receptors that were used in the Level II Screening Assessment were presented in Section 7.3.1 and Appendix J.

12.3.3.3 Identification of Chemicals of Potential Ecological Concern

The first two steps of the CPEC identification process presented in Section 12.2.1 (i.e., evaluation detection frequency and comparison to Reference Area concentrations for inorganics) were performed for each AOPC dataset and the combined AOPCs dataset in Section 9.1.1. In the first step, Upland OU COIs that were detected in ≤ 5% of samples per media and AOPC were not retained as CPECs, as long as there were at least 20 samples collected. Multiple COIs were eliminated as potential CPECs in this first step of the evaluation. In the uncertainty assessment (Appendix O), COIs that were eliminated based on detection frequency were evaluated to ensure these COIs do not pose an unacceptable risk. Groundwater and soil of the Landfill and Sandblast Area AOPCs were the only areas where elimination of COIs based on frequency of detection occurred.

For the second step, a statistical comparison of two independent datasets was performed between the Reference Area surface soil data and the Upland OU soil data (for each depth interval; 0-1 and 0-3 ft bgs) within each AOPC. In addition, the comparison to Reference Area soils was performed for the combined data sets (including all four Upland AOPCs) for each depth interval. The objective of the statistical analysis was to assess whether the mean inorganic COI concentrations in soil within each AOPC, as well as the mean soil COI concentrations for all four AOPCs combined, were significantly higher than the mean Reference Area concentrations. This approach is commonly known as a population-to-population comparison. The results of this statistical comparison are presented in detail in Section 8.2.1 and Appendix L and summarized in Table 8-1.

There are insufficient groundwater data to perform statistical comparisons between site and reference area data. Therefore the groundwater and seep water data were evaluated by comparing the range of COI concentrations observed in groundwater samples from monitoring wells and in seep samples with the range of concentrations observed in the Reference Area monitoring well (MW-10). The results are summarized in Appendix L, Table L-3 and Table 8-2

The COIs detected above a 5% detection frequency and inorganic COIs with concentrations higher than Reference Area levels (see Tables 9-1 through 9-7), were retained for the third step of the CPEC identification process, (i.e., toxicity-based screening). The approach used for this evaluation is described in the following section.

In addition to the first three quantitative steps of the process, the potential for bioaccumulation and the availability of SLVs are two additional qualitative elements that were evaluated in the identification of CPECs.

12.3.3.3.1 Toxicity Ratios for Individual COIs within a Given Medium

Toxicity ratios were developed based on the following equations and logic:

$$T_{ij} = \frac{C_{ij}}{SLV_{ij}}$$

$$\text{COIs with} \quad T_{ij} \quad > \quad Q$$

were retained as CPECs.

where:

T_{ij}	=	Toxicity ratio for COI *i* in medium *j* (unitless)
C_{ij}	=	Environmental concentration of COI *i* in medium *j* (mg COI per kg environmental medium);
SLV_{ij}	=	Screening level value for COI *i* in medium *j* (mg COI per kg environmental medium)
Q	=	Receptor designator that dictates the level of protection appropriate for a certain site (unitless)

If T_{ij} for a specific COI is greater than the receptor designator (Q) appropriate for the site, then further investigation of the COI is warranted and it was retained as a CPEC. As defined by DEQ (2001), Q is equal to 1.0 for listed threatened and endangered species and Q equals 5.0 for nonthreatened and endangered species. However, for this project, CPECs were identified when Q is equal to 1.0 for terrestrial plants, soil invertebrates, and birds, and Q is equal to 5.0 for mammals. Although no threatened and endangered plant or soil invertebrate species are potentially present, a Q of 1.0 was applied for these receptor groups at request of DEQ due to basis of certain SLVs (e.g., USEPA's Eco-SSLs, 2005 - 2008). Nonetheless, consideration of a Q equal to 5.0 was also considered during the risk interpretation phase. Likewise, selection of CPECs at the Q equal to 1.0 level to account for the bald eagle, and possible transient juvenile spotted owls is appropriate, but these special-status species are not likely to forage at the 1.36 acre Landfill AOPC. For this reason, the Q equal to 5.0 level for birds in the Upland OU is also considered in the risk interpretation. For all aquatic (and benthic) organisms, the Q is equal to 1.0 threshold was used (DEQ 2001).

12.3.3.3.2 Evaluation of Multiple COIs Simultaneously within a Given Medium

To assess the potential for cumulative effects attributed to multiple COIs within soil, all COIs present in a given medium was collectively compared to SLVs. Based on the toxicity ratios estimated from the equation above, the incremental effects from each COI was identified from the approach expressed in the following equation:

$$\text{COIs with } \frac{T_{ij}}{T_j} \geq \frac{1}{N_{ij}} \times Q$$

was retained as CPECs.

where :

T_{ij}	=	Toxicity ratio for COI *i* in medium *j* (unitless)
T_j	=	Summation of toxicity ratios for *i* COIs in medium *j* (unitless)
N_{ij}	=	Total number of *i* COIs in medium *j* for which an SLV is available (unitless)
Q	=	Receptor designator that dictates the level of protection appropriate for a certain site

(unitless)

If the toxicity ratio for a specific COI is a high contributor to the total risk for a given medium, represented by the summation of all toxicity ratios (T_j), then further investigation of the COI is warranted and it was retained as a CPEC. This approach allows evaluation of the incremental risks associated with simultaneous exposure to multiple COIs. As stated previously (Section 12.3.3.3.1), Q is equal to 1.0 for terrestrial plants, soil invertebrates, birds, and aquatic and benthic organisms, and Q equals 5.0 for mammals.

12.3.4 Risk Characterization

Risk characterization is the process of integrating the previous elements of the risk assessment into quantitative or semiquantitative estimates of risk. Risk characterization consists of risk estimation and uncertainty assessment. Risk estimation or the quantification of risk is then used as an integral component in remedial decision making and selection of potential remedies or actions. Uncertainty assessment describes the level of confidence in the risk estimation.

12.3.4.1 Results of Screening for Each AOPC

The toxicity screening for COIs in soil at all four AOPCs, groundwater at all AOPCs except the Bulb Slope AOPC, seep and surface water for the Landfill AOPC, and lagoon sediment for the Pistol Range AOPC involved a comparison of appropriate EPCs to soil, water, and sediment SLVs protective of the receptor groups evaluated in this Level II Screening Assessment. The potential for ecological risk to occur was evaluated based on exposure to individual COIs within a specific medium and from exposure to multiple COIs simultaneously within a given medium.

Toxicity ratios were estimated for each COI, and COIs were retained as CPECs as described above (Section 12.3.3.3). COIs were also retained as CPECs if there are no SLVs available (referred to as "Yes – No SLV" in the risk tables) or if the COI is bioaccumulative but lack of a dietary-based SLV and precluded appropriate evaluation of this pathway (referred to as "Yes-Bio" in the risk tables). The implications of not performing a quantitative evaluation for CPECs without SLVs and bioaccumulative CPECs without dietary-based SLVs are explained in Section 7.4 and in the uncertainty assessment (Appendix O).

The following sections present the results of the screening process for each AOPC for all receptors and all four AOPCs combined for birds and mammals. For soils, the screening results for the 0 to 1 foot-depth interval and 0 to 3 feet-depth interval are shown on the same tables. In the following sections, if individual benzofluoranthenes (e.g., benzo(b)fluoranthene) were retained as a CPEC, then the total benzofluoranthenes were not included in the CPEC counts. For soil invertebrates and mammals, individual LPAHs and HPAHs were screened by their respective total PAH SLVs in order to determine which individual PAHs drive risk.

The data from the surface soil samples (0-1 ft bgs) collected within the potentially erodible/mass wasting areas identified within the Upland OU were utilized for evaluation of the overland transport pathway. The results of the evaluation to address overland transport through mass wasting and soil erosion into the River OU is provided in Appendix O (Tables O.3-5 through O.3-11).

12.3.4.1.1 Landfill AOPC

Tables N-1 through N-5 of Appendix N present the results of the screening for individual COIs evaluated for terrestrial plants, soil invertebrates, birds, mammals, and aquatic organisms. Tables

N-6 through N-10 provide the results of the toxicity-based screening analysis that involved an evaluation of the cumulative risks associated with simultaneous exposure to multiple COIs present in a given medium.

Terrestrial Plants - In surface and shallow soil, arsenic (shallow soil only), lead, mercury, zinc, LPAHs , and HPAHs have toxicity ratios greater than 1.0 (Table N-1) and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in the plant community at the Landfill AOPC.

Lead (shallow soil only), mercury, and nine HPAHs contribute to a cumulative risk greater than 1.0 (Table N-6). All of these HPAHs were already identified as CPECs based on the individual COI screening evaluation.

Soil Invertebrates - Two metals (mercury and zinc), ethylbenzene, carbazole, and Total HPAHs have toxicity ratios greater than 1.0 (Table N-2) and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in the soil invertebrate community at the Landfill AOPC. To be consistent with the Ecological Soil Screening Levels (EcoSSL) guidance, total HPAHs (and total LPAHs) were screened against the corresponding SLVs, and the individual HPAHs were evaluated from the perspective of their contribution to the toxicity ratio for total HPAHs.

These same three CPECs contribute to a cumulative risk greater than 1.0 (Table N-7).

Birds - Five metals (antimony, cadmium, lead, mercury and zinc), two herbicides, and B2EHP have toxicity ratios greater than 1.0 (Table N-3) and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in individual birds at the Landfill AOPC. Of these eight CPECs, antimony, lead, mercury (and zinc at 0 to 3 foot bgs only) and MCPP (an herbicide) have toxicity ratios greater than 5.0. All PAHs except naphthalene, as well as eight other bioaccumulative COIs, were retained as CPECs due to the lack of SLVs that address the dietary pathway.

Antimony (shallow soils only), lead, mercury, and MCPP contribute to a cumulative risk greater than 1.0 (Table N-8). All of these COIs were already identified as CPECs based on the individual COI screening evaluation.

Mammals - In surface and shallow soil, antimony, lead, mercury, zinc (shallow soil only), two herbicides, dibenzofuran, and HPAHs have toxicity ratios greater than 5.0 (Table N-4) and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in mammal populations at the Landfill AOPC. To be consistent with the EcoSSL guidance, total HPAHs (and total LPAHs) were screened against the corresponding SLVs, and the individual HPAHs were evaluated from the perspective of their contribution to the toxicity ratio for total HPAHs. There are eight bioaccumulative COIs that were retained as CPECs due to the lack of SLVs that address the dietary pathway. Even though three individual HPAHs have toxicity ratios less than 5.0, all HPAHs were retained as CPECs for mammals because the total HPAH toxicity ratio is above 5.0 and all are potentially bioaccumulative.

When evaluating cumulative risk, no additional COIs contribute to a risk greater than 5.0 for mammals (Table N-9).

Aquatic Organisms and Aquatic-Dependent Wildlife - Four metals (barium, iron, manganese and zinc) and B2EHP in groundwater have toxicity ratios greater than 1.0 (Table N-5) and require further investigation in the risk interpretation section to assess their potential to elicit

adverse effects in individual aquatic organisms or wildlife that could be exposed to surface water that has been impacted by COIs in groundwater of the Landfill. Barium, iron, manganese, and zinc also have toxicity ratios greater than 1.0 for seep water (Table N-5). No COIs for surface water samples that are co-located with the seep samples have toxicity ratios greater than 1.0. There are 11 bioaccumulative COIs in groundwater, as well as two in seep water and two in surface water, that were retained as CPECs due to the lack of SLVs that address the dietary pathway (Table N-5).

Barium, iron, and manganese contribute to a cumulative risk greater than 1.0 for groundwater, and barium and manganese also contribute to a cumulative risk greater than 1.0 for seep water (Table N-10). No individual COI contributes to a cumulative risk greater than 1.0 for co-located surface water. All of these COIs were already identified as CPECs based on the individual COI screening evaluation.

12.3.4.1.2 Sandblast Area AOPC

Tables N-11 through N-15 of Appendix N present the results of the screening for individual COIs evaluated for terrestrial plants, soil invertebrates, birds, mammals, and aquatic organisms. Tables N-16 through N-20 provide the results of the toxicity-based screening analysis that involved an evaluation of the cumulative risks associated with simultaneous exposure to multiple COIs present in a given medium.

Terrestrial Plants - Seven metals (antimony, arsenic, chromium, lead, nickel, selenium and zinc), o-xylene (shallow soils only), PCE (shallow soils only), LPAHs (shallow soils only) and HPAHs have toxicity ratios greater than 1.0 (Table N-11) and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in the plant community at the Sandblast Area AOPC.

Chromium, lead, nickel, zinc (surface soils only), PCE (shallow soils only), and HPAHs (four in surface soils and six in shallow soils) contribute to a cumulative risk greater than 1.0 (Table N-16). These chemicals were already identified as CPECs based on the individual COI screening evaluation.

Soil Invertebrates - Five metals (arsenic, chromium, lead, nickel, and zinc), and HPAHs have toxicity ratios greater than 1.0 (Table N-12) and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in the soil invertebrate community at the Sandblast Area AOPC. To be consistent with the EcoSSL guidance, total HPAHs (and total LPAHs) were screened against the corresponding SLVs, and the individual HPAHs were evaluated from the perspective of their contribution to the toxicity ratio for total HPAHs.

Only chromium and zinc contribute to a cumulative risk greater than 1.0 (Table N-17), which was already identified as CPECs based on the individual COI screening evaluation.

Birds - Six metals (antimony, cadmium, chromium, lead, nickel, and zinc), Total DDTs (surface soil only), and B2EHP have toxicity ratios greater than 1.0 (Table N-13) and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in individual birds at the Sandblast Area AOPC. All PAHs except naphthalene, as well as 21 other bioaccumulative COIs, were retained as CPECs due to the lack of SLVs that address the dietary pathway.

Antimony, cadmium, chromium, lead, zinc (shallow soils only), and B2EHP contribute to a cumulative risk greater than 1.0 (Table N-18), which were already identified as CPECs based on the individual COI screening evaluation.

Mammals - Four metals (antimony, cadmium, chromium, and lead), dibenzofuran, and HPAHs have toxicity ratios greater than 5.0 (Table N-14) and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in mammal populations at the Sandblast Area AOPC. To be consistent with the EcoSSL guidance, total HPAHs (and total LPAHs) were screened against the corresponding SLVs, and the individual HPAHs were evaluated from the perspective of their contribution to the toxicity ratio for total HPAHs. There are 21 bioaccumulative COIs that were retained as CPECs due to the lack of SLVs that address the dietary pathway. Even though the majority of individual HPAHs have toxicity ratios greater less than 5.0, all HPAHs were retained as CPECs for mammals because the total HPAH toxicity ratio is above 5.0 and all are potentially bioaccumulative.

Antimony (surface soils only), chromium, dibenzofuran, and total HPAHs contribute to a cumulative risk greater than 5.0 (Table N-19), which were already identified as CPECs based on the individual COI screening evaluation.

Aquatic Organisms and Aquatic-Dependent Wildlife - The toxicity ratio for cis-1,2-DCE is only slightly greater than 1.0 (at 1.12, Table N-15), and since this is the only CPEC with a detection above the benchmark, no further investigation is recommended to assess the potential for adverse effects to aquatic organisms or wildlife that could be exposed to surface water that has been impacted by COIs in groundwater of the Sandblast Area AOPC. Arsenic, four LPAHs, and five HPAHs are bioaccumulative COIs that were retained as a CPECs due to the lack of SLVs that address the dietary pathway.

Calcium, magnesium, monobutyltin, 1,1-trichloroethane, carbon disulfide, cis-1,2-DCE, and benzo(a)pyrene (only direct push groundwater data available for this HPAH) contribute to a cumulative risk greater than 1.0 (Table N-20). With the exception of cis-1,2-DCE, none of these CPECs have individual toxicity ratios above 1.0. The sum of the toxicity ratios for all PAHs in groundwater is less than 1.0 (sum toxicity ratio of 0.7). Due to the very low toxicity ratios, the fact that two of these CPECs are essential nutrients, and three are VOCs that would not be expected to persist in surface water or bioaccumulate, no further investigation is recommended.

12.3.4.1.3 Pistol Range AOPC

Tables N-21 through N-27 of Appendix N present the results of the screening for individual COIs evaluated for terrestrial plants, soil invertebrates, birds, mammals, aquatic organisms, and the two receptor groups potentially exposed to lagoon sediment (benthic invertebrates exposed via direct contact and fish and wildlife exposed through bioaccumulation). Tables N-28 through N-34 provide the results of the toxicity-based screening analysis that involved an evaluation of the cumulative risks associated with simultaneous exposure to multiple COIs present in a given medium.

Terrestrial Plants – Lead and zinc have toxicity ratios greater than 1.0 (Table N-21) and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in the plant community at the Pistol Range AOPC.

Only lead contributes to a cumulative risk greater than 1.0 for terrestrial plants (Table N-28), which was already identified as a CPEC based on the individual COI screening evaluation.

Soil Invertebrates - Zinc has a toxicity ratio greater than 1.0 (Table N-22) and requires further investigation in the risk interpretation section to assess its potential to elicit adverse effects in the plant community at the Pistol Range AOPC.

Zinc also contributes to a cumulative risk greater than 1.0 for terrestrial plants (Table N-29).

Birds - Lead and zinc have toxicity ratios greater than 1.0 (Table N-23) and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in individual birds at the Pistol Range AOPC. Of these two CPECs, only lead has a toxicity ratio greater than 5.0.

Only lead contributes to a cumulative risk greater than 1.0 (Table N-30), which was already identified as a CPEC based on the individual COI screening evaluation.

Mammals - Lead has a toxicity ratio greater than 5.0 (Table N-24) and requires further investigation in the risk interpretation section to assess its potential to elicit adverse effects in mammal populations at the Pistol Range AOPC.

No individual COI contributes to a cumulative risk greater than 5.0 for mammals (Table N-31).

Aquatic Organisms and Aquatic-Dependent Wildlife - No toxicity ratios for groundwater of the Pistol Range AOPC are greater than 1.0 (Table N-25). Zinc is the only bioaccumulative COI that was retained as a CPEC due to the lack of SLVs that address the dietary pathway.

No individual COI contributes to a cumulative risk greater than 1.0 for groundwater (Table N-32). Since zinc was already evaluated for its potential to bioaccumulate in the ERA for the River OU (Section 12.5), no further investigation of groundwater at the Pistol Range AOPC is recommended.

Benthic Invertebrates - Zinc has a toxicity ratio slightly greater than 1.0 (1.41) for the benthic invertebrate community at the lagoon adjacent to the Pistol Range AOPC (Tables N-26). Lead and zinc contribute to a cumulative risk greater than 1.0 for the benthic community (Table N-33). However, the individual toxicity ratio for lead is below 1.0. As discussed in the RI/FS MP (URS 2007a), sediment samples from the lagoon were collected to determine if any COIs that could have originated from the former Pistol Range AOPC should be added to the list of COIs evaluated for the River OU. Both lead and zinc were already included in the list of COIs evaluated for their potential to bioaccumulate in the ERA for the River OU (Section 12.5), so no further action was required.

Fish and Aquatic-Dependent Wildlife - The maximum detected concentrations of lead and zinc in lagoon sediment are greater than the Reference Area 95% UPLs (Tables N-27 and N-34), which were used in the absence of sediment SLVs that are protective of fish and wildlife. As discussed in the RI/FS MP (URS 2007a), these sediment samples were collected to determine if any COIs that could have originated from the former Pistol Range AOPC should be added to the list of COIs evaluated for the River OU. Both lead and zinc were already included in the list of COIs evaluated for their potential to bioaccumulate in the ERA for the River OU (Section 12.5), so no further action was required.

12.3.4.1.4 Bulb Slope AOPC

Tables N-35 through N-38 of Appendix N present the results of the screening for individual COIs evaluated for terrestrial plants, soil invertebrates, birds, and mammals. Tables N-39 through N-42 provide the results of the toxicity-based screening analysis that involved an

evaluation of the cumulative risks associated with simultaneous exposure to multiple COIs present in a given medium.

Terrestrial Plants – Lead and mercury have toxicity ratios greater than 1.0 (Table N-35) and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in the plant community at the Bulb Slope AOPC.

These two metals also contribute to a cumulative risk greater than 1.0 for terrestrial plants (Table N-39), and were already identified as CPECs based on the individual COI screening evaluation.

Soil Invertebrates - Mercury has a toxicity ratio greater than 1.0 (Table N-36) and requires further investigation in the risk interpretation section to assess its potential to elicit adverse effects in the soil invertebrate community at the Bulb Slope AOPC.

Mercury also contributes to a cumulative risk greater than 1.0 for soil invertebrates (Table N-40) and was already identified as CPECs based on the individual COI screening evaluation.

Birds - Lead and mercury have toxicity ratios greater than 1.0 (Table N-37) and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in individual birds at the Bulb Slope AOPC. Both of these CPECs, have a toxicity ratio greater than 5.0.

Lead and mercury also contribute to a cumulative risk greater than 1.0 (Table N-41) and were already identified as CPECs based on the individual COI screening evaluation.

Mammals - Lead has a toxicity ratio greater than 5.0 (Table N-38) and requires further investigation in the risk interpretation section to assess its potential to elicit adverse effects in mammal populations at the Bulb Slope AOPC.

No individual COI contributes to a cumulative risk greater than 5.0 for mammals (Table N-42).

12.3.4.1.5 All Four AOPCs Combined

Tables N-43 and N-44 of Appendix N present the results of the screening for individual COIs evaluated for birds and mammals that have home ranges equal to or larger than the size of the entire Upland OU and could, therefore, forage over all four AOPCs. Tables N-45 and N-46 provide the results of the toxicity-based screening analysis that involved an evaluation of the cumulative risks associated with simultaneous exposure to multiple COIs present in a given medium.

Birds - Seven metals (antimony, cadmium, chromium, lead, mercury, nickel and zinc), two herbicides, and B2EHP have toxicity ratios greater than 1.0 (Table N-43) and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in individual birds over the four AOPCs combined. Of these ten CPECs, antimony, chromium, lead, mercury, MCPP (an herbicide), and B2EHP have toxicity ratios greater than 5.0. All PAHs except naphthalene, as well as 18 other bioaccumulative COIs, were retained as CPECs due to the lack of SLVs that address the dietary pathway.

Antimony, chromium, lead, mercury (surface soils only), MCPP, and B2EHP contribute to a cumulative risk greater than 1.0 (Table N-45), which were already identified as CPECs based on the individual COI screening evaluation.

Mammals - Four metals (antimony, cadmium, chromium, and lead), two herbicides, and total HPAHs have toxicity ratios greater than 5.0 (Table N-44) and require further investigation in the

risk interpretation section to assess their potential to elicit adverse effects in mammal populations over the four AOPCs combined. To be consistent with the EcoSSL guidance, total HPAHs (and total LPAHs) were screened against the corresponding SLVs, and the individual HPAHs were evaluated from the perspective of their contribution to the toxicity ratio for total HPAHs. There are 18 bioaccumulative COIs that were retained as CPECs due to the lack of SLVs that address the dietary pathway. Even though not all HPAHs have toxicity ratios greater than 5.0, all were retained as CPECs for mammals because the toxicity ratio for Total HPAHs is above 5.0 and all of these individual HPAHs are potentially bioaccumulative.

MCPP contributes to a cumulative risk greater than 5.0 (Table N-46), which were already identified as CPECs based on the individual COI screening evaluation.

12.3.4.2 Uncertainty Assessment

Uncertainty and the relative degree of such uncertainty should be considered when interpreting the results of the ERA. Uncertainty is introduced at each step of the process, and occurs because risk assessment is complex and requires the integration of many factors:

- Fate and transport of constituents in a variety of different and variable environments
- Selection of EPCs representative of actual exposure experienced by mobile receptors
- Potential for adverse health effects in ecological receptors as extrapolated from laboratory bioassays for which SLVs are often based
- Probability of adverse effects on ecological receptors is highly variable based on genetics, life stage, and trophic level.

Specific sources of uncertainty for this Level II ERA are presented in Appendix O.

12.3.4.3 Risk Interpretation

In this final phase of the risk characterization process, the quantitative and qualitative components of the risk screening (i.e., toxicity ratios) and uncertainty assessment are evaluated to gain a better understanding of the actual potential for ecological risk. Multiple lines of evidence are considered during risk interpretation to identify actual risk drivers at the site and to develop a supportable recommendation for risk managers to review. The outcome of the risk characterization will constitute the basis of remedial decisions for the protection of ecological receptors and risk driving exposure pathways.

For each AOPC and receptor, the CPECs identified in the previous section with toxicity ratios greater than 5.0 for mammals and toxicity ratios greater than 1.0 for all other receptors are plotted in Figures 12-6 through 12-17, and discussed in the text below. Those CPECs where a limited number of exceedances were noted (e.g., zinc for plants in the Landfill AOPC) were not included on the spatial distribution maps and the rationale for their exclusion is discussed prior to discussing the other CPECs.

To summarize the risk screening process, first the SLVs protective of ecological receptors were compared to the EPCs (i.e., 95% UCLs for mobile receptors and maximum concentrations for stationary receptors) for each analyte to identify CPECs that could require further assessment. The magnitude of the exceedance, detection frequency, confidence in the SLV, and other lines of evidence were considered to identify those CPECs that warrant a more rigorous evaluation of the data. For this whittled down list of CPECs, the spatial distribution of the concentrations relative

to the SLVs was assessed through a review of this information on figures presented in this section. Based on this weight of evidence approach, those CPECs that truly warrant additional investigation or risk management are identified and discussed below.

12.3.4.3.1 Landfill AOPC

Terrestrial Plants - Arsenic (shallow soil only), lead, mercury, zinc, Total LPAHs, and Total HPAHs have toxicity ratios greater than 1.0 (Table N-1) and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in the plant community at the Landfill AOPC. Arsenic, lead, and zinc were detected in all soil samples, and mercury was detected in approximately 80% of the samples (Table 9-1). Maximum concentrations of lead, zinc, and most LPAHs were detected below 1 foot bgs, while the maximum concentrations of arsenic, mercury and most HPAHs were detected at the surface. As shown in Tables 8-1, L-1, and L-2, all of the LPAHs and HPAHs were detected at concentrations statistically higher than the Reference Area data.

No further assessment of arsenic is recommended for plants, given that only the maximum concentration, which was collected below the surface, exceeded the SLV and the toxicity ratio is low (1.67). In addition, concentrations of arsenic in surface soils are statistically lower than the Reference Area data (Table L-1).

No further assessment of zinc is recommended for plants. Seven surface soil and a single shallow soil sample exceeded the SLV for plants. The toxicity ratio based on the maximum surface soil concentration is 3.97, and the remaining few surface soil exceedances result in low sample-specific toxicity ratios ranging from 1.13 to 1.64. Only the maximum zinc concentration, which was collected below the surface, exceeded the 5 times the SLV (BIL22). In addition, no sensitive plant species exist at the Landfill, which is maintained as goose pasture (Section 3.1.6.1.1), and zinc is an essential nutrient for plants (USEPA 2005-2008; Efroymson et al. 1997a).

The toxicity ratio for Total LPAHs of 1.87 for the 0 to 1 foot interval and 3.48 for the 0 to 3 feet interval are driven primarily by concentrations of phenanthrene, and secondarily by concentrations of anthracene (Table N-1). Three samples had concentrations in exceedance of the SLV for plants (BIl04SSI, BIL18, and L-02), and no samples have concentrations in exceedance of 5 times the SLV (Table H-1). The highest concentration of LPAHs occurred at the Gully Test Pit (BIL18). No further assessment of LPAHs is recommended for plants, given the low and infrequent exceedances of the SLV.

Figure 12-6 shows observed soil concentrations compared to SLVs for lead, mercury, and HPAHs for plants. One detected concentration of mercury was between 10 and 50 times the SLV (at the mercury vapor-lamp test pit). Three lead samples collected at the surface and five collected from the subsurface had concentrations in exceedance of the corresponding SLV. Concentrations exceeding 5 times the SLV were observed at the Lead Hotspot Test Pit #1, one location in the Gully Test Pit, and one just north of the Gully Test Pit. The highest concentrations of HPAHs (greater than 50 times the SLV) also occurred at Lead Hotspot Test Pit #1 and the Gully Test Pit, with some lower level exceedances at a few locations outside of these areas.

Based on the assessment for plants at the Landfill AOPC, it is possible that localized impacts could occur from exposure to the primary risk drivers: lead, mercury, and HPAHs. Potential effects to the terrestrial plant community as a whole are likely overestimated, as only a few individual plants (i.e., grasses) are exposed to the maximum concentration of each CPEC

throughout their life span. In addition, the studies upon which terrestrial plant SLVs were derived typically use crops as the test species, and sensitivity levels of undomesticated plant species are likely to be different from crops species. Furthermore, the types of plants found at the Landfill AOPC (ruderal vegetation and some remaining ornamental plants) are not considered sensitive species. Based on these considerations, adverse effects to the terrestrial plant community at the Landfill AOPC are not expected to occur. However, these three CPECs are recommended for further investigation in a Level III BERA because they been identified as CPECs for other receptors at the Landfill as well as plants.

Soil Invertebrates - Two metals (mercury and zinc), ethylbenzene (shallow soil only), carbazole, and total HPAHs had toxicity ratios greater than 1.0 and were assessed for their potential to elicit adverse effects in the soil invertebrate community at the Landfill AOPC. Zinc was detected in all soil samples, and mercury was detected in approximately 80% of the samples (Table I-1). Ethylbenzene was detected in 6% of soil samples collected from 0 to 1 foot bgs, and in 5% of samples collected from 0 to 3 feet bgs (not a CPEC for this depth interval). Carbazole had detection frequencies of 70% (0 to 1 foot bgs) and 72% (0 to 3 feet bgs). The maximum concentrations of zinc and carbazole were detected below 1 foot bgs, while the maximum concentrations of mercury, ethylbenzene, and most HPAHs were detected at the surface. As shown in Tables 8-1, L-1, and L-2, all of the HPAHs were detected at concentrations statistically higher than the Reference Area data.

Toxicity ratios for zinc were 5.29 and 9.50 for surface and shallow soil, respectively. However, as shown in Figure 12-7, the majority of concentrations of zinc above the SLV were between 1 and 5 times greater than the SLV for soil invertebrates (12 samples). Only two locations (maximum surface and shallow) had concentrations of zinc between 5 and 10 times the SLV, one of which is below the surface. No further assessment of zinc is recommended for soil invertebrates, given the low-level exceedances of the SLV, lack of special status soil invertebrate species at the Landfill AOPC, and because zinc is an essential nutrient (USEPA 2005-2008; and Efroymson et al. 1997b).

The toxicity ratio for ethylbenzene was 1.19, and the toxicity ratios for carbazole were 1.17 and 1.26 for surface and shallow soil, respectively (Table N-2). The only detection of ethylbenzene out of 18 samples collected from 0 to 1 foot bgs exceeded the SLV. Two of 29 samples from the 0 to 3 feet depth interval had concentrations of carbazole slightly greater than the SLV. No further assessment of ethylbenzene and carbazole are recommended for soil invertebrates, given the low and infrequent exceedances of their SLVs and lack of special status soil invertebrate species at the Landfill AOPC.

Figure 12-7 also shows observed soil concentrations compared to SLVs for mercury and HPAHs for soil invertebrates. Concentrations of mercury were greater than the SLV in 15 samples. Of these 15 SLV exceedances, three samples had concentrations between 5 and 10 times the SLV and two had concentrations between 10 and 50 times the SLV. Four of the highest detections of mercury occurred at the mercury vapor-lamp test pit, and the other occurred just east of the Pesticide/Herbicide Wash Area.

Concentrations of HPAHs were greater than the SLV in 12 samples (Figure 12-7). Of these 12 SLV exceedances, three had concentrations between 10 and 50 times the SLV, while the remaining exceedances were less than 5 times the SLV. The highest concentrations of HPAHs (between 10 and 50 times the SLV) occurred at Lead Hotspot Test Pit #1 and the Gully Test Pit.

Based on the assessment for invertebrates at the Landfill AOPC, it is possible that localized impacts could occur from exposure to the primary risk drivers: mercury and HPAHs. Effects to the soil invertebrate community are likely to be overestimated due to the assumption that these organisms are exposed to the maximum concentration of each CPEC throughout their life span. No sensitive invertebrate species are known to be present at the Landfill AOPC. Based on these considerations, adverse effects to the soil invertebrate community at the Landfill AOPC are not expected to occur. Nonetheless, mercury and HPAHs are recommended for further investigation in a Level III BERA because they been identified as CPECs for other receptors at the Landfill as well as soil invertebrates.

Birds - Five metals (antimony, cadmium, lead, mercury, and zinc), two herbicides, and B2EHP had toxicity ratios greater than 1.0 and were assessed for their potential to elicit adverse effects in individual birds at the Landfill AOPC. Antimony, lead, mercury, zinc (shallow soils only) and MCPP (an herbicide) had toxicity ratios greater than 5.0 and were assessed for potential impacts to bird populations. The approach for the Level II Screening Assessment focused on protection of birds at the individual level to account for the bald eagle, and possible transient juvenile spotted owls, but these special-status species are not likely to forage at the 1.36-acre Landfill AOPC. Owls have not been documented to occur on the island, and bald eagles have been seen roosting in the vicinity of the Landfill AOPC, but these piscivorous birds would be much more likely to forage in the adjacent River OU. Piscivorous birds were evaluated in the Level II Screening Assessment for the River OU (Section 12.5).

In the absence of an avian SLV for antimony, the Reference Area UPL for soil was used in the screening evaluation. Antimony is not considered bioaccumulative (Table J-6) and therefore, would not be expected to be present in dietary tissues at levels of concern for birds. However, antimony was identified as a CPEC for mammals at the Landfill and will be included in the Level III BERA. In the Level III BERA, antimony will be evaluated for all receptors at the Landfill AOPC for consistency purposes.

Based on the low toxicity ratios for cadmium (1.26 for the 0 to 1-foot interval and 1.52 for the 0 to 3-feet interval), high confidence in the SLV (USEPA EcoSSL), and absence of protected species of terrestrial birds, no further evaluation is recommended for cadmium.

The two herbicides with toxicity ratios greater than 1.0 were dichloroprop and MCPP. These CPECs were detected in two of 14 samples (14% detection frequency) for the 0 to 3-feet interval (Table I-1). In the absence of avian toxicity data for these herbicides, the SLV for Total DDTs was used as a surrogate. Use of DDT as a surrogate for these herbicides is expected to be very conservative due to the high bioaccumulation potential associated with DDTs, which is the basis of the SLV, compared to that of these two herbicides, which are not expected to bioaccumulate (Section 7.3 and Table J-6; log $K_{ow} < 3.5$). For these reasons, no further evaluation is recommended for dichloroprop or MCPP.

Figure 12-8 shows a sample by sample comparison to SLVs for the following CPECs that remain for birds: lead, mercury, zinc, and B2EHP. As described in Section 5.1.1, the two mercury vapor-lamp test pit samples shown in the figure (BIL28TPM and BIL29TPM) were collected from stockpiled soils that were used to backfill their respective excavation pits. The soil may have been placed anywhere within the 0-10 feet bgs depth of the test pits. Since there is no way to assign a depth at which the results for these samples occur, both samples were used to assess risk to ecological receptors exposed to surface and shallow soils.

Low toxicity ratios were calculated for zinc (2.89 for the 0 to 1-foot interval and 5.82 for the 0 to 3-feet interval) – these ratios were calculated using the Reference Area UPL as the SLV because the USEPA EcoSSL for zinc is below the site-specific UPL.

As shown on the figure, the majority of locations at the Landfill AOPC had zinc concentrations between 1 to 5 times the UPL. Only one location east of Lead Hot Spot Test Pit # 1 (BIL05SSI) had a detected zinc concentration between 5 to 10 times the UPL, and only the maximum detected concentration from the Gully Test Pit (BIL22) was between 10 and 50 times the UPL. The later sample is from a depth (1 to 3 ft bgs) where exposure to birds is reduced. Given that this sample was detected below the surface and because zinc has a low toxicity ratio for surface soil and is an essential nutrient for birds (metabolically regulated; USEPA 2005-2008), no further evaluation is recommended for zinc.

Only two detected concentrations of B2EHP were above the soil SLV. These samples, with concentrations between 1 to 5 times the SLV, were collected at the Lead Hot Spot Test Pit #1 and adjacent to that test pit. The toxicity ratios for B2EHP were relatively low (2.15 for the 0 to 1-foot interval and 1.42 for the 0 to 3-feet interval). Based on the low frequency of SLV exceedances and low magnitude of these exceedances, no further evaluation is recommended for B2EHP.

As shown on Figure 12-8, several locations had concentrations of lead and mercury in exceedance of the avian SLVs. For lead, several locations are between 1 to 5 times the SLV, eight locations are between 5 to 10 times the SLV, seven locations were between 10 to 50 times the SLV, and a single location (subsurface soil) was greater than 50 times the SLV. For mercury, the majority of the samples had concentrations between 1 to 5 times the SLV, two locations were between 5 to 10 times the SLV, two locations were between 10 to 50 times the SLV, and a single location had a concentration greater than 50 times the SLV.

The highest concentrations of these CPECs in soil (10 times or 50 times greater than the SLVs) were detected in the Mercury Vapor-Lamp Test Pit, Gully Test Pit, Lead Hot-Spot Test Pit #1, and a sample collected just outside of the Pesticide/Herbicide Wash Area. Due to the elevated toxicity ratios for lead and mercury, which are potentially bioaccumulative (mercury is known to bioaccumulate), and the fact that several locations have concentrations greater than the SLVs, further assessment or remediation of the locations with elevated lead and mercury is recommended.

In a Level III BERA to evaluate exposure to lead and mercury in soil by birds, the following site-specific factors should be considered:

- First, as discussed above, the approach for the Level II Screening Assessment focused on protection of birds at the individual level to account for the bald eagle, and possible transient juvenile spotted owls, but these special-status species are not likely to forage at the 1.36 acre Landfill AOPC. For this reasons, protection of terrestrial bird species at the population-level would be emphasized in the Level III BERA for the Upland OU.
- Second, the site-specific Reference UPLs were greater than the risk-based soil SLVs (EcoSSL for lead and Avian PRG for mercury) and, therefore, the SLVs were replaced by the UPLs in the screening evaluation. In addition to evaluating specific bird target species and using literature-based BAFs to estimate dose, the contribution of background levels of metals would also be considered to better understand site-related dose contribution.

- Third, the size of the Landfill AOPC relative to the size of a birds' home range would be factored into the daily dose estimation.

Mammals - Four metals (antimony, lead, mercury, and zinc), two herbicides, dibenzofuran and HPAHs had toxicity ratios greater than 5.0 and were assessed for their potential to elicit adverse effects in mammal populations at the Landfill AOPC. As shown in Tables 8-1, L-1, and L-3, all of the HPAHs were detected at concentrations statistically higher than the Reference Area data.

The two herbicides with toxicity ratios greater than 5.0 were dichloroprop and MCPP. As discussed above for birds, these CPECs were detected in two of 14 samples (14% detection frequency for the 0 to 3-feet interval; Table I-1). In the absence of chemical-specific SLVs for these herbicides, the mammal SLV for Total DDTs was used as a surrogate. Use of DDT as a surrogate for these herbicides is expected to be very conservative due to the high bioaccumulation potential associated with DDTs, which is the basis of the SLV, compared to that of the two herbicides, which are not expected to bioaccumulate (Table J-6; log K_{ow} < 3.5). For these reasons, no further evaluation is recommended for of dichloroprop and MCPP.

Figure 12-9 shows a sample by sample comparison to SLVs for the following CPECs that remain for mammals: antimony, lead, mercury, zinc, dibenzofuran, and total HPAHs. Several locations had concentrations of these CPECs in exceedance of the mammal SLVs, and the highest concentrations of these CPECs in soil (10 times or 50 times greater than the SLVs) were detected in the Mercury Vapor-Lamp Test Pit, the Gully Test Pit, Lead Hot Spot Test Pit #1, and a couple of locations in and near the Pesticide/Herbicide Wash Area. There were also a few elevated detections just outside the boundaries of the Gully Test Pit and Lead Hot Spot Test Pit #1.

Based on the low toxicity ratios for zinc (<5.0 for the 0 to 1-foot interval and 5.28 for the 0 to 3-feet interval), high confidence in the SLV (USEPA EcoSSL), and because zinc is an essential nutrient for mammals (metabolically regulated), no further evaluation is recommended for zinc.

Dibenzofuran in soil does have the potential to bioaccumulate (log K_{ow} < 3.5), but little toxicity data exist to evaluate the consumption pathway for mammals. TRVs could not be found in USEPA or Oak Ridge National Laboratory (ORNL) publications or databases, nor does USEPA's Integrated Risk Information System (IRIS) database provide an oral reference dose for dibenzofuran. Given the lack of toxicity data, a meaningful Level III BERA is not possible for dibenzofuran, and no further evaluation is recommended for this COPC. Furthermore, as shown on Figure 12-9, dibenzofuran co-occurred with elevated detections of the other risk-driver CPECs at the following main areas of the Landfill: Lead Hot Spot Test Pit #1 (lead and HPAHs), Mercury Vapor-Lamp Test Pit (antimony, mercury and HPAHs), and Gully Test Pit (lead, and HPAHs). A few other locations just outside of the boundaries of the Lead Hot Spot and Gully Test Pits demonstrate co-occurrence of dibenzofuran with these other CPECs. Since antimony, lead, mercury, and HPAHs are recommended for further investigation and there is more confidence in the available data for these CPECs, lack of a site-specific evaluation of dibenzofuran is a manageable uncertainty for the Upland OU ERA.

Due to toxicity ratios greater than 10 times the SLV for antimony, lead, mercury, and total HPAHs, which are potentially bioaccumulative (with the exception of antimony), and the fact that several locations had concentrations greater than the SLVs, further investigation of these CPECs is recommended in the form of a Level III BERA or remediation of the locations with elevated concentrations.

In a Level III BERA to evaluate exposure to antimony, lead, mercury, and HPAHs in soil by mammals, site-specific factors should be considered. In addition to evaluating specific mammal target species and using literature-based BAFs to estimate dose, the contribution of background levels of metals would also be considered to better understand site-related dose contribution. Also, the size of the Landfill AOPC relative to the size of a mammals' home range would be factored into the daily dose estimation.

Aquatic Organisms and Aquatic-Dependent Wildlife - Four metals (barium, iron, manganese and zinc) and B2EHP had toxicity ratios greater than 1.0 for groundwater and were assessed for their potential to elicit adverse effects in individual aquatic organisms or wildlife that could be exposed to surface water that has been impacted by COIs in groundwater of the Landfill AOPC. Barium, iron, manganese, and zinc had toxicity ratios greater than 1.0 for seep water, of which barium and manganese had toxicity ratios above 5.0. No CPECs were identified in the surface water samples that are co-located with the seep samples.

Based on the low toxicity ratios for zinc in groundwater and seep water (2.56 and 1.12, respectively), and the absence of a detection in co-located surface water, and because zinc is an essential nutrient (metabolically regulated), no further evaluation is recommended for zinc.

Figure 12-10 compares observed concentrations to SLVs for aquatic biota for the following CPECs: barium, iron, manganese, and B2EHP. The direction of groundwater flow beneath the Landfill AOPC is to the north. B2EHP was detected above the SLV in two groundwater wells (MW-1 and MW-2). MW-2 is the well farthest from the shoreline (south) of the River OU, and MW-1 is approximately 60 feet from the shoreline. This CPEC was not detected in other wells located closer to the shoreline and was not detected in seep or co-located surface water. Based on these reasons and given the generally low toxicity ratio for groundwater (1.57), no further evaluation is recommended for B2EHP.

Neither USEPA National Recommended Water Quality Criteria (NRWQC; USEPA 2009) nor DEQ WQC (Table 33A) were available for barium and manganese. Therefore, DEQ's Level II SLVs for surface water were used, which are Tier II secondary chronic values (Suter and Tsao 1996). Confidence in these surface water SLVs is lower than in SLVs derived from the NRWQC or WQC. The surface water SLV used for iron is a DEQ WQC.

Dissolved barium concentrations exceeded the SLV in three groundwater samples (Figure 12-10). The maximum detected dissolved phase barium concentration occurred in a seep sample collected in 2000 ("SEEP"). In the absence of dissolved barium data for wells MW-1 and MW-5 through MW-9, total barium concentrations from these wells are shown on Figure 12-10 for these wells. Using data from unfiltered samples contributes to an overestimate of risk to aquatic biota since the SLVs are typically based on the dissolved phase, as this is the most bioavailable fraction. All dissolved and total concentrations of barium in Landfill and Reference Area groundwater exceeded the surface water SLV for barium, illustrating the conservativeness of the SLV.

Iron is well known to occur in leachate from landfills, and was detected in Landfill AOPC groundwater at concentrations exceeding the surface water SLVs in 15 samples representing four monitoring wells (Figure 12-10). It was also detected at approximately three times the SLV in the seep sample collected in 2000. The toxicity ratios for groundwater and seep water were 31 and 3.21, respectively (Table N-5), and the mean concentration of iron in groundwater generated a toxicity ratio of 9.8 (the mean seep concentration is below the SLV). Iron was not detected

above the SLV in the seep samples collected in 2008 and 2009 (S2 and S4). The co-located surface water samples result in an iron toxicity ratio of 0.0092 (Table N-5). Given the low detections of iron in seep and co-located surface water, which are more likely to represent actual exposure by aquatic biota, and because iron is an essential nutrient, no further evaluation is recommended for iron.

Manganese concentrations were above the SLV in several of the groundwater wells, and were co-located with elevated levels of barium and iron. Manganese was approximately ten times the SLV in the seep sample collected in 2000. The toxicity ratios for groundwater and seep water were 29.2 and 12.3, respectively (Table N-5), and the mean concentrations of manganese (dissolved) in groundwater and seep water generated toxicity ratios of 9.0 and 2.4, respectively. Manganese was not detected above the SLV in the seep samples collected in 2008 and 2009 or in the co-located surface water samples (toxicity ratio of 0.00842). Given the low detections of manganese in seep and co-located surface water, which are more likely to represent actual exposure by aquatic biota, no further evaluation is recommended for manganese.

Concentrations of iron and manganese measured in the seep sample collected in 2000 were two orders of magnitude higher than those measured in 2008 and 2009. Although barium was not analyzed for in the new seep samples, it is likely that concentrations of this CPEC have also decreased. Based on this trend in the data, the low concentrations of CPECs in seep and surface water samples compared to the groundwater samples from interior of the Landfill AOPC, and the other lines of evidence discussed above for each CPEC, no further investigation of groundwater at the Landfill AOPC is recommended to protect aquatic biota.

12.3.4.3.2 Sandblast Area AOPC

Terrestrial Plants - Seven metals (antimony, arsenic, chromium, lead, nickel, selenium and zinc), o-xylene (shallow soils only), PCE (shallow soils only), LPAHs (shallow soils only) and HPAHs have toxicity ratios greater than 1.0 and were assessed for their potential to elicit adverse effects in the plant community at the Sandblast Area AOPC. Chromium, lead, nickel, and zinc were detected in all soil samples, while arsenic was detected in 98% to 99% of the samples (Table I-2). Antimony was detected in 71% to 73% of the samples, and selenium was detected 52% to 57% of the samples. o-xylene and PCE were detected in 11% of the samples collected from the 0 to 3 foot depth interval. LPAHs and HPAHs were detected in nearly all samples. Maximum concentrations of all seven metals were detected at the surface, while the maximum concentrations of o-xylene, PCE and several PAHs were detected below 1 foot bgs (maximum concentrations of some individual PAHs were detected at the surface). As shown in Tables 8-1, L-1, and L-2, all of the PAHs were detected at concentrations statistically higher than the Reference Area data.

Four samples had antimony concentrations in exceedance of the plant SLV, all of which were detected in the surface soil interval. The maximum concentration (SBB12) resulted in a relatively low toxicity ratio of 2.74. Therefore, adverse effects to the terrestrial plant community at the Sandblast AOPC are not expected to occur. However, antimony is recommended for further investigation in a Level III BERA because it was also identified as a CPEC for mammals at the Sandblast Area AOPC (see below). In the Level III BERA, antimony will be evaluated for all receptors at the Sandblast Area AOPC for consistency purposes.

No further assessment of arsenic is recommended for plants, given the low, limited exceedances of the SLV and lack of special status plant species at the Sandblast Area AOPC. Only the three

highest detected concentrations of arsenic exceeded the plant SLV (DSA07, DSA11, and SBB18), all of which were detected in the surface soil interval. The maximum concentration, which was detected near the southwest corner of the current HSMA (SBB18), resulted in a relatively low toxicity ratio of 4.49.

No further assessment of selenium is recommended for plants, given the low toxicity ratio of 1.73 and lack of sensitive plant species at the Sandblast Area AOPC. Although selenium is one of the few metals with the potential for significant bioaccumulation, it was not identified as a CPEC for birds and mammals.

No further assessment of LPAHs is recommended for plants, given the low, single exceedance of the SLV and lack of special status plant species at the Sandblast Area AOPC. The toxicity ratio for Total LPAHs of 1.31 for the 0 to 3 feet interval is driven primarily by concentrations of phenanthrene, and secondarily by concentrations of anthracene (Table N-11). Only the maximum concentration, which was detected below the surface, exceeded the SLV for plants. The toxicity ratio for the 0 to 1 foot depth is 0.569.

No further evaluation of o-xylene and PCE is recommended for plants, given that only the maximum concentration of each exceeded the SLVs, and were located in a single sample below the surface. In addition, the toxicity ratios for the 0 to 1 foot depth are notably low at 0.00018 (o-xylene) and 0.00031 (PCE) (Table N-11).

Figure 12-11 shows a sample by sample comparison to SLVs for the following CPECs for plants:, chromium, lead, nickel, zinc, and HPAHs.

The toxicity ratio for zinc based on the maximum concentration, which was detected in the surface soil interval, is 7.25 (Table N-12). When the 95% UCL (212 mg/kg) or mean (173 mg/kg) zinc concentrations in the 0 to 1-foot interval are used, the toxicity ratio drops to 1.3 and 1.08, respectively. With the exception of the maximum concentration of zinc at SBB15, all remaining locations with exceedances of the SLV shown on Figure 12-11 have concentrations between 1 and 5 times the SLV. Therefore, no further assessment of zinc is recommended for plants, given the low exceedances of the SLV, lack of special status plant species at the Sandblast Area AOPC, high confidence in the SLV (USEPA EcoSSL), and the fact that zinc is an essential nutrient for plants.

Chromium concentrations exceeded 5 times the SLV at 25 surface locations, seventeen of which were between 10 and 50 times the SLV and three were greater than 50 times the SLV. Lead exceeded 5 times the SLV at 11 surface locations and 1 subsurface location, of which, only one surface location was between 10 and 50 times the SLV. Nickel exceeded 5 times the SLV at 16 surface locations, ten of which were between 10 and 50 times the SLV. The majority of the chromium, lead, and nickel exceedances occurred throughout the spent sandblast grit disposal area and surrounding CB-1.

Total HPAH concentrations exceeded 5 times the SLV at 10 surface locations, of which five had concentrations between 10 and 50 times the SLV, and one had a concentration greater than 50 times the SLV (HA-3). Total HPAH concentrations also exceeded the SLV at two subsurface locations, one of which had a concentration between 10 and 50 times the SLV, and one had a concentration greater than 50 times the SLV. The locations with elevated HPAH concentrations occur in the northeast portion of the equipment laydown area, adjacent to the current HMSA, adjacent to the roadway in the south, and within the area of erodible soils within the AOPC.

Based on the assessment for plants at the Sandblast Area AOPC, it is possible that impacts could occur from exposure to the primary risk drivers: chromium, lead, nickel, and HPAHs. However, the studies upon which terrestrial plant SLVs were derived typically use crops as the test species, and sensitivity levels of undomesticated plant species are likely to be different than crop species. Potential effects to the plant community are likely to be overestimated due to the assumption that these organisms are exposed to the maximum concentration of each CPEC throughout their life span. No sensitive plant species are known to be present at the Sandblast Area AOPC.

However, due to the elevated toxicity ratios for chromium, lead, nickel, and HPAHs, further investigation of these CPECs is recommended in the form of either a Level III BERA or remediation at the locations of highest elevations: the northeastern portion of the equipment laydown area, south of the current HMSA, within the central portion of the spent sandblast grit area, and around CB-1.

Soil Invertebrates - Five metals (arsenic, chromium, lead, nickel, and zinc), and HPAHs have toxicity ratios greater than 1.0 and were assessed for their potential to elicit adverse effects in the soil invertebrate community at the Sandblast Area AOPC. Chromium, lead, nickel and zinc were detected in all soil samples. Arsenic was detected in 98% to 99% of the samples, while the detections of individual HPAHs varied. Maximum concentrations of all five metals were detected at the surface, while the maximum concentration of total HPAHs was detected below 1 foot bgs. As shown in Tables 8-1, L-1 and L-2, all of the HPAHs were detected at concentrations statistically higher than the Reference Area data.

No further assessment of arsenic is recommended for soil invertebrates, given the low, single exceedance of the SLV and lack of special status invertebrate species at the Sandblast Area AOPC. Only the maximum concentration of arsenic exceeded the invertebrate SLV, resulting in a low toxicity ratio of 1.35.

Only the maximum concentration of lead exceeded the soil invertebrate SLV, resulting in a toxicity ratio of 1.92. Given the low, single exceedances of the SLV and lack of special status invertebrate species at the Sandblast Area AOPC, adverse effects to the soil invertebrate community are not expected to occur from exposure to lead. However, lead is recommended for further investigation if a Level III BERA is performed because it was identified as a CPEC for other receptors at the Sandblast Area AOPC as well as soil invertebrates.

Figure 12-12 shows a sample by sample comparison to SLVs for the following CPECs for soil invertebrates: chromium, nickel, zinc, and HPAHs.

No further assessment of nickel is recommended for soil invertebrates, given the low exceedances of the SLV (Figure 12-12) and lack of special status invertebrate species at the Sandblast Area AOPC. The toxicity ratio for nickel based on the maximum concentration is 3.79 (Table N-12), and when the 95% UCL (353 mg/kg) or mean (167 mg/kg) nickel concentrations for the 0 to 1-foot interval are used the toxicity ratio drops to 1.26 and 0.60, respectively. All locations with exceedances of the SLV shown on Figure 12-12 have concentrations between 1 and 5 times the SLV (primarily within Spent Sandblast Grit Disposal Area).

No further assessment of zinc is recommended for soil invertebrates, given the relatively low exceedances of the SLV, lack of special status soil invertebrate species at the Sandblast Area AOPC, high confidence in the SLV (USEPA EcoSSL), and the fact that zinc is an essential nutrient for invertebrates. The toxicity ratio for zinc based on the maximum concentration is 9.67

(Table N-12), and when the 95% UCL (212 mg/kg) or mean (173 mg/kg) zinc concentrations are used the toxicity ratio drops to 1.77 and 1.44, respectively.

Four samples had concentrations of total HPAHs greater than the SLV for soil invertebrates, and one sample had a concentration greater than 5 times the SLV. The toxicity ratios of 4.02 for surface soils and 5.84 for shallow soils are driven primarily by concentrations of fluoranthene and pyrene. Concentrations of chromium were greater than 5 times the SLV at 25 surface soil locations, of which sixteen were between 10 and 50 times the SLV and three were greater than 50 times the SLV. The majority of the chromium exceedances occurred throughout the spent sandblast grit disposal area and surrounding CB-1.

Based on the assessment for soil invertebrates at the Sandblast Area AOPC, it is possible that localized impacts could occur from exposure to the primary risk drivers: chromium, and to a lesser extent, HPAHs. Potential effects to the soil invertebrate community are likely to be overestimated due to the assumption that these organisms are exposed to the maximum concentration of each CPECs throughout their life span. No sensitive invertebrate species are known to be present at the Sandblast Area AOPC. Due to the elevated toxicity ratios for chromium, further investigation of this CPEC is recommended in the form of either a Level III BERA or remediation at the locations of highest elevations: south of the Current HMSA, within the central portion of the spent sandblast grit disposal area, and around CB-1.

Given the lower and less frequent exceedances of the SLV for HPAHs, the potential for adverse effects to the soil invertebrate community from exposure to HPAHs is expected to be lower than for chromium. However, HPAHs are recommended for further investigation if a Level III BERA is performed because they were identified as a CPEC for other receptors at the Sandblast Area AOPC as well as soil invertebrates.

Birds - Six metals (antimony, cadmium, chromium, lead, nickel, and zinc), Total DDTs (surface soil only), and B2EHP had toxicity ratios greater than 1.0 and were assessed for their potential to elicit adverse effects in the individual birds at the Sandblast Area AOPC. Antimony, chromium, lead, and B2EHP had toxicity ratios greater than 5.0 and were assessed for potential impacts to bird populations.

In the absence of an avian SLV for antimony, the Reference Area UPL for soil was used in the screening evaluation. Antimony is not considered bioaccumulative (Table J-6) and therefore, would not be expected to be present in dietary tissues at levels of concern for birds. No further evaluation is recommended for antimony.

As stated previously in the Landfill AOPC risk interpretation, there are no protected species of terrestrial birds at the site. Based on the low toxicity ratios for nickel (1.68 for the 0 to 1-foot interval and 1.2 for the 0 to 3-feet interval), high confidence in the SLV (USEPA EcoSSL), and absence of protected species of terrestrial birds, no further evaluation is recommended for nickel.

The toxicity ratio for Total DDTs is essentially equivalent to 1.0 for the 0 to 1-foot interval (toxicity ratio of 1.029). 4,4'-DDT has the highest toxicity ratio of 0.347, and the toxicity ratios for the remaining two isomers are much lower (0.0078 for 4,4'-DDD and 0.0068 for 4,4'-DDE). The slight exceedance of 1.0 by the estimated concentration of Total DDTs is likely an artifact of the summation process. Based on the low toxicity ratios for Total DDTs, high confidence in the SLV (USEPA EcoSSL), and absence of protected species of terrestrial birds, no further evaluation is recommended for Total DDTs or the individual DDT isomers.

Figure 12-13 shows a sample by sample comparison to SLVs for the following CPECs that remain for birds: cadmium, chromium, lead, zinc, and B2EHP. The ratios for chromium, lead, and zinc were calculated using the Reference Area UPL as the SLV because the USEPA EcoSSLs for these metals are below the site-specific UPLs.

Low toxicity ratios were calculated for cadmium (4.16 for the 0 to 1-foot interval and 3.42 for the 0 to 3-feet interval) and zinc (2.96 for the 0 to 1-foot interval and 3.31 for the 0 to 3-feet interval) (Table N-13). As shown on the figure, the majority of locations at the Sandblast Area AOPC had concentrations of cadmium and zinc ranging between 1 to 5 times the SLV/UPL. Cadmium concentrations were between 5 and 10 times the SLV at three locations and between 10 and 50 times the SLV at three additional locations, all of which were located in the northeastern portion of the equipment laydown area. Zinc concentrations were between 5 and 10 times the UPL at a five scattered locations and between 10 and 50 times the UPL at a single location adjacent to the road east of the former sandblast building. Given that the equipment laydown area with the elevated cadmium concentrations is actively used and currently covered by equipment, the location with the maximum concentration of zinc is adjacent to an active roadway the fact that zinc is an essential nutrient for birds, and the low toxicity ratios, no further evaluation is recommended for cadmium or zinc. If, in the future, the equipment is removed and the habitat at the equipment laydown area is allowed to naturally restore, the potential for risk tor birds may need to be reevaluated.

As shown on Figure 12-13, B2EHP concentrations were between 1 and 5 times the SLV at eight surface soil locations and two subsurface soil locations. Only one surface soil location had a concentration of B2EHP between 10 and 50 times the SLV and only one surface soil sample had a concentration greater than 50 times the SLV, both of which were composite samples of the erodible area north of the former sandblast building. Many of the surface soil and several subsurface soil locations had concentrations of chromium and lead in exceedance of the Reference Area UPLs. The highest concentrations of these metals in soil (greater than 5 times the UPLs) were detected throughout the spent sandblast grit disposal area, the equipment laydown area, surrounding CB-1, within the area of erodible soils, and at two locations along the southeastern roadway. The locations with the highest concentrations (greater than 50 times the UPL) of chromium and lead were located along the northern area of the spent sandblast grit disposal area (HA6 through HA8; chromium and others for lead) and in the northern equipment laydown area (HA3), respectively.

Due to the elevated toxicity ratios for chromium, lead, and B2EHP, which are potentially bioaccumulative and the fact that several locations had concentrations greater than the SLVs, further investigation of these CPECs is recommended in the form of either a Level III BERA or remediation of the locations with elevated locations described above. In a Level III BERA to evaluate exposure to chromium, lead, and B2EHP in soil by birds, the following site-specific factors should be considered:

1. As previously described in the Sandblast Area AOPC risk interpretation, the approach for the Level II Screening Assessment focused on protection of birds at the individual level to account for the bald eagle, and possible transient juvenile spotted owls. However, these special-status species are not likely to forage at the 3.1 acre Sandblast Area AOPC and protection of terrestrial bird species at the population-level would be emphasized in the BERA for the Upland OU.

2. The site-specific Reference UPLs were greater than the risk-based soil SLVs (EcoSSLs) for chromium and lead and, therefore, the SLVs were replaced by the UPLs in the screening evaluation. In addition to evaluating specific bird target species and using literature-based BAFs to estimate dose, the contribution of background levels of metals would also be considered to better understand site-related dose contribution.
3. The size of the Sandblast Area AOPC relative to the size of a birds' home range would be factored into the daily dose estimation.

Mammals - Four metals (antimony, cadmium, chromium, and lead), dibenzofuran, and total HPAHs had toxicity ratios greater than 5.0 and were assessed for their potential to elicit adverse effects in mammal populations at the Sandblast Area AOPC. As shown in Tables 8-1, L-1 and L-2, all of the HPAHs were detected at concentrations statistically higher than the Reference Area data.

Figure 12-14 shows a sample by sample comparison to SLVs for the following CPECs that remain for mammals: antimony, cadmium, chromium, lead, dibenzofuran, and total HPAHs. Several locations had concentrations of these CPECs in exceedance of the mammal SLVs. The highest concentrations of these CPECs in soil (greater than 10 times the SLVs) were detected along the roadway in the southern portion of the AOPC, in the northeastern portion of the equipment laydown area, within the spent sandblast disposal area, in the erodible soils north of the former sandblast building, and around CB-1.

Due to the elevated toxicity ratios for antimony, cadmium, chromium, lead, and total HPAHs (Table N-14), which are potentially bioaccumulative with the exception of antimony, and the fact that several locations have concentrations greater than the SLVs (EcoSSLs that account for bioaccumulation), further investigation of these CPECs is recommended in the form of a Level III BERA or remediation of the locations with elevated concentrations. Antimony is not considered bioaccumulative (Table J-6) and therefore, would not be expected to be present in dietary tissues at levels of concern for mammals. However, due to the elevated toxicity ratios for this CPEC, which is based on the EcoSSL, additional evaluation is warranted. Studies have also demonstrated that PAHs are rapidly metabolized upon ingestion by birds and mammals, according to the USEPA EcoSSLs guidance document (2005a), and the potential for bioaccumulation in terrestrial habitats of PAHs is expected to be limited.

Dibenzofuran in soil does have potential to bioaccumulate, but little toxicity data exist to evaluate the consumption pathway for mammals precluding a meaningful Level III BERA for this CPEC. TRBs could not be found in USEPA or ORNL publications or databases, nor does USEPA's IRIS database provide an oral reference dose for dibenzofuran. As shown on Figure 12-14, dibenzofuran co-occurs with elevated detections of the other risk-driver CPECs at the northeastern portion of the equipment laydown area (cadmium, lead, and/or HPAHs), south of the current HMSA (HPAHs), and along the roadway in the southern portion of the AOPC (HPAHs). Since cadmium, lead, and HPAHs are recommended for further investigation and there is more confidence in the available data for these CPECs, lack of a site-specific evaluation of dibenzofuran is a manageable uncertainty for the Upland OU ERA. For these reasons, no further evaluation is recommended for dibenzofuran.

In a Level III BERA to evaluate exposure to antimony, cadmium, chromium, lead, and total HPAHs in soil by mammals, site-specific factors should be considered. In addition to evaluating specific mammal target species and using literature-based BAFs to estimate dose, the

contribution of background levels of metals would also be considered to better understand site-related dose contribution. Also, the size of the Sandblast Area AOPC relative to the size of a mammals' home range would be factored into the daily dose estimation.

Aquatic Organisms and Aquatic-Dependent Wildlife - Only one COI, cis-1,2-DCE, has a toxicity ratio greater than 1.0 and was assessed for its potential to elicit adverse effects in individual aquatic organisms or wildlife that could be exposed to surface water that has been impacted by COIs in groundwater from the Sandblast Area AOPC. However, based on the low toxicity ratio for cis-1,2-DCE (1.12; Table N-15), that it is not expected to bioaccumulate (log Kow < 3.5, Table J-6), and the fact that the wells immediately down gradient and adjacent to the river have concentrations below the SLV (Figure 12-15), no further evaluation is recommended for cis-1,2-DCE and no further investigation of groundwater at the Sandblast Area AOPC is recommended for protection of aquatic biota.

12.3.4.3.3 Pistol Range AOPC

Terrestrial Plants - Lead and zinc had toxicity ratios greater than 1.0 and were assessed for their potential to elicit adverse effects in the plant community at the Pistol Range AOPC. Lead was detected in all soil samples (63 total from 0 to 1.5 feet bgs) at concentrations ranging from 7.5 to 1,100 mg/kg (Table I-3). Zinc was detected in all soil samples (10 total from 0 to 1.5 feet bgs) at concentrations ranging from 74 to 199 mg/kg (Table I-3). Based on the low toxicity ratio for zinc (1.24), high confidence in the SLV (USEPA EcoSSL), the fact that zinc is an essential nutrient, and the absence of protected species of terrestrial plants, no further evaluation is recommended for zinc.

Figure 12-16 shows a sample by sample comparison of lead concentrations to plant SLVs. The highest concentrations of lead, including the maximum concentration, were detected at and behind the backstop. Lead concentrations in this area of the site range between 5 and 10 times the SLV. The toxicity ratio for lead based on the maximum concentration is 9.25 (Table N-21), and when the 95% UCL (365 mg/kg) or mean (208 mg/kg) lead concentrations are used the toxicity ratio drops to 3.04 and 1.73, respectively.

Currently, the ground surface is vegetated with a mix of scrub-shrub and herbaceous vegetation, with no special status plant species. A meadow covers the firing range, and the hillside behind the backstop is densely vegetated with herbaceous vegetation and shrub/forest fringe communities.

Based on the assessment for plants at the Pistol Range AOPC, it is possible that very localized impacts could occur from exposure to lead, although no visible signs of distress have been observed in the areas with highest lead concentrations. Potential effects to the terrestrial plant community are likely overestimated due to the assumption that these organisms are exposed to the maximum concentration of each CPEC throughout their life span. In addition, the studies upon which terrestrial plant SLVs were derived typically use crops as the test species, and sensitivity levels of undomesticated plant species are likely to be different than crops species. Based on these considerations, adverse effects to the terrestrial plant community at the Pistol Range are not expected to occur. However, lead is recommended for further investigation if a Level III BERA is performed because it was identified as a CPEC for other receptors at the Sandblast Area AOPC as well as plants..

Soil Invertebrates - Zinc has a toxicity ratio greater than 1.0 and was assessed for its potential to elicit adverse effects in the soil invertebrate community at the Pistol Range AOPC. Zinc was detected in all soil samples (10 total from 0 to 1.5 feet bgs) at concentrations ranging from 74 to 199 mg/kg (Table I-3). Based on the low toxicity ratio for zinc (1.66), high confidence in the SLV (USEPA EcoSSL), the fact that zinc is an essential nutrient, and the absence of protected species of soil invertebrates, no further evaluation is recommended for zinc.

Birds - Lead and zinc had toxicity ratios greater than 1.0 and were assessed for their potential to elicit adverse effects in individual birds at the Pistol Range AOPC. Of these two CPECs, only lead had a toxicity ratio greater than 5.0 and was assessed for potential impacts to bird populations. Figure 12-16 shows a sample by sample comparison to the SLVs for lead and zinc for birds. The toxicity ratios for lead and zinc were calculated using the Reference Area UPL as the SLV because the USEPA EcoSSLs for these metals are below the site-specific UPLs.

As shown on Figure 12-16, six locations near the former firing shed had zinc concentrations ranging between 1 to 5 times the SLV/UPL. The toxicity ratio for zinc was 2.06 (Table N-23). As stated previously in the Landfill AOPC risk interpretation, there are no protected species of terrestrial birds at the site. Based on the low toxicity ratio for zinc, absence of protected species of terrestrial birds, and because zinc is an essential nutrient for birds (metabolically regulated), no further evaluation is recommended for zinc.

The toxicity ratio for lead was 14.3 (Table N-23), and the highest concentrations of lead were detected at and behind the backstop. Although the majority of lead concentrations were between 1 to 5 times the SLV, lead concentrations were between 5 and 10 times the SLV at five locations around the former firing shed and between 10 and 50 times the SLV at nine locations around the backstop and at two locations around the former firing shed. Due to the elevated toxicity ratio for lead, which is potentially bioaccumulative, and the fact that several locations have concentrations greater than the SLV, further investigation of this CPECs is recommended in the form of either a Level III BERA or remediation of the locations with elevated locations described above. In a Level III BERA to evaluate exposure to lead in soil by birds, the following site-specific factors should be considered.

1. As previously described in the Landfill AOPC risk interpretation, the approach for the Level II Screening Assessment focused on protection of birds at the individual level to account for the bald eagle, and possible transient juvenile spotted owls; however, these special-status species are not likely to forage at the 0.26-acre Pistol Range AOPC and protection of terrestrial bird species at the population-level would be emphasized in the BERA for the Upland OU.
2. The site-specific Reference UPL was greater than the risk-based soil SLV (EcoSSL) for lead and, therefore, the SLV was replaced by the UPL in the screening evaluation. In addition to evaluating specific bird target species and using literature-based BAFs to estimate dose, the contribution of background levels of lead would also be considered to better understand site-related dose contribution.
3. The small size of the Pistol Range AOPC and the size of a birds' home range would be factored into the daily dose estimation.
4. A qualitative evaluation of the potential bioavailability of lead originating from the former firing range activities (i.e., lead shot) would be performed.

Mammals - Only lead had a toxicity ratio greater than 5.0 and was assessed for its potential to elicit adverse effects in mammal populations at the Pistol Range AOPC. The toxicity ratio for lead was 6.52 (Table N-24), and the highest concentrations of lead were detected at and behind the backstop. Lead concentrations were between 10 and 50 times the SLV at six locations around the backstop and at one location on the eastern corner of the former firing shed. Two other locations near the backstop had lead concentrations between 5 and 10 times the SLV. Lead was elevated above the SLV/UPL in 14 of the 63 soil samples collected. Due to the elevated toxicity ratio for lead, which is potentially bioaccumulative, and the fact that several locations have concentrations greater than the SLV, further investigation of this CPEC is recommended in the form of either a Level III BERA or remediation of the locations with elevated locations described above.

In a Level III BERA to evaluate exposure to lead in soil by mammals, site-specific factors should be considered. In addition to evaluating specific mammal target species and using literature-based BAFs to estimate dose, the contribution of background levels of metals would also be considered to better understand site-related dose contribution. Also, the size of the Pistol Range AOPC and the size of a mammals' home range would be factored into the daily dose estimation.

Aquatic Organisms and Aquatic-Dependent Wildlife - Although no CPECs were identified for the aquatic organisms potentially exposed to groundwater at the Pistol Range AOPC (based on their toxicity ratios all less than 1.0), zinc, a bioaccumulative COI, was retained as a CPEC due to the lack of a dietary-based SLV.

Benthic Invertebrates - Zinc has a toxicity ratio slightly greater than 1.0 (1.41), and the maximum concentration of zinc in lagoon sediment (174 mg/kg; Table I-14) was higher than the concentration detected in random Forebay sediment samples (113 mg/kg; Table I-18a). However, the low toxicity ratio for zinc detected in lagoon sediment and lack of special status benthic invertebrate species suggests a low potential for risk to the benthic community in the lagoon from exposure to zinc.

As mentioned previously, sediment samples from the lagoon were collected to determine if any COIs that could have originated from the former Pistol Range AOPC should be added to the list of COIs evaluated for the River OU. Zinc was assessed for its potential to elicit adverse effects in the benthic invertebrate community in the ERA for the River OU through an evaluation of zinc detected in sediment of the River (Section 12.5). Protection of the benthic community in the River is discussed in that section of the ERA.

Fish and Aquatic-Dependent Wildlife - The maximum detected concentrations of lead and zinc in lagoon sediment were greater than the Reference Area UPLs, which were used in the absence of sediment SLVs that are protective of fish and wildlife. Maximum concentrations of lead and zinc in lagoon sediment (33 and 174 mg/kg, respectively; Table I-14) were higher than concentrations detected in random Forebay sediment samples (16.8 and 113 mg/kg, respectively; Table I-18a). However, these metals were evaluated for their potential to bioaccumulate in the ERA for the River OU through an evaluation of these metals in detected in site tissue samples (Section 12.5), and the protection of fish and aquatic-dependent wildlife is discussed in that section of the ERA.

12.3.4.3.4 Bulb Slope AOPC

Terrestrial Plants – Lead and mercury had toxicity ratios greater than 1.0 and were assessed for their potential to elicit adverse effects in the plant community at the Bulb Slope AOPC. Lead was detected in all soil samples (12 total from 0 to 1-foot bgs) at concentrations ranging from 25 to 597 mg/kg (Table I-4). Mercury was also detected in all soil samples (12 total from 0 to 1-foot bgs) at concentrations ranging from 0.05 to 1.54 mg/kg (Table I-4). The topography is steep and the substrate at the Bulb Slope AOPC consists of a mixture of soils, rock that may have been placed in some areas, and what appear to be natural rock outcrops, all of which is underlain by siltstone bedrock. The majority of the Bulb Slope AOPC is herbaceously vegetated and/or covered with organic debris.

Figure 12-17 shows a sample by sample comparison of soil concentrations to the plant SLV for lead and mercury. The toxicity ratio for lead based on the maximum concentration was 4.98 (Table N-35), and when the 95% UCL of 307 mg/kg or mean of 222 mg/kg lead concentrations at 0 to 1 foot (Table I-15) are used the toxicity ratio dropped to 2.6 and 1.85, respectively. Nine samples had concentrations in exceedance of the SLV, and no samples have concentrations in exceedance of 5 times the SLV.

The toxicity ratio for mercury based on the maximum concentration was 5.13 (Table N-35), and when the 95% UCL of 0.72 mg/kg or mean of 0.4 mg/kg mercury concentrations (Table I-15) are used the toxicity ratio dropped to 2.4 and 1.35, respectively. Six samples had concentrations in exceedance of the SLV (between the SLV and 5 times the SLV), and only one of these six samples (Pile #3 Bank #4) had a concentration between 5 and 10 times the SLV (Figure 12-17).

Given the relatively low exceedances of the plant SLVs for lead and mercury and lack of special status plant species at the Bulb Slope AOPC, the potential for adverse effects to the terrestrial plant community is expected to be limited. However, these CPECs are recommended for further investigation in a Level III BERA because they were identified as CPECs for other receptors at the Bulb Slope Area AOPC as well as plants.

Soil Invertebrates - Mercury had a toxicity ratio greater than 1.0 and was assessed for its potential to elicit adverse effects in the invertebrate community at the Bulb Slope AOPC. As stated above, mercury was detected in all soil samples, with concentrations ranging from 0.05 to 1.54 mg/kg.

Figure 12-17 shows a sample by sample comparison of soil concentrations to the invertebrate SLV for mercury. Nine soil samples had concentrations in exceedance of the SLV, and three of these nine samples had concentrations higher than 5 times the SLV (one of these also exceeded ten times the SLV). The toxicity ratio for mercury based on the maximum concentration was 15.4 (Table N-36), and when the 95% UCL (0.72 mg/kg) or mean (0.4 mg/kg) mercury concentrations (Table I-15) were used the toxicity ratio dropped to 7.2 and 4.0, respectively.

Based on the number of exceedances of the soil invertebrate SLVs for mercury and elevated toxicity ratios, further investigation of this CPEC is recommended in the form of either a Level III BERA or remediation of the locations with elevated locations.

Birds - Lead and mercury had toxicity ratios greater than 1.0 and were assessed for their potential to elicit adverse effects in birds at the Bulb Slope AOPC. Figure 12-17 shows a sample by sample comparison of soil concentrations to the avian SLVs for lead and mercury. The toxicity ratios for lead and mercury were calculated using the Reference Area UPL as the SLV

because the USEPA EcoSSLs for these metals are below the site-specific UPLs. The toxicity ratios for lead and mercury were 12.0 and 10.9, respectively (Table N-37).

As shown on Figure 12-17, lead and mercury concentrations at most locations (9 of 12) exceeded the UPLs/SLVs. Of these nine samples, five locations had concentrations between 5 and 10 times the SLV and four locations had concentrations between 10 and 50 times the SLV for one or both of these CPECs. Due to the elevated toxicity ratios for lead and mercury, which are potentially bioaccumulative, and the fact that several locations had concentrations greater than the SLV, further investigation of these CPECs is recommended in the form of either a Level III BERA or remediation of the locations with elevated locations described above. In a Level III BERA to evaluate exposure to lead and mercury in soil by birds, the following site-specific factors should be considered.

1. As previously described in the Landfill AOPC risk interpretation, the approach for the Level II Screening Assessment focused on protection of birds at the individual level to account for the bald eagle, and possible transient juvenile spotted owls; however, these special-status species are not likely to forage at the 0.05-acre Bulb Slope AOPC and protection of terrestrial bird species at the population-level would be emphasized in the BERA for the Upland OU.
2. The site-specific Reference UPL was greater than the risk-based soil SLV (EcoSSL) for lead and mercury and, therefore, the SLVs were replaced by the UPLs in the screening evaluation. In addition to evaluating specific bird target species and using literature-based BAFs to estimate dose, the contribution of background levels of these CPECs would also be considered to better understand site-related dose contribution.
3. The small size of the Bulb Slope AOPC and the size of a birds' home range would be factored into the daily dose estimation.

Mammals - Lead had a toxicity ratio greater than 5.0 and was assessed for its potential to elicit adverse effects in mammal populations at the Bulb Slope AOPC. Figure 12-17 shows a sample by sample comparison of soil concentrations to the mammalian SLV for lead. Two soil samples had concentrations between 5 and 10 times the SLV, and one sample had a lead concentration between 10 and 50 times the SLV. The toxicity ratio for lead was only slightly above 5.0 (5.48) (Table N-38).

The topography is steep and the substrate at the Bulb Slope AOPC consists of a mixture of soils, rock that may have been placed in some areas, and what appear to be natural rock outcrops, all of which is underlain by siltstone bedrock. Access to this area would be challenging for larger mammals, given the steep slope and rocks. Based on the low magnitude of the toxicity ratio for lead, lack of special status mammals, and in consideration of small size of this rocky area, adverse effects to mammal populations at the site are not expected to occur. However, lead is recommended for further investigation in a Level III BERA because it has been identified as CPEC for other receptors at the Bulb Slope as well as mammals.

12.3.4.3.5 All Four AOPCs Combined

Tables N-43 and N-44 present the results of the screening for individual COIs evaluated for birds and mammals, respectively, that potentially have home ranges equal to or larger than the size of the entire Upland OU and could, therefore, forage over all four AOPCs. Tables N-45 and N-46 provide the results of the toxicity-based screening analysis that involved an evaluation of the

cumulative risks associated with simultaneous exposure to multiple COIs present in a given medium.

A comparison of the soil CPECs identified for the four AOPCs combined versus those identified for the individual AOPCs was performed to determine if any discrepancies exist in this lists of CPECs. No additional CPECs for birds and mammals were identified for the combined AOPCs dataset that were not already identified for the individual AOPC datasets. To address exposures for birds and mammals that could forage over all four AOPCs, the CPECs identified through the individual AOPC screening evaluations should also be assessed for exposures to all four AOPCs by birds and mammals, as appropriate, in a Level III BERA.

12.3.5 Summary of Level II Screening Assessment for Upland OU

Table 12-1 summarizes the CPECs identified through the Level II Screening Assessment that are recommended for risk management, which could entail further investigation or focused remediation.

In addition to the receptors and CPECs listed in Table 12-1 for the Upland AOPCs, the bioaccumulative CPECs at the Landfill and Sandblast Area AOPCs for which dietary-based SLVs are not available (Tables N-3, N-4, N-13, and N-14) also warrant further consideration for birds and mammals. If a Level III BERA is performed, a first critical step would be to determine which bioaccumulative CPECs have corresponding TRVs, as the absence of TRVs for these CPECs could preclude a full quantitative evaluation. At a minimum, all bioaccumulative CPECs would be discussed qualitatively. Finally, risk management is recommended to address the potential erosional soils at the Landfill, Sandblast Area, and Bulb Slope AOPCs that could be mobilized and transported to the River OU if erosion/mass wasting were to occur (e.g., localized soil removal, erosion control measures).

As discussed in Section 8.2.1, to address the uncertainty with the results of the statistical background comparison, metals with high MDDs were subjected to a risk-based screening evaluation in Appendix O. The purpose of this evaluation is to explore whether or not these metals should be included as COPCs, and ultimately advanced to the next level of risk assessment or directly to the FS. A weight-of-evidence approach similar to the one implemented in Section 12 was used to evaluate these metals, as described in Appendix O.

12.4 Level I Scoping Assessment For River OU

The general tasks involved in a Level I Scoping Assessment summarized in Section 12.1.1 for the Upland OU also apply to the River OU. The main goal of the Level I evaluation is to determine if complete exposure pathways potentially exist at a site, and if a Level II Screening Assessment should be performed. To fulfill the requirements of a Scoping Assessment, the ecological setting, site features (topography, structures), nature and extent of all known chemical releases, current and future uses of land and water, and any unique site-specific characteristics described in previous sections were carefully considered. The identification of COIs and CPECs described for the Upland OU in Section 12.2.1 is equivalent to the process used for the River OU.

12.4.1 COIs in River Media

The physical environment of the River OU is much more dynamic than the Upland OU. As discussed previously, the electrical equipment and debris and the majority of the contaminated sediment have been removed from the river, and water movement and human activities have redistributed sediment within the Forebay. In Section 6.2, recent site investigations are described in detail, and the COIs in River media are identified.

In order to focus on the current river conditions and the identification of current COIs, only analytical results from investigations in the River OU since 2007 are included in the RI River OU data set and used in the ERA, with the exception of smallmouth bass collected in 2006. Based on the presence of potentially complete exposure pathways and associated analytical data, COIs in the River OU were identified for the following media: sediment, surface water, and fish and benthic invertebrate tissue.

The categories of COIs that were identified in the recent River OU and 2006 Forebay smallmouth bass analytical data include metals, PCBs, TPH, and SVOCs including PAHs. Of these COIs, a subset is considered to be bioaccumulative in aquatic environments, as presented in Section 7.3 and Table J-7. The screening tables described in Section 12.5.4.1 and presented in Appendix N provide the potentially bioaccumulative COIs detected in the random Forebay, Goose Island, and Eagle Creek sediment data sets. The tissue data collected from the Forebay (including Goose Island) were emphasized in the identification of truly bioaccumulative COIs for this project.

12.4.2 Ecological Exposure Pathways

Sediment and water are sources for uptake of bioaccumulative chemicals by benthic and aquatic organisms, which are consumed by upper trophic level receptors. The following potential exposure pathways are identified for the River OU, and these pathways were more thoroughly investigated to identify those that warrant a quantitative evaluation in the Level II Screening Assessment (Section 12.5.2.1):

- Uptake of contaminants potentially present in surface water by aquatic organisms (plants, aquatic invertebrates, and fish)
- Ingestion of and dermal contact with contaminants potentially present in sediment and surface water by benthic invertebrates
- Incidental ingestion of and dermal contact with potentially contaminated surface water and sediment by aquatic-dependent wildlife (dermal contact is expected to be minor due to the barriers offered by fur and feathers)
- Ingestion of benthic and aquatic dietary components (e.g., invertebrates and fish) by upper trophic level receptors (fish and wildlife)

The exposure pathways that are complete at the River OU and their associated receptors were quantitatively evaluated in the Level II Screening Assessment.

12.5 Level II Screening Assessment For River OU

This section describes the methodology and findings of Level II Screening Assessment for the River OU.

The comprehensive description of the nature and extent of COIs in the River OU is provided in Section 9.6. In Sections 9.1.2, the first two steps of the CPEC selection process (evaluation of detection frequency and comparison to background levels for inorganics) were performed for all media associated with the Forebay, Goose Island, and Eagle Creek (Tables 9-9 to 9-11).

The two targeted sediment sample locations placed on the eastern bank of the mouth of Eagle Creek were collected to evaluate potential exposure by recreational waders, and these samples are also included as a targeted dataset in this ecological Level II Screening Assessment. The two targeted sample locations placed in the slough on the southern side of Goose Island, where sediment, clams, crayfish, and sculpin were collected at the request of DEQ, were also included in the screening.

12.5.1 Receptors of Interest

A simplified food-web model for the River OU is presented on Figure 12-18. Discussion regarding the selection of aquatic receptors of interest (or "target receptors") occurred in several meetings during 2005 and early 2006 with the TAG for Bradford Island. The following terrestrial receptors of interest were selected in the RI/FS MP (URS 2007a):

- Benthic invertebrates represented by the clam (*Corbicula fluminea*) and crayfish (*Pacifastus spp.*)
- Aquatic plants and water-column invertebrates
- Resident fish represented by the sculpin (*Cottus spp.*) and smallmouth bass (*Micropterus dolomieu*) (Although salmonids are known to be particularly sensitive to exposure to PAHs and PCBs (Meador 2000; Johnson et al 2000), evaluation of the resident species is expected to be protective of anadromous and transient species due to their higher level of site use at all life stages.)
- Osprey (*Pandion haliaetus)*
- Bald eagle
- Mink

In the Level II Screening Assessment, these organisms are evaluated as receptor groups (aquatic plants and invertebrates, benthic invertebrates, fish, and piscivorous birds and mammals) through a comparison to generic SLVs for each group. During a Level III BERA, the specific receptors listed above, which represent the feeding guilds present in the River OU, would be assessed for exposure and risk.

Although considered to be semiaquatic and highly reliant upon the riverine environment for resources, the bald eagle and the mink may both frequent the uplands, where they would likely supplement their primarily aquatic diet with upland prey items, such as small mammals. In the event that unacceptable risks are demonstrated for piscivorous birds and mammals from exposure to media of the River OU, more realistic assumptions that incorporate refinements to their dietary compositions may be considered if a Level III BERA is warranted.

12.5.2 Exposure Assessment

Exposure assessment is the process of estimating the magnitude, frequency, and duration of site-specific exposure concentrations of chemicals to a receptor. To assess whether COI concentrations at the site have the potential to cause adverse effects in the selected ecological receptors, it is first necessary to develop reasonable estimates of the concentrations to which the receptors might be exposed.

12.5.2.1 Conceptual Exposure Model for Ecological Receptors

A CEM for ecological receptors of the River OU is presented on Figure 12-19. This CEM focuses on potentially complete pathways associated with the Forebay, which are also applicable to Goose Island Slough and Mouth of Eagle Creek. The aquatic-related exposure pathways identified for the River OU in Section 12.4.2 are reflected in the CEM :

- Uptake of contaminants potentially present in surface water by aquatic organisms
- Ingestion of and dermal contact with contaminants potentially present in sediment and surface water by benthic invertebrates, fish, and wildlife (dermal contact is expected to be minor for aquatic-dependent wildlife due to the barriers offered by fur and feathers)
- Ingestion of benthic and aquatic dietary components (e.g., invertebrates and fish) by piscivorous fish and wildlife

These pathways are potentially complete for the River OU and were quantitatively evaluated.

12.5.2.2 Assessment Endpoints

The recommended assessment endpoints for the ecological receptors addressed in the River OU are listed below.

- Protection of aquatic biota (invertebrates and fish) that may be exposed to COIs in sediment or surface water or from Upland OU sources (e.g., groundwater or soil washoff).
- Protection of piscivorous mammals, such as the mink, against unacceptable effects on reproduction, growth, or development at the population level due to COIs in sediment, invertebrates, water, and aquatic food.
- Protection of top-level predatory birds, such as the American bald eagle and osprey, against unacceptable effects on reproduction, growth, or development at the population level due to COIs in sediment, water, and aquatic food.

Protection on an individual basis was the focus for state- or federally listed threatened and endangered species (i.e., bald eagle, salmon) that may occur from exposure to media of the River and/or Upland OUs.

12.5.2.3 Estimation of Exposure Point Concentrations

For plankton, aquatic plants and invertebrates, fish, and benthic invertebrates, the EPC is estimated as a function of the COI concentration measured in water, sediment, or tissue. For piscivorous birds and mammals, the exposure dose may be estimated as a function of the COI concentration in relevant environmental media and several other parameters related to biological transfer through the food web and the manner in which receptors use the site.

All samples collected from the River were analyzed for both PCB congeners (all 209 congeners) and Aroclors, volume permitting. Therefore, EPCs in abiotic and biotic media collected from the site may be calculated for the following PCB groupings:

- Individual Aroclors
- Total PCBs as the sum of Aroclors
- Total PCBs as sum of 209 congeners
- 2,3,7,8-TCDD TEQs for the 12 dioxin-like PCB congeners

Aquatic Organisms (plankton, aquatic plants, pelagic invertebrates, and fish) and Aquatic-Dependent Wildlife - For the Level II Screening Assessment, EPCs in flowing surface water are represented by the maximum concentration detected in the five surface water samples.

Benthic Invertebrates - The maximum detected concentration was selected as the EPC for sediment, clam, and crayfish data evaluated to assess risk to the benthic community (as represented by these two organisms). Use of the maximum concentration of each COI is a conservative approach that serves to protect sessile organisms that could conceivably be exposed to the maximum concentration throughout their entire life span.

Piscivorous Birds, Mammals, and Fish - For food web-based receptors such as birds, mammals, and piscivorous fish, the EPC was based on the 95% UCL on the mean concentration in sediment and tissue. The lower of the 95% UCL and maximum detected concentration was ultimately used as the EPC for these receptors. This value provides an estimate of the representative concentration more relevant to terrestrial wildlife receptors that generally are mobile and not continuously exposed to site-related COIs in one geographic location.

As presented in the RI/FS MP (URS 2007a), site-specific bird and mammals target receptors that would be evaluated if a Level III BERA is warranted for the River OU include bald eagle, osprey, and mink. The tissue sampling performed in the River between 2008 and 2009 to support the RI was designed with a specific aquatic food web model in mind and the following assumptions regarding dietary intake by these target receptors:

- Bald eagle and osprey consume 100% smallmouth bass (i.e., Level 3-4 fish)
- Mink consumes 33% crayfish (benthic invertebrates), 33% sculpin (Level 2-3 fish), and 33% smallmouth bass

The bald eagle and osprey would not likely consume significant amounts of smaller fish (e.g., sculpin) and invertebrates (e.g., crayfish) in the River OU, and the assumption that they solely consume top predatory fish, like smallmouth bass, is expected to result in worst-case exposure to bioaccumulative and biomagnifying COIs. However, for purposes of this Level II Screening Assessment, aquatic-dependent birds as a general category were assumed to feed on crayfish, sculpin, and bass.

Although a specific target fish species was not selected, several species were identified that could inhabit the Forebay in Table C-4 of the RI/FS MP (URS 2007a). These fish species occupy various feeding guilds in the food web and, therefore, it was assumed that all types of tissue collected (clams, crayfish, sculpin, and bass) could be consumed by fish as a generic receptor group. The single sample of sucker was considered too small of a sample size to be included in the tissue dataset. However, the data from the sucker were evaluated relative to the bass tissue

concentrations and tissue SLVs protective of fish (i.e., critical tissue levels [CTLs]) and wildlife (i.e., ATLs) in the uncertainty analysis (Appendix O).

12.5.3 Effects Analysis

A brief introduction to the Effects Analysis phase of the ERA was provided for the Upland OU (Section 12.3.3). The same process was applied to the River OU.

12.5.3.1 Measurement Endpoints

As discussed in Section 12.3.3.1, the measures of exposure and measures of effect proposed for the assessment endpoints were provided in Table C-1 of the RI/FS MP (URS 2007a). Measurement endpoints for the River ERA primarily include measured EPCs in sediment, tissue, and surface water collected from the Forebay. No modeling of sediment or water to tissue was necessary, as site-specific COI concentrations in two types of benthic invertebrates (clams and crayfish) and two types of fish (sculpin and smallmouth bass) were compared directly to tissue SLVs protective of these receptors groups, as well as to SLVs protective of upper-trophic-level receptors that may consume these organisms.

12.5.3.2 Direct Toxicity and Bioaccumulation SLVs

The EPCs for sediment, water, and tissue were compared to the SLVs protective of the individual receptor groups of interest evaluated for the River OU (e.g., aquatic plants and invertebrates, benthic invertebrates, fish, and piscivorous birds and mammals). The primary literature sources of SLVs protective of ecological receptors that were used in the Level II Screening Assessment were presented in Section 7.3 and Appendix J.

The tissue SLVs were compared to the types of tissue that correspond to the dietary intake assumptions described in Section 12.5.2.3:

1. SLVs protective of fish/shellfish were compared to all tissue data
2. SLVs protective of birds were compared to crayfish, sculpin, and smallmouth bass tissue data (as three distinct datasets; no combination of tissues indicating dietary proportions were performed for this Screening Assessment)
3. SLVs protective of mammals were compared to crayfish, sculpin, and smallmouth bass data (as three distinct datasets; no combination of tissues indicating dietary proportions were performed for this Screening Assessment)

The following section describes the methods used to screen the site data against these SLVs for the identification of CPECs.

12.5.3.3 Identification of Chemicals of Potential Ecological Concern

The first two steps of the CPEC identification process presented in Section 12.2.1 (i.e., evaluation detection frequency and comparison to Reference Area concentrations for inorganics) were considered for the random and target Forebay data sets in Section 9.1. River OU COIs that were detected in ≤ 5% of samples per media could potentially be eliminated as CPECs, as long as there were at least 20 samples collected. However, because none of the River OU media had at least 20 samples no COIs were removed from CPEC evaluation based on detection frequency (Tables 9-9 through 9-11).

For the second step, a comparison of two independent data sets for each media was performed between the Reference Area sediment and tissues (clam, crayfish, smallmouth bass, and sculpin) and the random Forebay sediment and tissues, including the 2006 smallmouth bass tissue. The objective of the statistical analysis was to assess whether the mean inorganic COI concentrations in the random Forebay post-removal sediment and tissues were significantly higher than the mean Reference Area sediment and tissue concentrations. This approach is commonly known as a population-to-population comparison. The results of this statistical comparison are presented in detail in Section 8.0 and Appendix L and summarized in Table 8-3.

Since the comparisons for between Forebay and Reference Area surface water only evaluated total concentrations, and the screening level ERA uses dissolved concentrations, no inorganic compounds were eliminated based on comparison to Reference Area concentrations. All detected metals were screened against surface water SLVs.

The following summarizes the inorganic COIs in sediment and tissue at the Forebay (random) with significantly higher concentrations than the Reference Area (Tables 8-3):

- Sediment – None.
- Clam – Beryllium and cadmium.
- Crayfish – Antimony, arsenic, chromium, mercury, methyl mercury, and nickel.
- Sculpin – Cadmium, lead, and mercury.
- Smallmouth bass – Aluminum, barium, copper, mercury, and zinc.

For the targeted Forebay sampling locations at Goose Island Slough and the mouth of Eagle Creek, which do not have enough samples to perform a statistical (population-to-population) comparison, the maximum detected inorganic concentrations in sediment and tissue (clam and crayfish) were compared to the inorganic 95% UPLs in the Reference Area. The following summarizes the inorganic COIs in sediment and tissue at Goose Island and Eagle Creek with maximum detected concentrations greater than the Reference Area 95% UPLs (Table L-7).

- Eagle Creek Sediment – None.
- Goose Island Sediment – Antimony, cadmium, thallium, and zinc.
- Goose Island Clam – Beryllium.
- Goose Island Crayfish – Mercury.

The inorganic COIs in sediment and tissue at the Forebay (random and targeted) that were found to not be elevated above the Reference Area were not retained as CPECs.

All detected organic COIs and all inorganic COIs with concentrations above Reference Area levels were retained for the third step of the CPEC identification process, i.e., toxicity-based screening. The approach used for the screening to evaluate direct toxicity for benthic invertebrates (exposed to sediment) and aquatic organisms (exposed to surface water) is the same as the approach described in Section 12.3.3.3 for the Upland OU (i.e., toxicity ratios for individual COIs and multiple COIs).

The potential for bioaccumulation and the availability of SLVs are two additional qualitative elements that were evaluated in the identification of CPECs. Bioaccumulation potential of COIs

in sediment was assessed using the methods presented in Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment (DEQ 2007). COIs detected in sediment and tissue were screened against DEQ's bioaccumulation SLVs (including ATLs and CTLs) for freshwater fish and shellfish, bird, mammal populations by creating bioaccumulation indices, calculated using the following equation:

$$R_{BAC} = \frac{EPC}{Bioaccumulation\ SLV}$$

where :

R_{BAC}	=	bioaccumulation index for chemical
EPC	=	Exposure point concentration
Bioaccumulation SLV	=	DEQ's Bioaccumulation SLV (2007)

In general, bioaccumulation indices less than 1 indicate sediment or tissue concentrations at which adverse environmental effects are not expected to occur. Any individual bioaccumulative COI in a given medium with $R_{BAC} > 0.1$, and for which the sum $R_{BAC} > 1$ for a given medium (i.e., addition of all R_{BAC}s for that medium), was identified as a CPEC to account for both exposures to individual COIs, as well as simultaneous exposure to all COIs.

The tissue data were the primary line of evidence to select CPECs for the fish and benthic invertebrate consumption pathway for predatory fish and wildlife. Given the uncertainties regarding chemical transfer, uptake, and accumulation in organisms that are ingested by predators inherent to sediment bioaccumulation SLVs, site-specific tissue data are always a better representation of EPCs that receptors would encounter at a site. For this reason, all COIs in tissue were evaluated in the Screening Assessment, and then the list of CPECs in tissue was carried to the sediment data evaluation. The list of CPECs in tissue comprises the list of COIs which were evaluated in sediment, and this analysis will assist with risk management decisions for the River OU based on the two possible outcomes:

- If a CPEC in tissue is also present in sediment at concentrations in exceedance of the bioaccumulation SLV (i.e., it is also a CPEC in sediment), then further risk assessment may be helpful to evaluate the actual potential for adverse effects to occur from exposure to site-related CPEC concentrations.
- If a CPEC in tissue is undetected in sediment, present below Reference Area levels (inorganics only), or present at concentrations below sediment SLVs, further risk assessment may not be helpful because tissue concentrations likely do not correlate with current sediment concentrations at the site. If this is the case, the tissue levels could reflect exposure to other sources in the river or could reflect historical body burdens. Risk management or some level of monitoring may be warranted for certain tissue CPECs that are not found to be CPECs in sediment.

Since the objective of collecting the samples at the mouth of Eagle Creek was to assess exposure by people wading, no tissue data were collected from that area. Therefore, the potentially bioaccumulative COIs in these samples were compared to the bioaccumulation SLVs for sediment.

12.5.4 Risk Characterization

A brief introduction to the Risk Characterization phase of the ERA was provided for the Upland OU (Section 12.3.4). The same process was applied to the River OU.

12.5.4.1 Results of Toxicity Screening

The toxicity screening for COIs in sediment, tissue, and surface water of the River OU involved a comparison of appropriate EPCs to corresponding media-specific SLVs protective of the receptor groups evaluated in this Level II Screening Assessment. The potential for ecological risk to occur was evaluated based on exposure to individual COIs within a specific medium and from exposure to multiple COIs simultaneously within a given medium.

Toxicity ratios for benthic invertebrates exposed directly to sediment and aquatic organisms exposed to surface water were estimated for each COI, as described in Section 12.5.3.3. If the toxicity ratio (T_{ij}) for a specific COI is greater than the receptor designator (Q) appropriate for the site, or if the toxicity ratio for a specific COI is a high contributor to the total risk for a given medium (summation of all toxicity ratios), then further investigation of the COI is warranted and it was retained as a CPEC. As defined by DEQ (2001), Q is equal to 1.0 for all benthic and aquatic organisms exposed to sediment and surface water.

Any individual bioaccumulative COI in a given medium with $R_{BAC} > 0.1$, and for which the sum $R_{BAC} > 1$ for a given medium, was identified as a CPEC. The bioaccumulation SLVs protective of individuals of listed threatened and endangered wildlife species (birds and mammals) and SLVs protective of populations of these receptors groups were applied in the screening comparison.

The results of the screening are presented for the Random Forebay, Goose Island, and Eagle Creek in the following sections.

12.5.4.1.1 Random Forebay Data

Tables N-47 through N-50 of Appendix N present the results of the screening for individual COIs in Forebay sediments and surface water, and simultaneous exposure to multiple COIs, to evaluate direct toxicity to benthic invertebrates and aquatic organisms. Tables N-51, N-53, N-54, N-57, and N-58 present the results of the screening for COIs in tissue to evaluate the dietary exposure pathway for predatory fish and shellfish (and other aquatic organisms) and aquatic-dependent wildlife at both the individual and population levels. Tables N-52, N-55, N-56, N-59, and N-60 present the results of the screening for COIs in sediment to evaluate the dietary exposure pathway and essentially assess the potential current site contribution to tissue levels. As discussed in Section 12.5.3.3, the information gathered through the comparison of tissue CPECs and sediment CPECs was used to guide recommendations for the next steps of the site investigation process, including the utility of future risk assessment.

Benthic Invertebrates

Direct Toxicity Evaluation - Only Aroclor 1254 was identified for the benthic invertebrate community in the Forebay based on the individual COI screening evaluation for sediment (Table N-47). Maximum concentrations of total PCBs as the sum of all Aroclors and as the sum of all congeners were below the corresponding SLVs. Aroclor 1254 also contributes to a cumulative risk greater than 1.0 (Table N-48) and requires further investigation in the risk interpretation section to assess its potential to elicit adverse effects in the benthic community.

DRO and RRO were retained as CPECs in sediment due to the lack of SLVs protective of benthic invertebrates. The implications to the findings of the Screening Assessment are discussed in the uncertainty assessment (Appendix O).

Bioaccumulation Evaluation - Refer to the findings of the evaluation for "Fish and Shellfish" below, which were based on a comparison of measured clam and crayfish concentrations from the site to tissue SLVs protective of fish and shellfish.

Aquatic Organisms and Aquatic-Dependent Wildlife

Direct Contact Evaluation - Barium was the only CPEC identified for the aquatic receptors in the Forebay based on the individual and multiple COI screening evaluations for surface water (Tables N-49 and N-50). Barium requires further investigation in the risk interpretation section to assess its potential to elicit adverse effects in aquatic receptors.

DRO were retained as CPECs in surface water due to the lack of SLVs protective of aquatic organisms and wildlife. The implications to the findings of the Screening Assessment are discussed in the uncertainty assessment (Appendix O).

Bioaccumulation Evaluation - Refer to the findings of the evaluation for "Fish and Shellfish" below, which were based on a comparison of measured clam and crayfish concentrations from the site to tissue SLVs protective of fish and shellfish. Likewise, the findings of the evaluation for birds and mammals were based on a comparison of measured sculpin, crayfish, or bass concentrations from the site to tissue SLVs protective of birds and mammals (Section 12.5.3.2).

Fish and Shellfish

Tissue. Table N-51 presents the bioaccumulative CPECs with a tissue $R_{BAC} > 0.1$ and sum tissue $R_{BAC} > 1.0$ for each type of organism collected in the Forebay. The tissue SLVs (i.e., DEQ's CTLs) are protective of upper trophic level fish and shellfish in and of themselves and, therefore, were screened against the Forebay clam, crayfish, sculpin, and smallmouth bass data. Cadmium, PCBs (as total congeners only), and B2EHP were identified as CPECs in clam tissue. There were no CPECs identified for crayfish due to exceedance of tissue SLVs. Cadmium, lead, mercury, and PCBs (Aroclor 1254, total Aroclors, total PCB congeners, three of 12 dioxin-like congeners, and PCB TEQ for Fish [i.e., Fish TEQ]) were identified as CPECs in sculpin tissue. Mercury, PCBs (Aroclors 1242 and 1254, total Aroclors, total PCB congeners, five of 12 dioxin-like congeners, and Fish TEQ), B2EHP, and butyl benzyl phthalate were identified as CPECs in smallmouth bass tissue. All of these CPECs require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in upper trophic level fish and shellfish that consume these tissues. In addition, beryllium and p-cresol (4-Methylphenol) in clam tissue, antimony, chromium, and nickel in crayfish tissue, and aluminum, barium, copper, and zinc in bass tissue were retained as CPECs due to the lack of SLVs for tissue.

Sediment. Of the CPECs listed above for the various tissue types, only PCBs (Aroclor 1254 and total Aroclors) were also identified as CPECs in sediment (Table N-52). B2EHP was detected in sediment and was retained as a CPEC due to the lack of a sediment SLV that addresses the dietary pathway. The results of the population to population statistical comparisons demonstrated that the metals detected in tissue above Reference Area concentrations were not present in the Forebay sediment at concentrations above Reference Area sediment concentrations (Tables L-4 and N-52). Therefore, it is difficult to assess the site contribution of the metal CPECs in site sediment to the Forebay tissue levels. Due to this difficulty, all CPECs in sediment (and tissue) were carried to the risk interpretation section.

Piscivorous Birds

Tissue. Tables N-53 and N-54 present the bioaccumulative CPECs with a tissue $R_{BAC} > 0.1$ and sum tissue $R_{BAC} > 1.0$ for crayfish, sculpin, and smallmouth tissue collected in the Forebay that could be consumed by piscivorous birds (such as bald eagles and osprey) known to occur in the vicinity of Bradford Island. Table N-53 shows the results of the bioaccumulation screening to assess potential adverse effects at the individual level, and Table N-54 shows the results of the population level assessment.

The tissue SLVs (or DEQ's ATLs) are protective of piscivorous birds that could forage in the Forebay. Mercury, methyl mercury and total PCB congeners were identified as CPECs in crayfish tissue. Mercury and PCBs (Aroclor 1254, total Aroclors, total PCB congeners, five of the 12 dioxin-like congeners, and PCB TEQ for birds [i.e., Avian TEQ]) were identified as CPECs in sculpin tissue. Mercury, PCBs (Aroclors 1242 and 1254, total Aroclors, total PCB congeners, seven dioxin-like congeners, and Avian TEQ), and di-n-butyl phthalate were identified as CPECs in smallmouth bass tissue. All of these CPECs require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in individual protected threatened and endangered birds. Mercury and most of the PCBs listed above also require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in bird populations (Table N-54).

In addition, antimony, chromium, and nickel in crayfish tissue and aluminum, barium, copper, and zinc in bass tissue were retained as CPECs due to the lack of SLVs for tissue. PAHs were also retained as tissue CPECs due to the lack of tissue SLVs for birds, and the implications of this uncertainty to the findings of the Screening Assessment are discussed in Appendix O.

Sediment. Of the CPECs listed above in the various tissue types, PCBs (Aroclor 1254, total Aroclors, total PCB congeners, and one dioxin-like congener) were also identified as CPECs in sediment and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in individual protected threatened and endangered birds (Table N-55). None of these CPECs were found in sediment at concentrations that could cause adverse effects in piscivorous bird populations (Table N-56).The results of the population to population statistical comparisons demonstrated that metals detected in tissue above Reference Area concentrations were not present in the Forebay sediment at concentrations above Reference Area sediment concentrations (Tables L-4, N-55, and N-56).Therefore, it is difficult to assess the site contribution of the metal CPECs in site sediment to the Forebay tissue levels. Due to this, all CPECs in sediment (and tissue) were carried to the risk interpretation section.

Piscivorous Mammals

Tissue. Tables N-57 and N-58 present the bioaccumulative CPECs with a tissue $R_{BAC} > 0.1$ and sum tissue $R_{BAC} > 1.0$ for crayfish, sculpin, and smallmouth tissue collected in the Forebay that could be consumed by piscivorous mammals (such as mink) that are known to occur in the vicinity of Bradford Island. Table N-57 shows the results of the bioaccumulation screening to assess potential adverse effects at the individual level, and Table N-58 shows the results of the population level assessment.

The tissue SLVs (or DEQ's ATLs) are protective of piscivorous (and invertivorous) mammals that could forage in the Forebay. With the exception of CPECs retained due to lack of SLVs, only PCBs (three dioxin-like congeners and the PCB TEQ for mammals [i.e., Mammalian TEQ]) are CPECs for crayfish tissue. Mercury and PCBs (Aroclors 1254, total Aroclors, total PCB congeners, eight of the 12 dioxin-like congeners, and Mammalian TEQ) are CPECs in sculpin tissue. Mercury and PCBs (Aroclors 1242 and 1254, total Aroclors, total PCB congeners, ten dioxin-like congeners, and Mammalian TEQ) were identified as CPECs in smallmouth bass tissue. All of these tissue CPECs require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in individual protected threatened and endangered mammals. Mercury and most of the PCBs listed above also require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in mammal populations.

In addition, antimony, chromium, and nickel in crayfish tissue and aluminum, barium, copper, and zinc in bass tissue were retained as CPECs due to the lack of SLVs for tissue.

Sediment. Of the CPECs listed above in the various tissue types, PCBs (four dioxin-like congeners and the Mammalian TEQ) were also identified as CPECs in sediment and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in individual protected mammals (Tables N-59). No CPECs were found in sediment at concentrations that could cause adverse effects in piscivorous mammal populations (Table N-60). The results of the population to population statistical comparisons demonstrated that metals detected in tissue above Reference Area concentrations were not present in the Forebay sediment at concentrations above Reference Area sediment concentrations (Tables L-4, N-57, and N-58). Therefore, it is difficult to assess the site contribution of the metal CPECs in site sediment to the Forebay tissue levels. Due to this, all CPECs in sediment (and tissue) were carried to the risk interpretation section.

12.5.4.1.2 Mouth of Eagle Creek

Tables N-61 and N-62 of Appendix N present the results of the screening for individual COIs in sediments collected from the mouth of Eagle Creek (two samples), and simultaneous exposure to multiple COIs, to evaluate direct toxicity to benthic invertebrates. Tables N-63 through N-67 present the results of the screening for bioaccumulative COIs in sediment to evaluate the dietary exposure pathway for predatory fish and shellfish and aquatic-dependent wildlife at both the individual and population levels. Since the objective of collecting the samples from Eagle Creek was to assess the direct contact pathway for waders in the HHRA (URS 2007a), no tissue samples were collected from this area. The sediment samples were analyzed for PCBs as Aroclors, in addition to metals, SVOCs (PAHs), and TPH. No PCB congener data were collected.

Because tissue data have been collected from the greater Forebay (the random samples), the purpose of the bioaccumulation evaluation for Eagle Creek sediment was to identify any

additional CPECs that have not already been identified through the random Forebay sampling event. Any bioaccumulative CPECs identified in Eagle Creek sediments (i.e., maximum sediment concentration above the bioaccumulation SLV) were compared to the tissue data to determine their actual presence in measured tissue data from the Forebay.

Benthic Invertebrates

Direct Toxicity Evaluation – PCBs (Aroclor 1248 and total Aroclors) were the only CPECs identified for the benthic community at the mouth of Eagle Creek based on the individual and multiple COI screening evaluations for sediment (Tables N-61 and N-62). PCBs require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in the benthic community.

DRO were retained as CPECs in sediment due to the lack of SLVs protective of benthic invertebrates, and the implications of these uncertainties to the findings of the Screening Assessment are discussed in the uncertainty assessment (Appendix O).

Bioaccumulation Evaluation - Refer to the findings of the evaluation for "Fish and Shellfish" below, which are based on a comparison of bioaccumulative COI concentrations in sediment to sediment SLVs protective of fish and shellfish.

Fish and Shellfish

Table N-63 presents the bioaccumulative CPECs with a sediment $R_{BAC} > 0.1$ and sum sediment $R_{BAC} > 1.0$ that could pose a health risk to upper trophic level fish and shellfish. PCBs (Aroclor 1248 and total Aroclors) were detected in sediment at concentrations above the bioaccumulative SLV protective of fish and shellfish. These CPECs require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in upper trophic level fish and shellfish.

Carbazole and DRO were retained as CPECs in sediment due to the lack of a bioaccumulation SLV protective of fish and shellfish, and the implications of this uncertainty to the findings of the Screening Assessment are discussed in Appendix O. Of these two CPECs, only carbazole was identified as potentially bioaccumulative in aquatic environments based on the criteria discussed in Section 7.3 (Table J-7).

Aroclor 1248 was not detected in the random Forebay sediment samples (it was only detected in one sample at Eagle Creek). Instead, Aroclor 1254 is the primary PCB mixture detected in random sediment and tissue samples. Aroclor 1254 and total PCBs as Aroclors are bioaccumulative CPECs in Forebay sediment, crayfish, and smallmouth bass for which the Screening Assessment indicates the potential for adverse effects in upper trophic level fish and shellfish that consume these tissues and are exposed to CPECs in sediment.

Piscivorous Birds

Tables N-64 and N-65 present the bioaccumulative CPECs with a sediment $R_{BAC} > 0.1$ and sum sediment $R_{BAC} > 1.0$ that could pose a health risk to piscivorous birds (such as bald eagles and osprey) known to occur in the vicinity of Bradford Island. Table N-64 shows the results of the bioaccumulation screening to assess potential adverse effects at the individual level, and Table N-65 shows the results of the population level assessment.

PCBs (Aroclor 1248 and total Aroclors) were detected in sediment at concentrations above the bioaccumulative SLV protective of birds, and require further investigation in the risk

interpretation section to assess their potential to elicit adverse effects in individual protected threatened and endangered birds. Except for potential CPECs that were retained due to lack of SLVs, no CPECs were identified that could elicit adverse effects in bird populations.

Carbazole, PAHs, and DRO were retained as CPECs in sediment due to the lack of a bioaccumulation SLVs protective of birds, and the implications of these uncertainties to the findings of the Screening Assessment are discussed in Appendix O. Of these CPECs, carbazole and PAHs were identified as potentially bioaccumulative in aquatic environments based on the criteria discussed in Section 7.3 (Table J-7).

As stated above, Aroclor 1248 was not detected the random Forebay sediment samples (it was only detected in one sample at Eagle Creek). Instead, Aroclor 1254 is the primary PCB mixture detected in random sediment and tissue samples.

Piscivorous Mammals

Tables N-66 and N-67 present the bioaccumulative CPECs with a sediment $R_{BAC} > 0.1$ and sum sediment $R_{BAC} > 1.0$ that could pose a health risk to piscivorous mammals (such as mink) that are known to occur in the vicinity of Bradford Island. Table N-66 shows the results of the bioaccumulation screening to assess potential adverse effects at the individual level, and Table N-67 shows the results of the population level assessment.

PCBs (Aroclor 1248 and total Aroclors) were detected in sediment at concentrations above the bioaccumulative SLV protective of mammals, and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in individual protected threatened and endangered mammals. Except for potential CPECs that were retained due to lack of SLVs, no CPECs were identified that could elicit adverse effects in mammal populations.

Carbazole and DRO were retained as CPECs in sediment due to the lack of a bioaccumulation SLV protective of mammals, and the implications of this uncertainty to the findings of the Screening Assessment are discussed in Appendix O. Of these two CPECs, only carbazole was identified as potentially bioaccumulative in aquatic environments based on the criteria discussed in Section 7.3 (Table J-7).

As stated above, Aroclor 1248 was not detected in the random Forebay sediment samples (it was only detected in one sample at Eagle Creek). Instead, Aroclor 1254 is the primary PCB mixture detected in random sediment and tissue samples.

12.5.4.1.3 Goose Island Slough

Tables N-68 through N-69 of Appendix N present the results of the screening for individual COIs in Goose Island sediment samples, and simultaneous exposure to multiple COIs, to evaluate direct toxicity to benthic invertebrates. No surface water data have been collected at Goose Island. Tables N-70 and N-71 presents the results of the screening for COIs in tissue and sediment to evaluate the dietary exposure pathway for predatory fish and shellfish. Tables N-72 through N-75 present the results of the screening for COIs in tissue and sediment to evaluate dietary exposure to aquatic-dependent birds at both the individual and population levels. Tables N-76 through N-79 present the results of the screening for COIs in tissue and sediment to evaluate the dietary exposure pathway and essentially assess the potential current site contribution to tissue levels for aquatic-dependent mammals. As discussed in Section 12.5.3.3, the information gathered through the comparison of tissue CPECs and sediment CPECs will be

used to guide recommendations for the next steps of the site investigation process, including the utility of future risk assessment.

Many of the smallmouth bass collected in 2006 were from the Goose Island slough. These samples were collected as part of the random Forebay sampling effort and are, therefore, presented under the Random Forebay Data discussion above. Since bass are one of the primary food source for piscivorous birds and mammals and predatory fish that could forage at the Forebay, including Goose Island, a summary of the screening results for bass tissue collected from the Forebay is provided below for these three receptor groups.

Benthic Invertebrates

Direct Toxicity Evaluation - Cadmium, thallium, zinc, and Aroclor 1254 were identified for the benthic invertebrate community in the Goose Island slough based on the individual and cumulative COI screening evaluations for sediment (Tables N-68 and N-69) and require further investigation in the risk interpretation section to assess its potential to elicit adverse effects in the benthic community.

DRO and RRO were retained as CPECs in sediment due to the lack of SLVs protective of benthic invertebrates, and the implications of these uncertainties to the findings of the Screening Assessment are discussed in Appendix O.

Bioaccumulation Evaluation - Refer to the findings of the evaluation for "Fish and Shellfish" below, which are based on a comparison of measured clam and crayfish concentrations from the site to tissue SLVs protective of fish and shellfish.

Fish and Shellfish

Tissue. Table N-70 presents the bioaccumulative CPECs with a tissue $R_{BAC} > 0.1$ and sum tissue $R_{BAC} > 1.0$ for clams, crayfish, and sculpin collected from Goose Island. The tissue SLVs (or DEQ's CTLs) are protective of upper trophic level fish and shellfish in and of themselves and, therefore, were screened against these tissue data. No CPECs were identified in these targeted tissue samples from Goose Island, with the exception of beryllium and p-cresol (4-methylphenol), which were detected in clam tissue, due to the absence of tissue SLVs. As shown in Table N-51 and previously discussed in Section 12.5.4.1.1, aluminum, barium, copper, mercury, zinc, PCBs (Aroclors 1242 and 1254, total Aroclors, total PCB congeners, five of 12 dioxin-like congeners, and Fish TEQ), B2EHP, and butyl benzyl phthalate are CPECs in randomly-collected smallmouth bass tissue samples from the Forebay. Of the metals identified as tissue CPECs, a tissue SLV was only available for mercury. The EPC for mercury in randomly-collected bass tissue exceeded the tissue SLV; however, the EPC for mercury in crayfish tissue collected from the targeted locations at Goose Island is below the tissue SLV.

Sediment. Of the random Forebay smallmouth bass tissue organic CPECs, PCBs (Aroclor 1254 and total Aroclors) are also CPECs in Goose Island sediment (Table N-71). P-cresol (4-methylphenol), which was detected in Goose Island clam tissue but lacked a tissue SLV, was also detected in sediment and was retained as a sediment CPEC due to the lack of a sediment SLV that addresses the dietary pathway. In addition, B2EHP was detected in Goose Island sediment (but not in Goose Island clams, crayfish, and sculpin) and was retained as a CPEC due to the lack of a SLV that addresses the dietary pathway.

Of the metals identified above as tissue CPECs in Goose Island clam tissue and random Forebay bass tissue, zinc was also identified as a Goose Island sediment CPEC due to SLV exceedance

(Table N-71). The results of the Reference Area comparison demonstrated that all the remaining metals identified above were present in the targeted Goose Island sediment samples at concentrations similar to or less than Reference Area sediment concentrations (Tables L-7 and N-71). Therefore, it is difficult to assess the contribution of the metal CPECs in Goose Island sediment to the Forebay bass tissue levels, with the possible exception of zinc. Due to this difficulty, all CPECs in Goose Island sediment (and tissue) were carried to the risk interpretation section.

Piscivorous Birds

Tissue. Tables N-72 and N-73 present the bioaccumulative CPECs with a tissue $R_{BAC} > 0.1$ and sum tissue $R_{BAC} > 1.0$ for crayfish and sculpin tissue collected at Goose Island that could be consumed by piscivorous birds. Table N-72 shows the results of the bioaccumulation screening to assess potential adverse effects in birds at the individual level; Table N-73 shows the results of the population level assessment. The tissue SLVs (or DEQ's ATLs) are protective of piscivorous birds that could forage in the Forebay, including Goose Island.

No CPECs were identified in crayfish or sculpin tissue collected from Goose Island, with the exception of those without SLVs (i.e., PAHs.). As shown in Tables N-53 and N-54 and previously discussed in Section 12.5.4.1.1, aluminum, barium, copper, mercury, zinc, PCBs (Aroclors 1242 and 1254, total Aroclors, total PCB congeners, seven dioxin-like congeners, and Avian TEQ), di-n-butyl phthalate, and PAHs were identified as CPECs in the randomly-collected smallmouth bass tissue collected from the Forebay.

PAHs were retained as tissue CPECs due to the lack of SLVs for birds. The implications of this uncertainty to the findings of the Screening Assessment are discussed in Appendix O.

Sediment. Tables N-74 and N-75 present the bioaccumulative CPECs in targeted Goose Island sediment samples with $R_{BAC} > 0.1$ and sum sediment $R_{BAC} > 1.0$. Table N-74 shows the results of the bioaccumulation screening to assess potential adverse effects in birds at the individual level; Table N-75 shows the results of the population level assessment. Of the CPECs listed above in smallmouth bass, zinc, PCBs (Aroclor 1254, total Aroclors, total PCB congeners, one dioxin-like congener, and Avian TEQ) were also identified as CPECs in sediment and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in individual protected threatened and endangered birds. Zinc and PCBs (Aroclor 1254 and total Aroclors) were detected in sediment at levels that could elicit adverse effects in piscivorous bird populations (Table N-75). It is worth noting that the sediment SLV for zinc is represented by the Reference Area UPL (i.e., not a risk-based SLV). In addition, di-n-butyl phthalate and PAHs were retained as CPECs in sediment due to the lack of SLVs protective of birds.

Of the metals identified above as tissue CPECs in random Forebay bass tissue, the results of the Reference Area sediment comparison demonstrated that all but zinc were present in the targeted Goose Island sediment samples at concentrations similar to or less than Reference Area sediment concentrations (Tables L-7, N-74, and N-75). Therefore, it is difficult to assess the contribution of the metal CPECs in Goose Island sediment to the Forebay tissue levels, with the possible exception of zinc. Due to this, all CPECs in Goose Island sediment (and tissue) were carried to the risk interpretation section.

Piscivorous Mammals

Tissue. Tables N-76 and N-77 present the bioaccumulative CPECs with a tissue $R_{BAC} > 0.1$ and sum tissue $R_{BAC} > 1.0$ for clams, crayfish, and sculpin collected from Goose Island that could be consumed by piscivorous mammals. Table N-76 shows the results of the bioaccumulation screening to assess potential adverse effects in mammals at the individual level; Table N-77 shows the results of the population level assessment. No CPECs were identified in the targeted tissue samples from Goose Island at either the individual or population level. As shown in Tables N-57 and N-58 and previously discussed in Section 12.5.4.1.1, aluminum, barium, copper, mercury, zinc, PCBs (Aroclors 1242 and 1254, total Aroclors, total PCB congeners, ten of 12 dioxin-like congeners, and Mammalian TEQ) were identified as CPECs in randomly-collected smallmouth bass tissue samples from the Forebay that could be consumed by piscivorous mammals.

Sediment. Tables N-78 and N-79 present the bioaccumulative CPECs in targeted Goose Island sediment samples with $R_{BAC} > 0.1$ and sum sediment $R_{BAC} > 1.0$ at the individual and population level, respectively, for aquatic-dependent mammals. Of the CPECs identified for smallmouth bass, zinc and PCBs (Aroclor 1254 and total Aroclors) were also identified as CPECs in sediment and require further investigation in the risk interpretation section to assess their potential to elicit adverse effects in individual protected threatened and endangered mammals, as well as in mammal populations. It is worth noting that the sediment SLV for zinc is represented by the Reference Area UPL (i.e., not a risk-based SLV).

Of the metals identified above as tissue CPECs in random Forebay bass tissue, the results of the Reference Area sediment comparison demonstrated that all but zinc were present in the targeted Goose Island sediment samples at concentrations similar to or less than Reference Area sediment concentrations (Tables L-7, N-78, and N-79). Therefore, it is difficult to assess the contribution of the metal CPECs in Goose Island sediment to the Forebay tissue levels, with the possible exception of zinc. Due to this, all CPECs in Goose Island sediment (and tissue) were carried to the risk interpretation section.

12.5.4.2 Uncertainty Assessment

A brief introduction to the Uncertainty Assessment phase of the ERA was provided for the Upland OU (Section 12.3.4.2), which also applies to the River OU. Specific sources of uncertainty for this Level II ERA are presented in Appendix O.

12.5.4.3 Risk Interpretation

In this final phase of the risk characterization process, the quantitative and qualitative components of the risk screening (i.e., toxicity ratios and R_{BACs}) and the uncertainty assessment are evaluated to gain a better understanding of the actual potential for ecological risk. Multiple lines of evidence are considered during risk interpretation to identify actual risk drivers at the site and to develop a supportable recommendation for risk managers to review. The outcome of the risk characterization constitutes the basis of remedial decisions for the protection of ecological receptors and risk-driving exposure pathways.

For the screening to evaluate direct toxicity to benthic and aquatic receptors through exposure to sediment and surface water, the CPECs with toxicity ratios greater than 1.0 for benthic invertebrates and aquatic biota are retained for further investigation in this section. For the bioaccumulation screening to evaluate the dietary exposure pathway for fish and wildlife, the CPECs with a $R_{BAC} > 0.1$ and sum $R_{BAC} > 1.0$ are further investigated in this section.

The summary of the risk screening process described in Section 12.3.4.3 for the Upland OU, whereby SLVs were compared to 95% UCLs (mobile receptors) and maximum concentrations (stationary receptors) and a whittled down list of CPECs was identified to plot on figures to evaluate spatial distribution, also applies to the approach used for the River OU. Based on this weight of evidence approach, those CPECs that truly warrant additional investigation or risk management were identified and discussed.

Since evaluation of the tissue data was the preferred method to identify tissue CPECs for predatory fish and wildlife, all COIs in tissue were evaluated in the Screening Assessment, and then the list of CPECs in tissue was carried to the sediment data evaluation. The results of this phased screening process for tissue followed by sediment will assist with risk management decisions for the River OU based on the two possible outcomes previously presented (Section 12.5.3.3):

- If a CPEC in tissue is also present in sediment at concentrations in exceedance of the bioaccumulation SLV (i.e., it is also a CPEC in sediment), then further risk assessment may be helpful to evaluate the actual potential for adverse effects to occur from exposure to site-related CPEC concentrations.
- If a CPEC in tissue is either undetected, present below Reference Area concentrations (inorganics only), or present below sediment SLVs, further risk assessment may not be helpful because tissue concentrations likely do not correlate with current sediment concentrations at the site. If this is the case, the tissue levels could reflect exposure to other sources in the river or could reflect historical body burdens. Risk management or some level of monitoring may be warranted for certain tissue CPECs that are not found to be CPECs in sediment.

Those CPECs for which a limited number of exceedances were noted (e.g., Aroclor 1248 for benthic invertebrates in Eagle Creek) were generally not included on the spatial distribution maps, but were still discussed using a similar weight-of-evidence approach as the remaining CPECs. The CPECs identified in Section 12.5.4.1 for the Forebay (both random and targeted sample areas) and associated receptors are discussed below.

12.5.4.3.1 Random Forebay Data

Benthic Invertebrates

Direct Toxicity Evaluation - Only Aroclor 1254 was identified for the benthic invertebrate community in the Forebay based on the individual and cumulative COI risk screening evaluations for sediment (Tables N-47 and 48) and was assessed for its potential to elicit adverse effects in the benthic community. Maximum concentrations of total PCBs as the sum of all Aroclors and as the sum of all congeners were below the corresponding SLVs.

Aroclor 1254 was detected in two of 19 randomly-collected sediment samples (detection frequency of 11%), and exceeded the SLV in one of these samples (location P4 on the north side of Bradford Island, Figure 12-20). The toxicity ratio calculated using the maximum detected concentration of Aroclor 1254 was 3.86 (Table N-47), and decreases to 0.826 if the K-M mean concentration was used as the EPC (the maximum concentration was selected as the 95% UCL given the large number of non-detects) (Table I-18a). The elevated toxicity ratio for Aroclor 1254 indicates the potential for localized impacts (at P4) to benthic invertebrates. Given the low detection frequency for Aroclor 1254 in sediment and low toxicity ratios based on the maximum

and mean concentrations, adverse effects to the benthic invertebrate community at the Forebay are not expected to occur. However, PCBs (including Aroclor 1254) are recommended for further investigation because they been identified as CPECs for other receptors in the River as well as benthic invertebrates.

Bioaccumulation Evaluation - Refer to the findings of the evaluation for "Fish and Shellfish" below for a comparison of measured clam and crayfish concentrations from the site to tissue SLVs protective of fish and shellfish.

Aquatic Organisms and Aquatic-Dependent Wildlife

Direct Contact Evaluation - Barium was the only CPEC identified for the aquatic receptors in the Forebay based on the individual and multiple COI screening evaluations for surface water (Tables N-49 and N-50) and was assessed for its potential to elicit adverse effects in aquatic receptors.

Barium was detected above the surface water SLV in all five Forebay filtered surface water samples as well as the five filtered surface water samples collected from the Reference Area. Dissolved barium concentrations in surface water in the Forebay ranged from 0.021 to 0.024 mg/L (Table 6-12c) and concentrations in the Reference Area ranged from 0.0215 to 0.0235 mg/L (Table 6-12d). The toxicity ratio for barium in surface water was 6.0 (Table N-49). Given the very similar concentrations of barium detected in Forebay and Reference Area surface water samples, and the relatively low toxicity ratio that is based on a Tier II Secondary Chronic Value (DEQ 2001), no further evaluation is recommended for aquatic receptors exposed through direct contact with Forebay surface water.

Bioaccumulation Evaluation - Refer to the findings of the evaluation for "Fish and Shellfish" below for a comparison of measured sculpin and bass concentrations from the site to tissue SLVs protective of fish and shellfish. Likewise, the findings of the evaluation for birds and mammals are based on a comparison of measured sculpin, crayfish, or bass concentrations from the site to tissue SLVs protective of birds and mammals (Section 12.5.3.2).

Fish and Shellfish

Tissue SLVs protective of upper trophic level fish and shellfish were screened against the Forebay clam, crayfish, sculpin, and smallmouth bass data. Table N-80 summarizes the CPECs for fish and shellfish based on a comparison to SLVs that were identified in the various tissues randomly collected from the Forebay (Table N-51). The CPECs shown with an asterisk on Table N-80 were also identified as CPECs in Forebay sediment (Table N-52).

As described in Section 12.5.4.1, EPCs for cadmium, lead, and mercury exceeded the tissue SLVs. Eight other metals were detected in Forebay tissues and retained as CPECs due to the lack of tissue SLVs. However, the results of the population to population statistical comparisons demonstrated that none of these metals were present in Forebay sediment at concentrations above Reference Area sediment concentrations (Table L-4). Therefore, it is difficult to assess the contribution of the metal CPECs in site sediment to the Forebay tissue levels. Although none of these metals are CPECs in sediment, those that are present above the tissue SLVs (cadmium, lead, and mercury) are recommended for further investigation in tissue and sediment during future data collection efforts to better understand the potential site contribution.

In addition, p-cresol (4-methylphenol) was detected in the Forebay in six of 19 sediment samples (at concentrations ranging from 4.8 to 21 µg/kg) and ten of 19 clam samples (at

concentrations ranging from 8.6 to 31 µg/kg). It was retained as a CPEC due to the lack of SLVs for sediment and tissue. p-Cresol was not detected in Forebay crayfish (15 samples) or smallmouth bass (19 samples). Furthermore, the concentrations detected in Forebay sediment and clam tissue were not statistically higher than the concentrations detected in the Reference Area for any of the media (Table 8-3). Based on the low concentrations of p-cresol detected in Forebay sediment and clams in comparison to the Reference Area, and the low bioaccumulation potential for p-cresol (log K_{ow} = 1.94; Table J-7), which is supported by the absence this CPEC in sculpin, crayfish, and bass, lack of a quantitative risk-based screening for p-cresol is not expected to influence the findings of the ERA. No further investigation of p-cresol is recommended.

Figure 12-20 shows a sample by sample comparison of CPEC concentrations to SLVs for the protection of upper trophic level fish and shellfish. Tissue concentrations are shown for cadmium, lead, mercury, PCBs, and the two phthalates. Sediment concentrations are shown for PCBs, which was the only sediment CPEC identified due to exceedance of its SLV (Table N-52). For simplicity, due to the higher level of confidence in PCB analytical data reported as congeners for weathered or metabolized PCBs, and due to the consistently higher risk estimates of total PCBs as congeners in tissue, only the PCB congener totals are presented on Figure 12-20. Additionally, B2EHP was identified as a CPEC due to lack of an SLV and potential to bioaccumulate (not shown on Figure 12-20).

Clams

The clam tissue R_{BACs} (i.e., EPC divided by bioaccumulation SLV) for cadmium, total PCB congeners, and B2EHP were 2.55, 0.298, and 0.407, respectively. The population to population comparison for clam tissue found that cadmium was present in the Forebay at concentrations above those measured in Reference Area clam tissue. Cadmium concentrations in clam tissue were between 1 and 10 times the SLV in all random samples collected from the Forebay (Figure 12-20). However, the cadmium concentration ranges were similar (0.286 and 0.461 mg/kg in the Forebay [Table 6-9a] and between 0.247 and 0.405 mg/kg in the Reference Area [Table 6-9b]; see Figure L-3a). Given the low R_{BACs} calculated with clam tissue from the Forebay, absence of CPECs in crayfish tissue, and similarity in cadmium concentration ranges in Forebay and Reference Area clams and sediment, there is a low potential for adverse effects to the benthic community from exposure through the dietary pathway.

Sculpin

The sculpin tissue R_{BACs} for cadmium, lead, and mercury were 0.162, 0.858, and 2.13, respectively (Table N-51). The sculpin tissue R_{BACs} for PCBs ranged from 0.186 (PCB 156+157) to 7.40 (total PCBs as congeners). For simplicity and due to the higher level of confidence in PCB analytical data reported as congeners for weathered or metabolized PCBs, total PCBs as congeners was used to represent all PCB CPECs on the figures. The tissue R_{BAC} for the Fish TEQ of 0.668 is much lower than the tissue R_{BAC} for total PCBs as congeners (7.40). The Fish TEQ SLV for tissue (0.0064 µg/kg) is only exceeded at SF-3, i.e., the location with the maximum concentration of total PCBs as congeners in sculpin tissue. The two other locations with the highest PCBs levels in sculpin tissue have concentrations in exceedance of 0.1 times the SLV for the Fish TEQ (SF-4 and SF-5). .

As stated previously, total PCBs as congeners was used to represent all PCB CPECs on Figure 12-20. The highest concentrations of PCBs in sculpin tissue occurred at SF-3, SF-4, and SF-5, on

the southeastern tip of the island, and these are the only three samples that exceed the SLV (but are less than 10 times the SLV). Co-located PCB sediment concentrations in this area were less than 0.1 times the SLV, and clam concentrations were between 0.1 and 1 times the SLV. Cadmium, mercury, and to a lesser extent, lead, concentrations were between 0.1 and 10 times the SLV in several sculpin samples collected throughout the Forebay, and did not appear attributable to site sediment concentrations (the Forebay sediment data were not statistically higher than the Reference Area data) (Table L-4).

Since cadmium, mercury, and lead concentrations in sculpin tissue were comparable throughout the Forebay (R_{BACs} are relatively low), and sediment concentrations of these metals were no different from the Reference Area (Table L-4), further risk assessment is unlikely to be helpful for these metals. Tissue concentrations likely do not correlate with current sediment concentrations in the Forebay. Based on the elevated sculpin tissue concentrations throughout the Forebay, it is likely that other sources (besides sediment concentrations) influence the cadmium, lead, and mercury concentrations measured in the sculpin. It is recommended that future investigations evaluate potential site-related sources (e.g., Upland OU overland pathway.

Risk management or monitoring is recommended for PCBs, and possibly cadmium, lead, and mercury, in sculpin tissue to protect predatory fish that may be exposed through their diet. The size of a sculpin's home range (1.61 km) is greater than the distance between the SF-3, SF-4, and SF-5 cluster, and sediment station P4 (approximately 0.36 km). Therefore, it is possible for the sculpin in these areas to have foraged in the vicinity of P4, where sediment concentrations of PCBs were between 1 and 10 times the SLV and clam concentrations were between 0.1 and 1 times the SLV. However, the implications of this localized exceedance of the sediment SLV in terms of current site contributions to concentrations of PCBs in sculpin tissue are unknown. It is likely that the sculpin tissue levels reflect historical body burdens, influences from upstream sources, or a combination of the two.

Smallmouth Bass

The smallmouth bass tissue R_{BACs} for mercury, B2EHP, and butylbenzyl phthalate were 3.60, 0.192, and 0.771, respectively (Table N-51). The bass tissue R_{BACs} for PCBs ranged from 0.153 (PCB 114) to 44.9 (total PCBs as congeners). The tissue R_{BAC} for the Fish TEQ of 4.58 is much lower than the tissue R_{BAC} for total PCBs as congeners (44.9), and the Fish TEQ SLV for tissue (0.0064 μg/kg) is only exceeded at bass locations 11 and 17, i.e., the locations with the maximum concentrations of total PCBs as congeners. The six remaining locations that exceed 0.1 times the SLV for the Fish TEQ (2, 3, 8, 13, 16 and 18) also exceed either 0.1 times the SLV or the whole SLV for total PCBs as congeners.

As stated previously, total PCBs as congeners was used to represent all PCB CPECs on Figure 12-20. The highest concentrations of PCBs in bass tissue occurred at location 17, on northeastern tip of the island, and location 11 in the Goose Island slough. Total PCB concentrations in bass at these locations exceed 10 times the SLV. Several other bass caught from locations had PCB concentrations between 0.1 and 10 times the SLV.

Mercury was also present in bass tissue at concentrations between 1 and 10 times the SLV. Although concentrations of mercury in Forebay bass were significantly higher than in the Reference Area (Table L-4), the concentration ranges in bass tissue were generally comparable between the Forebay (0.0710 – 0.512 mg/kg) (Table 6-6a) and the Reference Area (0.0548 –

0.333 mg/kg) (Table 6-6b). This is consistent with the fact that mercury concentrations in Forebay sediments were not significantly higher than those in the Reference Area (Table L-4).

B2EHP was detected between 0.1 and 1 times the SLV in two bass tissue samples (8 and 15) collected from the Goose Island slough, but did not have a sediment SLV for evaluation of the sediment samples (Figure 12-20). Butylbenzyl phthalate was detected at a concentration between 1 and 10 times the SLV in only one bass sample (16), and was undetected in all sediment samples (Figure 12-20).

The low detection frequency for B2EHP and butylbenzyl phthalate in Forebay bass tissue (37% and 11%, respectively, Table I-8a) and low concentrations detected supports the position that these compounds are readily metabolized and only weakly bioaccumulate (similar to the metabolic action noted in PAHs). At other contaminated sediment sites, including the Lower Duwamish Waterway, phthalates often occur with other compounds (e.g., PCBs) that drive risk. The phthalates are typically overshadowed by these more potent risk-drivers (Sediment Phthalate Work Group 2007). Given the low frequency of tissue SLV exceedances and low R_{BACs} for the phthalates, there is a low potential for adverse effects to fish from exposure through the dietary pathway. However, it is recommended that future investigations analyze for and evaluate all SVOCs.

Since mercury bass tissue concentrations were elevated throughout the Forebay, mercury bass tissue concentrations were similar between the Forebay and Reference Area, and concentrations of mercury in Forebay sediment were not elevated relative to the Reference Area, further risk assessment may not be helpful for mercury. Based on the ubiquitously elevated bass tissue levels for mercury in the River as a whole, it is likely that other sources influenced the concentrations measured in the Forebay. It is recommended that future investigations evaluate potential site-related sources (e.g., Upland OU overland pathway).

Risk management or monitoring is recommended for PCBs, and possibly mercury, in bass tissue to protect predatory fish that may be exposed through their diet. While it is possible for the bass to forage in the vicinity of P4, where the maximum sediment concentration of PCB was between 1 and 10 times the SLV and clam concentrations were between 0.1 and 1 times the SLV, this small area is unlikely to account for the PCB concentrations measured in bass tissue. Although the implications of this localized exceedance of the sediment SLV in terms of current site contribution to concentrations of PCBs and mercury in bass tissue are unknown, it is likely that the measured bass tissue concentrations reflect historical body burdens, influences from upstream sources, or a combination of the two.

Piscivorous Birds

The Forebay crayfish, sculpin, and smallmouth bass data were screened against tissue SLVs protective of piscivorous birds. Table N-81 summarizes the CPECs for piscivorous birds identified in crayfish and fish tissues based on a comparison to SLVs (Tables N-53 and Table N-54). The CPECs shown with an asterisk in Table N-81 were also identified as CPECs in Forebay sediment (Tables N-55). No population-level CPECs were identified for sediment.

As described in Section 12.5.4.1, EPCs for mercury exceeded the tissue SLVs. Seven other metals were detected in Forebay tissues and retained as CPECs due to the lack of tissue SLVs. However, the results of the population to population statistical comparisons demonstrated that none of these metals were present in the Forebay sediment at concentrations above Reference

Area sediment concentrations (Table L-4). Therefore, it is difficult to assess the contribution of the metal CPECs in site sediment to the Forebay tissue levels.

Although none of these metals are CPECs in sediment, the one present above the tissue SLVs (mercury) is recommended for further investigation in tissue and sediment during future data collection efforts to better understand the potential site contribution.

Figure 12-21 shows a sample by sample comparison of CPEC concentrations to SLVs for the protection of piscivorous birds at the individual level. Tissue and sediment concentrations are shown for mercury, total PCBs as congeners, and Avian TEQs.

Crayfish

The crayfish tissue R_{BACs} for mercury at the avian individual and population levels were 0.320, and 0.158, respectively (Table N-53 and Table N-54). The crayfish tissue R_{BACs} for methyl mercury at the avian individual and population levels were very similar at 0.445, and 0.219, respectively. Only the crayfish tissue R_{BAC} for total PCBs as congeners was above 0.1 times the SLV at the individual level (R_{BAC} = 1.04). All other R_{BACs} for PCBs, including the Avian TEQ, are below 0.1 times the SLV protective of individual birds and, therefore, only total PCBs as congeners in crayfish tissue was identified as a CPEC.

As shown on Figure 12-21, the highest concentration of PCBs in crayfish tissue (between 1 and 10 times the SLV protective of individual birds) occurred at P6-CF on the southeastern tip of the island. PCB concentrations in crayfish from P4-CF, P5-CF, P7-CF, and P14-CF were between 0.1 and 1 times the SLVs protective of individual birds. PCBs detected in sediment were greater than 10 times the SLV for individual birds in one sample (P4), between the SLV and 10 times the SLV in one sample (P9), and between 0.1 times the SLV and the whole SLV in most of the remaining samples.

Mercury (and methyl mercury) concentrations in crayfish tissue were below the SLV protective of individual birds in all samples, and between 0.1 times the SLV and the whole SLV in all samples collected throughout the Forebay. Although concentrations of methyl mercury in Forebay crayfish were significantly higher than in the Reference Area (Table L-4), the concentration ranges in crayfish tissue were generally comparable between the Forebay (0.025 – 0.04 mg/kg) and the Reference Area (0.0181 – 0.0367 mg/kg). This is consistent with the fact that mercury concentrations in Forebay sediment were no higher than in Reference Area sediment (Table L-4 and N-55). Based on the low methyl mercury concentrations in crayfish, the potential for adverse effects in birds is expected to be low.

Risk management or monitoring is recommended for PCBs in crayfish tissue to protect piscivorous birds that may be exposed through their diet. The low R_{BACs} for crayfish tissue of 1.04 (Table N-53) and sediment of 1.99 (Table N-55) based on exposure by individual birds should be considered, as crayfish are not likely a driver species for birds (higher concentrations were detected in sculpin and bass tissue).

Sculpin

The sculpin tissue R_{BACs} for mercury at the avian individual and population levels were 2.53, and 1.25, respectively (Table N-53 and Table N-54). The sculpin tissue R_{BACs} greater than 0.1 times the SLVs for PCBs at the individual level ranged from 0.309 (PCB 126) to 90.9 (total PCBs as congeners), and at the population level ranged from 0.125 (PCB 118) to 1.77 (total PCBs as

congeners). The sculpin tissue R_{BACs} for the Avian TEQ at the individual and population levels were 1.59, and 0.754, respectively.

As shown on Figure 12-21, the highest concentrations of PCBs in sculpin tissue (greater than 10 times the SLV) occurred at SF-3, SF-4 and SF-5 on the southeastern tip of the island. PCB concentrations in sculpin from SF-2. SF-6, SF-12, SF-14, SF-16, and SF-17 were between the SLV and 10 times the SLV, and concentrations at the remaining locations are between 0.1 times the SLV and the whole SLV. The highest concentration of the Avian TEQ in sculpin tissue (between the SLV and 10 times the SLV) occurred at SF-3, and most of the remaining concentrations fall between 0.1 times the SLV and the whole SLV.

As indicated above, PCBs detected in sediment were greater than 10 times the SLV for individual birds in one sample (P4), between the SLV and 10 times the SLV in one sample(P9), and between 01 times the SLV and the whole SLV in most of the remaining samples. Sample P04 is the only location with an Avian TEQ concentration between 0.1 times the SLV and the whole SLV, all remaining sediment concentrations are below 0.1 times the SLV (Figure 12-21).

Mercury concentrations were between the SLV and 10 times the SLV in several sculpin samples collected throughout the Forebay. Although concentrations of mercury in sculpin were significantly higher than in the Reference Area (Table L-4), the concentration ranges in sculpin tissue were generally comparable between the Forebay (0.037 – 0.308 mg/kg) and the Reference Area (0.0448 – 0.141 mg/kg). This is consistent with the fact that mercury concentrations in Forebay sediment were no higher than in Reference Area sediment (Table L-4 and N-55).

Since mercury sculpin tissue concentrations were elevated throughout the Forebay (R_{BACs} were relatively low), mercury sculpin tissue concentrations were similar between the Forebay and Reference Area, and concentrations of mercury in Forebay sediment were not elevated relative to the Reference Area, further risk assessment may not be helpful. Based on the ubiquitously elevated bass tissue levels for mercury in the River as a whole, it is likely that other sources influenced the concentrations measured in the Forebay. It is recommended that future investigations evaluate potential site-related sources (e.g., Upland OU overland pathway).

Risk management or monitoring is recommended for PCBs, and possibly mercury, in sculpin tissue to protect piscivorous birds that may be exposed through their diet. However, the low sediment R_{BACs} for PCBs, and low concentrations detected in the sediment samples relative to the tissue data, do not indicate a current source of PCBs in the Forebay. It is likely that the sculpin tissue levels reflect historical body burdens, influences from upstream sources, or a combination of the two.

Smallmouth Bass

Di-n-butyl phthalate was detected in one of 19 bass tissue samples (Table I-8a) and was not detected in any other medium collected from the Forebay. It was not detected in Reference Area tissues, but was detected in Reference Area sediment (Table I-11). The R_{BAC} for di-n-butyl phthalate in bass tissue from the Forebay is 0.24 (Table N-53). Based on the absence of this compound from all but one Forebay tissue sample and low detection in this sample, no further investigation of di-n-butyl phthalate is recommended.

PAHs were retained as tissue CPECs due to the lack of tissue SLVs for birds, and the implications of this uncertainty to the findings of the Screening Assessment are discussed in Appendix O.

Figure 12-21 shows a sample by sample comparison of CPEC concentrations to SLVs for the protection of birds. Tissue concentrations are shown for mercury and PCBs (total PCBs as congeners and Avian TEQs). Sediment concentrations are shown for PCBs (total PCBs as congeners and Avian TEQs), which were the only sediment CPECs identified (Table N-55), as well as mercury.

The smallmouth bass tissue R_{BACs} for mercury at the individual and population levels were 4.28, and 2.11, respectively (Tables N-53 and N-54). The bass tissue R_{BACs} for PCBs at the individual level ranged from 0.135 (PCB 167) to 552 (total PCBs as congeners), and at the population level ranged from 0.144 (Aroclor 1242) to 10.7 (total PCBs as congeners). The bass tissue R_{BACs} for the Avian TEQ at the individual and population levels were 36.4, and 17.3, respectively.

As shown on Figure 12-21, the highest concentrations of total PCBs as congeners in bass tissue occurred at locations 17 and 18, on the tip of the Bradford island, locations 3 and 16, which were also located adjacent to the island, and locations 2, 8, 11 and 13 in the Goose Island slough. Total PCBs as congeners concentrations in bass at these locations exceeded 10 times the SLV protective of individual birds, and PCB concentrations at locations 11 and 17 also exceeded 10 times the SLV protective of bird populations. Several other bass sample locations throughout the Forebay had PCB concentrations between 0.1 and 10 times the SLVs (Figure 12-21). The highest concentrations of the Avian TEQ in bass tissue (greater than 10 times the SLV) also occurred at locations 11 and 17, while concentrations in six samples fall between the SLV and 10 times the SLV, and concentrations in the remaining samples are between 0.1 times the SLV and the whole SLV.

The Avian TEQ was not identified as a CPEC in sediment (Tables N-55 and N-56). Total PCBs as congeners are a sediment CPEC and were detected in sediment from P4 at a concentration greater than 10 times the sediment SLV protective of individual birds and between 0.1 and 1 times the SLV protective of bird populations. Sediment total PCB concentrations were greater than 0.1 times the SLV protective of individual birds at several other locations. However, the affected area is unlikely to account for the PCB concentrations observed in the bass. Although the implications of these localized exceedances of the sediment SLV in terms of current site contribution to concentrations of PCBs in bass tissue are unknown, it is likely that the observed bass tissue levels reflect historical body burdens, influences from upstream sources, or a combination of the two.

Mercury was also measured in several bass samples at concentrations between 0.1 and 10 times the SLV (Figure 12-21). Although concentrations of mercury in Forebay bass were significantly higher than in the Reference Area (Table L-4), the concentration ranges in bass tissue were generally comparable between the Forebay (0.0710 – 0.512 mg/kg) and the Reference Area (0.0548 – 0.333 mg/kg). This is consistent with the fact that mercury concentrations in Forebay sediments were not significantly higher than those in the Reference Area.

Since mercury bass tissue concentrations are elevated throughout the Forebay, mercury bass tissue concentrations were similar between the Forebay and Reference Area, and concentrations of mercury in Forebay sediment were not elevated relative to the Reference Area, further risk assessment may not be helpful. Based on the ubiquitously elevated bass tissue concentrations for mercury, it is likely that other sources influenced the levels measured in the Forebay. It is recommended that future investigations evaluate potential site-related sources (e.g., Upland OU overland pathway) .

Risk management or monitoring is recommended for PCBs, and possibly mercury, in bass tissue to protect piscivorous birds that may be exposed through their diet. More confidence is placed in the R_{BACs} for PCBs measured as congeners, including totals as congeners and TEQs, for reasons previously stated. The low sediment R_{BAC} for PCB congeners in the Forebay and absence of mercury sediment concentrations above Reference Area sediment concentrations should be considered in risk management decisions regarding the best way to proceed with the ERA process.

Piscivorous Mammals

Tissue SLVs protective of piscivorous mammals were screened against the Forebay crayfish, sculpin, and smallmouth bass tissue data. Table N-82 summarizes the CPECs for piscivorous mammals identified in these randomly-collected tissues from the Forebay (Table N-57 and Table N-58). The CPECs shown with an asterisk in Table N-82 were also identified as CPECs in Forebay sediment (Tables N-59 and N-60). No population-level CPECs were identified for sediment.

As described in Section 12.5.4.1, EPCs for mercury exceeded the tissue SLVs. Seven other metals were detected in Forebay tissues and retained as CPECs due to the lack of tissue SLVs. However, the results of the population to population statistical comparisons demonstrated that none of these metals were present in the Forebay sediment at concentrations above Reference Area sediment concentrations (Table L-4). Therefore, it is difficult to assess the contribution of the metal CPECs in site sediment to the Forebay tissue levels.

Although none of these metals are CPECs in sediment, the one present above the tissue SLVs (mercury) is recommended for further investigation in tissue and sediment during future data collection efforts to better understand the potential site contribution.

Figure 12-22 shows a sample by sample comparison of CPEC concentrations to SLVs for the protection of piscivorous mammals, both at the individual and population levels. Tissue and sediment concentrations are shown for mercury, total PCBs as congeners, and Mammalian TEQs.

Crayfish

The crayfish tissue R_{BACs} for total mercury at the individual and population levels were 0.198, and 0.119, respectively, and the R_{BACs} for methyl mercury were 0.274 and 0.165 (Table N-57 and Table N-58). Although total PCBs as congeners in crayfish tissue were not identified as a CPEC for mammals, three dioxin-like PCB congeners and the Mammalian TEQ were selected as CPECs (Tables N-57 and Table N-82). The crayfish tissue R_{BACs} for PCBs at the individual level ranged from 0.177 (PCB 156+157) to 2.01 (Mammalian TEQ), and no tissue CPECs were identified based on the population level evaluation for mammals.

As shown on Figure 12-22, the highest concentrations of Mammalian TEQs in crayfish tissue (between 1 and 10 times the SLV protective of individual mammals) occurred at P5-CF and P6-CF on the southeastern tip of the island. Mammalian TEQ concentrations in crayfish from P1-CF, P4-CF, and P7-CF were between 0.1 times the SLV and the whole SLV protective of individual mammals, and the remaining concentrations are below 0.1 times the SLV.

Total PCBs as congeners detected in sediment were below the SLVs (and sum $R_{BAC} < 1.0$) (Tables N-59 and N-60). The Mammalian TEQ and PCBs 105, 118, 126, and 156+157 were identified as CPECs in Forebay sediment (Tables N-59) based on exceedances of the sediment

SLV protective of individual mammals. Mammalian TEQ concentrations in sediment were below the SLVs protective of mammal populations (Table N-60). The Mammalian TEQ concentration in sediment at P4 is the only one in exceedance of the SLV protective of individual mammals (Figure 12-22), while Mammalian TEQ concentrations were between 0.1 times the SLV and the whole SLV at five locations.

Concentrations of mercury, including methyl mercury, in crayfish were all below the SLVs protective of mammals (individuals and the population). Mercury concentrations were between 0.1 times the SLVs and the SLVs protective of individual mammals and mammal populations in all but three crayfish samples collected throughout the Forebay. These three samples, which only had concentrations between 0.1 times the SLV and the SLV protective of individual mammals (below 0.1 times the SLV protective of populations), were P4-CF (former removal area), P20-CF (northwest shore of Goose Island), and P3-CF (southeast shore of Cascade Locks). Although concentrations of mercury in crayfish were significantly higher than in the Reference Area (Table L-4), the concentration ranges in crayfish tissue were generally comparable between the Forebay (0.0157 – 0.0315 mg/kg) and the Reference Area (0.0105 – 0.0246 mg/kg). This is consistent with the fact that mercury concentrations in Forebay sediment were no higher than in Reference Area sediment (Table L-4).

Since mercury crayfish tissue concentrations were only greater than 0.1 times the mammalian SLVs throughout the Forebay (R_{BACs} were low), mercury crayfish tissue concentrations were similar between the Forebay and Reference Area, and concentrations of mercury in Forebay sediment were not elevated relative to the Reference Area, further risk assessment may not be helpful. Based on the relatively uniform crayfish tissue levels for mercury in the River as a whole, it is likely that other sources influenced the concentrations measured in the Forebay. It is recommended that future investigations evaluate potential site-related sources (e.g., Upland OU overland pathway).

Given the lack of CPECs in crayfish tissue based on the comparison to SLVs protective of mammal populations, low R_{BACs} for the individual level evaluation, the absence of sensitive mammalian species at the site, the potential for adverse effects to mammals from consumption of crayfish tissue is low. No further investigation of crayfish for the protection of mammal populations is recommended.

Sculpin

The sculpin tissue R_{BAC} for mercury at the individual and population levels were 1.56, and 0.935, respectively (Table N-57 and Table N-58). The sculpin tissue R_{BACs} for PCBs at the individual level ranged from 0.183 (PCB 169) to 25 (PCB 118), and at the population level ranged from 0.148 (PCB 156+157) to 1.87 (total PCBs as congeners). The sculpin tissue R_{BACs} for the Mammalian TEQ at the individual and population levels were 25.2, and 0.913, respectively.

As shown on Figure 12-22, the highest concentrations of total PCBs as congeners in sculpin tissue (between 1 and 10 times the SLVs), occurred at SF-3, and SF-5 on the southeastern tip of the island. Total PCB concentrations in sculpin from SF-4 and SF-6 were between 0.1 and 1 times the SLVs. Mammalian TEQ concentrations in SF-3, SF-4, and SF-5 are greater than 10 times the tissue SLV, between the SLV and 10 times the SLV in nine samples, and concentrations in the remaining samples fall between 0.1 times the SLV and the whole SLV.

Total PCBs as congeners detected in sediment were below the SLVs (and sum $R_{BAC} < 1.0$) (Tables N-59 and N-60). The Mammalian TEQ and PCBs 105, 118, 126, and 156+157 were identified as CPECs in Forebay sediment (Tables N-59) based on exceedances of the sediment SLV protective of individual mammals. Mammalian TEQ concentrations in sediment were below the SLVs protective of mammal populations (Table N-60). The Mammalian TEQ concentration in sediment at P4 is the only one in exceedance of the SLV protective of individual mammals (Figure 12-22), while Mammalian TEQ concentrations were between 0.1 times the SLV and the whole SLV at five locations.

Mercury concentrations were between 0.1 and 10 times the SLV in several sculpin samples collected throughout the Forebay. Although concentrations of mercury in sculpin were significantly higher than in the Reference Area (Table L-4), the concentration ranges in sculpin tissue were generally comparable between the Forebay (0.037 – 0.308 mg/kg) and the Reference Area (0.0448 – 0.0141 mg/kg). This is consistent with the fact that mercury concentrations in Forebay sediment were no higher than in Reference Area sediment (Table L-4).

Since mercury sculpin tissue concentrations were elevated throughout the Forebay (R_{BACs} were relatively low), mercury sculpin tissue concentrations were similar between the Forebay and Reference Area, and concentrations of mercury in Forebay sediment were not elevated relative to the Reference Area, further risk assessment may not be helpful. Based on the ubiquitously elevated sculpin tissue levels for mercury in the River as a whole, it is likely that other sources influenced the concentrations measured in the Forebay. It is recommended that future investigations evaluate potential site-related sources (e.g., Upland OU overland pathway).

Risk management or monitoring is recommended for PCBs, and possibly mercury, in sculpin tissue to protect piscivorous mammals that may be exposed through their diet. However, the low sediment R_{BACs} for PCBs (including the Mammalian TEQs), and low concentrations of PCBs and mercury detected in the sediment samples relative to the tissue data, do not indicate a current source of PCBs and mercury in the Forebay. It is likely that the sculpin tissue levels reflect historical body burdens, influences from upstream sources, or a combination of the two.

Smallmouth Bass

The smallmouth bass tissue R_{BAC} for mercury at the individual and population levels were 2.64, and 1.59, respectively (Tables N-57 and N-58). The bass tissue R_{BACs} for PCBs at the individual level ranged from 0.295 (Aroclor 1242) to 331 (PCB 126), and at the population level ranged from 0.121 (PCB 114) to 12 (PCB 126). As stated previously, total PCBs as congeners was used to represent all PCB CPECs on the figures.

As shown on Figure 12-22, the highest concentrations of PCBs in bass tissue occurred at location 17, on northeastern tip of the island, and 11 in the Goose Island slough. Bass concentrations at these locations exceeded 10 times the SLVs protective of mammals at the individual and population levels. Several other locations near Bradford Island and Goose Island had PCB concentrations between 0.1 and 10 times the tissue SLVs.

Total PCBs as congeners detected in sediment were below the SLVs (and sum $R_{BAC} < 1.0$) (Tables N-59 and N-60). The Mammalian TEQ and PCBs 105, 118, 126, and 156+157 were identified as CPECs in Forebay sediment (Tables N-59) based on exceedances of the sediment SLV protective of individual mammals. Mammalian TEQ concentrations in sediment were below the SLVs protective of mammal populations (Table N-60). The Mammalian TEQ

concentration in sediment at P4 is the only one in exceedance of the SLV protective of individual mammals (Figure 12-22), while Mammalian TEQ concentrations were between 0.1 times the SLV and the whole SLV at five locations.

Mercury was also present at concentrations between 0.1 and 10 times the SLV in several bass samples. Although concentrations of mercury in Forebay bass were significantly higher than in the Reference Area (Table L-4), the concentration ranges in bass tissue were generally comparable between the Forebay (0.0710 – 0.512 mg/kg) and the Reference Area (0.0548 – 0.333 mg/kg). This is consistent with the fact that mercury concentrations in Forebay sediments were not significantly higher than those in the Reference Area sediment (Table L-4).

Since mercury bass tissue concentrations were elevated throughout the Forebay (R_{BACs} were relatively low), mercury bass tissue concentrations were similar between the Forebay and Reference Area, and concentrations of mercury in Forebay sediment were not elevated relative to the Reference Area, further risk assessment may not be helpful. Based on the ubiquitously elevated bass tissue concentrations for mercury, it is likely that other sources influenced the levels measured in the Forebay. It is recommended that future investigations evaluate potential site-related sources (e.g., Upland OU overland pathway).

Risk management or monitoring is recommended for mercury and PCBs in bass tissue to protect piscivorous mammals that may be exposed through their diet. More confidence is placed in the R_{BACs} for PCBs measured as congeners for reasons previously stated. The absence of sediment concentrations in exceedance of the bioaccumulation SLVs for PCBs and absence of mercury sediment concentrations above Reference Area sediment concentrations should be considered in risk management decisions regarding the best way to proceed with the ERA process.

12.5.4.3.2 Mouth of Eagle Creek

Benthic Invertebrates

Direct Toxicity Evaluation - PCBs (Aroclor 1248 and total Aroclors) were the only CPECs identified for the benthic community at the mouth of Eagle Creek based on the individual and multiple COI screening evaluations for sediment (Tables N-61 and N-62). Aroclor 1248 was assessed for its potential to elicit adverse effects in the benthic community.

Aroclor 1248 was detected at one of the two targeted sampling locations at Eagle Creek (Table I-9). The toxicity ratio for this sediment CPEC was 10.9. The toxicity ratio for total PCBs as Aroclors was 2.29. Aroclor 1248 was not detected in any other random or targeted locations in the Forebay (Table I-9) or in the Reference Area (Table I-11), including sediment and tissue samples. Aroclor 1254 was the primary PCB mixture detected in random sediment and tissue samples in the Forebay.

The elevated toxicity ratio for Aroclor 1248 indicates the potential for localized impacts to benthic invertebrates at the mouth of Eagle Creek. The absence of this CPEC in any other samples collected from the Forebay suggests that the Aroclor 1248 detection is not site-related. Given the potential for localized effects to the benthic community, however, Aroclor 1248 should be maintained as a CPEC for further investigation.

Bioaccumulation Evaluation - Refer to the findings of the evaluation for “Fish and Shellfish” below, which are based on a comparison of bioaccumulative COI concentrations in sediment to sediment SLVs protective of fish and shellfish.

Fish and Shellfish

Sediment SLVs protective of upper trophic level fish and shellfish that may be exposed through their diet were screened against the Eagle Creek sediment data (Table N-63). PCBs (Aroclor 1248 and total Aroclors) were detected in sediment at concentrations above the bioaccumulation SLVs. Aroclor 1248 was detected at one of the two targeted sampling locations at Eagle Creek (Table I-9). The toxicity ratios for Aroclor 1248 and total PCBs as Aroclors were 3.45 and 3.53, respectively. Aroclor 1248 was not detected in any other random or targeted locations in the Forebay or in the Reference Area, including sediment and tissue samples. Aroclor 1254 was the primary PCB mixture detected in random sediment and tissue samples in the Forebay.

The elevated toxicity ratios for Aroclor 1248 and total PCBs as Aroclors indicate the potential for localized impacts to fish and shellfish at the mouth of Eagle Creek. The absence of this CPEC in any other samples collected from the Forebay indicates that the Aroclor 1248 detection is not likely site-related. Given the influence of weathering and metabolic processes on the ability to identify PCBs measured as Aroclors in tissue, however, Aroclor 1248 is recommended for further investigation in Eagle Creek sediments as a possible contributor to PCB levels measured in fish tissue from the Forebay.

Carbazole was retained as a CPEC in sediment due to the lack of a bioaccumulation SLV. This sediment CPEC was detected in one of 19 Forebay random samples and was not detected in any of the clam (19 samples), crayfish (15 samples), or smallmouth bass (19 samples) random Forebay samples (Table L-4). Lack of evidence for bioaccumulation in site tissues is consistent with the low log K_{ow} for carbazole of 3.72 – which just barely falls within the optimal range for bioaccumulation of 3.5 to 6.5 (Suter 1993). Given the lack of carbazole in tissue collected from the Forebay, no further investigation is recommended.

Piscivorous Birds

Tissue SLVs protective of piscivorous birds were screened against the Eagle Creek data (Tables N-64 and N-65). Table N-64 shows the results of the bioaccumulation screening to assess potential adverse effects at the individual level, and Table N-65 shows the results of the population level assessment. PCBs (Aroclor 1248 and total Aroclors) were detected in sediment at concentrations above these bioaccumulative SLVs protective of individual birds. No CPECs were identified that could elicit adverse effects in bird populations.

Aroclor 1248 was detected at one of the two targeted sampling locations at Eagle Creek. The R_{BACs} for Aroclor 1248 and total PCBs as Aroclors based on the SLVs protective of individuals were 42.2 and 43.2, respectively. With the exception of these Eagle Creek samples, Aroclor 1248 was not detected in any random or targeted locations in the Forebay or the Reference Area, including sediment and tissue samples. Aroclor 1254 is the primary PCB mixture detected in random sediment and tissue samples.

The elevated R_{BACs} for Aroclor 1248 and total PCBs as Aroclors indicate the potential for localized impacts to individual protected threatened and endangered birds at the mouth of Eagle Creek. The absence of this CPEC in any other samples collected from the Forebay indicates that the Aroclor 1248 detection is not likely site-related. Given the influence of weathering and metabolic processes on the ability to identify PCBs measured as Aroclors in tissue, however, Aroclor 1248 is recommended for further investigation in Eagle Creek sediments as a possible contributor to PCB levels measured in fish tissue from the Forebay.

As stated above, carbazole was retained as a CPEC in sediment due to the lack of a bioaccumulation SLV. This sediment CPEC was detected in one of 19 Forebay random samples and was not detected in any of the clam (19 samples), crayfish (15 samples), or smallmouth bass (19 samples) random Forebay data (Table L-4). Lack of evidence for bioaccumulation in site tissues is consistent with the low log K_{ow} for carbazole of 3.72, which just barely falls within the optimal range for bioaccumulation of 3.5 to 6.5 (Suter 1993). Given the lack of carbazole in tissue collected from the Forebay, no further investigation is recommended.

Piscivorous Mammals

Tissue SLVs protective of piscivorous mammals were screened against the Eagle Creek sediment data (Tables N-66 and N-67). Table N-66 shows the results of the bioaccumulation screening to assess potential adverse effects at the individual level, and Table N-67 shows the results of the population level assessment. PCBs (Aroclor 1248 and total Aroclors) were detected in sediment at concentrations above these bioaccumulative SLVs protective of individual mammals. No CPECs were identified that could elicit adverse effects in mammal populations.

Aroclor 1248 was detected at one of the two targeted sampling locations at Eagle Creek. The R_{BACs} for Aroclor 1248 and total PCBs as Aroclors based on the SLVs protective of individuals were 1.73 and 1.77, respectively. With the exception of these Eagle Creek samples, Aroclor 1248 was not detected in any random or targeted locations in the Forebay or the Reference Area, including sediment and tissue samples. Aroclor 1254 is the primary PCB mixture detected in random sediment and tissue samples.

The elevated R_{BACs} for Aroclor 1248 and total PCBs as Aroclors indicate the potential for localized impacts to individual protected threatened and endangered mammals at the mouth of Eagle Creek. No impacts to mammal populations were demonstrated. No threatened or endangered mammal species are known to be present in the Forebay. Piscivorous mammals could access the sediment at the mouth of Eagle Creek during foraging due to the shallow water level and less challenging terrain compared to other areas of Forebay. However, the absence of Aroclor 1248 in any other samples collected from the Forebay indicates that the Aroclor 1248 detection is not likely site-related. Given the influence of weathering and metabolic processes on the ability to identify PCBs measured as Aroclors in tissue, however, Aroclor 1248 is recommended for further investigation in Eagle Creek sediments as a possible contributor to PCB levels measured in fish tissue from the Forebay. The low R_{BACs} for Aroclor 1248 in sediment of Eagle Creek should be considered, especially given the absence of threatened and endangered mammal species.

As stated above, carbazole was retained as a CPEC in sediment due to the lack of a bioaccumulation SLV. This sediment CPEC was detected in one of 19 Forebay random samples and was not detected in any of the clam (19 samples), crayfish (15 samples), or smallmouth bass (19 samples) random Forebay data (Table L-4). Lack of evidence for bioaccumulation in site tissues is consistent with the low log K_{ow} for carbazole of 3.72, which just barely falls within the optimal range for bioaccumulation of 3.5 to 6.5 (Suter 1993). Given the lack of carbazole in tissue collected from the Forebay, no further investigation is recommended.

12.5.4.3.3 Goose Island Slough

Benthic Invertebrates

Direct Toxicity Evaluation - Cadmium, thallium, zinc, and Aroclor 1254 were identified for the benthic invertebrate community in the Goose Island slough based on the individual and cumulative COI screening evaluations for sediment (Tables N-68 and N-69). The toxicity ratios for these CPECs range from 1.20 (zinc) to 1.74 (cadmium), and their concentrations in Goose Island sediment are fairly comparable to Reference Area sediment (Table L-7). Given the low toxicity ratios for these CPECs and lack of sensitive benthic invertebrate species in the Forebay, the potential for adverse effects to the benthic community through direct toxicity is low.

Bioaccumulation Evaluation - Refer to the findings of the evaluation for "Fish and Shellfish" below, which are based on a comparison of measured clam and crayfish concentrations from the site to tissue SLVs protective of fish and shellfish.

Fish and Shellfish

Tissue SLVs protective of upper trophic level fish and shellfish were screened against the targeted Goose Island clam, crayfish, and sculpin data (Table N-70). No CPECs were identified in these targeted tissue samples from Goose Island, with the exception of those for which no SLV is available: beryllium and p-cresol (4-methylphenol) (discussed below). PCBs were not identified as CPECs in clams, crayfish, or sculpin collected from Goose Island. As shown in Table N-51 and discussed above, aluminum, barium, copper, mercury, zinc, PCBs (Aroclors 1242 and 1254, total Aroclors, total PCB congeners, and five of 12 dioxin-like congeners, and Fish TEQ), B2EHP, and butyl benzyl phthalate were identified as CPECs in randomly-collected smallmouth bass tissue samples from the Forebay. These bass tissue CPECs were evaluated in Goose Island sediments.

As described in Section 12.5.4.1, the EPC for mercury in bass tissue from the Forebay exceeded the tissue SLV. Four other metals were detected in Forebay bass tissue (aluminum, barium, beryllium, copper, and zinc) and beryllium was detected in clam tissue from Goose Island; all five metals were retained as CPECs due to the lack of tissue SLVs. However, the results of the comparison of maximum metals concentrations in Goose Island sediment to the Reference Area UPL concentrations in sediment demonstrated that only zinc was elevated in Goose Island sediment (Table L-7). Therefore, it is difficult to assess the contribution of the metal CPECs in site sediment to the Forebay tissue levels, with the possible exception of zinc. The R_{BAC} for zinc in sediment based on the comparison to the Reference Area sediment UPL is low (1.40) (Table N-71). Since the maximum concentration of zinc in Goose Island sediment (148 mg/kg) is similar to the Reference Area sediment UPL (106 mg/kg) (Table L-7), , and zinc is an essential nutrient, the contribution of zinc in Goose Island sediment to Forebay bass tissue concentrations is questionable, especially since zinc was not elevated in the targeted clam and crayfish sample from Goose Island (these invertebrates are generally less mobile and more likely to accumulate localized CPECs than fish species).

None of the other metals are CPECs in sediment (Table N-71). However, because mercury is present in Forebay bass tissue above the tissue SLV protective of fish, mercury is recommended for further investigation in tissue and sediment during future data collection efforts to better understand the potential site contribution.

P-cresol was detected in one of the two sediment samples and in the single clam sample collected from Goose Island (Table L-6) and was retained as a CPEC due to the absence of SLVs. It was not detected in crayfish or smallmouth bass. P-cresol was detected in 11 of 18 sediment samples and 18 of 18 clam samples collected from the Reference Area (Table I-20a). Maximum

concentrations of p-cresol in the Reference Area sediment (210 µg/kg) and clams (110 µg/kg) (Table I-20a) are higher than concentrations detected in the Goose Island sediment (maximum of 8.5 µg/kg) and clams (maximum of 29 µg/kg) (Tables N-71 and N-70). Based on the low concentrations of p-cresol detected in Forebay sediment and clams in comparison to the Reference Area, and the low bioaccumulation potential for p-cresol (log K_{ow} = 1.94; Table J-7), which is consistent with the fact that P-cresol was not identified as a CPEC in sculpin, crayfish, or bass, lack of a quantitative risk-based screening for p-cresol is not expected to influence the findings of the ERA. No further investigation of p-cresol is recommended.

Of the organic CPECs listed above for randomly collected smallmouth bass tissue samples from the Forebay, PCBs (Aroclor 1254 and total Aroclors) were also identified as CPECs in Goose Island sediment (Table N-71) with sediment R_{BACs} of 0.45 and 0.57. These were approximately 3 times lower than the corresponding R_{BACs} for the randomly collected Forebay sediment samples (Table N-52). The low R_{BACs} for targeted Goose Island sediments (P110 and P111) and tissue (P110) samples do not suggest that sediment or food sources in the Goose Island slough contribute to the elevated concentrations of PCBs measured in smallmouth bass tissue from the Forebay (Figure 12-20).

Of the two phthalates identified as CPECs in randomly-collected smallmouth bass tissue samples from the Forebay (B2EHP and butyl benzyl phthalate), B2EHP was also detected in Goose Island sediment (Table 6-13b) and was retained as a CPEC due to the lack of a SLV that addresses the dietary pathway. B2EHP was not detected in the targeted samples of clams and crayfish from Goose Island (Table 6-13a). Butyl benzyl phthalate was not detected in any targeted samples collected from Goose Island (sediment, clams, or crayfish). Even for the bass tissue samples, the R_{BACs} for these two phthalates were low because neither are greater than the SLVs (they were retained as CPECs because their R_{BACs} are between 0.1 times the SLV and the whole SLV; Table N-51). Given the low concentration of butyl benzyl phthalate in Forebay bass tissue (below the SLV) and lack of detections in Goose Island media (sediment and tissue), no further investigation of butyl benzyl phthalate is recommended.

B2EHP was detected at concentrations between 0.1 and 1 times the SLV in two bass tissue samples collected from the Goose Island slough (Figure 12-20). The maximum detected concentration of this CPEC in Goose Island sediment (13 µg/kg; Table L-7) was more than 25 times lower than the maximum detected concentration in the random Forebay sediment samples (340 µg/kg; Table I-18a). The lower concentrations in Goose Island samples do not suggest a significant contribution on the elevated concentrations of B2EHP in smallmouth bass tissue from the Forebay. As discussed in Section 12.5.4.3.1 for the Random Forebay data, the low detection frequency (16%) for B2EHP in Forebay bass tissue (Table I-8a), low concentrations detected in bass (Table N-51), and absence of this CPEC in Goose Island tissues supports the position that phthalates are readily metabolized and weakly bioaccumulate (similar to the metabolic action noted in to PAHs). Given the low R_{BACs} for bass tissue and the minimal sediment B2EHP concentrations at Goose Island, no further evaluation of B2EHP is recommended to protect fish from exposure through the dietary pathway.

Piscivorous Birds

Tissue SLVs protective of individual piscivorous birds and bird populations were screened against the targeted Goose Island crayfish and sculpin data (Tables N-72 and N-73, respectively). No CPECs were identified in these targeted tissue samples from Goose Island, with the

exception of those for which no SLV is available: PAHs. PCBs were not identified as CPECs in crayfish or sculpin tissues collected from Goose Island.

As shown in Tables N-53 and N-54, aluminum, barium, copper, mercury, zinc, PCBs (Aroclors 1242 and 1254, total Aroclors, total PCB congeners, seven dioxin-like congeners, and Avian TEQ), di-n-butyl phthalate, and PAHs were all identified as CPECs in randomly collected smallmouth bass tissue samples from the Forebay. PAHs were retained as CPECs due to the absence of tissue SLVs, and the implications of this uncertainty to the findings of the Screening Assessment are discussed in Appendix O.

As described in Section 12.5.4.1, the EPC for mercury in bass tissue from the Forebay exceeded the tissue SLV. Four other metals were detected in Forebay bass tissue and were retained as CPECs due to the lack of tissue SLVs. However, the results of the comparison of maximum metals concentrations in Goose Island sediment to the Reference Area UPL concentrations in sediment demonstrated that only zinc was elevated in Goose Island sediment (Table L-7). Therefore, it is difficult to assess the contribution of the metal CPECs in site sediment to the Forebay tissue levels, with the possible exception of zinc. The R_{BAC} for zinc in sediment based on the comparison to the Reference Area sediment UPL is low (1.40). As the maximum concentration of zinc in Goose Island sediment (148 mg/kg) is similar to the Reference Area UPL (106 mg/kg) (Table L-7), and because zinc is an essential nutrient, the contribution of zinc in Goose Island sediment to Forebay bass tissue concentrations is questionable, especially since zinc was not elevated in the targeted clam and crayfish sample from Goose Island (these invertebrates are generally less mobile and more likely to accumulate localized CPECs than fish species).

None of the other metals are CPECs in sediment (Table N-74). However, because mercury is present in Forebay bass tissue above the tissue SLV protective of fish, mercury is recommended for further investigation in tissue and sediment during future data collection efforts to better understand the potential site contribution.

Of the smallmouth bass tissue organic CPECs listed above, PCBs (Aroclor 1254, total Aroclors, total congeners, one dioxin-like congener, and Avian TEQ) were also identified as CPECs in Goose Island sediment, with sediment R_{BACs} based on the protection of individual birds ranging from 0.107 (Avian TEQ) to 7.0 (total PCBs as Aroclors) (Table N-74). The R_{BACs} for the randomly collected Forebay sediment samples (Table N-55) are higher than the Goose Island sediment R_{BACs} for Aroclor 1254, total Aroclors, and total congeners (Table N-74), while the Goose Island sediment R_{BACs} for PCB 77 and the Avian TEQ are slightly higher than R_{BACs} for the randomly collected Forebay sediment samples. Sediment R_{BACs} for the Goose Island data based on the protection of bird populations are less than the SLV, but greater than 0.1 times the SLV for Aroclor 1254 and total Aroclors (Table N-75). Population level-based sediment R_{BACs} for the Goose Island data are less than 0.1 times the SLV for total congeners, PCB 77, and the Avian TEQ. The low R_{BACs} for PCBs (total congeners and Avian TEQ) in targeted Goose Island sediments and absence of CPECs in Goose Island tissue suggest that sediment and food sources in the Goose Island slough contribute minimally to the elevated concentrations of PCBs measured in smallmouth bass tissue from the Forebay (Figure 12-21).

Di-n-butyl phthalate was also detected in both Forebay bass and Goose Island sediment (Table 6-13b) (but not in clams and crayfish from Goose Island; Table 6-13a) and was retained as a CPEC.. Di-n-butyl phthalate was detected in one of 19 Forebay bass tissue samples and was not

detected in any other medium collected from the Forebay. It was not detected in Reference Area tissues, but was detected in Reference Area sediment at concentrations similar to those detected in the Goose Island sediment samples. The R_{BAC} for di-n-butyl phthalate in bass tissue from the Forebay was 0.24. Based on the absence of this compound from all but one Forebay tissue sample, the low concentration in this bass sample, and low concentrations in Goose Island sediment, no further investigation of di-n-butyl phthalate is recommended.

Piscivorous Mammals

Tissue SLVs protective of individual piscivorous mammals and mammal populations were screened against the targeted Goose Island crayfish and sculpin data (Tables N-76 and N-77, respectively). No CPECs were identified in these targeted tissue samples from Goose Island. As shown in Tables N-53 and N-54 and discussed above, aluminum, barium, copper, mercury, zinc, PCBs (Aroclors 1242 and 1254, total Aroclors, total PCB congeners, seven dioxin-like congeners, and Mammalian TEQ) are CPECs in randomly-collected smallmouth bass tissue samples from the Forebay. These bass tissue CPECs were evaluated in Goose Island sediments.

As described in Section 12.5.4.1, the EPC for mercury in bass tissue from the Forebay exceeded the tissue SLV. Four other metals were detected in Forebay bass tissue and were retained as CPECs due to the lack of tissue SLVs. However, the results of the comparison of maximum metals concentrations in Goose Island sediment to the Reference Area UPL concentrations in sediment demonstrated that only zinc was elevated in Goose Island sediment (Table L-7). Therefore, it is difficult to assess the contribution of the metal CPECs in site sediment to the Forebay tissue levels, with the possible exception of zinc. The R_{BAC} for zinc in sediment based on the comparison to the Reference Area sediment UPL is low (1.40). As the maximum concentration of zinc in Goose Island sediment (148 mg/kg) is similar to the Reference Area UPL (106 mg/kg) (Table L-7), and because zinc is an essential nutrient, the contribution of zinc in Goose Island sediment to Forebay bass tissue concentrations is questionable, especially since zinc was not elevated in the targeted clam and crayfish sample from Goose Island.

None of these metals are CPECs in sediment (Table N-78 and N-79). However, because mercury is present in Forebay bass tissue above the tissue SLV protective of fish, mercury is recommended for further investigation in tissue and sediment during future data collection efforts to better understand the potential site contribution.

Of the smallmouth bass tissue organic CPECs listed above, PCBs (Aroclor 1254 and total Aroclors) were also identified as CPECs in Goose Island sediment, with sediment R_{BACs} of 0.225 and 0.286 based on the protection of individual mammals (Table N-78). These are approximately 3 times lower than the corresponding R_{BACs} for the randomly collected Forebay sediment samples of 0.614 and 0.652 (Table N-59). Total PCBs as congeners, individual dioxin-like congeners, and the Mammalian TEQ were not identified as CPECs in sediment based on the individual and population level evaluations for mammals. Because PCBs (total congeners, individual dioxin-like congeners, and the Mammalian TEQ) were not identified as CPECs in targeted Goose Island sediments and tissue, it is likely that sediment and food sources in the Goose Island slough contribute minimally to the elevated concentrations of PCBs measured in smallmouth bass tissue from the Forebay (Figure 12-22).

12.5.5 Summary of Level II Screening Assessment for River OU

Tables N-80 through N-82 summarize the initial sediment and tissue CPECs for the benthic community, fish and shellfish (Table N-80), piscivorous birds (Table N-81), and piscivorous mammals (Table N-82) identified in the ERA screening tables for the River OU (both random and targeted Forebay datasets). As discussed in the Risk Interpretation (Section 12.5.4.3), some of these CPECs were eliminated from further evaluation based on low R_{BACs}, lack of detections in other tissue types, similarity between Forebay and Reference Area tissue concentrations, or concentrations in sediment below Reference Area sediment levels. Table 12-2 presents the CPECs for the Forebay that are recommended for risk management, which are cadmium, lead, mercury, and PCBs. Unlike the Upland OU, the River OU is not comprised of individual AOPCs. The Forebay was considered one exposure are, and the only differentiation between the Forebay data sets is a reflection of the specific sampling techniques employed (i.e., random or targeted). These four CPECs for the Forebay were identified through an evaluation of the random Forebay dataset. PCBs in sediment from Eagle Creek (targeted samples) are also recommended for risk management. Based on the evaluation of Goose Island sediment and tissue samples, no CPECs are recommended for risk management at these targeted locations (see further discussion below). All CPECs recommended for risk management based on the evaluation of clam, crayfish, sculpin, and smallmouth bass tissue are also recommended for risk management in sediment even though measured concentrations in Forebay sediment do not likely account for all of the elevated tissue levels.

Risk management or monitoring is recommended for cadmium, lead, mercury, and PCBs (Aroclors and 209 PCB congeners) in sediment and tissue from the Forebay to protect predatory fish and piscivorous wildlife that may be exposed through their diet. Aroclor 1248 was the only Aroclor detected at Eagle Creek and was not detected in any other random or targeted locations in the Forebay or in the Reference Area, including sediment and tissue samples. Aroclor 1254 is the primary PCB mixture detected in random Forebay sediment and tissue samples. The absence of Aroclor 1248 in any other samples collected from the Forebay indicates that the Aroclor 1248 detection in Eagle Creek sediment is not likely site-related. Given the influence of weathering and metabolic processes on the ability to identify PCBs measured as Aroclors in tissue, however, Aroclor 1248 is recommended for further investigation in Eagle Creek sediments as a possible contributor to PCB levels measured in fish tissue from the Forebay.

Based on the low R_{BACs} for targeted Goose Island sediments samples relative to the random Forebay R_{BACs} for PCBs, and the absence of elevated PCB concentrations in Goose Island tissues, PCB concentrations in the targeted Goose Island samples are likely to have contributed minimally to the elevated concentrations of PCBs measured in smallmouth bass tissue from the Forebay. Although the Aroclor data demonstrated elevated R_{BACs} in sediment, the available congener data, which is expected to provide a more accurate measure of total PCB concentrations, demonstrate acceptable R_{BAC} values. Although CPEC concentrations in media collected from the targeted Goose Island samples indicate acceptable risk levels, Goose Island will be maintained as part of the Forebay evaluation in the forthcoming FS in response to DEQ's request.

12.6 Recommendations

One of two options is recommended for the Upland AOPCs:

1. Evaluate targeted removal or remedial actions to decrease residual concentrations to acceptable risk levels or
2. Perform a site-specific Level III BERA to determine if risks are unacceptable.

If a Level III BERA is performed for soil in the Upland OU, the evaluation would be focused solely on the CPECs recommended for risk management for each AOPC (Table 12-1). Site-wide exposure to the combined AOPCs would be evaluated for wildlife receptors with larger home ranges (e.g., predatory birds).

The River OU is recommended for risk management, which may include further risk assessment or a feasibility study and long-term monitoring of cadmium, lead, mercury, and PCB concentrations (Table 12-2).

13.0 SUMMARY AND RECOMMENDATIONS

This RI report, including the screening level HHRA and ERA presented in Sections 11 and 12, documents the current conditions at the Bradford Island Upland and River OUs. The results are summarized separately for each of the Upland AOPCs and for the River OU, below. The HHRA and ERA also evaluated all four AOPCs combined for receptors that could regularly utilize all four AOPCs (i.e., on-site maintenance worker or terrestrial birds and mammals); however, no additional COPCs or CPECs were identified (when compared to those identified for the individual AOPCs).

13.1 Landfill AOPC

Physical and Chemical Characteristics

Historical use of the Landfill AOPC to manage, store, and dispose of waste materials has resulted in contamination of soil, groundwater, and seep water with chemicals associated with the wastes. The extent of the waste disposal area is well defined based on topography, review of historical aerial photographs, a geophysical survey, excavation of test pits, observation of wastes on the ground surface, and the analysis of soil, groundwater, seep ,and surface water samples. The type and magnitude of contamination is variable, consistent with the variable waste management, storage, and disposal activities that occurred at the Landfill AOPC.

Soil throughout the Landfill AOPC is impacted by metals, PAHs, and other SVOCs. Impacts to soil from butyltins, herbicides, pesticides, PCBs, TPH, and VOCs are much more limited. Similarly, metals, TPHs, and VOCs were detected in groundwater throughout the Landfill AOPC, as well as at low concentrations in seep water sampled along the northern perimeter of the AOPC. Butyltins, herbicides, pesticides, PCBs, PAHs, and SVOCs had generally limited detections in groundwater. Butyltins, herbicides, pesticides, PCBs, and PAHs were not detected in seep water.

The majority of the ground surface at the Landfill AOPC is relatively flat, well vegetated, and shows minimal evidence of surface runoff, soil erosion, or sediment deposition, indicating that the ground surface is stable and there is minimal potential for off-site migration of contaminated soil or buried debris. The north and east sides of the Landfill AOPC include steep slopes leading down to the Columbia River. Although the potential for mass wasting appears low, soil on these slopes has the potential to migrate to the Columbia River via mass wasting.

Human Health Risk Screening

Soils were evaluated for direct contact under occupational and soil-intrusive exposure scenarios and groundwater was evaluated for hypothetical use as a potable water supply source as well as discharge to the river. COPCs warranting additional consideration in soil at the Landfill AOPC included arsenic, cPAHs, and PCE. In addition, the degradation products of PCE as well as chromium and lead were also retained as COPCs based on DEQ's selection process. In groundwater, the COPCs warranting further consideration included arsenic, manganese, B2EHP, DNOP, TPH and several chlorinated VOCs. Several other VOCs and metals were also identified based on DEQ's selection process. The vast majority of non-carcinogenic compounds were not a concern.. Arsenic and cPAHs emerged as the carcinogenic COPCs contributing most to risk, along with PCE and TCE. Arsenic was retained in soil and groundwater at the Landfill AOPC for the Adult Outdoor worker and potable use exposure scenarios; cPAHs were retained in soils

for potential direct contact exposures for Adult Outdoor and Construction workers. Areas of the Landfill AOPC that pose the highest potential risk to human health include the Gully Test Pit and the Mercury Vapor Lamp Test Pit.

Finally, COPCs in Landfill soils identified through the evaluation of potential transport to the River OU via mass wasting or erosion are also recommended for risk management.

Ecological Risk Screening

Only soil was identified as a medium concern for ecological receptors at the Landfill AOPC. The following CPECs warrant further consideration for all terrestrial receptors potentially exposed to soil (plants, soil invertebrates, birds, and mammals): antimony, chromium, copper, lead, mercury, nickel, and total HPAHs. The areas where the highest concentrations of these CPECs were observed include the mercury vapor-lamp test pit, lead hot-spot test pits #1 and #2, gully test pit, and pesticide/herbicide wash area. In addition, the bioaccumulative CPECs for which dietary-based SLVs are not available also warrant further consideration for birds and mammals (primarily pesticides and herbicides). Finally, CPECs in Landfill soils identified through the evaluation of potential transport to the River OU via mass wasting or erosion are also recommended for risk management.

13.2 Sandblast Area AOPC

Physical and Chemical Characteristics

Historical and ongoing uses of the Sandblast Area AOPC include equipment storage and management, storage, and disposal of various hazardous substances and wastes. These uses have resulted in contamination of soil, groundwater, and soil gas with chemicals associated with the equipment and wastes. The extent of the contaminated area is defined based on topography, location of former and existing site features and structures, knowledge of former and current site uses, visual observation of wastes (i.e. sandblast grit) and equipment on the ground surface, and the analysis of soil, groundwater, and soil gas samples. The sandblast grit disposal area, the equipment laydown area, and an inferred VOC release at the current HMSA appear to be the primary sources of contamination.

Metals, pesticides, PCBs, PAHs, SVOCs, and VOCs were detected in soil samples from throughout the Sandblast Area AOPC. The type and magnitude of contamination is variable, consistent with the variable hazardous substance and waste management, storage, and disposal practices that occurred at the various subareas within the Sandblast Area AOPC. Metals, butyltins, pesticides, PAHs, TPHs, SVOCs, and VOCs were detected at low concentrations in groundwater, indicating that these contaminants are leaching from source area soils to groundwater. PCBs were not detected in groundwater. VOCs were detected in soil gas at locations corresponding to the footprint of the VOC plume originating at the current HMSA. This plume is in an area where there are currently no structures that could be occupied by site workers.

An area of potentially erodible soils, resulting from recent construction activities, was identified during a site visit in 2009. During the past year, this area has become revegetated and the soils are no longer considered erodible. Stormwater runoff from impervious surfaces (asphalt) drains to four catch basins that discharge to the Columbia River through two outfalls. It appears, however, that the majority of the runoff from asphalt immediately southeast of the former

sandblast building flows northeast and discharges onto a short, steep, forested hill slope, where it causes rills to develop on the hill slope. This runoff travels down the slope to the equipment laydown area and adjacent Landfill access road, and onto a vegetated area between the Landfill road and the river. Evidence of surface runoff or erosion is absent in this vegetated area, suggesting that runoff flowing onto this area infiltrates before reaching the river.

Human Health Risk Screening

At the Sandblast Area, soils were evaluated for direct contact under occupational and soil-intrusive exposure scenarios and groundwater was evaluated for hypothetical use as a potable water supply as well as discharge to the river. In addition, soil gas was also evaluated for vapor intrusion into future enclosed structures. The COPCs identified in soil were primarily arsenic, chromium, lead, PCE, and cPAHs. In addition, the degradation products of PCE were also identified as COPCs based on DEQ's selection process. The COPCs in groundwater were arsenic, cPAHs, PCE, TCE and vinyl chloride. Vanadium and some TPH fractions were also identified as COPCs based on DEQ's selection process. The COPCs in soil gas were primarily PCE, TCE and their degradation compounds. Lead in soil may be a minor contributor to non-cancer hazards at the Sandblast Area AOPC. Arsenic, chlorinated VOCs, and cPAHs were the primary carcinogenic COPCs. VOCs in soil and soil gas are a concern in the vicinity of SB-10 and SB-12.

Ecological Risk Screening

Only soil was identified as a medium concern for ecological receptors at the Sandblast Area AOPC. The following CPECs warrant further consideration for all terrestrial receptors potentially exposed to soil: antimony, cadmium, chromium, lead, mercury, nickel, B2EHP, and total HPAHs. Areas with soil concentrations exceeding ecological screening values occurred throughout the AOPC, including the spent sandblast grit disposal area, around CB-1, the equipment laydown area, south of the current HMSA, and within the area where soils were identified as erodible in 2009. In addition, the bioaccumulative CPECs for which dietary-based SLVs are not available also warrant further consideration for birds and mammals (primarily pesticides and herbicides). Finally, CPECs in Sandblast Area soils identified through the evaluation of potential transport to the River OU via erosion are also recommended for risk management.

13.3 Pistol Range AOPC

Physical and Chemical Characteristics

Historical use of the Pistol Range AOPC as a firing range has resulted in the contamination of surface soil with lead and zinc. It is unlikely that significant concentrations of lead or zinc are leaching to groundwater. The Pistol Range AOPC may also be a historical source of zinc to the adjacent lagoon sediment. Currently, the area is well vegetated and does not show evidence of surface runoff, soil erosion, or sediment deposition.

Human Health Risk Screening

At the Pistol Range, soils were evaluated for direct contact under occupational exposure scenarios. Groundwater was evaluated as a hypothetical potable water supply source and for discharge to the river. Lagoon sediments were also evaluated for off-shore exposures. Current and likely exposure pathways for offsite human receptors to COIs from the Pistol Range are

insignificant. No COPCs warranting further consideration were identified in soil, groundwater or sediments at this AOPC. The Pistol Range AOPC is not considered to pose a threat to human health and is not recommended for any further human health risk evaluation

Ecological Risk Screening

Only lead in soil was identified as a CPEC and medium of concern for the Pistol Range AOPC. Areas with soil lead concentrations exceeding ecological screening values occurred behind the backstop and at the eastern corner of the former firing shed.

13.4 Bulb Slope AOPC

Physical and Chemical Characteristics

Placement of debris at the Bulb Slope AOPC has resulted in the contamination of soil with lead, mercury, and PCBs. The lateral extent of contamination is well constrained by the visible presence of debris in the soil and the underlying siltstone bedrock defines the vertical extent of contamination. Groundwater is not present. Soils may potentially be transported to the adjacent Columbia River by mass wasting.

Human Health Risk Screening

Due to the lack of COPCs for the exposure pathways identified in the CEM, the Bulb Slope AOPC is not considered to pose a threat to human health and no further consideration of human health is warranted.

Ecological Risk Screening

Lead and mercury in soil were identified as CPECs for the Bulb Slope AOPC. In addition, CPECs in Bulb Slope soils identified through the evaluation of potential transport to the River OU via mass wasting or erosion are also recommended for risk management.

13.5 River OU

Physical and Chemical Characteristics

Historical disposal of electrical debris into the Columbia River along the north side of Bradford Island has resulted in the contamination of the surrounding sediment with PCBs and potentially other compounds. The electrical equipment and debris were removed in 2000 and 2002 and the majority of the associated PCB-contaminated sediment was removed in 2007. Residual contaminated sediment, as well as historically contaminated biota (e.g., fish and shellfish) may currently be sources of contamination.

Historical sampling, supported by hydrologic modeling, demonstrated that sediment from the Forebay is not transported upstream beyond Goose Island. Sediment samples collected downstream of the dam demonstrated that contaminated sediment is not being transported beyond the Forebay. Therefore, the boundaries of the River OU include the Bonneville Dam and Spillway, the two powerhouses, the riverbanks of the Columbia River, and the northern end of Goose Island.

The nature of the contamination in the Forebay has been characterized by both random and targeted sampling of surface water, sediment, and various tissues. The targeted sampling included sediments at the mouth of Eagle Creek, as well as sediments and tissue from Goose

Island Slough. To characterize conditions upstream of the site, random sampling of surface water, sediment, and tissues was also conducted in the River Reference Area. This allows the distinction between potential risks that may be associated with the Forebay from potential risks that are due to other sources.

Population-to-population statistical comparisons showed that for all metals, concentrations observed in the 19 random Forebay sediment samples were not significantly higher than the concentrations observed in the 18 random Reference Area samples. Statistical comparisons also showed that concentrations of organic compounds were not significantly higher in Forebay sediment than in the Reference Area sediment, with the exception of RRO and PCBs.

Tissue samples collected in the Forebay were found to have elevated concentrations of some metals, B2EHP, and various HPAHs. However, no clear spatial pattern was observed for any of these COIs. And, since the COIs were not found at concentrations of concern in Forebay sediments, the source(s) of these COIs are unclear.

PCBs have impacted biota in the Forebay. The clams, crayfish, and sculpin with the highest total PCB concentrations were all located along the north shore of Bradford Island. The spatial distribution of total PCB concentrations in bass was much more variable. Some of the bass with the highest concentrations were caught adjacent to bass with the lowest concentrations. This lack of a spatial pattern is consistent with bass migrating into the Goose Island Slough to spawn, bringing with them a wide range of PCB body burdens picked up from various locations in the Forebay. Targeted sampling of sediment, clams, sculpin, and crayfish from the Goose Island Slough did not find any difference between the slough and the remainder of the Forebay (excluding the north shore and tip of Bradford Island.) It is also important to remember that the Forebay bass were collected in 2006, before the 2007 sediment removal. Some of the older bass were estimated to have been up to 10 years old in 2006, meaning that they were exposed to conditions before the electrical debris and contaminated sediments were removed.

Human Health Risk Screening

In the River OU, sediments, surface water, crayfish tissue and smallmouth bass tissue were evaluated for exposure via the shellfish and fish consumption pathway for subsistence and recreational fishers. Surface water was also evaluated for use as a potable water supply. Sediments in the area of Eagle Creek were evaluated for direct contact exposures by waders. Sediments and tissue from Goose Island Slough were also included in the evaluation.

The COPCs that are recommended for risk management in the River OU include the following:

- Sediment – PCBs, mercury
- Surface Water – Arsenic, PCBs
- Crayfish tissue – Arsenic, PCBs
- Smallmouth Bass tissue – Mercury, cPAHs, PCBs
- Eagle Creek Sediments – PCBs, cPAHs, TPH
- Goose Island Sediments – PCBs
- Goose Island Crayfish – PCBs

An expanded list of COPCs that were identified through DEQ's selection process but are not expected to contribute significantly to risk is provided in Table 11-3.

In general, PCBs contributed the most to health risk for sediment (bioaccumulation) and crayfish and smallmouth bass tissue consumption for both subsistence and recreational fish consumers. Arsenic was also consistently selected as a COPC and to a lesser extent, cPAHs and mercury (only in bass tissue and sediments). Aroclor 1248 was the primary COPC in Eagle Creek sediments. Goose Island is recommended for management at the request of DEQ although its contribution to human health risk is likely to be low. The observed concentrations in tissues are likely the result of historical body burden and may not represent current exposure conditions.

Ecological Risk Screening

The CPECs in sediment and tissue of the Forebay that are recommended for risk management to protect ecological receptors include the following:

- benthic community – PCBs in sediment
- fish and shellfish – cadmium, lead, mercury, and PCBs in sediment and tissue
- aquatic-dependent birds and mammals – mercury and PCBs in sediment and tissue.

These four CPECs for the Forebay were identified through an evaluation of the random and targeted Forebay datasets. All CPECs recommended for risk management based on the evaluation of clam, crayfish, sculpin, and smallmouth bass tissue are also recommended for risk management in sediment even though measured concentrations in Forebay sediment do not likely account for all of the elevated tissue levels. For example, the results of the population to population statistical background comparisons demonstrated that metals concentrations in Forebay sediment are below Reference Area sediment concentrations. In addition, the observed concentrations of PCBs in fish tissue (especially smallmouth bass) are likely the result of historical body burden and may not represent current exposure conditions.

Given the low risk levels estimated for targeted Goose Island sediments samples relative to the risk levels estimated for the random Forebay for PCBs, and the absence of elevated PCB concentrations in Goose Island tissues, PCB concentrations in the targeted Goose Island samples are likely to have contributed minimally to the elevated concentrations of PCBs measured in smallmouth bass tissue from the Forebay. Although the Aroclor data for Goose Island demonstrated elevated risk estimates for sediment, the available congener data, which are expected to provide a more accurate measure of total PCB concentrations, demonstrate acceptable risk levels. Although CPEC concentrations in media collected from the targeted Goose Island samples indicate acceptable risk levels, Goose Island will be maintained as part of the Forebay evaluation in the forthcoming FS in response to DEQ's request.

PCBs were identified as a concern in sediment at three locations within the Forebay: stations P04 on the north shore of Bradford Island, P09 on the south side of the island (for birds only), and P43 at the mouth of Eagle Creek. Elevated concentrations of PCBs in sculpin and bass tissue were more widespread, although the observed concentrations are likely the result of historical body burden. PCB concentrations in crayfish tissue were notably lower than the concentrations detected in the other tissues (clams, sculpin, and bass). PCBs are the only CPEC in crayfish that were recommended for further consideration, which is based on slightly elevated risk levels for aquatic-dependent birds. This recommendation stems from the known presence of protected bird species in the vicinity of Bradford Island. However, crayfish are not a driver species for birds due to the much higher concentrations detected in sculpin and bass tissue.

13.6 Limitations of Screening Level Risk Assessments

The HHRA problem formulation (Chapter 11) relies on conservative assumptions regarding highly-uncertain parameters, such as duration of contact with soils and sediment, fish/shellfish consumption rates, quantity of untreated groundwater or surface water consumed, etc. If a BHHRA is performed for one or more OUs or AOPCs, site specific factors can be considered. Examples include:

1. Actual site use and reasonably-likely duration of work activities at each Upland AOPC.
2. Actual drinking water sources in use at the site.
3. Actual human consumption rates for Forebay bass for both subsistence and recreational fishers.
4. Actual human consumption rates for Forebay crayfish for both subsistence and recreational fishers, if such consumption even occurs.
5. Use of whole-body crayfish and fish tissue data instead of edible portions only.
6. Actual occurrence of different forms of compounds such as arsenic, chromium, mercury, PAHs and phthalates which have different levels of bioavailability and toxicity based on chemical species and exposure media, different degrees of accumulation in edible tissue, and variations in, metabolic pathways that affect their persistence.

Similarly, the Level II ERA (Chapter 12) also used conservative SLVs which generally assume worst-case exposure scenarios. If a Level III BERA is performed at one or more OUs or AOPCs to better understand the potential for adverse effects to ecological receptors, the following site-specific factors would be considered:

Plants

The studies upon which terrestrial plant SLVs were derived typically use crops as the test species, and sensitivity levels of undomesticated plant species are likely to be different than crop species. Effects to the plant community are likely to be overestimated due to the assumption that these organisms are exposed to the maximum concentration of each CPEC throughout their life span. No sensitive plant species are known to be present at the Upland OU.

Soil Invertebrates

Potential effects to the soil invertebrate community are likely to be overestimated by the SLVs due to the assumption that these organisms are exposed to the maximum concentration of each CPEC throughout their life span. In addition, studies used to develop SLVs for invertebrates commonly use earthworms as the test organism and, hence, earthworms are used to represent the entire soil invertebrate community. No sensitive invertebrate species are known to be present at the Upland OU.

Birds

1. The approach for the Level II Screening Assessment focused on protection of birds at the individual level to account for the bald eagle, and possible transient juvenile spotted owls, but these special-status species are not likely to forage at the AOPCs. The disturbed nature of some of the Upland AOPCs, (e.g., Landfill and Sandblast Area) which have

been graded and continuously subjected to vegetation control activities, precludes high quality habitat and species diversity. Furthermore, no state- or federally listed threatened and endangered terrestrial species are known to occur on the island, with the exception of the bald eagle (which is evaluated for the River OU). For these reasons, protection of terrestrial bird species at the population-level would be emphasized in the BERA for the Upland OU.

2. The site-specific Reference UPLs were greater than the risk-based soil SLVs (EcoSSL for lead and Avian PRG for mercury) and, therefore, the SLVs were replaced by the UPLs in the screening evaluation. In addition to evaluating specific bird target species and using literature-based BAFs to estimate dose, the contribution of background levels of metals would also be considered to better understand site-related dose contribution.
3. The size of the each AOPC or OU relative to the size of a birds' home range would be factored into the daily dose estimation.

Mammals

1. Site-specific mammal target species would be evaluated.
2. Literature-based BAFs would be used to estimate dose.
3. The contribution of background levels of metals would also be considered to better understand site-related dose contribution.
4. The size of each OU or AOPC relative to the size of a mammal's home range would be factored into the daily dose estimation.

13.7 Recommendations

Landfill AOPC

Based on the screening level risk assessments at the Landfill AOPC, implementation of one of two options is recommended:

1. Perform a FS to identify targeted soil removal or other remedial actions which will decrease residual concentrations to acceptable risk levels or
2. Perform a site-specific BHHRA and a Level III BERA to determine if risks to human and ecological receptors are unacceptable.

Sandblast Area AOPC

Further site-specific evaluation of human exposures to lead in soil using the size fraction-specific data is not necessary. However, based on the screening level risk assessment for soil gas at the Sandblast Area AOPC, an evaluation of the feasibility of a using a vapor extraction system or other remedial techniques to achieve acceptable soil gas VOC concentrations is recommended.

In addition, implementation of one of two options is recommended for addressing soil contamination:

1. Perform a FS to identify targeted soil removal or other remedial actions which will decrease residual concentrations to acceptable risk levels or

2. Perform a site-specific BHHRA and a Level III BERA to determine if risks to human and ecological receptors are unacceptable.

Pistol Range AOPC

No additional evaluation of this AOPC is warranted for potential human health risk. However, further action addressing the potential for risk to ecological receptors from exposure to lead is recommended - either in the form of a Level III BERA or remediation of the soils with elevated CPEC concentrations (primarily behind the backstop). If a Level III BERA is performed for lead in soil to better understand the potential for adverse effects to terrestrial plants, soil invertebrates, birds, and mammals, site-specific factors would be considered (i.e., absence of special-status species, AOPC size [0.26 acres], contribution of background levels of lead, *etc*.).

Bulb Slope AOPC

No additional evaluation of this AOPC is warranted for potential human health risk. However, further action addressing the potential for risk to ecological receptors from exposure to lead and mercury is recommended - either in the form of a Level III BERA or remediation of the soils with elevated CPEC concentrations. If a Level III BERA is performed for lead and mercury in soil to better understand the potential for adverse effects to terrestrial plants, soil invertebrates, birds, and mammals, site-specific factors would be considered (i.e., absence of special-status species, AOPC size [0.05 acres], contribution of background levels of lead and mercury, *etc*.).

River OU

Neither a Level III BERA nor a BHHRA is recommended for the River OU. Instead, progression to a FS is recommended. PCBs (through the consumption pathway) were identified as the primary risk drivers for both humans and wildlife, and secondarily cadmium, lead, and mercury for fish and wildlife (through the consumption pathway). All COPCs recommended for risk management based on the evaluation of site-specific tissue data are also recommended for risk management in sediment even though measured concentrations in Forebay sediment do not likely account for all of the elevated tissue levels. For example, the results of the population to population statistical background comparisons demonstrated that concentrations of cadmium, lead, and mercury in Forebay sediment are below Reference Area sediment concentrations.

The PCB concentrations remaining in Forebay sediment (after the 2002 and 2007 removal actions) are inconsistent with PCB concentrations measured in Forebay tissue (most notably in smallmouth bass). This is attributed to the fact that the bass were collected in 2006, prior to the sediment removal action, and are therefore not representative of current Forebay conditions. Similarly, the lifespan of crayfish and sculpin is also long enough that the concentrations measured in these samples probably also incorporate exposure to pre-sediment removal conditions. Monitoring of PCB concentrations in Forebay tissue may be recommended to confirm that tissue concentrations are decreasing with time and that residual sediment concentrations are at acceptable levels.

13.8 Post-RI Activity

As part of the pre-FS work for the River OU, additional bass, clam, and sediment samples were collected. In order to meet project goals of nineteen bass samples from the Forebay and Reference Area from a wide range of ages, twenty-three bass samples were collected from the Reference Area in August 2011 and twenty-three bass samples were collected from the Forebay

in September 2011. In the Forebay, bass were collected north of Bradford Island, north of Goose Island, and south of Cascade Island. Of the twenty-three samples collected from each area, four samples from the Reference Area and three samples from the Forebay were not analyzed because they comprised very young bass and were not needed to meet the project goals.

The sediment and clam samples were collected from seven locations along the north-shore of Bradford Island in October 2011. The co-located sediment and clam samples were collected in the areas suggested by DEQ as most likely to be influenced by Upland sources. Sediment samples were successfully collected at all seven proposed sample locations. While clams were located and collected at all seven proposed sample locations, only six of the locations yielded enough clam tissue for the planned analysis.

Sediment and tissue samples were analyzed for PCBs (Aroclors and 209 congeners), metals, PAHs, pesticides, butyltins, and SVOCs. This data will be presented in a subsequent document and will be used to verify the COPCs identified in the RI/RA for the River OU, as well as the COPCs originating from erosion or mass wasting evaluation of soils from the Upland OU. If the results indicate a potential source of contamination was overlooked, the list of sediment and tissue COPCs may be modified to reflect the new information. A more thorough evaluation of the potential for erosion and mass wasting of Upland soils will be conducted during the FS phase to support conclusions made regarding the likelihood and magnitude of the overland transport pathway.

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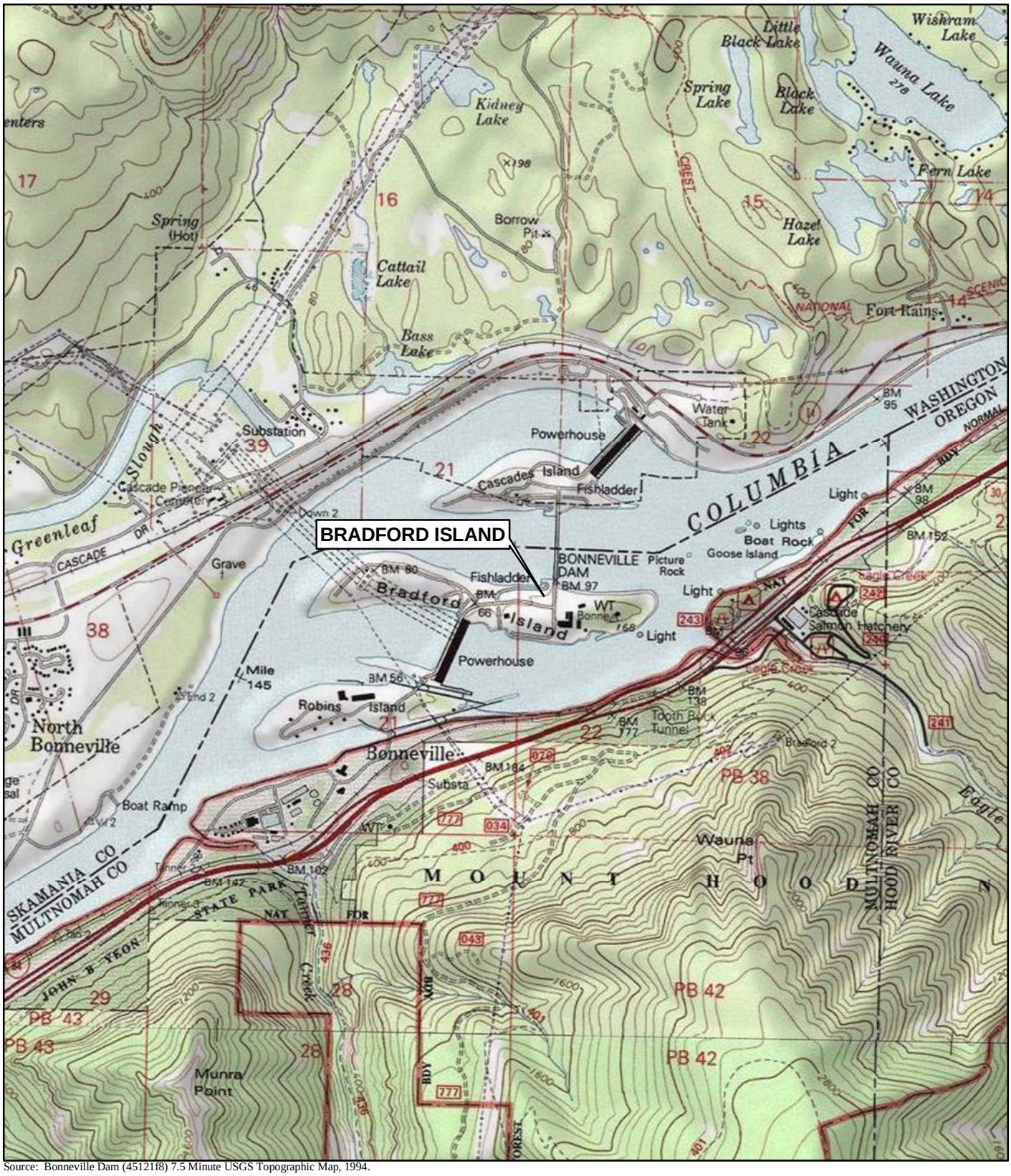
FIGURES



Source: Bonneville Dam (45121f8) 7.5 Minute USGS Topographic Map, 1994.

0 1,000 2,000 Feet

VICINITY MAP

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BRADFORD ISLAND
CASCADE LOCKS, OREGON

FIGURE 1-1

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O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 1-2.mxd

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

BONNEVILLE DAM COMPLEX

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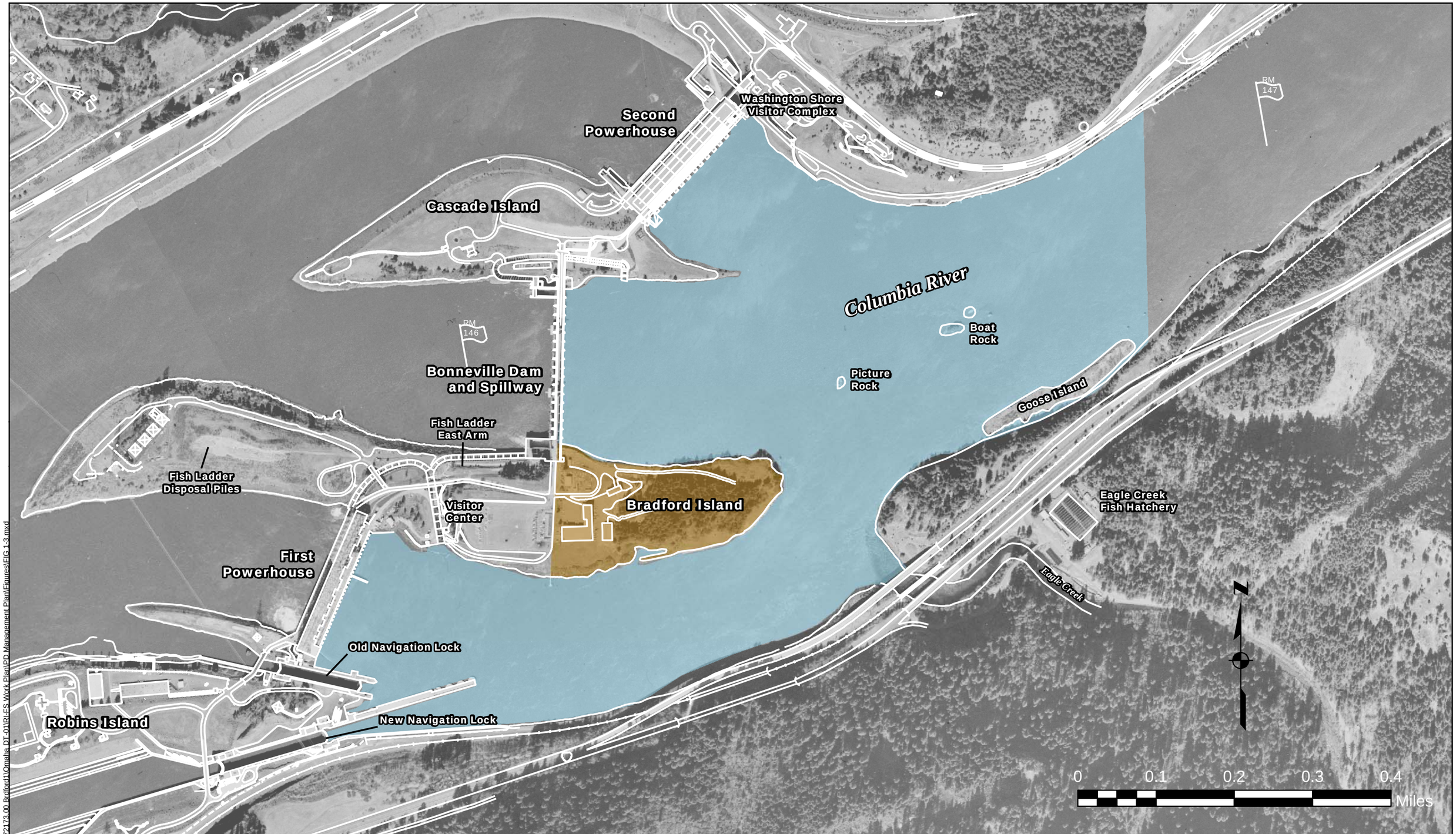

Legend

- Upland OU
- River OU

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

LOCATION OF OPERABLE UNITS

DRAWING NUMBER: FIGURE 1-3

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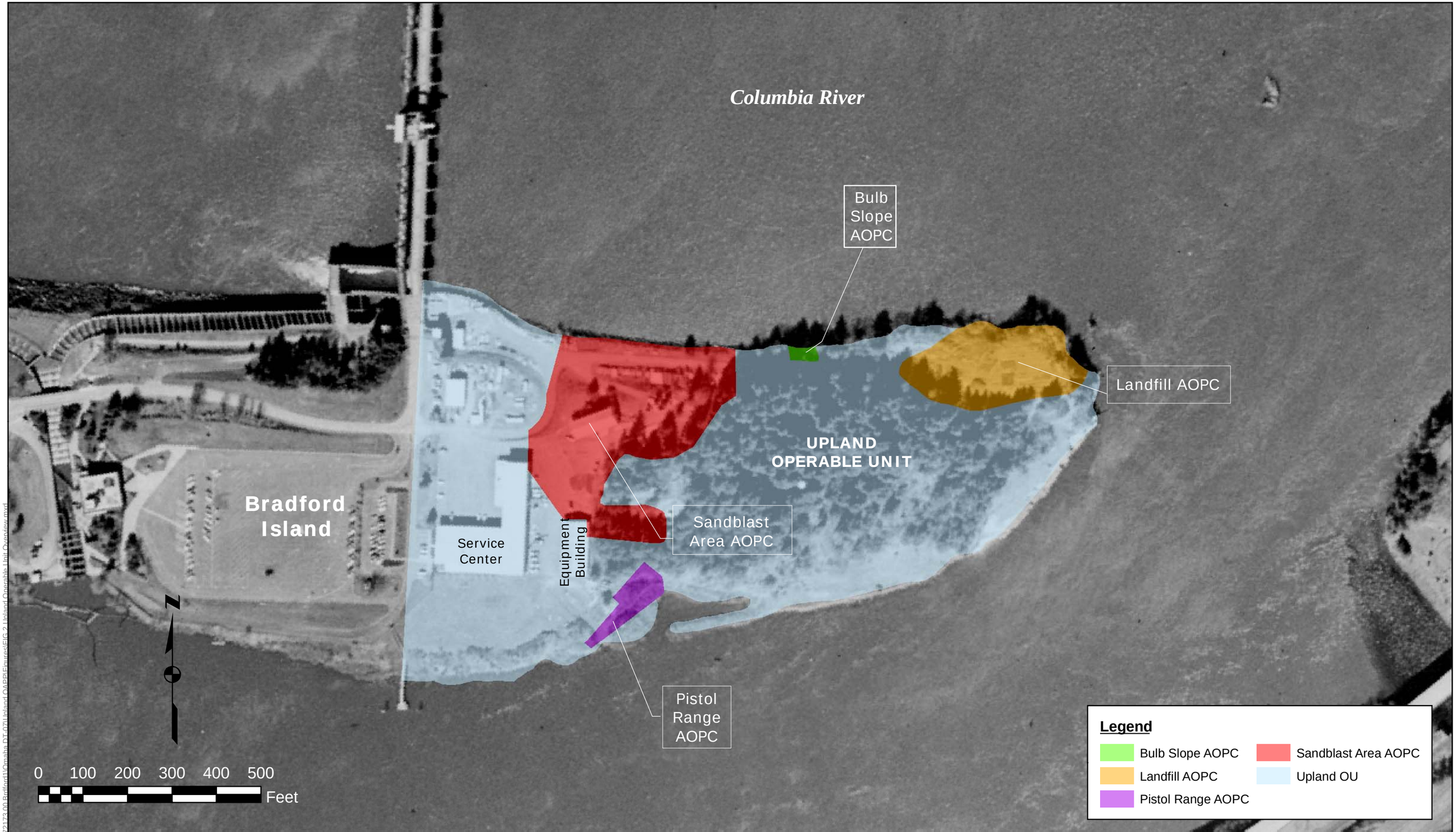

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	DRAWN BY: SB	APPROVED BY: MP		111 S.W. Columbia, Suite 1500 Portland, Oregon 97201 (tel) 503-222-7200 (fax) 503-222-4292 www.urscorp.com	CASCADE LOCKS, OREGON		GIS FILE NUMBER: FIG 1-4
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MAP SOURCE: U.S. ARMY CORPS OF ENGINEERS
NOT TO SCALE

BONNEVILLE DAM IN RELATIONSHIP TO OTHER DAMS

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BRADFORD ISLAND
CASCADE LOCKS, OREGON

FIGURE 3-1

LEGEND

- Drinking Water Supply Well
- Drinking Water Supply Well No Longer in Use
- Hatchery & Drinking Water Supply Well

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	DRAWN BY: SB	APPROVED BY: MP				GIS FILE NUMBER: FIG 3-2
	CHECKED BY: SB	DATE: JULY 2010				SHEET: REV.

O:\25692709 USACEL53-F0072173.00 Bradford1\Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 3-2.mxd

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction

Extent of Landfill Debris

Access Road

Pesticide/Herbicide Wash Area

Landfill AOPC

120

15 0 15 30

SCALE IN FEET

LEGEND

- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- AOPC Boundary
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

LANDFILL AOPC

OPERATIONAL AREAS

DRAWING NUMBER: FIGURE 3-3

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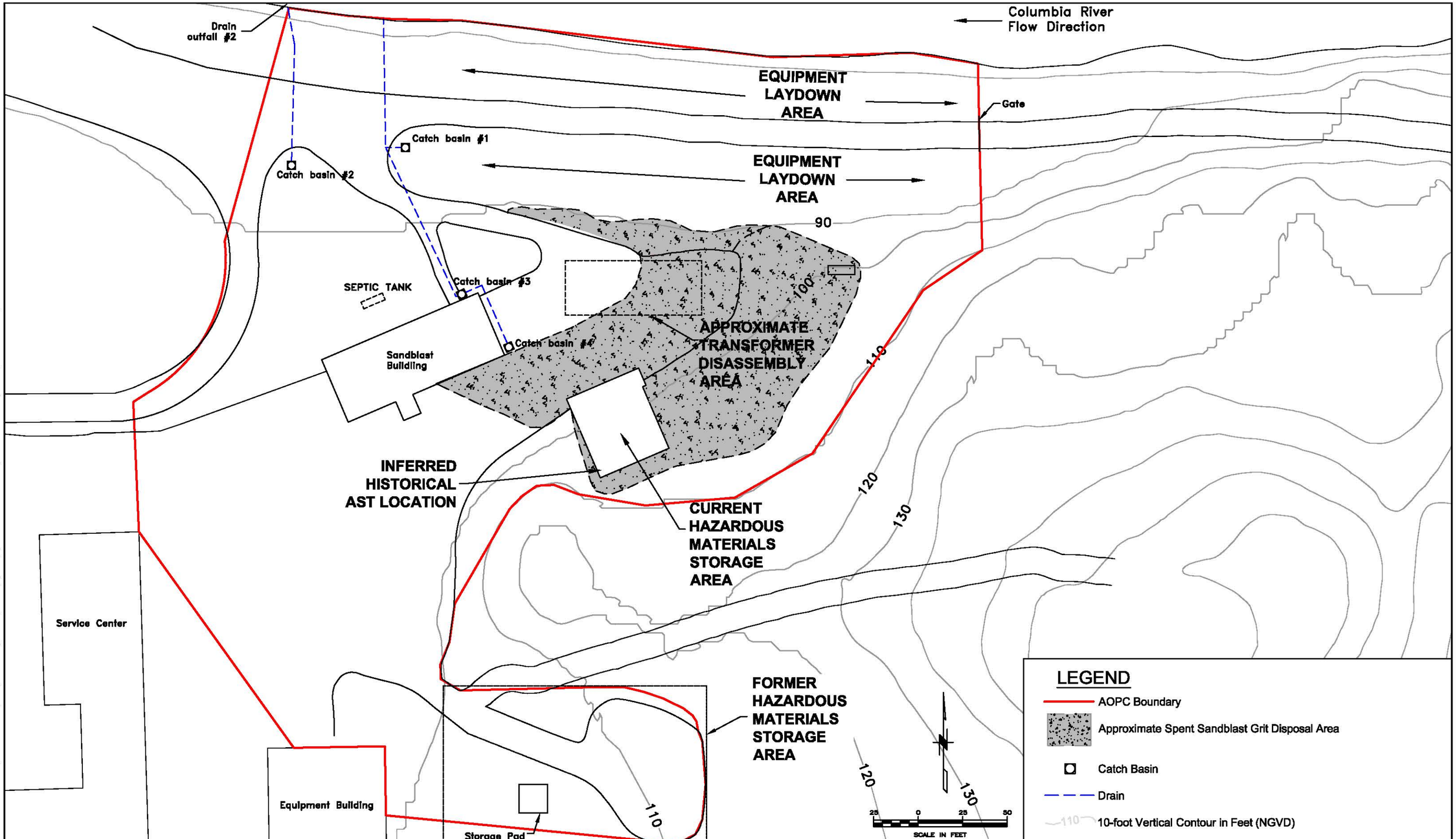

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

SANDBLAST AREA AOPC

OPERATIONAL AREAS

DRAWING NUMBER: FIGURE 3-4
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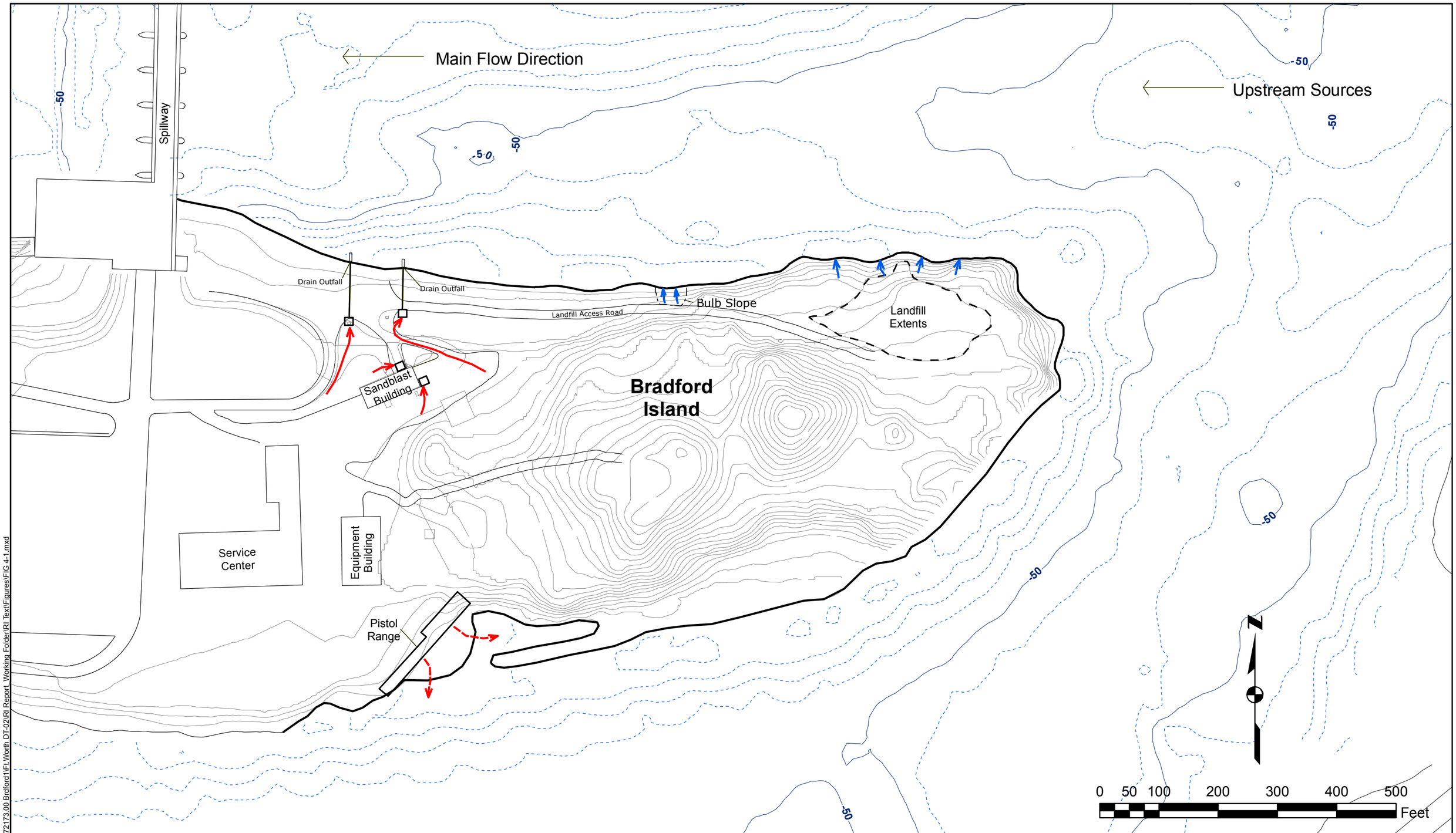

LEGEND

- Surface Water Drainage
- Mass Wasting (Sloughing)
- Historical Surface Water Drainage
- Catch Basin

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

UPLAND OU TO RIVER OU POTENTIAL CONTANIMATION TRANSPORT PATHWAYS

DRAWING NUMBER: FIGURE 4-1

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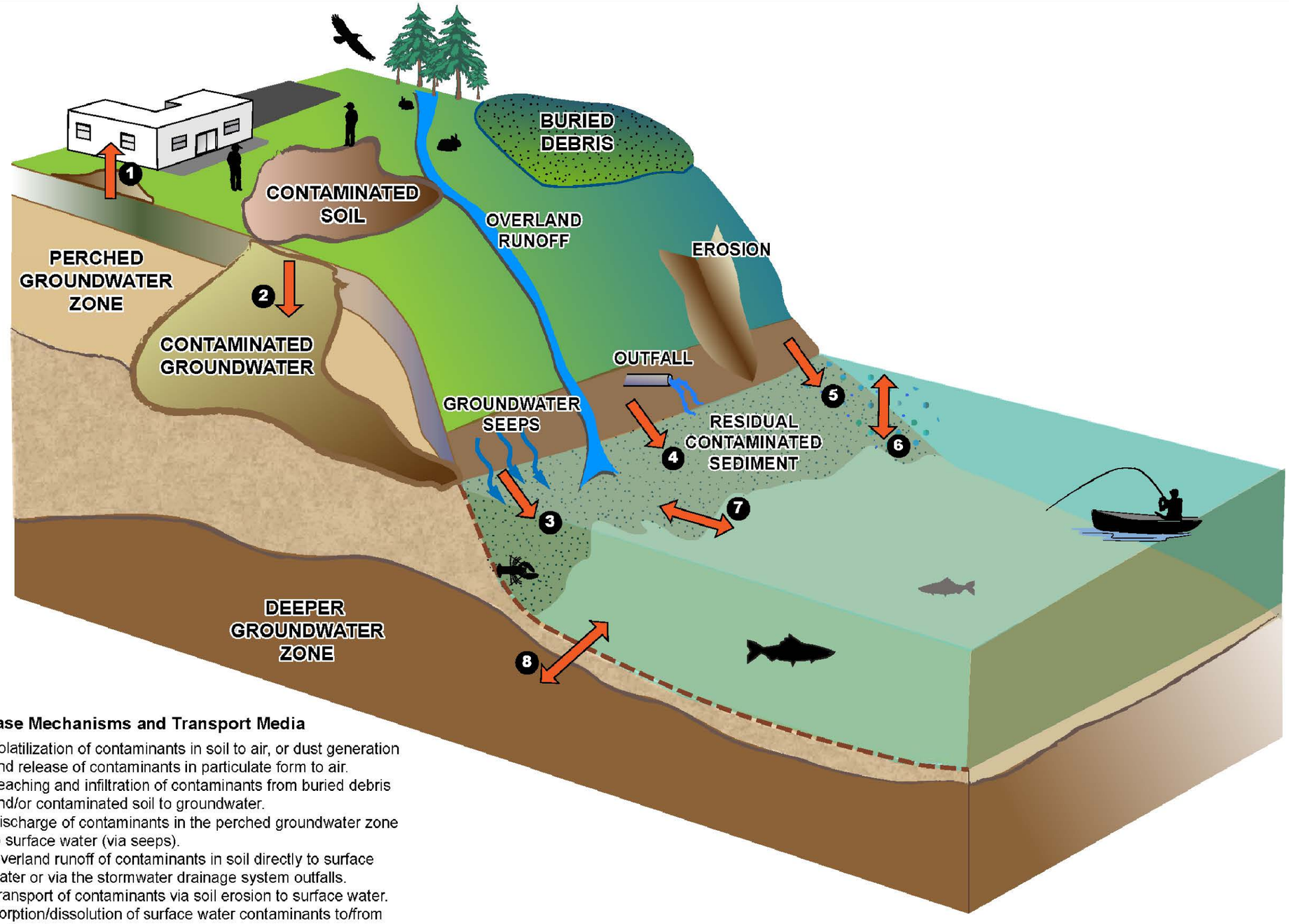

Release Mechanisms and Transport Media

1. Volatilization of contaminants in soil to air, or dust generation and release of contaminants in particulate form to air.
2. Leaching and infiltration of contaminants from buried debris and/or contaminated soil to groundwater.
3. Discharge of contaminants in the perched groundwater zone to surface water (via seeps).
4. Overland runoff of contaminants in soil directly to surface water or via the stormwater drainage system outfalls.
5. Transport of contaminants via soil erosion to surface water.
6. Sorption/dissolution of surface water contaminants to/from sediments.
7. Contaminated sediment transport within the river.
8. Potential surface water communication to the deeper groundwater zone.

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

CONCEPTUAL SITE MODEL

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Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction

S2
SEEP1
BIL13SSI
S4
BIL09USE
BIL03USE
BIL08USE
BIL02USE
BIL07USE
BIL01USE
L-02
L-01
BIL22
MW-6
BIL17
BIL18
L-04
L-03
BIL15
BIL20
BIL21
MW-7
BIL13
BIL14
Gully Test Pit
BIL19
BIL16
MW-5
MW-8
MW-1
TP2-SS-01
BIL11SSI
BIL26
BIL24
BIL04SSI
TP7-SS-01
BIL27
TP1-SS-01
BIL05SSI
Lead Hot Spot
Test Pit #1
MW-9
Mercury Vapor-Lamp Test Pit
BIL05USE
BIL04USE
BIL06USE
TP5-SS-01
BIL09
BIL10
BIL31
BIL11
BIL05
BIL06SSI
BIL07
BIL32
BIL06
MW-4
BIL08
BIL30
BIL12SSI
Lead Hot Spot
Test Pit #2
TP4-SS-01
MW-3
BIL09SSI
TP6-SS-02
TP6-SS-01
Extent of
Landfill Debris
BIL10SSI
Access Road
TP8-SS-01
BK-1-SS-01
BIL01SSI
BIL03SSI
MW-2
BIL02SSI
PW-1-SS-01
Pesticide/Herbicide
Wash Area
Landfill AOPC
120

15 0 15 30
SCALE IN FEET

LEGEND

- Landfill Surface and Shallow Soil Monitoring Location
- Landfill Deeper Soil Monitoring Location
- Landfill Groundwater Sampling Location
- Landfill Surface Water Sampling Location
- Landfill Seep Monitoring Location
- Landfill Test Pit Soil Sample Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

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CASCADE LOCKS, OREGON

LANDFILL AOPC

SAMPLING LOCATIONS

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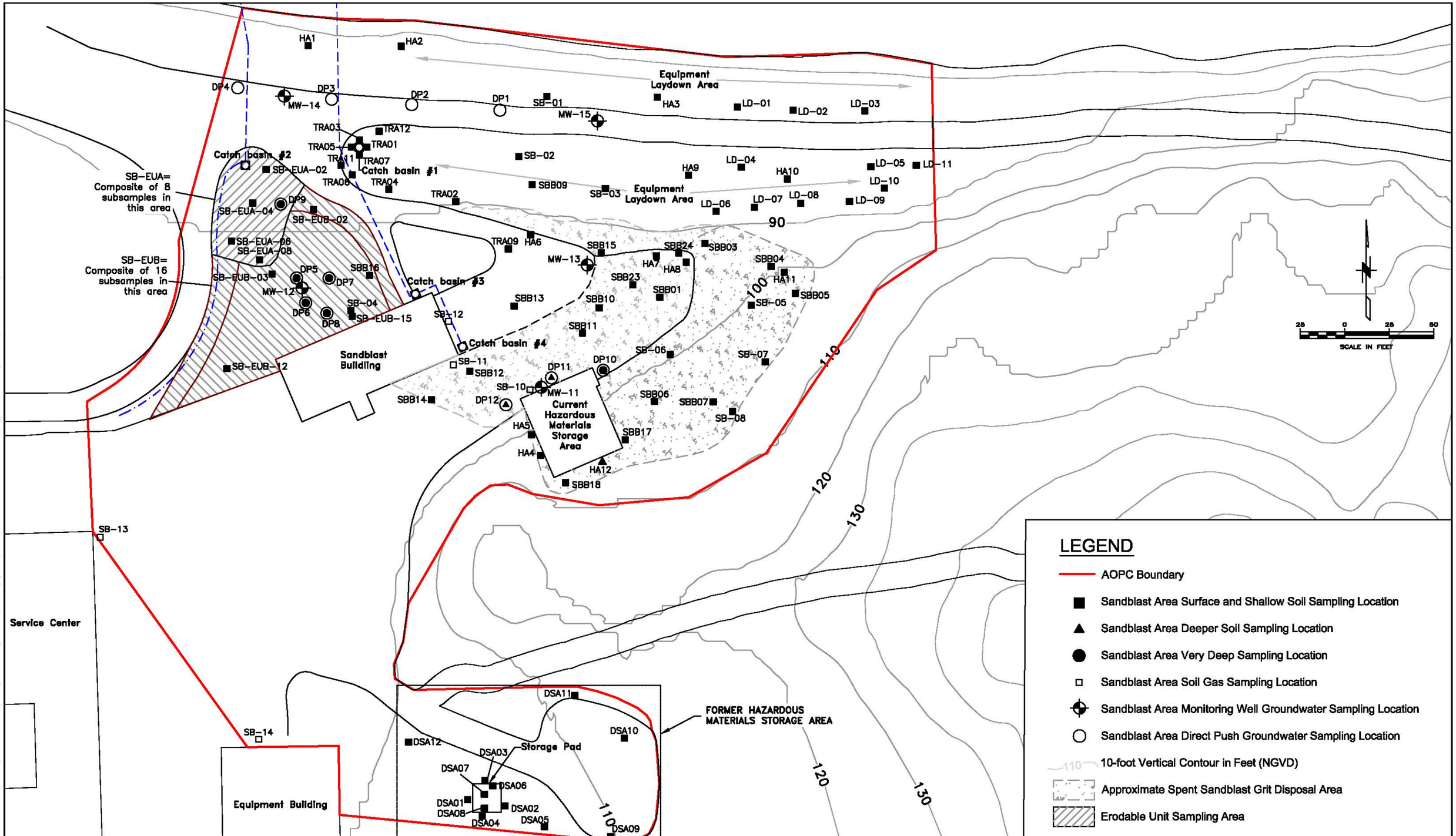

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

SANDBLAST AREA AOPC

SAMPLING LOCATIONS

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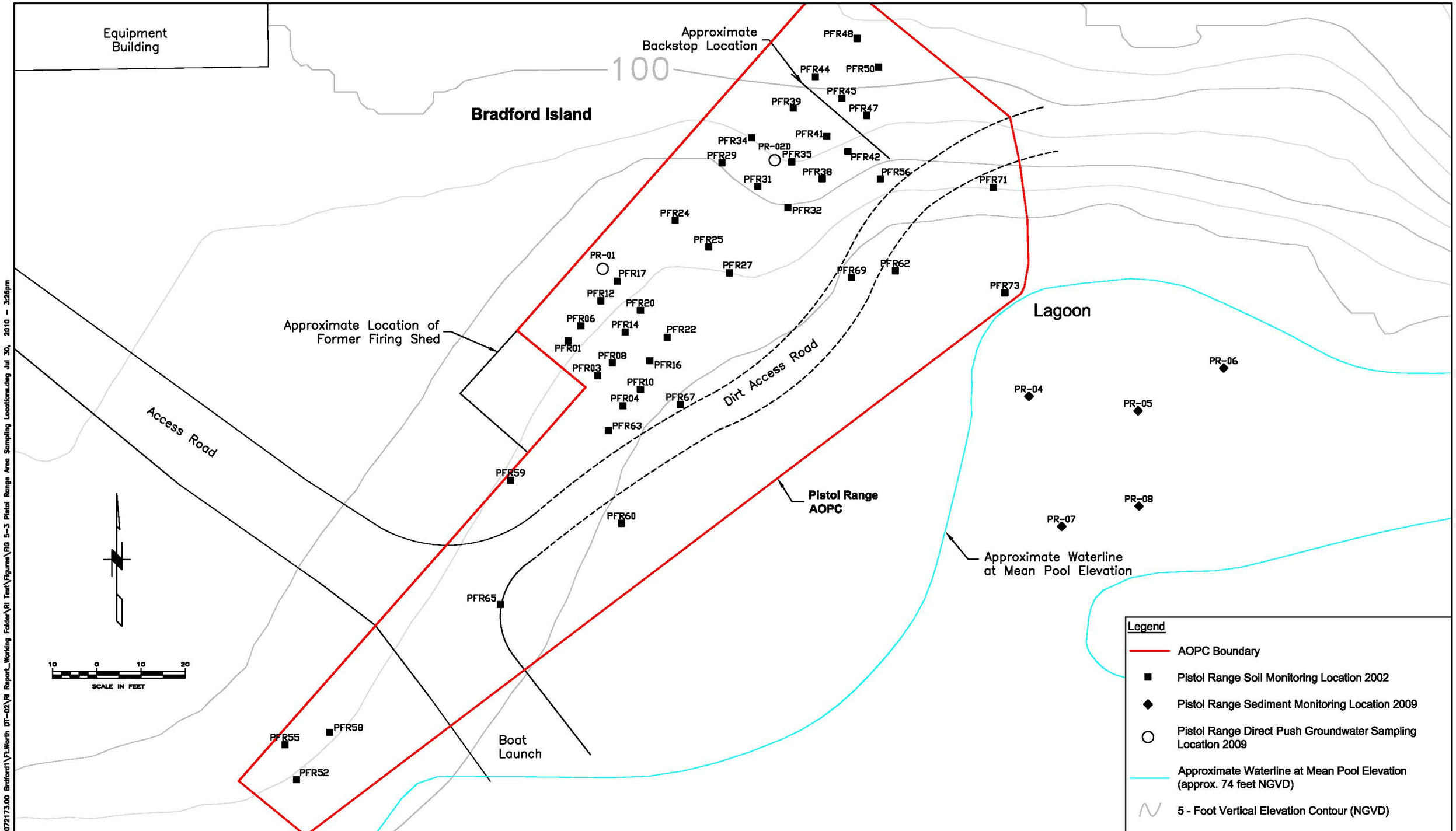

C:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 5-3 Pistol Range Area Sampling Locations.dwg Jul 30, 2010 - 3:26pm

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: SB	APPROVED BY: LSM
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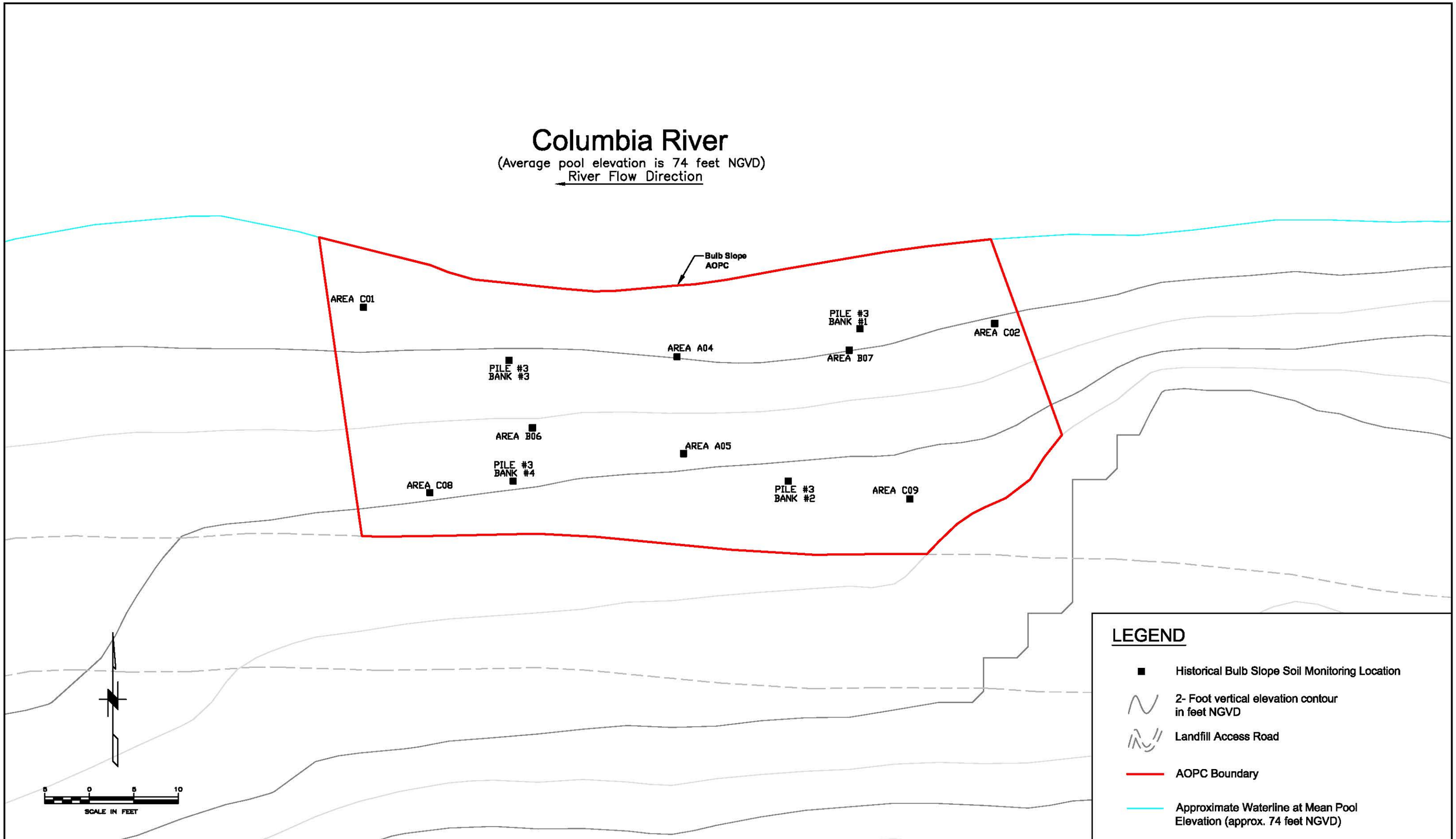
CASCADE LOCKS, OREGON

PISTOL RANGE AOPC

PISTOL RANGE AOPC
SAMPLING LOCATIONS

DRAWING NUMBER: FIGURE 5-3
CAD FILE NUMBER: FIG 5-3
SHEET: OF
REV.



No.	DATE	BY	REVISION

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SCALE:	DRAWN BY: SB	APPROVED BY: LSM
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BRADFORD ISLAND

CASCADE LOCKS, OREGON

BULB SLOPE AOPC

SAMPLING LOCATIONS

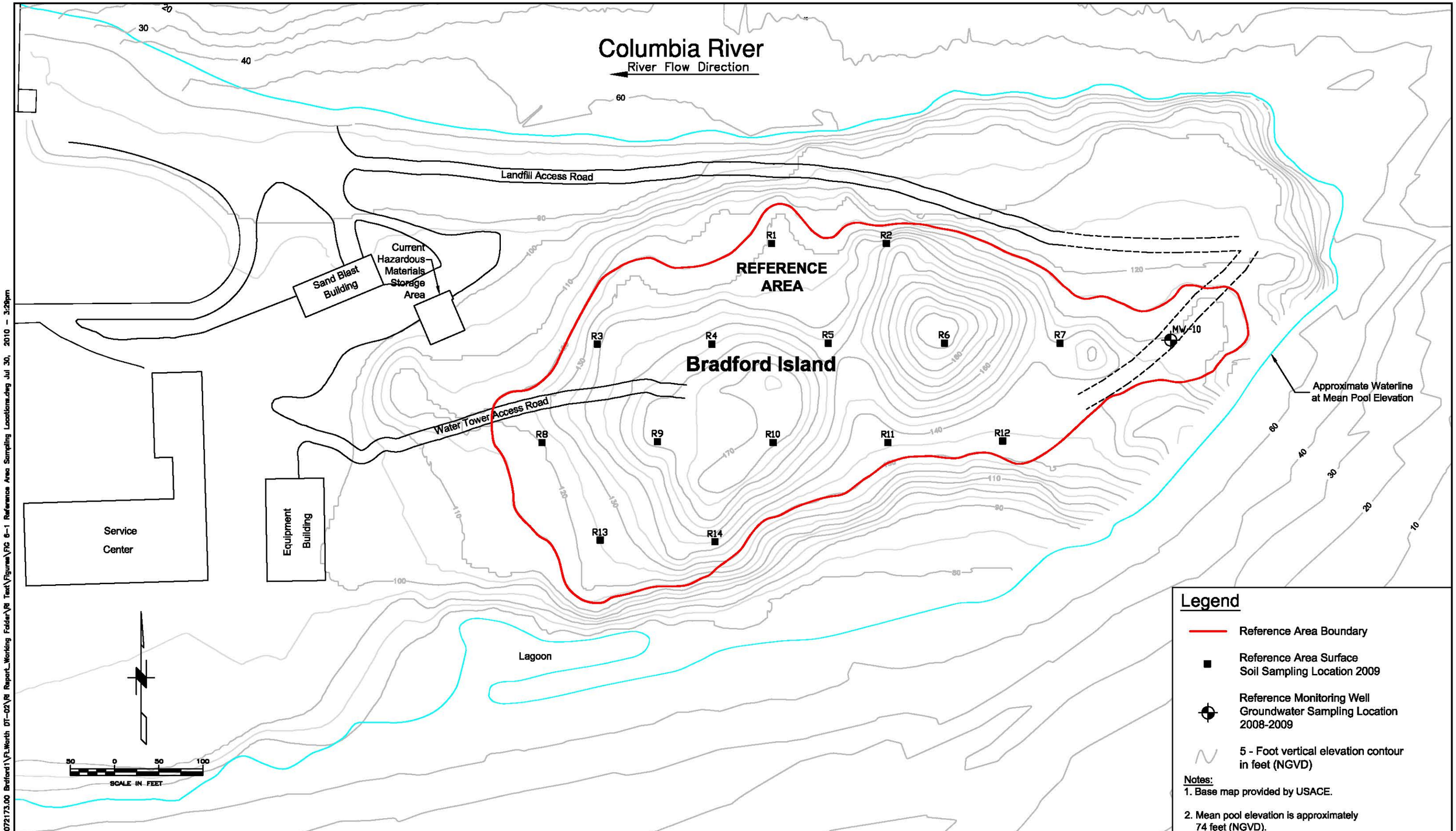
DRAWING NUMBER: FIGURE 5-4

CAD FILE NUMBER: FIG 5-4

SHEET: OF

REV.

G:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 5-4 Bulb Slope AOPC Sampling Locations.dwg Jul 30, 2010 - 3:27pm



C:\25692709 USACE\53-F0072173.00 Bradford1\FL.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 6-1 Reference Area Sampling Locations.dwg Jul 30, 2010 - 3:29pm

No.	DATE	BY	REVISION

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

UPLAND OPERABLE UNIT

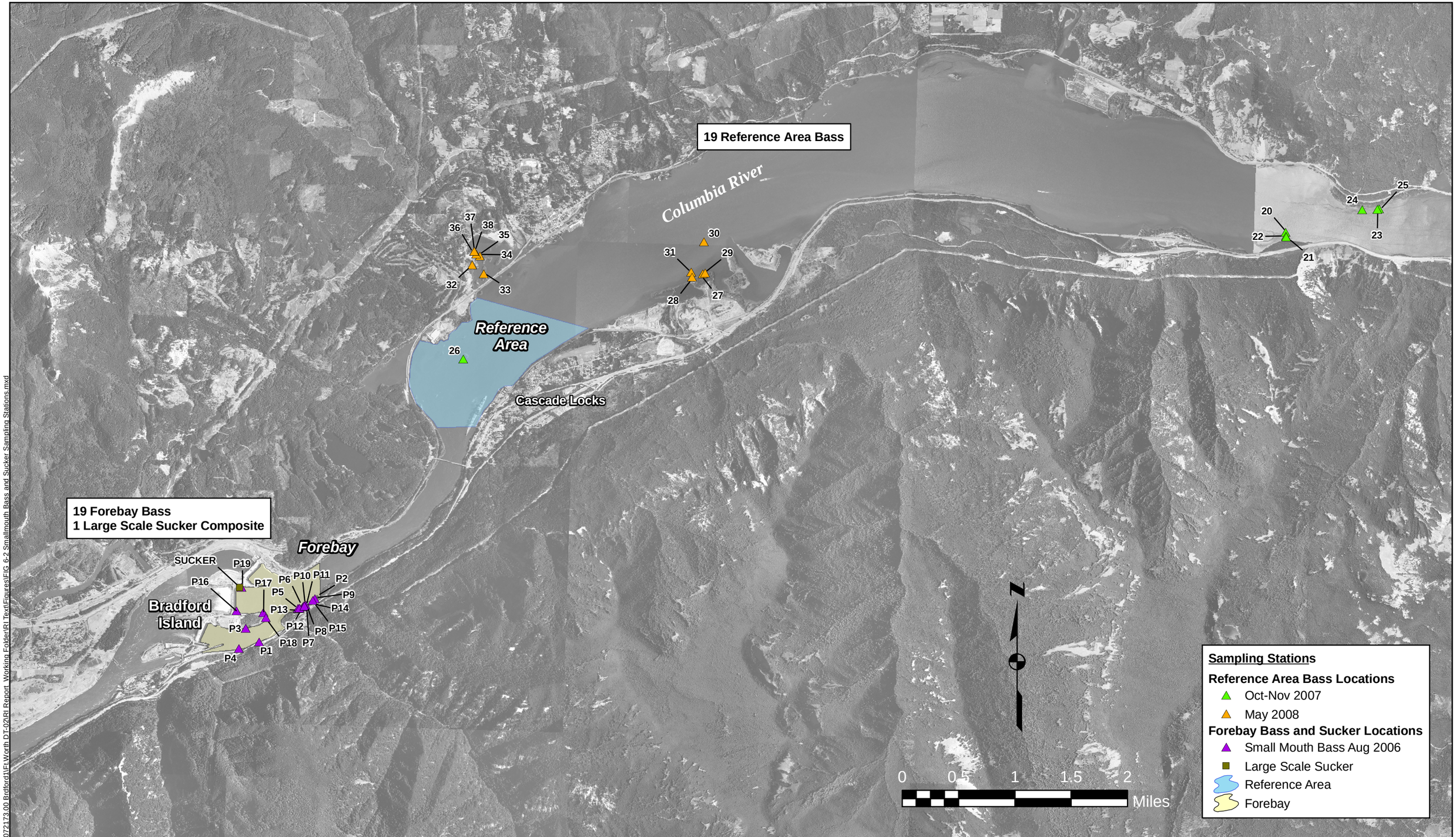
REFERENCE AREA
SAMPLING LOCATIONS

DRAWING NUMBER: FIGURE 6-1

CAD FILE NUMBER: FIG 6-1

SHEET: OF

REV.



O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 6-2 Smallmouth Bass and Sucker Sampling Stations.mxd

JOB No.	DESIGNED:	PROJ. ENGINEER:
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	DRAWN BY: SB	APPROVED BY: MP
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BRADFORD ISLAND

CASCADE LOCKS, OREGON

RIVER OPERABLE UNIT

SMALLMOUTH BASS AND LARGE SCALE SUCKER SAMPLING STATIONS

DRAWING NUMBER: FIGURE 6-2

GIS FILE NUMBER: FIG 6-2

SHEET:

REV.

Forebay Sampling Stations

- Clam & Sediment 2008
- Crayfish Composite 2008
- Sculpin Composite 2008
- Smallmouth Bass 2006
- Water - High Volulme XAD 2007

Targeted Sampling Stations

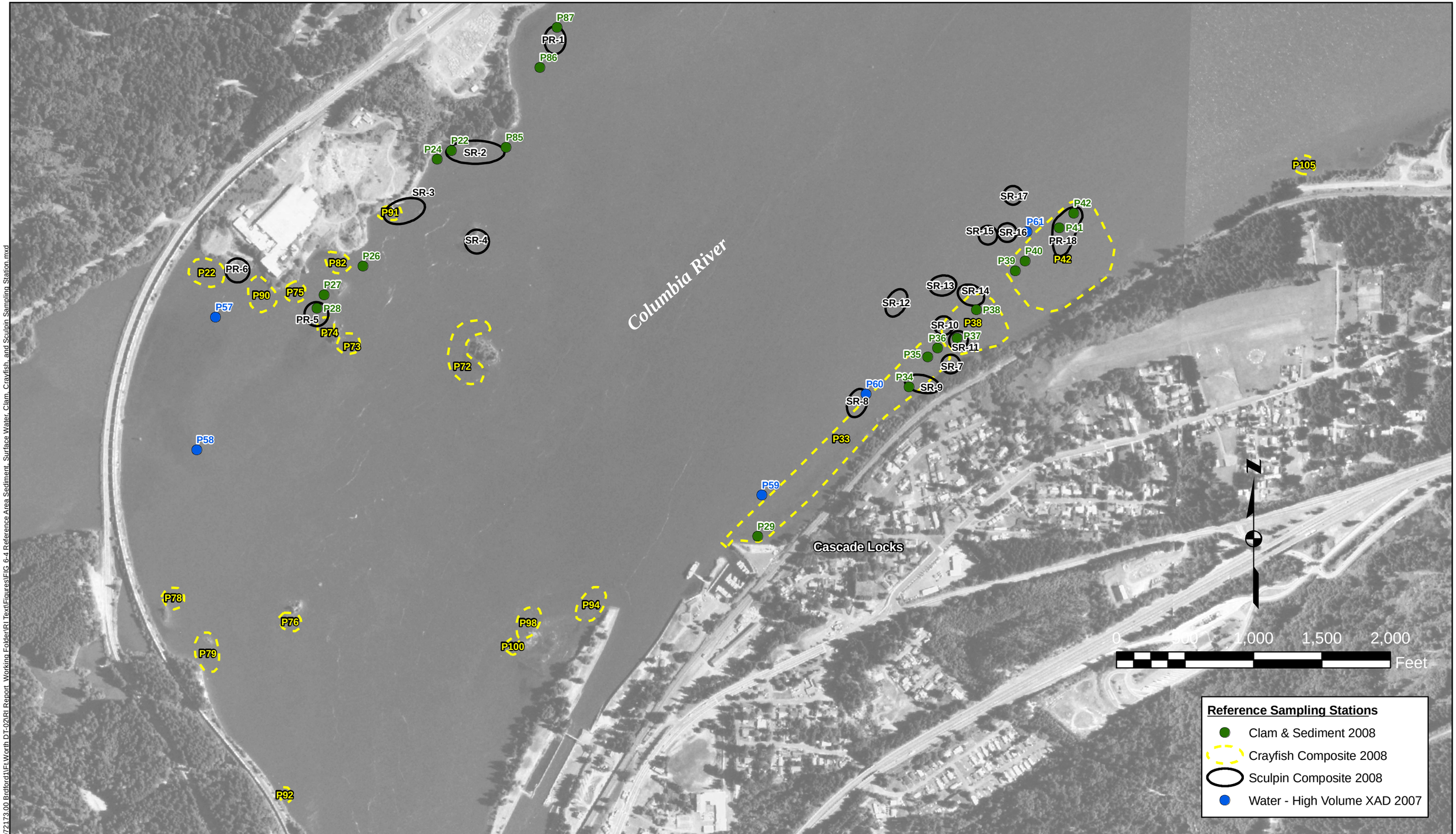
- Eagle Creek Sediment 2008
- Goose Island Sediment 2009
- Goose Island Sediment, Clam, Crayfish, and Sculpin 2009

Pre-Removal Sampling Stations

- Sediment & Clam Composite 2007

O:\25692709 USACE\53-F0072173.00 Bradford\Ft.Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 6-3 Final Forebay Sampling Stations.mxd

JOB No. 25696528	DESIGNED: LSM	PROJ. ENGINEER: LSM	URS	BRADFORD ISLAND	RIVER OPERABLE UNIT	DRAWING NUMBER: FIGURE 6-3
	DRAWN BY: SB	APPROVED BY: MP	111 S.W. Columbia, Suite 1500 Portland, Oregon 97201 (tel) 503-222-7200 (fax) 503-222-4292 www.urscorp.com	CASCADE LOCKS, OREGON	**FOREBAY SAMPLING STATIONS**	GIS FILE NUMBER: FIG 6-3
	CHECKED BY: SB	DATE: JULY 2010				SHEET: / REV.



O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 6-4 Reference Area Sediment, Surface Water, Clam, Crayfish, and Sculpin Sampling Station.mxd

JOB No. 25696528	DESIGNED: LSM	PROJ. ENGINEER: LSM		URS	BRADFORD ISLAND	RIVER OPERABLE UNIT	DRAWING NUMBER: FIGURE 6-4
	DRAWN BY: SB	APPROVED BY: MP		111 S.W. Columbia, Suite 1500 Portland, Oregon 97201 (tel) 503-222-7200 (fax) 503-222-4292 www.urscorp.com	CASCADE LOCKS, OREGON	**REFERENCE AREA SAMPLING STATIONS**	GIS FILE NUMBER: FIG 6-4
	CHECKED BY: SB	DATE: JULY 2010					SHEET: REV.

Downstream Sampling Stations

Sediment 2008

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

RIVER OPERABLE UNIT

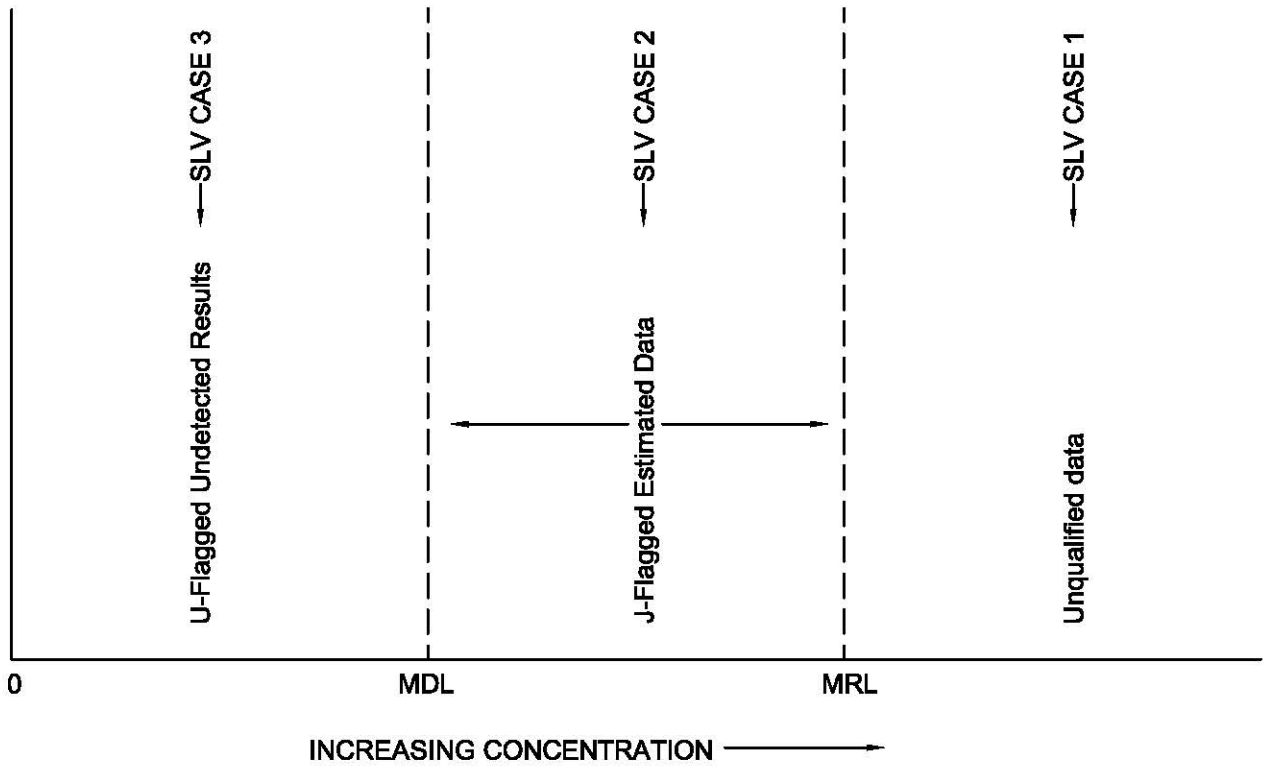
DOWNSTREAM SAMPLING STATIONS

DRAWING NUMBER: FIGURE 6-5

GIS FILE NUMBER: FIG 6-5

SHEET: REV.

O:\25692709 USACE\53-F0072173.00 Bradford\Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 6-5 Downstream Sampling Stations.mxd



MDL = Method Detection Limit
MRL = Method Reporting Limit
SLV = Screening Level Value

RELATIONSHIP BETWEEN MDL, MRL, AND J-FLAGGED DATA

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25696528

BRADFORD ISLAND
CASCADE LOCKS, OREGON

FIGURE 7-1

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction

Depth	Sb	As	Cd	Pb	Hg	Zn
0.0-0.5	-	1.98	0.343	5.34	0.106	41.6

BIL13SSI

Depth	Sb	As	Cd	Pb	Hg	Zn
0.5	0.300 UJ	3.20	0.720	680 J	0.130	194

Depth	Sb	As	Cd	Pb	Hg	Zn
3.0	2.62 J	5.95	3.54	1,240 J	0.0834	1140 J

Depth	Sb	As	Cd	Pb	Hg	Zn
2.0	0.810	4.07	0.731	1,660 J	0.0475	101 J

Depth	Sb	As	Cd	Pb	Hg	Zn
1.0	0.309 J	2.98	2.09	741 J	0.122	262 J

L-01

L-02

L-03

L-04

BIL17

BIL18

BIL22

Gully Test Pit

BIL01TPG - BIL04TPG

Depth	Sb	As	Cd	Pb	Hg	Zn
0.5	0.300 UJ	4.50	1.70	127 J	0.110	189

BIL09USE

Depth	Sb	As	Cd	Pb	Hg	Zn
0.5	0.200 UJ	6.20	0.940	131 J	0.0700	157

BIL03USE

BIL08USE

BIL02USE

BIL07USE

Depth	Sb	As	Cd	Pb	Hg	Zn
0.5	0.200 UJ	6.10	0.660	147 J	0.290	143

BIL01USE

Depth	Sb	As	Cd	Pb	Hg	Zn
0.5	0.300 UJ	3.70	0.670	174 J	0.100	180

Depth	Sb	As	Cd	Pb	Hg	Zn
0.5	0.300 UJ	5.10	0.540	119 J	0.190	151

Depth	Sb	As	Cd	Pb	Hg	Zn
2.5	-	-	-	87.6 J	-	-

Mercury Vapor-Lamp Test Pit

Sample ID	Depth	Sb	As	Cd	Pb	Hg	Zn
BIL28TPM	0-10?	-	-	-	-	0.505 J	-
BIL29TPM	0-10?	-	-	-	-	0.552 J	-

Depth	Sb	As	Cd	Pb	Hg	Zn
0.5	0.200 UJ	3.30	0.570	49.0 J	0.230	144

BIL05USE

BIL04USE

Depth	Sb	As	Cd	Pb	Hg	Zn
0.5	0.200 UJ	3.70	0.570	51.0 J	0.0700	138

BIL06USE

Depth	Sb	As	Cd	Pb	Hg	Zn
0.5	0.200 UJ	4.00	1.30	148 J	0.320	221

Depth	Sb	As	Cd	Pb	Hg	Zn
0.0-0.5	3.90	3.70	1.75	168	4.15	138

Lead Hot Spot

Test Pit #1

BIL31

BIL06SSI

BIL32

Depth	Sb	As	Cd	Pb	Hg	Zn
2.5	-	-	-	115 J	-	-

Depth	Sb	As	Cd	Pb	Hg	Zn
0.0-0.5	2.70 U	2.80	0.270 U	22.8	0.110 U	69.0

BIL12SSI

Depth	Sb	As	Cd	Pb	Hg	Zn
2	-	-	-	711 J	-	-

Depth	Sb	As	Cd	Pb	Hg	Zn
3	-	-	-	614 J	-	-

Depth	Sb	As	Cd	Pb	Hg	Zn
0.0-0.5	2.90 U	11.3	0.290 U	36.5	0.110 U	163

BIL11SSI

BIL26

BIL24

BIL04SSI

Depth	Sb	As	Cd	Pb	Hg	Zn
3	-	-	-	954 J	-	-

BIL30

Lead Hot Spot

Test Pit #2

Depth	Sb	As	Cd	Pb	Hg	Zn
0.0-0.5	2.70 U	3.20	0.440	699	0.120	134

BIL27

BIL05SSI

Depth	Sb	As	Cd	Pb	Hg	Zn
2.5	-	-	-	110 J	-	-

Depth	Sb	As	Cd	Pb	Hg	Zn
0.0-0.5	4.20	30.1	1.30	486	0.840	635

Depth	Sb	As	Cd	Pb	Hg	Zn
0.0-0.5	2.80 U	3.00	0.280 U	40.5	0.120	85.1

BIL09SSI

Extent of

Landfill Debris

BIL10SSI

Depth	Sb	As	Cd	Pb	Hg	Zn
0.0-0.5	2.60 U	3.10	0.260 U	19.3	0.110 U	69.6

Access Road

Depth	Sb	As	Cd	Pb	Hg	Zn
0.0-0.33	2.80	3.60	0.270 U	74.5	0.110 U	88.7

BIL01SSI

BIL03SSI

Depth	Sb	As	Cd	Pb	Hg	Zn
0.0-0.5	2.80 U	4.90	0.500	362	1.40	150

BIL02SSI

Depth	Sb	As	Cd	Pb	Hg	Zn
0.0-0.5	2.70 U	1.50	0.270 U	153	0.110 U	98.0

Pesticide/Herbicide

Wash Area

Landfill AOPC

120

15 0 15 30

SCALE IN FEET

LEGEND

- Landfill Surface and Shallow Soil Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Depth	Analyte
feet bgs	Concentration (mg/kg)

Sb = Antimony
As = Arsenic
Cd = Cadmium
Pb = Lead
Hg = Mercury
Zn = Zinc
SLV = screening level value
- = Not Analyzed

Soil SLVs Used for Screening (mg/kg):

Sb	As	Cd	Pb	Hg	Zn
0.270	5.40	0.360	25.5	0.0660	71.7

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at MDL shown.
Metals were not analyzed for at L-01 to L-04 or at Gully Test Pit Samples: BIL01TPG through BIL04TPG (shown in gray).

No.	DATE	BY	REVISION

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

LANDFILL AOPC

METALS IN SURFACE AND SHALLOW SOIL

DRAWING NUMBER: FIGURE 9-1a

CAD FILE NUMBER: FIG 9-1a

SHEET: OF

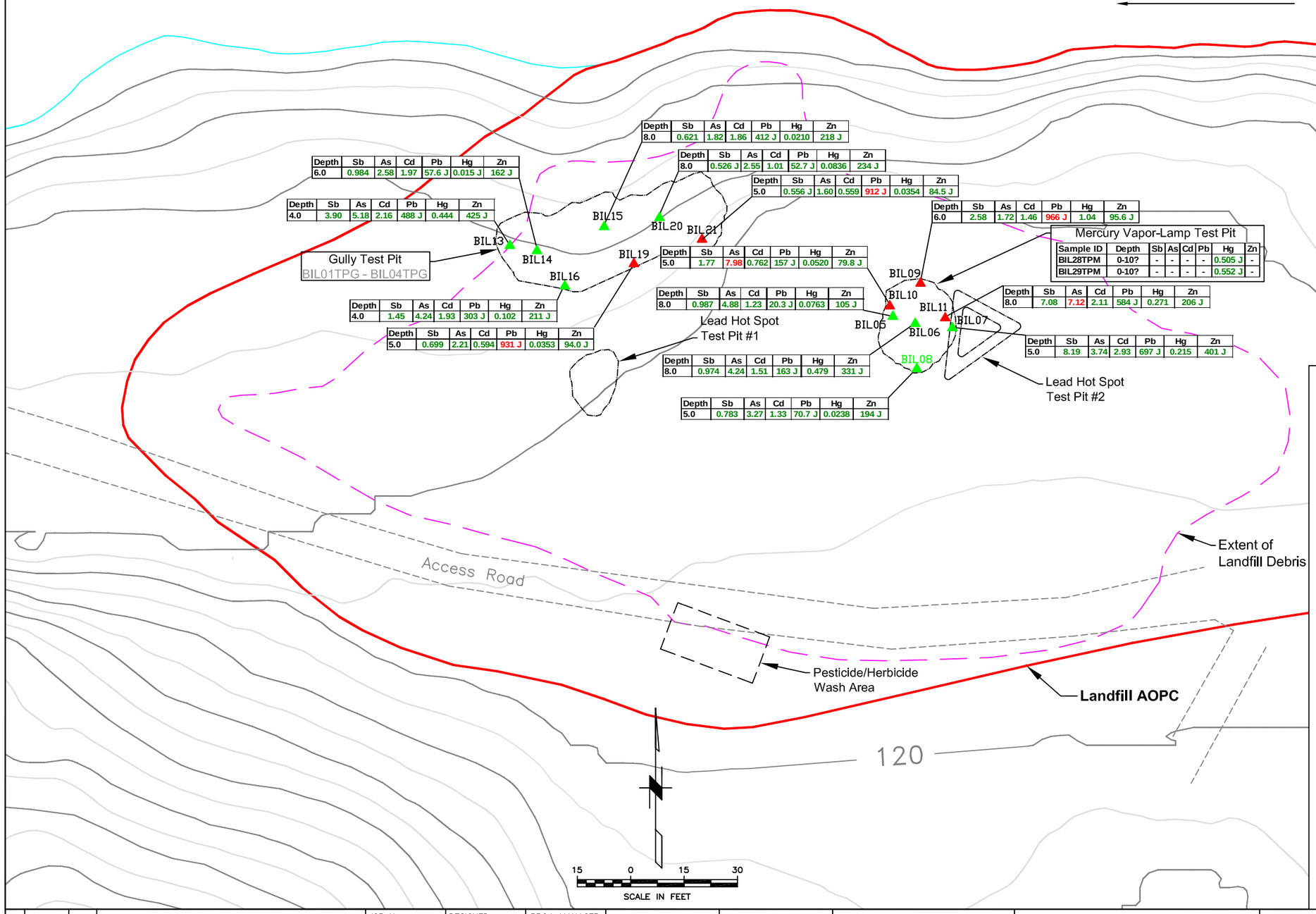
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-1a - Metals in Surface and Shallow Soil at Landfill AOPC.dwg Nov 18, 2010 - 9:27am

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction



Depth	Sb	As	Cd	Pb	Hg	Zn
6.0	0.984	2.58	1.97	57.6 J	0.015 J	162 J

Depth	Sb	As	Cd	Pb	Hg	Zn
4.0	3.90	5.18	2.16	488 J	0.444	425 J

Depth	Sb	As	Cd	Pb	Hg	Zn
4.0	1.45	4.24	1.93	303 J	0.102	211 J

Depth	Sb	As	Cd	Pb	Hg	Zn
5.0	0.699	2.21	0.594	931 J	0.0353	94.0 J

Depth	Sb	As	Cd	Pb	Hg	Zn
8.0	0.621	1.82	1.86	412 J	0.0210	218 J

Depth	Sb	As	Cd	Pb	Hg	Zn
8.0	0.526 J	2.55	1.01	52.7 J	0.0836	234 J

Depth	Sb	As	Cd	Pb	Hg	Zn
5.0	0.556 J	1.60	0.559	912 J	0.0354	84.5 J

Depth	Sb	As	Cd	Pb	Hg	Zn
5.0	1.77	7.98	0.762	157 J	0.0520	79.8 J

Depth	Sb	As	Cd	Pb	Hg	Zn
8.0	0.987	4.88	1.23	20.3 J	0.0763	105 J

Depth	Sb	As	Cd	Pb	Hg	Zn
8.0	0.974	4.24	1.51	163 J	0.479	331 J

Depth	Sb	As	Cd	Pb	Hg	Zn
5.0	0.783	3.27	1.33	70.7 J	0.0238	194 J

Depth	Sb	As	Cd	Pb	Hg	Zn
6.0	2.58	1.72	1.46	966 J	1.04	95.6 J

Mercury Vapor-Lamp Test Pit

Sample ID	Depth	Sb	As	Cd	Pb	Hg	Zn
BIL28TPM	0-10?	-	-	-	-	0.505 J	-
BIL29TPM	0-10?	-	-	-	-	0.552 J	-

Depth	Sb	As	Cd	Pb	Hg	Zn
8.0	7.08	7.12	2.11	584 J	0.271	206 J

Depth	Sb	As	Cd	Pb	Hg	Zn
5.0	8.19	3.74	2.93	697 J	0.215	401 J

LEGEND

- ▲ Landfill Deeper Soil Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Depth	Analyte
feet bgs	Concentration (mg/kg)

Sb = Antimony
As = Arsenic
Cd = Cadmium
Pb = Lead
Hg = Mercury
Zn = Zinc
SLV = screening level value

Soil SLVs Used for Screening (mg/kg):

Sb	As	Cd	Pb	Hg	Zn
410	5.4	150	800	93	310,000

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at MDL shown.
Metals were not analyzed for at Gully Test Pit Samples: BIL01TPG - BIL04TPG (shown in gray).

No.	DATE	BY	REVISION

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SCALE:	DRAWN BY: SB	APPROVED BY: LSM
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BRADFORD ISLAND

CASCADE LOCKS, OREGON

LANDFILL AOPC

METALS IN DEEPER SOIL

DRAWING NUMBER: FIGURE 9-1b
CAD FILE NUMBER: FIG 9-1b
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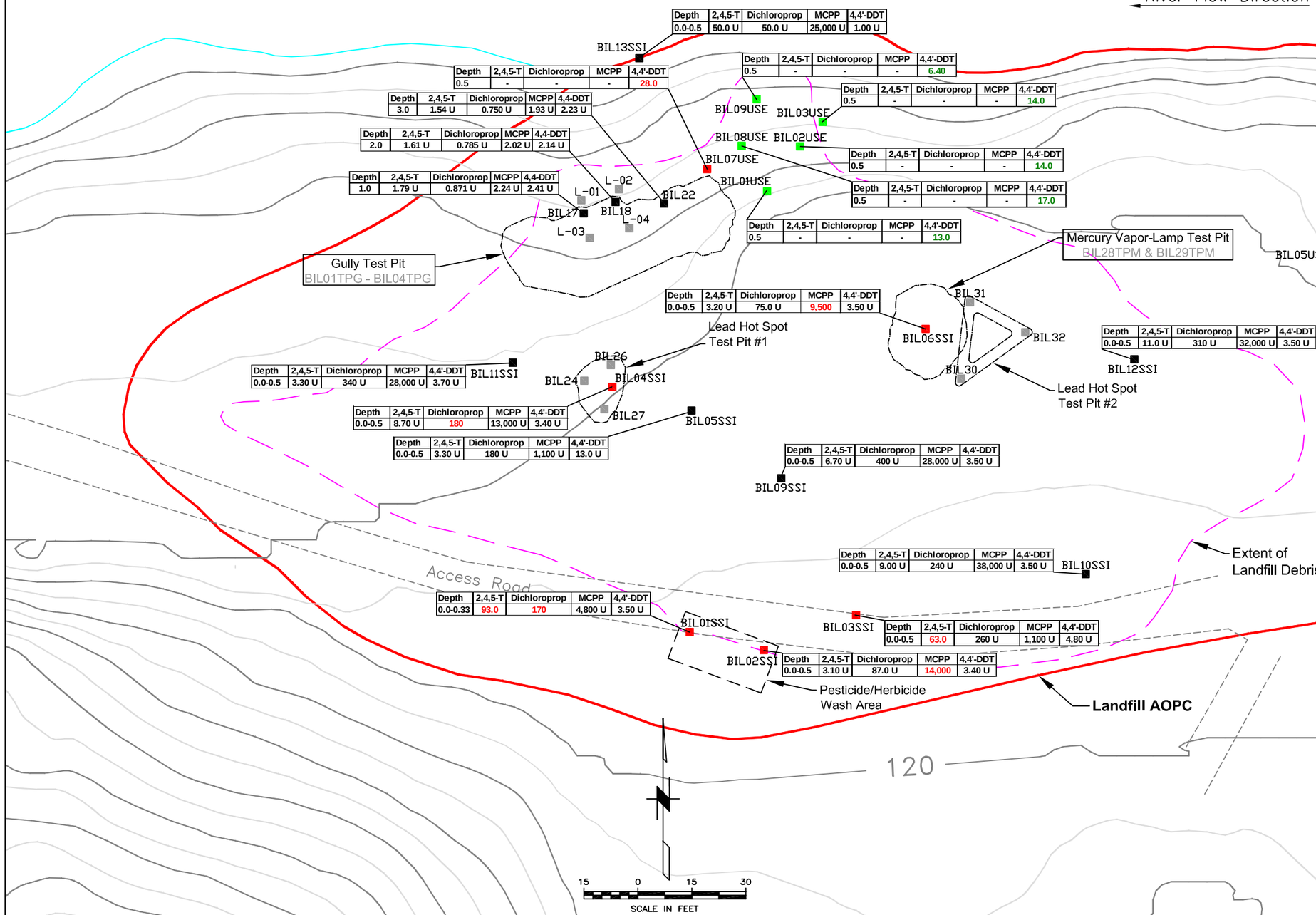
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-1b - Metals in Deeper Soil at Landfill AOPC.dwg Nov 18, 2010 - 9:28am

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction

NOTE:
In deeper soil, herbicides and pesticides were non-detected, less than SLVs, or not analyzed.



LEGEND

- Landfill Surface and Shallow Soil Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Depth	Analyte
ft bgs	Concentration (µg/kg)

SLV = screening level value
- = Not Analyzed

Soil SLVs Used for Screening (µg/kg):

2,4,5-T (µg/kg)	Dichloroprop (µg/kg)	MCPP (µg/kg)	4,4'-DDT (µg/kg)
21.0	21.0	21.0	21.0

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at MDL shown.
Pesticides were not analyzed for at L-01 to L-04, BIL24, BIL26, BIL27, BIL30 to BIL32, Mercury Vapor Lamp Test Pit Samples BIL28TPM or BIL29TPM, or Gully Test Pit Samples BIL01TPG through BIL04TPG (shown in gray).

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: SB	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

LANDFILL AOPC

HERBICIDES AND PESTICIDES
IN SURFACE AND SHALLOW SOIL

DRAWING NUMBER: FIGURE 9–1c
CAD FILE NUMBER: FIG 9–1c
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-1c - Herbicides and Pesticides in Surface and Shallow Soil at Landfill AOPC.dwg Nov 18, 2010 - 9:29am

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction

BIL13SSI

Depth	Aroclor 1260
0.0-0.5	50.0 UJ

Depth	Aroclor 1260
3.0	91.3

Depth	Aroclor 1260
0.5	74

Depth	Aroclor 1260
0.5	19

Depth	Aroclor 1260
0.5	31.0 J

Depth	Aroclor 1260
0.5	24

Depth	Aroclor 1260
2.0	39

Depth	Aroclor 1260
1.0	68

Depth	Aroclor 1260
0.5	42

Depth	Aroclor 1260
0.5	50

BIL09USE BIL03USE BIL08USE BIL02USE BIL07USE BIL01USE

L-01 L-02 L-03 L-04 BIL17 BIL18 BIL22

Gully Test Pit

Sample ID	Depth	Aroclor 1260
BIL01TPG	0-10?	26.3
BIL02TPG	0-10?	22.2
BIL04TPG	0-10?	87.6
BIL03TPG	0-10?	12.5

Mercury Vapor-Lamp Test Pit

Sample ID	Depth	Aroclor 1260
BIL28TPM	0-10?	46.5
BIL29TPM	0-10?	13.1

Depth	Aroclor 1260
0.5	12

Depth	Aroclor 1260
0.5	33

Depth	Aroclor 1260
0.5	92

BIL05USE BIL04USE BIL06USE

BIL31 BIL32 BIL30

BIL06SSI

Depth	Aroclor 1260
0.0-0.5	81.5 J

Lead Hot Spot Test Pit #1

Lead Hot Spot Test Pit #2

Depth	Aroclor 1260
0.0-0.5	35.0 UJ

BIL12SSI

BIL11SSI

Depth	Aroclor 1260
0.0-0.5	37.0 UJ

BIL26 BIL24 BIL04SSI BIL27

Depth	Aroclor 1260
0.0-0.5	660 J

BIL05SSI

Depth	Aroclor 1260
0.0-0.5	160 J

Depth	Aroclor 1260
0.0-0.5	35.0 UJ

BIL09SSI

Access Road

Depth	Aroclor 1260
0.0-0.33	58.0 J

BIL01SSI

BIL02SSI

Depth	Aroclor 1260
0.0-0.5	420 J

Pesticide/Herbicide Wash Area

BIL03SSI

Depth	Aroclor 1260
0.0-0.5	48.0 J

BIL10SSI

Depth	Aroclor 1260
0.0-0.5	35.0 UJ

Extent of Landfill Debris

Landfill AOPC

120

15 0 15 30

SCALE IN FEET

LEGEND

- Landfill Surface and Shallow Soil Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Depth	Analyte
feet bgs	Concentration (µg/kg)

Soil SLVs Used for Screening (µg/kg):

Aroclor 1260 (µg/kg)
371

Red = Concentration exceeds selected SLV.

Green = Concentration below selected SLV.

Black = Not detected at MDL shown.

PCBs were not analyzed at L-01 to L-04 or BIL24, BIL26, BIL27, or BIL30 to BIL32 (Shown in gray).

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: SB	APPROVED BY: LSM
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BRADFORD ISLAND

CASCADE LOCKS, OREGON

LANDFILL AOPC

PCBs IN SURFACE AND SHALLOW SOIL

DRAWING NUMBER: FIGURE 9-1d

CAD FILE NUMBER: FIG 9-1d

SHEET: OF

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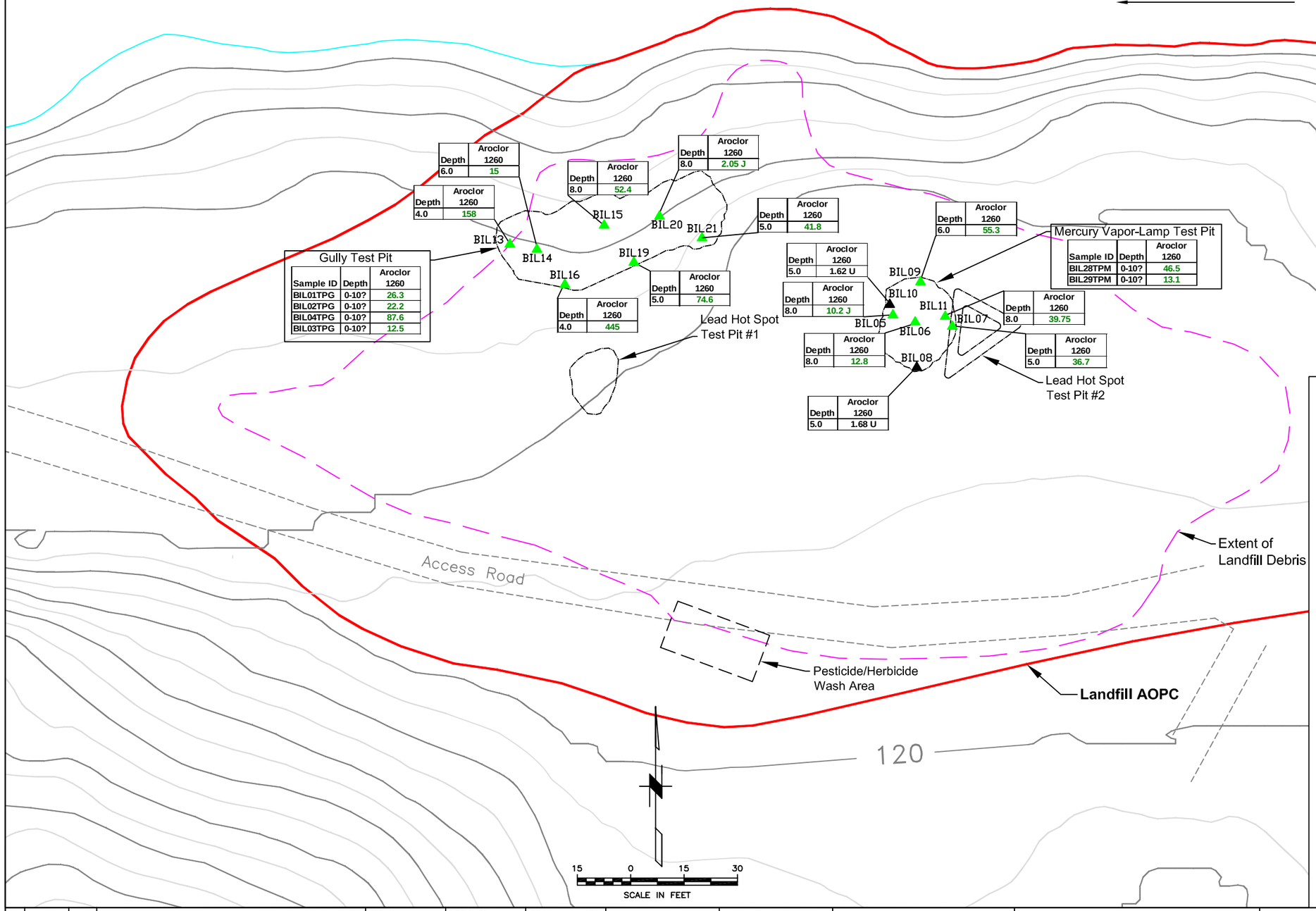
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-1d - PCBs in Surface and Shallow Soil at Landfill AOPC.dwg Nov 18, 2010 - 9:30am

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction



Depth	Aroclor 1260
6.0	15

Depth	Aroclor 1260
4.0	158

Depth	Aroclor 1260
8.0	52.4

Depth	Aroclor 1260
8.0	2.05 J

Depth	Aroclor 1260
5.0	41.8

Depth	Aroclor 1260
6.0	55.3

Depth	Aroclor 1260
5.0	1.62 U

Depth	Aroclor 1260
8.0	10.2 J

Depth	Aroclor 1260
8.0	12.8

Depth	Aroclor 1260
5.0	1.68 U

Depth	Aroclor 1260
8.0	39.75

Depth	Aroclor 1260
5.0	36.7

Depth	Aroclor 1260
5.0	74.6

Depth	Aroclor 1260
4.0	445

Gully Test Pit

Sample ID	Depth	Aroclor 1260
BIL01TPG	0-10?	26.3
BIL02TPG	0-10?	22.2
BIL04TPG	0-10?	87.6
BIL03TPG	0-10?	12.5

Mercury Vapor-Lamp Test Pit

Sample ID	Depth	Aroclor 1260
BIL28TPM	0-10?	46.5
BIL29TPM	0-10?	13.1

LEGEND

- ▲ Landfill Deeper Soil Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Depth	Analyte
feet bgs	Concentration (µg/kg)

Soil SLV Used for Screening (µg/kg):

Aroclor 1260 (µg/kg)
740

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at MDL shown.

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: SB	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

LANDFILL AOPC

PCBs IN DEEPER SOIL

DRAWING NUMBER: FIGURE 9-1e

CAD FILE NUMBER: FIG 9-1e

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O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-1e - PCBs in Deeper Soil at Landfill AOPC.dwg Nov 18, 2010 - 9:33am

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction

Depth	Total LPAHs	Total HPAHs
3.0	7,531 J	73,156

Depth	Total LPAHs	Total HPAHs
0.0-0.5	299 U	498 UJ

BIL13SSI

Depth	Total LPAHs	Total HPAHs
0.0-1.0	3,029	41,810
1.0-3.0	12,211	129,700

Depth	Total LPAHs	Total HPAHs
2.0	34,767	25,1840 J

Depth	Total LPAHs	Total HPAHs
0.0-1.0	556	7,210
1.0-3.0	2,203	48,770

Depth	Total LPAHs	Total HPAHs
1.0	4,406	84,685

Depth	Total LPAHs	Total HPAHs
0.0-1.0	5,382	49,100
1.0-3.0	4,334	51,400

L-01 L-02 L-03 L-04 BIL17 BIL18 BIL22

Depth	Total LPAHs	Total HPAHs
0.5	230 J	1,517 J

BIL09USE

Depth	Total LPAHs	Total HPAHs
0.5	290 J	3,645

BIL03USE

Depth	Total LPAHs	Total HPAHs
0.5	424 J	11,350

BIL08USE BIL02USE

Depth	Total LPAHs	Total HPAHs
0.5	770 J	13,060

BIL07USE

BIL01USE

Depth	Total LPAHs	Total HPAHs
0.5	4,268 J	55,030

Depth	Total LPAHs	Total HPAHs
0.5	279 J	6,051

Depth	Total LPAHs	Total HPAHs
0.0-1.0	7,043	49,700
1.0-3.0	4,270	53,000

Gully Test Pit

Sample ID	Depth	Total LPAHs	Total HPAHs
BIL01TPG	0-10?	5,750 J	66,200 J
BIL02TPG	0-10?	7,150	82,200 J
BIL03TPG	0-10?	3,610 J	53,500 J
BIL04TPG	0-10?	29,500 J	138,000 J

Mercury Vapor-Lamp Test Pit

Sample ID	Depth	Total LPAHs	Total HPAHs
BIL28TPM	0-10?	9,340 J	59,500 J
BIL29TPM	0-10?	3,750 J	6,210 J

Depth	Total LPAHs	Total HPAHs
0.5	141 J	880

BIL05USE BIL04USE

Depth	Total LPAHs	Total HPAHs
0.5	1,963 J	14,390

BIL06USE

Depth	Total LPAHs	Total HPAHs
0.5	277 J	2,516

Depth	Total LPAHs	Total HPAHs
0.0-0.5	2,105 J	16,150 J

Lead Hot Spot
Test Pit #1

BIL06SSI

BIL31 BIL32 BIL30

Lead Hot Spot
Test Pit #2

Depth	Total LPAHs	Total HPAHs
0.0-0.5	913 J	334 J

BIL12SSI

Depth	Total LPAHs	Total HPAHs
0.0-0.5	881 J	3,452 J

BIL11SSI

BIL26 BIL24 BIL04SSI BIL27

Depth	Total LPAHs	Total HPAHs
0.0-0.5	18,674 J	367,900

BIL05SSI

Depth	Total LPAHs	Total HPAHs
0.0-0.5	3,143 J	17,320 J

Depth	Total LPAHs	Total HPAHs
0.0-0.5	940 J	891 J

BIL09SSI

Access Road

Depth	Total LPAHs	Total HPAHs
0.0-0.5	936 J	640 J

BIL10SSI

Extent of
Landfill Debris

Depth	Total LPAHs	Total HPAHs
0.0-0.33	153 J	1,049 J

BIL01SSI

BIL03SSI

Depth	Total LPAHs	Total HPAHs
0.0-0.5	650 J	13,060

BIL02SSI

Depth	Total LPAHs	Total HPAHs
0.0-0.5	256 J	1,511 J

Pesticide/Herbicide
Wash Area

Landfill AOPC

120

15 0 15 30

SCALE IN FEET

LEGEND

- Landfill Surface and Shallow Soil Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Depth	Analyte
feet bgs	Concentration (µg/kg)

HPAHs = High Molecular Weight PAHs
LPAHs = Low Molecular Weight PAHs
SLV = screening level value

Soil SLVs Used for Screening (µg/kg):

Total LPAH (µg/kg)	Total HPAH (µg/kg)
29,000	1,100

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at MDL shown.
PAHs were not analyzed for at BIL24, BIL26, BIL27, or BIL30 to BIL32 (shown in gray).

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
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LANDFILL AOPC

PAHs IN SURFACE AND SHALLOW SOIL

DRAWING NUMBER: FIGURE 9-1f
CAD FILE NUMBER: FIG 9-1f
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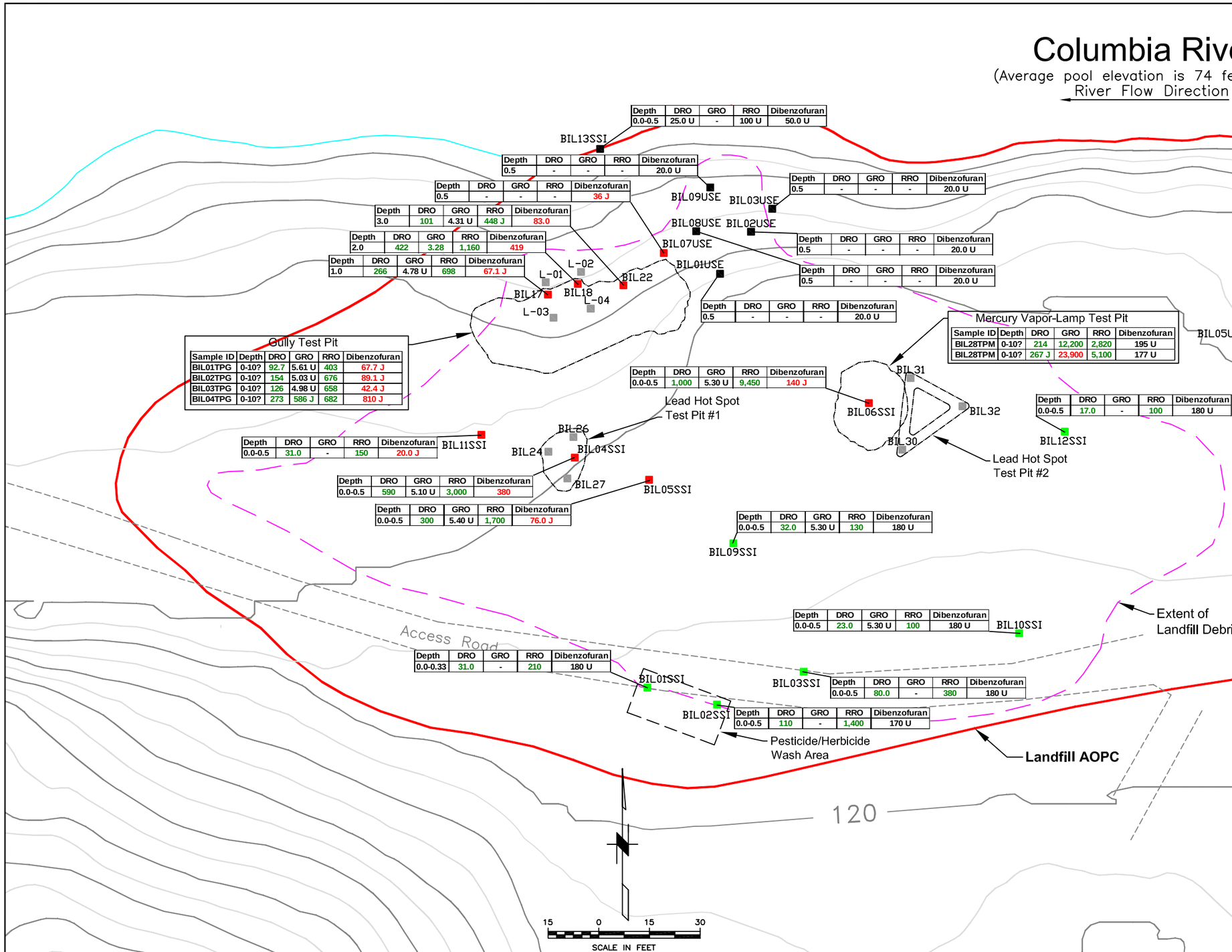
O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-1f - PAHs in Surface and Shallow Soil at Landfill AOPC.dwg Nov 18, 2010 - 9:33am



LEGEND

- Landfill Surface and Shallow Soil Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Depth	Analyte
ft bgs	Concentration (mg/kg or µg/kg)

DRO = Diesel Range Organics
GRO = Gasoline Range Organics
RRO = Residual Range Organics
SLV = screening level value
- = Not Analyzed

Soil SLVs Used for Screening (µg/kg):

DRO (mg/kg)	GRO (mg/kg)	RRO (mg/kg)	Dibenzofuran (µg/kg)
23,000	13,000	40,000	2.00

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at MDL shown.
TPH and Dibenzofuran were not analyzed for at L-01 to L-04, BIL24, BIL26, BIL27, or BIL30 to BIL32 (shown in gray).

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
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SCALE:	DRAWN BY: SB	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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CASCADE LOCKS, OREGON

LANDFILL AOPC

TPH AND DIBENZOFURAN
IN SURFACE AND SHALLOW SOIL

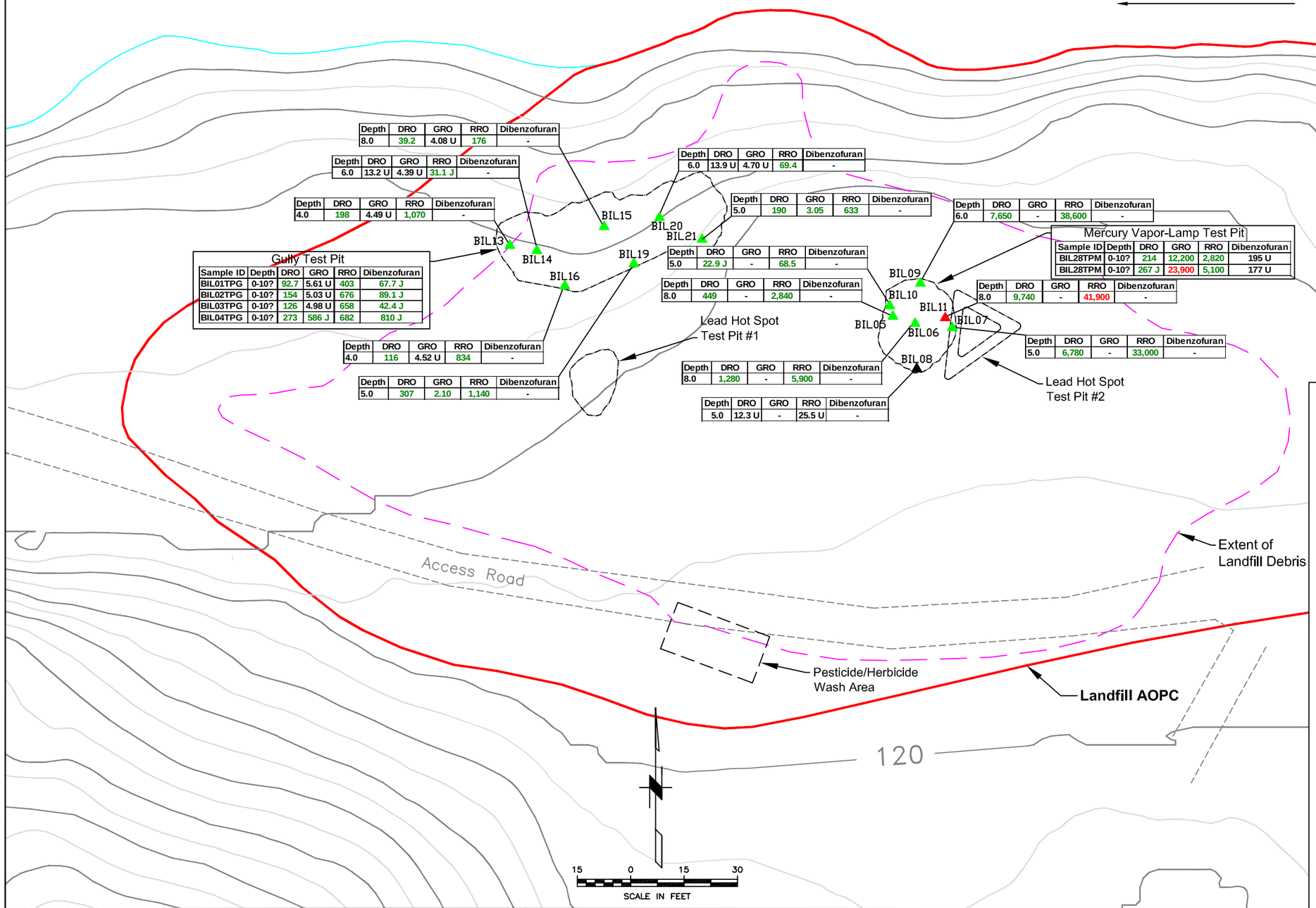
DRAWING NUMBER: FIGURE 9-1g
CAD FILE NUMBER: FIG 9-1g
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-1g - TPH and Dibenzofuran in Surface and Shallow Soil.dwg Nov 18, 2010 - 9:34am

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction



Depth	DRO	GRO	RRO	Dibenzofuran
8.0	39.2	4.08 U	176	-

Depth	DRO	GRO	RRO	Dibenzofuran
6.0	13.2 U	4.39 U	31.1 J	-

Depth	DRO	GRO	RRO	Dibenzofuran
4.0	198	4.49 U	1,070	-

Gully Test Pit

Sample ID	Depth	DRO	GRO	RRO	Dibenzofuran
BIL01TPG	0-10?	92.7	5.61 U	403	67.7 J
BIL02TPG	0-10?	154	5.03 U	676	89.1 J
BIL03TPG	0-10?	126	4.98 U	658	42.4 J
BIL04TPG	0-10?	273	586 J	682	810 J

Depth	DRO	GRO	RRO	Dibenzofuran
4.0	116	4.52 U	834	-

Depth	DRO	GRO	RRO	Dibenzofuran
5.0	307	2.10	1,140	-

Depth	DRO	GRO	RRO	Dibenzofuran
6.0	13.9 U	4.70 U	69.4	-

Depth	DRO	GRO	RRO	Dibenzofuran
5.0	190	3.05	633	-

Depth	DRO	GRO	RRO	Dibenzofuran
5.0	22.9 J	-	68.5	-

Depth	DRO	GRO	RRO	Dibenzofuran
8.0	449	-	2,840	-

Depth	DRO	GRO	RRO	Dibenzofuran
8.0	1,280	-	5,900	-

Depth	DRO	GRO	RRO	Dibenzofuran
5.0	12.3 U	-	25.5 U	-

Depth	DRO	GRO	RRO	Dibenzofuran
6.0	7,650	-	38,600	-

Mercury Vapor-Lamp Test Pit

Sample ID	Depth	DRO	GRO	RRO	Dibenzofuran
BIL28TPM	0-10?	214	12,200	2,820	195 U
BIL28TPM	0-10?	267 J	23,900	5,100	177 U

Depth	DRO	GRO	RRO	Dibenzofuran
8.0	9,740	-	41,900	-

Depth	DRO	GRO	RRO	Dibenzofuran
5.0	6,780	-	33,000	-

LEGEND

- ▲ Landfill Deeper Soil Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Depth	Analyte
ft bgs	Concentration (mg/kg or µg/kg)

DRO = Diesel Range Organics
GRO = Gasoline Range Organic
RRO = Residual Range Organics
SLV = screening level value
- = Not Analyzed

Soil SLVs Used for Screening:

DRO (mg/kg)	GRO (mg/kg)	RRO (mg/kg)	Dibenzofuran (µg/kg)
23,000	13,000	40,000	1,000,000

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at MDL shown.

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: SB	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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CASCADE LOCKS, OREGON

LANDFILL AOPC

TPH AND DIBENZOFURAN IN DEEPER SOIL

DRAWING NUMBER: FIGURE 9-1h

CAD FILE NUMBER: FIG 9-1h

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O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-1h - TPH and Dibenzofuran in Deeper Soil at Landfill AOPC.dwg Nov 18, 2010 - 9:36am

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction

Depth	As	Cd	Cr	Co	Cu	Pb	Hg	Ni	Th	Zn
0.0-0.5	1.98	0.343	23.1	-	58.6 J	5.34	0.106	20.2 J	0.378	41.6

BIL13SSI

Depth	Depth	As	Cd	Cr	Co	Cu	Pb	Hg	Ni	Th	Zn
0.5	0.5	3.20	0.720	801	22.7 J	41.3	680 J	0.130	570	0.300 U	194

Depth	As	Cd	Cr	Co	Cu	Pb	Hg	Ni	Th	Zn
0.5	4.50	1.70	22.0	8.50 J	39.1	127 J	0.110	21.0	0.300 U	189

BIL09USE

Depth	As	Cd	Cr	Co	Cu	Pb	Hg	Ni	Th	Zn
0.5	6.20	0.940	23.0	11.5 J	45.4	131 J	0.0700	20.0	0.200 U	157

BIL03USE

BIL08USE

BIL02USE

Depth	As	Cd	Cr	Co	Cu	Pb	Hg	Ni	Th	Zn
0.5	6.10	0.660	30.1	9.60 J	45.7	147 J	0.290	21.0	0.200 U	143

BIL07USE

BIL01USE

Depth	As	Cd	Cr	Co	Cu	Pb	Hg	Ni	Th	Zn
0.5	3.70	0.570	15.6	6.60 J	28.4	51.0 J	0.0700	15.0	0.200 U	138

Depth	As	Cd	Cr	Co	Cu	Pb	Hg	Ni	Th	Zn
0.5	5.10	0.540	28.6	15.3 J	54.9	119 J	0.190	30.0	0.300 U	151

L-01

L-02

L-03

L-04

Gully Test Pit

Mercury Vapor-Lamp Test Pit

Lead Hot Spot
Test Pit #1

Lead Hot Spot
Test Pit #2

Depth	As	Cd	Cr	Co	Cu	Pb	Hg	Ni	Th	Zn
0.5	3.30	0.570	16.1	6.40 J	24.4	49.0 J	0.230	15.0	0.200 U	144

BIL05USE

BIL04USE

Depth	As	Cd	Cr	Co	Cu	Pb	Hg	Ni	Th	Zn
0.5	3.70	0.670	117	10.7 J	52.1	174 J	0.100	72.0	0.300 U	180

BIL06USE

Depth	As	Cd	Cr	Co	Cu	Pb	Hg	Ni	Th	Zn
0.5	4.00	1.30	16.9	8.30 J	60.5	148 J	0.320	15.0	0.200 U	221

Access Road

Extent of
Landfill Debris

Landfill AOPC

120

15 0 15 30

SCALE IN FEET

LEGEND

- Landfill Surface and Shallow Soil Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Depth	Analyte
feet bgs	Concentration (mg/kg)

As = Arsenic
Cd = Cadmium
Cr = Chromium
Co = Cobalt
Cu =Copper
SLV = screening level value
- = Not Analyzed

Pb = Lead
Hg = Mercury
Ni = Nickel
Se = Selenium
Th = Thallium
Zn = Zinc

Sediment SLVs Used for Screening (mg/kg):

As	Cd	Cr	Co	Cu	Pb	Hg	Ni	Th	Zn
6.00	0.674	37.0	15.2	55.6	35.0	0.214	21.2	0.354	123

Pink = Soil Concentration exceeds Sediment SLV.
Green = Soil Concentration below Seiment SLV.
Black = Not detected at MDL shown.
Metals were not analyzed for at L-01 to L-04 (shown in gray).

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: SB	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: JULY 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

LANDFILL AOPC

METALS IN SURFACE SOIL
FOR MASS WASTING EVALUATION

DRAWING NUMBER: FIGURE 9-2a

CAD FILE NUMBER: FIG 9-2a

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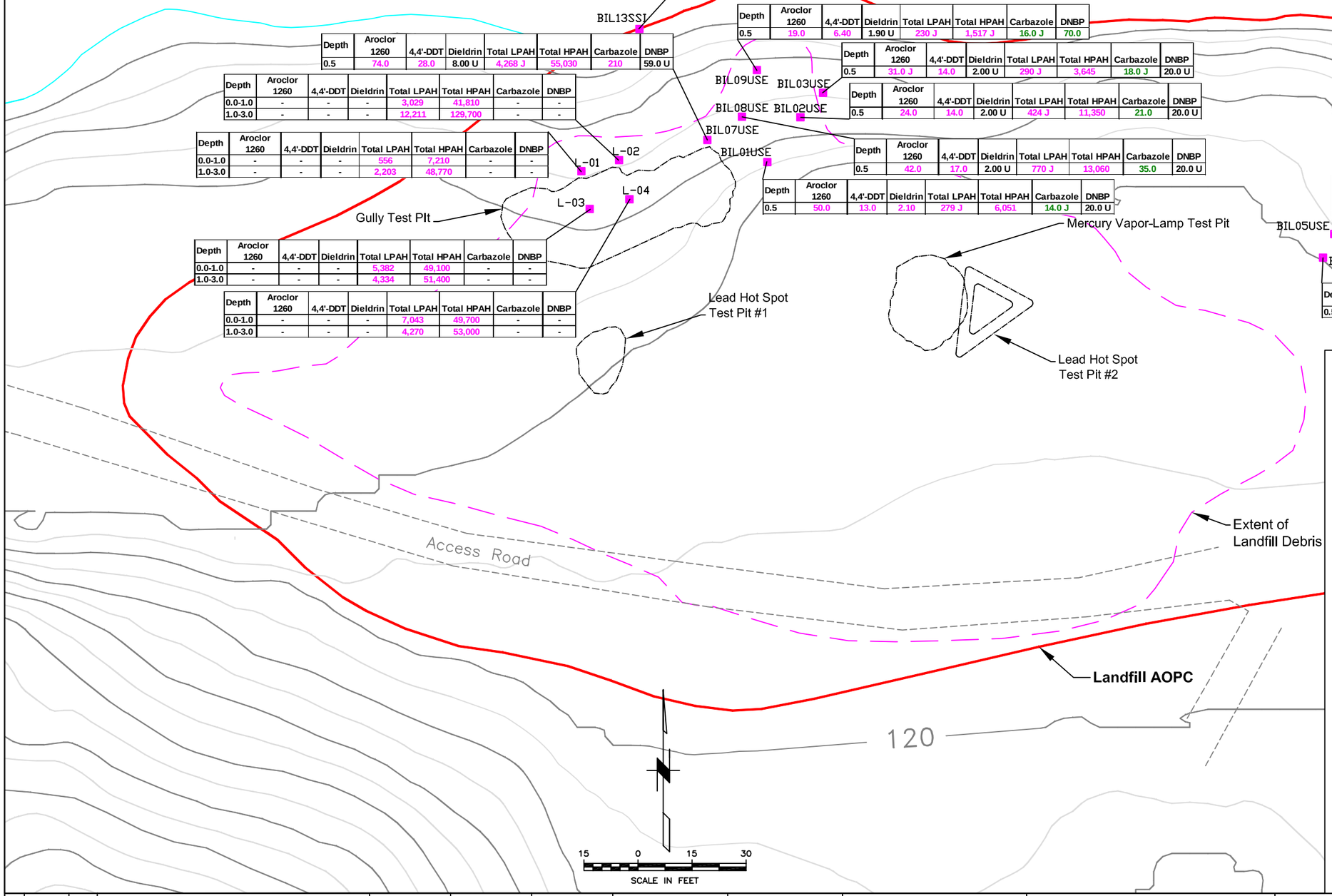
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-2a- Metals in Surface Soil for Mass Wasting Evaluation.dwg Nov 18, 2010 - 9:37am

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction



Depth	Aroclor 1260	4,4'-DDT	Dieldrin	Total LPAH	Total HPAH	Carbazole	DNBP
0.0-0.5	50.0 UJ	1.00 U	2.00 U	299 U	498 UJ	50.0 UJ	50.0 U

Depth	Aroclor 1260	4,4'-DDT	Dieldrin	Total LPAH	Total HPAH	Carbazole	DNBP
0.5	19.0	6.40	1.90 U	230 J	1,517 J	16.0 J	70.0

Depth	Aroclor 1260	4,4'-DDT	Dieldrin	Total LPAH	Total HPAH	Carbazole	DNBP
0.5	74.0	28.0	8.00 U	4,268 J	55,030	210	59.0 U

Depth	Aroclor 1260	4,4'-DDT	Dieldrin	Total LPAH	Total HPAH	Carbazole	DNBP
0.5	31.0 J	14.0	2.00 U	290 J	3,645	18.0 J	20.0 U

Depth	Aroclor 1260	4,4'-DDT	Dieldrin	Total LPAH	Total HPAH	Carbazole	DNBP
0.0-1.0	-	-	-	3,029	41,810	-	-
1.0-3.0	-	-	-	12,211	129,700	-	-

Depth	Aroclor 1260	4,4'-DDT	Dieldrin	Total LPAH	Total HPAH	Carbazole	DNBP
0.5	24.0	14.0	2.00 U	424 J	11,350	21.0	20.0 U

Depth	Aroclor 1260	4,4'-DDT	Dieldrin	Total LPAH	Total HPAH	Carbazole	DNBP
0.0-1.0	-	-	-	556	7,210	-	-
1.0-3.0	-	-	-	2,203	48,770	-	-

Depth	Aroclor 1260	4,4'-DDT	Dieldrin	Total LPAH	Total HPAH	Carbazole	DNBP
0.5	42.0	17.0	2.00 U	770 J	13,060	35.0	20.0 U

Depth	Aroclor 1260	4,4'-DDT	Dieldrin	Total LPAH	Total HPAH	Carbazole	DNBP
0.5	50.0	13.0	2.10	279 J	6,051	14.0 J	20.0 U

Depth	Aroclor 1260	4,4'-DDT	Dieldrin	Total LPAH	Total HPAH	Carbazole	DNBP
0.5	12.0	2.00 U	2.00 U	141 J	880	20.0 U	15.0 J

Depth	Aroclor 1260	4,4'-DDT	Dieldrin	Total LPAH	Total HPAH	Carbazole	DNBP
0.5	33.0	5.00 U	2.00 U	1,963 J	14,390	78.0	99.0

Depth	Aroclor 1260	4,4'-DDT	Dieldrin	Total LPAH	Total HPAH	Carbazole	DNBP
0.5	92.0	23.0	4.00 U	277 J	2,516	21.0	1,800

Depth	Aroclor 1260	4,4'-DDT	Dieldrin	Total LPAH	Total HPAH	Carbazole	DNBP
0.0-1.0	-	-	-	5,382	49,100	-	-
1.0-3.0	-	-	-	4,334	51,400	-	-

Depth	Aroclor 1260	4,4'-DDT	Dieldrin	Total LPAH	Total HPAH	Carbazole	DNBP
0.0-1.0	-	-	-	7,043	49,700	-	-
1.0-3.0	-	-	-	4,270	53,000	-	-

LEGEND

- Landfill Surface and Shallow Soil Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Depth	Analyte
feet bgs	Concentration (µg/kg)

HPAHs = High Molecular Weight PAHs
LPAHs = Low Molecular Weight PAHs
DNBP = Di-n-butyl Phthalate
SLV = screening level value
- = Not Analyzed

Sediment SLVs Used for Screening (µg/kg):

Aroclor 1260	4,4'-DDT	Dieldrin	Total LPAH	Total HPAH	Carbazole	DNBP
0.0480	0.0400	0.00100	76.0	193	140	110

Pink = Soil Concentration exceeds Sediment SLV.
Green = Soil Concentration below Seiment SLV.
Black = Not detected at MDL shown.

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: SB	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

LANDFILL AOPC

PCBs, PESTICIDES, PAHs, AND SVOCs IN SURFACE SOILS FOR MASS WASTING EVALUATION

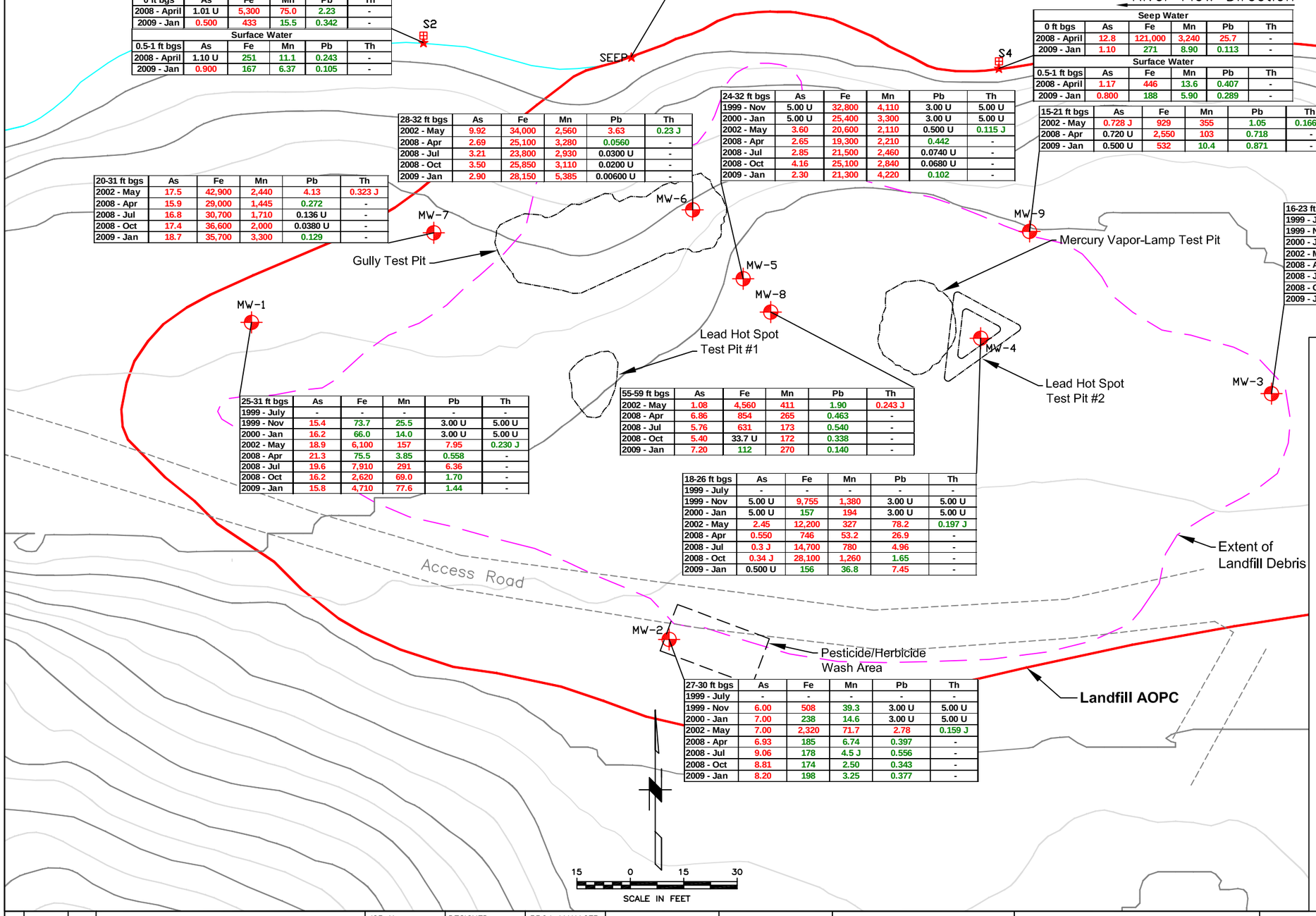
DRAWING NUMBER: FIGURE 9-2b
CAD FILE NUMBER: FIG 9-2b
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-2b- PCBs, Pesticides, PAHs, and SVOCs in Surface Soil for Mass Wasting Evaluation.dwg Nov 18, 2010 - 9:38am

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction



Seep Water					
0 ft bgs	As	Fe	Mn	Pb	Th
2008 - April	1.01 U	5,300	75.0	2.23	-
2009 - Jan	0.500	433	15.5	0.342	-
Surface Water					
0.5-1 ft bgs	As	Fe	Mn	Pb	Th
2008 - April	1.10 U	251	11.1	0.243	-
2009 - Jan	0.900	167	6.37	0.105	-

Seep Water					
0 ft bgs	As	Fe	Mn	Pb	Th
2000 - Apr	1.04	8,195	1,475	1.00 U	1.00 U

Seep Water					
0 ft bgs	As	Fe	Mn	Pb	Th
2008 - April	12.8	121,000	3,240	25.7	-
2009 - Jan	1.10	271	8.90	0.113	-
Surface Water					
0.5-1 ft bgs	As	Fe	Mn	Pb	Th
2008 - April	1.17	446	13.6	0.407	-
2009 - Jan	0.800	188	5.90	0.289	-

28-32 ft bgs	As	Fe	Mn	Pb	Th
2002 - May	9.92	34,000	2,560	3.63	0.23 J
2008 - Apr	2.69	25,100	3,280	0.0560	-
2008 - Jul	3.21	23,800	2,930	0.0300 U	-
2008 - Oct	3.50	25,850	3,110	0.0200 U	-
2009 - Jan	2.90	28,150	5,385	0.00600 U	-

24-32 ft bgs	As	Fe	Mn	Pb	Th
1999 - Nov	5.00 U	32,800	4,110	3.00 U	5.00 U
2000 - Jan	5.00 U	25,400	3,300	3.00 U	5.00 U
2002 - May	3.60	20,600	2,110	0.500 U	0.115 J
2008 - Apr	2.65	19,300	2,210	0.442	-
2008 - Jul	2.85	21,500	2,460	0.0740 U	-
2008 - Oct	4.16	25,100	2,840	0.0680 U	-
2009 - Jan	2.30	21,300	4,220	0.102	-

15-21 ft bgs	As	Fe	Mn	Pb	Th
2002 - May	0.728 J	929	355	1.05	0.166 J
2008 - Apr	0.720 U	2,550	103	0.718	-
2009 - Jan	0.500 U	532	10.4	0.871	-

20-31 ft bgs	As	Fe	Mn	Pb	Th
2002 - May	17.5	42,900	2,440	4.13	0.323 J
2008 - Apr	15.9	29,000	1,445	0.272	-
2008 - Jul	16.8	30,700	1,710	0.136 U	-
2008 - Oct	17.4	36,600	2,000	0.0380 U	-
2009 - Jan	18.7	35,700	3,300	0.129	-

16-23 ft bgs	As	Fe	Mn	Pb	Th
1999 - July	-	-	-	-	-
1999 - Nov	5.00 U	119	23.2	3.00 U	5.00 U
2000 - Jan	5.00 U	53.1	10.0 U	3.00 U	5.00 U
2002 - May	0.138 J	33.1 J	3.17	0.500 U	0.159 J
2008 - Apr	0.35 J	112	6.25	0.154	-
2008 - Jul	0.400 J	57.8 U	4.2 J	0.0560 U	-
2008 - Oct	0.520	9.4 J	0.810	0.0200 U	-
2009 - Jan	0.500 U	60.6 U	2.07	0.0400	-

25-31 ft bgs	As	Fe	Mn	Pb	Th
1999 - July	-	-	-	-	-
1999 - Nov	15.4	73.7	25.5	3.00 U	5.00 U
2000 - Jan	16.2	66.0	14.0	3.00 U	5.00 U
2002 - May	18.9	6,100	157	7.95	0.230 J
2008 - Apr	21.3	75.5	3.85	0.558	-
2008 - Jul	19.6	7,910	291	6.36	-
2008 - Oct	16.2	2,620	69.0	1.70	-
2009 - Jan	15.8	4,710	77.6	1.44	-

55-59 ft bgs	As	Fe	Mn	Pb	Th
2002 - May	1.08	4,560	411	1.90	0.243 J
2008 - Apr	6.86	854	265	0.463	-
2008 - Jul	5.76	631	173	0.540	-
2008 - Oct	5.40	33.7 U	172	0.338	-
2009 - Jan	7.20	112	270	0.140	-

18-26 ft bgs	As	Fe	Mn	Pb	Th
1999 - July	-	-	-	-	-
1999 - Nov	5.00 U	9,755	1,380	3.00 U	5.00 U
2000 - Jan	5.00 U	157	194	3.00 U	5.00 U
2002 - May	2.45	12,200	327	78.2	0.197 J
2008 - Apr	0.550	746	53.2	26.9	-
2008 - Jul	0.3 J	14,700	780	4.96	-
2008 - Oct	0.34 J	28,100	1,260	1.65	-
2009 - Jan	0.500 U	156	36.8	7.45	-

27-30 ft bgs	As	Fe	Mn	Pb	Th
1999 - July	-	-	-	-	-
1999 - Nov	6.00	508	39.3	3.00 U	5.00 U
2000 - Jan	7.00	238	14.6	3.00 U	5.00 U
2002 - May	7.00	2,320	71.7	2.78	0.159 J
2008 - Apr	6.93	185	6.74	0.397	-
2008 - Jul	9.06	178	4.5 J	0.556	-
2008 - Oct	8.81	174	2.50	0.343	-
2009 - Jan	8.20	198	3.25	0.377	-

LEGEND

- Landfill Groundwater Sampling Location
- Landfill Surface Water Sampling Location
- Landfill Seep Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Depth	Analyte
Date	Concentration (µg/L)

As = Arsenic
Fe = Iron
Mn = Manganese
SLV = screening level value
- = Not Analyzed
Pb = Lead
Th = Thallium

Water SLVs Used for Screening (µg/L):

As	Fe	Mn	Pb	Th
0.0180	300	50.0	2.50	0.240

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at MDL shown.

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: SB	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

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LANDFILL AOPC

TOTAL METALS IN GROUNDWATER, SEEP WATER, AND SURFACE WATER

DRAWING NUMBER: FIGURE 9-3a
CAD FILE NUMBER: FIG 9-3a
SHEET: OF
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O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-3a - Total Metals in Groundwater, Seep Water, and Surface Water.dwg Nov 18, 2010 - 9:39am

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction

Seep Water			
0 ft bgs	DRO	GRO	RRO
2008 - April	13.0 U	13.0 U	23.0 U
2009 - Jan	29.0 J	13.0 U	110 U
Surface Water			
0.5-1 ft bgs	DRO	GRO	RRO
2008 - April	12.0 U	13.0 U	20.0 U
2009 - Jan	26.0 J	13.0 U	100 U

Seep Water			
0 ft bgs	DRO	GRO	RRO
2000 - Apr	250 U	250 U	500 U

Seep Water			
0 ft bgs	DRO	GRO	RRO
2008 - April	120 U	13.0 U	120 U
2009 - Jan	130	13.0 U	130
Surface Water			
0.5-1 ft bgs	DRO	GRO	RRO
2008 - April	120 U	13.0 U	120 U
2009 - Jan	30.0 J	13.0 U	100 U

28-32 ft bgs	DRO	GRO	RRO
2002 - May	889	100 U	1,030
2008 - Apr	360	30.0 J	120 U
2008 - Jul	465	35.5 J	230
2008 - Oct	395	30.0 J	170 U
2009 - Jan	515	29.5 J	140

15-21 ft bgs	DRO	GRO	RRO
2002 - May	471	100 U	965
2008 - Apr	65.0 J	13.0 U	130
2009 - Jan	110 J	13.0 U	130

20-31 ft bgs	DRO	GRO	RRO
2002 - May	567	281	708
2008 - Apr	110 U	13.0 J	110 U
2008 - Jul	110 U	13.0 U	110 U
2008 - Oct	97.0 J	13.0 U	130 U
2009 - Jan	77.0 J	13.0 U	80.0 J

24-32 ft bgs	DRO	GRO	RRO
1999 - Nov	1,800	300	1,900
2000 - Jan	1,100	430	750 U
2002 - May	1,100	63.1 J	1,270
2008 - Apr	490	120 J	180
2008 - Jul	980	110 J	370
2008 - Oct	730	32.0 J	260
2009 - Jan	970	90.0 J	330

16-23 ft bgs	DRO	GRO	RRO
1999 - July	240 U	100 U	710 U
1999 - Nov	240 U	100 U	710 U
2000 - Jan	250 U	100 U	750 U
2002 - May	100 U	100 U	310 J
2008 - Apr	110 U	18.0 J	110 U
2008 - Jul	110 U	13.0 U	110 U
2008 - Oct	13.0 J	13.0 U	110 U
2009 - Jan	23.0 J	13.0 U	51.0 J

25-31 ft bgs	DRO	GRO	RRO
1999 - July	240 U	100 U	710 U
1999 - Nov	340	100 U	840
2000 - Jan	280	100 U	750 U
2002 - May	122 J	100 U	275 J
2008 - Apr	12.0 U	13.0 U	21.0 U
2008 - Jul	-	13.0 U	-
2008 - Oct	480	14.0 J	200
2009 - Jan	-	13.0 U	-

55-59 ft bgs	DRO	GRO	RRO
2002 - May	371	100 U	407
2008 - Apr	15.0 J	13.0 U	22.0 U
2008 - Jul	110	14.0 J	100 U
2008 - Oct	440	13.0 J	150
2009 - Jan	53.0 J	13.0 U	52.0 J

18-26 ft bgs	DRO	GRO	RRO
1999 - July	240 U	100 U	710 U
1999 - Nov	295	100 U	710 U
2000 - Jan	305	100 U	750 U
2002 - May	485	100 U	750
2008 - Apr	120 U	13.0 U	110 U
2008 - Jul	130	13.0 U	140 U
2008 - Oct	120	13.0 U	160
2009 - Jan	210	13.0 U	160

27-30 ft bgs	DRO	GRO	RRO
1999 - July	240 U	100 U	710 U
1999 - Nov	240 U	100 U	710 U
2000 - Jan	250 U	100 U	750 U
2002 - May	131 J	100 U	351 J
2008 - Apr	110 U	13.0 U	110 U
2008 - Jul	110 U	13.0 U	110 U
2008 - Oct	13.0 U	13.0 U	120 U
2009 - Jan	19.0 J	13.0 U	57.0 J

S2
SEEP
S4
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
MW-8
MW-9
Gully Test Pit
Lead Hot Spot Test Pit #1
Mercury Vapor-Lamp Test Pit
Lead Hot Spot Test Pit #2
Extent of Landfill Debris
Access Road
Pesticide/Herbicide Wash Area
Landfill AOPC
120

15 0 15 30
SCALE IN FEET

LEGEND

- Landfill Groundwater Sampling Location
- Landfill Surface Water Sampling Location
- Landfill Seep Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Depth	Analyte
Date	Concentration (µg/L)

GRO = Gasoline Range Organics
DRO = Diesel Range Organics
RRO = Residual Range Organics
SLV = screening level value
- = Not Analyzed

Water SLVs Used for Screening (µg/L):

DRO	GRO	RRO
90.0	100	290

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at MDL shown.

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: SB	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

LANDFILL AOPC

TPH IN GROUNDWATER, SEEP WATER, AND SURFACE WATER

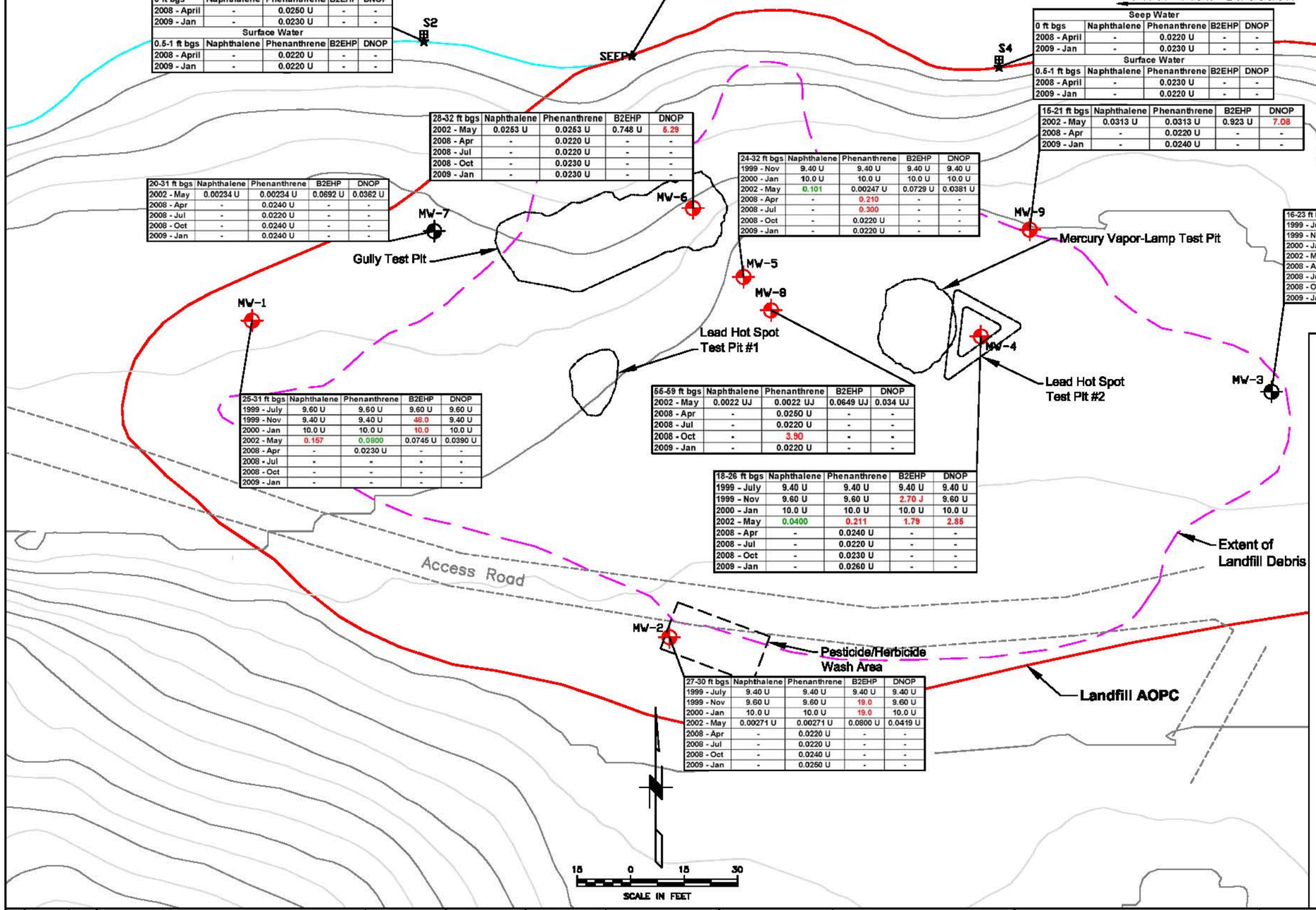
DRAWING NUMBER: FIGURE 9-3b
CAD FILE NUMBER: FIG 9-3b
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-3b - TPH in Groundwater, Seep Water, and Surface Water.dwg Nov 18, 2010 - 9:39am

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction



Seep Water				
0 ft bgs	Naphthalene	Phenanthrene	B2EHP	DNOP
2008 - April	-	0.0250 U	-	-
2009 - Jan	-	0.0230 U	-	-
Surface Water				
0.5-1 ft bgs	Naphthalene	Phenanthrene	B2EHP	DNOP
2008 - April	-	0.0220 U	-	-
2009 - Jan	-	0.0220 U	-	-

Seep Water				
0 ft bgs	Naphthalene	Phenanthrene	B2EHP	DNOP
2000 - Apr	4.80 UJ	4.80 UJ	24.0 U	4.80 UJ

Seep Water				
0 ft bgs	Naphthalene	Phenanthrene	B2EHP	DNOP
2008 - April	-	0.0220 U	-	-
2009 - Jan	-	0.0230 U	-	-
Surface Water				
0.5-1 ft bgs	Naphthalene	Phenanthrene	B2EHP	DNOP
2008 - April	-	0.0230 U	-	-
2009 - Jan	-	0.0220 U	-	-

28-32 ft bgs	Naphthalene	Phenanthrene	B2EHP	DNOP
2002 - May	0.0263 U	0.0263 U	0.748 U	6.29
2008 - Apr	-	0.0220 U	-	-
2008 - Jul	-	0.0220 U	-	-
2008 - Oct	-	0.0230 U	-	-
2009 - Jan	-	0.0230 U	-	-

15-21 ft bgs	Naphthalene	Phenanthrene	B2EHP	DNOP
2002 - May	0.0313 U	0.0313 U	0.923 U	7.08
2008 - Apr	-	0.0220 U	-	-
2009 - Jan	-	0.0240 U	-	-

20-31 ft bgs	Naphthalene	Phenanthrene	B2EHP	DNOP
2002 - May	0.00234 U	0.00234 U	0.0692 U	0.0362 U
2008 - Apr	-	0.0240 U	-	-
2008 - Jul	-	0.0220 U	-	-
2008 - Oct	-	0.0240 U	-	-
2009 - Jan	-	0.0240 U	-	-

24-32 ft bgs	Naphthalene	Phenanthrene	B2EHP	DNOP
1999 - Nov	9.40 U	9.40 U	9.40 U	9.40 U
2000 - Jan	10.0 U	10.0 U	10.0 U	10.0 U
2002 - May	0.101	0.00247 U	0.0729 U	0.0381 U
2008 - Apr	-	0.210	-	-
2008 - Jul	-	0.300	-	-
2008 - Oct	-	0.0220 U	-	-
2009 - Jan	-	0.0220 U	-	-

16-23 ft bgs	Naphthalene	Phenanthrene	B2EHP	DNOP
1999 - July	9.40 U	9.40 U	9.40 U	9.40 U
1999 - Nov	9.40 U	9.40 U	9.40 U	9.40 U
2000 - Jan	10.0 U	10.0 U	10.0 U	10.0 U
2002 - May	0.00252 U	0.00252 U	0.0745 U	0.0389 U
2008 - Apr	-	0.0230 U	-	-
2008 - Jul	-	0.0240 U	-	-
2008 - Oct	-	0.0230 U	-	-
2009 - Jan	-	0.0230 U	-	-

25-31 ft bgs	Naphthalene	Phenanthrene	B2EHP	DNOP
1999 - July	9.60 U	9.60 U	9.60 U	9.60 U
1999 - Nov	9.40 U	9.40 U	48.0	9.40 U
2000 - Jan	10.0 U	10.0 U	10.0	10.0 U
2002 - May	0.157	0.0800	0.0745 U	0.0390 U
2008 - Apr	-	0.0230 U	-	-
2008 - Jul	-	-	-	-
2008 - Oct	-	-	-	-
2009 - Jan	-	-	-	-

55-59 ft bgs	Naphthalene	Phenanthrene	B2EHP	DNOP
2002 - May	0.0022 UJ	0.0022 UJ	0.0649 UJ	0.034 UJ
2008 - Apr	-	0.0250 U	-	-
2008 - Jul	-	0.0220 U	-	-
2008 - Oct	-	3.90	-	-
2009 - Jan	-	0.0220 U	-	-

18-26 ft bgs	Naphthalene	Phenanthrene	B2EHP	DNOP
1999 - July	9.40 U	9.40 U	9.40 U	9.40 U
1999 - Nov	9.60 U	9.60 U	2.70 J	9.60 U
2000 - Jan	10.0 U	10.0 U	10.0 U	10.0 U
2002 - May	0.0400	0.211	1.79	2.85
2008 - Apr	-	0.0240 U	-	-
2008 - Jul	-	0.0220 U	-	-
2008 - Oct	-	0.0230 U	-	-
2009 - Jan	-	0.0260 U	-	-

27-30 ft bgs	Naphthalene	Phenanthrene	B2EHP	DNOP
1999 - July	9.40 U	9.40 U	9.40 U	9.40 U
1999 - Nov	9.60 U	9.60 U	19.0	9.60 U
2000 - Jan	10.0 U	10.0 U	19.0	10.0 U
2002 - May	0.00271 U	0.00271 U	0.0800 U	0.0419 U
2008 - Apr	-	0.0220 U	-	-
2008 - Jul	-	0.0220 U	-	-
2008 - Oct	-	0.0240 U	-	-
2009 - Jan	-	0.0250 U	-	-

LEGEND

- Landfill Groundwater Sampling Location
- Landfill Surface Water Sampling Location
- Landfill Seep Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Depth	Analyte
Date	Concentration (µg/L)

B2EHP = Bis(2-ethylhexyl) Phthalate
DNOP = Di-n-octyl phthalate
SLV = Screening Level Value
NV = No Value
- = Not Analyzed

Water SLVs Used for Screening (µg/L):

Naphthalene	Phenanthrene	B2EHP	DNOP
0.140	0.140	1.20	1.20

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at MDL shown.

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: SB	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

LANDFILL AOPC

PAHs AND SVOCs IN GROUNDWATER, SEEP WATER, AND SURFACE WATER

DRAWING NUMBER: FIGURE 9-3c
CAD FILE NUMBER: FIG 9-3c
SHEET: OF
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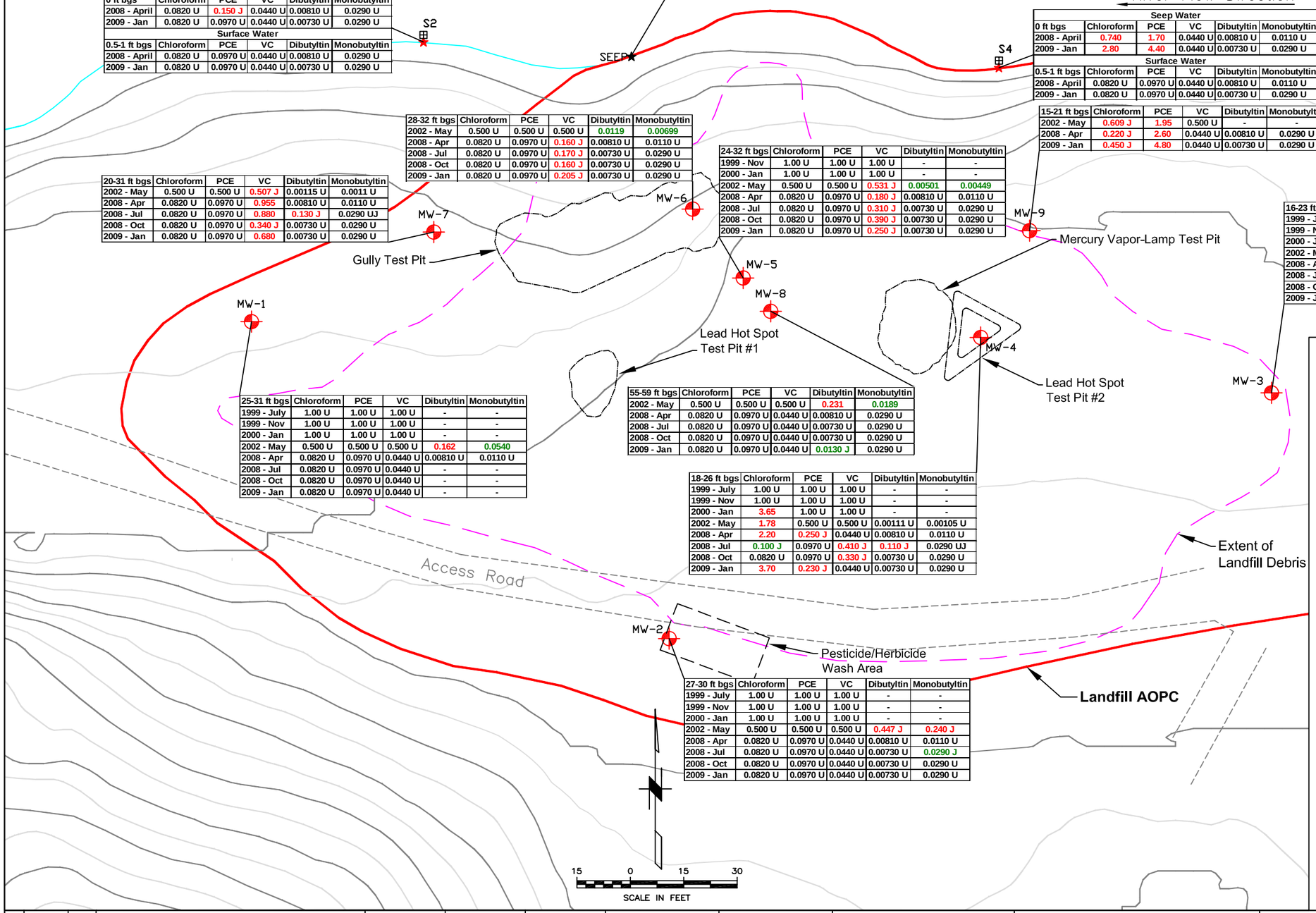
G:\25692709 USACE\53-F0072173.00 Bedford1\R.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-3c - PAHs and SVOCs in Groundwater, Seep Water, and Surface Water.dwg Feb 13, 2012 - 2:16pm

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction



Seep Water					
0 ft bgs	Chloroform	PCE	VC	Dibutyltin	Monobutyltin
2008 - April	0.0820 U	0.150 J	0.0440 U	0.00810 U	0.0290 U
2009 - Jan	0.0820 U	0.0970 U	0.0440 U	0.00730 U	0.0290 U
Surface Water					
0.5-1 ft bgs	Chloroform	PCE	VC	Dibutyltin	Monobutyltin
2008 - April	0.0820 U	0.0970 U	0.0440 U	0.00810 U	0.0290 U
2009 - Jan	0.0820 U	0.0970 U	0.0440 U	0.00730 U	0.0290 U

Seep Water					
0 ft bgs	Chloroform	PCE	VC	Dibutyltin	Monobutyltin
2000 - Apr	1.00 U	1.00 U	1.00 U	-	-

Seep Water					
0 ft bgs	Chloroform	PCE	VC	Dibutyltin	Monobutyltin
2008 - April	0.740	1.70	0.0440 U	0.00810 U	0.0110 U
2009 - Jan	2.80	4.40	0.0440 U	0.00730 U	0.0290 U
Surface Water					
0.5-1 ft bgs	Chloroform	PCE	VC	Dibutyltin	Monobutyltin
2008 - April	0.0820 U	0.0970 U	0.0440 U	0.00810 U	0.0110 U
2009 - Jan	0.0820 U	0.0970 U	0.0440 U	0.00730 U	0.0290 U

28-32 ft bgs	Chloroform	PCE	VC	Dibutyltin	Monobutyltin
2002 - May	0.500 U	0.500 U	0.500 U	0.0119	0.00699
2008 - Apr	0.0820 U	0.0970 U	0.160 J	0.00810 U	0.0110 U
2008 - Jul	0.0820 U	0.0970 U	0.170 J	0.00730 U	0.0290 U
2008 - Oct	0.0820 U	0.0970 U	0.160 J	0.00730 U	0.0290 U
2009 - Jan	0.0820 U	0.0970 U	0.205 J	0.00730 U	0.0290 U

15-21 ft bgs	Chloroform	PCE	VC	Dibutyltin	Monobutyltin
2002 - May	0.609 J	1.95	0.500 U	-	-
2008 - Apr	0.220 J	2.60	0.0440 U	0.00810 U	0.0290 U
2009 - Jan	0.450 J	4.80	0.0440 U	0.00730 U	0.0290 U

20-31 ft bgs	Chloroform	PCE	VC	Dibutyltin	Monobutyltin
2002 - May	0.500 U	0.500 U	0.507 J	0.00115 U	0.0011 U
2008 - Apr	0.0820 U	0.0970 U	0.955	0.00810 U	0.0110 U
2008 - Jul	0.0820 U	0.0970 U	0.880	0.130 J	0.0290 UJ
2008 - Oct	0.0820 U	0.0970 U	0.340 J	0.00730 U	0.0290 U
2009 - Jan	0.0820 U	0.0970 U	0.680	0.00730 U	0.0290 U

24-32 ft bgs	Chloroform	PCE	VC	Dibutyltin	Monobutyltin
1999 - Nov	1.00 U	1.00 U	1.00 U	-	-
2000 - Jan	1.00 U	1.00 U	1.00 U	-	-
2002 - May	0.500 U	0.500 U	0.531 J	0.00501	0.00449
2008 - Apr	0.0820 U	0.0970 U	0.180 J	0.00810 U	0.0110 U
2008 - Jul	0.0820 U	0.0970 U	0.310 J	0.00730 U	0.0290 U
2008 - Oct	0.0820 U	0.0970 U	0.390 J	0.00730 U	0.0290 U
2009 - Jan	0.0820 U	0.0970 U	0.250 J	0.00730 U	0.0290 U

16-23 ft bgs	Chloroform	PCE	VC	Dibutyltin	Monobutyltin
1999 - July	1.00 U	5.10	1.00 U	-	-
1999 - Nov	1.00 U	2.60	1.00 U	-	-
2000 - Jan	1.00 U	2.40	1.00 U	-	-
2002 - May	0.500 U	8.78	0.500 U	0.0113	0.00682
2008 - Apr	0.0820 U	6.80	0.0440 U	0.0150 J	0.0110 U
2008 - Jul	0.0820 U	7.20	0.0440 U	0.0910 J	0.0290 UJ
2008 - Oct	0.0820 U	5.90	0.0440 U	0.00730 U	0.0290 U
2009 - Jan	0.0820 U	5.70	0.0440 U	0.00730 U	0.0290 U

25-31 ft bgs	Chloroform	PCE	VC	Dibutyltin	Monobutyltin
1999 - July	1.00 U	1.00 U	1.00 U	-	-
1999 - Nov	1.00 U	1.00 U	1.00 U	-	-
2000 - Jan	1.00 U	1.00 U	1.00 U	-	-
2002 - May	0.500 U	0.500 U	0.500 U	0.162	0.0540
2008 - Apr	0.0820 U	0.0970 U	0.0440 U	0.00810 U	0.0110 U
2008 - Jul	0.0820 U	0.0970 U	0.0440 U	-	-
2008 - Oct	0.0820 U	0.0970 U	0.0440 U	-	-
2009 - Jan	0.0820 U	0.0970 U	0.0440 U	-	-

55-59 ft bgs	Chloroform	PCE	VC	Dibutyltin	Monobutyltin
2002 - May	0.500 U	0.500 U	0.500 U	0.231	0.0189
2008 - Apr	0.0820 U	0.0970 U	0.0440 U	0.00810 U	0.0290 U
2008 - Jul	0.0820 U	0.0970 U	0.0440 U	0.00730 U	0.0290 U
2008 - Oct	0.0820 U	0.0970 U	0.0440 U	0.00730 U	0.0290 U
2009 - Jan	0.0820 U	0.0970 U	0.0440 U	0.0130 J	0.0290 U

18-26 ft bgs	Chloroform	PCE	VC	Dibutyltin	Monobutyltin
1999 - July	1.00 U	1.00 U	1.00 U	-	-
1999 - Nov	1.00 U	1.00 U	1.00 U	-	-
2000 - Jan	3.65	1.00 U	1.00 U	-	-
2002 - May	1.78	0.500 U	0.500 U	0.00111 U	0.00105 U
2008 - Apr	2.20	0.250 J	0.0440 U	0.00810 U	0.0110 U
2008 - Jul	0.100 J	0.0970 U	0.410 J	0.110 J	0.0290 UJ
2008 - Oct	0.0820 U	0.0970 U	0.330 J	0.00730 U	0.0290 U
2009 - Jan	3.70	0.230 J	0.0440 U	0.00730 U	0.0290 U

27-30 ft bgs	Chloroform	PCE	VC	Dibutyltin	Monobutyltin
1999 - July	1.00 U	1.00 U	1.00 U	-	-
1999 - Nov	1.00 U	1.00 U	1.00 U	-	-
2000 - Jan	1.00 U	1.00 U	1.00 U	-	-
2002 - May	0.500 U	0.500 U	0.500 U	0.447 J	0.240 J
2008 - Apr	0.0820 U	0.0970 U	0.0440 U	0.00810 U	0.0110 U
2008 - Jul	0.0820 U	0.0970 U	0.0440 U	0.00730 U	0.0290 J
2008 - Oct	0.0820 U	0.0970 U	0.0440 U	0.00730 U	0.0290 U
2009 - Jan	0.0820 U	0.0970 U	0.0440 U	0.00730 U	0.0290 U

LEGEND

- Landfill Groundwater Sampling Location
- Landfill Surface Water Sampling Location
- Landfill Seep Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Depth	Analyte
Date	Concentration (µg/L)

PCE = Tetrachloroethene
VC = Vinyl Chloride
SLV = Screening Level Value
- = Not Analyzed

Water SLVs Used for Screening (µg/L):

Chloroform	PCE	VC	Dibutyltin	Monobutyltin
0.190	0.0930	0.0250	0.0630	0.0630

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at MDL shown.

No.	DATE	BY	REVISION

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	CHECKED BY: LSM	DATE: NOV 2010

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LANDFILL AOPC

VOCs AND BUTYLTINS IN GROUNDWATER, SEEP WATER, AND SURFACE WATER

DRAWING NUMBER: FIGURE 9-3d
CAD FILE NUMBER: FIG 9-3d
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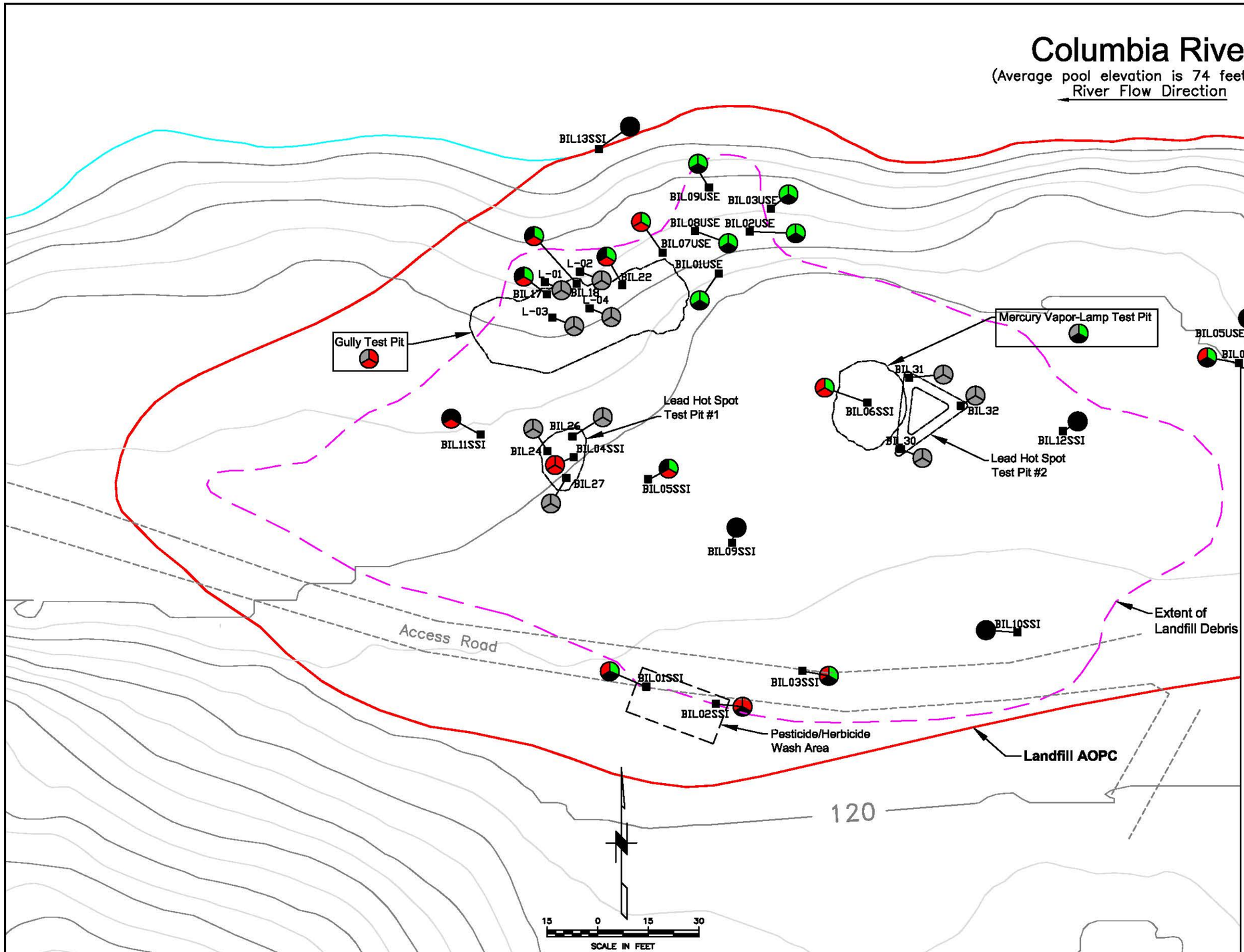
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-3d - VOCs and Butyltins in Groundwater, Seep Water, and Surface Water.dwg Nov 22, 2010 - 7:59am



LEGEND

- Landfill Surface and Shallow Soil Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Soil SLVs used for Screening (µg/kg):

2,4,5-T	Dichloroprop	MCPP	4,4'-DDT	Total PCBs (Aroclors)	Dibenzofuran
21.0	21.0	21.0	21.0	371	2

SLV = Screening Level Value

Summary of Herbicides, Pesticides, PCBs, and Dibenzofurans in Surface and Shallow Soil

- Herbicides/Pesticides Concentration
- PCBs Concentration
- Dibenzofuran Concentration

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at MDL.
Gray = Not Analyzed.

No.	DATE	BY	REVISION

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LANDFILL AOPC

SUMMARY OF HERBICIDES, PESTICIDES, PCBs, AND DIBENZOFURAN IN SURFACE AND SHALLOW SOIL

DRAWING NUMBER: FIGURE 9-4a
CAD FILE NUMBER: FIG 9-4a
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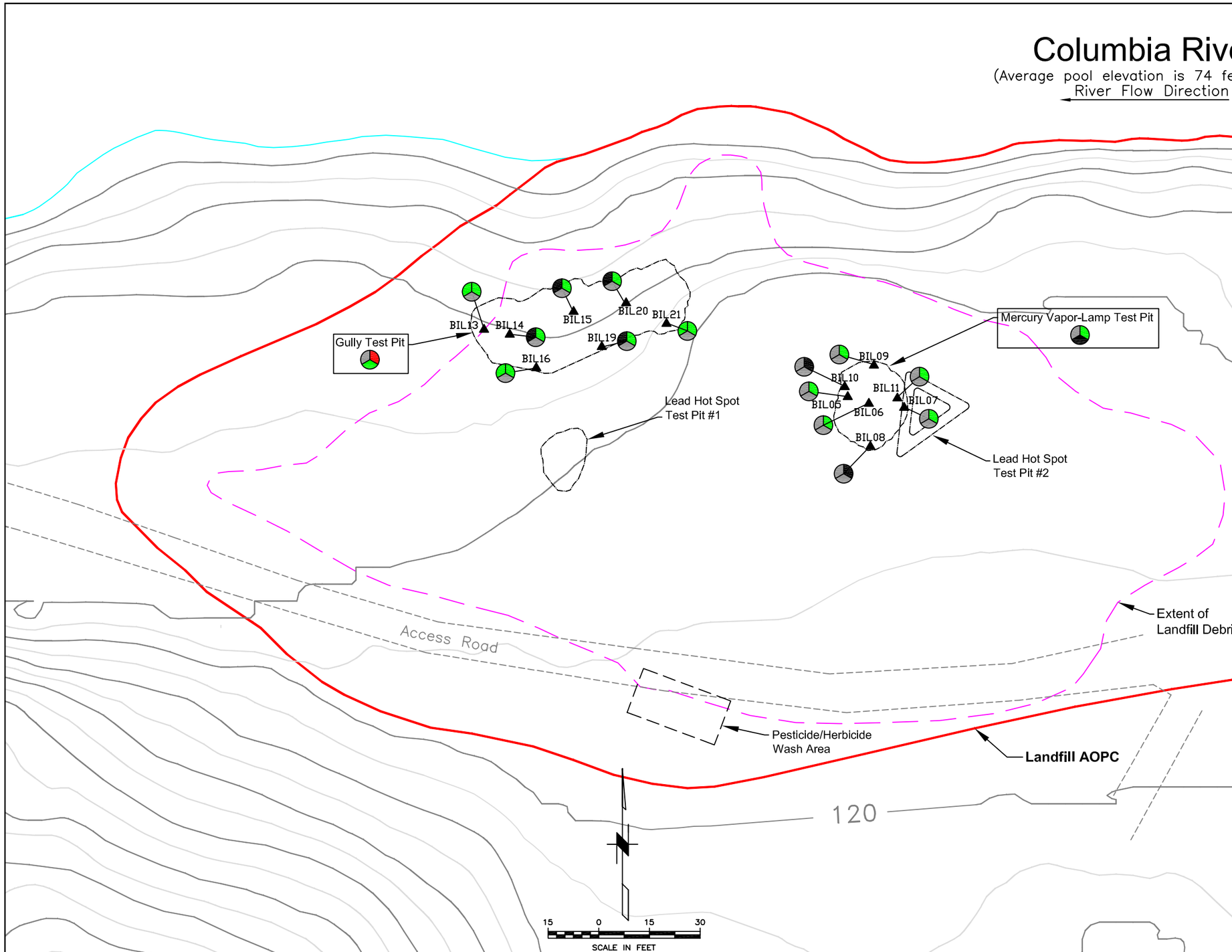
C:\25692709 USACE\53-F0072173.00 Bradford1\FL.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-4a Summary of Herbicides, Pesticides, PCBs, and Dibenzofurans in Surface and Shallow Soil.dwg Nov 18, 2010 - 9:41am



LEGEND

- Landfill Deeper Soil Monitoring Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Soil SLVs used for Screening (µg/kg):

2,4,5-T	Dichloroprop	MCPP	4,4'-DDT	Total PCBs (Aroclors)	Dibenzofuran
4,900,000	NV	620,000	7,700	740	1,000,000

SLV = Screening Level Value

Summary of Herbicides, Pesticides, PCBs, and Dibenzofurans in Deeper Soil

- Herbicides/Pesticides Concentration
- PCBs Concentration
- Dibenzofuran Concentration

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at MDL.
Gray = Not Analyzed.

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SUMMARY OF HERBICIDES, PESTICIDES, PCBs, AND DIBENZOFURAN IN DEEPER SOIL

DRAWING NUMBER: FIGURE 9-4b
CAD FILE NUMBER: FIG 9-4b
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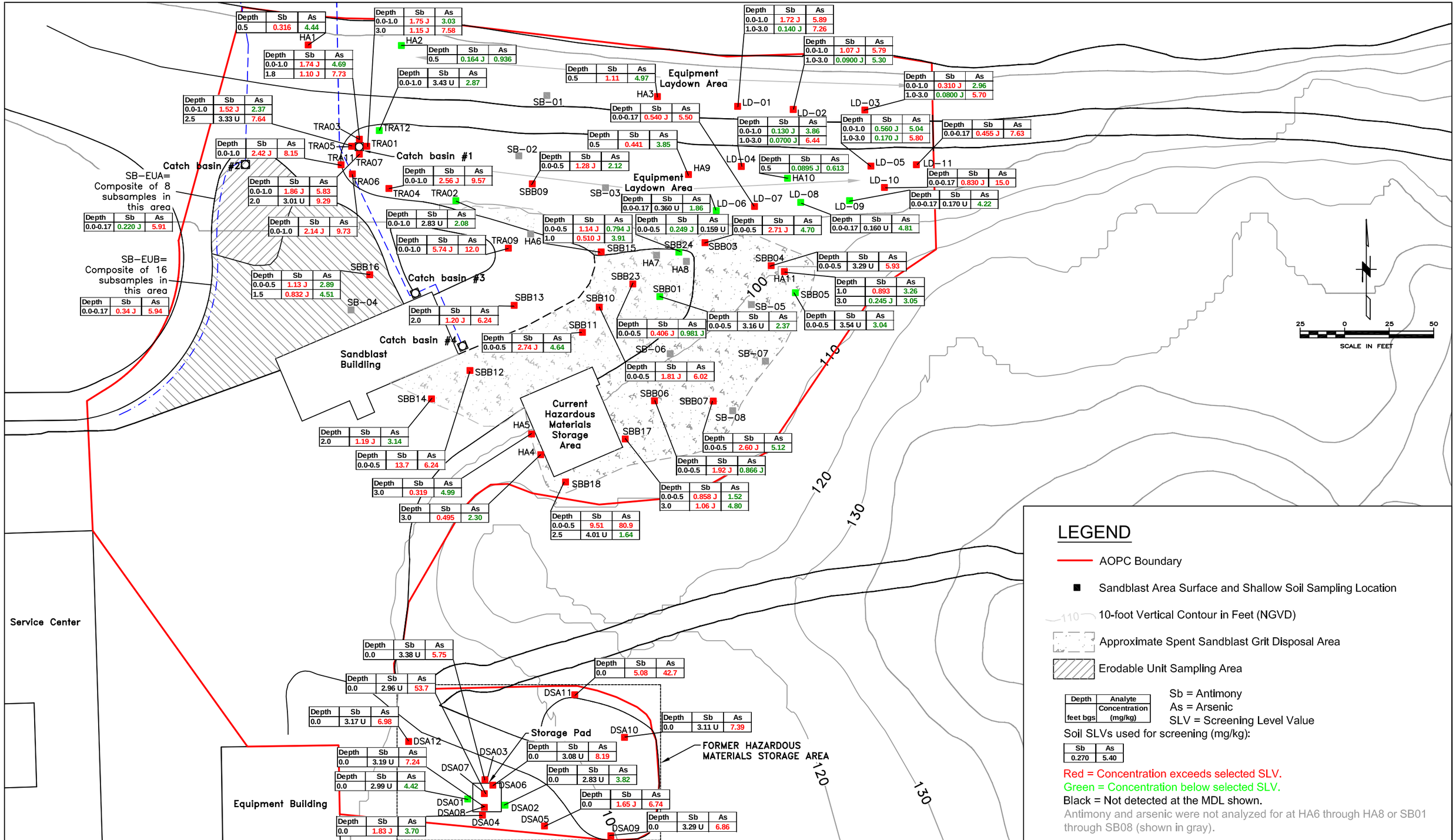
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-4b Summary of Herbicides, Pesticides, PCBs, and Dibenzofurans in Deeper Soil.dwg Nov 18, 2010 - 9:42am



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SANDBLAST AREA AOPC

ANTIMONY AND ARSENIC
IN SURFACE AND SHALLOW SOIL

DRAWING NUMBER: FIGURE 9-5a
CAD FILE NUMBER: FIG 9-5a
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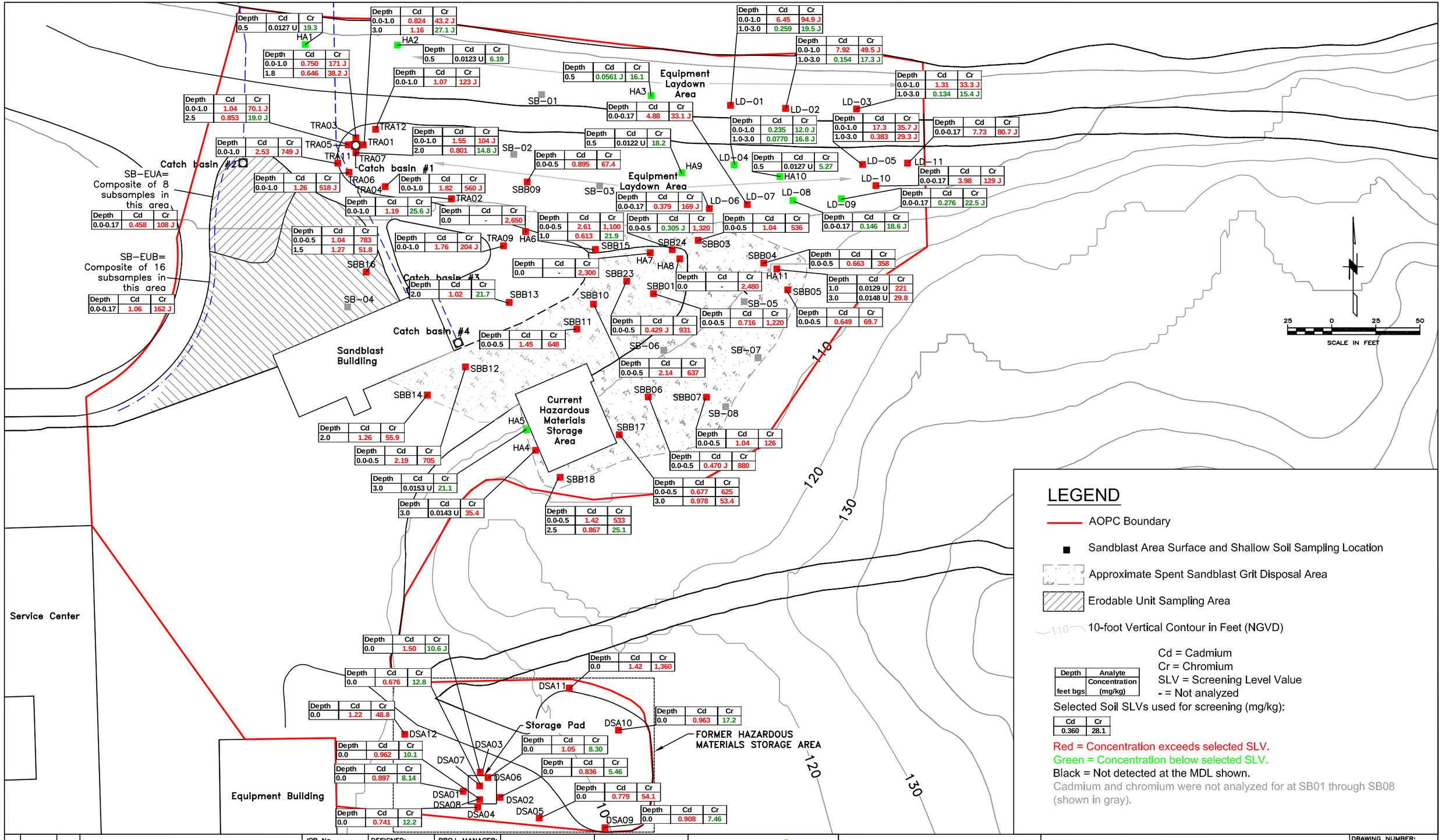
O:\25692709 USACE\53-F0072173.00 Bradford\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-5a - Antimony and Arsenic in Surface and Shallow Soil.dwg Nov 18, 2010 - 9:42am



Depth (feet bgs)	Analyte Concentration (mg/kg)	
0.5	0.0127 U	19.3
0.0-1.0	0.824	43.2 J
3.0	1.16	27.1 J
0.0-1.0	6.45	94.9 J
1.0-3.0	0.259	19.5 J
0.0-1.0	7.92	49.5 J
1.0-3.0	0.154	17.3 J
0.5	0.0123 U	6.19
0.0-1.0	0.750	171 J
1.8	0.646	38.2 J
0.5	0.0561 J	16.1
0.0-1.0	1.07	123 J
0.0-1.0	1.31	33.3 J
1.0-3.0	0.134	15.4 J
0.0-1.0	1.04	70.1 J
2.5	0.853	19.0 J
0.0-0.17	4.88	33.1 J
0.0-1.0	0.235	12.0 J
1.0-3.0	0.0770	16.8 J
0.0-1.0	17.3	35.7 J
1.0-3.0	0.383	29.3 J
0.0-0.17	7.73	80.7 J
0.0-1.0	2.53	749 J
0.0-1.0	1.55	104 J
2.0	0.801	14.8 J
0.5	0.0122 U	18.2
0.0-0.5	0.895	67.4
0.5	0.0127 U	5.27
0.0-0.17	3.98	129 J
0.0-1.0	1.26	518 J
0.0-1.0	1.82	560 J
0.0-0.17	0.379	169 J
0.0-0.17	0.276	22.5 J
0.0-0.17	0.458	108 J
0.0-1.0	1.19	25.6 J
0.0	-	2,650
0.0-0.5	2.61	1,100
1.0	0.613	21.9
0.0-0.5	0.305 J	1,320
0.0-0.5	1.04	536
0.0-0.17	0.146	18.6 J
0.0-0.5	1.04	783
1.5	1.27	51.8
0.0-1.0	1.76	204 J
0.0-0.5	0.663	358
0.0	-	2,300
0.0	-	2,480
0.0-0.17	1.06	162 J
2.0	1.02	21.7
1.0	0.0129 U	221
3.0	0.0148 U	29.8
0.0-0.5	0.429 J	931
0.0-0.5	0.716	1,220
0.0-0.5	0.649	69.7
0.0-0.5	1.45	648
0.0-0.5	2.14	637
2.0	1.26	55.9
0.0-0.5	1.04	126
0.0-0.5	2.19	705
0.0-0.5	0.470 J	880
3.0	0.0153 U	21.1
0.0-0.5	0.677	625
3.0	0.978	53.4
3.0	0.0143 U	35.4
0.0-0.5	1.42	533
2.5	0.867	25.1
0.0	1.50	10.6 J
0.0	1.42	1,360
0.0	0.676	12.8
0.0	1.22	48.8
0.0	0.963	17.2
0.0	0.962	10.1
0.0	1.05	8.30
0.0	0.897	8.14
0.0	0.836	5.46
0.0	0.779	54.1
0.0	0.741	12.2
0.0	0.908	7.46

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SANDBLAST AREA AOPC

CADMIUM AND CHROMIUM
IN SURFACE AND SHALLOW SOIL

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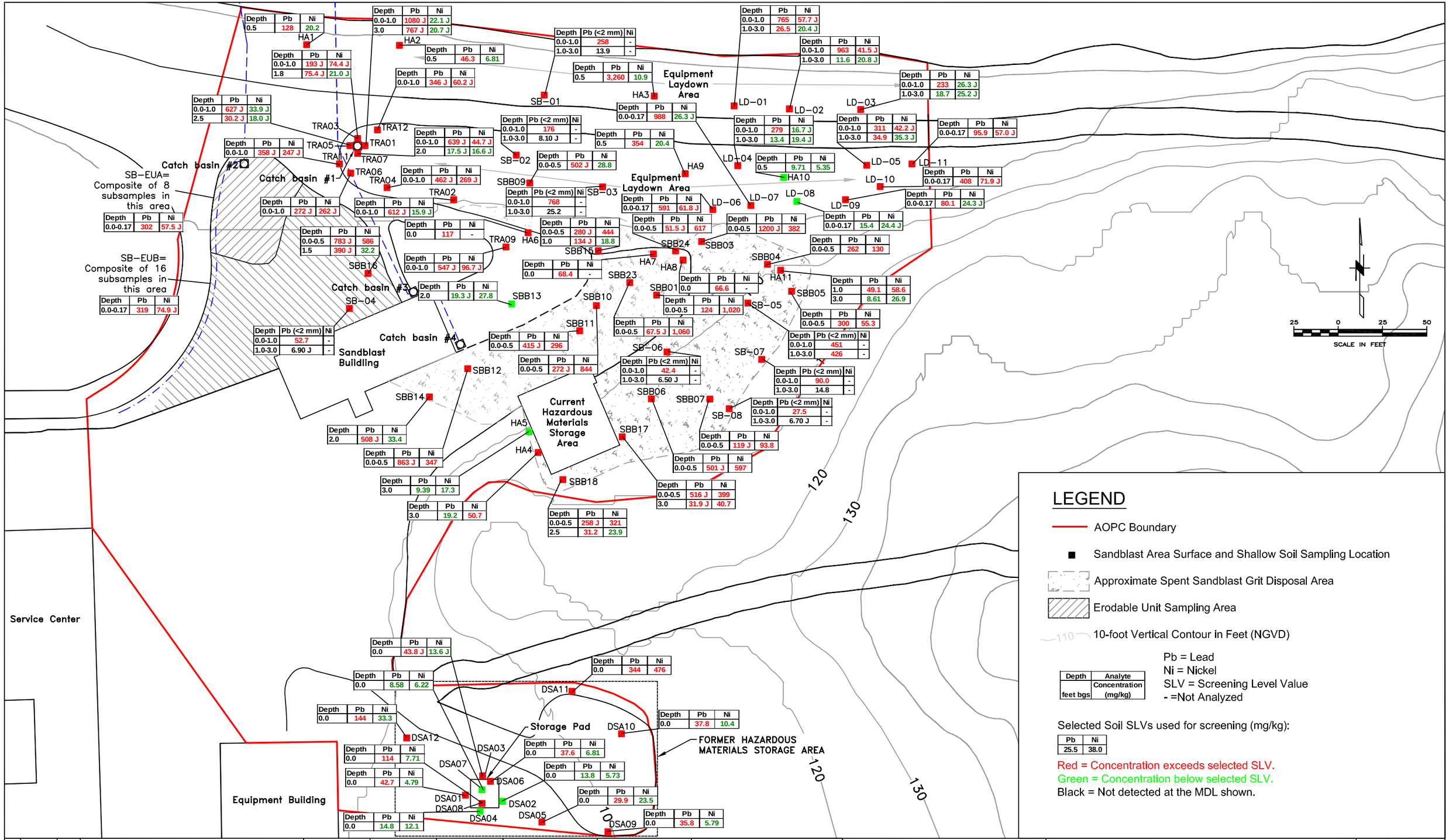
O:\25692709 USACE\53-F0072173.00 Bradford\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-5b - Cadmium and Chromium in Surface and Shallow Soil.dwg Nov 18, 2010 - 9:43am



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SANDBLAST AREA AOPC

LEAD AND NICKEL
IN SURFACE AND SHALLOW SOIL

DRAWING NUMBER: FIGURE 9-5c
CAD FILE NUMBER: FIG 9-5c
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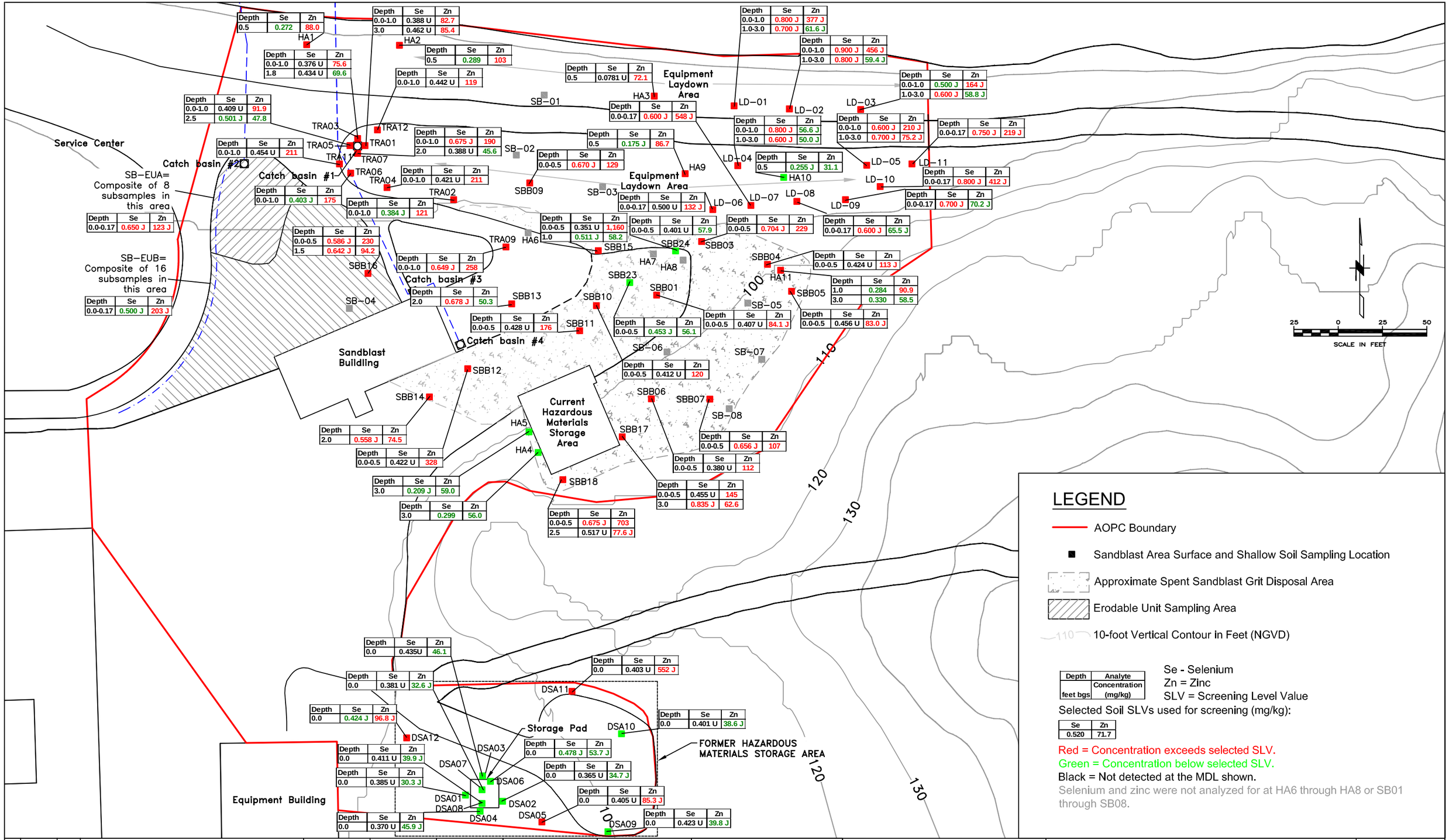
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-5c - Lead and Nickel in Surface and Shallow Soil.dwg Nov 18, 2010 - 9:44am



Depth	Se	Zn
0.5	0.272	88.0

Depth	Se	Zn
0.0-1.0	0.388 U	82.7
3.0	0.462 U	85.4

Depth	Se	Zn
0.0-1.0	0.376 U	75.6
1.8	0.434 U	69.6

Depth	Se	Zn
0.5	0.289	103

Depth	Se	Zn
0.0-1.0	0.442 U	119

Depth	Se	Zn
0.0-1.0	0.409 U	91.9
2.5	0.501 J	47.8

Depth	Se	Zn
0.0-1.0	0.454 U	211

Depth	Se	Zn
0.0-1.0	0.675 J	190
2.0	0.388 U	45.6

Depth	Se	Zn
0.0-1.0	0.421 U	211

Depth	Se	Zn
0.0-1.0	0.403 J	175

Depth	Se	Zn
0.0-1.0	0.384 J	121

Depth	Se	Zn
0.0-0.17	0.650 J	123 J

Depth	Se	Zn
0.0-0.5	0.586 J	230
1.5	0.642 J	94.2

Depth	Se	Zn
0.0-1.0	0.649 J	258

Depth	Se	Zn
2.0	0.678 J	50.3

Depth	Se	Zn
0.0-0.17	0.500 J	203 J

Depth	Se	Zn
0.0-0.5	0.428 U	176

Depth	Se	Zn
2.0	0.558 J	74.5

Depth	Se	Zn
0.0-0.5	0.422 U	328

Depth	Se	Zn
3.0	0.209 J	59.0

Depth	Se	Zn
3.0	0.299	56.0

Depth	Se	Zn
0.0-1.0	0.800 J	377 J
1.0-3.0	0.700 J	61.6 J

Depth	Se	Zn
0.0-1.0	0.900 J	456 J
1.0-3.0	0.800 J	59.4 J

Depth	Se	Zn
0.5	0.0781 U	72.1

Depth	Se	Zn
0.0-1.0	0.500 J	164 J
1.0-3.0	0.600 J	58.8 J

Depth	Se	Zn
0.0-0.17	0.600 J	548 J

Depth	Se	Zn
0.0-1.0	0.800 J	56.6 J
1.0-3.0	0.600 J	50.0 J

Depth	Se	Zn
0.0-1.0	0.600 J	210 J
1.0-3.0	0.700 J	75.2 J

Depth	Se	Zn
0.0-0.17	0.750 J	219 J

Depth	Se	Zn
0.5	0.175 J	86.7

Depth	Se	Zn
0.0-0.5	0.670 J	129

Depth	Se	Zn
0.5	0.255 J	31.1

Depth	Se	Zn
0.0-0.17	0.800 J	412 J

Depth	Se	Zn
0.0-0.17	0.500 U	132 J

Depth	Se	Zn
0.0-0.17	0.700 J	70.2 J

Depth	Se	Zn
0.0-0.5	0.351 U	1,160
1.0	0.511 J	58.2

Depth	Se	Zn
0.0-0.5	0.401 U	57.9

Depth	Se	Zn
0.0-0.5	0.704 J	229

Depth	Se	Zn
0.0-0.17	0.600 J	65.5 J

Depth	Se	Zn
0.0-0.5	0.424 U	113 J

Depth	Se	Zn
1.0	0.284	90.9
3.0	0.330	58.5

Depth	Se	Zn
0.0-0.5	0.453 J	56.1

Depth	Se	Zn
0.0-0.5	0.407 U	84.1 J

Depth	Se	Zn
0.0-0.5	0.456 U	83.0 J

Depth	Se	Zn
0.0-0.5	0.412 U	120

Depth	Se	Zn
0.0-0.5	0.656 J	107

Depth	Se	Zn
0.0-0.5	0.380 U	112

Depth	Se	Zn
0.0-0.5	0.455 U	145
3.0	0.835 J	62.6

Depth	Se	Zn
0.0-0.5	0.675 J	703
2.5	0.517 U	77.6 J

Depth	Se	Zn
0.0	0.435U	46.1

Depth	Se	Zn
0.0	0.381 U	32.6 J

Depth	Se	Zn
0.0	0.403 U	552 J

Depth	Se	Zn
0.0	0.424 J	96.8 J

Depth	Se	Zn
0.0	0.401 U	38.6 J

Depth	Se	Zn
0.0	0.478 J	53.7 J

Depth	Se	Zn
0.0	0.411 U	39.9 J

Depth	Se	Zn
0.0	0.385 U	30.3 J

Depth	Se	Zn
0.0	0.365 U	34.7 J

Depth	Se	Zn
0.0	0.405 U	85.3 J

Depth	Se	Zn
0.0	0.370 U	45.9 J

Depth	Se	Zn
0.0	0.423 U	39.8 J

LEGEND

- AOPC Boundary
- Sandblast Area Surface and Shallow Soil Sampling Location
- Approximate Spent Sandblast Grit Disposal Area
- Erodable Unit Sampling Area
- 110 10-foot Vertical Contour in Feet (NGVD)

Depth	Analyte
feet bgs	Concentration (mg/kg)

Se - Selenium
Zn = Zinc
SLV = Screening Level Value

Selected Soil SLVs used for screening (mg/kg):

Se	Zn
0.520	71.7

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at the MDL shown.
Selenium and zinc were not analyzed for at HA6 through HA8 or SB01 through SB08.

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: SB	APPROVED BY: LSM
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CASCADE LOCKS, OREGON

SANDBLAST AREA AOPC

SELENIUM AND ZINC
IN SURFACE AND SHALLOW SOIL

DRAWING NUMBER: FIGURE 9-5d
CAD FILE NUMBER: FIG 9-5d
SHEET: OF
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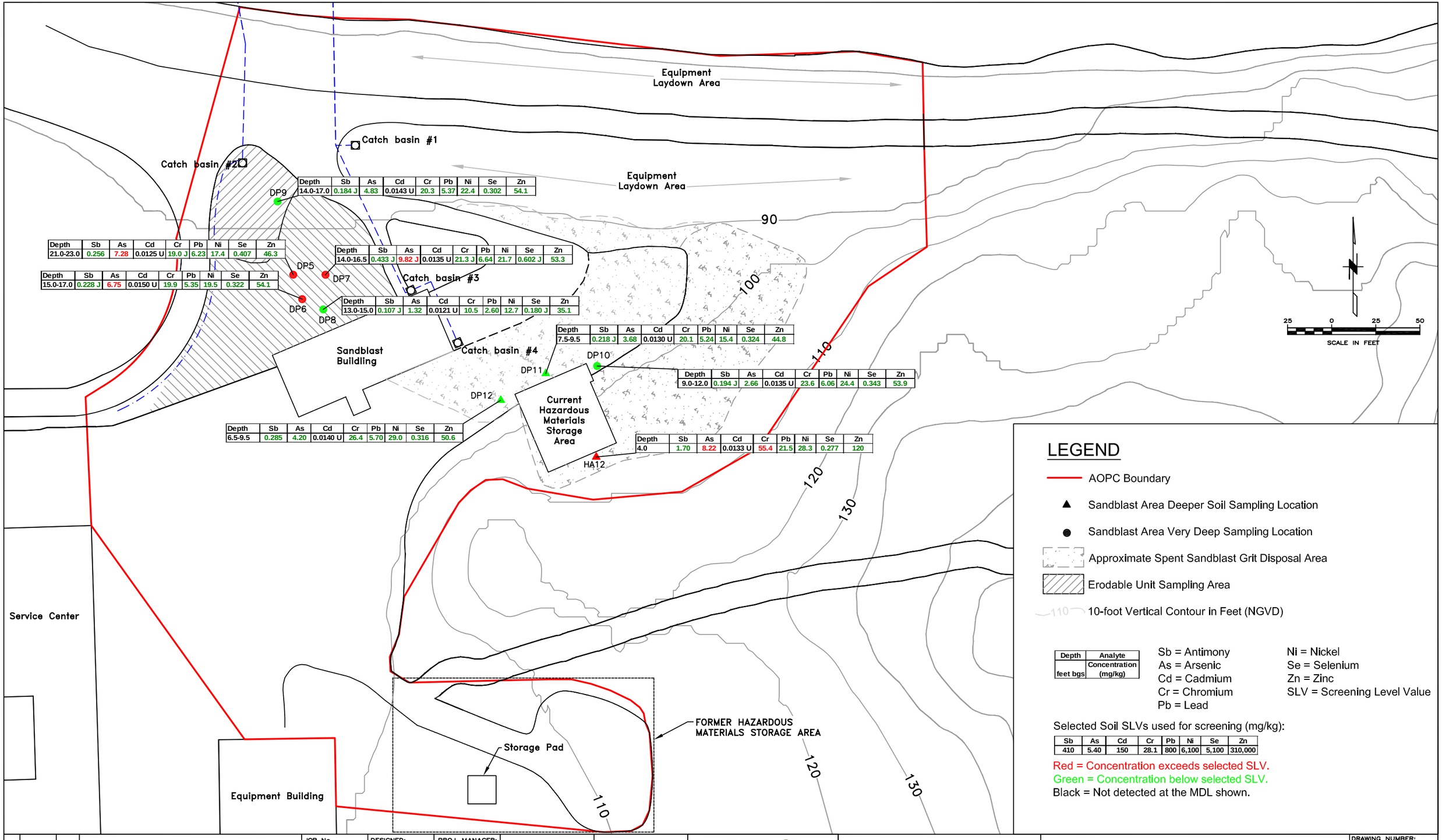
O:\25692709 USACE\53-F0072173.00 Bradford\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-5d - Selenium and Zinc in Surface and Shallow Soil.dwg Nov 18, 2010 - 9:44am



Depth	Sb	As	Cd	Cr	Pb	Ni	Se	Zn
14.0-17.0	0.184 J	4.83	0.0143 U	20.3	5.37	22.4	0.302	54.1

Depth	Sb	As	Cd	Cr	Pb	Ni	Se	Zn
21.0-23.0	0.256	7.28	0.0125 U	19.0 J	6.23	17.4	0.407	46.3

Depth	Sb	As	Cd	Cr	Pb	Ni	Se	Zn
15.0-17.0	0.228 J	6.75	0.0150 U	19.9	5.35	19.5	0.322	54.1

Depth	Sb	As	Cd	Cr	Pb	Ni	Se	Zn
14.0-16.5	0.433 J	9.82 J	0.0135 U	21.3 J	6.64	21.7	0.602 J	53.3

Depth	Sb	As	Cd	Cr	Pb	Ni	Se	Zn
13.0-15.0	0.107 J	1.32	0.0121 U	10.5	2.60	12.7	0.180 J	35.1

Depth	Sb	As	Cd	Cr	Pb	Ni	Se	Zn
7.5-9.5	0.218 J	3.68	0.0130 U	20.1	5.24	15.4	0.324	44.8

Depth	Sb	As	Cd	Cr	Pb	Ni	Se	Zn
9.0-12.0	0.194 J	2.66	0.0135 U	23.6	6.06	24.4	0.343	53.9

Depth	Sb	As	Cd	Cr	Pb	Ni	Se	Zn
6.5-9.5	0.285	4.20	0.0140 U	26.4	5.70	29.0	0.316	50.6

Depth	Sb	As	Cd	Cr	Pb	Ni	Se	Zn
4.0	1.70	8.22	0.0133 U	55.4	21.5	28.3	0.277	120

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
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CASCADE LOCKS, OREGON

SANDBLAST AREA AOPC

METALS IN DEEPER SOIL
AND VERY DEEP SOIL (> 10 ft bgs)

DRAWING NUMBER: FIGURE 9-5e
CAD FILE NUMBER: FIG 9-5e
SHEET: OF
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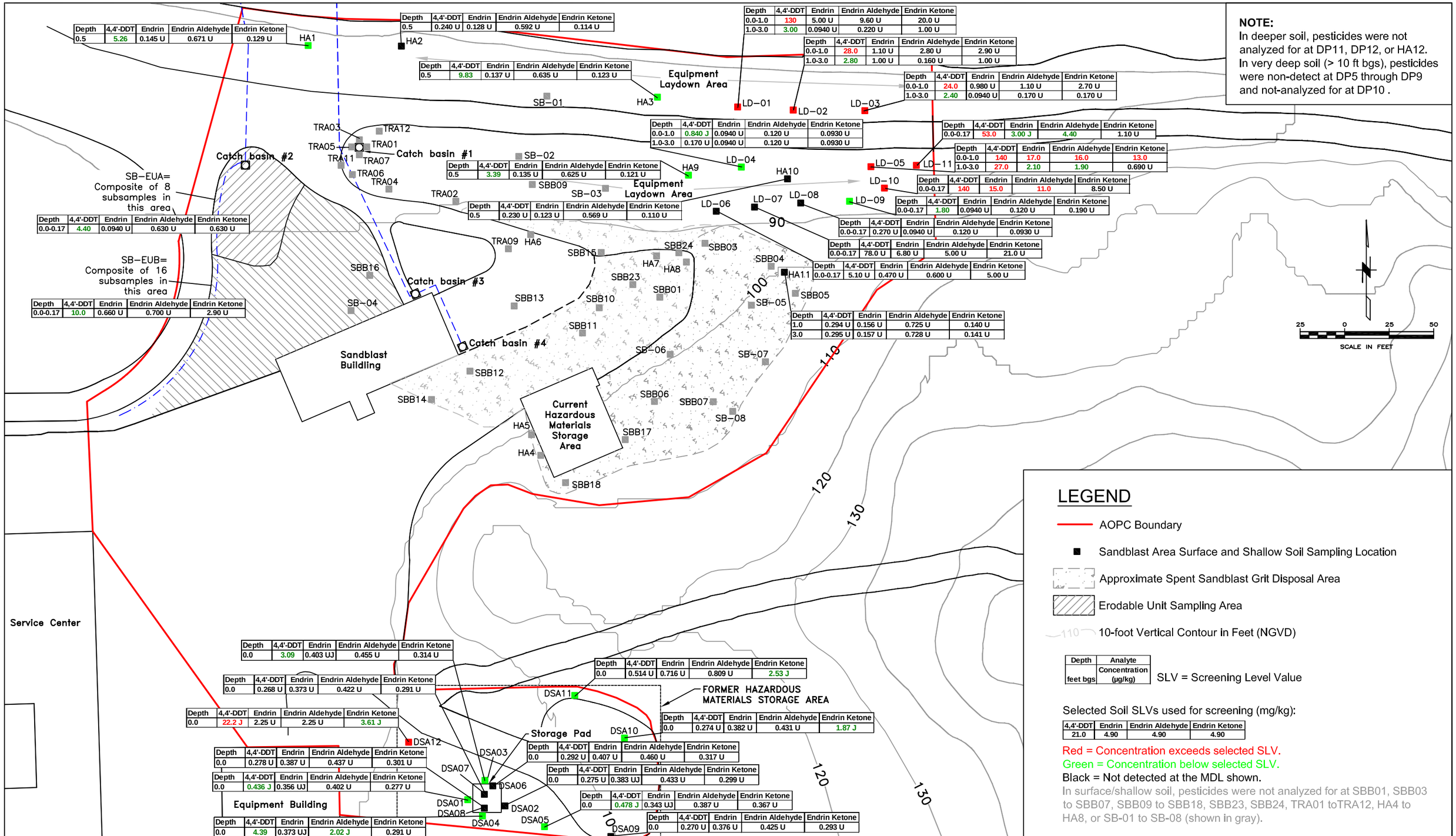
O:\25692709 USACE\53-F0072173.00 Bradford\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-5e - Metals in Deeper Soil and Very Deep Soil (g10 ft bgs).dwg Nov 18, 2010 - 9:45am



Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.5	5.26	0.145 U	0.671 U	0.129 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.5	0.240 U	0.128 U	0.592 U	0.114 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.5	9.83	0.137 U	0.635 U	0.123 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0-1.0	130	5.00 U	9.60 U	20.0 U
1.0-3.0	3.00	0.0940 U	0.220 U	1.00 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0-1.0	28.0	1.10 U	2.80 U	2.90 U
1.0-3.0	2.80	1.00 U	0.160 U	1.00 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0-1.0	24.0	0.980 U	1.10 U	2.70 U
1.0-3.0	2.40	0.0940 U	0.170 U	0.170 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0-1.0	0.840 J	0.0940 U	0.120 U	0.0930 U
1.0-3.0	0.170 U	0.0940 U	0.120 U	0.0930 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0-0.17	53.0	3.00 J	4.40	1.10 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0-1.0	140	17.0	16.0	13.0
1.0-3.0	27.0	2.10	1.90	0.690 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0-0.17	140	15.0	11.0	8.50 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.5	3.39	0.135 U	0.625 U	0.121 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0-0.17	1.80	0.0940 U	0.120 U	0.190 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.5	0.230 U	0.123 U	0.569 U	0.110 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0-0.17	0.270 U	0.0940 U	0.120 U	0.0930 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0-0.17	78.0 U	6.80 U	5.00 U	21.0 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0-0.17	4.40	0.0940 U	0.630 U	0.630 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0-0.17	5.10 U	0.470 U	0.600 U	5.00 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0-0.17	10.0	0.660 U	0.700 U	2.90 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
1.0	0.294 U	0.156 U	0.725 U	0.140 U
3.0	0.295 U	0.157 U	0.728 U	0.141 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0	3.09	0.403 UJ	0.455 U	0.314 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0	0.268 U	0.373 U	0.422 U	0.291 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0	22.2 J	2.25 U	2.25 U	3.61 J

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0	0.278 U	0.387 U	0.437 U	0.301 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0	0.436 J	0.356 UJ	0.402 U	0.277 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0	4.39	0.373 UJ	2.02 J	0.291 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0	0.514 U	0.716 U	0.809 U	2.53 J

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0	0.274 U	0.382 U	0.431 U	1.87 J

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0	0.292 U	0.407 U	0.460 U	0.317 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0	0.275 U	0.383 UJ	0.433 U	0.299 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0	0.478 J	0.343 UJ	0.387 U	0.367 U

Depth	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
0.0	0.270 U	0.376 U	0.425 U	0.293 U

NOTE:
In deeper soil, pesticides were not analyzed for at DP11, DP12, or HA12. In very deep soil (> 10 ft bgs), pesticides were non-detect at DP5 through DP9 and not-analyzed for at DP10 .

LEGEND

- AOPC Boundary
- Sandblast Area Surface and Shallow Soil Sampling Location
- Approximate Spent Sandblast Grit Disposal Area
- Erodable Unit Sampling Area
- 10-foot Vertical Contour in Feet (NGVD)

Depth	Analyte
feet bgs	Concentration (µg/kg)

SLV = Screening Level Value

Selected Soil SLVs used for screening (mg/kg):

4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
21.0	4.90	4.90	4.90

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at the MDL shown.
In surface/shallow soil, pesticides were not analyzed for at SBB01, SBB03 to SBB07, SBB09 to SBB18, SBB23, SBB24, TRA01 toTRA12, HA4 to HA8, or SB-01 to SB-08 (shown in gray).

No.	DATE	BY	REVISION

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25696946	LSM	MP
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	CHECKED BY: LSM	DATE: NOV 2010

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CASCADE LOCKS, OREGON

SANDBLAST AREA AOPC

PESTICIDES IN SURFACE AND SHALLOW SOIL

DRAWING NUMBER: FIGURE 9-5f
CAD FILE NUMBER: FIG 9-5f
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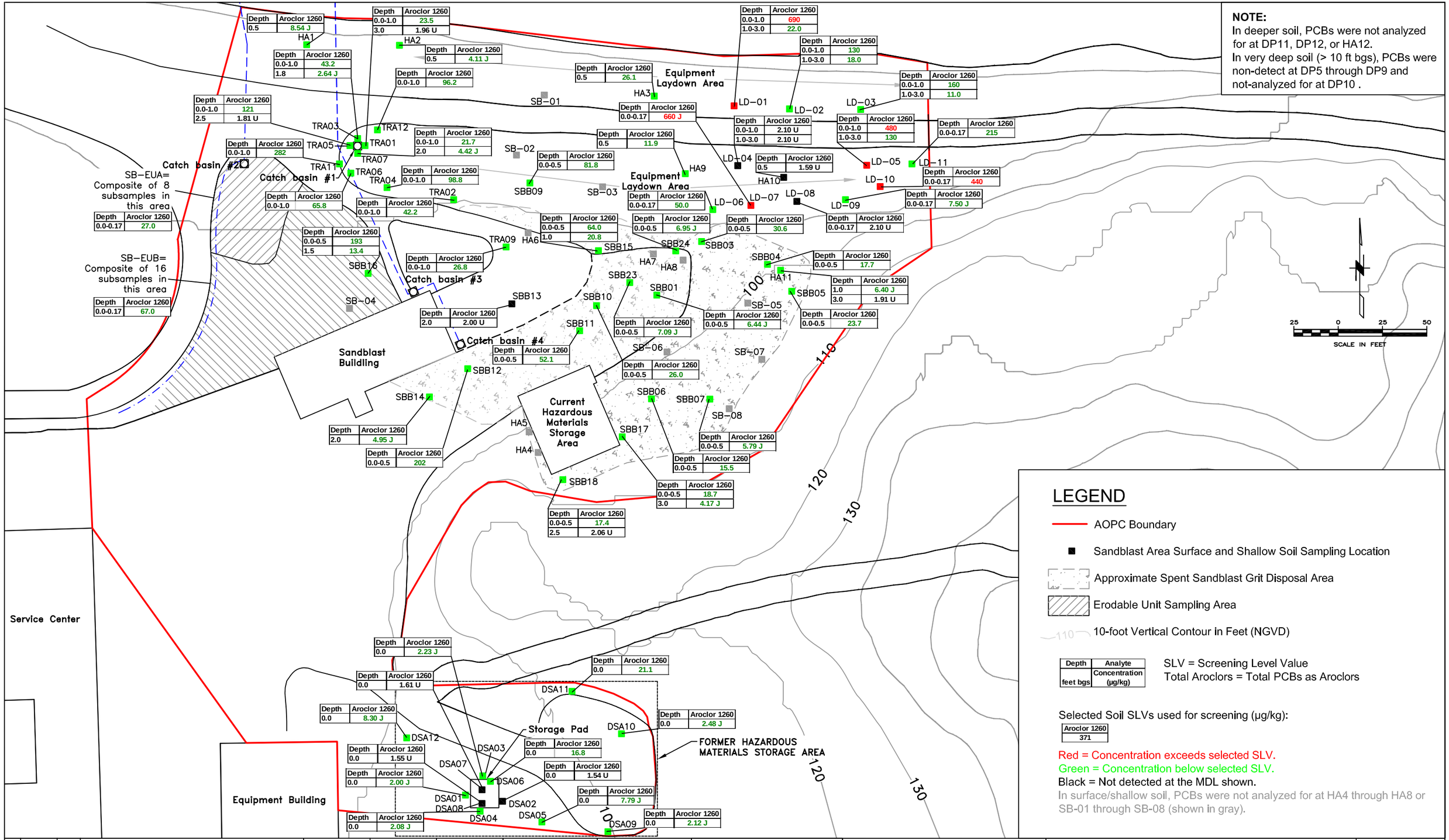
O:\25692709 USACE\53-F0072173.00 Bradford\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-5f - Pesticides in Surface and Shallow Soil.dwg Nov 18, 2010 - 9:45am



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	CHECKED BY: LSM	DATE: NOV 2010

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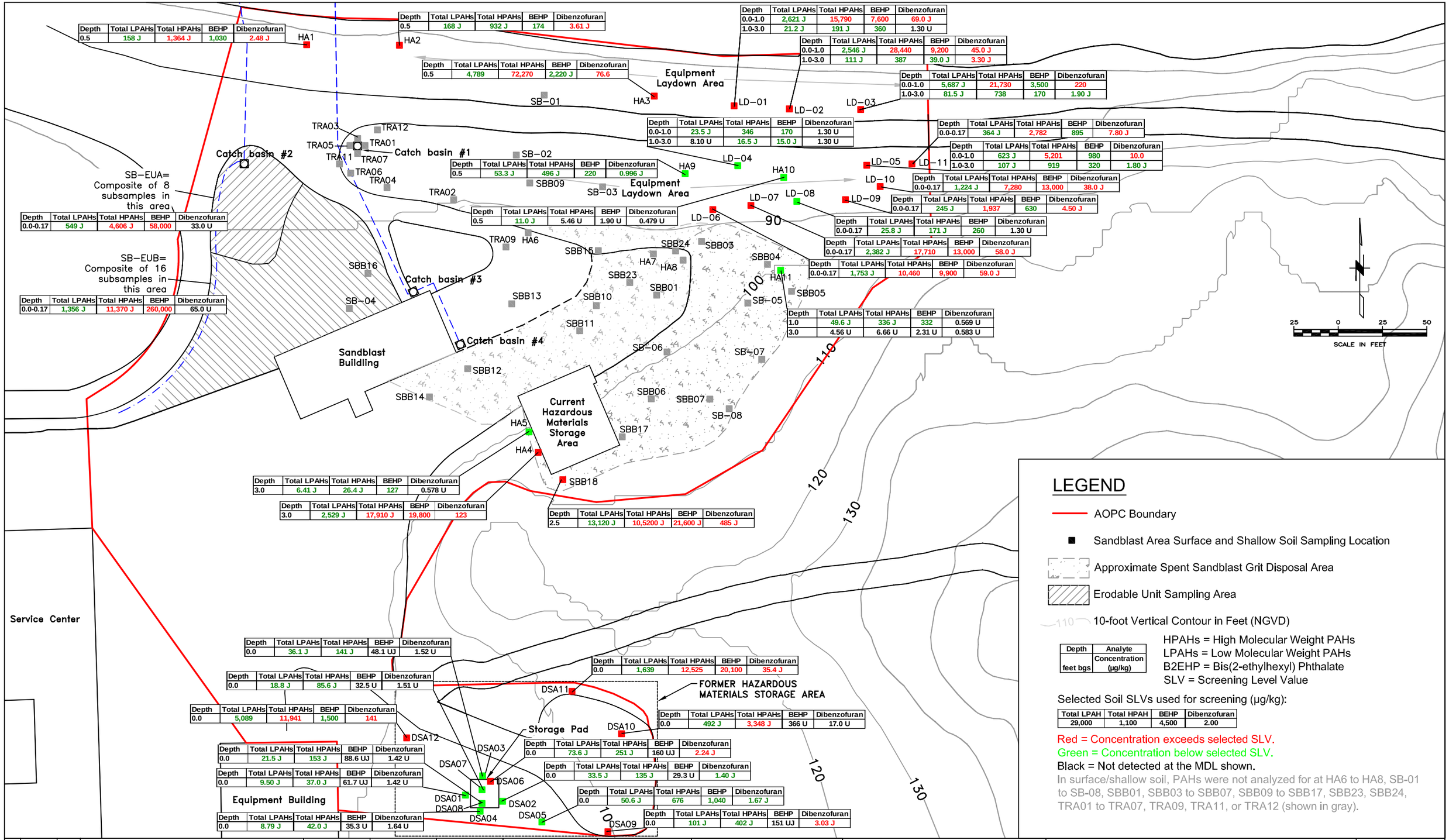
SANDBLAST AREA AOPC

PCBs IN SUFRACE AND SHALLOW SOIL

DRAWING NUMBER: FIGURE 9-5g
CAD FILE NUMBER: FIG 9-5g
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-5g - PCBs in Surface and Shallow Soil.dwg Nov 18, 2010 - 9:46am



Depth	Total LPAHs	Total HPAHs	BEHP	Dibenzofuran
0.5	158 J	1,364 J	1,030	2.48 J
0.5	168 J	932 J	174	3.61 J
0.5	4,789	72,270	2,220 J	76.6
0.0-1.0	2,621 J	15,790	7,600	69.0 J
1.0-3.0	21.2 J	191 J	360	1.30 U
0.0-1.0	2,546 J	28,440	9,200	45.0 J
1.0-3.0	111 J	387	39.0 J	3.30 J
0.0-1.0	5,687 J	21,730	3,500	220
1.0-3.0	81.5 J	738	170	1.90 J
0.0-1.0	23.5 J	346	170	1.30 U
1.0-3.0	8.10 U	16.5 J	15.0 J	1.30 U
0.0-0.17	364 J	2,782	895	7.80 J
0.0-1.0	623 J	5,201	980	10.0
1.0-3.0	107 J	919	320	1.80 J
0.5	53.3 J	496 J	220	0.996 J
0.0-0.17	1,224 J	7,280	13,000	38.0 J
0.0-0.17	245 J	1,937	630	4.50 J
0.5	11.0 J	5.46 U	1.90 U	0.479 U
0.0-0.17	549 J	4,606 J	58,000	33.0 U
0.0-0.17	25.8 J	171 J	260	1.30 U
0.0-0.17	2,382 J	17,710	13,000	58.0 J
0.0-0.17	1,753 J	10,460	9,900	59.0 J
0.0-0.17	1,356 J	11,370 J	260,000	65.0 U
1.0	49.6 J	336 J	332	0.569 U
3.0	4.56 U	6.66 U	2.31 U	0.583 U
3.0	6.41 J	26.4 J	127	0.578 U
3.0	2,529 J	17,910 J	19,800	123
2.5	13,120 J	10,5200 J	21,600 J	485 J
0.0	36.1 J	141 J	48.1 UJ	1.52 U
0.0	18.8 J	85.6 J	32.5 U	1.51 U
0.0	5,089	11,941	1,500	141
0.0	21.5 J	153 J	88.6 UJ	1.42 U
0.0	9.50 J	37.0 J	61.7 UJ	1.42 U
0.0	8.79 J	42.0 J	35.3 U	1.64 U
0.0	1,639	12,525	20,100	35.4 J
0.0	492 J	3,348 J	366 U	17.0 U
0.0	73.6 J	251 J	160 UJ	2.24 J
0.0	33.5 J	135 J	29.3 U	1.40 J
0.0	50.6 J	676	1,040	1.67 J
0.0	101 J	402 J	151 UJ	3.03 J

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
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BRADFORD ISLAND

CASCADE LOCKS, OREGON

SANDBLAST AREA AOPC

PAHs, B2EHP, AND DIBENZOFURAN IN SURFACE AND SHALLOW SOIL

DRAWING NUMBER: FIGURE 9-5h
CAD FILE NUMBER: FIG 9-5h
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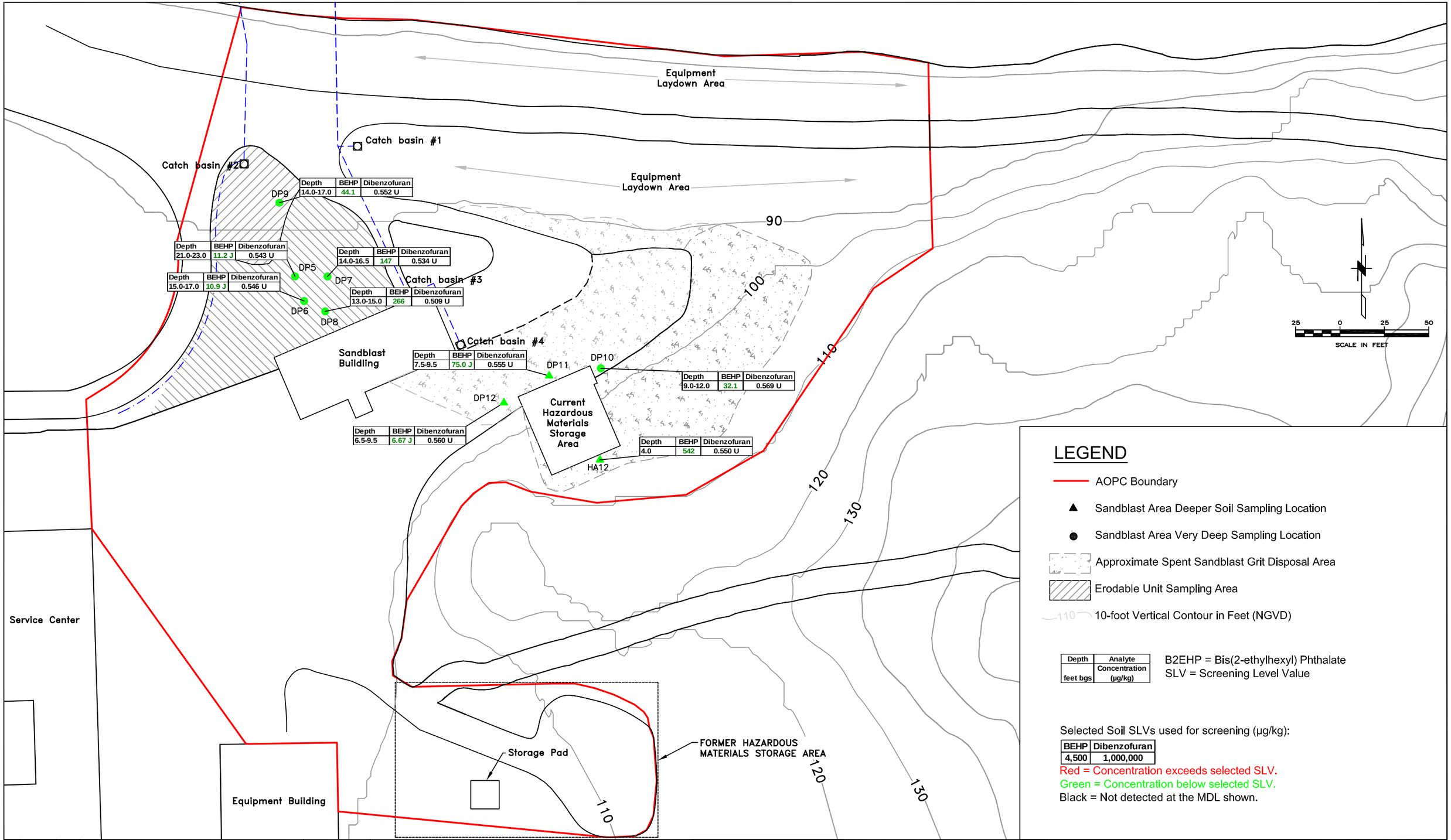
O:\25692709 USACE\53-F0072173.00 Bradford\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-5h - PAHs in Surface and Shallow Soil.dwg Nov 18, 2010 - 9:46am



Depth	BEHP	Dibenzofuran
14.0-17.0	44.1	0.552 U

Depth	BEHP	Dibenzofuran
21.0-23.0	11.2 J	0.543 U

Depth	BEHP	Dibenzofuran
15.0-17.0	10.9 J	0.546 U

Depth	BEHP	Dibenzofuran
14.0-16.5	147	0.534 U

Depth	BEHP	Dibenzofuran
13.0-15.0	266	0.509 U

Depth	BEHP	Dibenzofuran
7.5-9.5	75.0 J	0.555 U

Depth	BEHP	Dibenzofuran
9.0-12.0	32.1	0.569 U

Depth	BEHP	Dibenzofuran
6.5-9.5	6.67 J	0.560 U

Depth	BEHP	Dibenzofuran
4.0	542	0.550 U

Depth	Analyte
feet bgs	Concentration (µg/kg)

BEHP	Dibenzofuran
4,500	1,000,000

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
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CASCADE LOCKS, OREGON

SANDBLAST AREA AOPC

B2EHP AND DIBENZOFURAN IN DEEPER SOIL AND VERY DEEP SOIL (> 10 ft bgs)

DRAWING NUMBER: FIGURE 9-5i
CAD FILE NUMBER: FIG 9-5i
SHEET: OF
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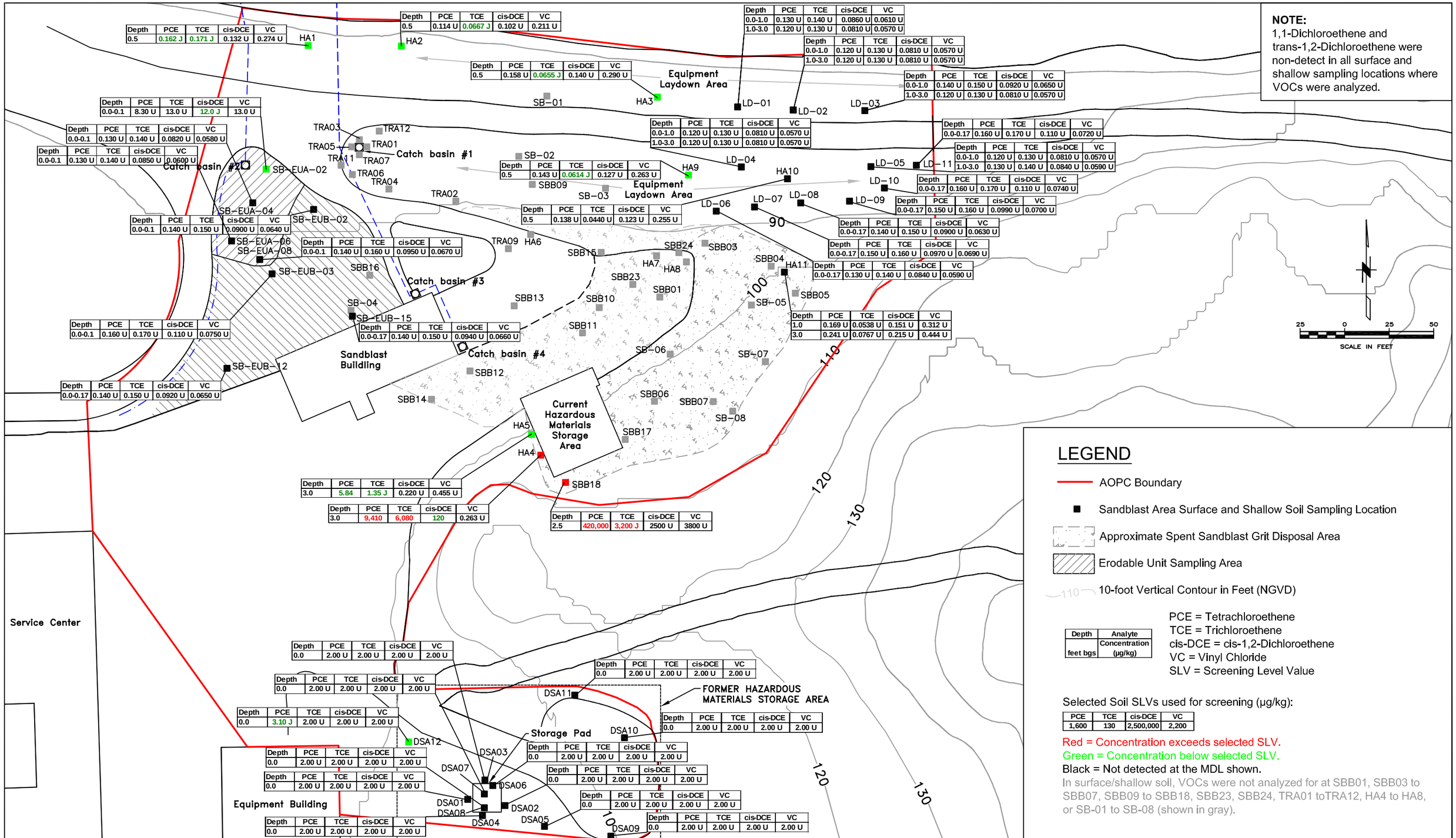
O:\25692709 USACE\53-F0072173.00 Bradford\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-5i- SVOCs in Deeper Soil and Very Deep Soil (g10 ft bgs).dwg Nov 18, 2010 - 9:47am



NOTE:
1,1-Dichloroethene and trans-1,2-Dichloroethene were non-detect in all surface and shallow sampling locations where VOCs were analyzed.

LEGEND

- AOPC Boundary
- Sandblast Area Surface and Shallow Soil Sampling Location
- Approximate Spent Sandblast Grit Disposal Area
- Erodable Unit Sampling Area
- 110 — 10-foot Vertical Contour in Feet (NGVD)

Depth	Analyte
feet bgs	Concentration (µg/kg)

PCE = Tetrachloroethene
TCE = Trichloroethene
cis-DCE = cis-1,2-Dichloroethene
VC = Vinyl Chloride
SLV = Screening Level Value

Selected Soil SLVs used for screening (µg/kg):

PCE	TCE	cis-DCE	VC
1,600	130	2,500,000	2,200

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at the MDL shown.
In surface/shallow soil, VOCs were not analyzed for at SBB01, SBB03 to SBB07, SBB09 to SBB18, SBB23, SBB24, TRA01 toTRA12, HA4 to HA8, or SB-01 to SB-08 (shown in gray).

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
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SCALE:	DRAWN BY: SB	APPROVED BY: LSM
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BRADFORD ISLAND
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SANDBLAST AREA AOPC
VOCs IN SURFACE AND SHALLOW SOIL

DRAWING NUMBER: FIGURE 9-5j
CAD FILE NUMBER: FIG 9-5j
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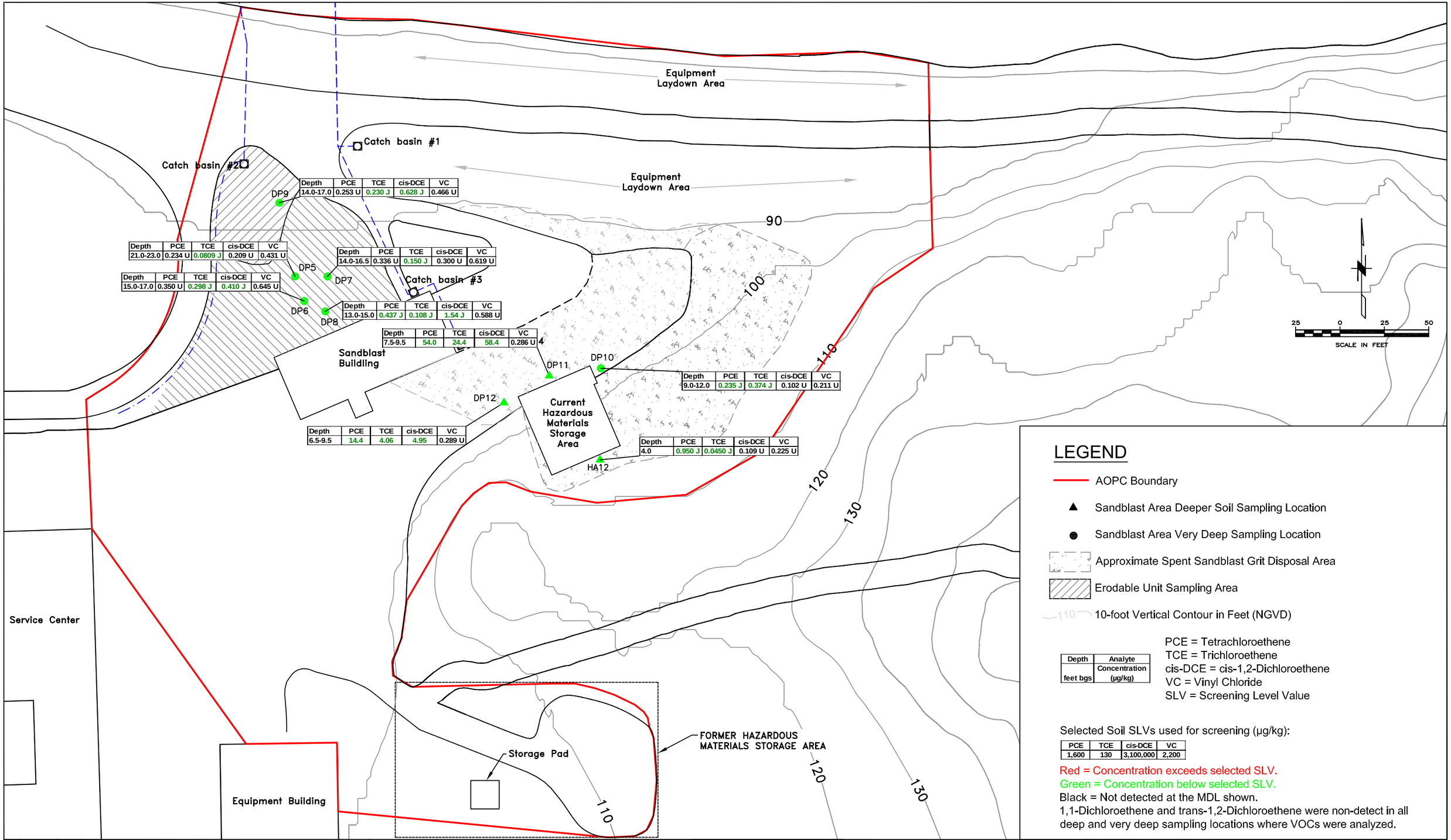
O:\25692709 USACE\53-F0072173.00 Bradford\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-5j - VOCs in Surface and Shallow Soil.dwg Nov 18, 2010 - 9:48am



Depth (feet bgs)	PCE	TCE	cis-DCE	VC
14.0-17.0	0.253 U	0.230 J	0.628 J	0.466 U

Depth (feet bgs)	PCE	TCE	cis-DCE	VC
21.0-23.0	0.234 U	0.0809 J	0.209 U	0.431 U

Depth (feet bgs)	PCE	TCE	cis-DCE	VC
14.0-16.5	0.336 U	0.150 J	0.300 U	0.619 U

Depth (feet bgs)	PCE	TCE	cis-DCE	VC
15.0-17.0	0.350 U	0.298 J	0.410 J	0.645 U

Depth (feet bgs)	PCE	TCE	cis-DCE	VC
13.0-15.0	0.437 J	0.108 J	1.54 J	0.588 U

Depth (feet bgs)	PCE	TCE	cis-DCE	VC
7.5-9.5	54.0	24.4	58.4	0.286 U

Depth (feet bgs)	PCE	TCE	cis-DCE	VC
9.0-12.0	0.235 J	0.374 J	0.102 U	0.211 U

Depth (feet bgs)	PCE	TCE	cis-DCE	VC
6.5-9.5	14.4	4.06	4.95	0.289 U

Depth (feet bgs)	PCE	TCE	cis-DCE	VC
4.0	0.950 J	0.0450 J	0.109 U	0.225 U

PCE	TCE	cis-DCE	VC
1,600	130	3,100,000	2,200

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CASCADE LOCKS, OREGON

SANDBLAST AREA AOPC

VOCs IN DEEPER SOIL
AND VERY DEEP SOIL (> 10 ft bgs)

DRAWING NUMBER: FIGURE 9-5k
CAD FILE NUMBER: FIG 9-5k
SHEET: OF
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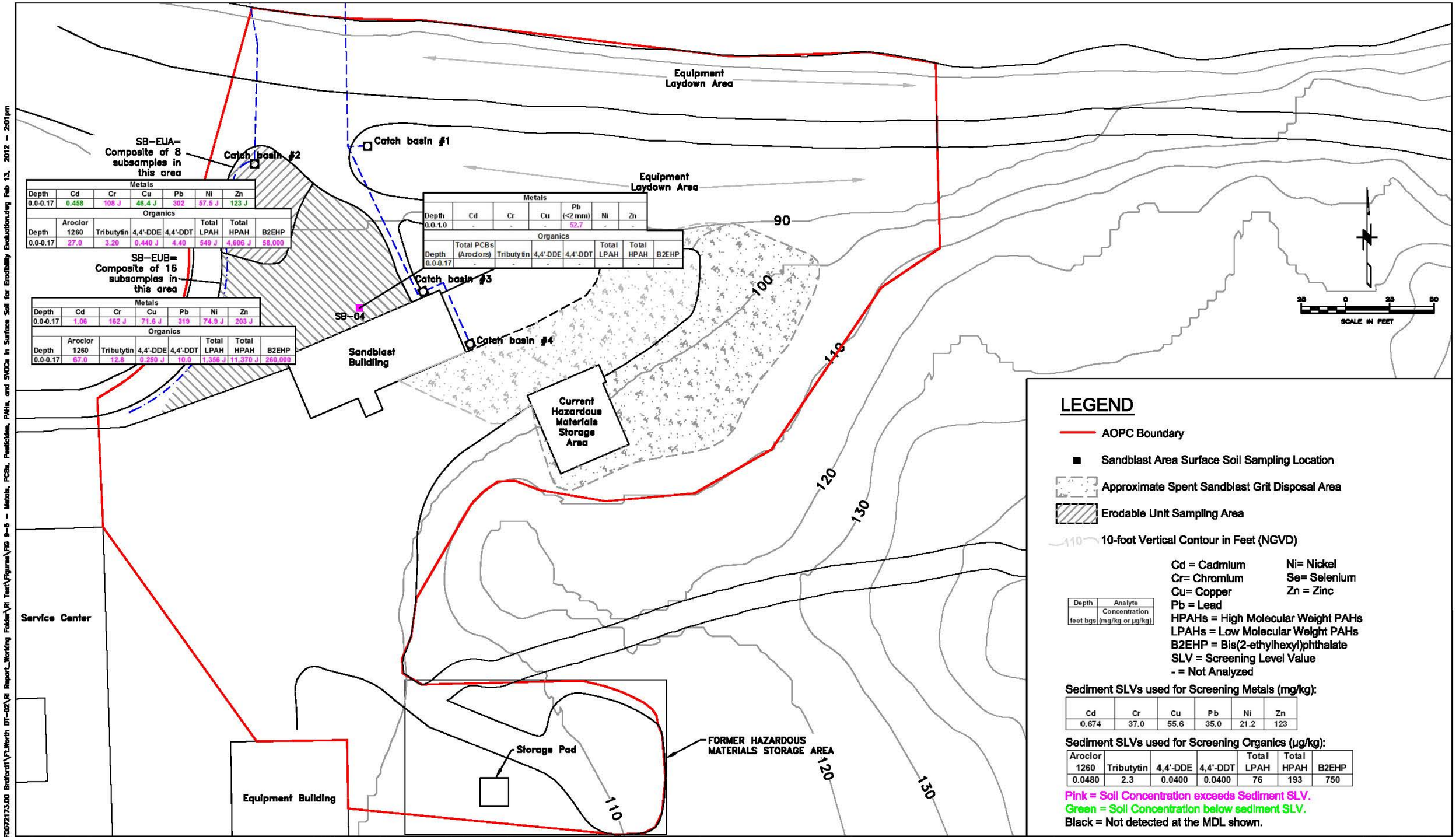
O:\25692709 USACE\53-F0072173.00 Bradford\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-5k - VOCs in Deeper Soil and Very Deep Soil (g10 ft bgs).dwg Nov 18, 2010 - 9:48am



Metals						
Depth	Cd	Cr	Cu	Pb	Ni	Zn
0.0-0.17	0.458	108 J	46.4 J	302	57.5 J	123 J

Organics							
Depth	Aroclor 1260	Tributytin	4,4'-DDE	4,4'-DDT	Total LPAH	Total HPAH	B2EHP
0.0-0.17	27.0	3.20	0.440 J	4.40	549 J	4,606 J	58,000

Metals						
Depth	Cd	Cr	Cu	Pb	Ni	Zn
0.0-0.17	1.06	162 J	71.6 J	319	74.9 J	203 J

Organics							
Depth	Aroclor 1260	Tributytin	4,4'-DDE	4,4'-DDT	Total LPAH	Total HPAH	B2EHP
0.0-0.17	67.0	12.8	0.250 J	10.0	1,356 J	11,370 J	260,000

Metals						
Depth	Cd	Cr	Cu	Pb (<2 mm)	Ni	Zn
0.0-1.0	-	-	-	52.7	-	-

Organics							
Depth	Total PCBs (Aroclors)	Tributytin	4,4'-DDE	4,4'-DDT	Total LPAH	Total HPAH	B2EHP
0.0-0.17	-	-	-	-	-	-	-

LEGEND

- AOPC Boundary
- Sandblast Area Surface Soil Sampling Location
- Approximate Spent Sandblast Grit Disposal Area
- Erodable Unit Sampling Area
- 110 10-foot Vertical Contour in Feet (NGVD)

Depth	Analyte
feet bgs	Concentration (mg/kg or µg/kg)

Cd = Cadmium
Cr= Chromium
Cu= Copper
Pb = Lead
Ni= Nickel
Se= Selenium
Zn = Zinc
HPAHs = High Molecular Weight PAHs
LPAHs = Low Molecular Weight PAHs
B2EHP = Bis(2-ethylhexyl)phthalate
SLV = Screening Level Value
- = Not Analyzed

Sediment SLVs used for Screening Metals (mg/kg):

Cd	Cr	Cu	Pb	Ni	Zn
0.674	37.0	55.6	35.0	21.2	123

Sediment SLVs used for Screening Organics (µg/kg):

Aroclor 1260	Tributytin	4,4'-DDE	4,4'-DDT	Total LPAH	Total HPAH	B2EHP
0.0480	2.3	0.0400	0.0400	76	193	750

Pink = Soil Concentration exceeds Sediment SLV.
Green = Soil Concentration below sediment SLV.
Black = Not detected at the MDL shown.

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SANDBLAST AREA AOPC

COIs IN SURFACE SOIL
FOR ERODABILITY EVALUATION

DRAWING NUMBER: FIGURE 9-6
CAD FILE NUMBER: FIG 9-6
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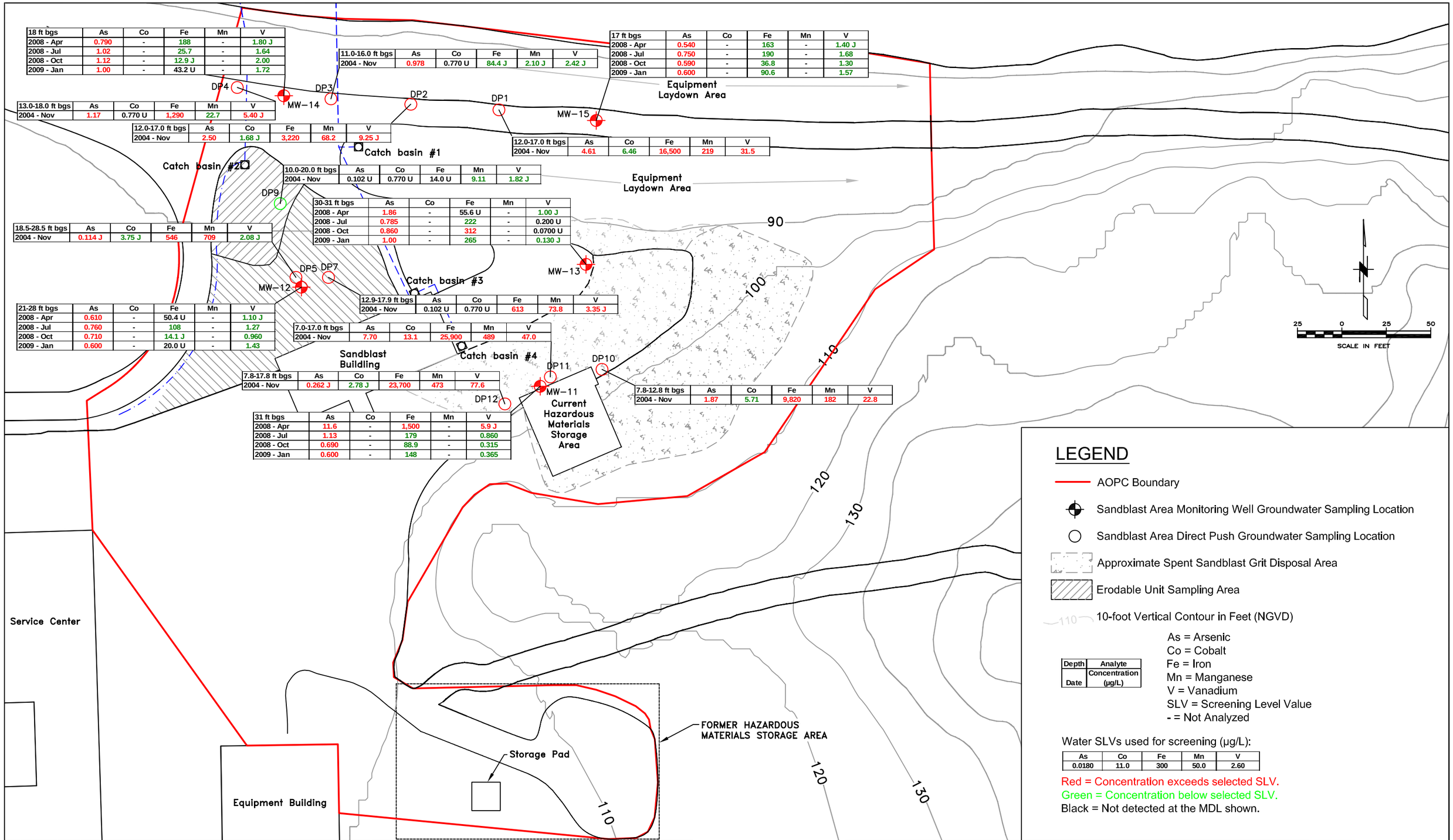
G:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-6 - Metals, PCBs, Pesticides, PAHs, and SVOCs in Surface Soil for Erodibility Evaluation.dwg Feb 13, 2012 - 2:01pm



18 ft bgs	As	Co	Fe	Mn	V
2008 - Apr	0.790	-	188	-	1.80 J
2008 - Jul	1.02	-	25.7	-	1.64
2008 - Oct	1.12	-	12.9 J	-	2.00
2009 - Jan	1.00	-	43.2 U	-	1.72

11.0-16.0 ft bgs	As	Co	Fe	Mn	V
2004 - Nov	0.978	0.770 U	84.4 J	2.10 J	2.42 J

17 ft bgs	As	Co	Fe	Mn	V
2008 - Apr	0.540	-	163	-	1.40 J
2008 - Jul	0.750	-	190	-	1.68
2008 - Oct	0.590	-	36.8	-	1.30
2009 - Jan	0.600	-	90.6	-	1.57

13.0-18.0 ft bgs	As	Co	Fe	Mn	V
2004 - Nov	1.17	0.770 U	1,290	22.7	5.40 J

12.0-17.0 ft bgs	As	Co	Fe	Mn	V
2004 - Nov	2.50	1.68 J	3,220	68.2	9.25 J

12.0-17.0 ft bgs	As	Co	Fe	Mn	V
2004 - Nov	4.61	6.46	16,500	219	31.5

10.0-20.0 ft bgs	As	Co	Fe	Mn	V
2004 - Nov	0.102 U	0.770 U	14.0 U	9.11	1.82 J

30-31 ft bgs	As	Co	Fe	Mn	V
2008 - Apr	1.86	-	55.6 U	-	1.00 J
2008 - Jul	0.785	-	222	-	0.200 U
2008 - Oct	0.860	-	312	-	0.0700 U
2009 - Jan	1.00	-	265	-	0.130 J

18.5-28.5 ft bgs	As	Co	Fe	Mn	V
2004 - Nov	0.114 J	3.75 J	546	709	2.08 J

21-28 ft bgs	As	Co	Fe	Mn	V
2008 - Apr	0.610	-	50.4 U	-	1.10 J
2008 - Jul	0.760	-	108	-	1.27
2008 - Oct	0.710	-	14.1 J	-	0.960
2009 - Jan	0.600	-	20.0 U	-	1.43

12.9-17.9 ft bgs	As	Co	Fe	Mn	V
2004 - Nov	0.102 U	0.770 U	613	73.8	3.35 J

7.0-17.0 ft bgs	As	Co	Fe	Mn	V
2004 - Nov	7.70	13.1	25,900	489	47.0

7.8-17.8 ft bgs	As	Co	Fe	Mn	V
2004 - Nov	0.262 J	2.78 J	23,700	473	77.6

7.8-12.8 ft bgs	As	Co	Fe	Mn	V
2004 - Nov	1.87	5.71	9,820	182	22.8

31 ft bgs	As	Co	Fe	Mn	V
2008 - Apr	11.6	-	1,500	-	5.9 J
2008 - Jul	1.13	-	179	-	0.860
2008 - Oct	0.690	-	88.9	-	0.315
2009 - Jan	0.600	-	148	-	0.365

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SANDBLAST AREA AOPC

TOTAL METALS
IN GROUNDWATER

DRAWING NUMBER: FIGURE 9-7a
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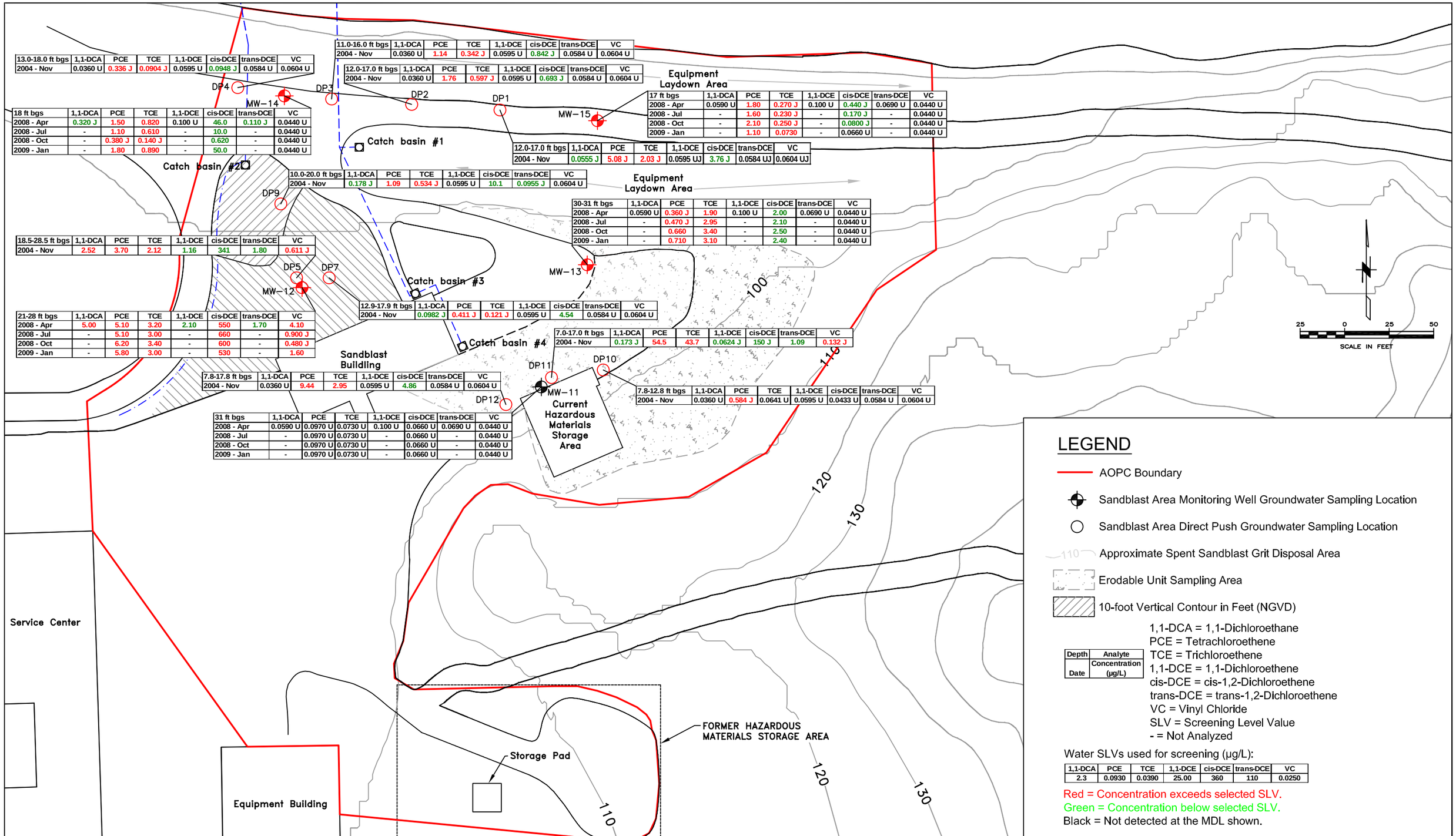
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-7a - Total Metals in Groundwater.dwg Nov 18, 2010 - 10:14am



13.0-18.0 ft bgs	1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2004 - Nov	0.0360 U	0.336 J	0.0904 J	0.0595 U	0.0948 J	0.0584 U	0.0604 U

11.0-16.0 ft bgs	1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2004 - Nov	0.0360 U	1.14	0.342 J	0.0595 U	0.842 J	0.0584 U	0.0604 U

12.0-17.0 ft bgs	1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2004 - Nov	0.0360 U	1.76	0.597 J	0.0595 U	0.693 J	0.0584 U	0.0604 U

18 ft bgs	1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2008 - Apr	0.320 J	1.50	0.820	0.100 U	46.0	0.110 J	0.0440 U
2008 - Jul	-	1.10	0.610	-	10.0	-	0.0440 U
2008 - Oct	-	0.380 J	0.140 J	-	0.620	-	0.0440 U
2009 - Jan	-	1.80	0.890	-	50.0	-	0.0440 U

17 ft bgs	1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2008 - Apr	0.0590 U	1.80	0.270 J	0.100 U	0.440 J	0.0690 U	0.0440 U
2008 - Jul	-	1.60	0.230 J	-	0.170 J	-	0.0440 U
2008 - Oct	-	2.10	0.250 J	-	0.0800 J	-	0.0440 U
2009 - Jan	-	1.10	0.0730	-	0.0660 U	-	0.0440 U

12.0-17.0 ft bgs	1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2004 - Nov	0.0555 J	5.08 J	2.03 J	0.0595 UJ	3.76 J	0.0584 UJ	0.0604 UJ

10.0-20.0 ft bgs	1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2004 - Nov	0.178 J	1.09	0.534 J	0.0595 U	10.1	0.0955 J	0.0604 U

30-31 ft bgs	1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2008 - Apr	0.0590 U	0.360 J	1.90	0.100 U	2.00	0.0690 U	0.0440 U
2008 - Jul	-	0.470 J	2.95	-	2.10	-	0.0440 U
2008 - Oct	-	0.660	3.40	-	2.50	-	0.0440 U
2009 - Jan	-	0.710	3.10	-	2.40	-	0.0440 U

18.5-28.5 ft bgs	1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2004 - Nov	2.52	3.70	2.12	1.16	341	1.80	0.611 J

21-28 ft bgs	1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2008 - Apr	5.00	5.10	3.20	2.10	550	1.70	4.10
2008 - Jul	-	5.10	3.00	-	660	-	0.900 J
2008 - Oct	-	6.20	3.40	-	600	-	0.480 J
2009 - Jan	-	5.80	3.00	-	530	-	1.60

12.9-17.9 ft bgs	1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2004 - Nov	0.0982 J	0.411 J	0.121 J	0.0595 U	4.54	0.0584 U	0.0604 U

7.0-17.0 ft bgs	1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2004 - Nov	0.173 J	54.5	43.7	0.0624 J	150 J	1.09	0.132 J

7.8-17.8 ft bgs	1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2004 - Nov	0.0360 U	9.44	2.95	0.0595 U	4.86	0.0584 U	0.0604 U

7.8-12.8 ft bgs	1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2004 - Nov	0.0360 U	0.584 J	0.0641 U	0.0595 U	0.0433 U	0.0584 U	0.0604 U

31 ft bgs	1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2008 - Apr	0.0590 U	0.0970 U	0.0730 U	0.100 U	0.0660 U	0.0690 U	0.0440 U
2008 - Jul	-	0.0970 U	0.0730 U	-	0.0660 U	-	0.0440 U
2008 - Oct	-	0.0970 U	0.0730 U	-	0.0660 U	-	0.0440 U
2009 - Jan	-	0.0970 U	0.0730 U	-	0.0660 U	-	0.0440 U

LEGEND

- AOPC Boundary
- Sandblast Area Monitoring Well Groundwater Sampling Location
- Sandblast Area Direct Push Groundwater Sampling Location
- 110 Approximate Spent Sandblast Grit Disposal Area
- Erodable Unit Sampling Area
- 10-foot Vertical Contour in Feet (NGVD)

Depth	Analyte
Date	Concentration (µg/L)

1,1-DCA = 1,1-Dichloroethane
PCE = Tetrachloroethene
TCE = Trichloroethene
1,1-DCE = 1,1-Dichloroethene
cis-DCE = cis-1,2-Dichloroethene
trans-DCE = trans-1,2-Dichloroethene
VC = Vinyl Chloride
SLV = Screening Level Value
- = Not Analyzed

Water SLVs used for screening (µg/L):

1,1-DCA	PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2.3	0.0930	0.0390	25.00	360	110	0.0250

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at the MDL shown.

No.	DATE	BY	REVISION

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SANDBLAST AREA AOPC

VOCs IN GROUNDWATER

DRAWING NUMBER: FIGURE 9-7b
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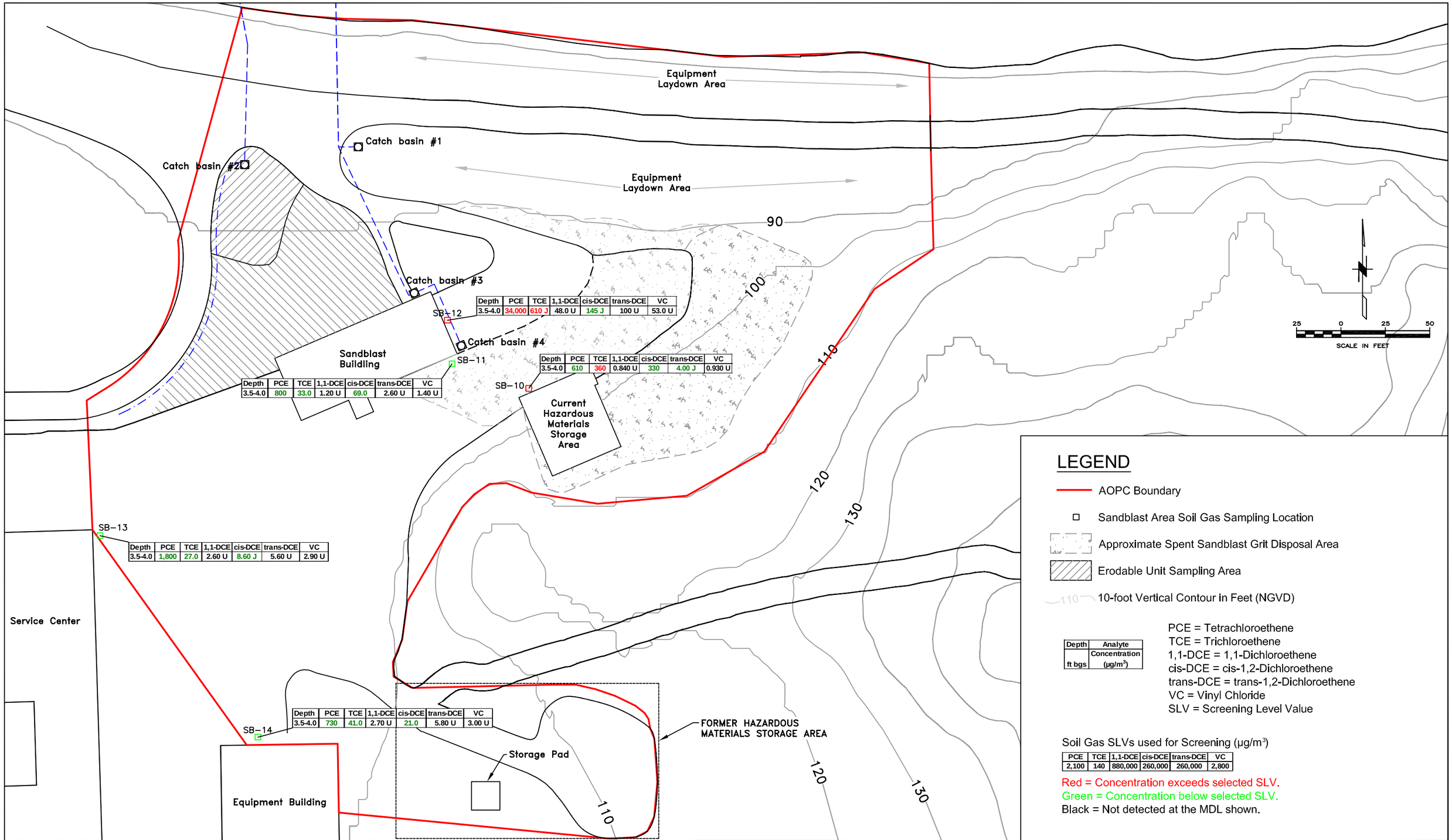

Depth ft bgs	Analyte Concentration (µg/m³)					
SB-10						
3.5-4.0	610	360	0.840 U	330	4.00 J	0.930 U
SB-11						
3.5-4.0	800	33.0	1.20 U	69.0	2.60 U	1.40 U
SB-12						
3.5-4.0	34,000	610 J	48.0 U	145 J	100 U	53.0 U
SB-13						
3.5-4.0	1,800	27.0	2.60 U	8.60 J	5.60 U	2.90 U
SB-14						
3.5-4.0	730	41.0	2.70 U	21.0	5.80 U	3.00 U

Soil Gas SLVs used for Screening (µg/m³)

PCE	TCE	1,1-DCE	cis-DCE	trans-DCE	VC
2,100	140	880,000	260,000	260,000	2,800

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SANDBLAST AREA AOPC

VOCs IN SOIL GAS

DRAWING NUMBER: FIGURE 9-8
CAD FILE NUMBER: FIG 9-8
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REV.

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NOTE:
In deeper soil, PCBs were not analyzed for at DP11, DP12, or HA12.
In very deep soil (> 10 ft bgs), PCBs were non-detect at DP5 through DP9 and not-analyzed for at DP10 .

Equipment Laydown Area

Catch basin #1

Catch basin #2

Catch basin #3

Catch basin #4

SB–EUA= Composite of 8 subsamples in this area

SB–EUB= Composite of 16 subsamples in this area

Sandblast Building

Current Hazardous Materials Storage Area

Service Center

Equipment Building

Storage Pad

FORMER HAZARDOUS MATERIALS STORAGE AREA

90 100 110 120 130

25 0 25 50
SCALE IN FEET

LEGEND

AOPC Boundary

Sandblast Area Surface and Shallow Soil Sampling Location

Approximate Spent Sandblast Grit Disposal Area

Erodable Unit Sampling Area

110 10-foot Vertical Contour in Feet (NGVD)

Soil SLVs used for Screening (µg/kg):

Total Aroclors	4,4'-DDT	Endrin	Endrin Aldehyde	Endrin Ketone
371	21.0	4.90	4.90	4.90

SLV = Screening Level Value

Summary of PCBs and Pesticides in Surface and Shallow Soil

PCBs Concentration

Pesticides Concentration

Red = Concentration exceeds selected SLV.
Green = Concentration below selected SLV.
Black = Not detected at MDL.
Gray = Not Analyzed.

No.	DATE	BY	REVISION

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SANDBLAST AREA AOPC

SUMMARY OF PCBs AND PESTICIES IN SURFACE AND SHALLOW SOIL

DRAWING NUMBER: FIGURE 9-9a
CAD FILE NUMBER: FIG 9-9a
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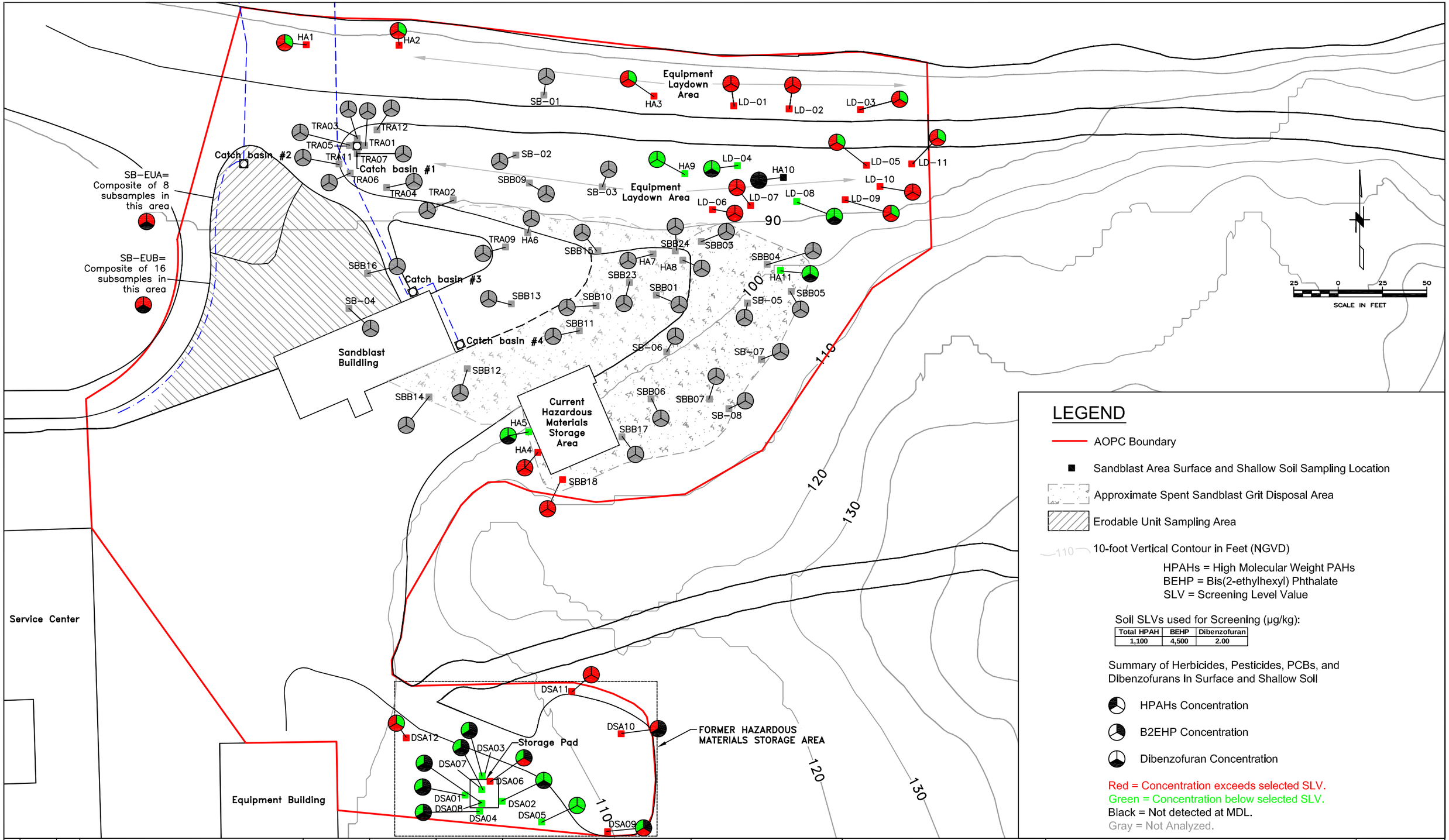

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SANDBLAST AREA AOPC

SUMMARY OF HPAHs, B2EHP, AND DIBENZOFURAN IN SURFACE AND SHALLOW SOIL

DRAWING NUMBER: FIGURE 9-9b
CAD FILE NUMBER: FIG 9-9b
SHEET: OF
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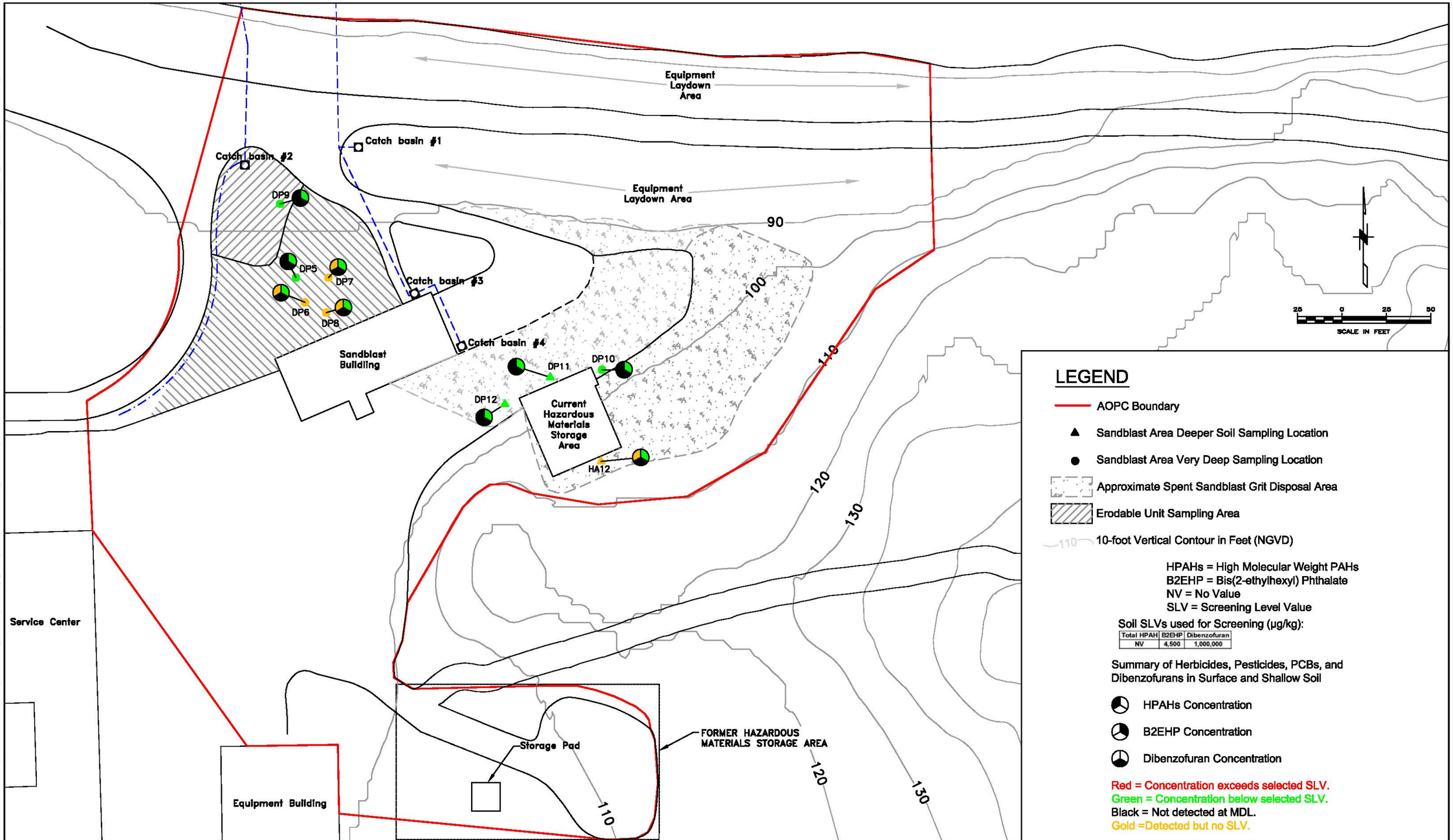
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-9b - Summary of HPAHs in Surface and Shallow Soil.dwg Nov 18, 2010 - 10:17am



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SANDBLAST AREA AOPC

SUMMARY OF HPAHs, B2EHP, AND DIBENZOFURAN IN DEEPER SOIL AND VERY DEEP SOIL (> 10 ft bgs)

DRAWING NUMBER: FIGURE 9-9c
CAD FILE NUMBER: FIG 9-9c
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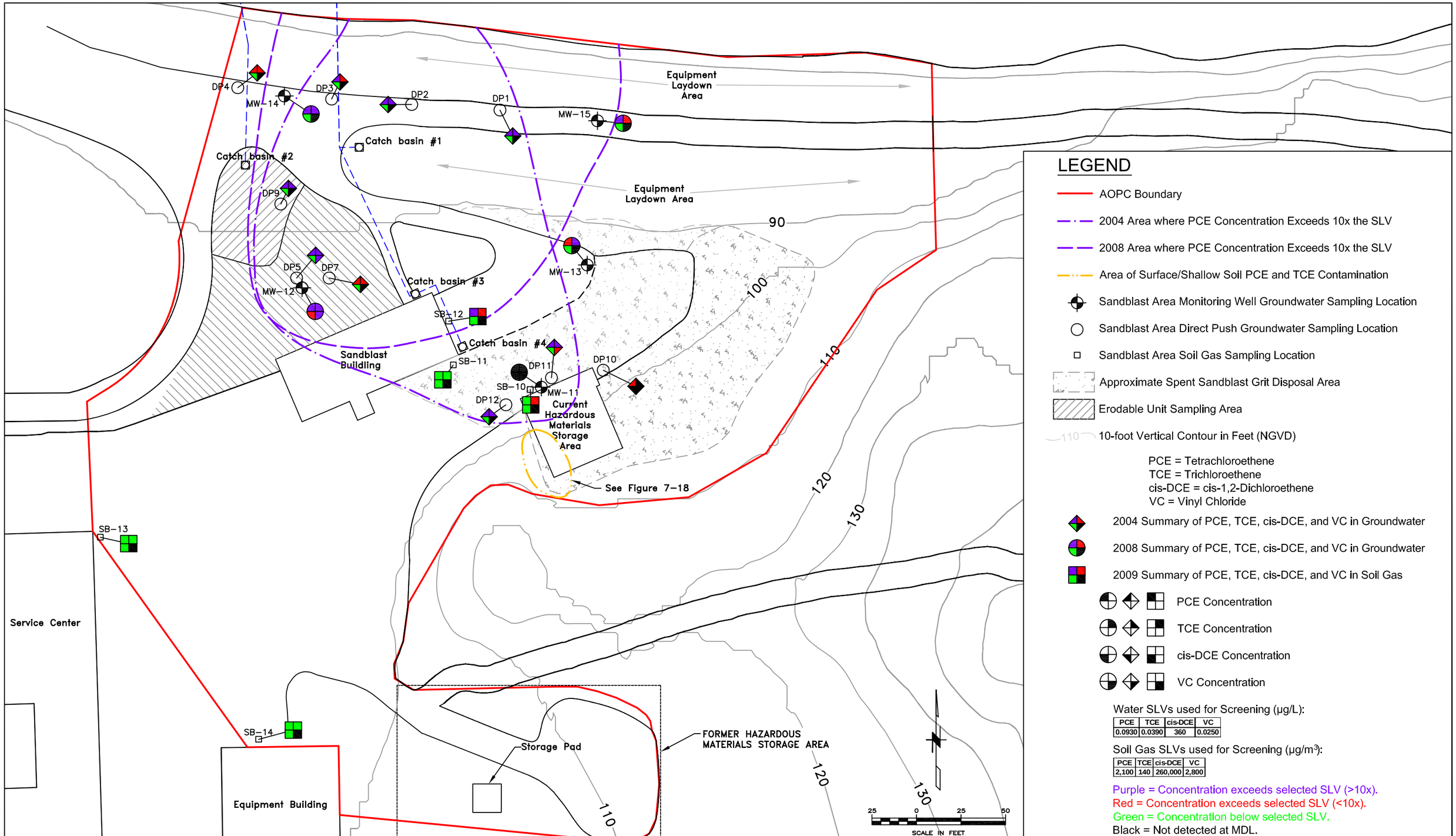
C:\25696946 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-9c- Summary of HPAHs, BEHP, and Dibenzofuran in Deeper Soil and Very Deep Soil (g10 ft bgs).dwg Feb 13, 2012 - 2:03pm



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CASCADE LOCKS, OREGON

SANDBLAST AREA AOPC

SUMMARY OF VOCs
IN GROUNDWATER AND SOIL GAS

DRAWING NUMBER: FIGURE 9-10
CAD FILE NUMBER: FIG 9-10
SHEET: OF
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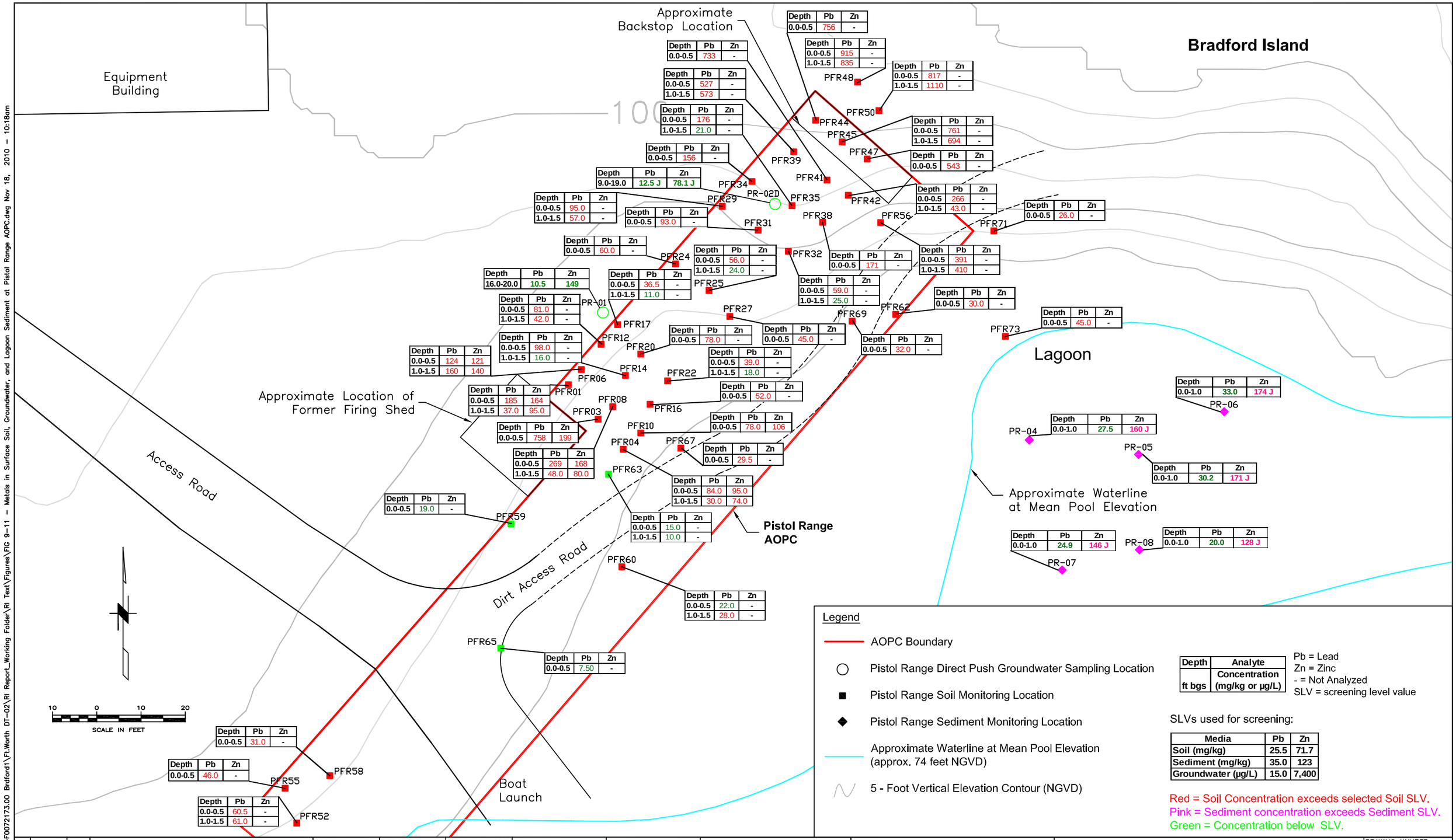

Depth	Pb	Zn
0.0-0.5	756	-

Depth	Pb	Zn
0.0-0.5	733	-

Depth	Pb	Zn
0.0-0.5	915	-
1.0-1.5	835	-

Depth	Pb	Zn
0.0-0.5	817	-
1.0-1.5	1110	-

Depth	Pb	Zn
0.0-0.5	527	-
1.0-1.5	573	-

Depth	Pb	Zn
0.0-0.5	176	-
1.0-1.5	21.0	-

Depth	Pb	Zn
0.0-0.5	761	-
1.0-1.5	694	-

Depth	Pb	Zn
0.0-0.5	156	-

Depth	Pb	Zn
0.0-0.5	543	-

Depth	Pb	Zn
9.0-19.0	12.5 J	78.1 J

Depth	Pb	Zn
0.0-0.5	266	-
1.0-1.5	43.0	-

Depth	Pb	Zn
0.0-0.5	95.0	-
1.0-1.5	57.0	-

Depth	Pb	Zn
0.0-0.5	26.0	-

Depth	Pb	Zn
0.0-0.5	93.0	-

Depth	Pb	Zn
0.0-0.5	60.0	-

Depth	Pb	Zn
0.0-0.5	56.0	-
1.0-1.5	24.0	-

Depth	Pb	Zn
0.0-0.5	171	-

Depth	Pb	Zn
0.0-0.5	391	-
1.0-1.5	410	-

Depth	Pb	Zn
16.0-20.0	10.5	149

Depth	Pb	Zn
0.0-0.5	36.5	-
1.0-1.5	11.0	-

Depth	Pb	Zn
0.0-0.5	59.0	-
1.0-1.5	25.0	-

Depth	Pb	Zn
0.0-0.5	30.0	-

Depth	Pb	Zn
0.0-0.5	81.0	-
1.0-1.5	42.0	-

Depth	Pb	Zn
0.0-0.5	45.0	-

Depth	Pb	Zn
0.0-0.5	78.0	-

Depth	Pb	Zn
0.0-0.5	45.0	-

Depth	Pb	Zn
0.0-0.5	32.0	-

Depth	Pb	Zn
0.0-0.5	98.0	-
1.0-1.5	16.0	-

Depth	Pb	Zn
0.0-0.5	124	121
1.0-1.5	160	140

Depth	Pb	Zn
0.0-0.5	39.0	-
1.0-1.5	18.0	-

Depth	Pb	Zn
0.0-0.5	52.0	-

Depth	Pb	Zn
0.0-0.5	185	164
1.0-1.5	37.0	95.0

Depth	Pb	Zn
0.0-0.5	758	199

Depth	Pb	Zn
0.0-0.5	78.0	106

Depth	Pb	Zn
0.0-0.5	269	168
1.0-1.5	48.0	80.0

Depth	Pb	Zn
0.0-0.5	29.5	-

Depth	Pb	Zn
0.0-0.5	84.0	95.0
1.0-1.5	30.0	74.0

Depth	Pb	Zn
0.0-0.5	19.0	-

Depth	Pb	Zn
0.0-0.5	15.0	-
1.0-1.5	10.0	-

Depth	Pb	Zn
0.0-0.5	22.0	-
1.0-1.5	28.0	-

Depth	Pb	Zn
0.0-0.5	7.50	-

Depth	Pb	Zn
0.0-0.5	31.0	-

Depth	Pb	Zn
0.0-0.5	46.0	-

Depth	Pb	Zn
0.0-0.5	60.5	-
1.0-1.5	61.0	-

Depth	Pb	Zn
0.0-1.0	33.0	174 J

Depth	Pb	Zn
0.0-1.0	27.5	160 J

Depth	Pb	Zn
0.0-1.0	30.2	171 J

Depth	Pb	Zn
0.0-1.0	24.9	146 J

Depth	Pb	Zn
0.0-1.0	20.0	128 J

Legend

- AOPC Boundary
- Pistol Range Direct Push Groundwater Sampling Location
- Pistol Range Soil Monitoring Location
- Pistol Range Sediment Monitoring Location
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)
- 5 - Foot Vertical Elevation Contour (NGVD)

Depth	Analyte
ft bgs	Concentration (mg/kg or µg/L)

Pb = Lead
Zn = Zinc
- = Not Analyzed
SLV = screening level value

SLVs used for screening:

Media	Pb	Zn
Soil (mg/kg)	25.5	71.7
Sediment (mg/kg)	35.0	123
Groundwater (µg/L)	15.0	7,400

Red = Soil Concentration exceeds selected Soil SLV.
Pink = Sediment concentration exceeds Sediment SLV.
Green = Concentration below SLV.

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

PISTOL RANGE AOPC

METALS IN SURFACE SOIL, GROUNDWATER, AND LAGOON SEDIMENT

DRAWING NUMBER: FIGURE 9-11
CAD FILE NUMBER: FIG 9-11
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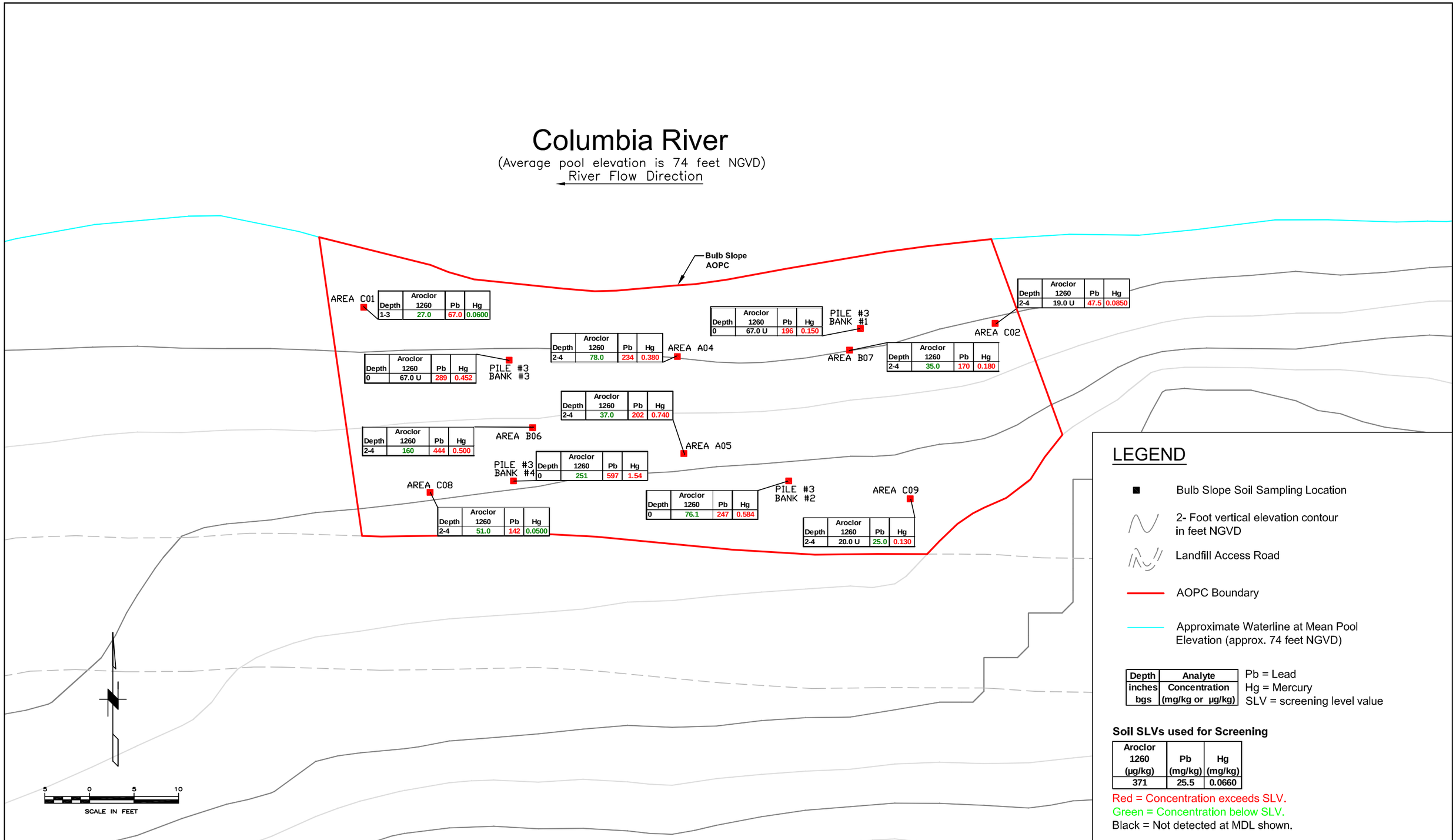
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-11 - Metals in Surface Soil, Groundwater, and Lagoon Sediment at Pistol Range AOPC.dwg Nov 18, 2010 - 10:18am



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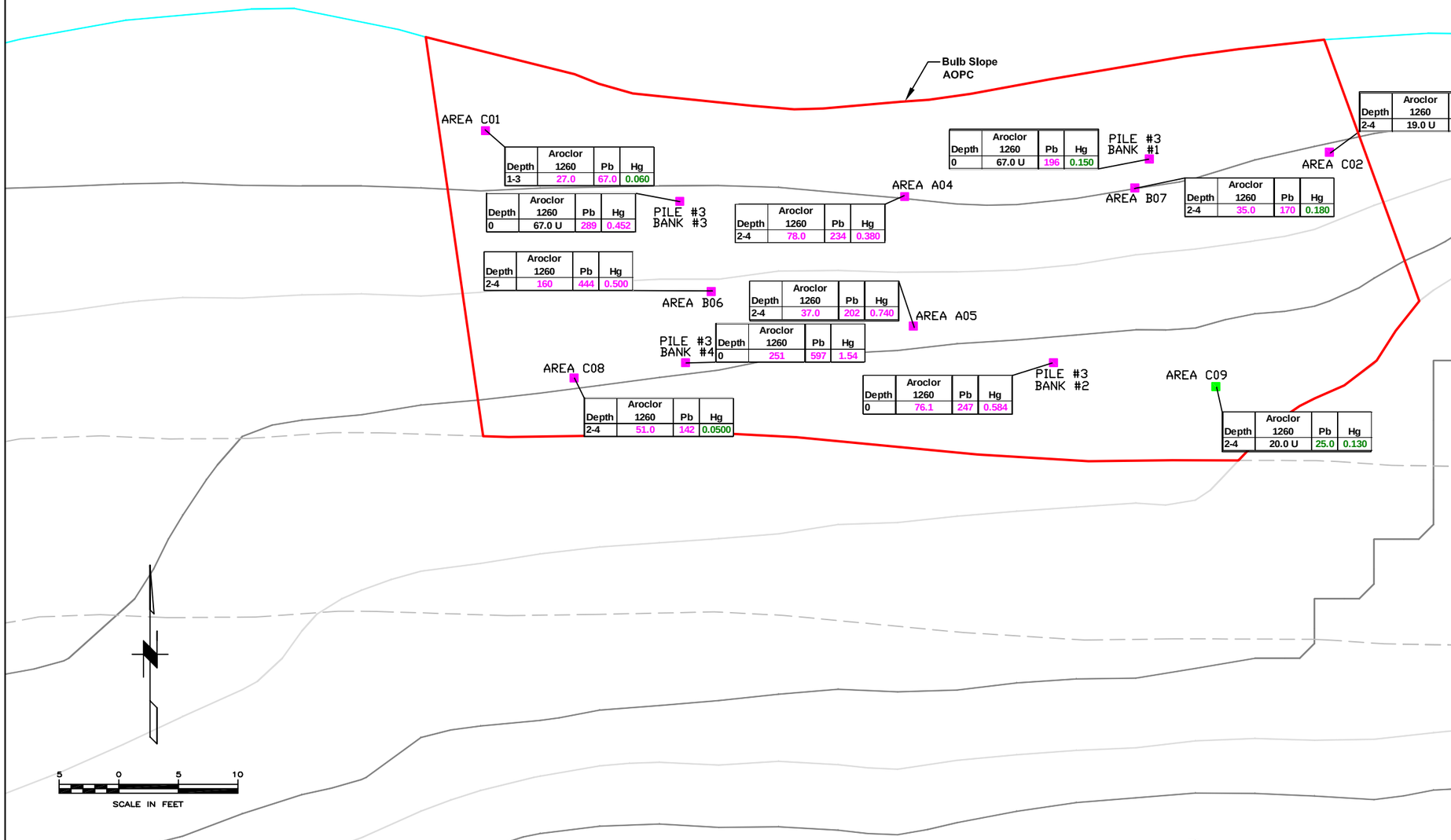
BULB SLOPE AOPC

METALS AND PCBs IN SURFACE SOIL

DRAWING NUMBER: FIGURE 9-12
CAD FILE NUMBER: FIG 9-12
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-12 - Metals and PCBs in Surface Soil at Bulb Slope AOPC.dwg Nov 18, 2010 - 10:19am



LEGEND

- Bulb Slope Soil Sampling Location
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Depth	Analyte
inches bgs	Concentration (mg/kg or µg/kg)

Pb = Lead
Hg = Mercury
SLV = screening level value

Sediment SLVs used for Screening:

Aroclor 1260 (µg/kg)	Pb (mg/kg)	Hg (mg/kg)
0.0480	35	0.214

Pink = Soil Concentration exceeds Sediment SLV.
Green = Concentration below SLV.

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CASCADE LOCKS, OREGON

BULB SLOPE AOPC

METALS AND PCBs IN SURFACE SOIL FOR MASS WASTING EVALUATION

DRAWING NUMBER: FIGURE 9-13
CAD FILE NUMBER: FIG 9-13
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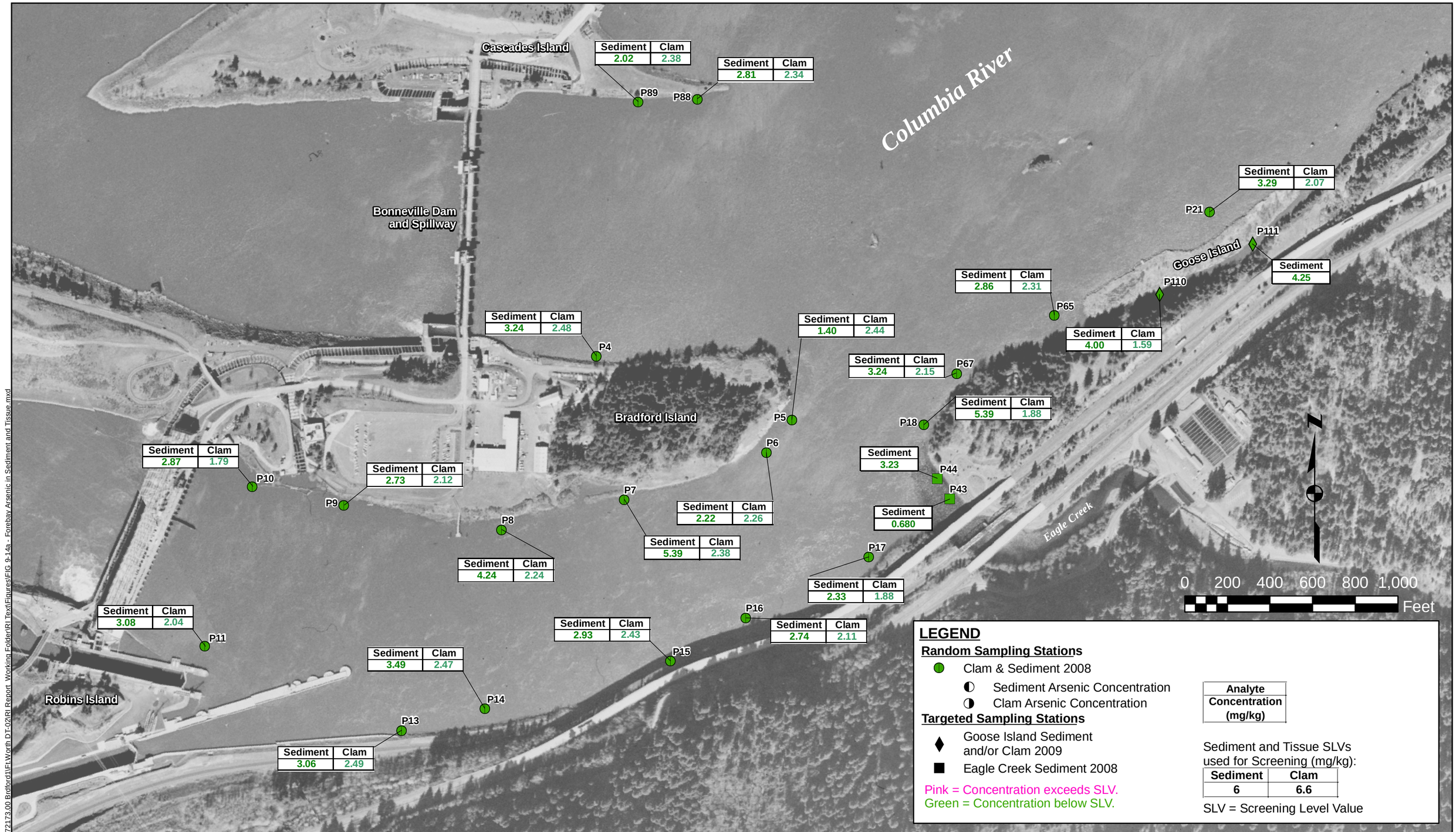
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-13 - Metals and PCBs in Surface Soil at Bulb Slope AOPC for Mass Wasting Evaluation.dwg Nov 18, 2010 - 10:20am



O:\25692709 USACE\53-F0072173.00 Bradford\Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 9-14a - Forebay Arsenic in Sediment and Tissue.mxd

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

RIVER OPERABLE UNIT

FOREBAY ARSENIC IN SEDIMENT AND CLAM TISSUE

DRAWING NUMBER: FIGURE 9-14a

GIS FILE NUMBER: FIG 9-14a

SHEET: REV.

O:\25692709 USACE\53-F0072173.00 Bradford\Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 9-14b - Forebay Cadmium in Sediment and Tissue.mxd

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RIVER OPERABLE UNIT

FOREBAY CADMIUM IN SEDIMENT AND CLAM TISSUE

DRAWING NUMBER: FIGURE 9-14b

GIS FILE NUMBER: FIG 9-14b

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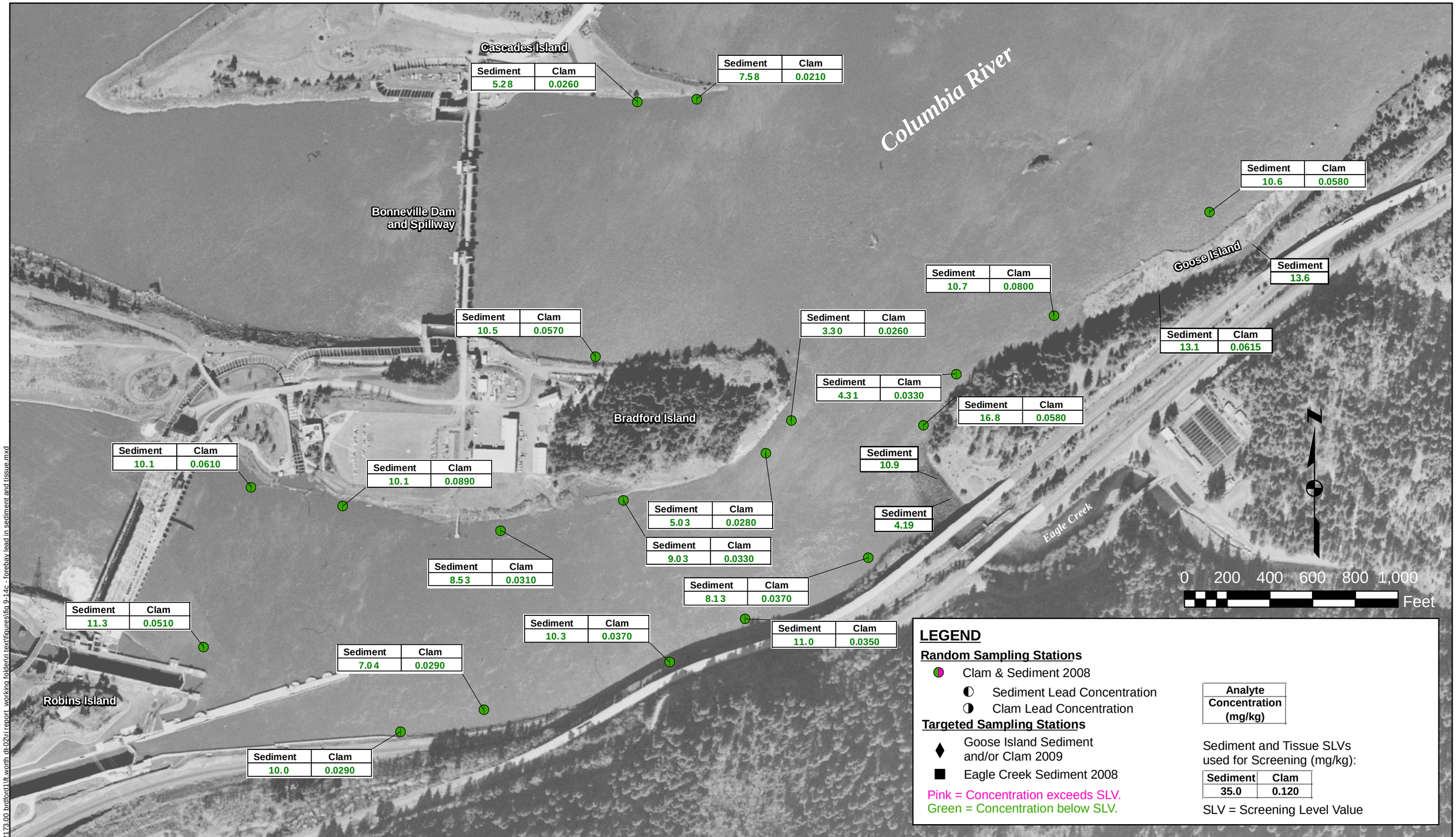

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RIVER OPERABLE UNIT

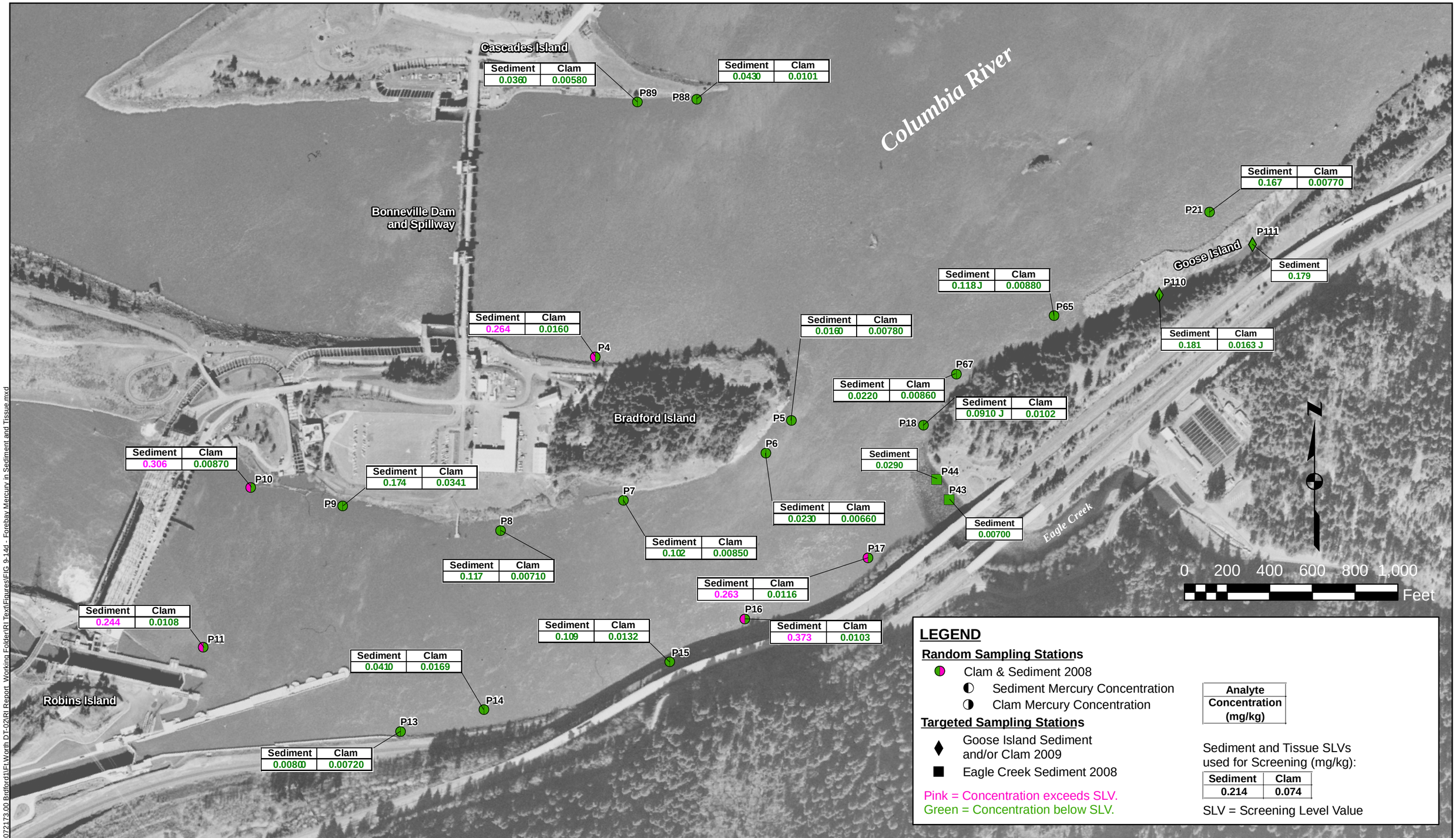
FOREBAY LEAD IN SEDIMENT AND CLAM TISSUE

DRAWING NUMBER: FIGURE 9-14c

GIS FILE NUMBER: FIG 9-14c

SHEET: REV.

o:\25692709 usace\53-f0072173.00 bradford1lft.worth dt-02\ri report_working folder\ri text\figures\fig 9-14c - forebay lead in sediment and tissue.mxd



O:\25692709 USACE\53-F0072173.00 Bradford\1\Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 9-14d - Forebay Mercury in Sediment and Tissue.mxd

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RIVER OPERABLE UNIT

FOREBAY MERCURY IN SEDIMENT AND CLAM TISSUE

DRAWING NUMBER: FIGURE 9-14d

GIS FILE NUMBER: FIG 9-14d

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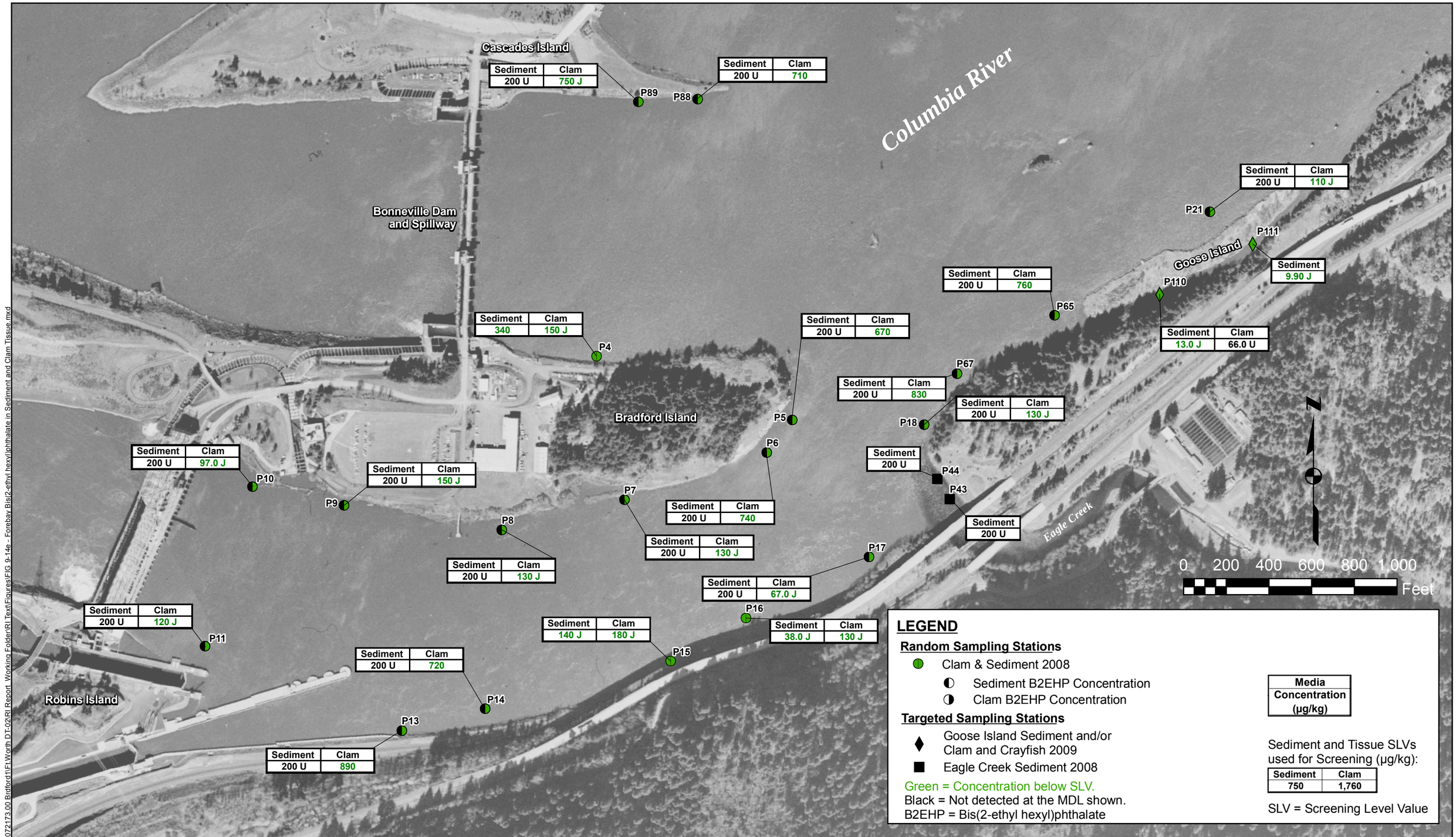

O:\25692709 USACE\53-F0072173.00 Bradford\Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 9-14e - Forebay Bis(2-ethyl hexyl)phthalate in Sediment and Clam Tissue.mxd

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RIVER OPERABLE UNIT

FOREBAY B2EHP IN SEDIMENT AND CLAM TISSUE

DRAWING NUMBER: FIGURE 9-14e

GIS FILE NUMBER: FIG 9-14e

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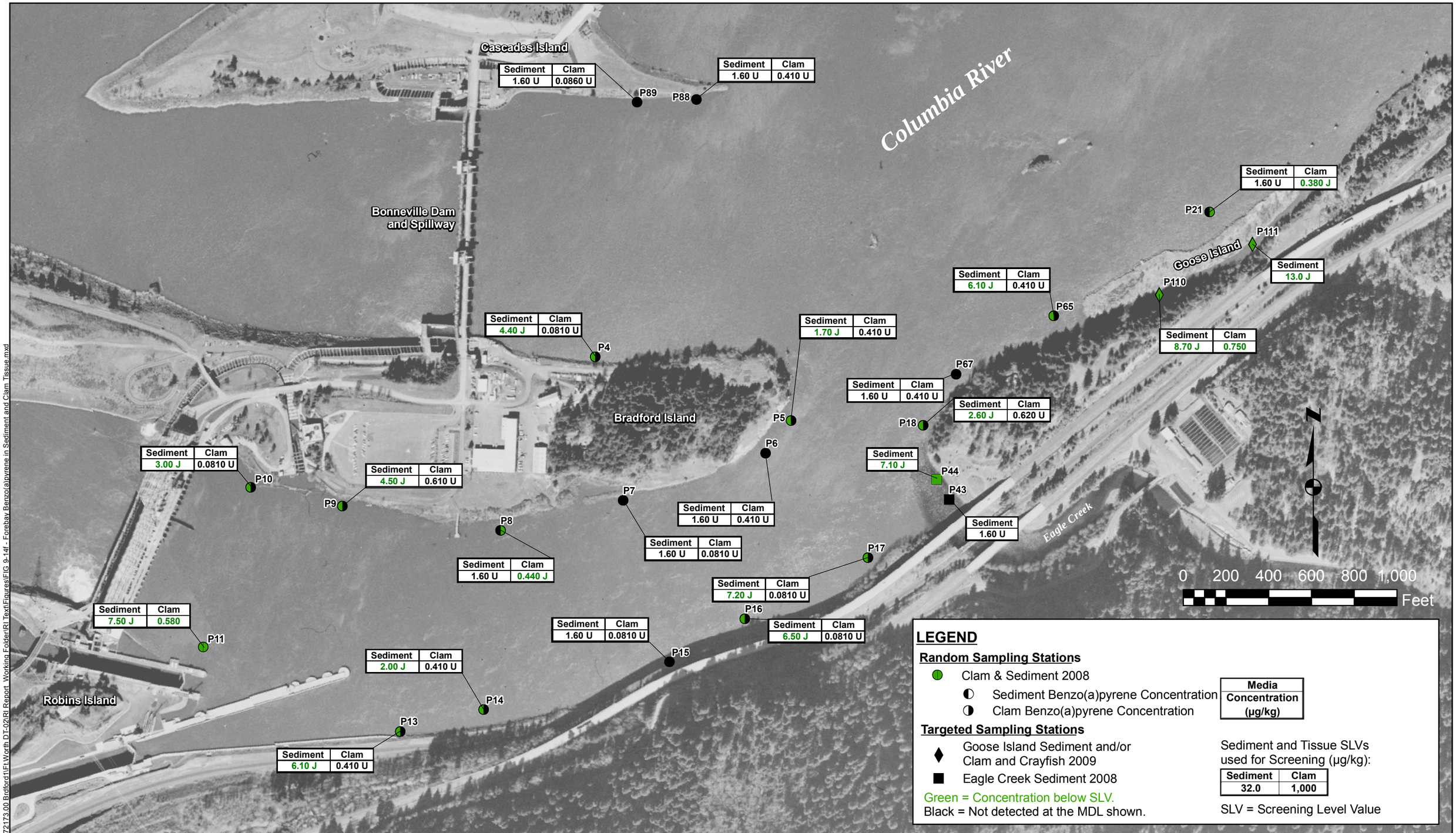

O:\25692709 USACE\53-F0072173.00 Bradford\Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 9-14f - Forebay Benzo(a)pyrene in Sediment and Clam Tissue.mxd

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RIVER OPERABLE UNIT

FOREBAY BENZO(A)PYRENE IN SEDIMENT AND CLAM TISSUE

DRAWING NUMBER: FIGURE 9-14f

GIS FILE NUMBER: FIG 9-14f

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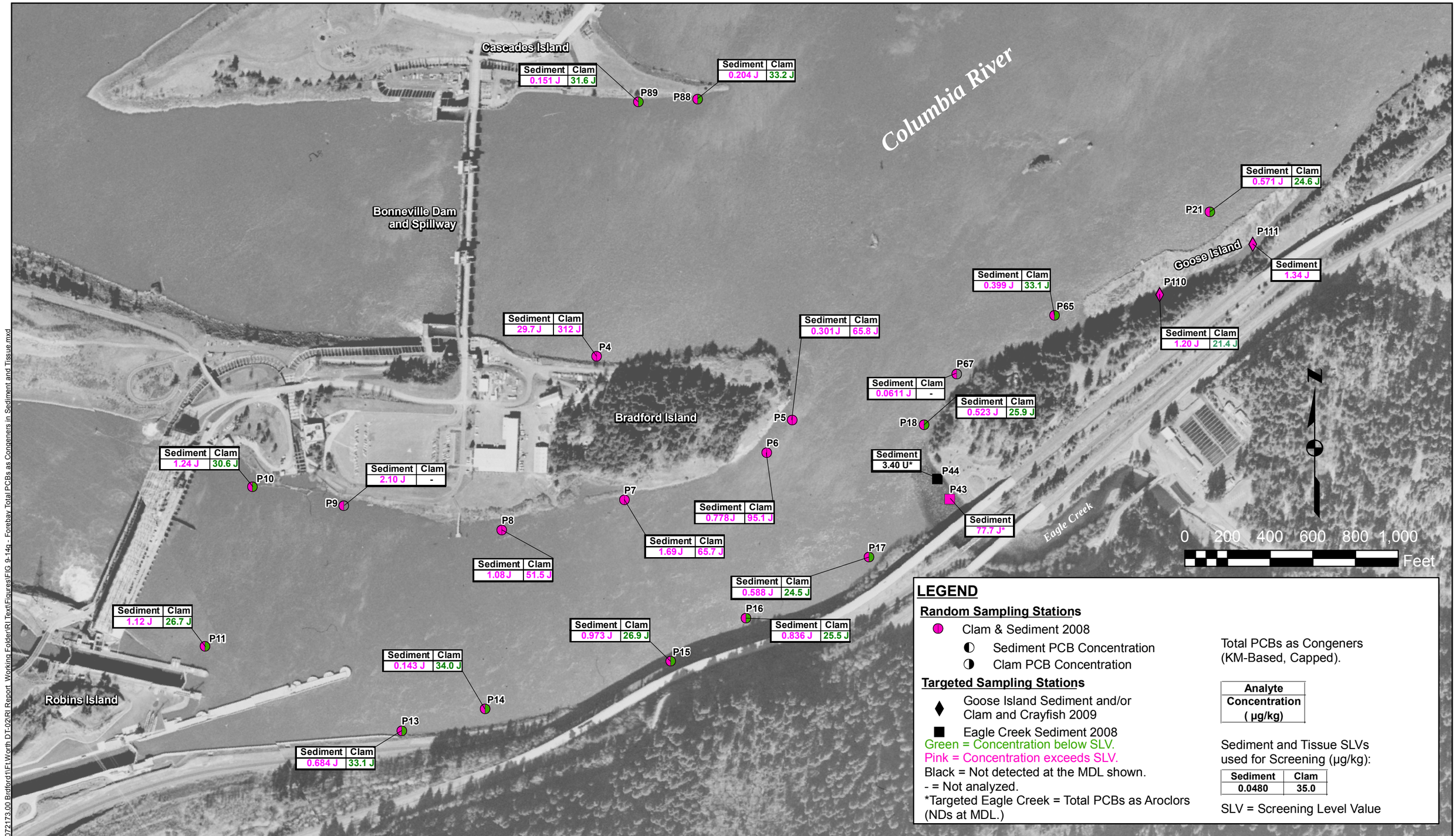

LEGEND

Random Sampling Stations

- Clam & Sediment 2008
  - Sediment PCB Concentration
  - Clam PCB Concentration

Targeted Sampling Stations

- Goose Island Sediment and/or Clam and Crayfish 2009
- Eagle Creek Sediment 2008

Green = Concentration below SLV.
Pink = Concentration exceeds SLV.
Black = Not detected at the MDL shown.
- = Not analyzed.
*Targeted Eagle Creek = Total PCBs as Aroclors (NDs at MDL.)

Total PCBs as Congeners (KM-Based, Capped).

Analyte Concentration (µg/kg)

Sediment and Tissue SLVs used for Screening (µg/kg):

Sediment	Clam
0.0480	35.0

SLV = Screening Level Value

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

RIVER OPERABLE UNIT

FOREBAY TOTAL PCBs AS CONGENERS IN SEDIMENT AND CLAM TISSUE

DRAWING NUMBER: FIGURE 9-14g
GIS FILE NUMBER: FIG 9-14g
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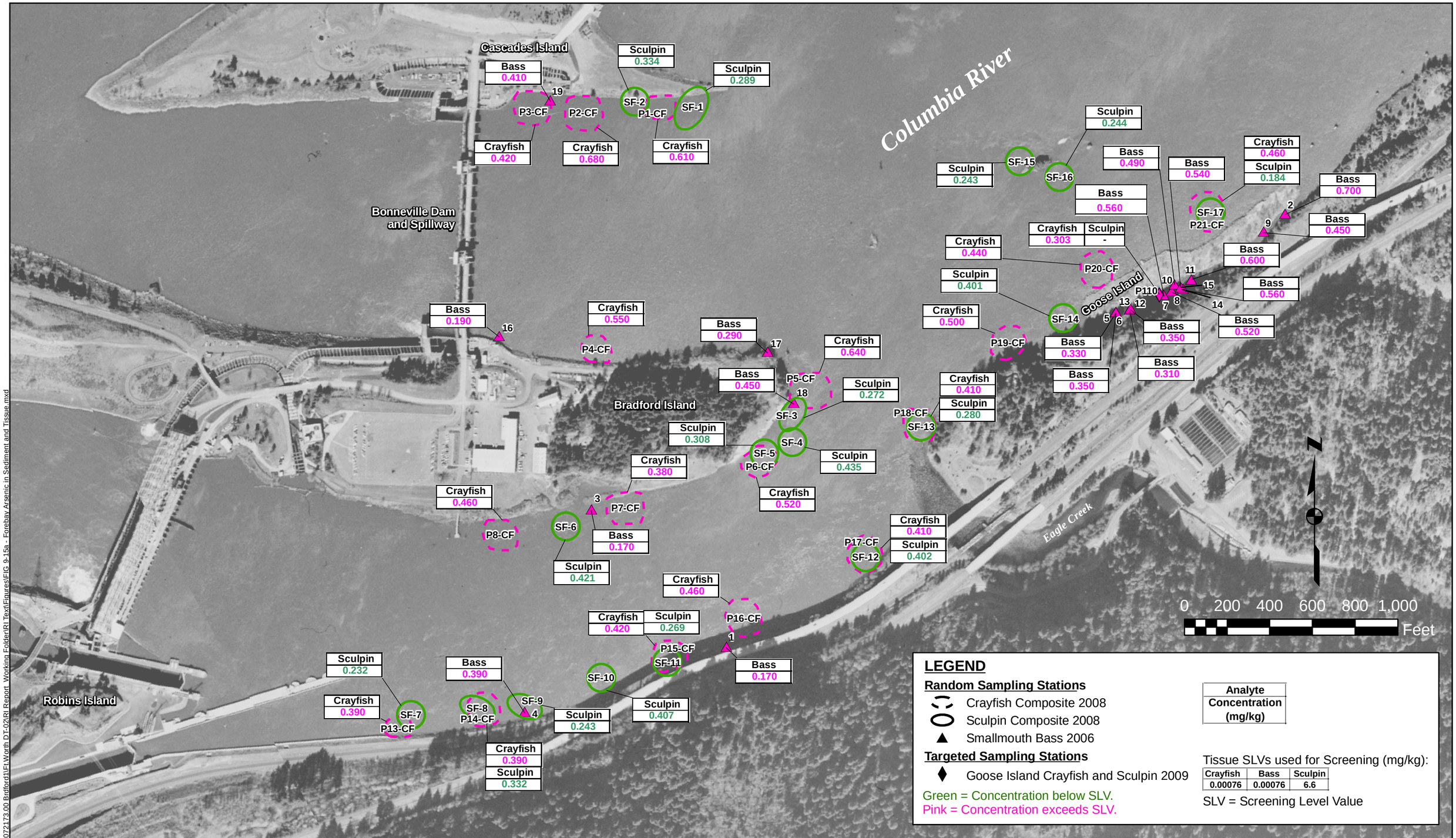

O:\25692709 USACE153-F0072173.00 Bradford1\Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 9-15a - Forebay Arsenic in Sediment and Tissue.mxd

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RIVER OPERABLE UNIT

FOREBAY ARSENIC IN CRAYFISH, SCULPIN, AND SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIGURE 9-15a

GIS FILE NUMBER: FIG 9-15a

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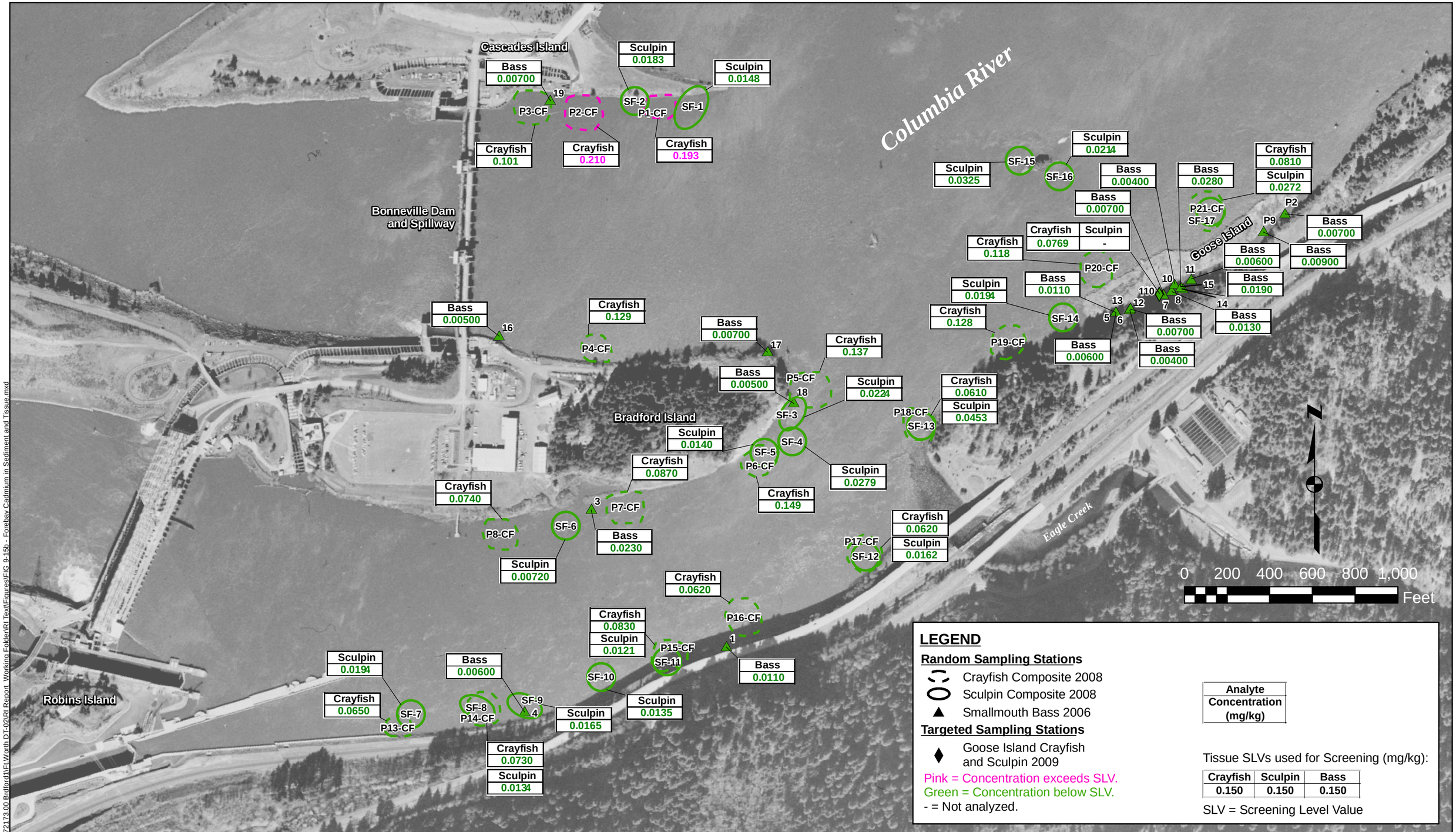

O:\25692709 USACE\53-F0072173.00 Bradford\Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 9-15b - Forebay Cadmium in Sediment and Tissue.mxd

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

RIVER OPERABLE UNIT

FOREBAY CADMIUM IN CRAYFISH, SCULPIN AND SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIGURE 9-15b

GIS FILE NUMBER: FIG 9-15b

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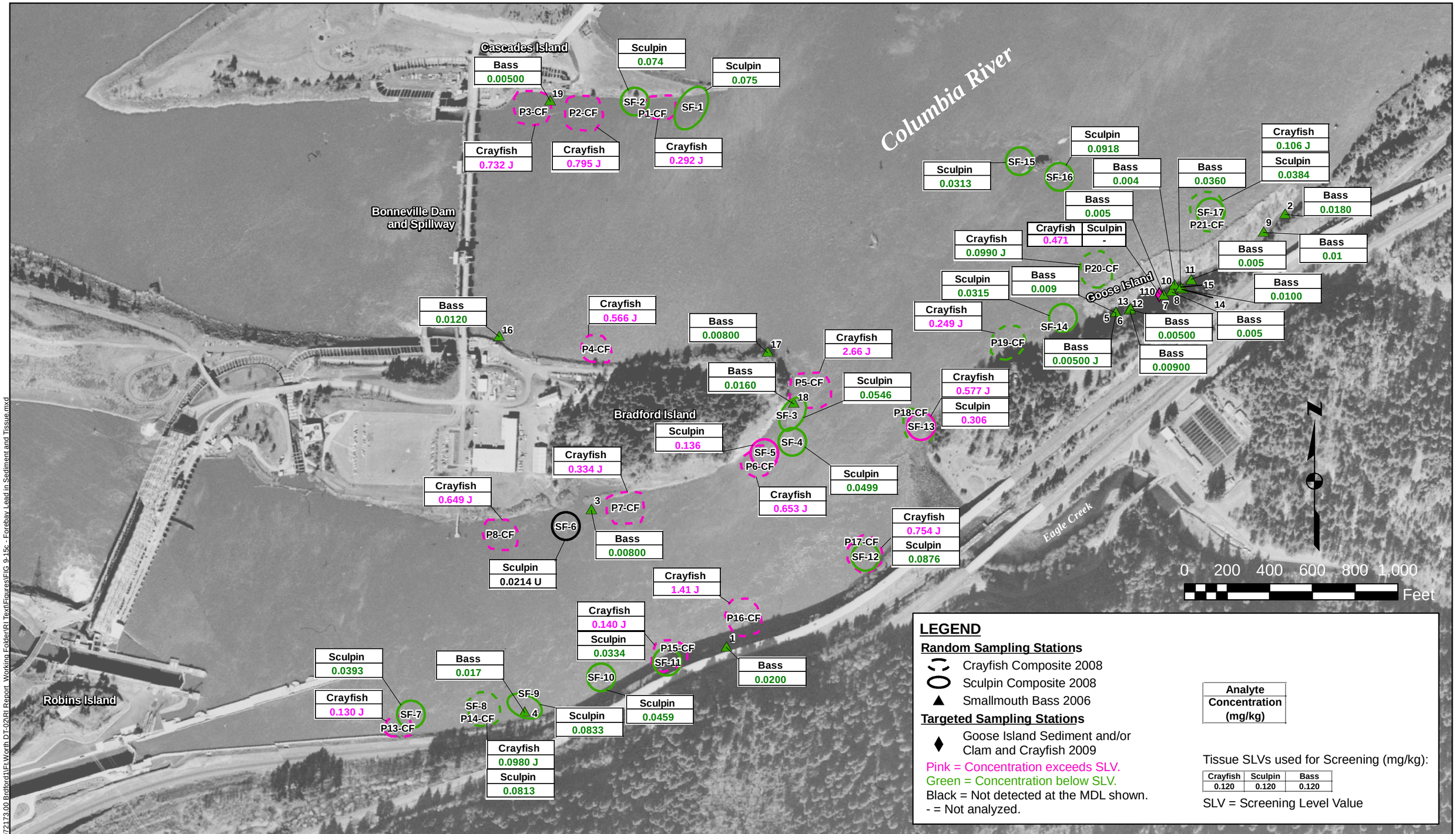

Q:\25692709 USACE\53-F0072173.00 Bradford\1Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-15c - Forebay Lead in Sediment and Tissue.mxd

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

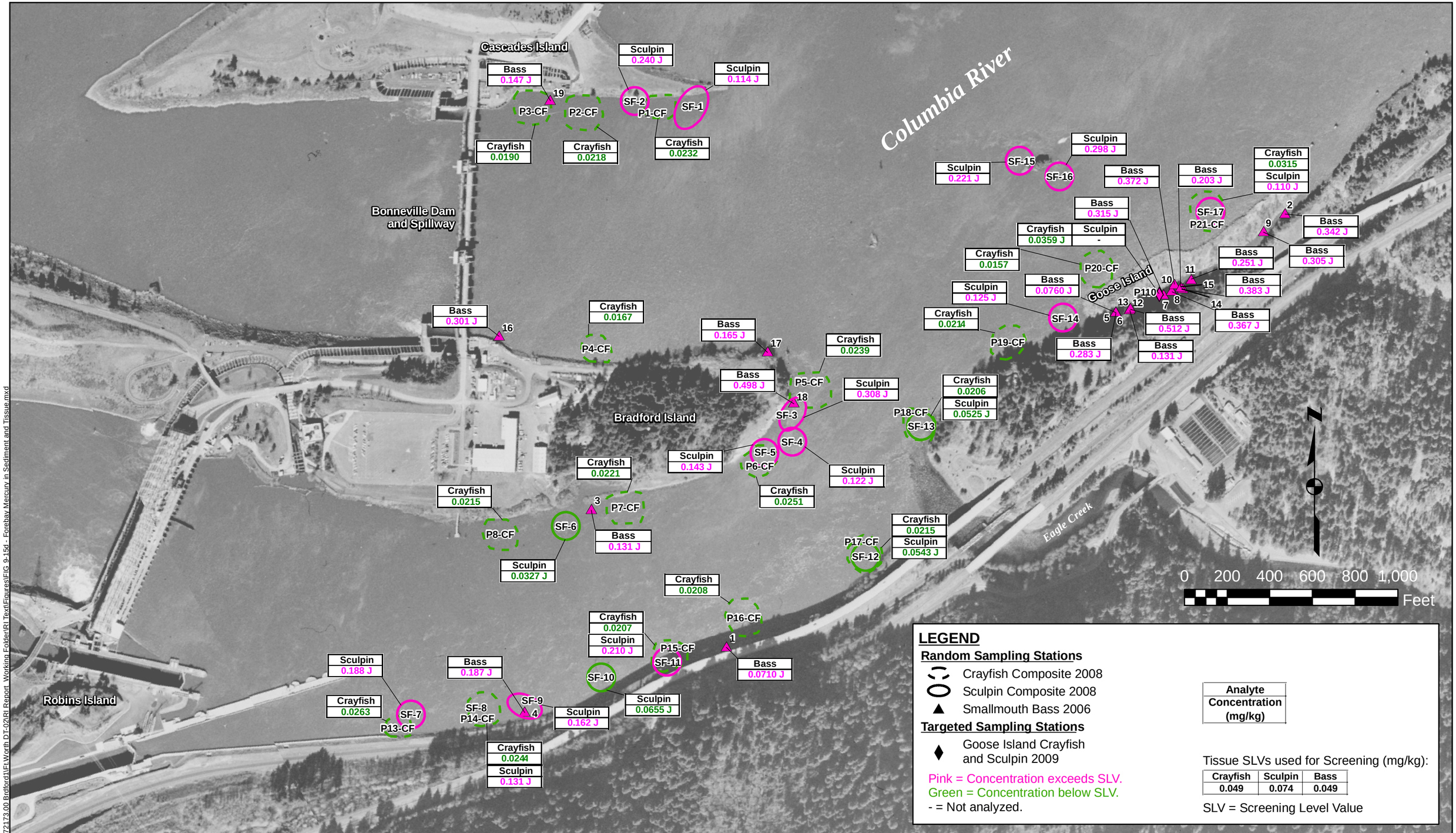
RIVER OPERABLE UNIT

FOREBAY LEAD IN CRAYFISH, SCULPIN, AND SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIGURE 9-15c

GIS FILE NUMBER: FIG 9-15c

SHEET: REV.



O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 9-15d - Forebay Mercury in Sediment and Tissue.mxd

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

RIVER OPERABLE UNIT

FOREBAY MERCURY IN CRAYFISH, SCULPIN, AND SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIGURE 9-15d

GIS FILE NUMBER: FIG 9-15d

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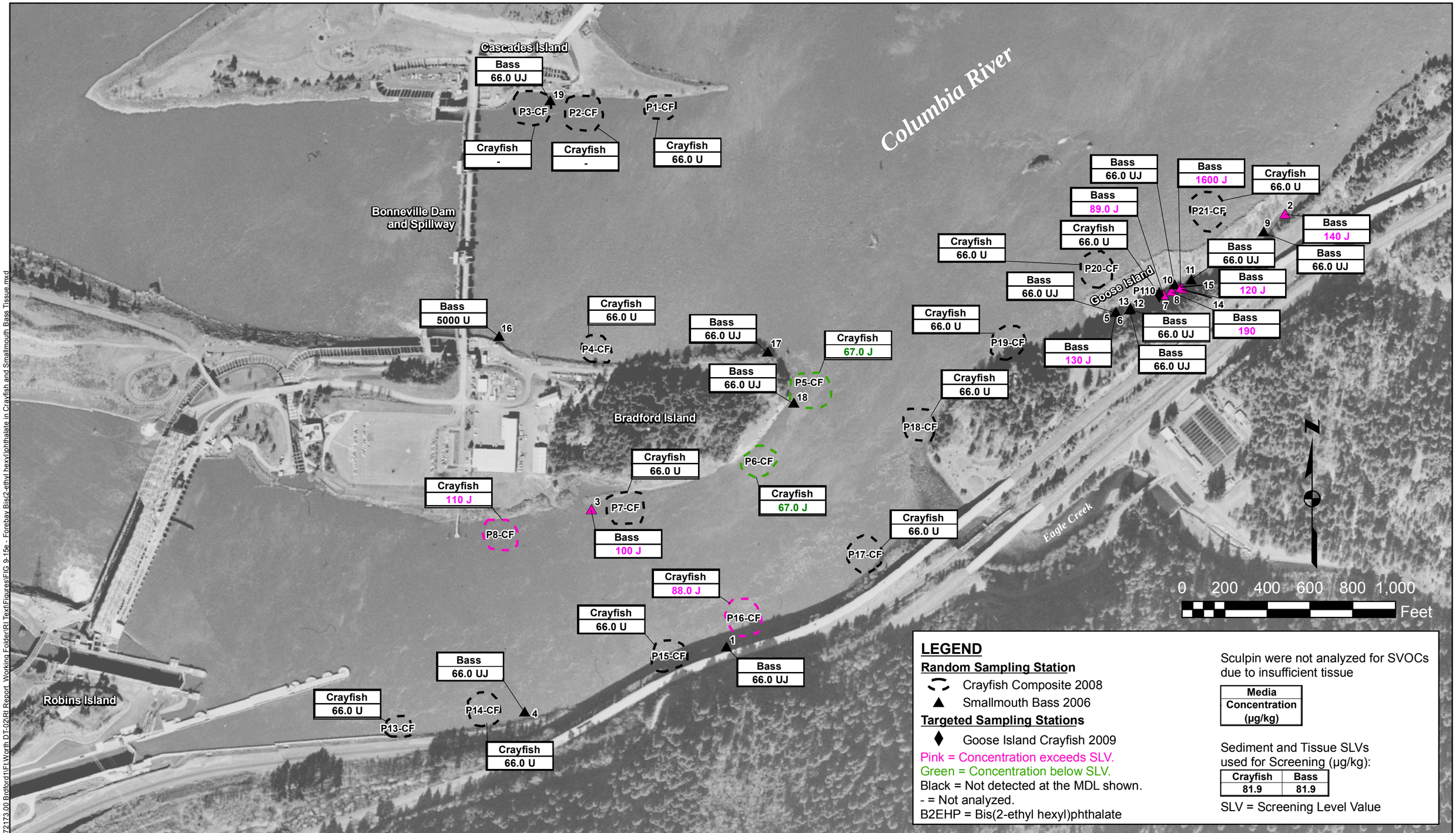

O:\25692709 USACE\53-F0072173.00 Bradford1\Fl\Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 9-15e - Forebay Bis(2-ethyl hexyl)phthalate in Crayfish and Smallmouth Bass Tissue.mxd

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

RIVER OPERABLE UNIT

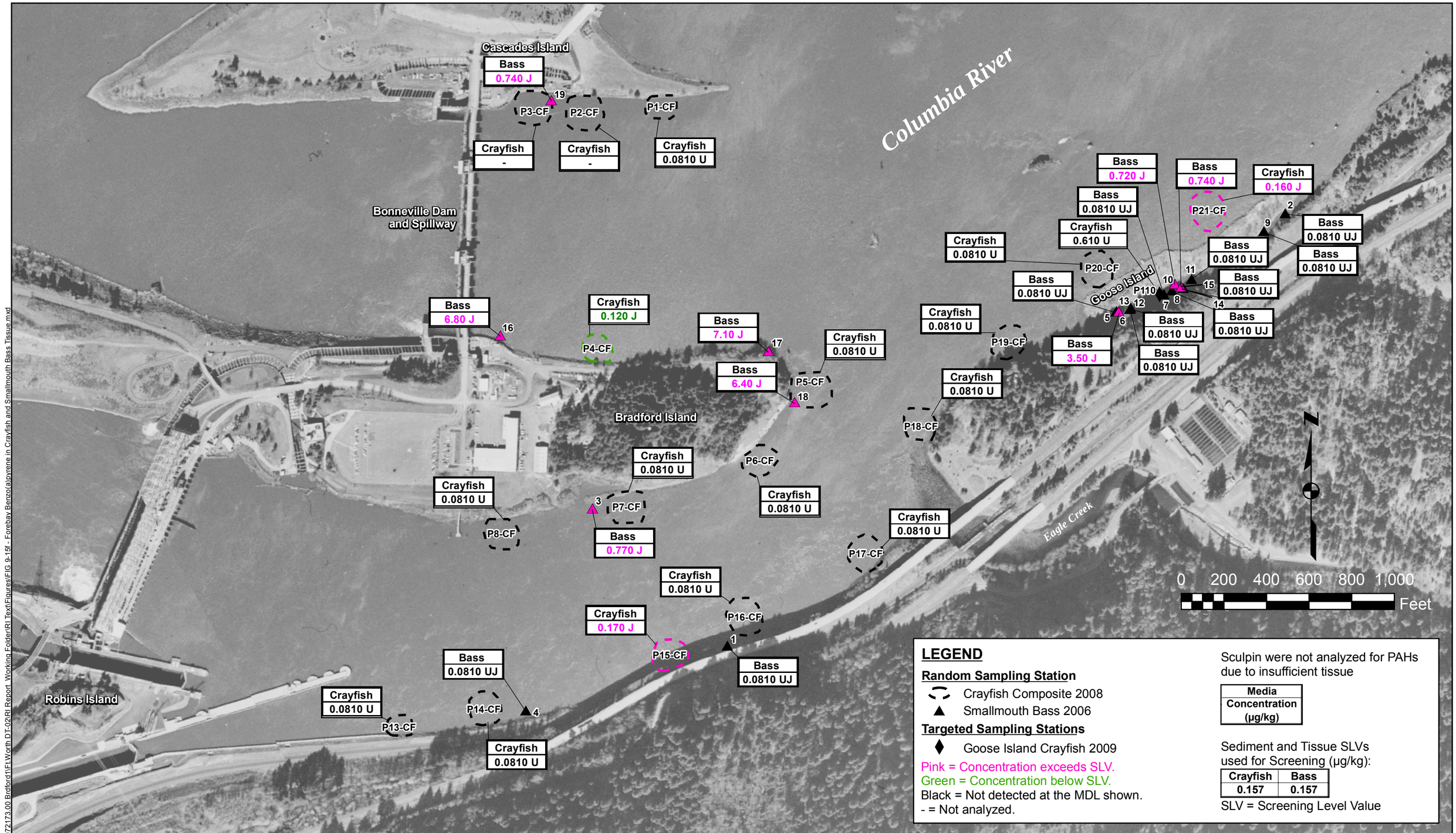
FOREBAY B2EHP IN CRAYFISH AND SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIGURE 9-15e

GIS FILE NUMBER: FIG 9-15e

SHEET:

REV.



LEGEND

Random Sampling Station

- Crayfish Composite 2008
- Smallmouth Bass 2006

Targeted Sampling Stations

- Goose Island Crayfish 2009

Pink = Concentration exceeds SLV.
Green = Concentration below SLV.
Black = Not detected at the MDL shown.
- = Not analyzed.

Sculpin were not analyzed for PAHs due to insufficient tissue

Media Concentration (µg/kg)

Sediment and Tissue SLVs used for Screening (µg/kg):

Crayfish	Bass
0.157	0.157

SLV = Screening Level Value

JOB No. 25696528	DESIGNED: LSM	PROJ. ENGINEER: LSM	
	DRAWN BY: SB	APPROVED BY: MP	
	CHECKED BY: SB	DATE: JULY 2010	

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BRADFORD ISLAND

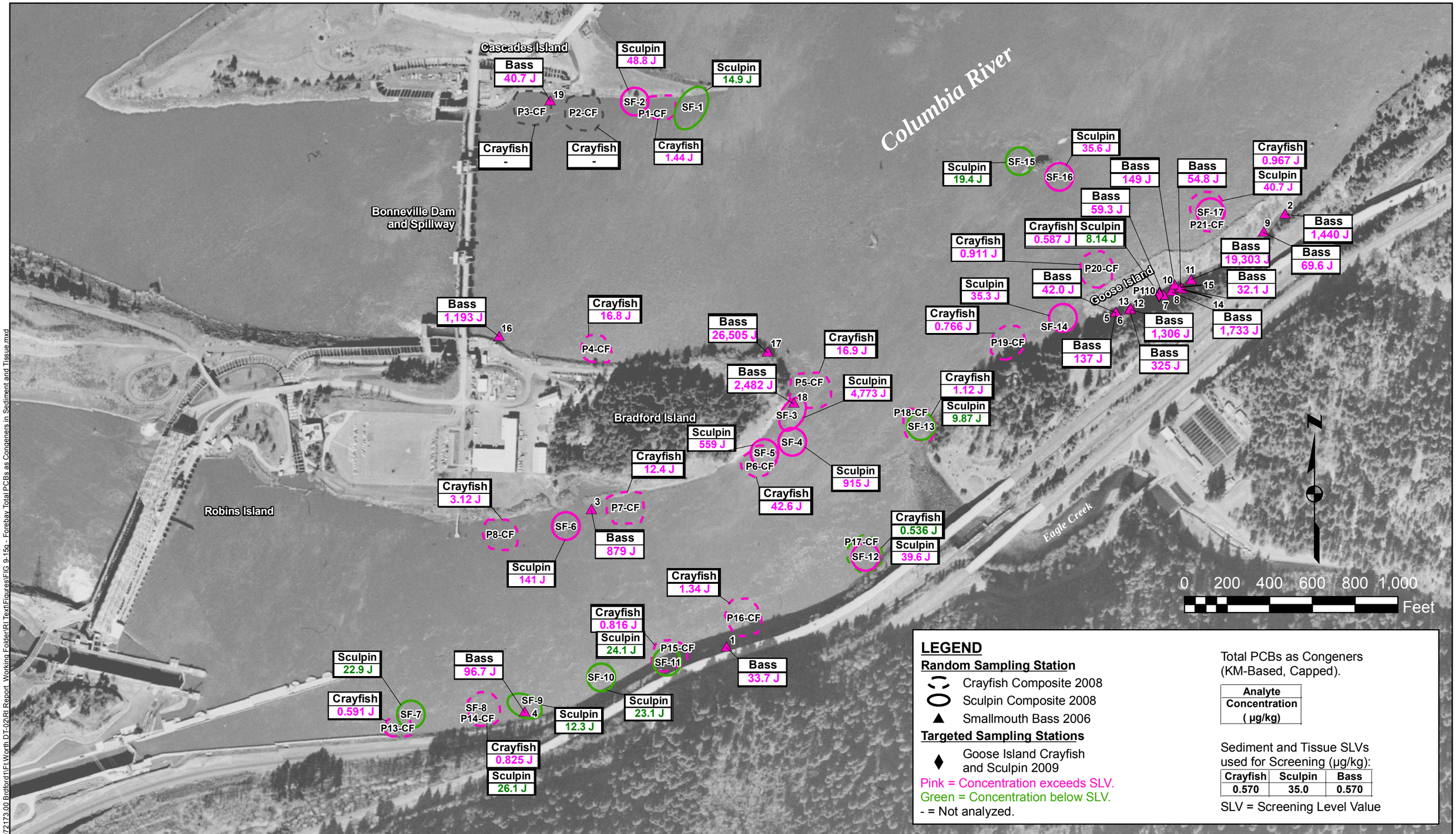
CASCADE LOCKS, OREGON

RIVER OPERABLE UNIT

FOREBAY BENZO(A)PYRENE IN CRAYFISH AND SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIGURE 9-15f
GIS FILE NUMBER: FIG 9-15f
SHEET:
REV.

Q:\25692709 USACE\53-F0072173.00 Bradford\1Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 9-15f - Forebay Benzo(a)pyrene in Crayfish and Smallmouth Bass Tissue.mxd



O:\25692709 USACE\53-F0072173.00 Bradford\Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 9-15g - Forebay Total PCBs as Conneners in Sediment and Tissue.mxd

JOB No.	DESIGNED:	PROJ. ENGINEER:
25696528	LSM	LSM
	DRAWN BY: SB	APPROVED BY: MP
	CHECKED BY: SB	DATE: OCTOBER 2010

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RIVER OPERABLE UNIT

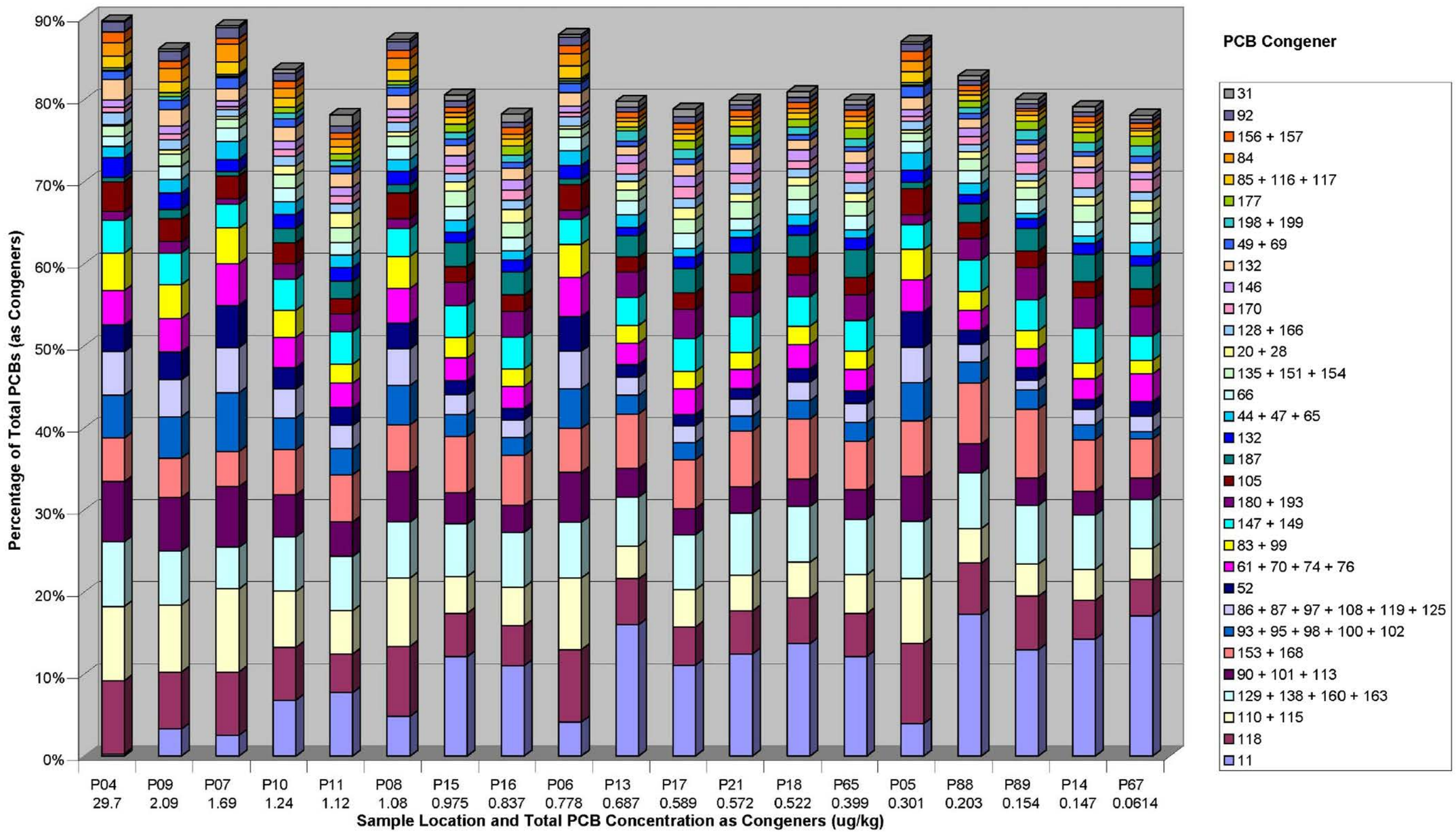
FOREBAY TOTAL PCBs AS CONGENERS IN CRAYFISH, SCULPIN, AND SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIGURE 9-15g

GIS FILE NUMBER: FIG 9-15g

SHEET:

REV.



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JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: JULY 2010

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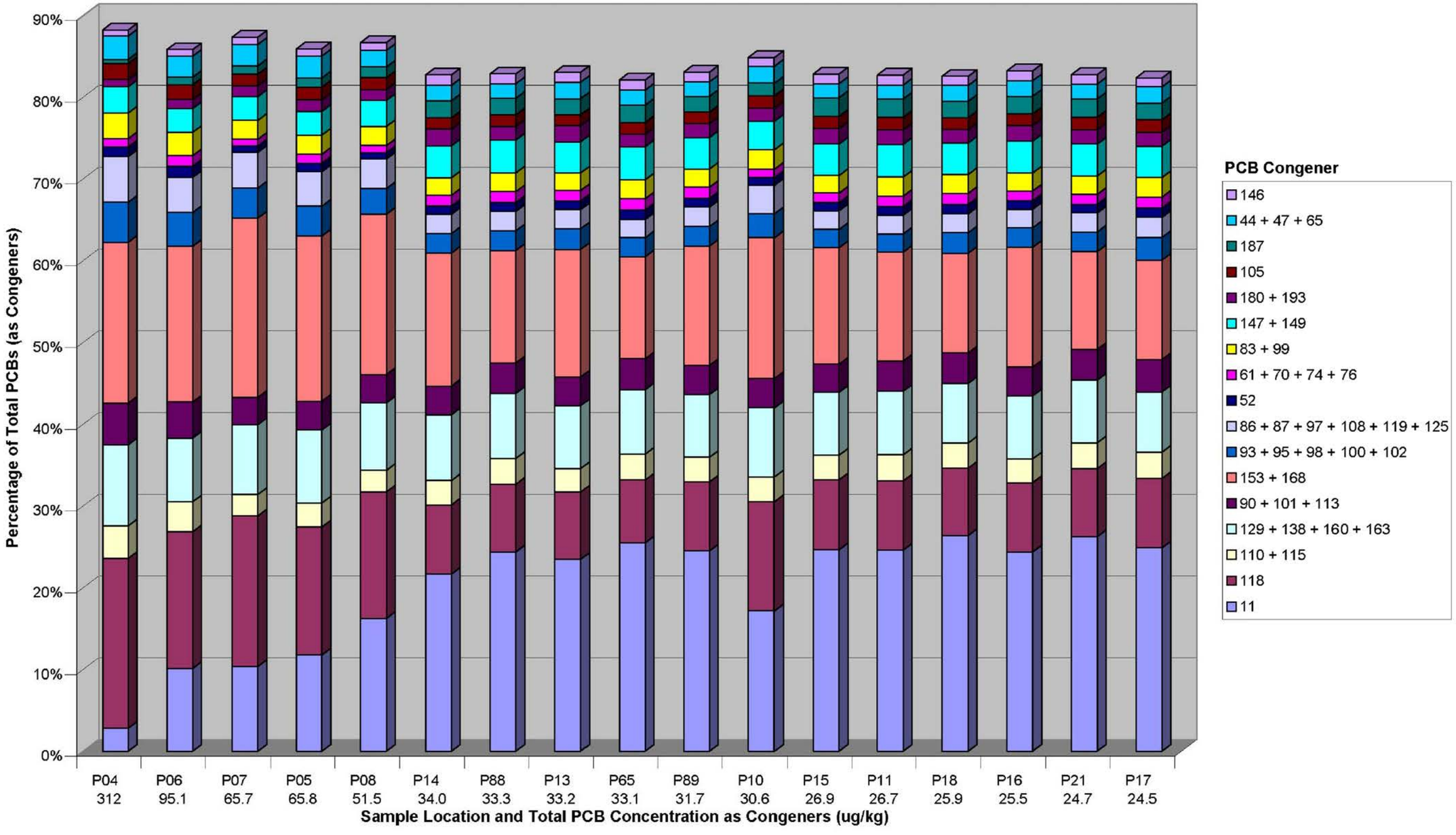
FOREBAY PCB CONGENER
DISTRIBUTION IN SEDIMENT

DRAWING NUMBER: FIG 9-16a
CAD FILE NUMBER: FIG 9-16a
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-16a - Forebay PCB Congener Distribution in Sediment.dwg Nov 18, 2010 - 10:20am



No.	DATE	BY	REVISION

JOB No. 25592946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: JULY 2010

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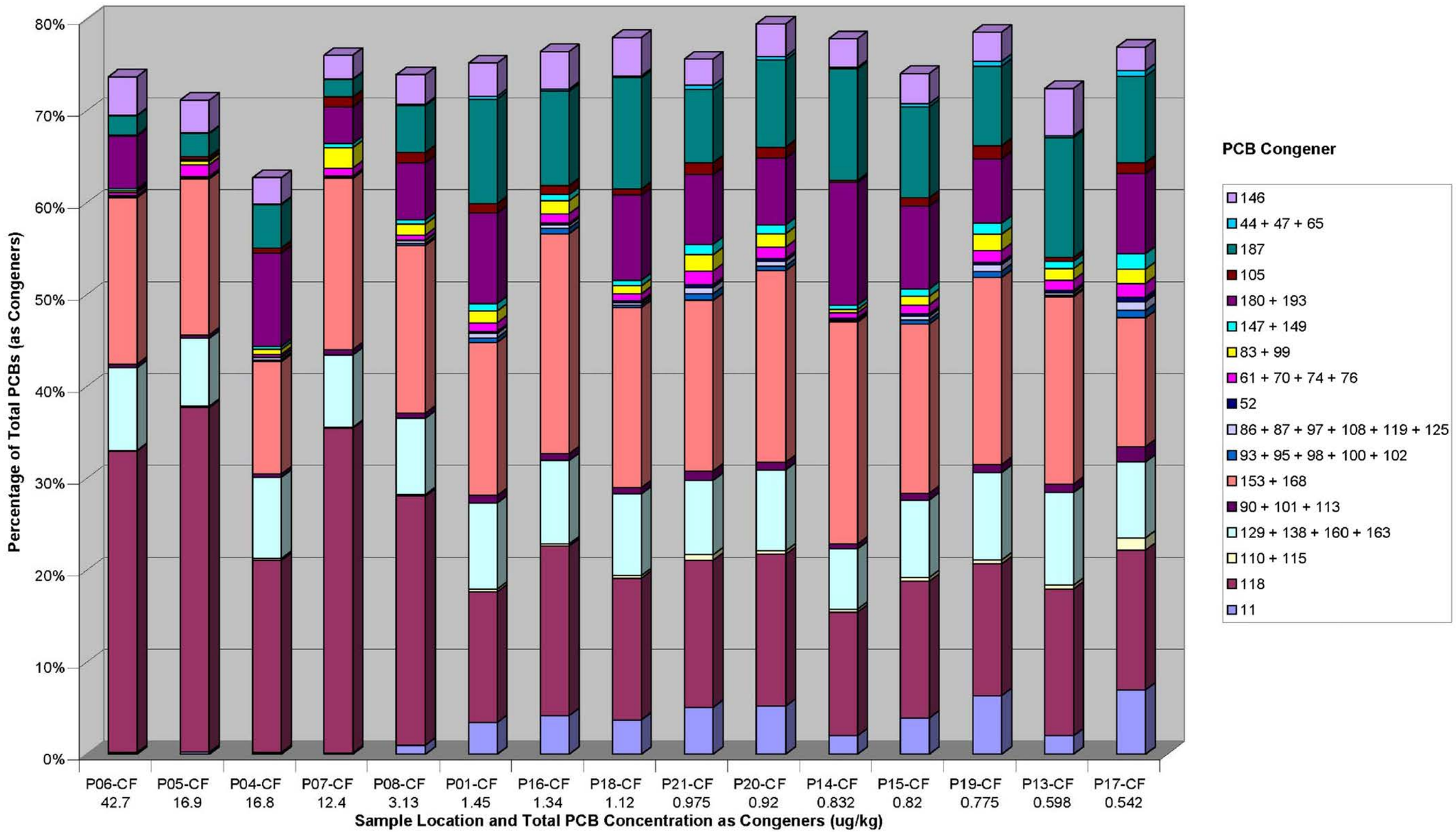
CASCADE LOCKS, OREGON

FOREBAY PCB CONGENER DISTRIBUTION IN CLAM TISSUE

DRAWING NUMBER: FIG 9-16b
CAD FILE NUMBER: FIG 9-16b
SHEET: OF
REV.

O:\25592709 USACE\53-F0072173.00 Bradford\FL-Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-16b - Forebay PCB Congener Distribution in Clam Tissue.dwg Nov 18, 2010 - 10:21am



No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: JULY 2010

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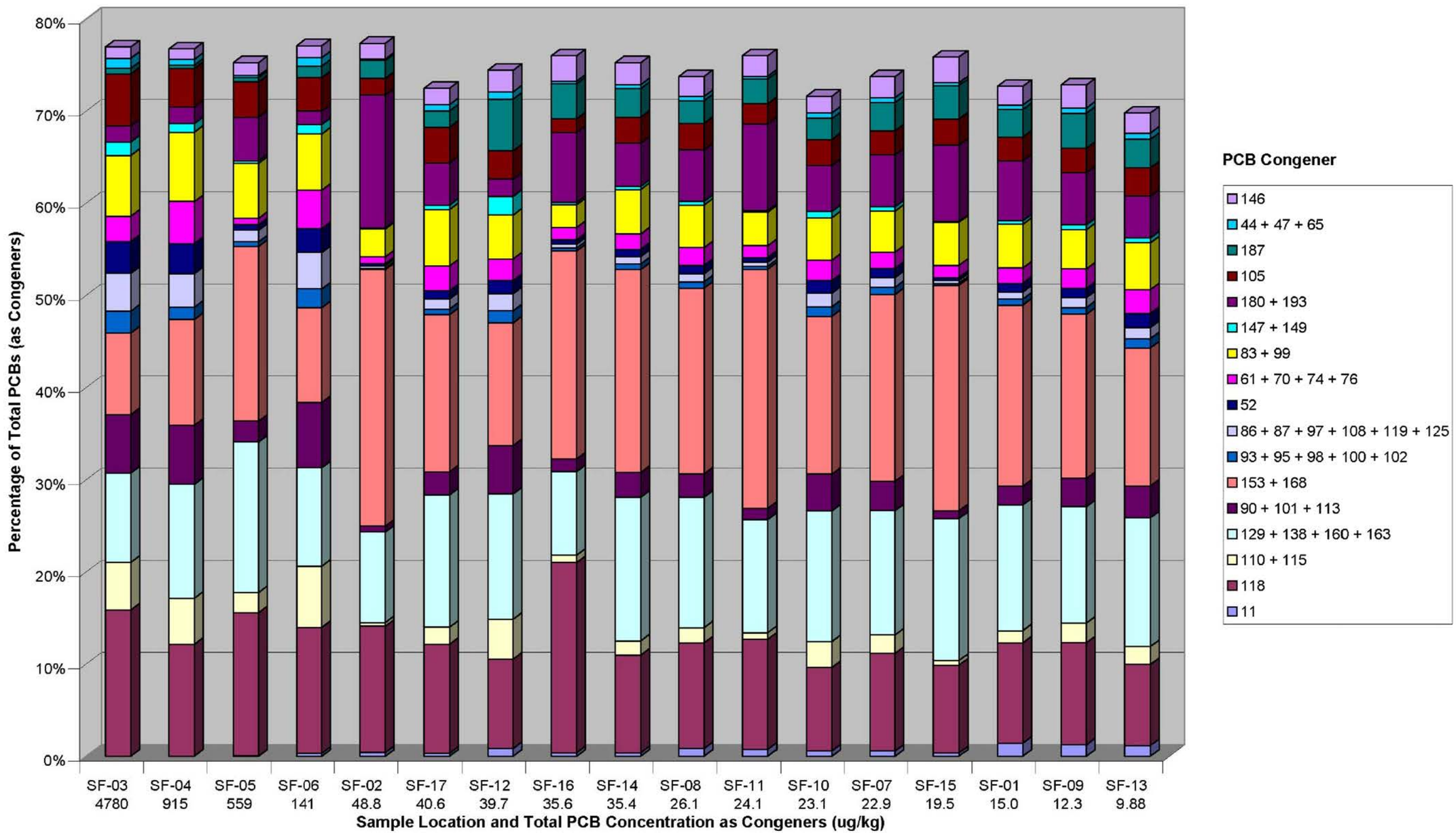
CASCADE LOCKS, OREGON

FOREBAY PCB CONGENER
DISTRIBUTION IN CRAYFISH TISSUE

DRAWING NUMBER: FIG 9-16c
CAD FILE NUMBER: FIG 9-16c
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-16c - Forebay PCB Congener Distribution in Crayfish Tissue.dwg Nov 18, 2010 - 10:21am



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JOB No.	DESIGNED:	PROJ. MANAGER:
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SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: JULY 2010

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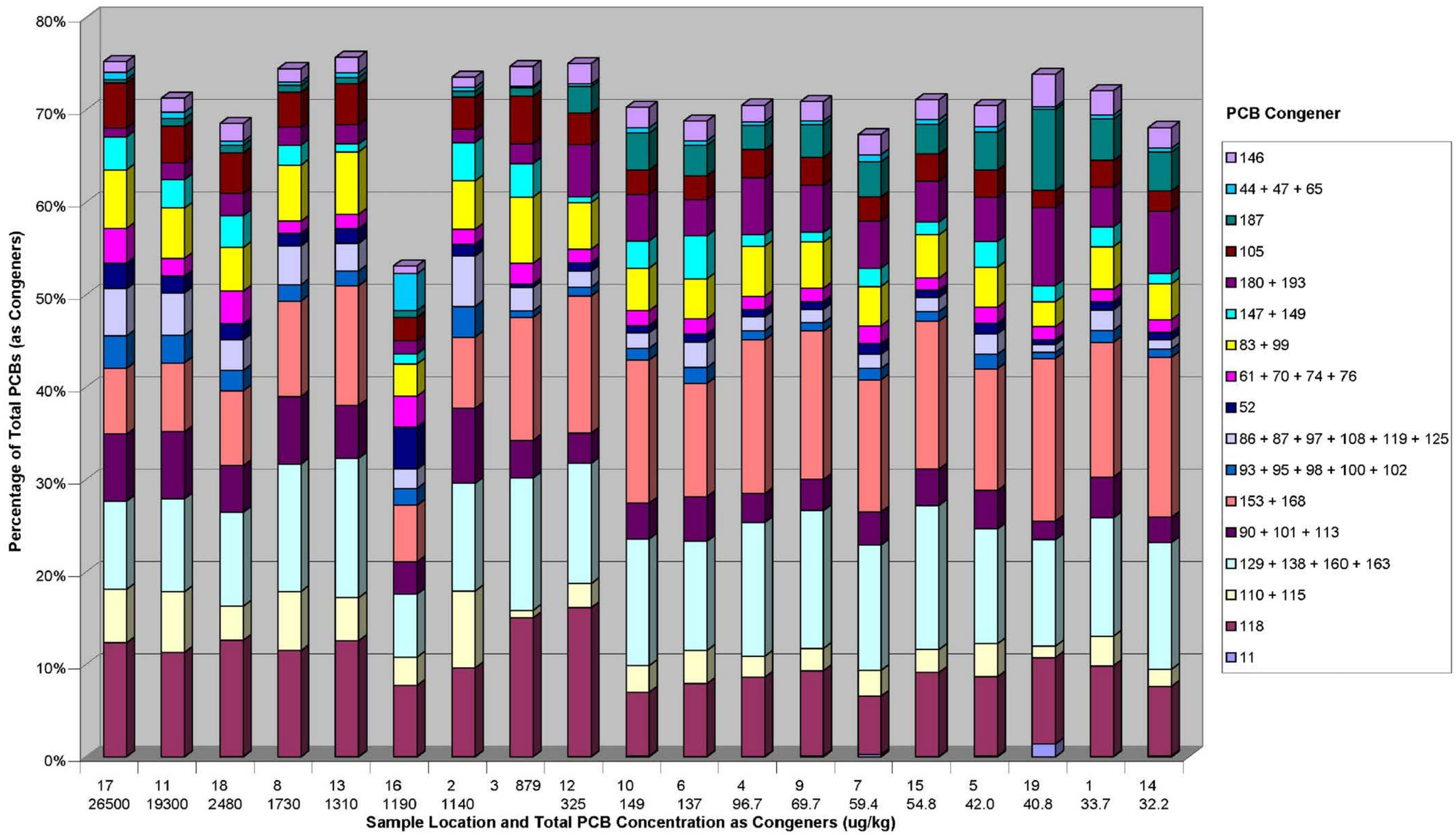
CASCADE LOCKS, OREGON

FOREBAY PCB CONGENER
DISTRIBUTION IN SCULPIN TISSUE

DRAWING NUMBER: FIG 9-16d
CAD FILE NUMBER: FIG 9-16d
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-16d - Forebay PCB Congener Distribution in Sculpin Tissue.dwg Nov 18, 2010 - 10:22am



No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: JULY 2010

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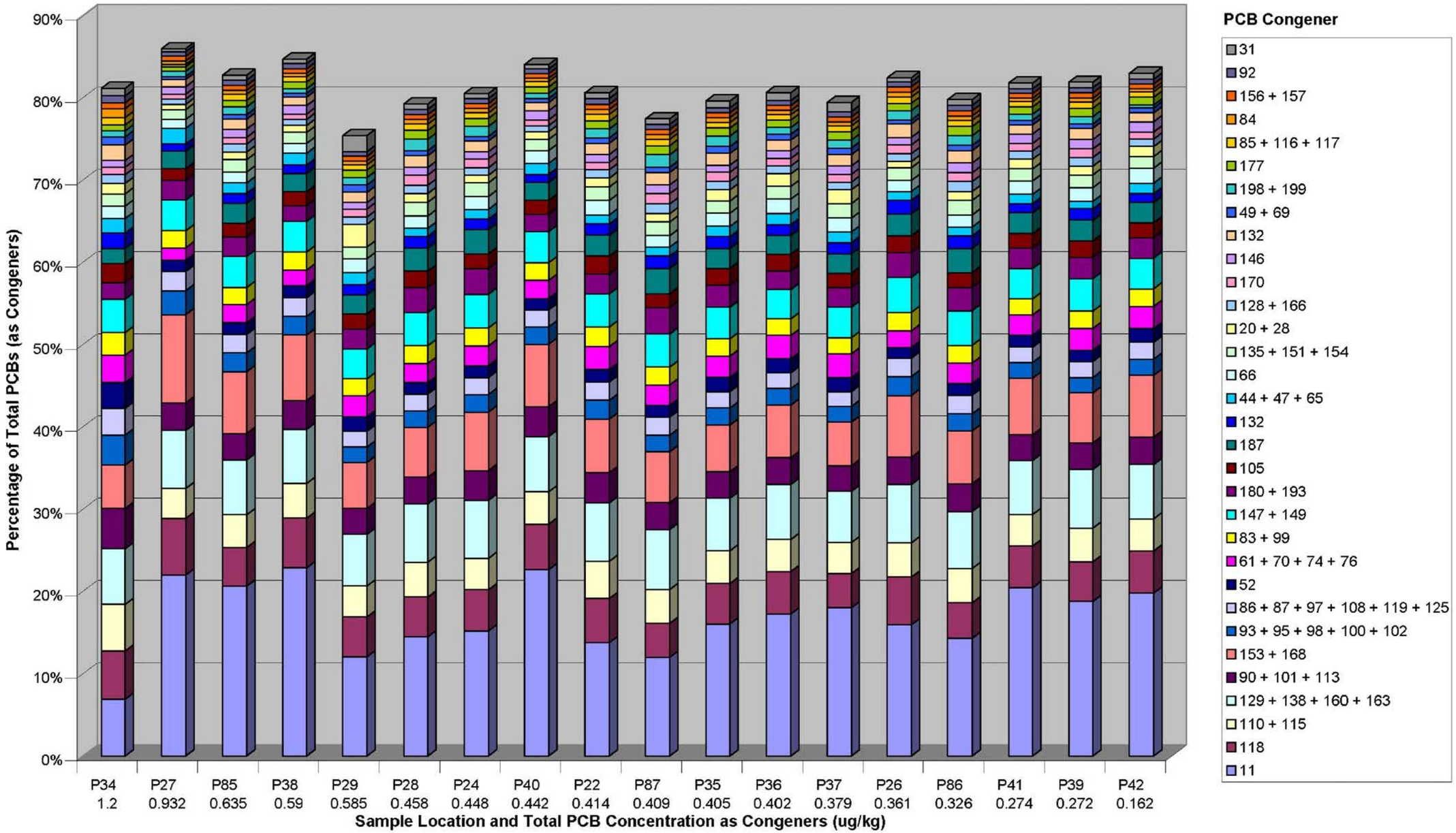
FOREBAY PCB CONGENER
DISTRIBUTION IN SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIG 9-16e
CAD FILE NUMBER: FIG 9-16e
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-16e - Forebay PCB Congener Distribution in Smallmouth Bass Tissue.dwg Nov 18, 2010 - 10:23am



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JOB No.	DESIGNED:	PROJ. MANAGER:
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SCALE:	DRAWN BY: HP	APPROVED BY: LSM
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REFERENCE AREA PCB CONGENER DISTRIBUTION IN SEDIMENT

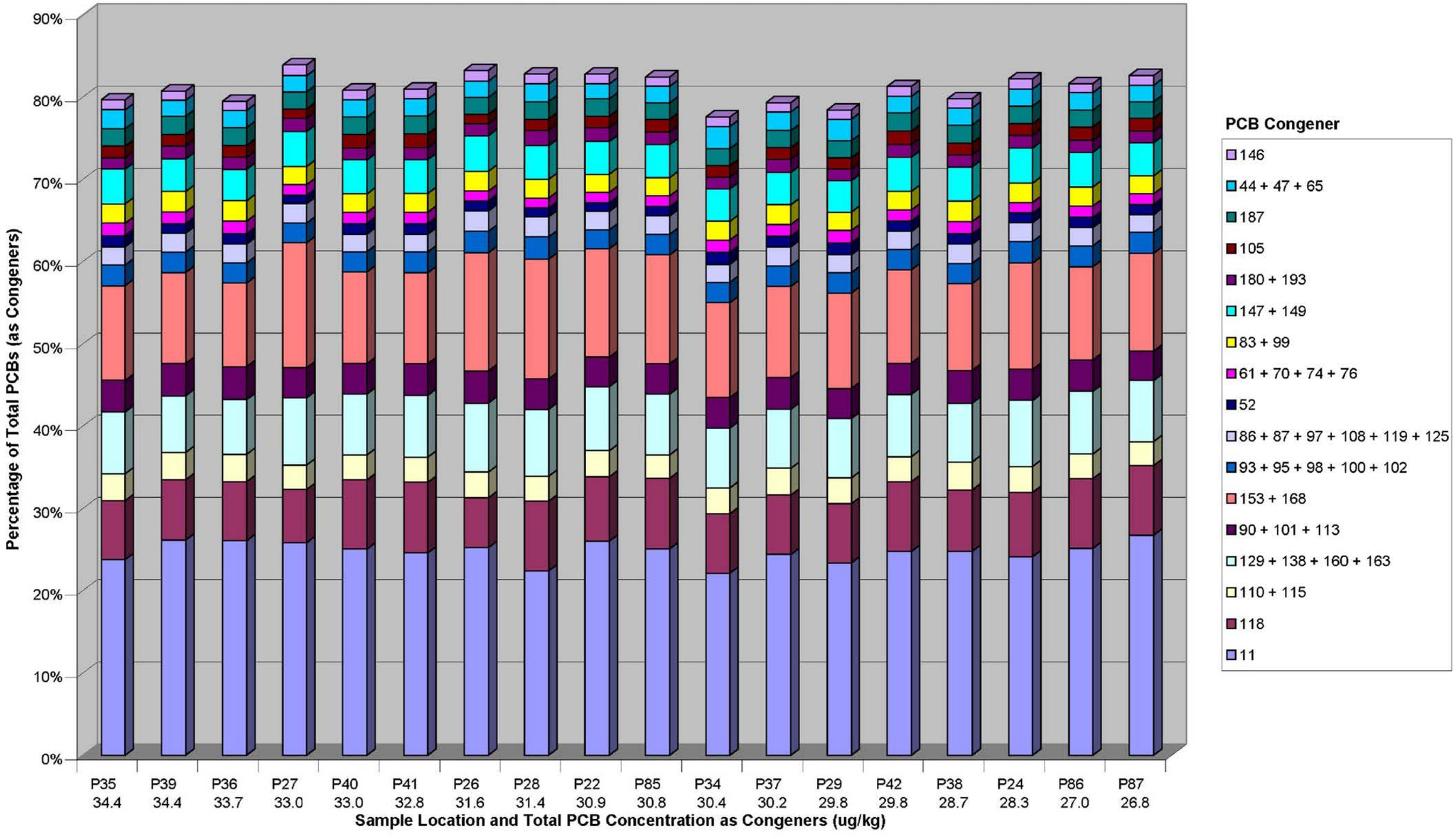
DRAWING NUMBER: FIG 9-17a

CAD FILE NUMBER: FIG 9-17a

SHEET: OF

REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-17a - Reference Area PCB Congener Distribution in Sediment.dwg Nov 18, 2010 - 10:23am



No.	DATE	BY	REVISION

JOB No. 25592946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
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REFERENCE AREA PCB CONGENER DISTRIBUTION IN CLAM TISSUE

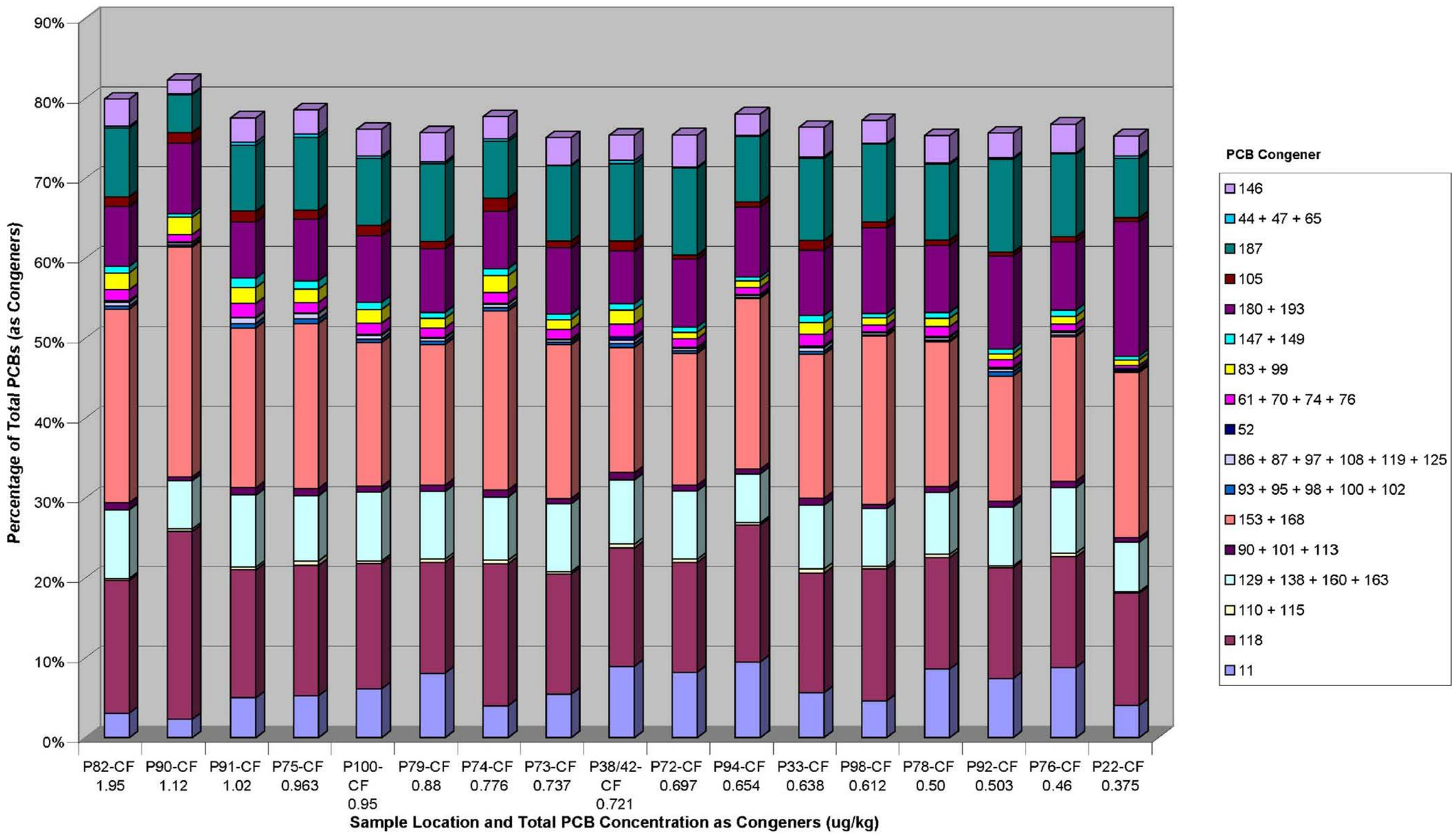
DRAWING NUMBER: FIG 9-17b

CAD FILE NUMBER: FIG 9-17b

SHEET: OF

REV.

C:\25592709 USACE\53-F0072173.00 Bradford\F:\Work DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-17b - Reference Area PCB Congener Distribution in Clam Tissue.dwg Nov 18, 2010 - 10:24am



No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
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REFERENCE AREA PCB CONGENER DISTRIBUTION IN CRAYFISH TISSUE

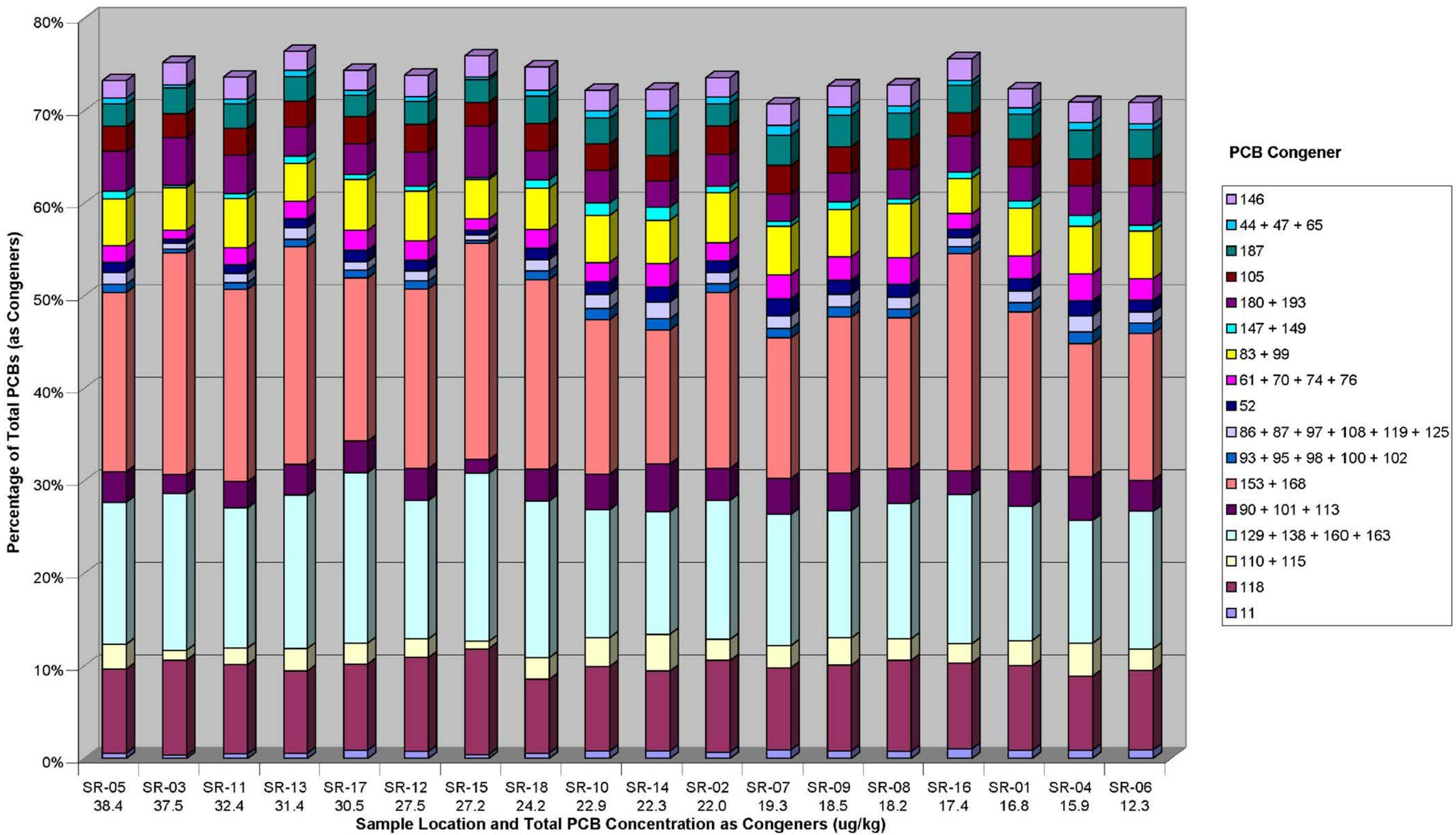
DRAWING NUMBER: FIG 9-17c

CAD FILE NUMBER: FIG 9-17c

SHEET: OF

REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-17c - Reference Area PCB Congener Distribution in Crayfish Tissue.dwg Nov 18, 2010 - 10:24am



No.	DATE	BY	REVISION

JOB No. 25662946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: JULY 2010

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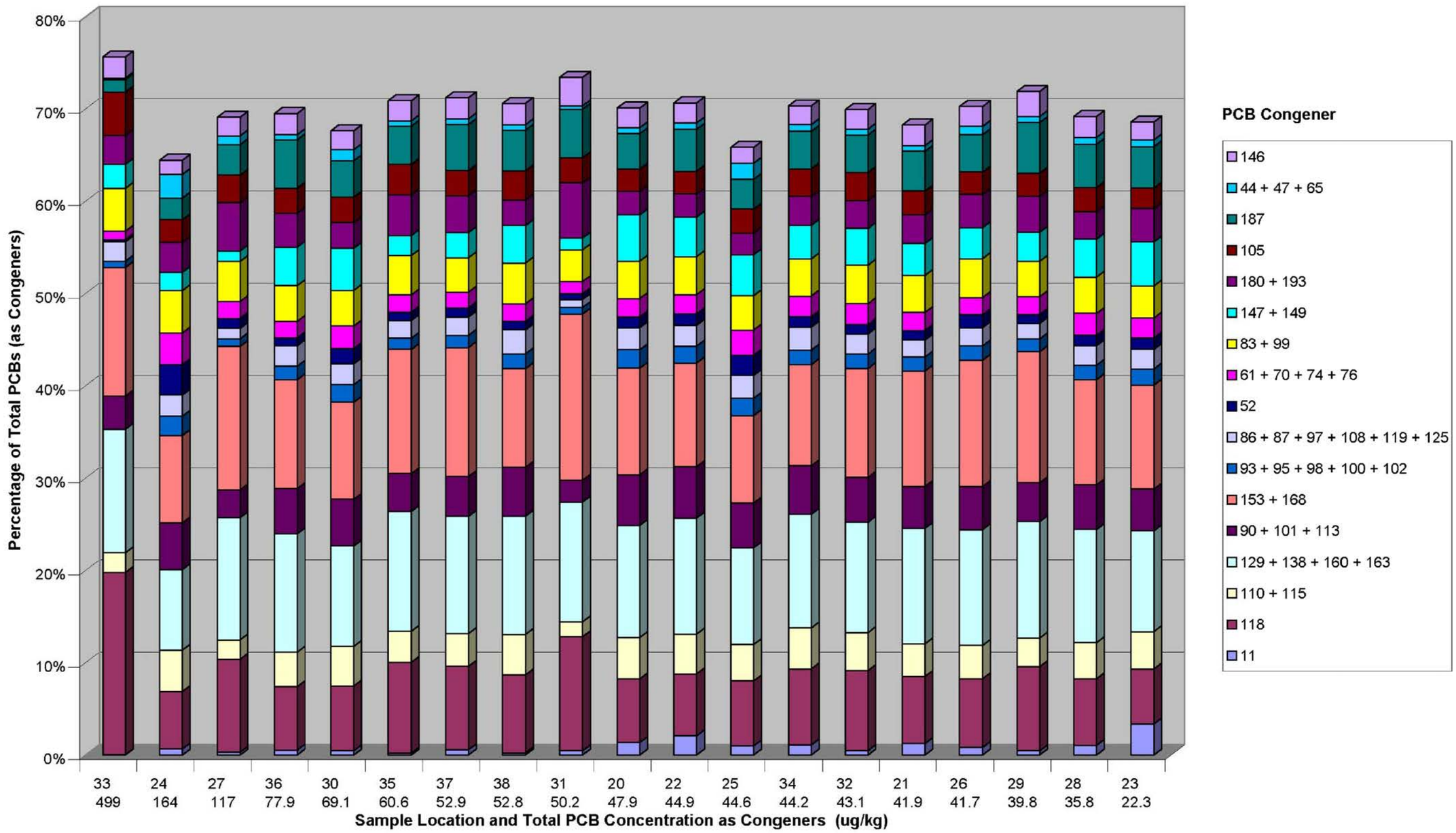
REFERENCE AREA PCB CONGENER DISTRIBUTION IN SCULPIN TISSUE

DRAWING NUMBER: FIG 9-17d
CAD FILE NUMBER: FIG 9-17d
SHEET: OF
REV.

C:\25662709 USACE\53-F0072173.00 Bradford\F:\Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-17d - Reference Area PCB Congener Distribution in Sculpin Tissue.dwg Nov 18, 2010 - 10:25am



No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
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SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: JULY 2010

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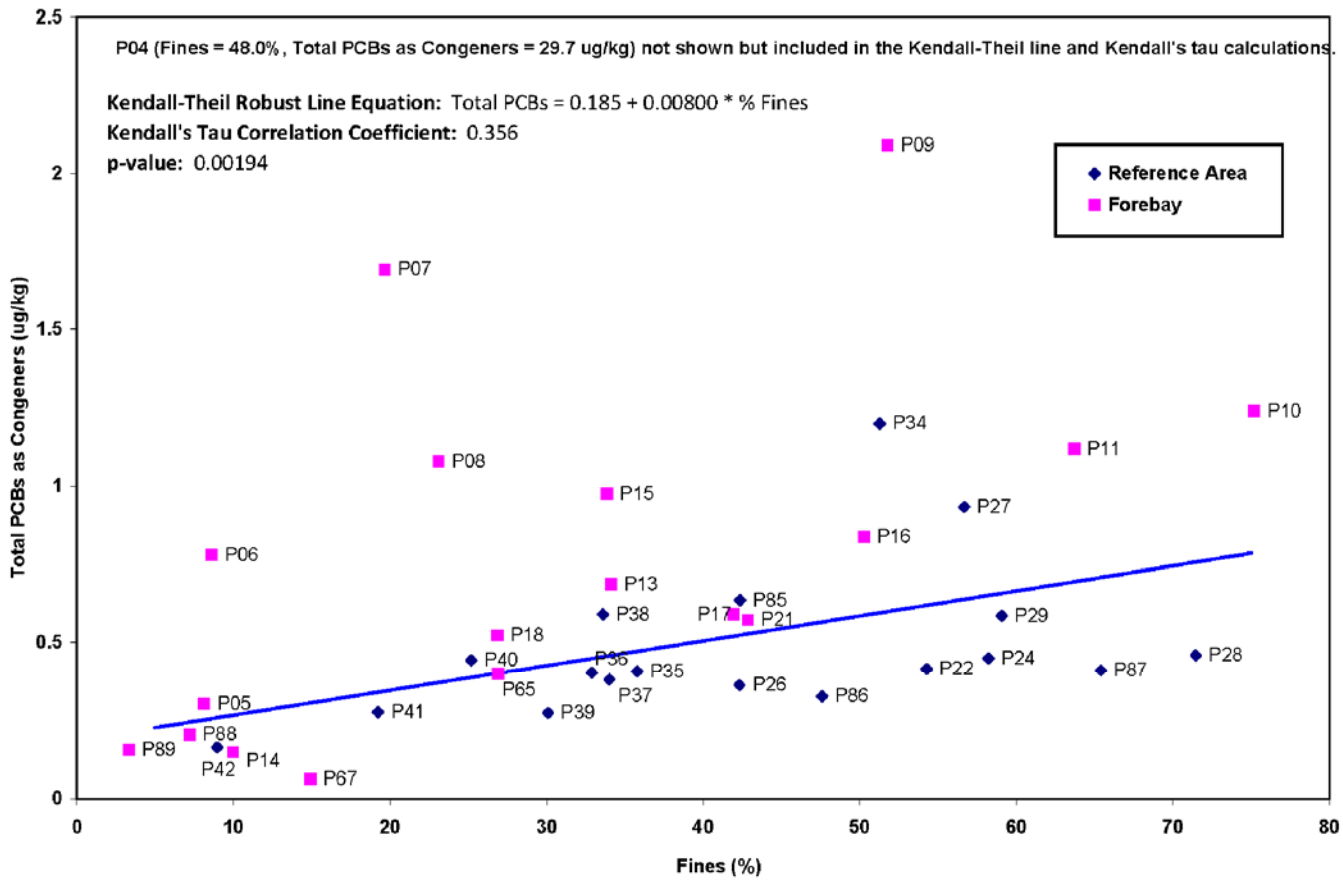
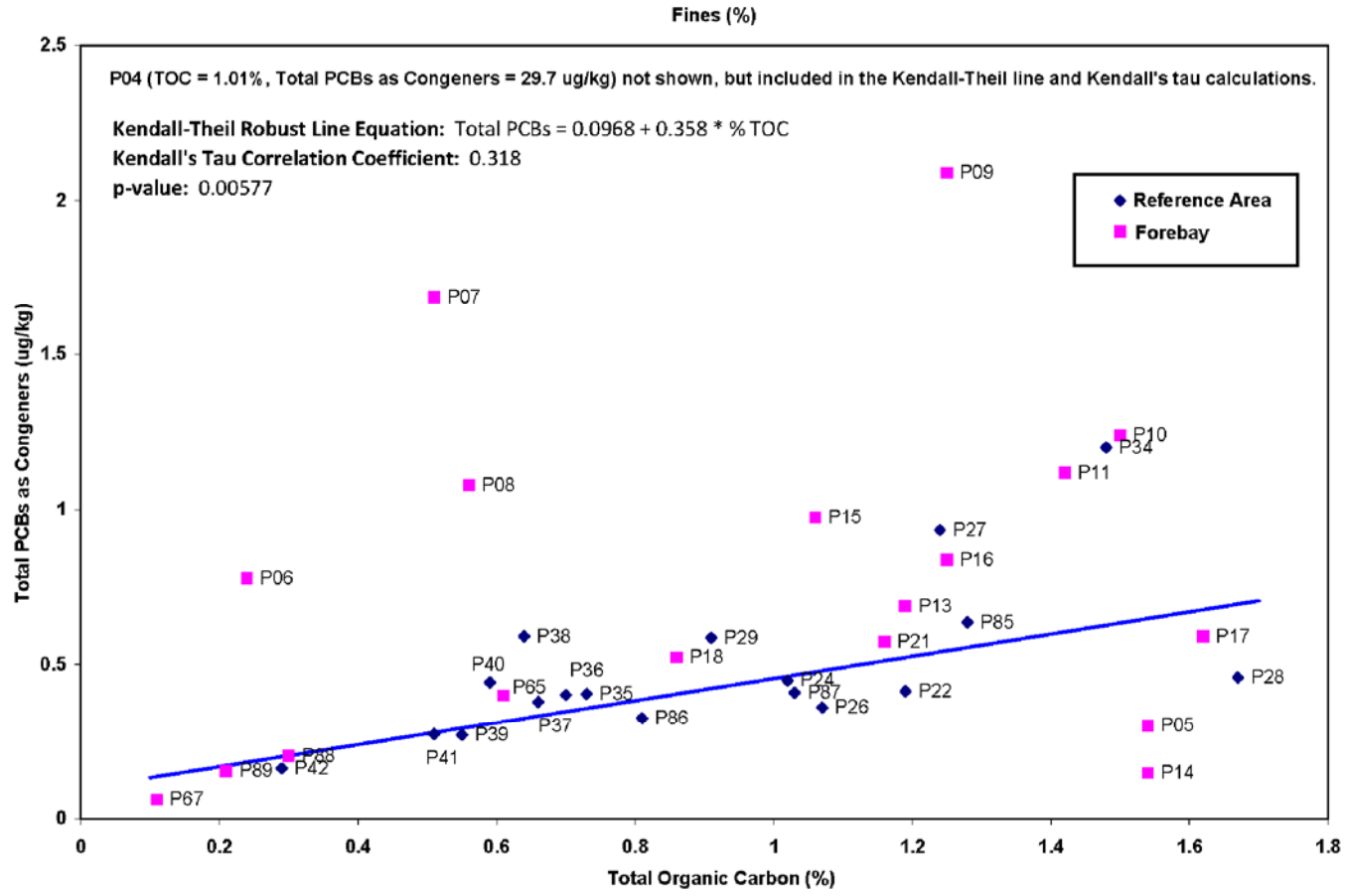
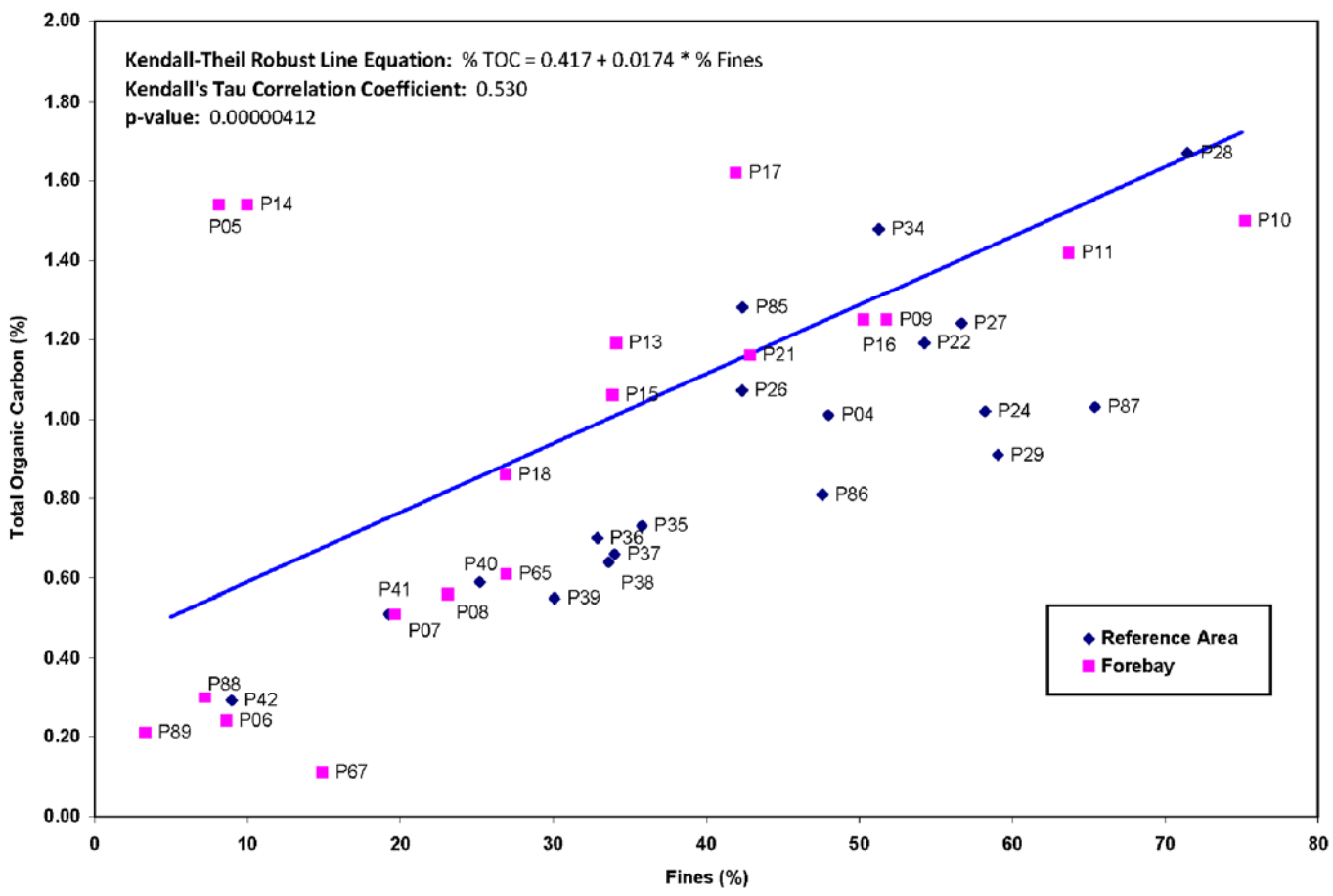
REFERENCE AREA PCB CONGENER
DISTRIBUTION IN SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIG 9-17e
CAD FILE NUMBER: FIG 9-17e
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-17e - Reference Area PCB Congener Distribution in Smallmouth Base Tissue.dwg Nov 18, 2010 - 10:26am







CORRELATION BETWEEN GRAINSIZE, TOC, AND TOTAL PCBs IN SEDIMENT

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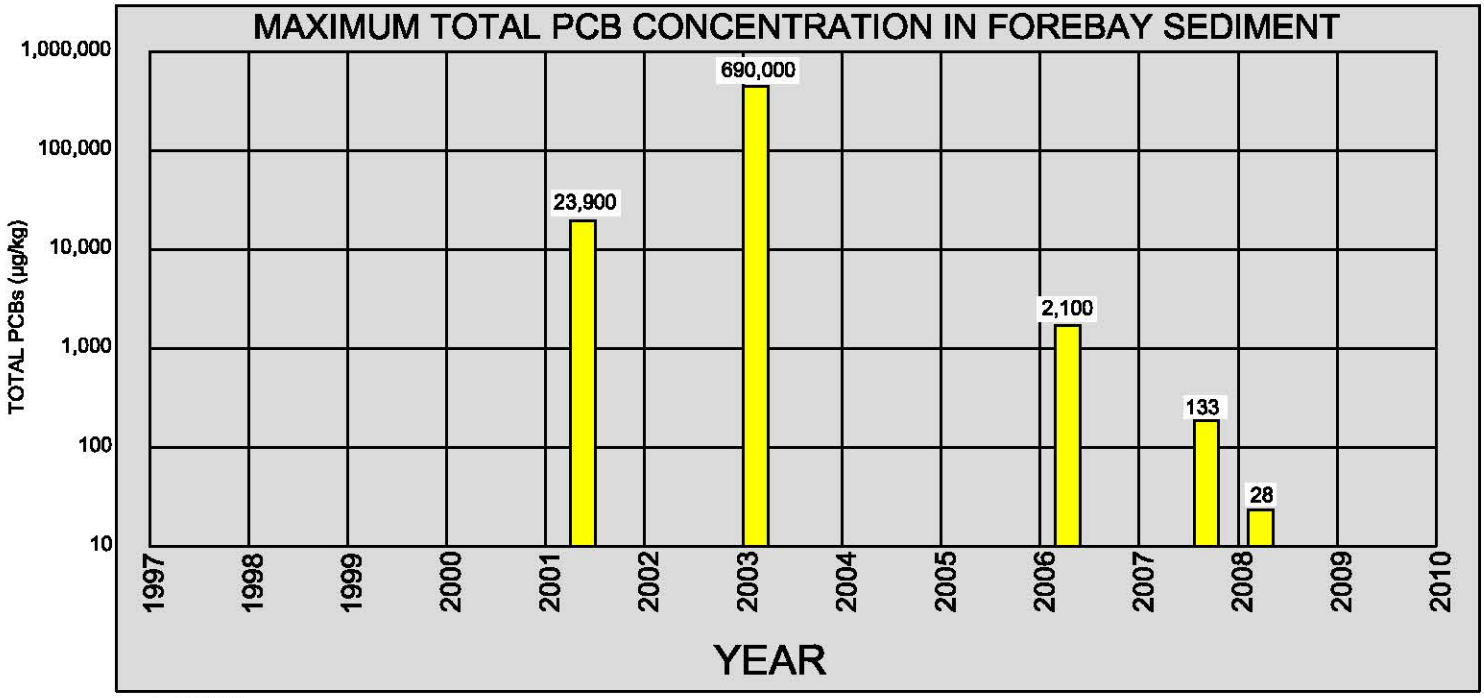
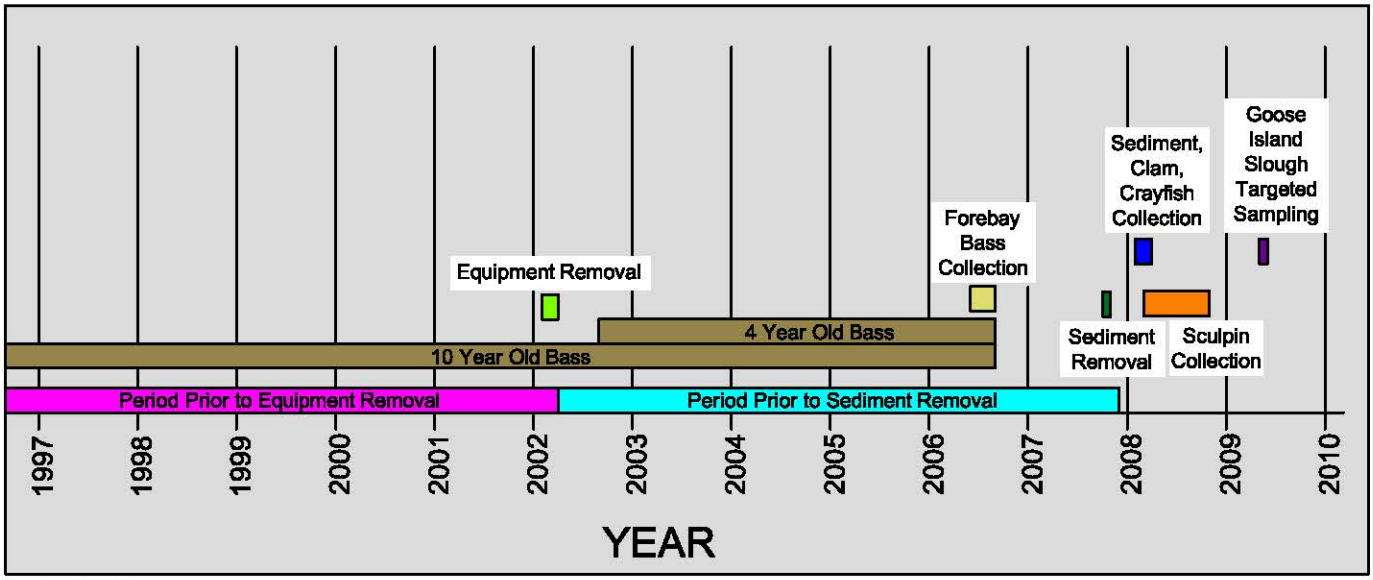
FIGURE 9-18

G:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 9-18 - Correlation Between Grainsize, TOC, and Total PCBs in Sediment.dwg Nov 18, 2010 - 10:26am



LEGEND

Maximum Measured PCB Concentration in Forebay Sediment



LEGEND

- Feb/Mar 2002 Electrical Equipment & Sediment Removal
- Oct 2007 Sediment Removal
- June/Aug 2006 Forebay Smallmouth Bass Collection
- Feb/Mar 2008 Forebay Sediment, Clam, Crayfish Collection
- Mar-Oct 2008 Forebay Sculpin Collection
- April 2009 Goose Island Slough Targeted Sampling
- Smallmouth Bass Lifespan

TIMELINE OF REMEDIAL ACTIONS AND SAMPLE COLLECTION ACTIVITIES

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NOVEMBER 2010
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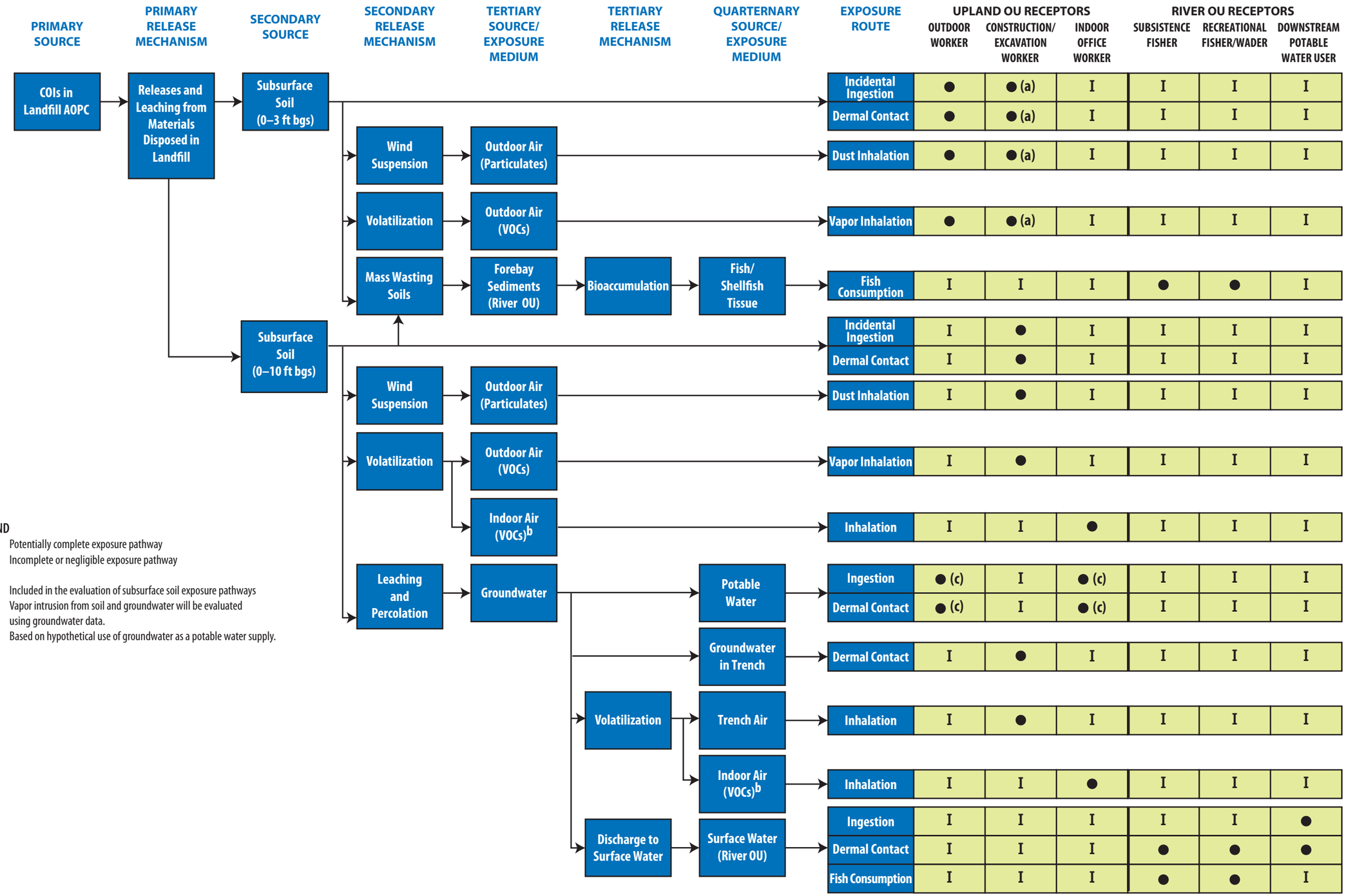
FIGURE 9-19



LEGEND

● Potentially complete exposure pathway

I Incomplete or negligible exposure pathway

a Included in the evaluation of subsurface soil exposure pathways

b Vapor intrusion from soil and groundwater will be evaluated using groundwater data.

c Based on hypothetical use of groundwater as a potable water supply.

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LANDFILL AOPC

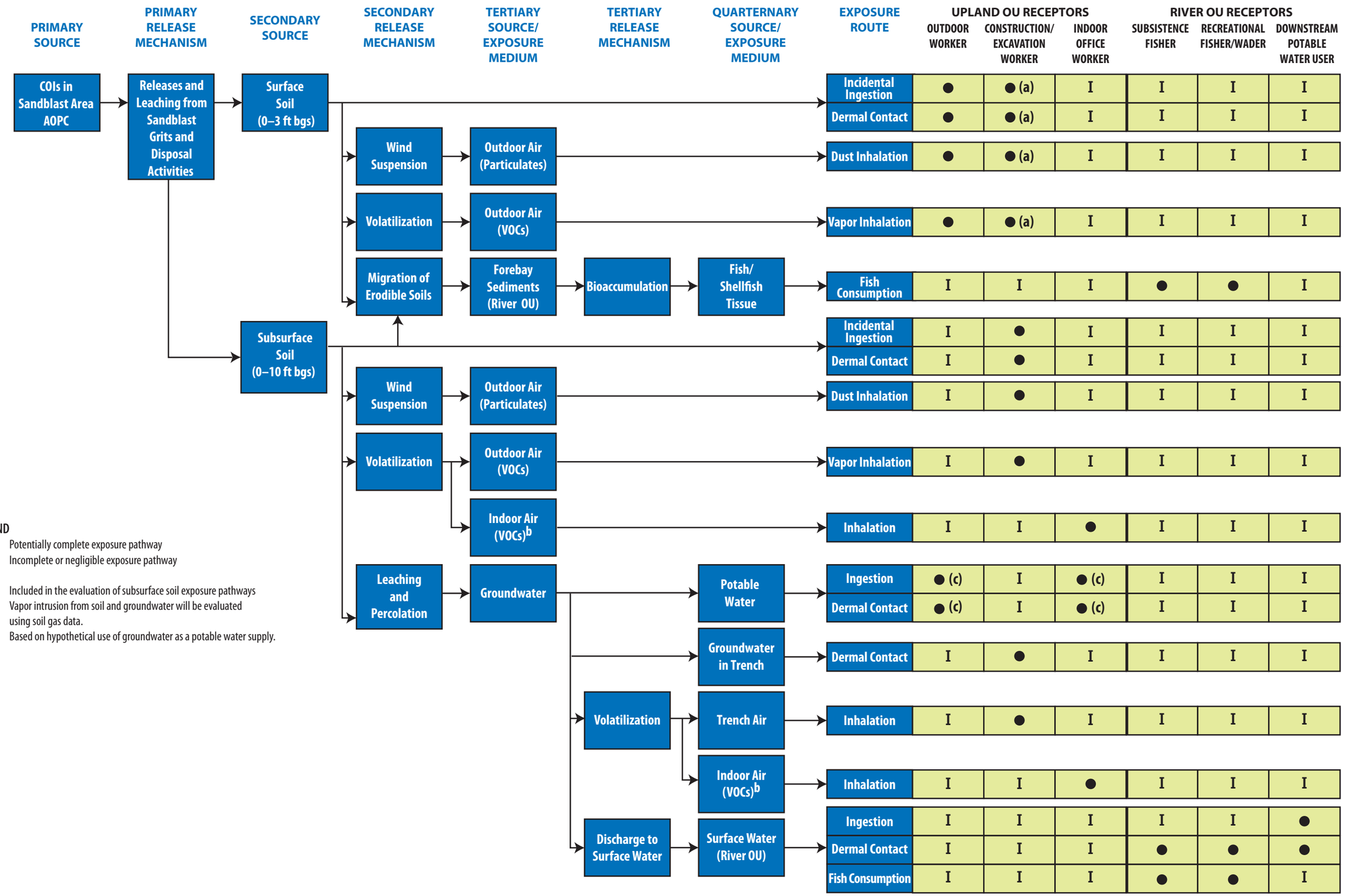
HUMAN HEALTH CONCEPTUAL EXPOSURE MODEL

DRAWING NUMBER: FIGURE 11-1

GIS FILE NUMBER: FIG 11-1

SHEET: REV.

O:\25692709 USACE\53-F0072173.00 Bradford11Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 11-1.ai



LEGEND

● Potentially complete exposure pathway

I Incomplete or negligible exposure pathway

a Included in the evaluation of subsurface soil exposure pathways

b Vapor intrusion from soil and groundwater will be evaluated using soil gas data.

c Based on hypothetical use of groundwater as a potable water supply.

O:\25692709 USACE\53-F0072173.00 Bradford11Ft.Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 11-2.ai

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CASCADE LOCKS, OREGON

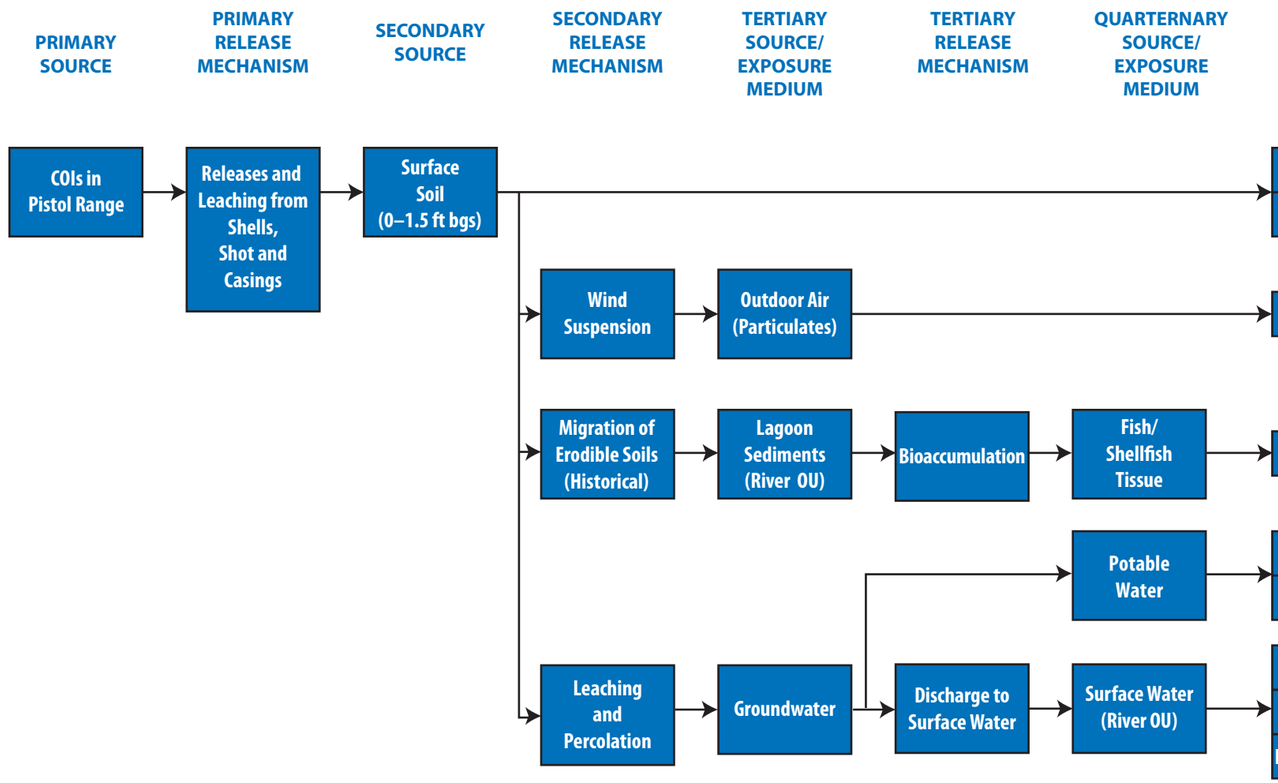
SANDBLAST AREA AOPC

HUMAN HEALTH CONCEPTUAL EXPOSURE MODEL

DRAWING NUMBER: FIGURE 11-2

GIS FILE NUMBER: FIG 11-2

SHEET: REV.



EXPOSURE ROUTE	UPLAND OU RECEPTORS: OUTDOOR WORKER	UPLAND OU RECEPTORS: CONSTRUCTION/ EXCAVATION WORKER	UPLAND OU RECEPTORS: INDOOR OFFICE WORKER	RIVER OU RECEPTORS: SUBSISTENCE FISHER	RIVER OU RECEPTORS: RECREATIONAL FISHER/WADER	RIVER OU RECEPTORS: DOWNSTREAM POTABLE WATER USER
Ingestion	●	●	I	I	I	I
Dermal Contact	●	●	I	I	I	I
Dust Inhalation	●	●	I	I	I	I
Fish Consumption	I	I	I	●	●	I
Ingestion	● (a)	I	● (a)	I	I	I
Dermal Contact	● (a)	I	● (a)	I	I	I
Ingestion	I	I	I	I	I	● (b)
Dermal Contact	I	I	I	●	●	● (b)
Fish Consumption	I	I	I	●	●	I

LEGEND

- ● Potentially complete exposure pathway
- I Incomplete or negligible exposure pathway
- a Based on hypothetical use of groundwater as a potable water supply
- b Based on use of downstream river water as a potable water supply

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 11-3.ai

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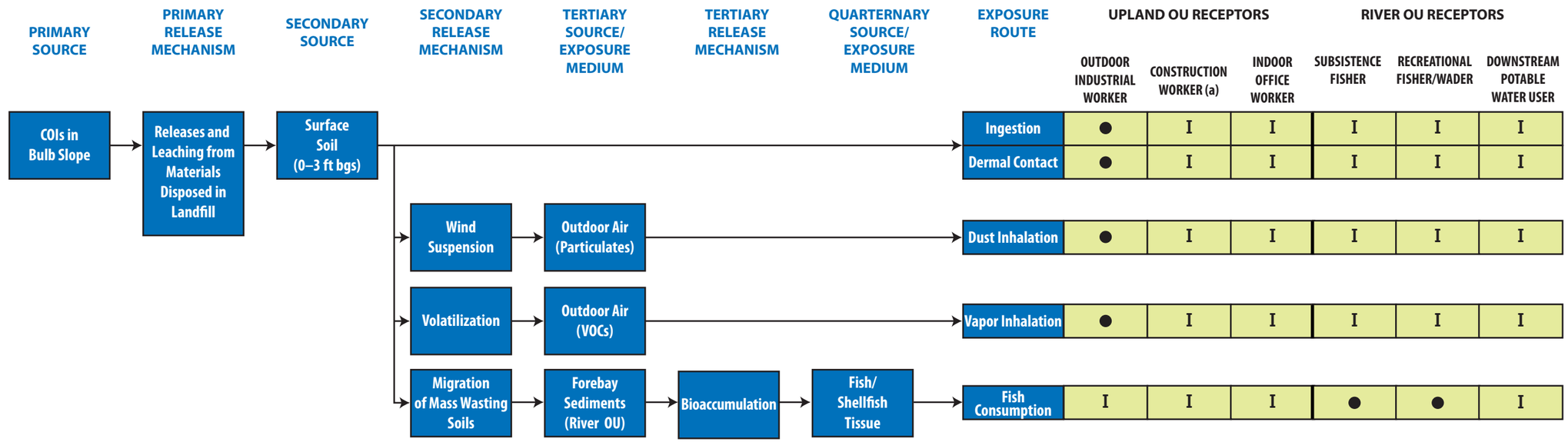
PISTOL RANGE AOPC

HUMAN HEALTH CONCEPTUAL EXPOSURE MODEL

DRAWING NUMBER: FIGURE 11-3
GIS FILE NUMBER: FIG 11-3
SHEET: REV.



LEGEND

● Potentially complete exposure pathway

I Incomplete or negligible exposure pathway

(a) No construction or excavation activities are feasible or likely at the Bulb Slope AOPC

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft. Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 11-3.ai

JOB No.	DESIGNED:	PROJ. ENGINEER:
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CASCADE LOCKS, OREGON

BULB SLOPE AOPC

HUMAN HEALTH CONCEPTUAL EXPOSURE MODEL

DRAWING NUMBER: FIGURE 11-4

GIS FILE NUMBER: FIG 11-4

SHEET: REV.

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction

Gully Test Pit
BIL01TPG BIL02TPG
BIL03TPG BIL04TPG

Mercury Vapor-Lamp Test Pit
BIL28TPM BIL29TPM

Lead Hot Spot Test Pit #1

Lead Hot Spot Test Pit #2

Pesticide/Herbicide Wash Area

Extent of Landfill Debris

Landfill AOPC

Access Road

120

SCALE IN FEET: 15 0 15 30

LEGEND

- Landfill Groundwater Sampling Station
- Landfill Surface and Shallow Soil Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

COPC	Units	Concentration Corresponding To: ELCR = 1E-6
As	mg/kg	5.4
cPAHs	µg/kg	NA

As = Arsenic
cPAHs = Carcinogenic PAHs
mg/kg = Milligram(s) per Kilogram
µg/kg = Microgram(s) per Kilogram
NA = Not Applicable
ELCR = Excess Lifetime Cancer Risk

POTENTIAL RISK DUE TO COPC

As — cPAHs

Gray = Not Analyzed
Black = Not Detected at MDL
Green = Concentrations corresponding to an ELCR of < 10-6.
Orange = Concentrations corresponding to an ELCR of ≥ 10-6 to < 10-5.
Red = Concentrations corresponding to an ELCR of ≥ 10-5 to < 10-4.
Purple = Concentrations corresponding to an ELCR of ≥ 10-4.
Note: ELCR estimates are based on ratio of single chemical concentration to the corresponding SLV for a single medium. Consideration of multi-media exposures is included in Section 11.

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

LANDFILL AOPC

MAGNITUDE OF POTENTIAL RISK IN SOIL
OUTDOOR WORKER (0-3 ft bgs)

DRAWING NUMBER: FIGURE 11-5
CAD FILE NUMBER: FIG 11-5
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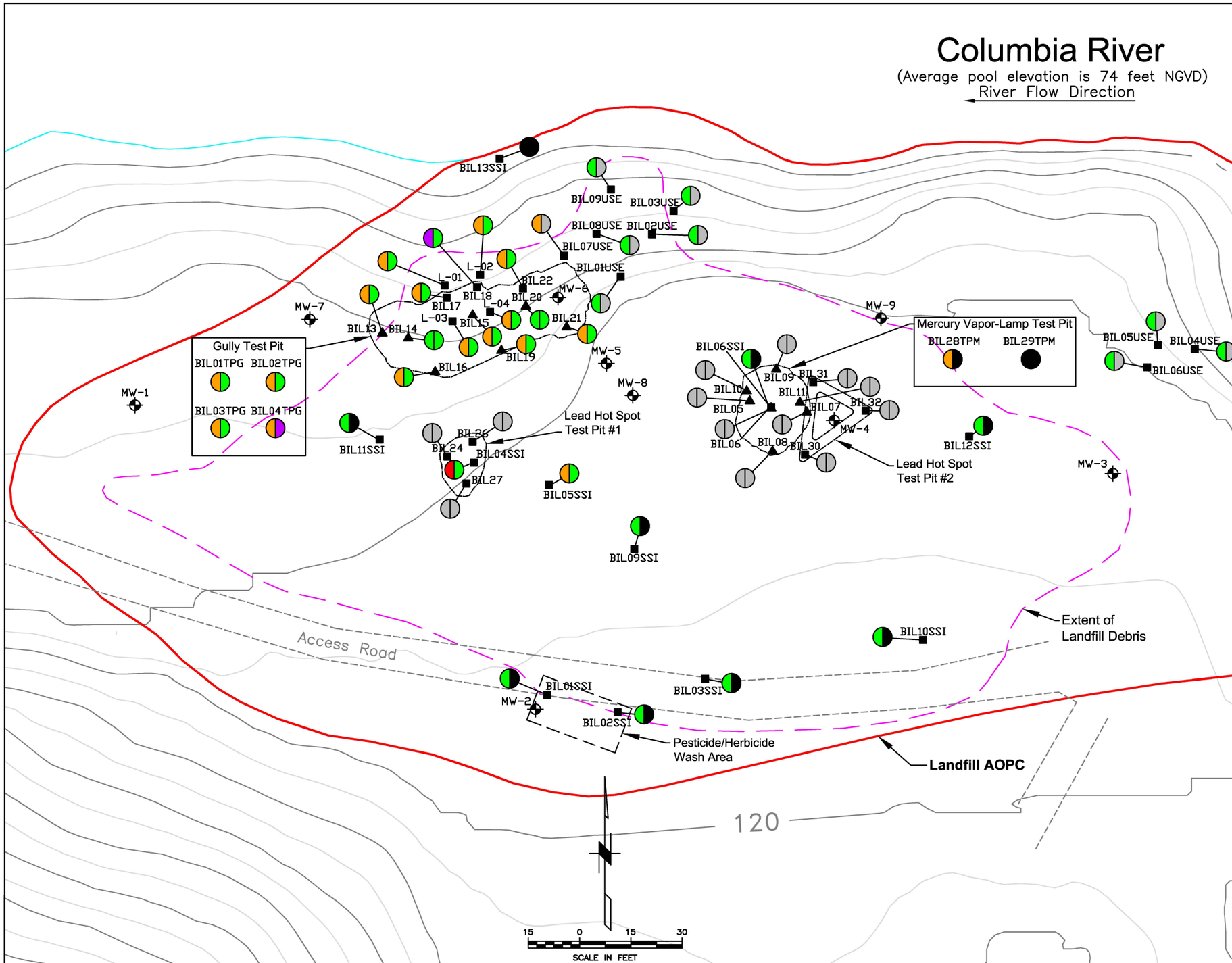
O:\25692709 USACE\53-F0072173.00 Bradford\FtWorth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 11-5 Magnitude of Potential Risk in Soil in Landfill AOPC - Outdoor Worker.dwg Jun 05, 2012 - 12:26pm



LEGEND

- Landfill Groundwater Sampling Station
- Landfill Surface and Shallow Soil Location
- Landfill Deeper Soil Sampling Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

COPC	Units	Concentration Corresponding To: ELCR = 1E-6
PCE	µg/kg	40,000
BAP	µg/kg	2,100

PCE = Tetrachloroethene
BAP = Benzo(a)pyrene
µg/kg = Microgram(s) per Kilogram
ELCR = Excess Lifetime Cancer Risk

POTENTIAL RISK
DUE TO COPC

BAP — PCE

Gray = Not Analyzed
Black = Not Detected at MDL
Green = Concentrations corresponding to an ELCR of < 10-6.
Orange = Concentrations corresponding to an ELCR of ≥ 10-6 to < 10-5.
Red = Concentrations corresponding to an ELCR of ≥ 10-5 to < 10-4.
Purple = Concentrations corresponding to an ELCR of ≥ 10-4.
Note: ELCR estimates are based on ratio of single chemical concentration to the corresponding SLV for a single medium. Consideration of multi-media exposures is included in Section 11.

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MAGNITUDE OF POTENTIAL RISK IN SOIL
CONSTRUCTION WORKER (0-10 ft bgs)

DRAWING NUMBER: FIGURE 11-6
CAD FILE NUMBER: FIG 11-6
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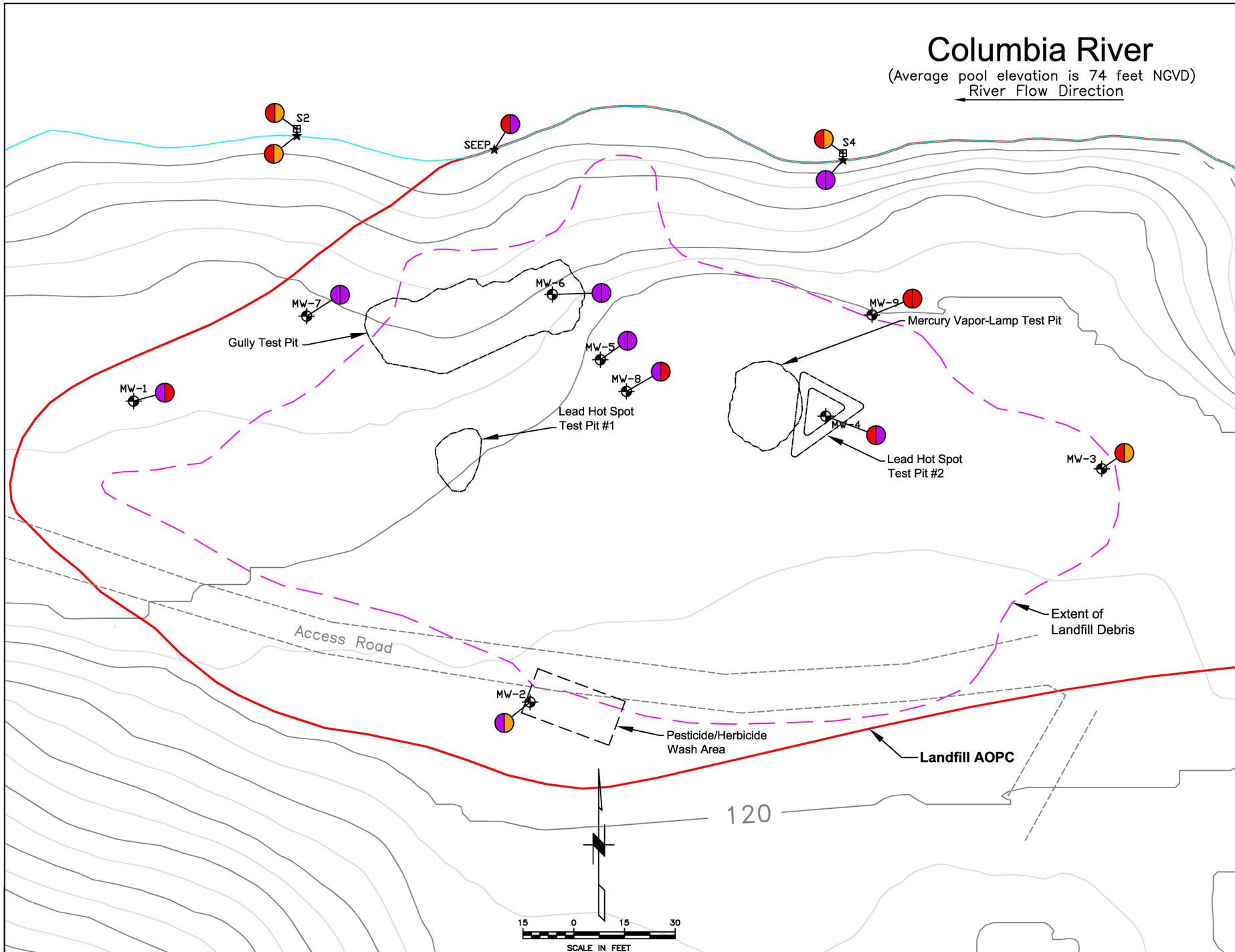
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 11-6 Magnitude of Potential Risk in Soil in Landfill Area AOPC - Construction Worker.dwg Jun 05, 2012 - 12:27pm



LEGEND

- Landfill Groundwater Sampling Station
- Landfill Surface Water Sampling Location
- Landfill Seep Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

COPC	Units	Concentration ELCR = 1E-06	Concentration NC HQ = 1
As	µg/L	0.038	-
Mn	µg/L	-	88

As = Arsenic
Mn = Manganese
µg/L = Microgram(s) per Liter
ELCR = Excess Lifetime Cancer Risk
NC HQ = Non-carcinogenic Hazard Quotient

POTENTIAL RISK DUE TO COPC

As — Mn

Black = Not Detected at MDL
Green = Concentrations corresponding to an ELCR of < 10-6 or a NC HQ of < 0.1.
Orange = Concentrations corresponding to an ELCR of ≥ 10-6 to < 10-5 or a NC HQ of ≥ 0.1 to < 1.
Red = Concentrations corresponding to an ELCR of ≥ 10-5 to < 10-4 or a NC HQ of ≥ 1 to < 10.
Purple = Concentrations corresponding to an ELCR of ≥ 10-4 or a NC HQ of ≥ 10.
Note: ELCR and HQ estimates are based on ratio of single chemical concentration to the corresponding SLV for a single medium. Consideration of multi-media exposures is included in Section 11.

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LANDFILL AOPC

MAGNITUDE OF POTENTIAL RISK (INORGANICS)
IN GROUNDWATER
POTABLE WATER USER

DRAWING NUMBER: FIGURE 11-7
CAD FILE NUMBER: FIG 11-7
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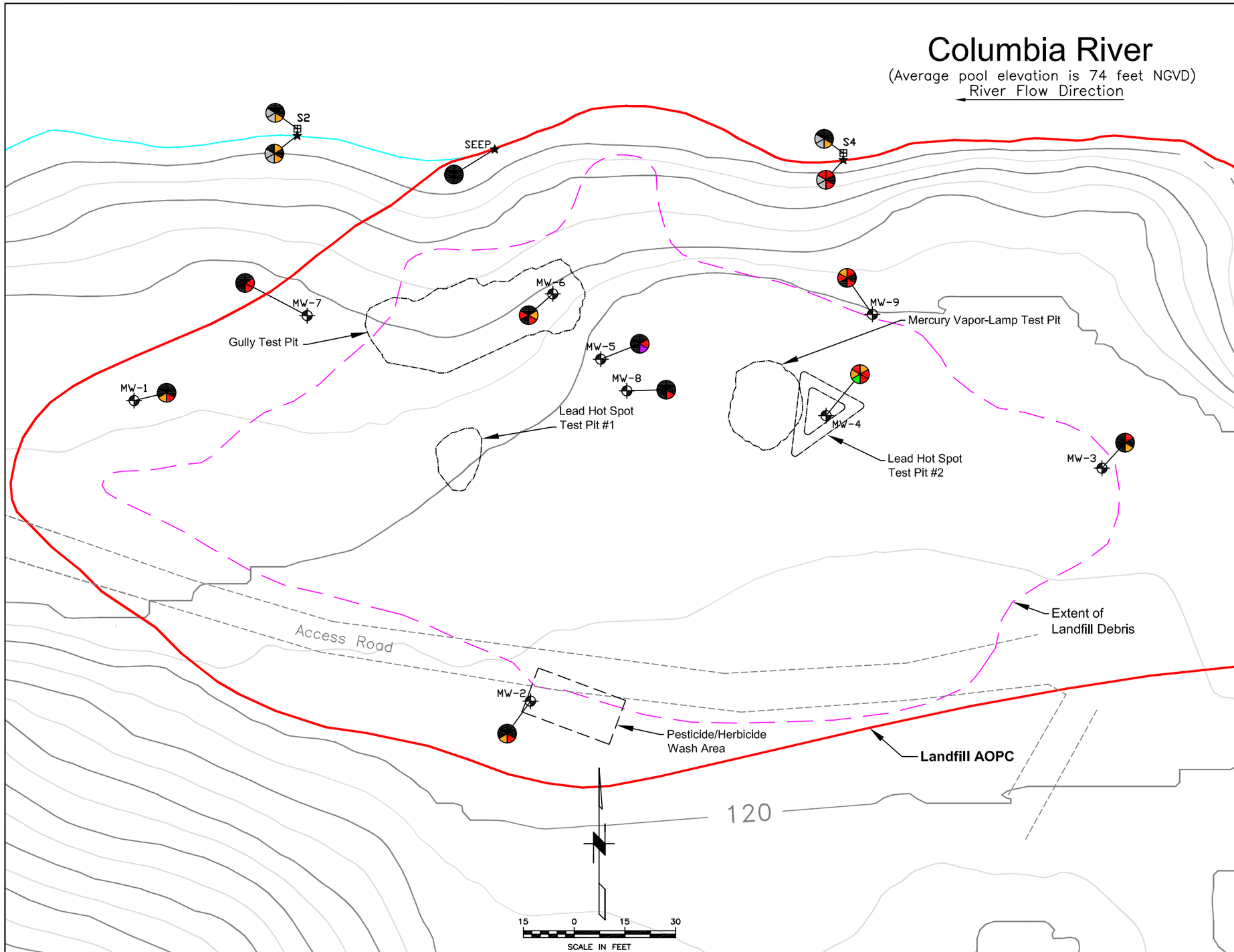
O:\25692709 USACE\53-F00721173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 11-7 Magnitude of Potential Risk in Groundwater in Landfill Area AOPC.dwg Jun 05, 2012 - 11:10am



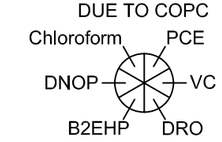
LEGEND

- Landfill Groundwater Sampling Station
- Landfill Surface Water Sampling Location
- Landfill Seep Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

COPC	Units	Concentration ELCR = 1E-06	Concentration NC HQ = 1
Chloroform	µg/L	0.19	-
PCE	µg/L	0.093	-
VC	µg/L	0.025	-
DRO	µg/L	-	90
B2EHP	µg/L	4.1	-
DNOP	µg/L	-	4.1

DRO = Diesel Range Organics
DNOP = Di-n-octyl Phthalate
B2EHP = Bis(2-ethylhexyl) Phthalate
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride
µg/L = Microgram(s) per Liter
ELCR = Excess Lifetime Cancer Risk
NC HQ = Non-carcinogenic Hazard Quotient

POTENTIAL RISK DUE TO COPC



Gray = Not Analyzed
Black = Not Detected at MDL
Green = Concentrations corresponding to an ELCR of < 10-6 or a NC HQ of < 0.1.
Orange = Concentrations corresponding to an ELCR of ≥ 10-6 to < 10-5 or a NC HQ of ≥ 0.1 to < 1.
Red = Concentrations corresponding to an ELCR of ≥ 10-5 to < 10-4 or a NC HQ of ≥ 1 to < 10.
Purple = Concentrations corresponding to an ELCR of ≥ 10-4 or a NC HQ of ≥ 10.
Note: ELCR and HQ estimates are based on ratio of single chemical concentration to the corresponding SLV for a single medium. Consideration of multi-media exposures is included in Section 11.

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LANDFILL AOPC

MAGNITUDE OF POTENTIAL RISK (ORGANICS)
IN GROUNDWATER
POTABLE WATER USER

DRAWING NUMBER: FIGURE 11-8
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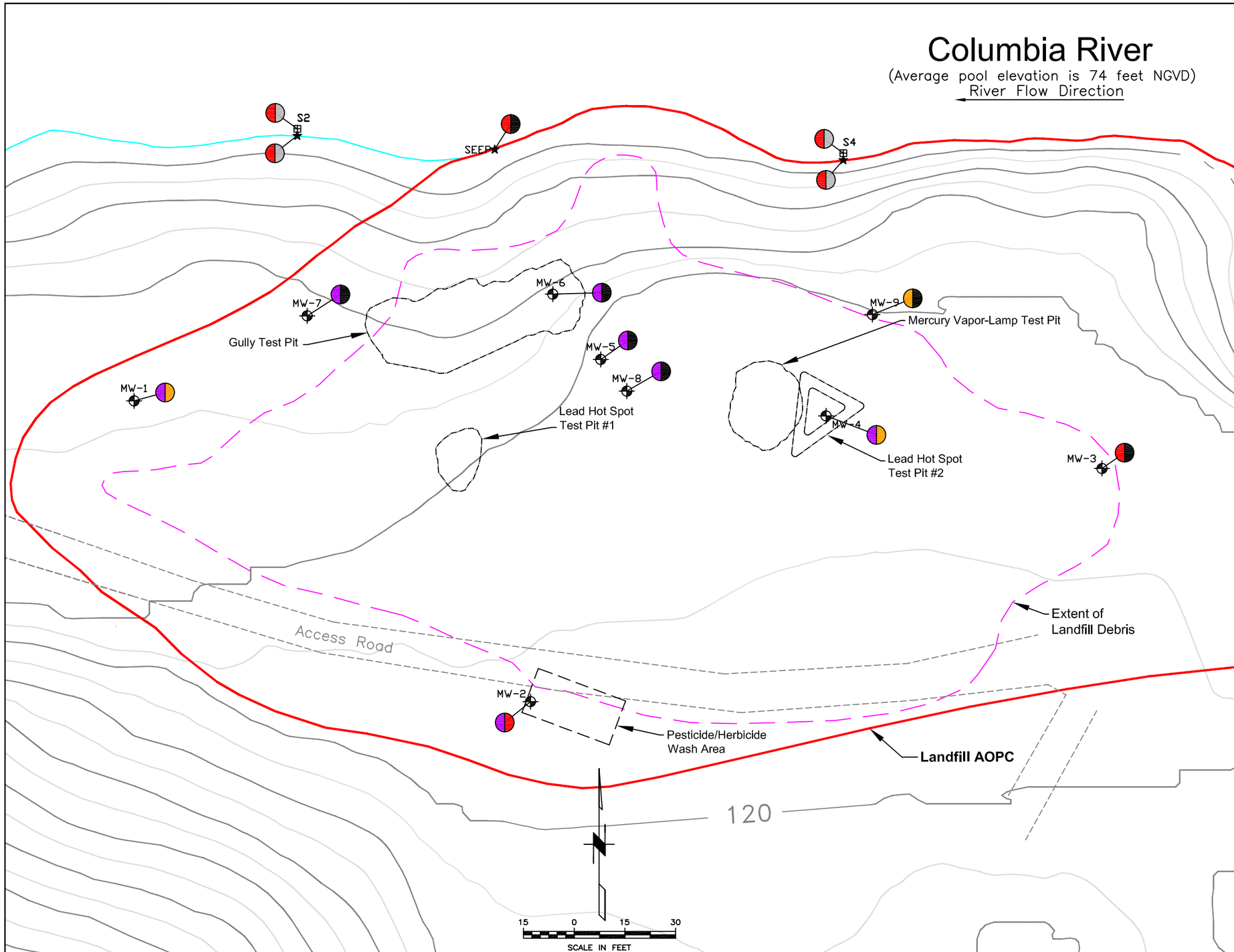
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 11-8 Magnitude of Potential Risk in Groundwater in Landfill Area AOPC - Potable Water User.dwg Nov 18, 2010 - 8:20am



LEGEND

- Landfill Groundwater Sampling Station
- Landfill Surface Water Sampling Location
- Landfill Seep Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

COPC	Units	Concentration Corresponding To: ELCR = 1E-06
AS	µg/L	0.018
B2EHP	µg/L	1.2

As = Arsenic
DNOP = Di-n-octyl Phthalate
B2EHP = Bis(2-ethylhexyl) Phthalate
µg/L = Microgram(s) per Liter
ELCR = Excess Lifetime Cancer Risk

POTENTIAL RISK DUE TO COPC

As — B2EHP

Gray = Not Analyzed
Black = Not Detected at MDL
Green = Concentrations corresponding to an ELCR of < 10-6.
Orange = Concentrations corresponding to an ELCR of ≥ 10-6 to < 10-5.
Red = Concentrations corresponding to an ELCR of ≥ 10-5 to < 10-4.
Purple = Concentrations corresponding to an ELCR of ≥ 10-4.
Note: ELCR estimates are based on ratio of single chemical concentration to the corresponding SLV for a single medium. Consideration of multi-media exposures is included in Section 11.

No.	DATE	BY	REVISION

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LANDFILL AOPC

MAGNITUDE OF POTENTIAL RISK IN GROUNDWATER DISCHARGE AND SUBSEQUENT BIOACCUMULATION

DRAWING NUMBER: FIGURE 11-9
CAD FILE NUMBER: FIG 11-9
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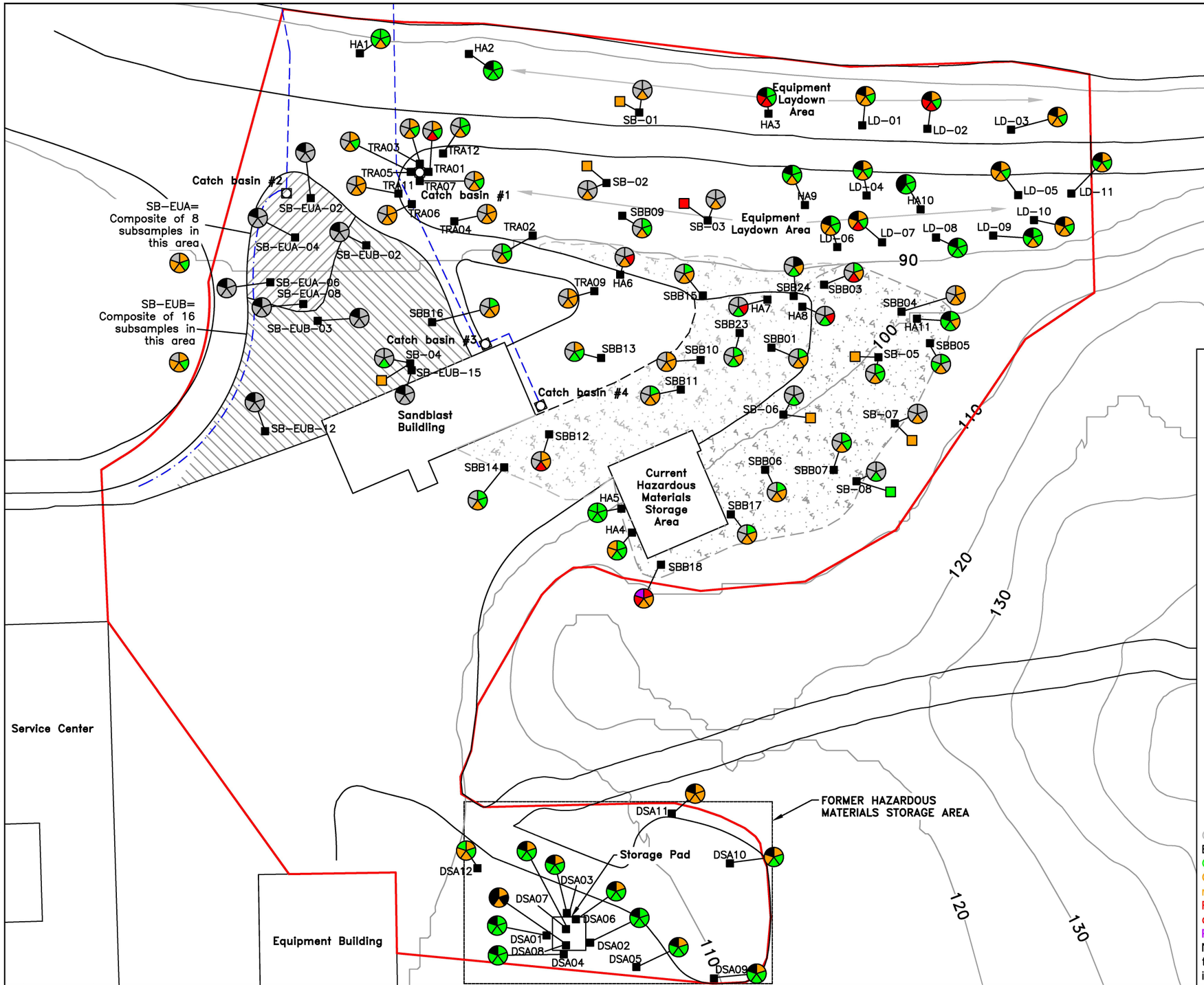
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 11-9 Magnitude of Potential Risk in Groundwater in Landfill Area AOPC - Groundwater Discharge.dwg Nov 16, 2010 - 3:32pm



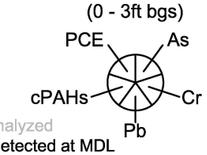
LEGEND

- AOPC Boundary
- Sandblast Area Surface and Shallow Soil Sampling Location
- 110 10-foot Vertical Contour in Feet (NGVD)
- Approximate Spent Sandblast Grit Dispoasal Area
- Erodable Unit Sampling Area

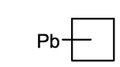
COPC	Units	Concentration Corresponding To: ELCR = 1E-6
As	mg/kg	5.4
Cr	mg/kg	190
Pb	mg/kg	800*
PCE	µg/kg	1,600
cPAHs	µg/kg	NA

As = Arsenic
Cr = Chromium
Pb = Lead
PCE = Tetrachloroethene
cPAHs = Carcinogenic PAHs
mg/kg = Milligram(s) per Kilogram
µg/kg = Microgram(s) per Kilogram
NA = Not Applicable
ELCR = Excess Lifetime Cancer Risk
*Pb SLV is based on blood lead levels (ELCR does not apply); concentration shown corresponds to C/SLV = 1.

POTENTIAL RISK DUE TO COPC (0 - 3ft bgs)



POTENTIAL RISK DUE TO LEAD (<250 µm) (0 - 1ft bgs)



Gray = Not Analyzed
Black = Not Detected at MDL
Green = Concentrations corresponding to an ELCR of < 10-6 or a Pb C/SLV ratio <0.1.
Orange = Concentrations corresponding to an ELCR of ≥ 10-6 to < 10-5 or a Pb C/SLV ratio of ≥ 0.1 to < 1.
Red = Concentrations corresponding to an ELCR of ≥ 10-5 to < 10-4 or a Pb C/SLV ratio of ≥ 1 to < 10.
Purple = Concentrations corresponding to an ELCR of ≥ 10-4 or a Pb C/SLV ratio of ≥ 10.
Note: ELCR and Pb C/SLV estimates are based on ratio of single chemical concentration to the corresponding SLV for a single medium. Consideration of multi-media exposures is included in Section 11.

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SANDBLAST AREA AOPC

MAGNITUDE OF POTENTIAL RISK IN SOIL
OUTDOOR WORKER (0-3 ft bgs)

DRAWING NUMBER: FIGURE 11-10
CAD FILE NUMBER: FIG 11-10
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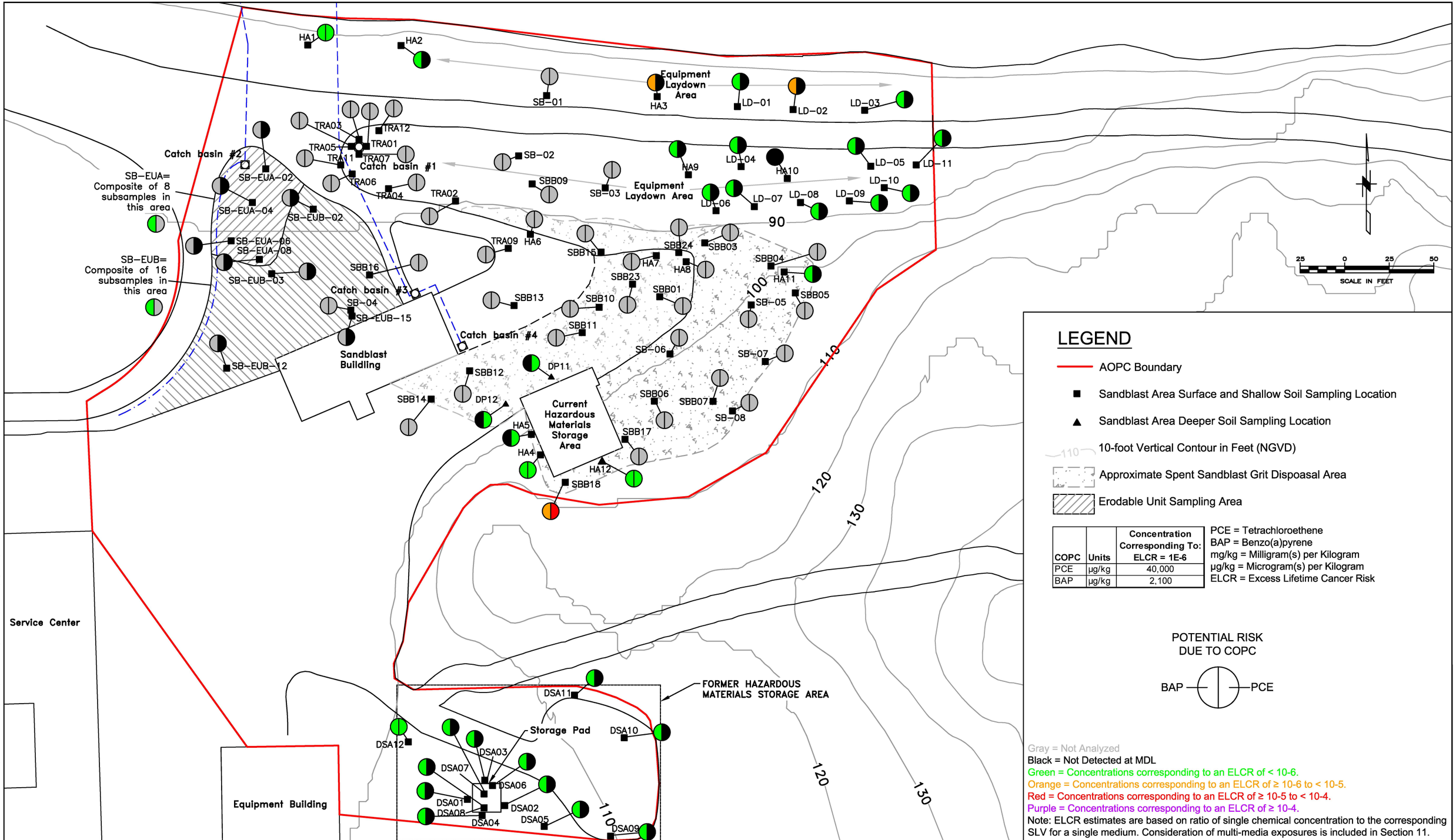
C:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 11-10 Magnitude of Potential Risk in Soil in Sandblast Area AOPC - Outdoor Worker.dwg Jun 06, 2012 - 10:58am



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SANDBLAST AREA AOPC

MAGNITUDE OF POTENTIAL RISK IN SOIL
CONSTRUCTION WORKER (0-10 ft bgs)

DRAWING NUMBER: FIGURE 11-11
CAD FILE NUMBER: FIG 11-11
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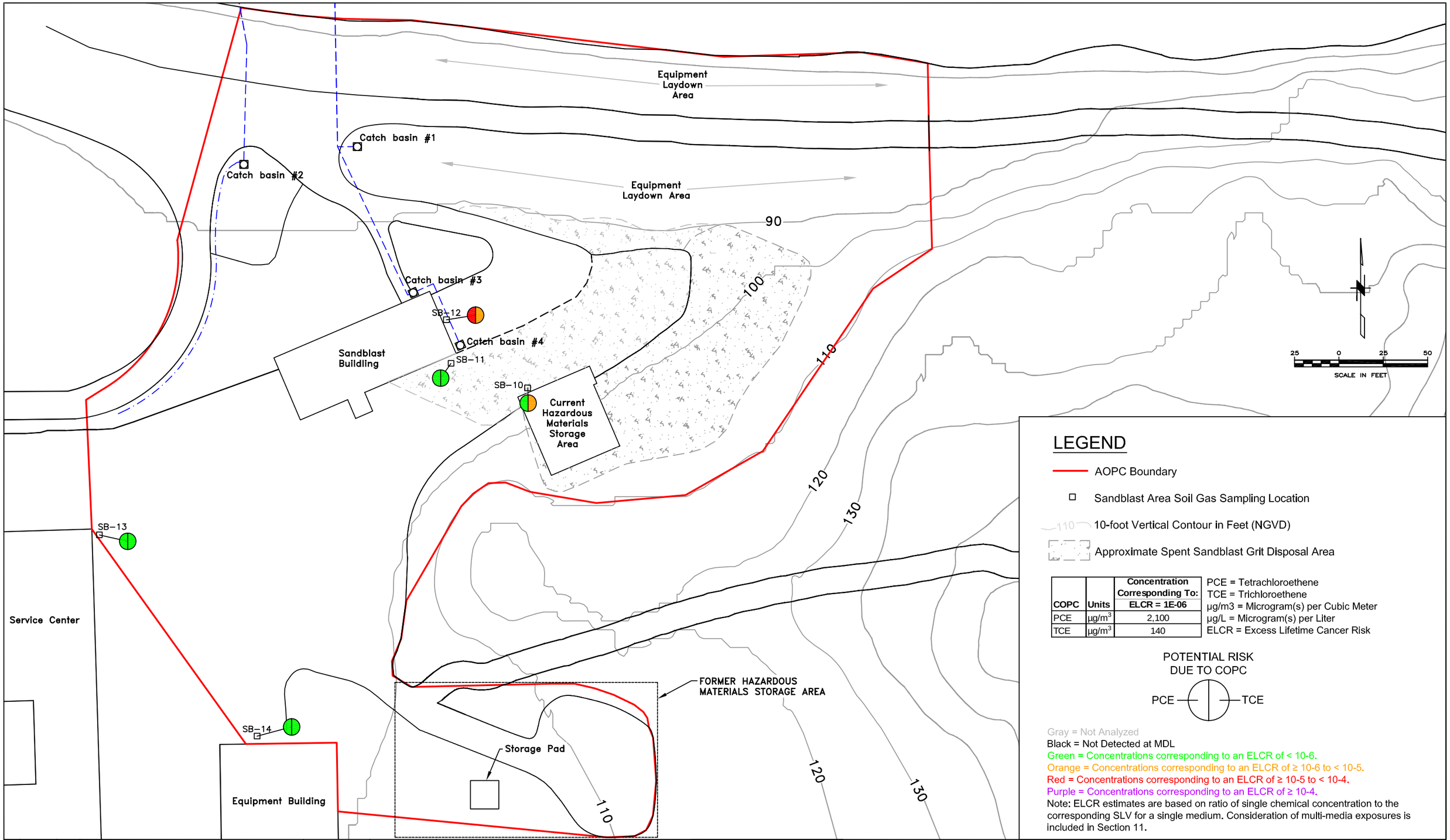
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 11-11 Magnitude of Potential Risk in Soil in Sandblast Area AOPC - Excavation Worker.dwg Jun 06, 2012 - 10:59am



COPC	Units	Concentration Corresponding To: ELCR = 1E-06
PCE	µg/m^3	2,100
TCE	µg/m^3	140

No.	DATE	BY	REVISION

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SANDBLAST AREA AOPC

MAGNITUDE OF POTENTIAL RISK IN SOIL GAS
INDOOR OFFICE WORKER

DRAWING NUMBER: FIGURE 11-12
CAD FILE NUMBER: FIG 11-12
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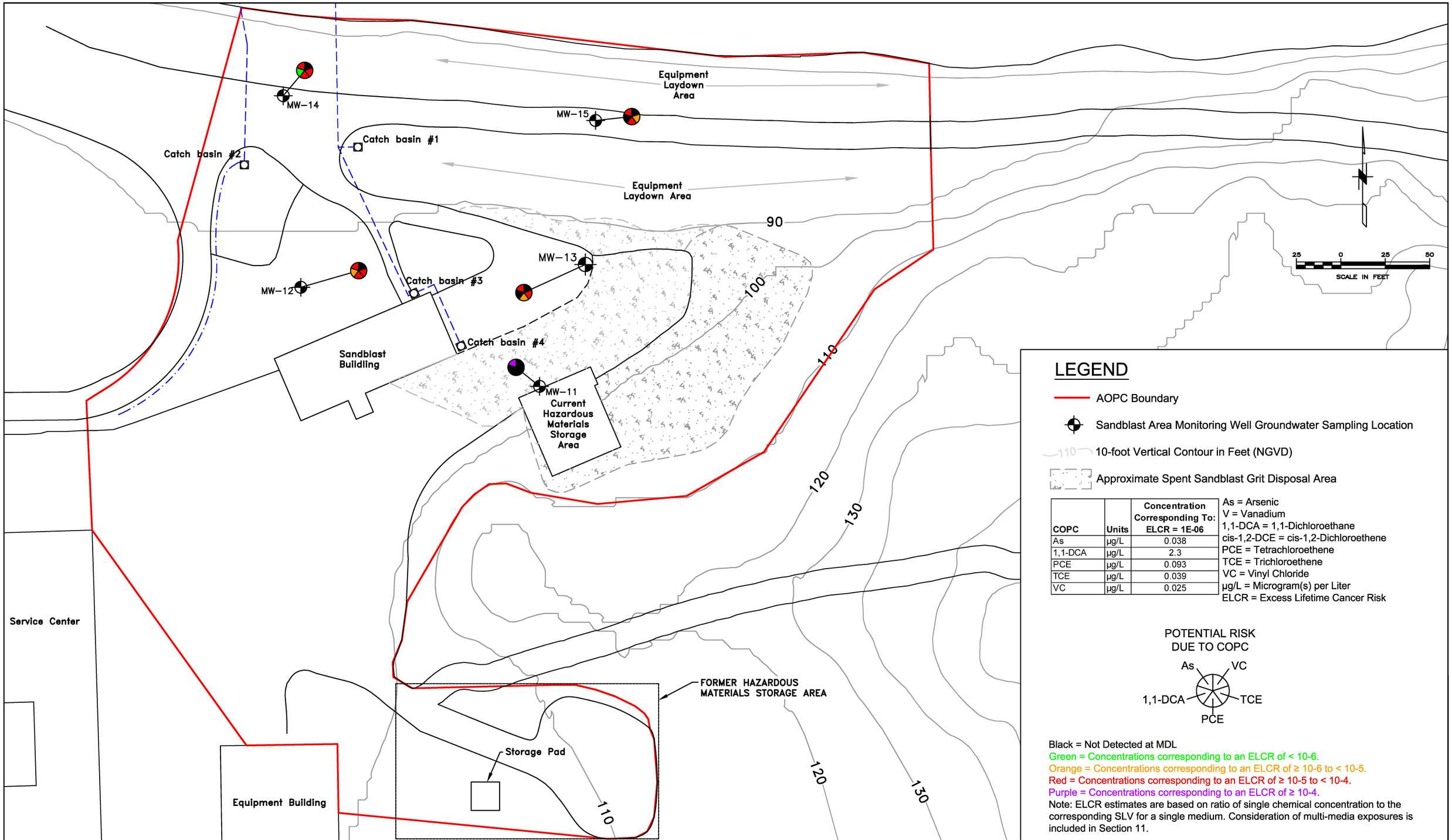
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 11-12 Magnitude of Potential Risk in Soil Gas in Sandblast Area AOPC -Indoor Office Worker.dwg Nov 16, 2010 - 3:49pm



COPC	Units	Concentration Corresponding To: ELCR = 1E-06
As	µg/L	0.038
1,1-DCA	µg/L	2.3
PCE	µg/L	0.093
TCE	µg/L	0.039
VC	µg/L	0.025

No.	DATE	BY	REVISION

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SANDBLAST AREA AOPC

MAGNITUDE OF POTENTIAL RISK IN GROUNDWATER POTABLE WATER USER

DRAWING NUMBER: FIGURE 11-13
CAD FILE NUMBER: FIG 11-13
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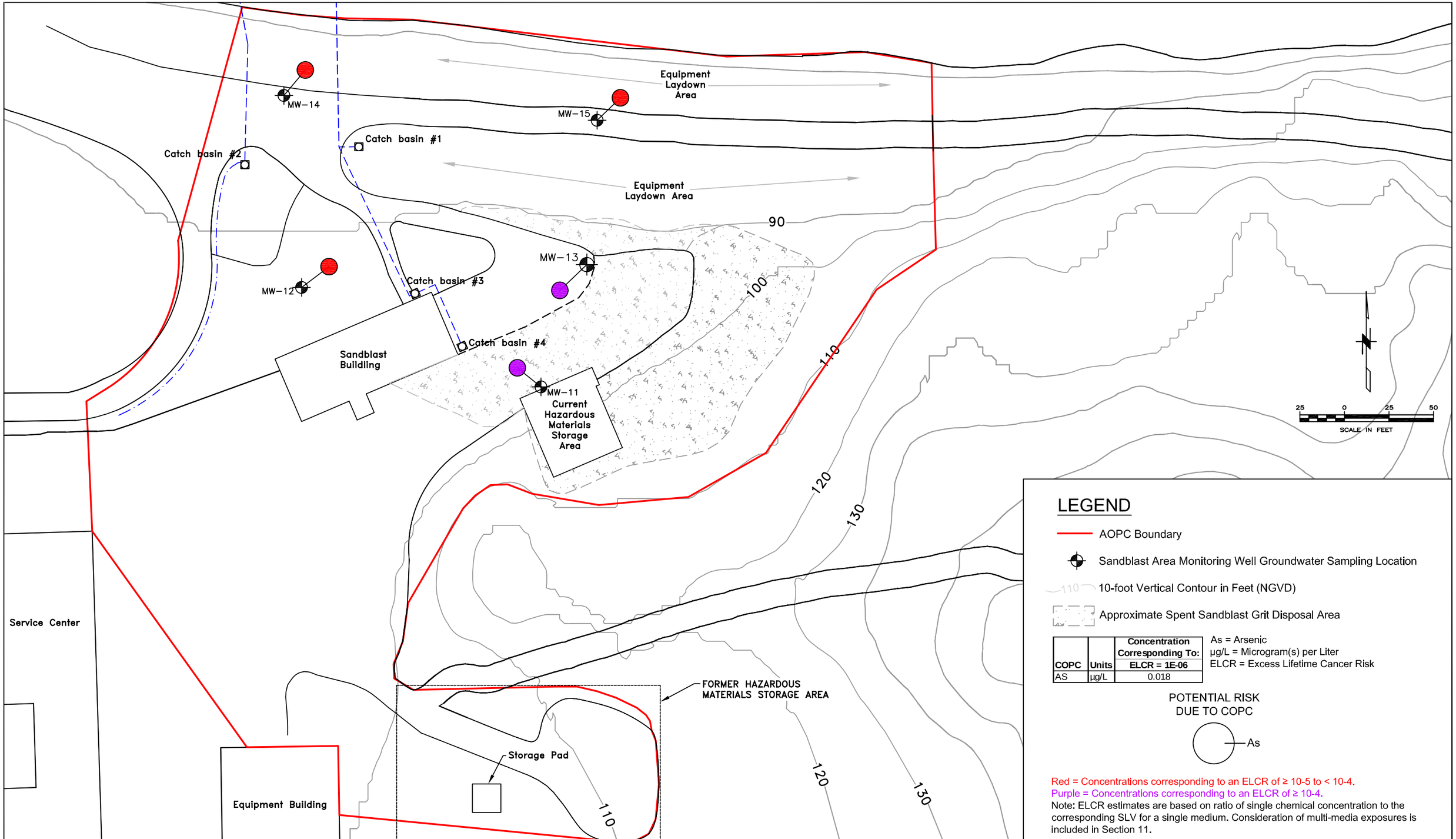
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 11-13 Magnitude of Potential Risk in Groundwater in Sandblast Area AOPC - Potable Water User.dwg Jun 06, 2012 - 9:01am



COPC	Units	Concentration Corresponding To: ELCR = 1E-06
AS	µg/L	0.018

No.	DATE	BY	REVISION

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SANDBLAST AREA AOPC

MAGNITUDE OF POTENTIAL RISK IN GROUNDWATER DISCHARGE AND SUBSEQUENT BIOACCUMULATION

DRAWING NUMBER: FIGURE 11-14
CAD FILE NUMBER: FIG 11-14
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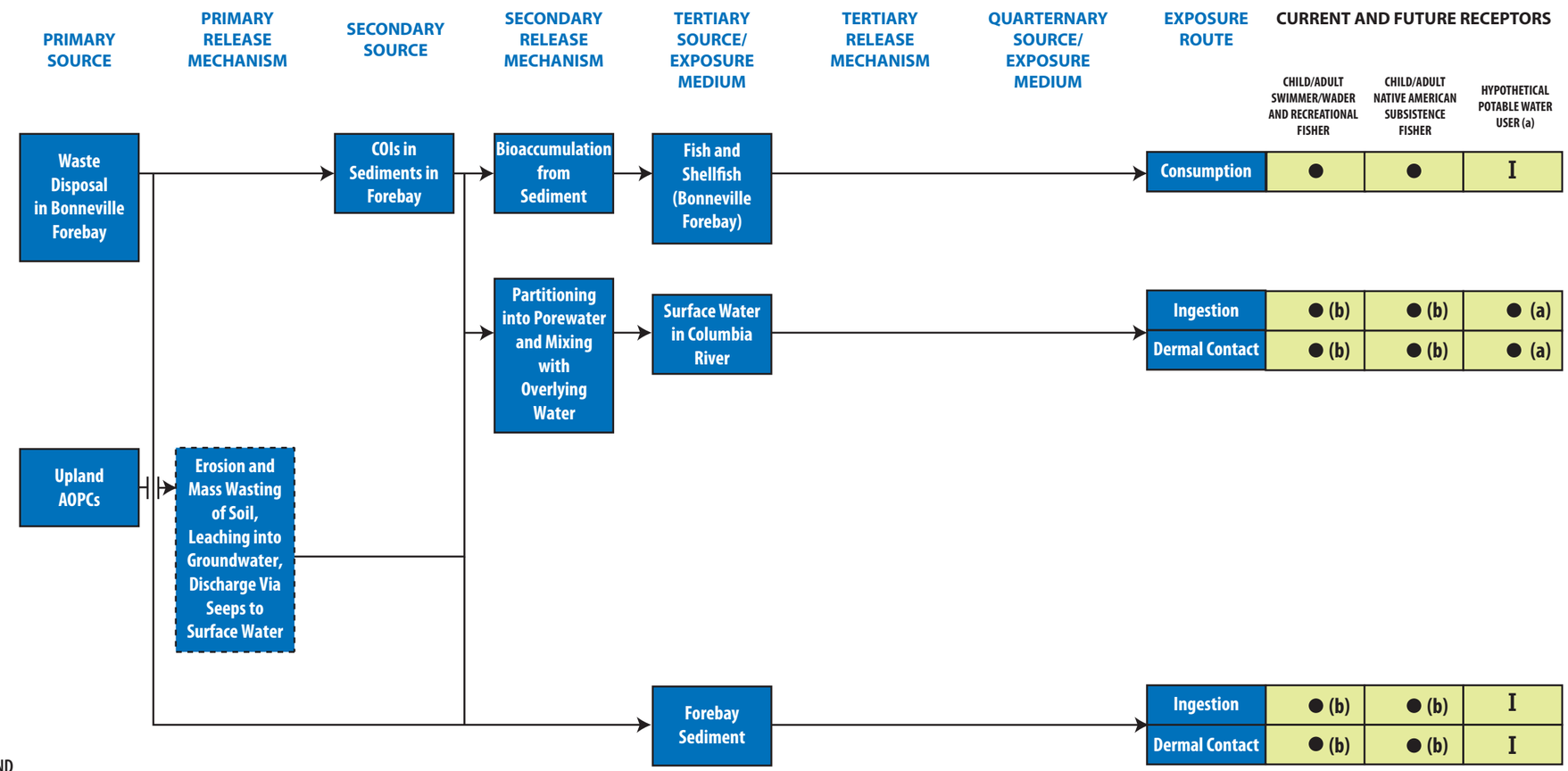
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 11-14 Magnitude of Potential Risk in Groundwater in Sandblast Area AOPC - Groundwater Discharge.dwg Nov 16, 2010 - 3:55pm



LEGEND

● Potentially complete exposure pathway

I Incomplete exposure pathway

a Based on hypothetical use of riverwater as a potable water supply.

b Direct contact while fishing from boats or wading in shallow sediments. (inclusive of Goose Island and the mouth of Eagle Creek).

O:\25692709 USACE\53-F0072173.00 Bradford\1Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 11-15.ai

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CASCADE LOCKS, OREGON

RIVER OPERABLE UNIT

HUMAN HEALTH CONCEPTUAL EXPOSURE MODEL

DRAWING NUMBER: FIGURE 11-15

GIS FILE NUMBER: FIG 11-15

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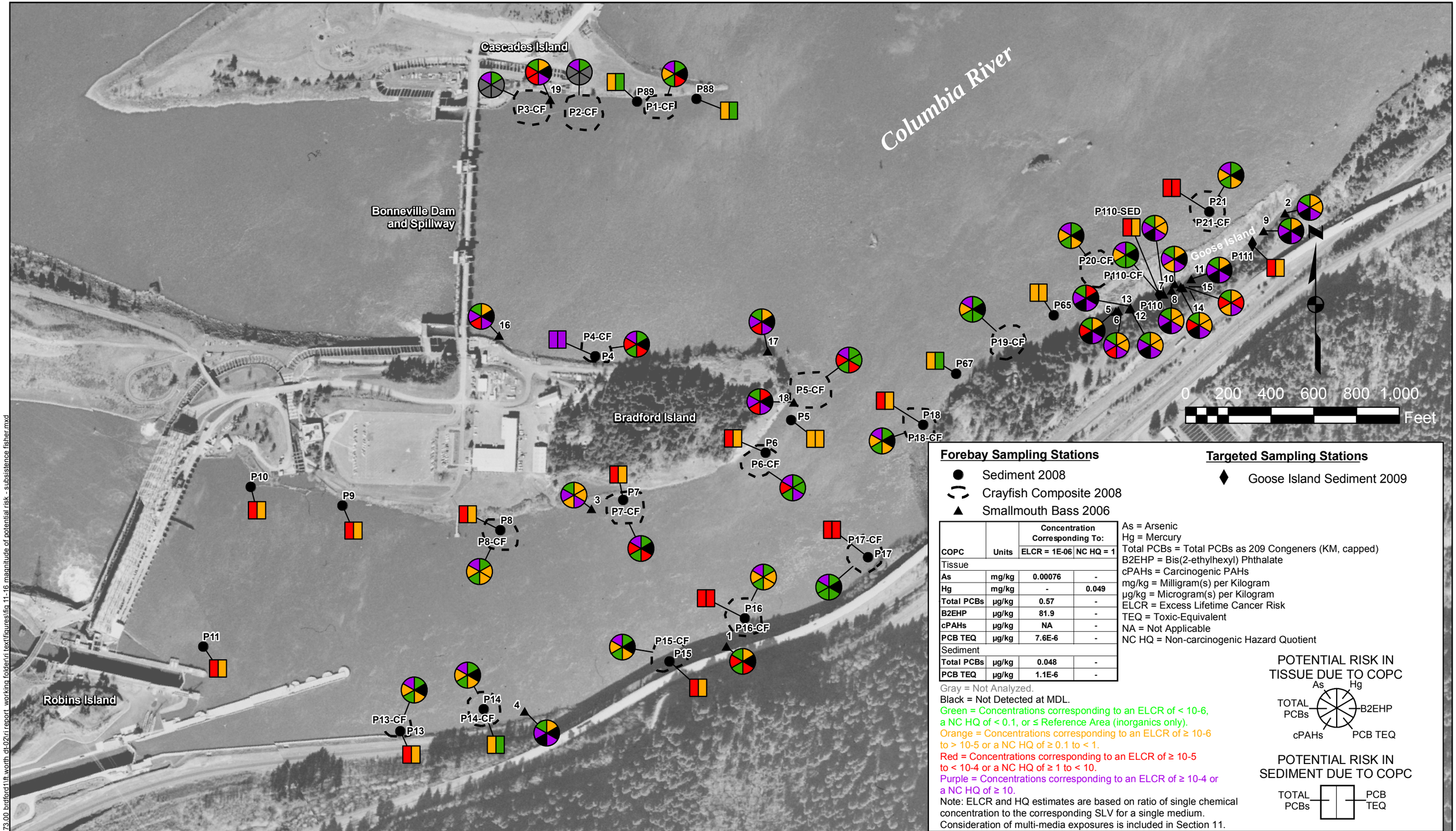

COPC	Units	Concentration Corresponding To: ELCR = 1E-06	NC HQ = 1
Tissue			
As	mg/kg	0.00076	-
Hg	mg/kg	-	0.049
Total PCBs	µg/kg	0.57	-
B2EHP	µg/kg	81.9	-
cPAHs	µg/kg	NA	-
PCB TEQ	µg/kg	7.6E-6	-
Sediment			
Total PCBs	µg/kg	0.048	-
PCB TEQ	µg/kg	1.1E-6	-

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CASCADE LOCKS, OREGON

RIVER OPERABLE UNIT

MAGNITUDE OF POTENTIAL RISK SUBSISTENCE FISHER

DRAWING NUMBER: FIGURE 11-16

GIS FILE NUMBER: FIG 11-16

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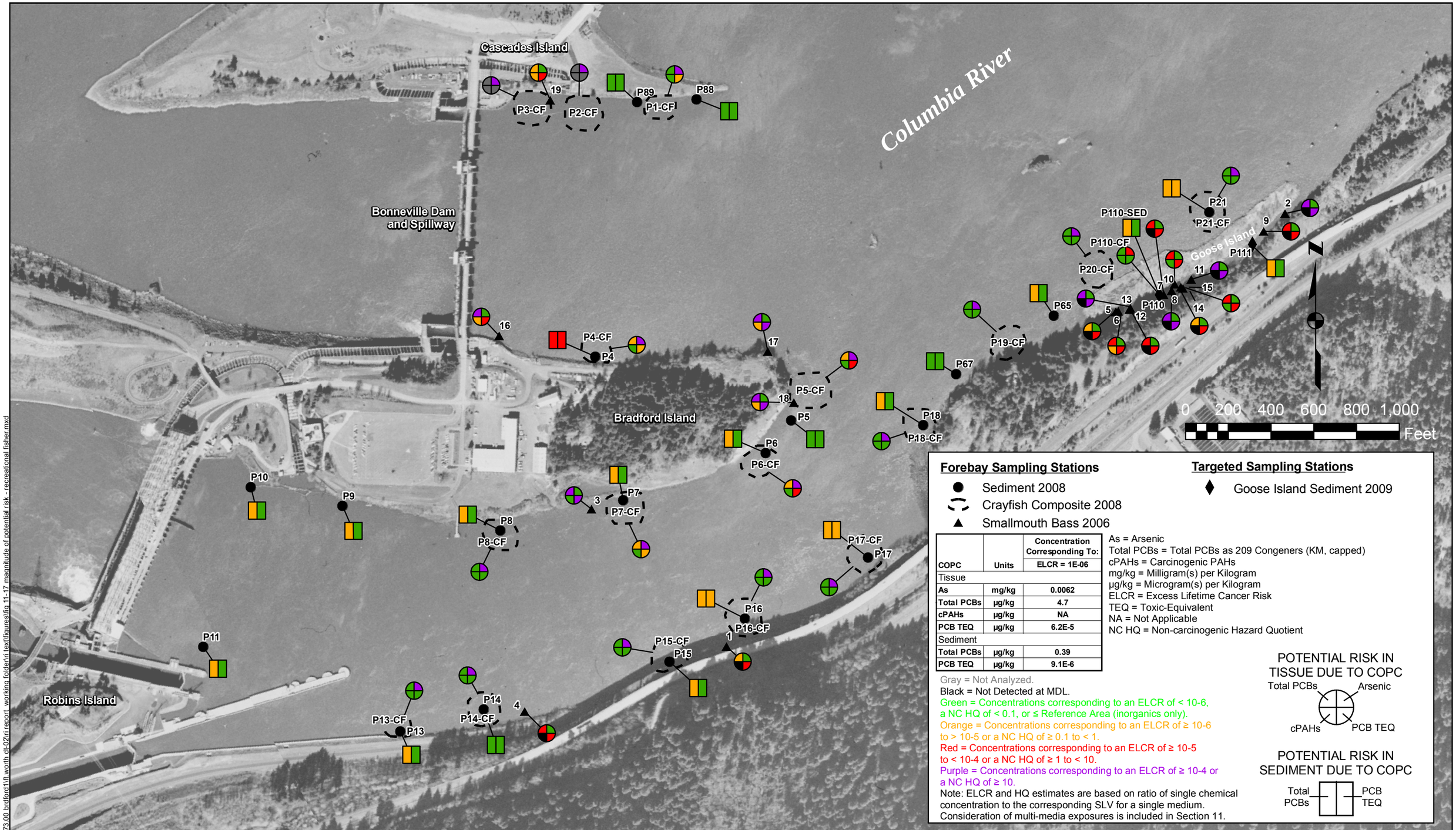

Forebay Sampling Stations

- Sediment 2008
- Crayfish Composite 2008
- Smallmouth Bass 2006

Targeted Sampling Stations

- Goose Island Sediment 2009

COPC	Units	Concentration Corresponding To: ELCR = 1E-06
Tissue		
As	mg/kg	0.0062
Total PCBs	µg/kg	4.7
cPAHs	µg/kg	NA
PCB TEQ	µg/kg	6.2E-5
Sediment		
Total PCBs	µg/kg	0.39
PCB TEQ	µg/kg	9.1E-6

As = Arsenic
Total PCBs = Total PCBs as 209 Congeners (KM, capped)
cPAHs = Carcinogenic PAHs
mg/kg = Milligram(s) per Kilogram
µg/kg = Microgram(s) per Kilogram
ELCR = Excess Lifetime Cancer Risk
TEQ = Toxic-Equivalent
NA = Not Applicable
NC HQ = Non-carcinogenic Hazard Quotient

Gray = Not Analyzed.
Black = Not Detected at MDL.
Green = Concentrations corresponding to an ELCR of < 10-6, a NC HQ of < 0.1, or ≤ Reference Area (inorganics only).
Orange = Concentrations corresponding to an ELCR of ≥ 10-6 to > 10-5 or a NC HQ of ≥ 0.1 to < 1.
Red = Concentrations corresponding to an ELCR of ≥ 10-5 to < 10-4 or a NC HQ of ≥ 1 to < 10.
Purple = Concentrations corresponding to an ELCR of ≥ 10-4 or a NC HQ of ≥ 10.
Note: ELCR and HQ estimates are based on ratio of single chemical concentration to the corresponding SLV for a single medium. Consideration of multi-media exposures is included in Section 11.

POTENTIAL RISK IN TISSUE DUE TO COPC

POTENTIAL RISK IN SEDIMENT DUE TO COPC

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CASCADE LOCKS, OREGON

RIVER OPERABLE UNIT

MAGNITUDE OF POTENTIAL RISK RECREATIONAL FISHER

DRAWING NUMBER: FIGURE 11-17
GIS FILE NUMBER: FIG 11-17
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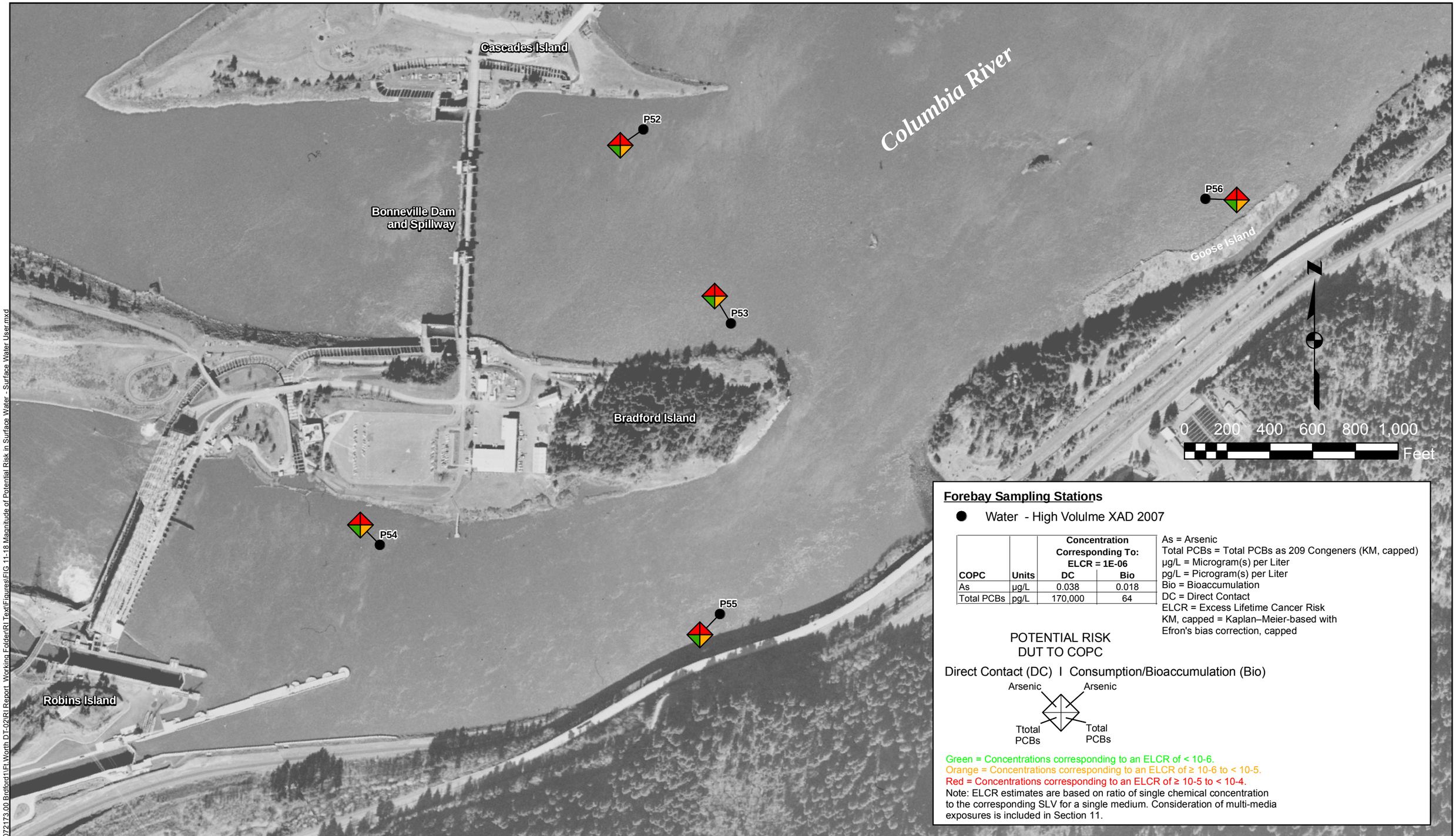

Forebay Sampling Stations

● Water - High Volulme XAD 2007

COPC	Units	Concentration Corresponding To: ELCR = 1E-06 DC	Bio
As	µg/L	0.038	0.018
Total PCBs	pg/L	170,000	64

As = Arsenic
Total PCBs = Total PCBs as 209 Congeners (KM, capped)
µg/L = Microgram(s) per Liter
pg/L = Picrogram(s) per Liter
Bio = Bioaccumulation
DC = Direct Contact
ELCR = Excess Lifetime Cancer Risk
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped

POTENTIAL RISK
DUT TO COPC

Direct Contact (DC) I Consumption/Bioaccumulation (Bio)

Arsenic Arsenic
Ttotal PCBs Total PCBs

Green = Concentrations corresponding to an ELCR of < 10-6.
Orange = Concentrations corresponding to an ELCR of ≥ 10-6 to < 10-5.
Red = Concentrations corresponding to an ELCR of ≥ 10-5 to < 10-4.
Note: ELCR estimates are based on ratio of single chemical concentration to the corresponding SLV for a single medium. Consideration of multi-media exposures is included in Section 11.

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RIVER OPERABLE UNIT

MAGNITUDE OF POTENTIAL RISK IN SURFACE WATER SURFACE WATER USER

DRAWING NUMBER: FIGURE 11-18
GIS FILE NUMBER: FIG 11-18
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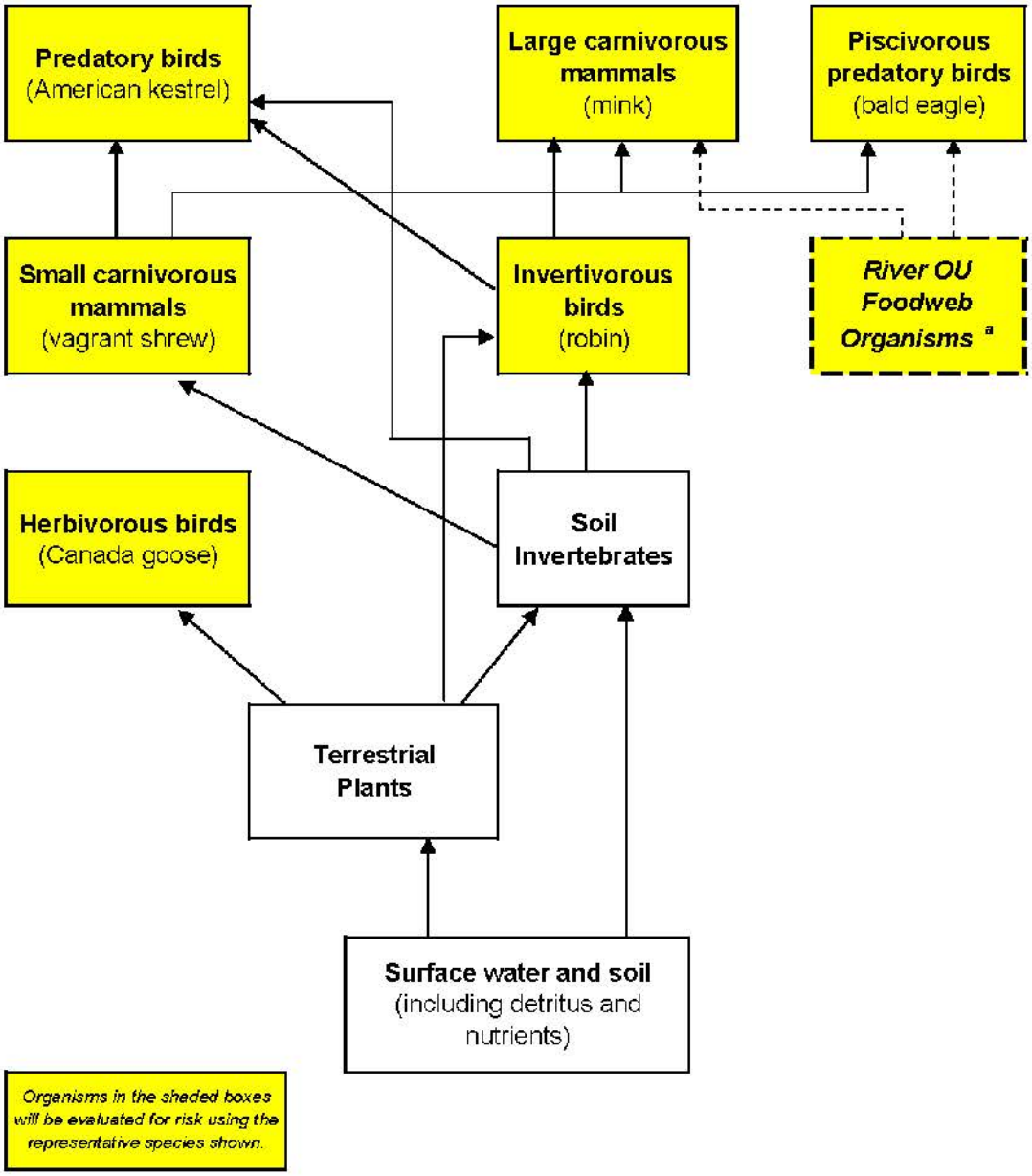
Q:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 11-18 Magnitude of Potential Risk in Surface Water - Surface Water User.mxd



[a] Risk assessment performed for terrestrial wildlife receptors (100% use of Upland OU) assumed to be protective of aquatic-dependent wildlife receptors.

UPLAND OPERABLE UNIT FOOD WEB

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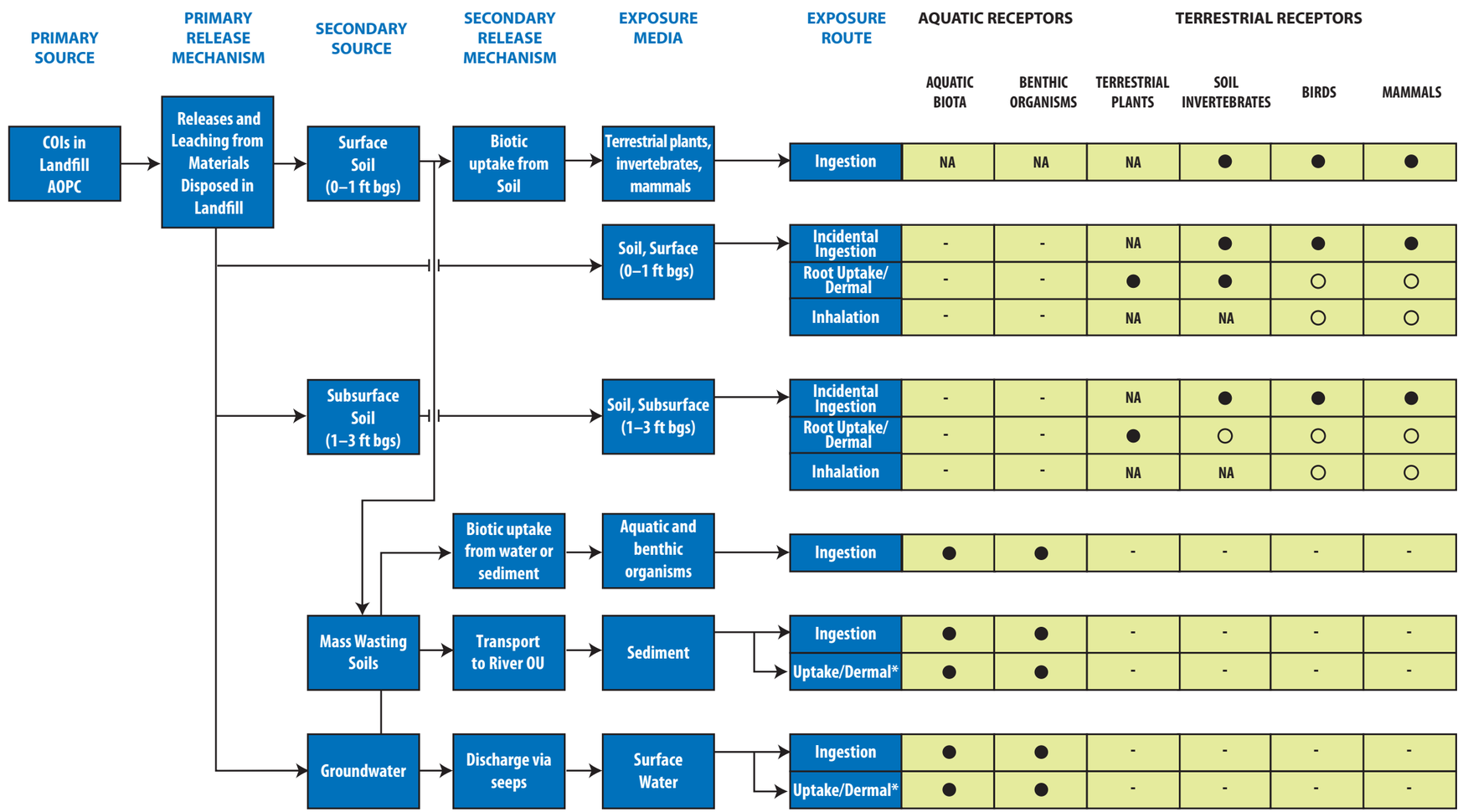
CASCADE LOCKS, OREGON

FIGURE 12-1

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 12-1 Upland OU Food Web.mxd



LEGEND

- ● Complete and potentially significant pathway
- ○ Complete but likely minor pathway
- \- Incomplete pathway
- NA Pathway not applicable to receptor

Aquatic Biota defined as aquatic plants, plankton, invertebrates, fish and aquatic-dependent wildlife.

*The dermal exposure pathway for aquatic-dependent wildlife is expected to be minor due to the barrier offered by fur and feathers.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 12-2.ai

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CASCADE LOCKS, OREGON

LANDFILL AOPC

ECOLOGICAL CONCEPTUAL EXPOSURE MODEL

DRAWING NUMBER: FIGURE 12-2
GIS FILE NUMBER: FIG 12-2
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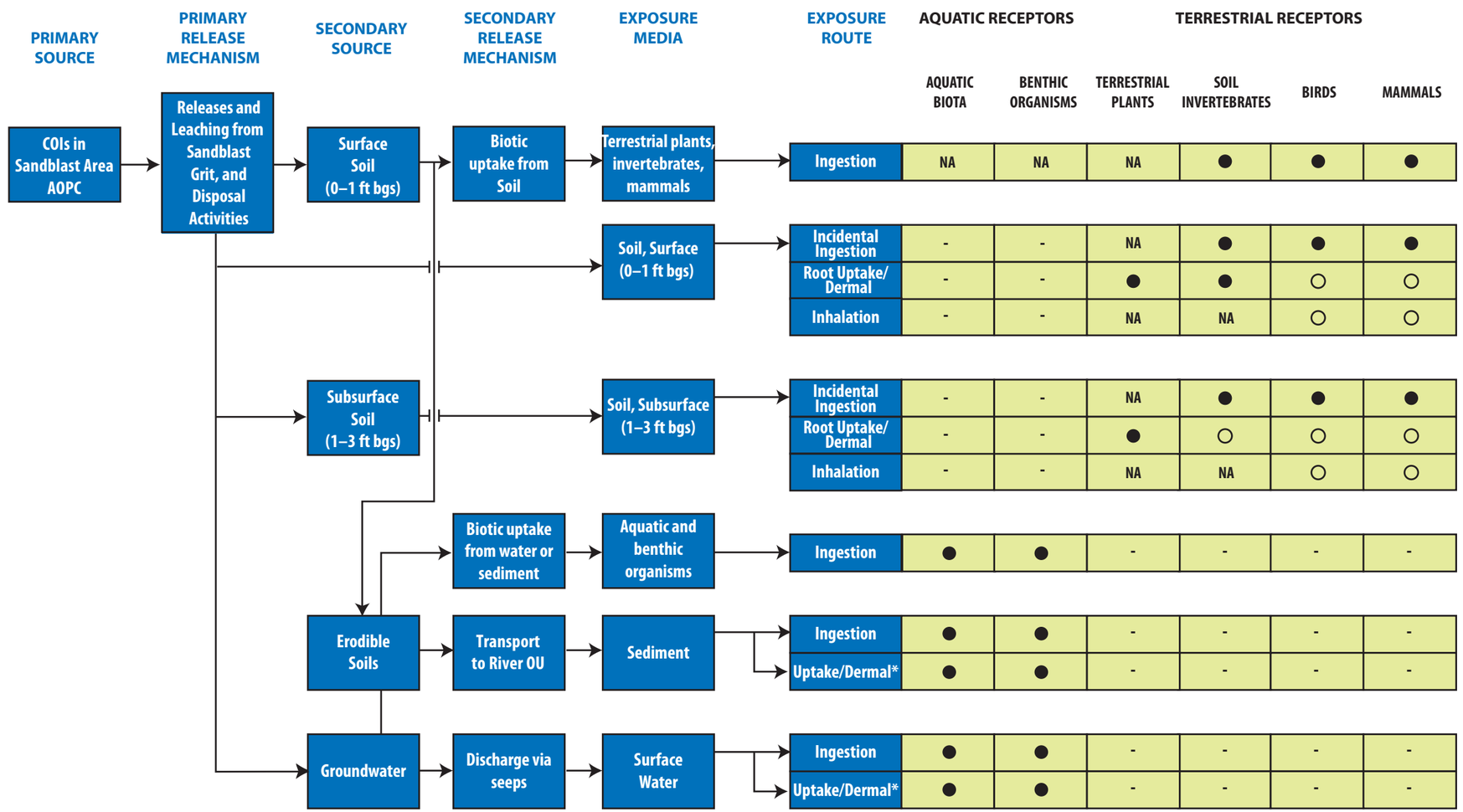

LEGEND

- ● Complete and potentially significant pathway
- ○ Complete but likely minor pathway
- \- Incomplete pathway
- NA Pathway not applicable to receptor

Aquatic Biota defined as aquatic plants, plankton, invertebrates, fish and aquatic-dependent wildlife.

*The dermal exposure pathway for aquatic-dependent wildlife is expected to be minor due to the barrier offered by fur and feathers.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 12-3.ai

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

SANDBLAST AREA AOPC

ECOLOGICAL CONCEPTUAL EXPOSURE MODEL

DRAWING NUMBER: FIGURE 12-3
GIS FILE NUMBER: FIG 12-3
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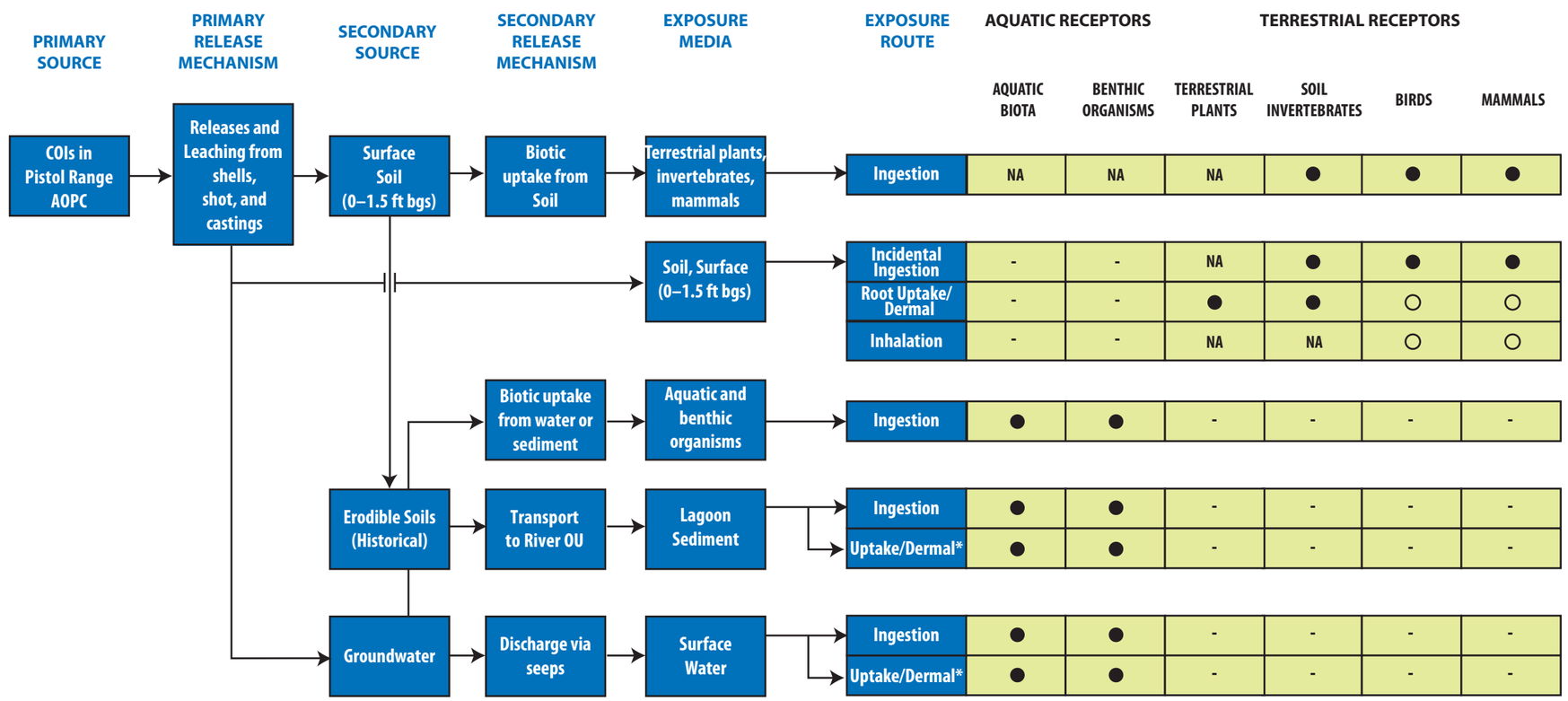

LEGEND

- ● Complete and potentially significant pathway
- ○ Complete but likely minor pathway
- \- Incomplete pathway
- NA Pathway not applicable to receptor

Aquatic Biota defined as aquatic plants, plankton, invertebrates, fish and aquatic-dependent wildlife.

*The dermal exposure pathway for aquatic-dependent wildlife is expected to be minor due to the barrier offered by fur and feathers.

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CASCADE LOCKS, OREGON

PISTOL RANGE AOPC

ECOLOGICAL CONCEPTUAL EXPOSURE MODEL

DRAWING NUMBER: FIGURE 12-4
GIS FILE NUMBER: FIG 12-4
SHEET:
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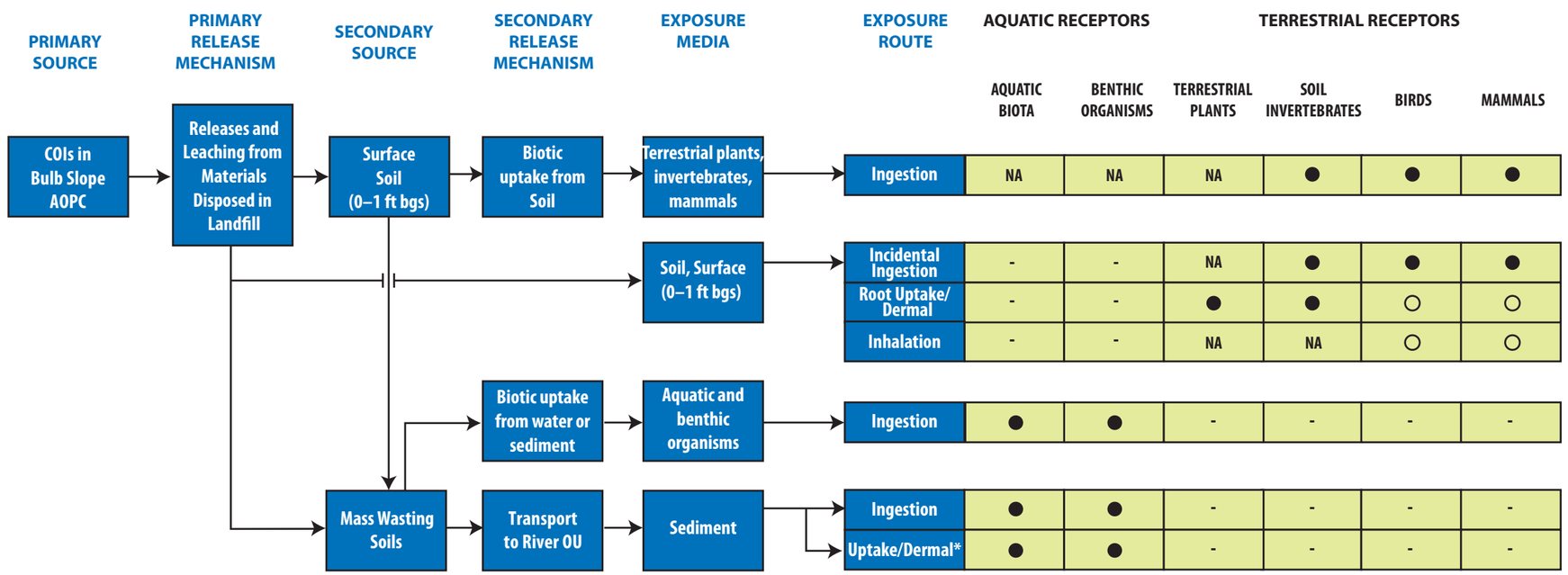
O:\25692709 USACE\53-F0072173.00 Brdford1\Fl Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 12-4.ai



LEGEND

- ● Complete and potentially significant pathway
- ○ Complete but likely minor pathway
- \- Incomplete pathway
- NA Pathway not applicable to receptor

Aquatic Biota defined as aquatic plants, plankton, invertebrates, fish and aquatic-dependent wildlife.

*The dermal exposure pathway for aquatic-dependent wildlife is expected to be minor due to the barrier offered by fur and feathers.

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BULB SLOPE AOPC

ECOLOGICAL CONCEPTUAL EXPOSURE MODEL

DRAWING NUMBER: FIGURE 12-5

GIS FILE NUMBER: FIG 12-5

SHEET: REV.

O:\25692709 USACE\63-F0072173.00 Bradford\Ft Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 12-5.ai

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction

Gully Test Pit
BIL01TPG BIL02TPG
BIL03TPG BIL04TPG

Mercury Vapor-Lamp Test Pit
BIL28TPM BIL29TPM

Lead Hot Spot Test Pit #1

Lead Hot Spot Test Pit #2

Extent of Landfill Debris

Pesticide/Herbicide Wash Area

Landfill AOPC

Access Road

120

SCALE IN FEET: 15 0 15 30

LEGEND

- Landfill Surface and Shallow Soil Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Plant Soil SLVs

	Pb (mg/kg)	Hg (mg/kg)	HPAHs (µg/kg)
SLV	120	0.30	1,200
5x	600	1.5	6,000
10x	1,200	3.0	12,000
50x	6,000	15	60,000

Pb = Lead
Hg = Mercury
HPAHs = Total High Molecular Weight PAHs

mg/kg = Milligram per Kilogram
µg/kg = Micrograms per Kilogram
Gray = Not Analyzed/Not Included
Black = Not detected at MDL
Green = Detected at or below SLV
Yellow = Detected above SLV to 5x SLV
Orange = Detected above 5x SLV to 10x SLV
Red = Detected above 10x SLV to 50x SLV
Purple = Detected above 50x SLV

CPEC Concentrations in Soil

0-1 ft bgs: Pb, Hg, HPAHs
1-3 ft bgs: Pb, Hg, HPAHs
0-10 ft bgs: Pb, Hg, HPAHs

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LANDFILL AOPC
PLANT CPECs IN SOIL

DRAWING NUMBER: FIG 12-6
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O:\25692709 USACE\53-F0072173.00 Bradford\FI-Worth DT-02\RI Report_Working Folder\RI Text\Figures\Fig 12-6 Plant CPECs in Soil at the Landfill AOPC.dwg Apr 13, 2012 - 11:06am

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction

BIL13SSI
BIL09USE
BIL03USE
BIL08USE
BIL02USE
BIL07USE
BIL01USE
L-01
L-02
L-03
L-04
BIL22
BIL18

Gully Test Pit
BIL01TPG BIL02TPG
BIL03TPG BIL04TPG

Mercury Vapor-Lamp Test Pit
BIL28TPM BIL29TPM

BIL05USE
BIL04USE
BIL06USE

BIL31
BIL32
BIL06SSI
BIL30
BIL12SSI

Lead Hot Spot
Test Pit #1

Lead Hot Spot
Test Pit #2

BIL11SSI
BIL26
BIL24
BIL04SSI
BIL27
BIL05SSI
BIL09SSI
BIL10SSI

Extent of
Landfill Debris

Access Road

BIL01SSI
BIL03SSI
BIL02SSI

Pesticide/Herbicide
Wash Area

Landfill AOPC

120

15 0 15 30
SCALE IN FEET

LEGEND

- Landfill Surface and Shallow Soil Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Soil SLVs

	Hg (mg/kg)	Zn (mg/kg)	HPAHs (µg/kg)
SLV	0.1	120	18,000
5x	0.5	600	90,000
10x	1	--	180,000

Hg = Mercury
Zn = Zinc
HPAHs = Total High Molecular Weight PAHs

mg/kg = Milligram per Kilogram
µg/kg = Micrograms per Kilogram
Gray = Not Analyzed
Black = Not detected at MDL
Green = Detected at or below SLV
Yellow = Detected above SLV to 5x SLV
Orange = Detected above 5x SLV to 10x SLV
Red = Detected above 10x SLV to 50x SLV

CPEC Concentrations in Soil

0-1 ft bgs: Hg, Zn, HPAHs
1-3 ft bgs: Hg, Zn, HPAHs
0-10 ft bgs: Hg, Zn, HPAHs

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LANDFILL AOPC

SOIL INVERTEBRATE CPECs IN SOIL

DRAWING NUMBER: FIG12-7
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O:\25696946 USACE\53-F0072173.00 Bradford\FL Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 12-7 Soil Invertebrate CPECs in Soil at the Landfill AOPC.dwg Apr 13, 2012 - 11:32am

Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction

BIL13SSI
BIL09USE
BIL03USE
BIL08USE
BIL02USE
BIL07USE
BIL01USE
L-02
L-01
BIL22
BIL17
BIL18
L-04
L-03

Gully Test Pit
BIL01TPG BIL02TPG
BIL03TPG BIL04TPG

Mercury Vapor-Lamp Test Pit
BIL28TPM BIL29TPM

BIL05USE
BIL04USE
BIL06USE

BIL31
BIL32
BIL06SSI
BIL30
BIL12SSI

Lead Hot Spot
Test Pit #1

Lead Hot Spot
Test Pit #2

BIL11SSI
BIL26
BIL24
BIL04SSI
BIL27
BIL05SSI
BIL09SSI

Access Road

BIL10SSI

Extent of
Landfill Debris

BIL01SSI
BIL03SSI
BIL02SSI

Pesticide/Herbicide
Wash Area

Landfill AOPC

120

15 0 15 30
SCALE IN FEET

LEGEND

- Landfill Surface and Shallow Soil Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Avian Soil SLVs

	Pb (mg/kg)	Hg (mg/kg)	Zn (mg/kg)	B2EHP (µg/kg)
SLV	25.5	0.066	72	4,500
5x	127.5	0.330	359	22,500
10x	255	0.66	717	--
50x	1,275	3.3	--	--

Pb = Lead
Hg = Mercury
Zn = Zinc
B2EHP = Bis(2-ethylhexyl)phthalate

mg/kg = Milligram per Kilogram
µg/kg = Micrograms per Kilogram
Gray = Not Analyzed
Black = Not detected at MDL
Green = Detected at or below SLV
Yellow = Detected above SLV to 5x SLV
Orange = Detected above 5x SLV to 10x SLV
Red = Detected above 10x SLV to 50x SLV
Purple = Detected above 50x SLV

CPEC Concentrations in Soil

0-1 ft bgs: Pb, Hg, Zn, B2EHP
1-3 ft bgs: Pb, Hg, Zn, B2EHP
0-10 ft bgs: Pb, Hg, Zn, B2EHP

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CASCADE LOCKS, OREGON

LANDFILL AOPC

BIRD CPECs IN SOIL

DRAWING NUMBER: FIG 12-8
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Columbia River

(Average pool elevation is 74 feet NGVD)

River Flow Direction

Gully Test Pit
BIL01TPG BIL02TPG
BIL03TPG BIL04TPG

Mercury Vapor-Lamp Test Pit
BIL28TPM BIL29TPM

Lead Hot Spot Test Pit #1

Lead Hot Spot Test Pit #2

Pesticide/Herbicide Wash Area

Extent of Landfill Debris

Landfill AOPC

Access Road

120

BIL13SSI BIL09USE BIL03USE BIL08USE BIL02USE BIL07USE BIL01USE BIL22 BIL18 BIL17 L-01 L-02 L-03 L-04 BIL05USE BIL04USE BIL06USE BIL31 BIL32 BIL06SSI BIL30 BIL12SSI BIL11SSI BIL26 BIL24 BIL04SSI BIL27 BIL05SSI BIL09SSI BIL10SSI BIL01SSI BIL03SSI BIL02SSI

15 0 15 30
SCALE IN FEET

LEGEND

- Landfill Surface and Shallow Soil Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

Mammal SLVs

	Sb (mg/kg)	Pb (mg/kg)	Hg (mg/kg)	Zn (mg/kg)	DBF (µg/kg)	HPAHs (µg/kg)
SLV	0.27	56	0.15	79	2.0	1,100
5x	1.35	280	0.73	395	10	5,500
10x	2.7	560	1.5	790	20	11,000
50x	--	--	--	--	100	55,000

Sb = Antimony
Pb = Lead
Hg = Mercury
Zn = Zinc
DBF = Dibenzofuran
HPAHs = Total High Molecular Weight PAHs

mg/kg = Milligram per Kilogram
µg/kg = Micrograms per Kilogram
Gray = Not Analyzed
Black = Not detected at MDL
Green = Detected at or below 5x SLV
Orange = Detected above 5x SLV to 10x SLV
Red = Detected above 10x SLV to 50x SLV
Purple = Detected above 50x SLV

CPEC Concentrations in Soil

0-1 ft bgs: Pb, Hg, Sb, Zn, DBF, HPAHs
1-3 ft bgs: Pb, Hg, Sb, Zn, DBF, HPAHs
0-10 ft bgs: Pb, Hg, Sb, Zn, DBF, HPAHs

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	CHECKED BY: LSM	DATE: JULY 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

LANDFILL AOPC

MAMMAL CPECs IN SOIL

DRAWING NUMBER: FIG 12-9
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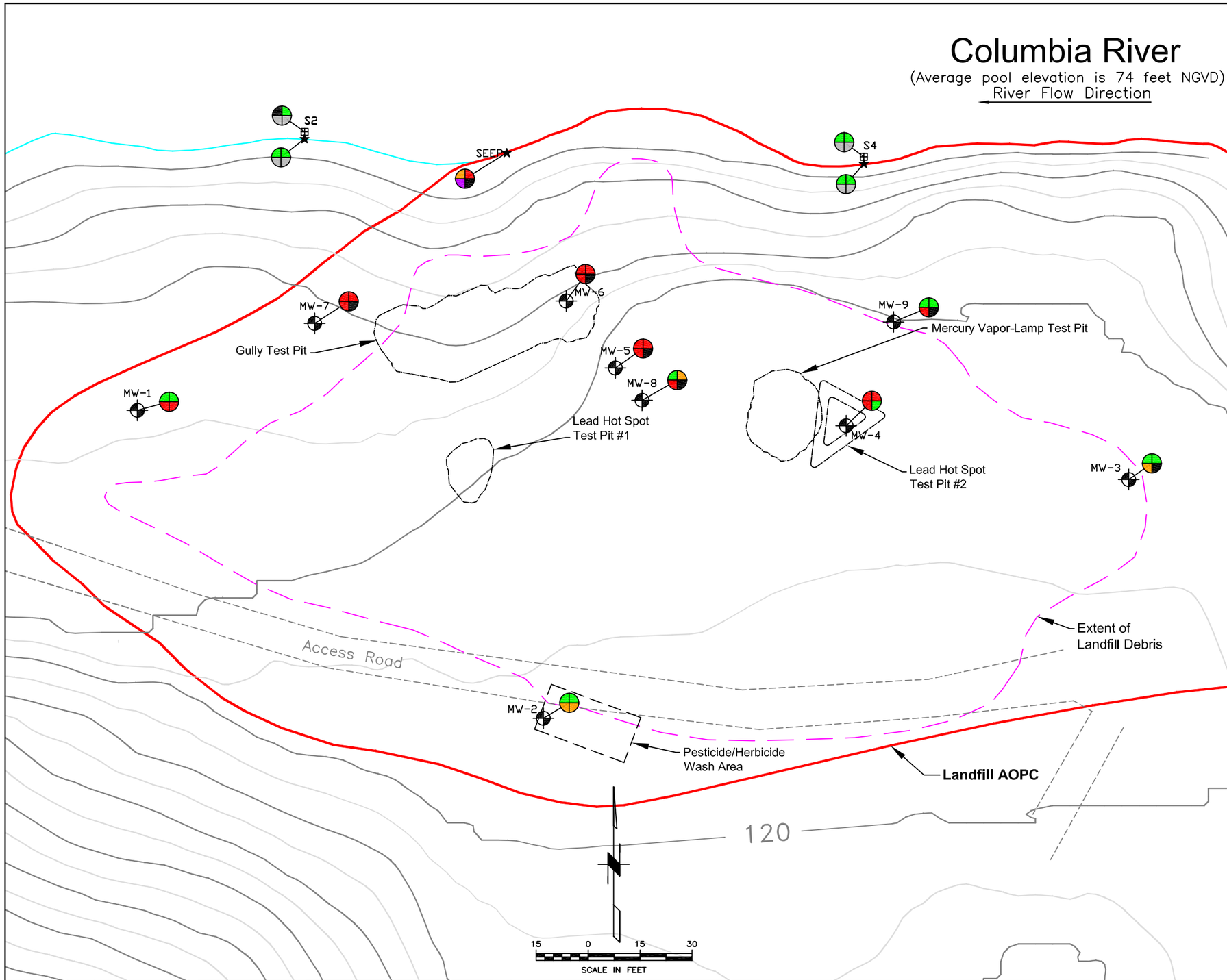
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 12-9 Mammal CPECs in Soil at the Landfill AOPC.dwg Nov 18, 2010 - 9:05am



LEGEND

- Landfill Groundwater Sampling Location
- Landfill Surface Water Sampling Location
- Landfill Seep Location
- Excavation Limits
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate extent of landfill debris based on geophysical reconnaissance survey using electrical resistivity and seismic refraction
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

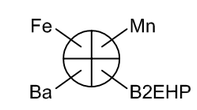
Aquatic Organism SLVs

	Ba (mg/kg)	Fe (mg/kg)	Mn (mg/kg)	B2EHP (µg/kg)
SLV	0.004	1.0	0.12	3.0
10x	0.04	10	1.2	30
50x	0.2	--	--	--

Ba = Barium
Fe = Iron
Mn = Manganese
B2EHP = Bis(2-ethylhexyl)phthalate

mg/kg = Milligram per Kilogram
µg/kg = Micrograms per Kilogram
Gray = Not Analyzed
Black = Not detected at MDL
Green = Detected at or below SLV
Orange = Detected above SLV to 10x SLV
Red = Detected above 10x SLV to 50x SLV
Purple = Detected above 50x SLV

CPEC Concentrations in Water



Note: Barium and zinc concentrations at MW-1 & MW-5 through MW-9 are totals because they were not analyzed for dissolved barium and zinc at these locations.

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LANDFILL AOPC

AQUATIC ORGANISM CPECs IN GROUNDWATER, SEEP WATER, AND SURFACE WATER

DRAWING NUMBER: FIG 12-10
CAD FILE NUMBER: FIG 12-10
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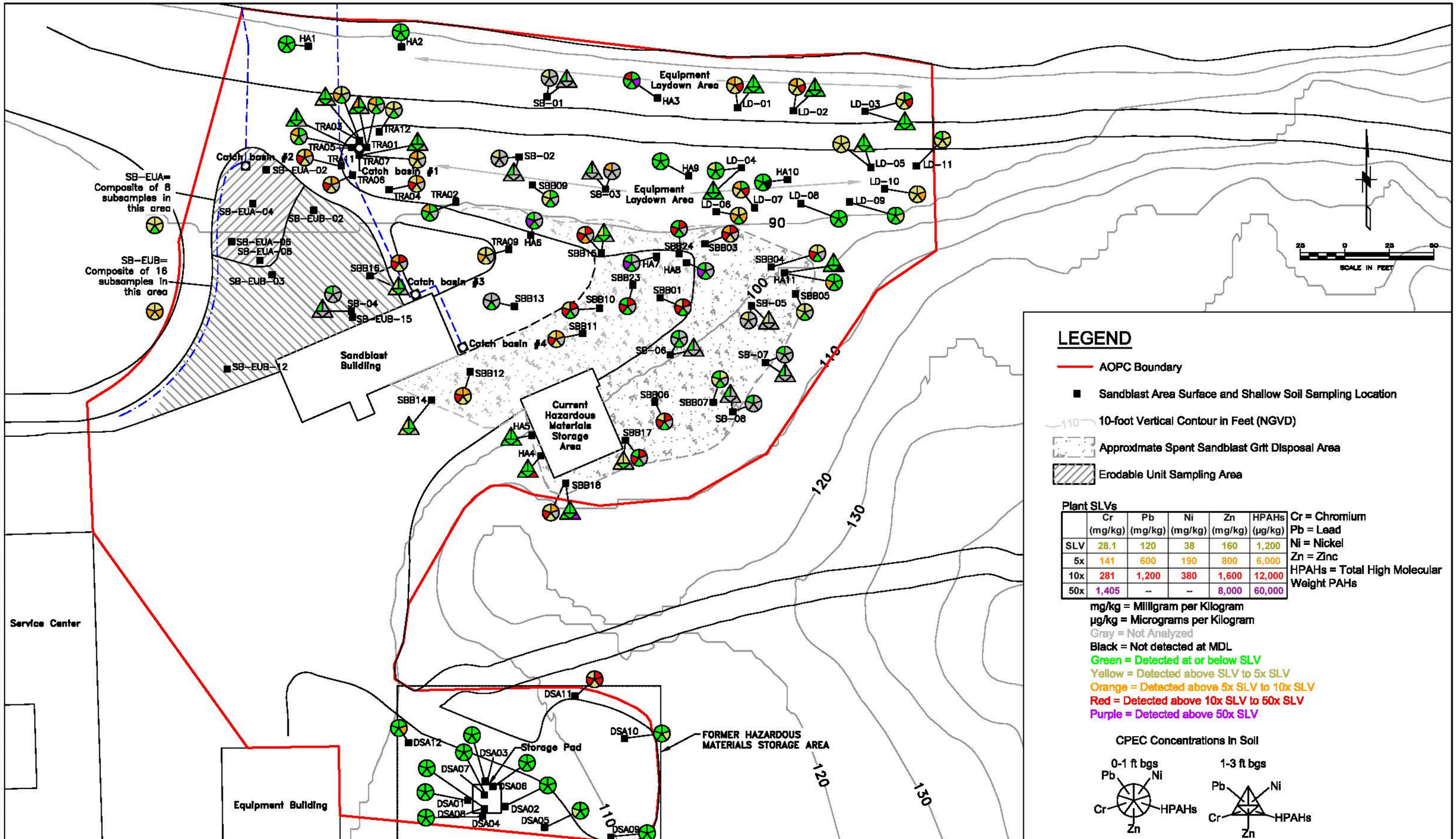
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 12-10 Aquatic Organism CPECs in GW, Seep Water, and Surface Water at the Landfill AOPC.dwg Nov 18, 2010 - 9:07am



LEGEND

- AOPC Boundary
- Sandblast Area Surface and Shallow Soil Sampling Location
- 10-foot Vertical Contour in Feet (NGVD)
- Approximate Spent Sandblast Grit Disposal Area
- Erodable Unit Sampling Area

Plant SLVs

	Cr (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	HPAHs (µg/kg)
SLV	28.1	120	38	160	1,200
5x	141	600	190	800	6,000
10x	281	1,200	380	1,600	12,000
50x	1,405	--	--	8,000	60,000

Cr = Chromium
Pb = Lead
Ni = Nickel
Zn = Zinc
HPAHs = Total High Molecular Weight PAHs

mg/kg = Milligram per Kilogram
µg/kg = Micrograms per Kilogram
Gray = Not Analyzed
Black = Not detected at MDL
Green = Detected at or below SLV
Yellow = Detected above SLV to 5x SLV
Orange = Detected above 5x SLV to 10x SLV
Red = Detected above 10x SLV to 50x SLV
Purple = Detected above 50x SLV

CPEC Concentrations In Soil

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SANDBLAST AREA AOPC

PLANT CPECs IN SOIL

DRAWING NUMBER: FIG12-11
CAD FILE NUMBER: FIG 12-11
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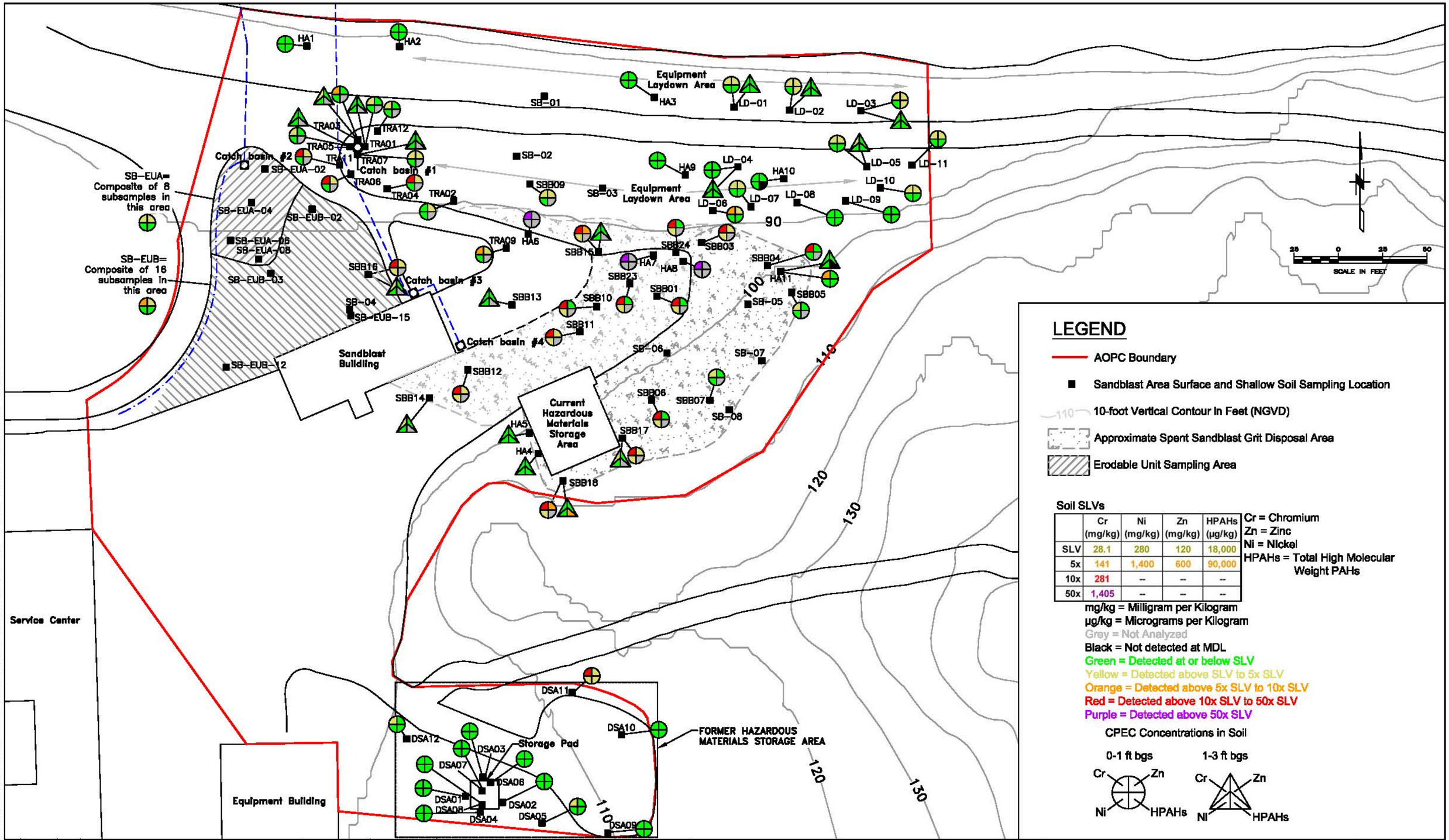
C:\25692706 USACE\53-F0072172.00 Bradford\FLWorth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 12-11 Plant CPECs in Soil at the Sandblast Area AOPC.dwg Apr 16, 2012 - 10:31am



	Cr (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	HPAHs (µg/kg)
SLV	28.1	280	120	18,000
5x	141	1,400	600	90,000
10x	281	--	--	--
50x	1,405	--	--	--

No.	DATE	BY	REVISION

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SANDBLAST AREA AOPC

SOIL INVERTEBRATE CPECs IN SOIL

DRAWING NUMBER: FIG 12-12
CAD FILE NUMBER: FIG 12-12
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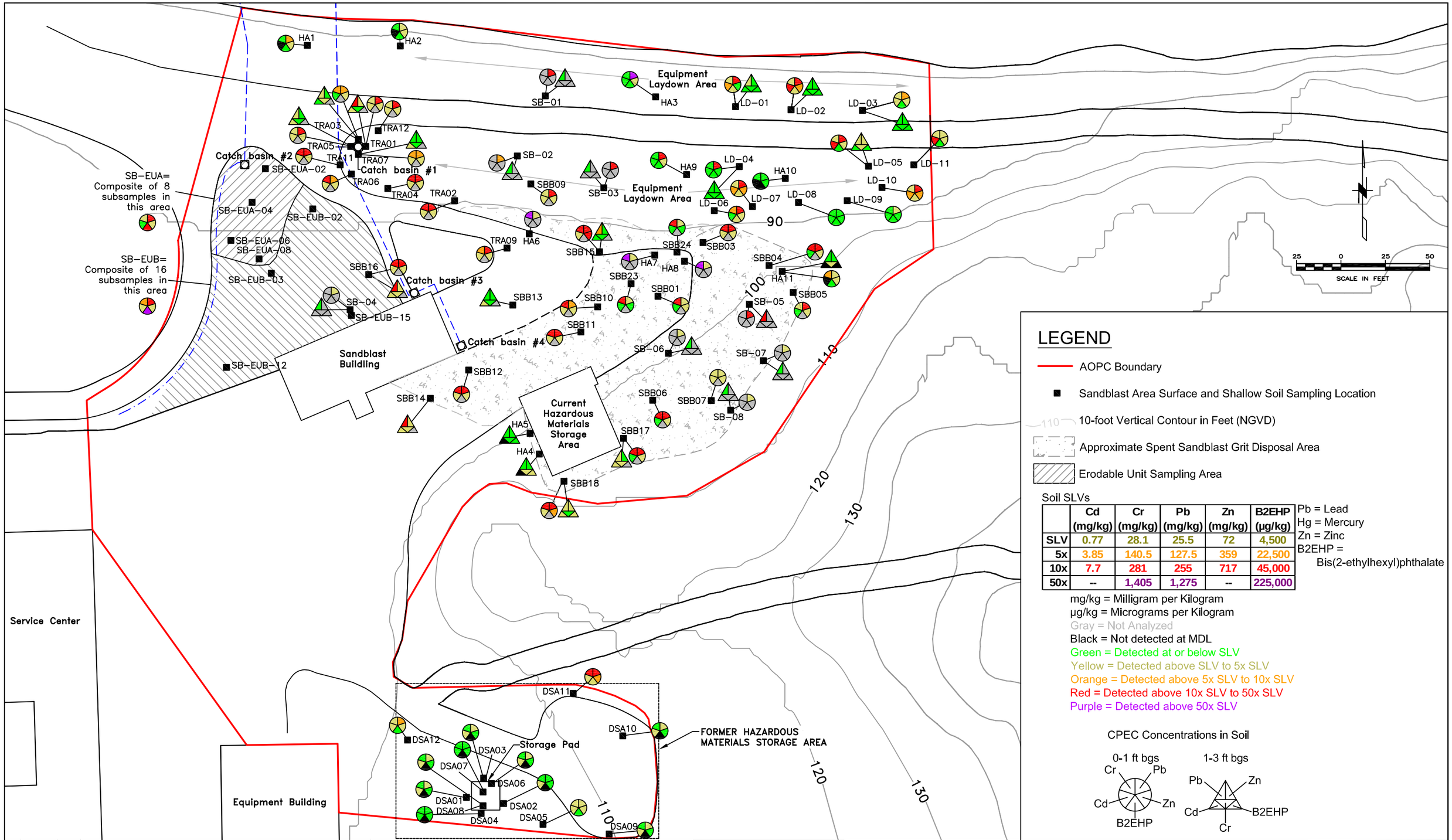
C:\25692706 USACE\53-F0072173.00 Bradford\FLWorth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 12-12 Soil Invertebrate CPECs in Soil at the Sandblast Area AOPC.dwg Apr 16, 2012 - 10:30am



	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	Zn (mg/kg)	B2EHP (µg/kg)
SLV	0.77	28.1	25.5	72	4,500
5x	3.85	140.5	127.5	359	22,500
10x	7.7	281	255	717	45,000
50x	--	1,405	1,275	--	225,000

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SANDBLAST AREA AOPC

BIRD CPECs IN SOIL

DRAWING NUMBER: FIG 12-13
CAD FILE NUMBER: FIG12-13
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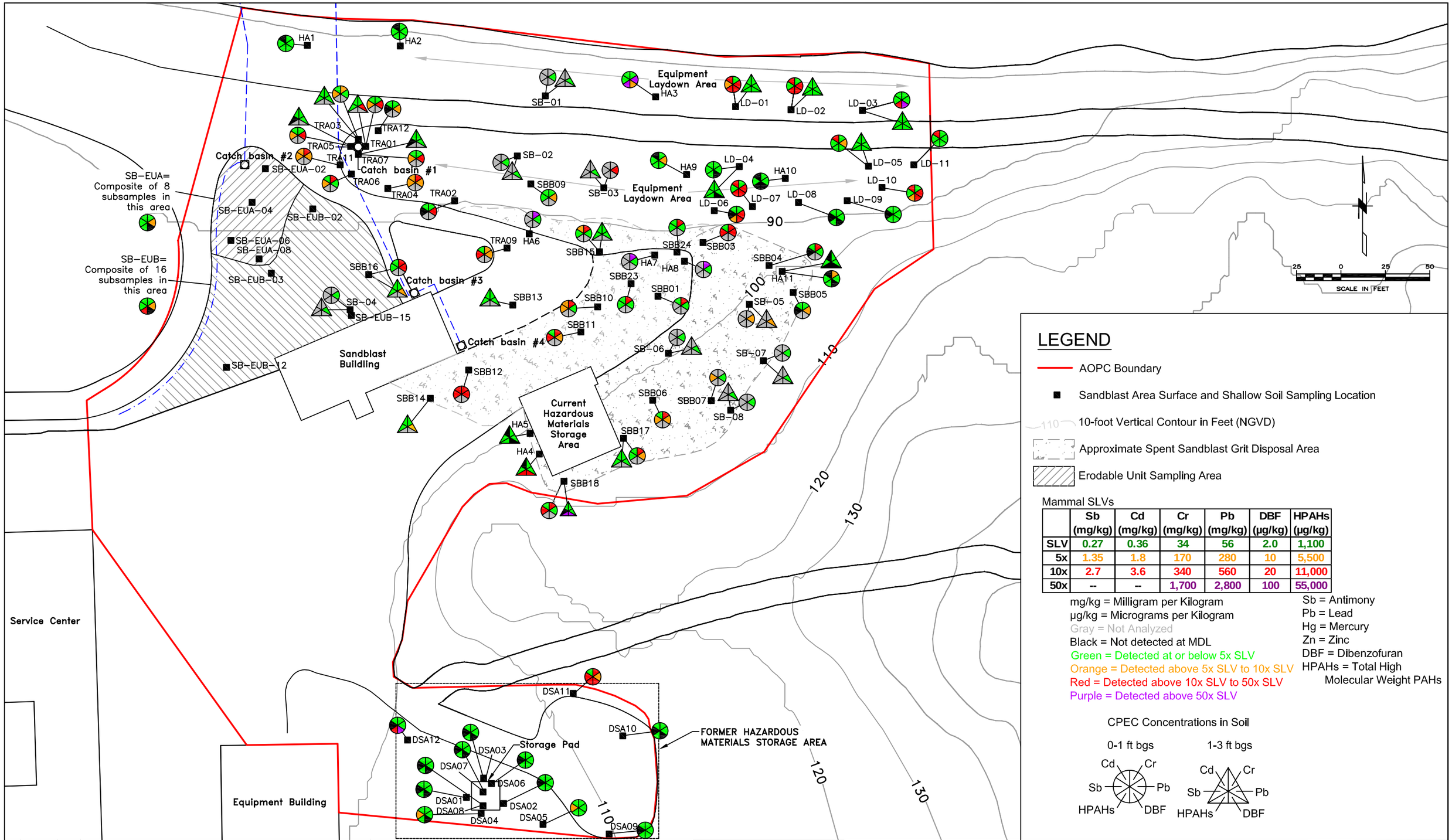
O:\25692709 USACE\53-F0072173.00 Bradford\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 12-13 Bird CPECs in Soil at the Sandblast Area AOPC.dwg Nov 18, 2010 - 9:08am



	Sb (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Pb (mg/kg)	DBF (µg/kg)	HPAHs (µg/kg)
SLV	0.27	0.36	34	56	2.0	1,100
5x	1.35	1.8	170	280	10	5,500
10x	2.7	3.6	340	560	20	11,000
50x	--	--	1,700	2,800	100	55,000

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SANDBLAST AREA AOPC

MAMMAL CPECs IN SOIL

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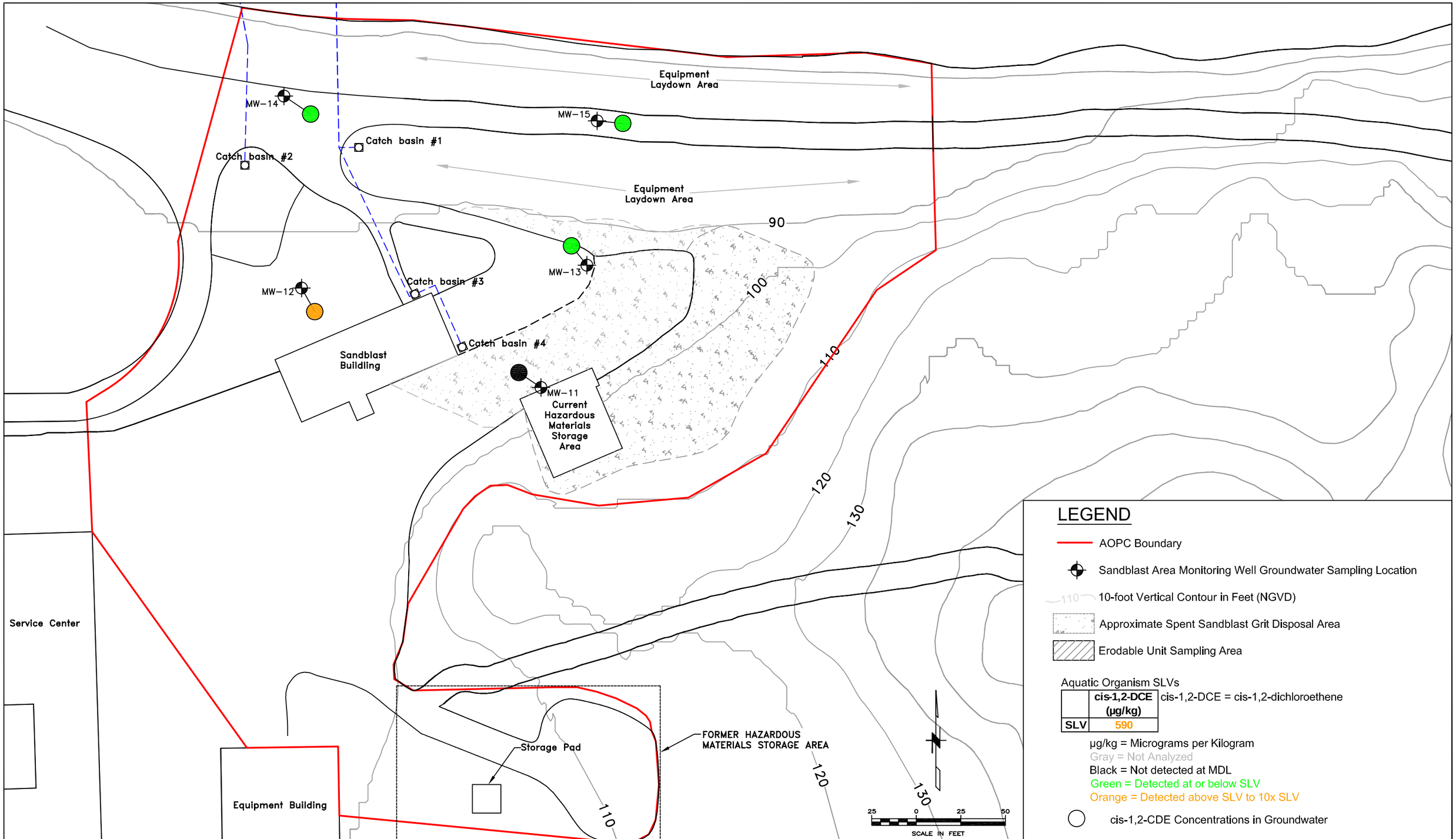
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 12-14 Mammal CPECs in Soil at the Sandblast Area AOPC.dwg Nov 18, 2010 - 9:09am



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SANDBLAST AREA AOPC

AQUATIC ORGANISM CPECs IN GROUNDWATER

DRAWING NUMBER: FIG 12-15
CAD FILE NUMBER: FIG 12-15
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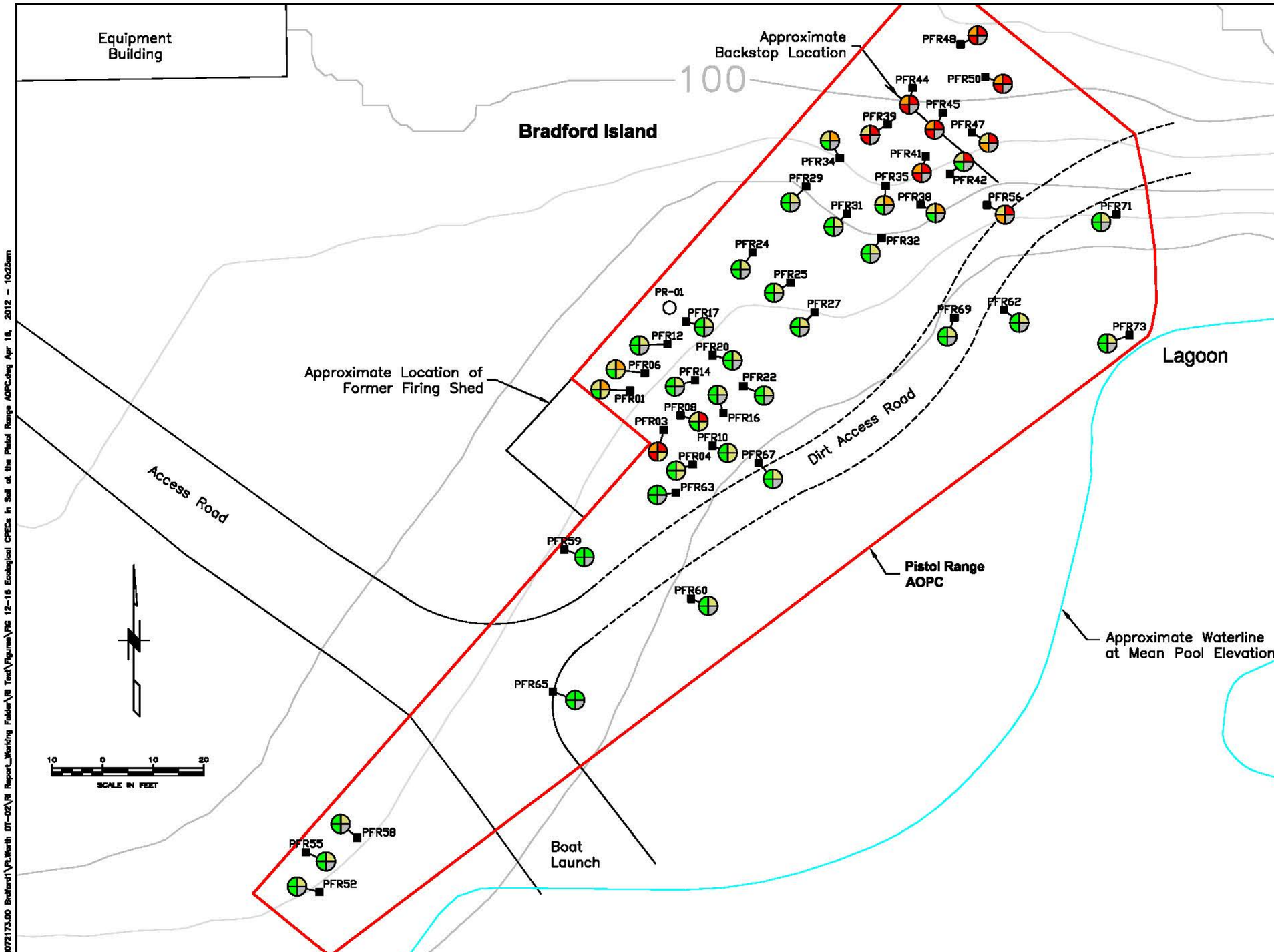
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 12-15 Aquatic Organism CPECs in GW at the Sandblast Area AOPC.dwg Nov 18, 2010 - 9:10am



Legend

- AOPC Boundary
- Pistol Range Soil Location 2002
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)
- 5 - Foot Vertical Elevation Contour (NGVD)

SLVs

	Pb (mg/kg)			Zn (mg/kg)
	Plants	Mammals	Birds	Birds
SLV	120	56	25.5	71.7
5x	600	280	127.5	355.5
10x	1200	560	255	717

Pb = Lead
Zn = Zinc

mg/kg = Milligram per Kilogram
µg/kg = Micrograms per Kilogram
Gray = Not Analyzed
Black = Not detected at MDL
Green = Detected at or below SLV for birds and plants and at or below 5x SLV for mammals
Yellow = Detected above SLV to 5x SLV for birds and plants
Orange = Detected above 5x SLV to 10x SLV
Red = Detected above 10x SLV to 50x SLV

CPEC Concentrations in Soil (0 - 1.5 ft bgs)

Plants Pb | Birds Pb
Mammals Pb | Birds Zn

Note: For locations with samples for both 0-0.5 and 1-1.5 ft bgs, the highest concentration was screened on this figure.

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PISTOL RANGE AOPC

ECOLOGICAL CPECs IN SOIL

DRAWING NUMBER: FIG 12-16
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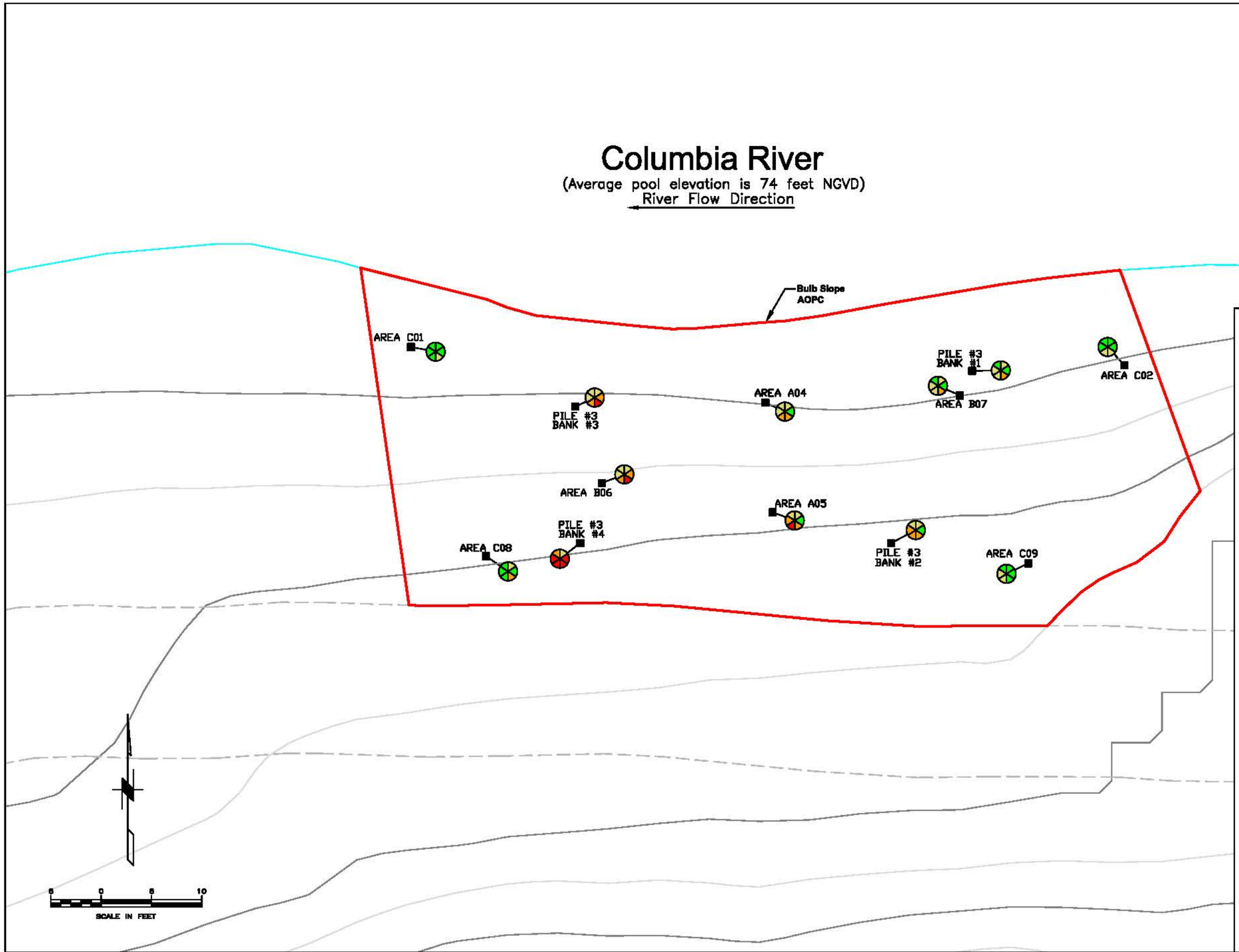
C:\25692708 USACE\53-F0072173.00 Bradford\FLWorth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 12-16 Ecological CPECs in Soil at the Pistol Range AOPC.dwg Apr 16, 2012 - 10:25am



LEGEND

- Historical Bulb Slope Surface Soil Location
- 2- Foot vertical elevation contour in feet NGVD
- Landfill Access Road
- AOPC Boundary
- Approximate Waterline at Mean Pool Elevation (approx. 74 feet NGVD)

SLVs

	Hg (mg/kg)			Pb (mg/kg)		
	Plants	Soil Invertebrates	Birds	Plants	Mammals	Birds
SLV	120	0.10	0.066	0.3	56	25.5
5x	600	0.50	0.33	1.5	280.00	127.50
10x	1,200	1.0	0.66	3.0	560	255

Pb = Lead
Hg = Mercury

mg/kg = Milligram per Kilogram
Gray = Not Analyzed
Black = Not detected at MDL
Green = Detected at or below SLV for birds, plants, and invertebrates, and at or below 5x SLV for and mammals
Yellow = Detected above SLV to 5x SLV (for birds, plants, and invertebrates)
Orange = Detected above 5x SLV to 10x SLV
Red = Detected above 10x SLV to 50x SLV

CPEC Concentrations in Soil (0 - 1 ft bgs)

Hg | Pb
Plants — Plants
Soil Invertebrates — Mammals
Birds — Birds

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BULB SLOPE AOPC

ECOLOGICAL CPECs IN SOIL

DRAWING NUMBER: FIG 12-17
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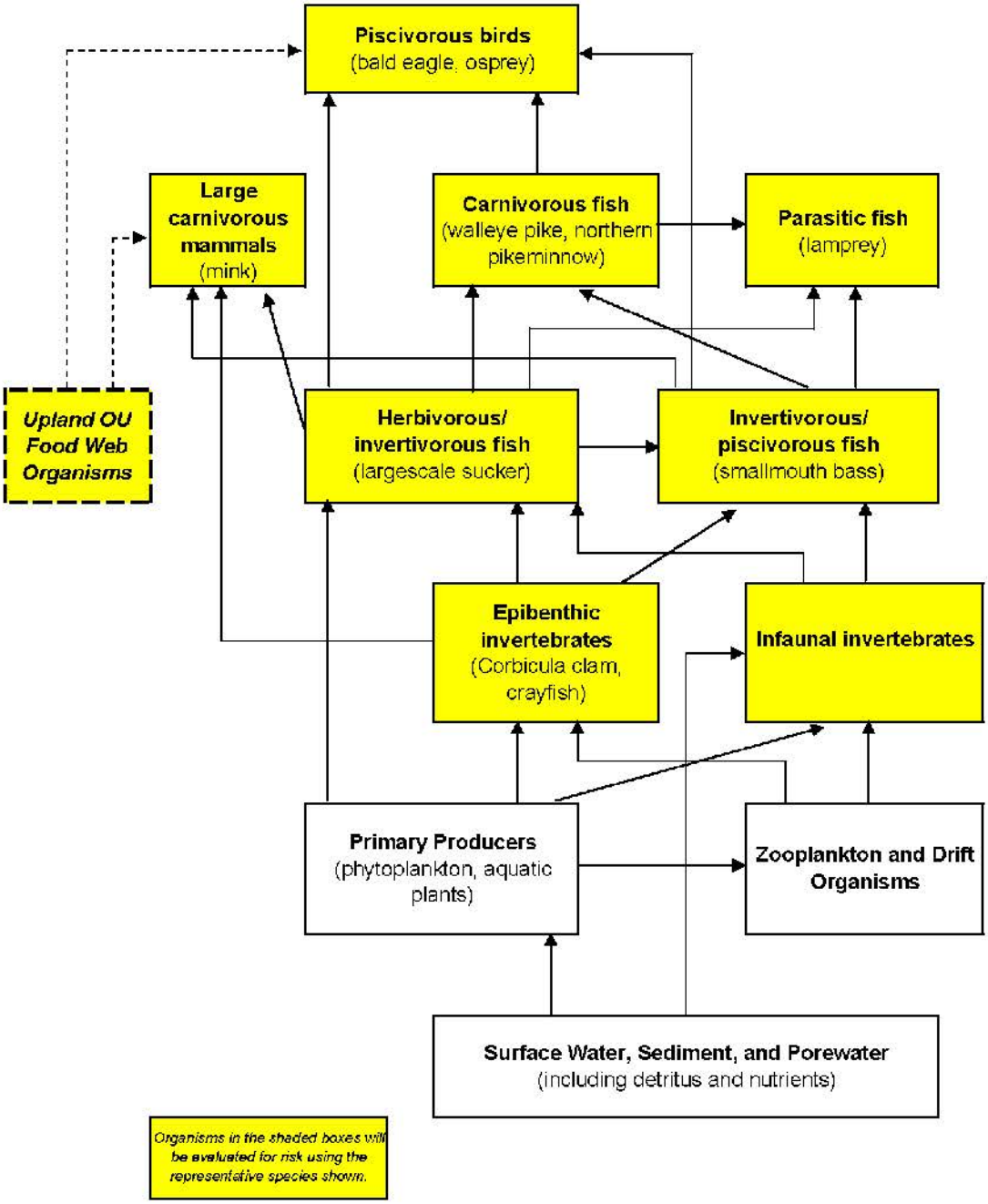
G:\25692709 USACE\53-F0072173.00 Bradford\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 12-17 Ecological CPECs in Soil at the Bulb Slope AOPC.dwg Apr 16, 2012 - 9:19am



RIVER OPERABLE UNIT FOOD WEB

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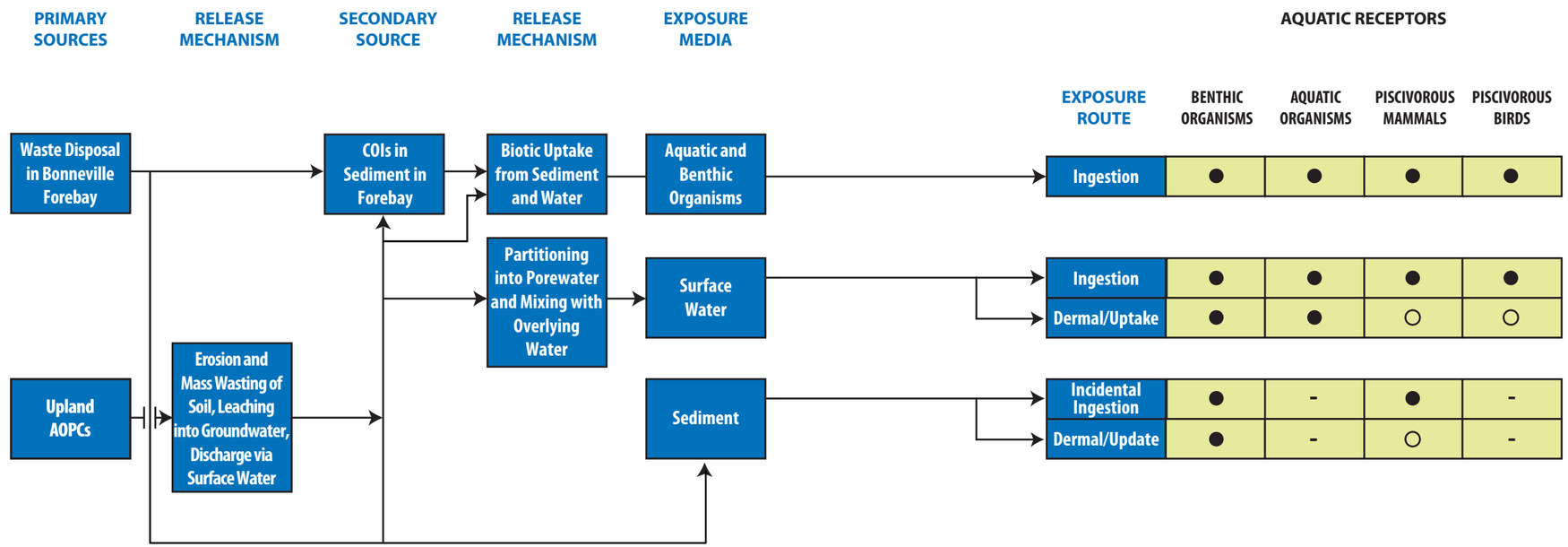
FIGURE 12-18

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 12-18 River OU Food Web.mxd



LEGEND

- ● Complete and potentially significant pathway
- ○ Complete but likely minor pathway
- \- Incomplete pathway

Aquatic Organisms defined as aquatic plants, plankton, invertebrates, fish (resident species: smallmouth bass; anadromous species: salmon, sturgeon)
Benthic Organisms defined as benthic invertebrates (infaunal invertebrates, clams, crayfish) and demersal fish (sculpin)
Piscivorous Mammals and Birds defined as those aquatic-dependent species that consume fish or shellfish from the river (bald eagle, osprey, mink)

O:\25692709 USACE\53-F0072173.00 Bradford11Ft Worth DT-02\RI Report Working Folder\RI Text\Figures\FIG 12-19.ai

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RIVER OPERABLE UNIT

ECOLOGICAL CONCEPTUAL EXPOSURE MODEL

DRAWING NUMBER: FIGURE 12-19
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Forebay Sampling Stations

- ● Sediment/Clam 2008
- ▲ Smallmouth Bass 2006
- ⬭ Sculpin Composite 2008

Targeted Sampling Stations

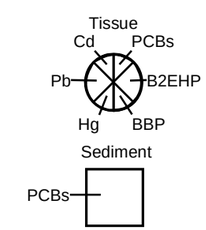
- ■ Eagle Creek Sediment 2008
- ♦ Goose Island Sediment 2009

Fish SLVs

	Cd (mg/kg)	Pb (mg/kg)	Hg (mg/kg)	PCB (µg/kg)	B2EHP (µg/kg)	BBP (µg/kg)
Tissue						
0.1x	0.015	0.012	0.0088	43	176	31.0000
SLV	0.15	0.12	0.088	430	1760	310.000
10x	--	--	--	4,300	--	--
Sediment						
0.1x	<Ref	<Ref*	< Ref &/or <0.1xSLV	2.2	NA*	ND*
SLV				22		
10x				--		

Cd = Cadmium
Pb = Lead
Hg = Mercury
PCBs = Total PCBs as Congeners
(except Eagle Creek = Total PCBs as Aroclors)
B2EHP = Bis(2-ethylhexyl)phthalate
BBP = Butyl benzyl phthalate
ND = Not detected at MDL
NA = Not Available
< Ref = Less than Reference Area
Gray = Not analyzed.
Black = Not detected at MDL
Green = Detected below 0.1x SLV
Orange = Detected at 0.1x SLV to SLV
Red = Detected at SLV to 10x SLV
Purple = Detected above 10x SLV
* Not shown on figure

CPEC Concentrations



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RIVER OPERABLE UNIT

FISH CPECs IN SEDIMENT AND TISSUE

DRAWING NUMBER: FIGURE 12-20
GIS FILE NUMBER: Fig 12-20
SHEET:
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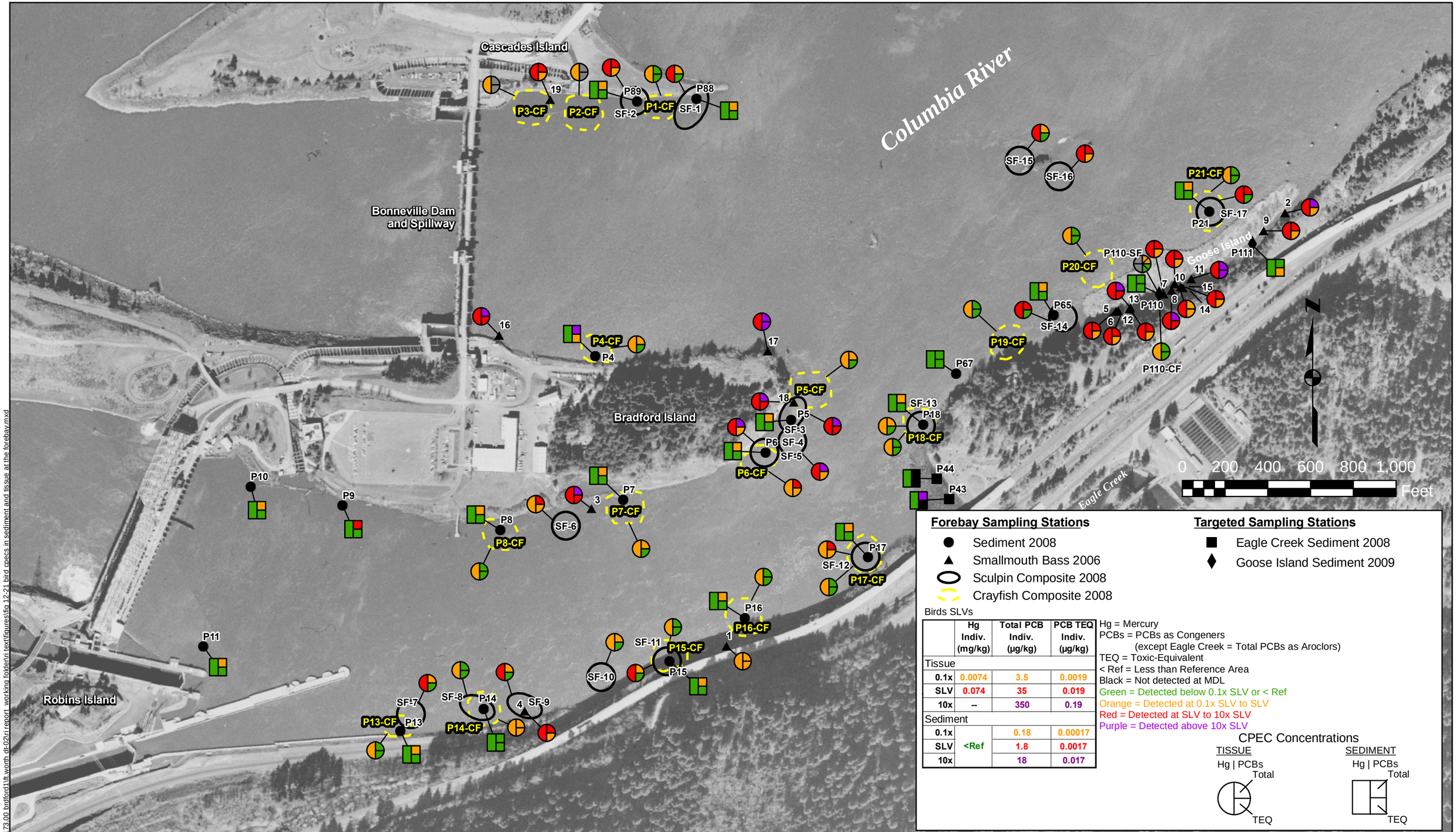
Q:\25692709 USACE\53-F00721\73.00 Bradford\1\Ft Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 12-20 Fish CPECs in Sediment and Tissue at the Forebay.mxd



Forebay Sampling Stations

- Sediment 2008
- Smallmouth Bass 2006
- Sculpin Composite 2008
- Crayfish Composite 2008

Targeted Sampling Stations

- Eagle Creek Sediment 2008
- Goose Island Sediment 2009

Birds SLVs

	Hg Indiv. (mg/kg)	Total PCB Indiv. (µg/kg)	PCB TEQ Indiv. (µg/kg)
Tissue			
0.1x	0.0074	3.5	0.0019
SLV	0.074	35	0.019
10x	--	350	0.19
Sediment			
0.1x	<Ref	0.18	0.00017
SLV		1.8	0.0017
10x		18	0.017

Hg = Mercury
PCBs = PCBs as Congeners
(except Eagle Creek = Total PCBs as Aroclors)
TEQ = Toxic-Equivalent
< Ref = Less than Reference Area
Black = Not detected at MDL
Green = Detected below 0.1x SLV or < Ref
Orange = Detected at 0.1x SLV to SLV
Red = Detected at SLV to 10x SLV
Purple = Detected above 10x SLV

CPEC Concentrations

TISSUE
Hg | PCBs
Total
TEQ

SEDIMENT
Hg | PCBs
Total
TEQ

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RIVER OPERABLE UNIT

BIRD CPECs IN SEDIMENT AND TISSUE

DRAWING NUMBER: FIGURE 12-21
GIS FILE NUMBER: Fig 12-21
SHEET:
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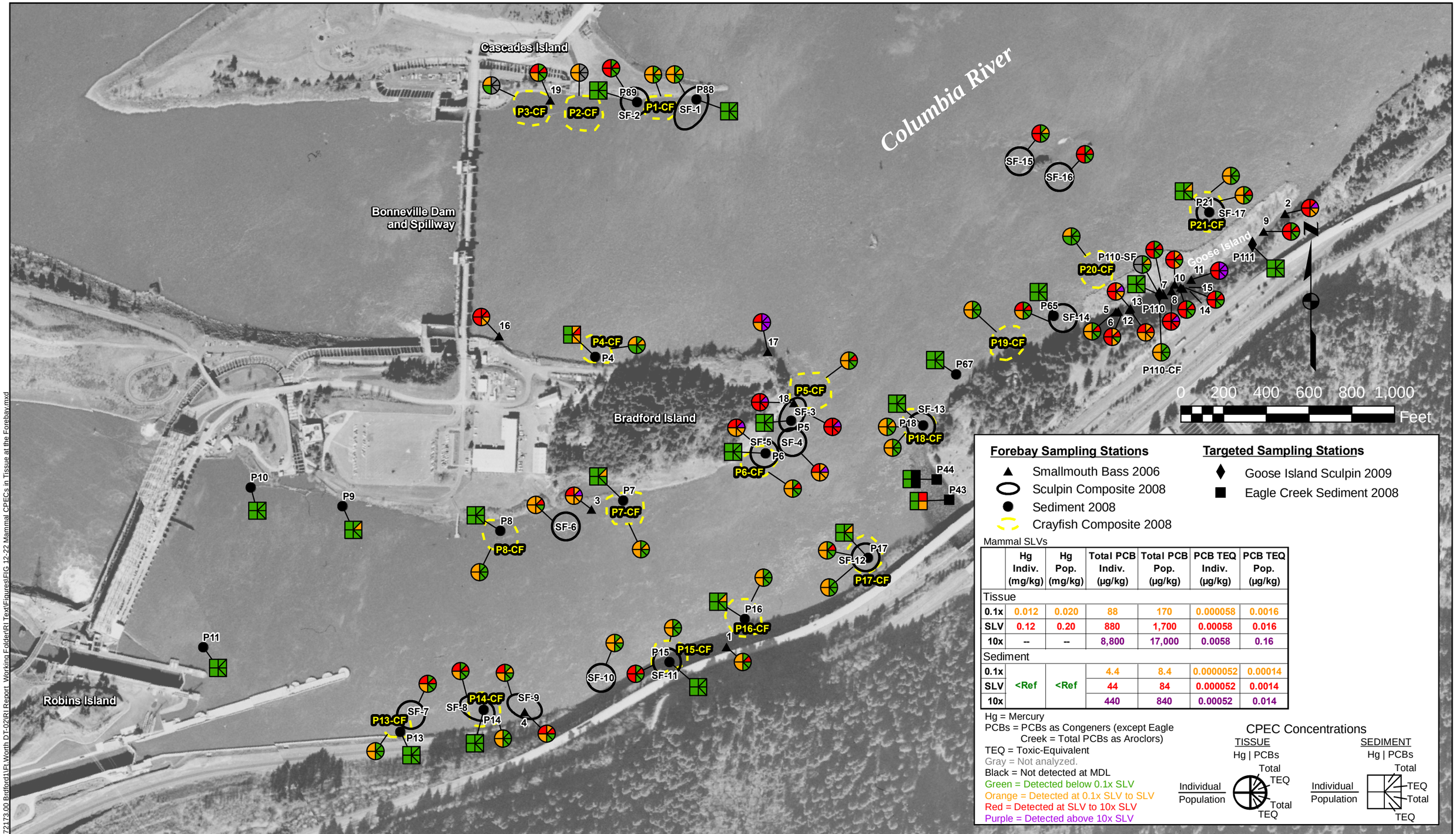
o:\25692709 usace\53-f0072173.00 brdford1\ft.worth dt-02\ri report working folder\ri text\figures\fig 12-21 bird cpecs in sediment and tissue at the forebay.mxd



Forebay Sampling Stations

- Smallmouth Bass 2006
- Sculpin Composite 2008
- Sediment 2008
- Crayfish Composite 2008

Targeted Sampling Stations

- Goose Island Sculpin 2009
- Eagle Creek Sediment 2008

Mammal SLVs

	Hg Indiv. (mg/kg)	Hg Pop. (mg/kg)	Total PCB Indiv. (µg/kg)	Total PCB Pop. (µg/kg)	PCB TEQ Indiv. (µg/kg)	PCB TEQ Pop. (µg/kg)
Tissue						
0.1x	0.012	0.020	88	170	0.000058	0.0016
SLV	0.12	0.20	880	1,700	0.00058	0.016
10x	--	--	8,800	17,000	0.0058	0.16
Sediment						
0.1x	<Ref	<Ref	4.4	8.4	0.0000052	0.00014
SLV			44	84	0.000052	0.0014
10x			440	840	0.00052	0.014

Hg = Mercury
PCBs = PCBs as Congeners (except Eagle Creek = Total PCBs as Aroclors)
TEQ = Toxic-Equivalent
Gray = Not analyzed.
Black = Not detected at MDL
Green = Detected below 0.1x SLV
Orange = Detected at 0.1x SLV to SLV
Red = Detected at SLV to 10x SLV
Purple = Detected above 10x SLV

CPEC Concentrations

TISSUE
Hg | PCBs
Individual / Population
Total TEQ
Total TEQ

SEDIMENT
Hg | PCBs
Individual / Population
Total TEQ
Total TEQ

JOB No.	DESIGNED:	PROJ. ENGINEER:
25696528	LSM	LSM
	DRAWN BY: SB	APPROVED BY: MP
	CHECKED BY: SB	DATE: APRIL 2012

URS
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BRADFORD ISLAND

CASCADE LOCKS, OREGON

RIVER OPERABLE UNIT

MAMMAL CPECs IN TISSUE

DRAWING NUMBER: FIGURE 12-22
GIS FILE NUMBER: Fig 12-22
SHEET:
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\FIG 12-22 Mammal CPECs in Tissue at the Forebay.mxd

TABLES

Table 3-1
Occurrence and Status of Threatened, Endangered, and Sensitive Species in the Bradford Island Vicinity, Oregon

Common and Scientific Name	Status				Probability of Occurrence
	Federal	State	ONHP List	TNC	
Plants					
Golden indian-paintbrush *(Castilleja levisecta)*	LT	LE	1-ex	G1, SH	Very unlikely, no suitable habitat, not seen in Oregon for 40 years, not observed.
Howellia (*Howellia aquatilus*)	LT	LT	1	G3, S1	Very unlikely, no suitable habitat, not observed.
Howell's daisy *(Erigeron howellii)*	SoC	C	1	G2, S2	Very unlikely, known from higher elevations in the Gorge, potentially suitable habitat on Bradford Island in forested areas, not project site, not observed.
Oregon daisy *(Erigeron oreganus)*	SoC	C	1	G3, S3	Very unlikely, last seen in early 1900s in Bonneville Dam area, unlikely to occur, not observed.
Tall bugbane *(Cimicifuga elata)*		C	1	G3, S3	Very unlikely, not observed, no suitable habitat.
Barrett's penstemon *(Penstemon barrettiae)*	SoC	C	1	G2, S2	Very unlikely, not observed in potentially suitable habitat, and would be identifiable if it had been present.
Howell's bentgrass *(Agrostis howellii)*	SoC	C	1	G2, S2	Very unlikely, not observed, should have been identifiable if present.
Cold-water corydalis *(Corydalis aquae-gelidae)*	SoC	C	1	G5T3, S3	Very unlikely, not observed, no habitat present.
Liverwort *(Scapania gymnostomophila)*			2	G4, S1	Very unlikely, not observed, potentially suitable habitat present on side of island north of project area.
Strickland's tauschia *(Tauschia stricklandii)*			2	G4, S1	Very unlikely, no suitable habitat, not observed.
Long-bearded hawkweed *(Hieracium longiberbe)*			4	G4G5, S3	Very unlikely, not observed, potential cliff habitat not within project area.
Sicklepod rockcress *(Arabis sparsiflora* var. *atrorubens)*			2	G5T3, S2	Very unlikely, not observed, probably no suitable habitat present.
Columbia lewisia (Lewisia columbiana var. columbiana)			2	G4T4, S2	Very unlikely, not observed, rocky slope habitat present outside of project area.
Oregon bolandra (Bolandra oregana)		SC	4	G3, S3	Very unlikely, not observed, no wet cliff/talus habitat present on Bradford Island.
Invertebrates					
Pristine springsnail (Pristinicola hempilli)			3	G3, S2	Very unlikely, no suitable habitat (springs) present in project area.

Table 3-1 (continued)
Occurrence and Status of Threatened, Endangered, and Sensitive Species in the Bradford Island Vicinity, Oregon

Common and Scientific Name	Status				Probability of Occurrence
	Federal	State	ONHP List	TNC	
Fish					
Sockeye salmon *(Oncorhynchus nerka)* Salmon River tributary to Snake River, Idaho ESU	LE		1-ex	G5T1Q, SXB, S1M	Any surviving fish of this extremely rare species would pass through Bonneville Dam and may move past Bradford Island on upstream and downstream migration. No spawning or rearing.
Chum salmon *(Oncorhynchus keta)* Lower Columbia River ESU	LT	SC	1	G5T2Q, S2	Unlikely, current range restricted to below Bonneville Dam. No spawning or rearing.
Steelhead *(Oncorhynchus mykiss)* Lower Columbia ESU	LT	SC	1	G5T2Q, S2	Adults and smolt pass through Bonneville Dam and may move past Bradford Island on upstream and downstream migrations. No spawning or rearing.
Steelhead *(Oncorhynchus mykiss)* Snake River Basin ESU	LT	SV	1	G5T2T3 Q, S2S3	Adults and smolt pass through Bonneville Dam and may move past Bradford Island on upstream and downstream migrations. No spawning or rearing.
Steelhead *(Oncorhynchus mykiss)* Middle Columbia ESU	LT	SV	1	G5T2Q, S2	Adults and smolt pass through Bonneville Dam and may move past Bradford Island on upstream and downstream migrations. No spawning or rearing.
Chinook salmon *(Oncorhynchus tsawytscha)* Snake River ESU	LT	LT	1	G5T1Q, S1	Adults and smolt pass through Bonneville Dam and may move past Bradford Island on upstream and downstream migrations. No spawning or rearing.
Chinook salmon *(Oncorhynchus tsawytscha)* Lower Columbia ESU	LT	SC	1	G5T2Q, S2	Adults and smolt pass through Bonneville Dam and may move past Bradford Island on upstream and downstream migrations. No spawning or rearing.
Coastal cutthroat trout *(Oncorhynchus clarki clarki)*	SoC	SC	1	G4T3Q, S2	Adults and juveniles pass through Bonneville Dam and may move past Bradford Island on upstream and downstream migrations. No spawning or rearing.
Coho salmon *(Oncorhynchus kisutch)* Lower Columbia ESU	LT	LE	1	G4T2Q, S2	Adults and juveniles pass through Bonneville Dam and may move past Bradford Island on upstream and downstream migrations. No spawning or rearing.
Pacific lamprey *(Lampropelta tridentata)*	SoC	SV	4	G5, S3	Adults and juveniles pass through Bonneville Dam and may move past Bradford Island on upstream and downstream migrations. No spawning or rearing.
Bull Trout *(Salvelinus confluentus)*	LT				Adults and juveniles pass thorugh Bonneville Dam and may move past Bradford Island on upstream and downstream migrations. No spawning or rearing.

Table 3-1 (continued)
Occurrence and Status of Threatened, Endangered, and Sensitive Species in the Bradford Island Vicinity, Oregon

Common and Scientific Name	Status				Probability of Occurrence
	Federal	State	ONHP List	TNC	
Amphibians					
Larch mountain salamander *(Plethodon larselli)*	SoC	SV	2	G3, S2	Very unlikely, suitable small-sized talus slope habitat not present.
Oregon spotted frog *(Rana pretiosa)*	C	SC	1	G2, S2	Very unlikely, no suitable warm, shallow marsh habitat present.
Reptiles					
Western painted turtle *(Chrysemys picta)*		SC	2	G5, S2	Very unlikely, observed in ponds near Cascade Locks, no suitable habitat in project area.
Birds					
Northern spotted owl *(Strix occidentalis caurina)*	LT	LT	1	G3T3, S3	Very unlikely to occur, only as transients passing through, area too small and disturbed to provide habitat.
Bald eagle *(Haliaeetus leucocephalus)*		LT	4	G5,S4B, S4N	Summer breeding and wintering resident of the vicinity.
Mammals					
Columbia white-tailed deer *(Odocoileus virginianus lecurus)*	PS:LE	SV	1	G5T2Q, S2	Very unlikely, no suitable habitat, current range below RM 50.
Northern (Stellar) Sea Lion *(Eumetopias jubatus)*	LT	SV	2	G3, S2	Sea lions have been observed foraging in the Bonneville pool, but they are not known to occur in the Bonneville forebay (above the dam).

State and Federal Status Definitions

LE – Listed Endangered. Taxa listed by the U.S. Fish and Wildlife Service or National Marine Fisheries Service as Endangered under the Endangered Species Act, or by the Oregon Departments of Agriculture (ODA) and Fish and Wildlife (ODFW) under the Oregon Endangered Species Act of 1987. Endangered taxa are those that are in danger of becoming extinct within the foreseeable future throughout all or a significant portion of their range.

LT – Listed Threatened. Taxa listed by the above agencies as Threatened; defined as those taxa likely to become endangered within the foreseeable future.

PS – Partial Status. Taxa listed by the above agencies in part of its range.

C – Candidate. Candidate taxa for which National Marine Fisheries Service or U.S. Fish and Wildlife Service have sufficient information to support a proposal to list under the Endangered Species Act, or which is a candidate for listing by the ODA under the Oregon Endangered Species Act.

SoC – Species of Concern. Former Category 2 candidates for which additional information is needed to propose as threatened or endangered under the Endangered Species Act; these species are under review for consideration as Candidates for listing under the Endangered Species Act.

SC – State Critical. Species for which listing as threatened or endangered is pending; or those for which listing as threatened or endangered may be appropriate if immediate conservation activities are not taken. Also considered critical are some peripheral species that are at risk throughout their range, and some disjunct populations.

SV – State Vulnerable. Species for which listing as threatened or endangered is not believed to be imminent and can be avoided through continued or expanded use of adequate protective measures and monitoring. In some cases the population is sustainable and protective measures are being implemented; in others, the population may be declining and improved protective measures are needed to maintain sustainable populations over time.

Oregon Natural Heritage Program (ONHP) Definitions

List 1 - taxa that are threatened with extinction or presumed to be extinct (-ex) throughout their entire range.

Table 3-1 (continued)
Occurrence and Status of Threatened, Endangered, and Sensitive Species in the Bradford Island Vicinity, Oregon

List 2 – taxa threatened with extirpation or presumed extirpated from Oregon; often peripheral or disjunct species that are of concern considering species diversity within Oregon; can be very significant in protecting the genetic diversity of the taxon; ONHP regards extreme rarity as a significant threat and has included species that are very rare in Oregon on this list.

List 3 – taxa for which more information is needed before status can be determined, but which may be threatened or endangered in Oregon or throughout their range.

List 4 – taxa that are of conservation concern but not currently threatened or endangered, including taxa that are very rare but considered secure as well as those declining in numbers or habitat but still too common to be proposed as threatened or endangered; these taxa require continued monitoring.

The Nature Conservancy's (TNC) Natural Heritage Network Ranks

The Natural Heritage Network ranks are part of a national system of ranking species throughout the world and is used throughout the U.S., Canada, and 13 Latin American countries. Both global and state ranks are provided in ONHP (2007), abbreviated as "G" and "S", respectively.

1 – Critically imperiled because of extreme rarity or because it is somehow especially vulnerable to extinction or extirpation, typically with 5 or fewer occurrences.

2 – Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (extirpation), typically with 6-20 occurrences.

3 – Rare, uncommon, or threatened, but not immediately imperiled, typically with 21-100 occurrences.

4 – Not rare and apparently secure, but with cause for long-term concern, usually with more than 100 occurrences.

5 – Demonstrably widespread, abundant, and secure.

B – Breeding. Conservation status refers to the breeding population of the species in the nation or state/province.

H – Possibly extirpated or extinct. Known from only historical records but still some hope of rediscovery. There is evidence that the species or ecosystem may no longer be present in the jurisdiction, but not enough to state this with certainty.

M – Migrant. Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the nation or state/province.

N – Nonbreeding. Conservation status refers to the non-breeding population of the species in the nation or state/province.

T – Infraspecific Taxon (trinomial). The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. A vertebrate animal population, (e.g., listed under the U.S. Endangered Species Act or assigned candidate status) may be tracked as an infraspecific taxon and given a T-rank; in such cases a Q is used after the T-rank to denote the taxon's informal taxonomic status.

Q – Questionable taxonomy that may reduce conservation priority. Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon or type in another taxon or type, with the resulting taxon having a lower-priority (numerically higher) conservation status rank.

X – Presumed extirpated or extinct.

Table 3-2
State and Federally Listed Anadromous Salmonid Species

Evolutionarily Significant Unit (ESU)	State Status	Federal Status	Life History Type	Federal Register (FR) Citation
Chinook Salmon (*Oncorhynchus tshawytscha*)				
Snake River	Threatened	Threatened	Ocean	57 FR 14653; April 22, 1992
Lower Columbia River		Threatened	Stream	64 FR 14308; March 24, 1999
Upper Columbia River		Endangered	Stream	64 FR 14308; March 24, 1999
Upper Willamette River		Threatened	Ocean	64 FR 14308; March 24, 1999
Chum Salmon (*Oncorhynchus keta*)				
Columbia River		Threatened	Ocean	64 FR 14508; March 25, 1999
Sockeye Salmon (*Oncorhynchus nerka*)				
Snake River		Endangered	Stream	56 FR 58619; November 20, 1991
Steelhead Trout (*Oncorhynchus mykiss*)				
Snake River Basin		Threatened	Stream	62 FR 43937; August 18, 1997
Lower Columbia River		Threatened	Stream	63 FR 13347; March 19, 1998
Middle Columbia River		Threatened	Stream	64 FR 14517; March 25, 1999
Upper Columbia River		Endangered	Stream	62 FR 43937; August 18, 1997
Upper Willamette River		Threatened	Stream	64 FR 14517; March 25, 1999
Coho Salmon *(Oncorhynchus kisutch)*				
Lower Columbia River	Endangered	Threatened	Stream	60 FR 38011; July 25, 1995

Table 3-3
Designated Beneficial Uses – Mainstem Columbia River

Beneficial Uses	Columbia River Mouth to RM 86	Columbia River RM 86 to 309
Public Domestic Water Supply[1]	X	X
Private Domestic Water Supply[1]	X	X
Industrial Water Supply	X	X
Irrigation	X	X
Livestock Watering	X	X
Fish & Aquatic Life[2]	X	X
Wildlife & Hunting	X	X
Fishing	X	X
Boating	X	X
Water Contact Recreation	X	X
Aesthetic Quality	X	X
Hydro Power		X
Commercial Navigation & Transportation	X	X

Source: OAR 340-41-0101, November 2003
[1] With adequate pretreatment and natural quality that meets drinking water standards.
[2] See also Table 3-3 for fish use designations for this river.

Table 3-4
Beneficial Use Designations – Fish Uses, Mainstem Columbia River

Geographic Extent of Use	**Salmon and Steelhead Migration Corridors (20°C)**	**Salmon and Steelhead Spawning through Fry Emergence**	**Shad and Sturgeon Spawning and Rearing**
Mainstem Columbia River			
Beacon Rock to Upstream of Ives Island (RM 141.5 to RM 143.5)		October 15 – March 31	
Columbia River, mouth to Washington border (RM309)	X		
Columbia River (RM 147 to RM 203)			X

Source: OAR 340-41-0101, November 2003
RM = River mile

Table 5-1a
1999/2000 Landfill Supplemental Site Inspection Soil Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Herbicides, and Pesticides
(Page 1 of 2)

Site ID	BIL01SSI	BIL02SSI	BIL03SSI	BIL04SSI	BIL05SSI	BIL06SSI*	BIL09SSI	BIL10SSI	BIL11SSI	BIL12SSI	BIL13SSI*	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	990920BIL01SS	990920BIL02SS	990920BIL03SS	990920BIL04SS	990920BIL05SS	990920BIL06SS	990920BIL09SS	990920BIL10SS	990921BIL11SS	990921BIL12SS	000413BIL13SS		
Sample Date	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/21/1999	9/21/1999	4/13/2000		
Sample Depth (Feet bgs)	0.0-0.33	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5		
PCB Aroclors (µg/kg dry)													
Aroclor 1016	35.0 UJ	34.0 UJ	35.0 UJ	34.0 UJ	36.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	37.0 UJ	35.0 UJ	50.0 UJ	371	Eco
Aroclor 1221	35.0 UJ	34.0 UJ	35.0 UJ	34.0 UJ	36.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	37.0 UJ	35.0 UJ	50.0 UJ	371	Eco
Aroclor 1232	35.0 UJ	34.0 UJ	35.0 UJ	34.0 UJ	36.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	37.0 UJ	35.0 UJ	50.0 UJ	371	Eco
Aroclor 1242	35.0 UJ	34.0 UJ	35.0 UJ	34.0 UJ	36.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	37.0 UJ	35.0 UJ	50.0 UJ	371	Eco
Aroclor 1248	35.0 UJ	34.0 UJ	35.0 UJ	34.0 UJ	36.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	37.0 UJ	35.0 UJ	50.0 UJ	371	Eco
Aroclor 1254	35.0 UJ	34.0 UJ	35.0 UJ	34.0 UJ	36.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	37.0 UJ	35.0 UJ	50.0 UJ	371	Eco
Aroclor 1260	**58.0 J**	**420 J**	**48.0 J**	**660 J**	**160 J**	**81.5 J**	35.0 UJ	35.0 UJ	37.0 UJ	35.0 UJ	50.0 UJ	371	Eco
Total PCBs as Aroclors (NDs at MDL) [1]	**128 J**	**488 J**	**118 J**	**728 J**	**232 J**	**152 J**	105 UJ	105 UJ	111 UJ	105 UJ	150 UJ	371	Eco
Metals (mg/kg dry)													
Antimony	**2.80**	2.70 U	2.80 U	2.70 U	**4.20**	**3.90**	2.80 U	2.60 U	2.90 U	2.70 U	-	0.270	Eco
Arsenic	**3.60**	**1.50**	**4.90**	**3.20**	**30.1**	**3.70**	**3.00**	**3.10**	**11.3**	**2.80**	**1.98**	5.40	UPL
Barium	**83.4**	**71.1**	**77.9**	**58.9**	**204**	**111**	**119**	**108**	**108**	**115**	**243**	330	Eco
Beryllium	**0.300**	0.270 U	0.280 U	0.270 U	**0.460**	**0.350**	**0.400**	**0.440**	**0.540**	**0.370**	**0.576**	21.0	Eco
Cadmium	0.270 U	0.270 U	**0.500**	**0.440**	**1.30**	**1.75**	0.280 U	0.260 U	0.290 U	0.270 U	**0.343**	0.360	Eco
Chromium	**25.2**	**15.8**	**14.7**	**33.8**	**237**	**21.9**	**18.8**	**16.3**	**50.0**	**17.3**	**23.1**	28.1	UPL
Copper	**43.8**	**39.3**	**74.8**	**56.2**	**494**	**143**	**26.6**	**25.5**	**131**	**23.5**	**58.7 J**	56.7	UPL
Iron	**26,700**	**22,900**	**16,500**	**14,100**	**37,000**	**21,600**	**20,700**	**22,200**	**31,400**	**19,700**	**45,900**	36,900	UPL
Lead	**74.5**	**153**	**362**	**699**	**486**	**168**	**40.5**	**19.3**	**36.5**	**22.8**	**5.34**	25.5	UPL
Manganese	**372**	**270**	**244**	**196**	**714**	**333**	**312**	**327**	**720**	**300**	**415**	885	UPL
Mercury	0.110 U	0.110 U	**1.40**	**0.120**	**0.840**	**4.15**	**0.120**	0.110 U	0.110 U	0.100 U	**0.106**	0.0660	UPL
Nickel	**40.0**	**18.0**	**13.4**	**15.4**	**170**	**19.2**	**14.9**	**14.9**	**42.4**	**13.6**	**20.3 J**	38.0	Eco
Selenium	0.260 U	0.270 U	0.270 U	0.270 U	1.40 U	0.280 U	0.550 U	0.520 U	1.50 U	0.510 U	**0.848 J**	0.520	Eco
Silver	0.540 U	0.530 U	0.560 U	0.530 U	**1.50**	0.510 U	0.560 U	0.510 U	0.570 U	0.540 U	0.262 U	4.20	Eco
Thallium	0.260 U	0.270 U	0.270 U	0.270 U	0.280 U	0.270 U	0.280 U	0.260 U	0.290 U	0.250 U	**0.378**	1.00	Eco
Zinc	**88.7**	**98.0**	**150**	**134**	**635**	**138**	**85.1**	**69.6**	**163**	**69.0**	**41.6**	71.7	UPL
Petroleum Hydrocarbons (mg/kg dry)													
Diesel Range Organics	**31.0**	**110**	**80.0**	**590**	**300**	**1,000**	**32.0**	**23.0**	**31.0**	**17.0**	25.0 U	23,000	HH
Residual Range Organics	**210**	**1,400**	**380**	**3,000**	**1,700**	**9,450**	**130**	**100**	**150**	**100**	100 U	40,000	HH
Gasoline Range Organics	-	-	-	5.10 U	5.40 U	5.30 U	5.30 U	5.30 U	-	-	20.0 U	13,000	HH
Herbicides (µg/kg dry)													
2,4,5-T	**93.0**	3.10 U	**63.0**	8.70 U	3.30 U	3.20 U	6.70 U	9.00 U	3.30 U	11.0 U	50.0 U	21.0	Eco
2,4,5-TP (Silvex)	4.00 U	2.90 U	5.00 U	3.60 U	2.50 U	4.50 U	10.0 U	5.50 U	9.60 U	13.0 U	50.0 U	21.0	Eco
2,4-D	21.0 U	21.0 U	21.0 U	20.0 U	22.0 U	21.0 U	21.0 U	21.0 U	30.0 U	30.0 U	50.0 U	21.0	Eco
2,4-DB	10.0 U	10.0 U	5.00 U	10.0 U	11.0 U	10.0 U	34.0 U	11.0 U	11.0 U	10.0 U	50.0 U	21.0	Eco
Dalapon	42.0 U	41.0 U	42.0 U	41.0 U	43.0 U	42.0 U	42.0 U	42.0 U	44.0 U	42.0 U	50.0 U	18,000,000	HH
Dicamba	2.10 U	2.10 U	2.10 U	4.80 U	5.70 U	2.10 U	12.0 U	2.10 U	2.20 U	2.10 U	50.0 U	18,000,000	HH
Dichloroprop	**170**	87.0 U	260 U	**180**	180 U	75.0 U	400 U	240 U	340 U	310 U	50.0 U	21.0	Eco
Dinoseb	13.0 U	10.0 U	15.0 U	10.0 U	16.0 U	10.0 U	15.0 U	16.0 U	11.0 U	10.0 U	50.0 U	620,000	HH
MCPA	1,000 U	1,400 U	16,000 U	1,000 U	1,100 U	1,900 U	1,100 U	1,100 U	1,100 U	2,500 U	25,000 U	21.0	Eco
MCPP	4,800 U	**14,000**	1,100 U	13,000 U	1,100 U	**9,500**	28,000 U	38,000 U	28,000 U	32,000 U	25,000 U	21.0	Eco

Table 5-1a
1999/2000 Landfill Supplemental Site Inspection Soil Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Herbicides, and Pesticides
(Page 2 of 2)

Site ID	BIL01SSI	BIL02SSI	BIL03SSI	BIL04SSI	BIL05SSI	BIL06SSI*	BIL09SSI	BIL10SSI	BIL11SSI	BIL12SSI	BIL13SSI*	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	990920BIL01SS	990920BIL02SS	990920BIL03SS	990920BIL04SS	990920BIL05SS	990920BIL06SS	990920BIL09SS	990920BIL10SS	990921BIL11SS	990921BIL12SS	000413BIL13SS		
Sample Date	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/21/1999	9/21/1999	4/13/2000		
Sample Depth (Feet bgs)	0.0-0.33	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5		
Pesticides (µg/kg dry)													
4,4'-DDD	3.50 U	3.40 U	6.10 U	3.40 U	5.10 U	7.40 U	18.0 U	13.0 U	3.70 U	25.0 U	1.00 U	21.0	Eco
4,4'-DDE	3.50 U	9.40 U	3.50 U	**17.0**	3.60 U	3.50 U	3.50 U	3.50 U	3.70 U	3.50 U	1.00 U	21.0	Eco
4,4'-DDT	3.50 U	3.40 U	4.80 U	3.40 U	13.0 U	3.50 U	3.50 U	3.50 U	3.70 U	3.50 U	1.00 U	21.0	Eco
Aldrin	1.80 U	1.70 U	1.80 U	1.70 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	1.00 U	4.90	Eco
BHC (alpha)	1.80 U	1.70 U	1.80 U	1.70 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	0.500 U	340	HH
BHC (beta)	1.80 U	1.70 U	1.80 U	2.10 U	1.80 U	1.80 U	1.80 U	1.80 U	**2.60**	1.80 U	0.900 U	960	HH
BHC (delta)	1.80 U	1.70 U	1.80 U	1.70 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	0.600 U	340	HH
BHC (gamma) Lindane	1.80 U	1.70 U	1.80 U	1.70 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	1.00 U	2,000	HH
Chlordane (alpha)	1.80 U	1.70 U	2.10 U	19.0 U	**4.00**	4.10 U	8.80 U	3.50 U	1.80 U	8.00 U	0.800 U	7,200	HH
Chlordane (gamma)	1.80 U	11.0 U	1.80 U	13.0 U	2.40 U	1.80 U	2.60 U	1.80 U	1.80 U	2.70 U	0.700 U	7,200	HH
Dieldrin	3.50 U	3.40 U	3.50 U	3.40 U	3.60 U	3.50 U	3.50 U	3.50 U	3.70 U	3.50 U	2.00 U	4.90	Eco
Endosulfan I	1.80 U	3.50 U	1.80 U	1.70 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	1.00 U	20,000	Eco
Endosulfan II	3.50 U	4.90 U	3.50 U	3.60 U	3.60 U	3.50 U	3.50 U	3.50 U	3.70 U	3.50 U	2.00 U	20,000	Eco
Endosulfan Sulfate	3.50 U	3.40 U	3.50 U	3.40 U	3.60 U	3.50 U	3.50 U	3.50 U	3.70 U	3.50 U	1.00 U	20,000	Eco
Endrin	3.50 U	3.40 U	3.50 U	3.40 U	3.60 U	3.50 U	3.50 U	3.50 U	3.70 U	3.50 U	2.00 U	4.90	Eco
Endrin Aldehyde	3.50 U	13.0 U	3.50 U	3.40 U	3.60 U	4.00 U	3.50 U	3.50 U	3.70 U	3.50 U	2.00 U	4.90	Eco
Endrin Ketone	3.50 U	3.40 U	3.50 U	3.40 U	3.60 U	3.50 U	3.50 U	3.50 U	3.70 U	3.50 U	-	4.90	Eco
Heptachlor	1.80 U	1.70 U	1.80 U	1.70 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	1.00 U	480	HH
Heptachlor Epoxide	1.80 U	3.20 U	1.80 U	7.10 U	2.00 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	1.00 U	240	HH
Methoxychlor	18.0 U	17.0 U	18.0 U	17.0 U	18.0 U	18.0 U	18.0 U	18.0 U	18.0 U	18.0 U	4.00 U	500,000	Eco
Toxaphene	35.0 U	34.0 U	35.0 U	34.0 U	36.0 U	35.0 U	35.0 U	35.0 U	37.0 U	35.0 U	50.0 U	2,000	HH

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit

[1] Only Aroclors 1248, 1254, and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Landfill AOPC soil samples.
- = Not Analyzed
-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-1b
1999/2000 Landfill Supplemental Site Inspection Soil Analytical Results
Volatile Organic Compounds
(Page 1 of 2)

Site ID	BIL01SSI	BIL02SSI	BIL03SSI	BIL04SSI	BIL05SSI	BIL06SSI*	Selected SLV (0-3 ft bgs)	SLV Source (0-3 ft bgs)
Sample ID	990920BIL01SS	990920BIL02SS	990920BIL03SS	990920BIL04SS	990920BIL05SS	990920BIL06SS		
Sample Date	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999		
Sample Depth (Feet bgs)	0.0-0.33	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5		
Volatile Organic Compounds (µg/kg dry)							--	--
1,1,1,2-Tetrachloroethane	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	9,300	HH
1,1,1-Trichloroethane (TCA)	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	38,000,000	HH
1,1,2,2-Tetrachloroethane	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	2,800	HH
1,1,2-Trichloroethane	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	2,700	HH
1,1-Dichloroethane	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	5,900	HH
1,1-Dichloroethene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	680,000	HH
1,1-Dichloropropene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	8,100	HH
1,2,3-Trichlorobenzene	5.30 U	5.20 U	5.30 U	5.10 U	5.40 U	5.30 U	20,000	Eco
1,2,3-Trichloropropane	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	95.0	HH
1,2,4-Trichlorobenzene	5.30 U	5.20 U	5.30 U	5.10 U	5.40 U	5.30 U	20,000	Eco
1,2,4-Trimethylbenzene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	200,000	Eco
1,2-Dibromo-3-chloropropane	5.30 U	5.20 U	5.30 U	5.10 U	5.40 U	5.30 U	69.0	HH
1,2-Dibromoethane (EDB)	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	140	HH
1,2-Dichlorobenzene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	2,260	Eco
1,2-Dichloroethane (EDC)	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	590	HH
1,2-Dichloropropane	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	4,500	HH
1,3,5-Trimethylbenzene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	150,000	HH
1,3-Dichlorobenzene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	2,260	Eco
1,3-Dichloropropane	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	20,000,000	HH
1,4-Dichlorobenzene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	17,000	HH
2,2-Dichloropropane	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	4,500	HH
2-Butanone (MEK)	10.0 U	10.0 U	11.0 U	10.0 U	11.0 U	10.0 U	200,000,000	HH
2-Chlorotoluene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	20,000,000	HH
2-Hexanone	10.0 U	10.0 U	11.0 U	10.0 U	11.0 U	10.0 U	1,250,000	Eco
4-Chlorotoluene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	72,000,000	HH
4-Isopropyltoluene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	200,000	Eco
4-Methyl-2-pentanone (MIBK)	10.0 U	10.0 U	11.0 U	10.0 U	11.0 U	10.0 U	1,250,000	Eco
Acetone	10.0 U	10.0 U	11.0 U	10.0 U	11.0 U	10.0 U	1,250,000	Eco
Benzene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	1,200	HH
Bromobenzene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	1,800,000	HH
Bromochloromethane	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	1,900	HH
Bromodichloromethane	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	1,900	HH
Bromoform	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	360,000	HH
Bromomethane	5.30 U	5.20 U	5.30 U	5.10 U	5.40 U	5.30 U	17,000	HH
Carbon Disulfide	10.0 U	10.0 U	11.0 U	10.0 U	11.0 U	10.0 U	1,000,000	Eco
Carbon Tetrachloride	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	630	HH
Chlorobenzene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	40,000	Eco
Chloroethane	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	61,000,000	HH
Chloroform	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	410	HH
Chloromethane	5.30 U	5.20 U	5.30 U	5.10 U	5.40 U	5.30 U	300,000	HH
cis-1,2-Dichloroethene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	2,500,000	Eco
cis-1,3-Dichloropropene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	8,100	HH
Dibromochloromethane	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	34,000	HH
Dibromomethane	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	110,000	HH
Dichlorodifluoromethane	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	730,000	Eco
Dichloromethane (Methylene Chloride)	10.0 U	10.0 U	11.0 U	**12.0**	11.0 U	10.0 U	20,000	HH
Ethylbenzene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	2,260	Eco
Hexachlorobutadiene	5.30 U	5.20 U	5.30 U	5.10 U	5.40 U	5.30 U	22,000	HH
Isopropylbenzene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	2,260	Eco
m,p-Xylenes	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	120,000	Eco
Naphthalene	5.30 U	5.20 U	5.30 U	5.10 U	5.40 U	5.30 U	23,000	HH
n-Butylbenzene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	-	-
n-Propylbenzene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	2,260	Eco
o-Xylene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	1,000	Eco
sec-Butylbenzene	5.30 U	5.20 U	5.30 U	5.10 U	5.40 U	5.30 U	2,260	Eco
Styrene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	300,000	Eco
tert-Butylbenzene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	2,260	Eco
Tetrachloroethene (PCE)	2.10 U	2.10 U	**15.0**	**23.0**	**65.0**	2.10 U	1,600	HH
Toluene	2.10 U	2.10 U	2.10 U	2.00 U	**5.30**	2.10 U	200,000	Eco
trans-1,2-Dichloroethene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	200,000	HH
trans-1,3-Dichloropropene	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	8,100	HH
Trichloroethene (TCE)	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	130	HH
Trichlorofluoromethane	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	730,000	Eco
Vinyl Acetate	10.0 U	10.0 U	11.0 U	10.0 U	11.0 U	10.0 U	4,100,000	HH
Vinyl Chloride	2.10 U	2.10 U	2.10 U	2.00 U	2.20 U	2.10 U	2,200	HH

Notes:

µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-1b
1999/2000 Landfill Supplemental Site Inspection Soil Analytical Results
Volatile Organic Compounds
(Page 2 of 2)

Site ID	BIL09SSI	BIL10SSI	BIL11SSI	BIL12SSI	BIL13SSI*	Selected SLV (0-3 ft bgs)	SLV Source (0-3 ft bgs)
Sample ID	990920BIL09SS	990920BIL10SS	990921BIL11SS	990921BIL12SS	000413BIL13SS		
Sample Date	9/20/1999	9/20/1999	9/21/1999	9/21/1999	4/13/2000		
Sample Depth (Feet bgs)	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5		
Volatile Organic Compounds (µg/kg dry)						--	--
1,1,1,2-Tetrachloroethane	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	9,300	HH
1,1,1-Trichloroethane (TCA)	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	38,000,000	HH
1,1,2,2-Tetrachloroethane	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	2,800	HH
1,1,2-Trichloroethane	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	2,700	HH
1,1-Dichloroethane	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	5,900	HH
1,1-Dichloroethene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	680,000	HH
1,1-Dichloropropene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	8,100	HH
1,2,3-Trichlorobenzene	5.30 U	5.30 U	5.60 U	5.30 U	100 UJ	20,000	Eco
1,2,3-Trichloropropane	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	95.0	HH
1,2,4-Trichlorobenzene	5.30 U	5.30 U	5.60 U	5.30 U	100 UJ	20,000	Eco
1,2,4-Trimethylbenzene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	200,000	Eco
1,2-Dibromo-3-chloropropane	5.30 U	5.30 U	5.60 U	5.30 U	500 UJ	69.0	HH
1,2-Dibromoethane (EDB)	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	140	HH
1,2-Dichlorobenzene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	2,260	Eco
1,2-Dichloroethane (EDC)	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	590	HH
1,2-Dichloropropane	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	4,500	HH
1,3,5-Trimethylbenzene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	150,000	HH
1,3-Dichlorobenzene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	2,260	Eco
1,3-Dichloropropane	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	20,000,000	HH
1,4-Dichlorobenzene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	17,000	HH
2,2-Dichloropropane	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	4,500	HH
2-Butanone (MEK)	11.0 U	11.0 U	11.0 U	10.0 U	1,000 UJ	200,000,000	HH
2-Chlorotoluene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	20,000,000	HH
2-Hexanone	11.0 U	11.0 U	11.0 U	10.0 U	1,000 UJ	1,250,000	Eco
4-Chlorotoluene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	72,000,000	HH
4-Isopropyltoluene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	200,000	Eco
4-Methyl-2-pentanone (MIBK)	11.0 U	11.0 U	11.0 U	10.0 U	1,000 UJ	1,250,000	Eco
Acetone	11.0 U	11.0 U	11.0 U	10.0 U	1,000 UJ	1,250,000	Eco
Benzene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	1,200	HH
Bromobenzene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	1,800,000	HH
Bromochloromethane	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	1,900	HH
Bromodichloromethane	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	1,900	HH
Bromoform	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	360,000	HH
Bromomethane	5.30 U	5.30 U	5.60 U	5.30 U	100 UJ	17,000	HH
Carbon Disulfide	11.0 U	11.0 U	11.0 U	10.0 U	100 UJ	1,000,000	Eco
Carbon Tetrachloride	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	630	HH
Chlorobenzene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	40,000	Eco
Chloroethane	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	61,000,000	HH
Chloroform	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	410	HH
Chloromethane	5.30 U	5.30 U	5.60 U	5.30 U	500 UJ	300,000	HH
cis-1,2-Dichloroethene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	2,500,000	Eco
cis-1,3-Dichloropropene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	8,100	HH
Dibromochloromethane	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	34,000	HH
Dibromomethane	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	110,000	HH
Dichlorodifluoromethane	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	730,000	Eco
Dichloromethane (Methylene Chloride)	11.0 U	11.0 U	11.0 U	10.0 U	1,000 UJ	20,000	HH
Ethylbenzene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	2,260	Eco
Hexachlorobutadiene	5.30 U	5.30 U	5.60 U	5.30 U	100 UJ	22,000	HH
Isopropylbenzene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	2,260	Eco
m,p-Xylenes	2.10 U	2.10 U	2.20 U	2.10 U	200 UJ	120,000	Eco
Naphthalene	5.30 U	5.30 U	5.60 U	5.30 U	100 UJ	23,000	HH
n-Butylbenzene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	-	-
n-Propylbenzene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	2,260	Eco
o-Xylene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	1,000	Eco
sec-Butylbenzene	5.30 U	5.30 U	5.60 U	5.30 U	100 UJ	2,260	Eco
Styrene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	300,000	Eco
tert-Butylbenzene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	2,260	Eco
Tetrachloroethene (PCE)	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	1,600	HH
Toluene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	200,000	Eco
trans-1,2-Dichloroethene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	200,000	HH
trans-1,3-Dichloropropene	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	8,100	HH
Trichloroethene (TCE)	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	130	HH
Trichlorofluoromethane	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	730,000	Eco
Vinyl Acetate	11.0 U	11.0 U	11.0 U	10.0 U	-	4,100,000	HH
Vinyl Chloride	2.10 U	2.10 U	2.20 U	2.10 U	100 UJ	2,200	HH

Notes:

µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-1c
1999/2000 Landfill Supplemental Site Inspection Soil Analytical Results
Semivolatile Organic Compounds
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Site ID	BIL01SSI	BIL02SSI	BIL03SSI	BIL04SSI	BIL05SSI	BIL06SSI*	BIL09SSI	BIL10SSI	BIL11SSI	BIL12SSI	BIL13SSI*	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	990920BIL01SS	990920BIL02SS	990920BIL03SS	990920BIL04SS	990920BIL05SS	990920BIL06SS	990920BIL09SS	990920BIL10SS	990921BIL11SS	990921BIL12SS	000413BIL13SS		
Sample Date	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/21/1999	9/21/1999	4/13/2000		
Sample Depth (Feet bgs)	0.0-0.33	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5		
Semivolatile Organic Compounds (µg/kg dry)													
1,2,4-Trichlorobenzene	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	20,000	Eco
1,2-Dichlorobenzene	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	2,260	Eco
1,3-Dichlorobenzene	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	2,260	Eco
1,4-Dichlorobenzene	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	17,000	HH
2,4,5-Trichlorophenol	880 U	860 U	880 U	860 U	900 U	880 U	880 U	880 U	930 U	880 U	49.8 U	4,000	Eco
2,4,6-Trichlorophenol	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	10,000	Eco
2,4-Dichlorophenol	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	20,000	Eco
2,4-Dimethylphenol	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	99.7 U	20,000	Eco
2,4-Dinitrophenol	880 U	860 U	880 U	860 U	900 U	880 U	880 U	880 U	930 U	880 U	249 UJ	20,000	Eco
2,4-Dinitrotoluene	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	249 UJ	5,500	HH
2,6-Dinitrotoluene	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	249 U	240,000	HH
2-Chloronaphthalene	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	82,000,000	HH
2-Chlorophenol	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	60,000	Eco
2-Methylphenol	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	50,000	Eco
2-Nitroaniline	880 U	860 U	880 U	860 U	900 U	880 U	880 U	880 U	930 U	880 U	249 U	6,000,000	HH
2-Nitrophenol	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 UJ	180,000,000	HH
3,3'-Dichlorobenzidine	350 U	340 U	350 U	680 U	350 U	350 U	350 U	350 U	370 U	350 U	2,490 UJ	4,800	HH
3-Nitroaniline	880 U	860 U	880 U	860 U	900 U	880 U	880 U	880 U	930 U	880 U	249 U	70,000	Eco
4,6-Dinitro-2-methylphenol	880 U	860 U	880 U	860 U	900 U	880 U	880 U	880 U	930 U	880 U	249 UJ	49,000	HH
4-Bromophenyl Phenyl Ether	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	-	-
4-Chloro-3-methylphenol	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	62,000,000	HH
4-Chloroaniline	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	249 UJ	8,600	HH
4-Chlorophenyl Phenyl Ether	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	-	-
4-Nitroaniline	880 U	860 U	880 U	860 U	900 U	880 U	880 U	880 U	930 U	880 U	249 U	40,000	Eco
4-Nitrophenol	880 U	860 U	880 U	860 U	900 U	880 U	880 U	880 U	930 U	880 U	249 U	7,000	Eco
Aniline	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	200,000	Eco
Benzidine	1,800 U	1,700 U	1,800 U	1,700 U	1,800 U	1,800 U	1,800 U	1,800 U	1,800 U	1,800 U	-	55,000	HH
Benzoic Acid	880 U	860 U	880 U	**34.0 J**	900 U	**32.0 J**	**20.0 J**	880 U	930 U	880 U	**300**	200,000	Eco
Benzyl Alcohol	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	2,260	Eco
Bis(2-chloroethoxy)methane	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	730,000	Eco
Bis(2-chloroethyl) Ether	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	1,000	HH
Bis(2-chloroisopropyl) Ether	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	1,000	HH
Bis(2-ethylhexyl) Phthalate	**150 J**	**430**	**330**	**21,000**	**5,100**	**825 J**	**180**	**770**	**760**	**1,900**	50.0 U	4,500	Eco
Butyl Benzyl Phthalate	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	**22.0 J**	180 U	49.8 U	450	Eco
Carbazole	180 U	170 U	**56.0 J**	**1,300**	**220**	**144 J**	180 U	180 U	**27.0 J**	180 U	49.8 UJ	2,260	Eco
Dibenzofuran	180 U	170 U	180 U	**380**	**76.0 J**	**140 J**	180 U	180 U	**20.0 J**	180 U	49.8 U	2.00	Eco
Diethyl Phthalate	180 U	170 U	180 U	**50.0 J**	**44.0 J**	180 U	180 U	180 U	190 U	180 U	49.8 U	100,000	Eco
Dimethyl Phthalate	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	150,000	HH
Di-n-butyl Phthalate	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	450	Eco
Di-n-octyl Phthalate	180 U	170 U	180 U	170 U	730 U	180 U	180 U	180 U	190 U	180 U	49.8 U	450	Eco
Hexachlorobenzene	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	1,800	HH
Hexachlorobutadiene	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	22,000	HH
Hexachlorocyclopentadiene	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	249 UJ	10,000	Eco
Hexachloroethane	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	150,000	HH
Isophorone	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	1,800,000	HH
Nitrobenzene	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	8,000	Eco
N-Nitrosodimethylamine	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	-	34.0	HH
N-Nitrosodi-n-propylamine	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	250	HH
N-Nitrosodiphenylamine	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	20,000	Eco
p-cresol (4-Methylphenol)	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	50,000	Eco
Pentachlorophenol	880 U	860 U	880 U	860 U	900 U	880 U	880 U	880 U	**72.0 J**	880 U	249 U	2,100	Eco
Phenol	180 U	170 U	180 U	170 U	180 U	180 U	180 U	180 U	190 U	180 U	49.8 U	30,000	Eco

Table 5-1c
1999/2000 Landfill Supplemental Site Inspection Soil Analytical Results
Semivolatile Organic Compounds
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Site ID	BIL01SSI	BIL02SSI	BIL03SSI	BIL04SSI	BIL05SSI	BIL06SSI*	BIL09SSI	BIL10SSI	BIL11SSI	BIL12SSI	BIL13SSI*	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	990920BIL01SS	990920BIL02SS	990920BIL03SS	990920BIL04SS	990920BIL05SS	990920BIL06SS	990920BIL09SS	990920BIL10SS	990921BIL11SS	990921BIL12SS	000413BIL13SS		
Sample Date	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/20/1999	9/21/1999	9/21/1999	4/13/2000		
Sample Depth (Feet bgs)	0.0-0.33	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5		
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)													
2-Methylnaphthalene	180 U	170 U	180 U	**57.0 J**	180 U	**76.0 J**	180 U	180 U	190 U	180 U	49.8 U	4,100,000	HH
Acenaphthene	180 U	**42.0 J**	**53.0 J**	**2,600 J**	**500**	**171 J**	180 U	180 U	**140 J**	180 U	49.8 U	19,000,000	HH
Acenaphthylene	180 U	170 U	180 U	**74.0 J**	180 U	**22.0 J**	180 U	180 U	190 U	180 U	49.8 U	23,000	HH
Anthracene	**12.0 J**	**18.0 J**	**110 J**	**2,700**	**460**	**177 J**	180 U	180 U	**100 J**	180 U	49.8 U	93,000,000	HH
Fluorene	180 U	170 U	**47.0 J**	**1,200**	**170 J**	**145 J**	180 U	180 U	**67.0 J**	180 U	49.8 U	12,000,000	HH
Naphthalene	180 U	170 U	180 U	**100 J**	**19.0 J**	**360**	180 U	180 U	190 U	180 U	49.8 U	23,000	HH
Phenanthrene	**39.0 J**	**68.0 J**	**300**	**12,000**	**1,900**	**1,230**	**40.0 J**	**36.0 J**	**370**	**13.0 J**	49.8 U	93,000,000	HH
Total LPAHs (KM, capped; NDs at MDL)	**153 J**	**256 J**	**650 J**	**18,674 J**	**3,143 J**	**2,105 J**	**940 J**	**936 J**	**881 J**	**913 J**	299 U	29,000	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)													
Benzo(a)anthracene	**98.0 J**	**130 J**	**1,600**	**32,000**	**2,200**	**1,400 J**	**82.0 J**	**60.0 J**	**400**	**29.0 J**	49.8 U	2,700	HH
Benzo(a)pyrene	**140 J**	**160 J**	**1,800**	**33,000**	**2,200**	**1,400 J**	**100 J**	**70.0 J**	**420**	**28.0 J**	49.8 U	270	HH
Benzo(b)fluoranthene	**110 J**	**170 J**	**2,000**	**65,000**	**340 J**	**2,350**	**82.0 J**	**58.0 J**	**66.0 J**	**34.0 J**	49.8 U	2,700	HH
Benzo(g,h,i)perylene	**71.0 J**	**150 J**	**790**	**18,000**	**1,800**	**1,250 J**	**82.0 J**	**51.0 J**	**290**	**20.0 J**	49.8 U	27,000	HH
Benzo(k)fluoranthene	**110 J**	**100 J**	**1,000**	**65,000**	**340 J**	**2,350**	**89.0 J**	**64.0 J**	**66.0 J**	**40.0 J**	49.8 U	27,000	HH
Chrysene	**120 J**	**160 J**	**1,600**	**32,000**	**1,700**	**1,650 J**	**100 J**	**79.0 J**	**420**	**62.0 J**	49.8 U	270,000	HH
Dibenz(a,h)anthracene	**37.0 J**	170 U	**450**	**9,900**	**540 J**	1,800 U	**32.0 J**	**24.0 J**	**150 J**	**18.0 J**	49.8 U	270	HH
Fluoranthene	**130 J**	**160 J**	**1,600**	**54,000**	**3,300**	**795**	**120 J**	**88.0 J**	**700**	**42.0 J**	49.8 U	8,900,000	HH
Indeno(1,2,3-cd)pyrene	**73.0 J**	**130 J**	**820**	**19,000**	**1,700**	**1,175 J**	**74.0 J**	**48.0 J**	**300**	**18.0 J**	49.8 U	2,700	HH
Pyrene	**160 J**	**210**	**1,400**	**40,000**	**3,200**	**2,500 J**	**130 J**	**98.0 J**	**640**	**43.0 J**	49.8 UJ	6,700,000	HH
Total HPAHs (KM, capped; NDs at MDL)	**1,049 J**	**1,511 J**	**13,060**	**367,900**	**17,320 J**	**16,150 J**	**891 J**	**640 J**	**3,452 J**	**334 J**	498 UJ	1,100	Eco

Notes:

µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table 5-1d
1999/2000 Landfill Supplemental Site Inspection Groundwater Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Herbicides, and Pesticides
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Site ID	MW-01	MW-01	MW-01	MW-02	MW-02	MW-02	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	990713BIL08GW	991108BIL14GW	000110BIL20GW	990712BIL07GW	991108BIL12GW	000110BIL15GW				
Sample Date	7/13/1999	11/8/1999	1/10/2000	7/12/1999	11/8/1999	1/10/2000				
Sample Depth (Feet btc)	27.5	27.5	27.5	29.56	29.56	29.56				
Medium	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater				
Total PCB Aroclors (µg/L)										
Aroclor 1016	0.960 U	0.960 U	1.00 U	0.940 U	0.950 UJ	1.00 U	0.0000640	HH	0.0140	Eco
Aroclor 1221	0.960 U	0.960 U	1.00 U	0.940 U	0.950 UJ	1.00 U	0.0000640	HH	0.00680	HH
Aroclor 1232	0.960 U	0.960 U	1.00 U	0.940 U	0.950 UJ	1.00 U	0.0000640	HH	0.00680	HH
Aroclor 1242	0.960 U	0.960 U	1.00 U	0.940 U	0.950 UJ	1.00 U	0.0000640	HH	0.0140	Eco
Aroclor 1248	0.960 U	0.960 U	1.00 U	0.940 U	0.950 UJ	1.00 U	0.0000640	HH	0.0140	Eco
Aroclor 1254	0.960 U	0.960 U	1.00 U	0.940 U	0.950 UJ	1.00 U	0.0000640	HH	0.0140	Eco
Aroclor 1260	0.960 U	0.960 U	1.00 U	0.940 U	0.950 UJ	1.00 U	0.0000640	HH	0.0140	Eco
Total Metals (µg/L)										
Antimony	-	50.0 U	50.0 U	-	50.0 U	50.0 U	5.60	HH	15.0	HH
Arsenic	-	**15.4**	**16.2**	-	**6.00**	**7.00**	0.0180	HH	0.0380	HH
Barium	-	**33.5**	**33.1**	-	**45.7**	**42.6**	1,000	HH	7,300	HH
Beryllium	-	5.00 U	5.00 U	-	5.00 U	5.00 U	--	--	73.0	HH
Cadmium	-	5.00 U	5.00 U	-	5.00 U	5.00 U	--	--	18.0	HH
Chromium	-	10.0 U	10.0 U	-	10.0 U	10.0 U	--	--	55,000	HH
Copper	-	10.0 U	10.0 U	-	10.0 U	10.0 U	1,300	HH	1,500	HH
Iron	-	**73.7**	**66.0**	-	**508**	**238**	300	HH	26,000	HH
Lead	-	3.00 U	3.00 U	-	3.00 U	3.00 U	--	--	15.0	HH
Manganese	-	**25.5**	**14.0**	-	**39.3**	**14.6**	50.0	HH	880	HH
Mercury	-	0.200 U	**0.330**	-	0.200 U	0.200 U	--	--	11.0	HH
Nickel	-	10.0 U	10.0 U	-	10.0 U	10.0 U	610	HH	730	HH
Selenium	-	**32.9**	**28.6**	-	5.00 U	5.00 U	170	HH	180	HH
Silver	-	10.0 U	10.0 U	-	10.0 U	10.0 U	--	--	180	HH
Thallium	-	5.00 U	5.00 U	-	5.00 U	5.00 U	0.240	HH	2.00	HH
Zinc	-	**16.8**	**19.5**	-	10.0 U	10.0 U	7,400	HH	11,000	HH
Dissolved Metals (µg/L)										
Antimony	-	-	-	50.0 U	-	-	5.60	HH	15.0	HH
Arsenic	-	-	-	**6.80**	-	-	0.0180	HH	0.0380	HH
Barium	-	-	-	**37.5**	-	-	4.00	Eco	4.00	Eco
Beryllium	-	-	-	5.00 U	-	-	5.30	Eco	5.30	Eco
Cadmium	-	-	-	5.00 U	-	-	0.250	Eco	0.250	Eco
Chromium	-	-	-	10.0 U	-	-	74.0	Eco	74.0	Eco
Copper	-	-	-	10.0 U	-	-	9.00	Eco	9.00	Eco
Iron	-	-	-	**188**	-	-	300	HH	1,000	Eco
Lead	-	-	-	3.00 U	-	-	2.50	Eco	2.50	Eco
Manganese	-	-	-	**14.2**	-	-	50.0	HH	120	Eco
Mercury	-	-	-	0.200 U	-	-	0.770	Eco	0.770	Eco
Nickel	-	-	-	10.0 U	-	-	52.0	Eco	52.0	Eco
Selenium	-	-	-	5.00 U	-	-	5.00	Eco	5.00	Eco
Silver	-	-	-	10.0 U	-	-	0.120	Eco	0.120	Eco
Thallium	-	-	-	5.00 U	-	-	0.240	HH	2.00	HH
Zinc	-	-	-	10.0 U	-	-	120	Eco	120	Eco

Table 5-1d
1999/2000 Landfill Supplemental Site Inspection Groundwater Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Herbicides, and Pesticides
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Site ID	MW-01	MW-01	MW-01	MW-02	MW-02	MW-02	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	990713BIL08GW	991108BIL14GW	000110BIL20GW	990712BIL07GW	991108BIL12GW	000110BIL15GW				
Sample Date	7/13/1999	11/8/1999	1/10/2000	7/12/1999	11/8/1999	1/10/2000				
Sample Depth (Feet btc)	27.5	27.5	27.5	29.56	29.56	29.56				
Medium	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater				
Total Petroleum Hydrocarbons (µg/L)										
Diesel Range Organics	240 U	**340**	**280**	240 U	240 U	250 U	--	--	90.0	HH
Residual Range Organics	710 U	**840**	750 U	710 U	710 U	750 U	--	--	290	HH
Gasoline Range Organics	100 U	100 U	100 U	100 U	100 U	100 U	--	--	100	HH
Total Herbicides (µg/L)										
2,4,5-T	-	0.100 U	0.150 U	0.150 U	0.100 U	0.150 U	36.0	Eco	36.0	Eco
2,4,5-TP (Silvex)	-	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	--	--	290	HH
2,4-D	-	0.250 U	1.00 U	1.00 U	0.250 U	1.00 U	4.00	Eco	4.00	Eco
2,4-DB	-	0.500 U	0.500 U	1.00 U	0.500 U	0.500 U	--	--	290	HH
Dalapon	-	0.500 U	2.00 U	2.00 U	0.500 U	2.00 U	--	--	1,100	HH
Dicamba	-	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	10.0	Eco	10.0	Eco
Dichloroprop	-	0.250 U	0.250 U	1.00 U	0.250 U	0.250 U	4.00	Eco	4.00	Eco
Dinoseb	-	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.0500	Eco	0.0500	Eco
MCPA	-	10.0 U	50.0 U	50.0 U	10.0 U	50.0 U	2.60	Eco	2.60	Eco
MCPP	-	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	--	--	37.0	HH
Total Pesticides (µg/L)										
4,4'-DDD	0.0960 U	0.0960 U	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.000310	HH	0.00100	Eco
4,4'-DDE	0.0960 U	0.0960 U	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.000220	HH	0.00100	Eco
4,4'-DDT	0.0960 U	0.0960 U	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.000220	HH	0.00100	Eco
Aldrin	0.0480 U	0.0480 U	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.0000490	HH	0.00330	HH
BHC (alpha)	0.0480 U	0.0480 U	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.00260	HH	0.00900	HH
BHC (beta)	0.0480 U	0.0480 U	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.00910	HH	0.0370	HH
BHC (delta)	0.0480 U	0.0480 U	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.00260	HH	0.00900	HH
BHC (gamma) Lindane	0.0480 U	0.0480 U	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.0800	Eco	0.0520	HH
Chlordane (alpha)	0.0480 U	0.0480 U	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.000800	HH	0.00430	Eco
Chlordane (gamma)	0.0480 U	0.0480 U	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.000800	HH	0.00430	Eco
Dieldrin	0.0960 U	0.0960 U	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.0000520	HH	0.00350	HH
Endosulfan I	0.0480 U	0.0480 U	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.0560	Eco	0.0560	Eco
Endosulfan II	0.0960 U	0.0960 U	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.0560	Eco	0.0560	Eco
Endosulfan Sulfate	0.0960 U	0.0960 U	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.0510	Eco	0.0510	Eco
Endrin	0.0960 U	0.0960 U	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.0360	Eco	0.0360	Eco
Endrin Aldehyde	0.0960 U	0.0960 U	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.150	Eco	0.150	Eco
Endrin Ketone	0.0960 U	0.0960 U	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.0590	HH	11.0	HH
Heptachlor	0.0480 U	0.0480 U	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.0000790	HH	0.00380	Eco
Heptachlor Epoxide	0.0480 U	0.0480 U	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.0000390	HH	0.00380	Eco
Methoxychlor	0.480 U	0.480 U	0.500 U	0.470 U	0.480 UJ	0.500 U	0.0300	Eco	0.0300	Eco
Toxaphene	0.960 U	0.960 U	1.00 U	0.940 U	0.950 UJ	1.00 U	0.000280	HH	0.00200	Eco

Notes:

µg/L = microgram per liter
mg/L = milligram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-1d
1999/2000 Landfill Supplemental Site Inspection Groundwater Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Herbicides, and Pesticides
(Page 3 of 4)

Site ID	MW-03	MW-03	MW-03	MW-04*	MW-04*	MW-04*	MW-05	MW-05	SEEP*	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	990712BIL06GW	991108BIL11GW	000110BIL18GW	990712BIL01GW	991108BIL09GW	000110BIL16GW	991108BIL13GW	000110BIL19GW	000413BIL21GW				
Sample Date	7/12/1999	11/8/1999	1/10/2000	7/12/1999	11/8/1999	1/10/2000	11/8/1999	1/10/2000	4/13/2000				
Sample Depth (Feet btc)	18.21	18.21	18.21	20.29	20.29	20.29	24.87	24.87	0.0				
Medium	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Seep Water				
Total PCB Aroclors (µg/L)													
Aroclor 1016	0.940 U	0.940 UJ	1.00 U	0.940 U	0.950 U	1.00 U	0.940 U	1.00 UJ	0.100 U	0.0000640	HH	0.0140	Eco
Aroclor 1221	0.940 U	0.940 UJ	1.00 U	0.940 U	0.950 U	1.00 U	0.940 U	1.00 UJ	0.100 U	0.0000640	HH	0.00680	HH
Aroclor 1232	0.940 U	0.940 UJ	1.00 U	0.940 U	0.950 U	1.00 U	0.940 U	1.00 UJ	0.100 U	0.0000640	HH	0.00680	HH
Aroclor 1242	0.940 U	0.940 UJ	1.00 U	0.940 U	0.950 U	1.00 U	0.940 U	1.00 UJ	0.100 U	0.0000640	HH	0.0140	Eco
Aroclor 1248	0.940 U	0.940 UJ	1.00 U	0.940 U	0.950 U	1.00 U	0.940 U	1.00 UJ	0.100 U	0.0000640	HH	0.0140	Eco
Aroclor 1254	0.940 U	0.940 UJ	1.00 U	0.940 U	0.950 U	1.00 U	0.940 U	1.00 UJ	0.100 U	0.0000640	HH	0.0140	Eco
Aroclor 1260	0.940 U	0.940 UJ	1.00 U	0.940 U	0.950 U	1.00 U	0.940 U	1.00 UJ	0.100 U	0.0000640	HH	0.0140	Eco
Total Metals (µg/L)													
Antimony	-	50.0 U	50.0 U	-	50.0 U	50.0 U	50.0 U	50.0 U	1.00 U	5.60	HH	15.0	HH
Arsenic	-	5.00 U	5.00 U	-	5.00 U	5.00 U	5.00 U	5.00 U	**1.04**	0.0180	HH	0.0380	HH
Barium	-	**15.7**	**10.8**	-	**290**	**238**	**164**	**126**	**74.2**	1,000	HH	7,300	HH
Beryllium	-	5.00 U	5.00 U	-	5.00 U	5.00 U	5.00 U	5.00 U	1.00 U	--	--	73.0	HH
Cadmium	-	5.00 U	5.00 U	-	**5.60**	5.00 U	5.00 U	5.00 U	1.00 U	--	--	18.0	HH
Chromium	-	10.0 U	10.0 U	-	10.0 U	10.0 U	10.0 U	10.0 U	**1.05**	--	--	55,000	HH
Copper	-	10.0 U	10.0 U	-	**17.6**	**45.2**	10.0 U	10.0 U	**2.72**	1,300	HH	1,500	HH
Iron	-	**119**	**53.1**	-	**9,755**	**157**	**32,800**	**25,400**	**8,195**	300	HH	26,000	HH
Lead	-	3.00 U	3.00 U	-	3.00 U	3.00 U	3.00 U	3.00 U	1.00 U	--	--	15.0	HH
Manganese	-	**23.2**	10.0 U	-	**1,380**	**194**	**4,110**	**3,300**	**1,475**	50.0	HH	880	HH
Mercury	-	0.200 U	**0.200**	-	0.200 U	0.200 U	0.200 U	0.200 U	1.00 U	--	--	11.0	HH
Nickel	-	10.0 U	10.0 U	-	**110**	**112**	10.0 U	10.0 U	**2.32**	610	HH	730	HH
Selenium	-	5.00 U	5.00 U	-	5.00 U	5.00 U	5.00 U	5.00 U	**1.11**	170	HH	180	HH
Silver	-	10.0 U	10.0 U	-	10.0 U	10.0 U	10.0 U	10.0 U	1.00 U	--	--	180	HH
Thallium	-	5.00 U	5.00 U	-	5.00 U	5.00 U	5.00 U	5.00 U	1.00 U	0.240	HH	2.00	HH
Zinc	-	10.0 U	10.0 U	-	**2,655**	**1,500**	**18.7**	**15.8**	10.0 U	7,400	HH	11,000	HH
Dissolved Metals (µg/L)													
Antimony	50.0 U	-	-	50.0 U	-	-	-	-	**2.28**	5.60	HH	15.0	HH
Arsenic	5.00 U	-	-	5.00 U	-	-	-	-	1.00 U	0.0180	HH	0.0380	HH
Barium	**21.2**	-	-	**134**	-	-	-	-	**277**	4.00	Eco	4.00	Eco
Beryllium	5.00 U	-	-	5.00 U	-	-	-	-	1.00 U	5.30	Eco	5.30	Eco
Cadmium	5.00 U	-	-	5.00 U	-	-	-	-	1.00 U	0.250	Eco	0.250	Eco
Chromium	10.0 U	-	-	10.0 U	-	-	-	-	1.00 U	74.0	Eco	74.0	Eco
Copper	10.0 U	-	-	10.0 U	-	-	-	-	**1.09**	9.00	Eco	9.00	Eco
Iron	50.0 U	-	-	**3,615**	-	-	-	-	**3,210**	300	HH	1,000	Eco
Lead	3.00 U	-	-	3.00 U	-	-	-	-	1.00 U	2.50	Eco	2.50	Eco
Manganese	**12.0**	-	-	**1,325**	-	-	-	-	**1,480 J**	50.0	HH	120	Eco
Mercury	0.200 U	-	-	0.200 U	-	-	-	-	1.00 U	0.770	Eco	0.770	Eco
Nickel	10.0 U	-	-	**18.7**	-	-	-	-	**2.22**	52.0	Eco	52.0	Eco
Selenium	5.00 U	-	-	5.00 U	-	-	-	-	1.00 U	5.00	Eco	5.00	Eco
Silver	10.0 U	-	-	10.0 U	-	-	-	-	1.00 U	0.120	Eco	0.120	Eco
Thallium	5.00 U	-	-	5.00 U	-	-	-	-	1.00 U	0.240	HH	2.00	HH
Zinc	10.0 U	-	-	**197**	-	-	-	-	**85.6**	120	Eco	120	Eco

Table 5-1d
1999/2000 Landfill Supplemental Site Inspection Groundwater Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Herbicides, and Pesticides
(Page 4 of 4)

Site ID	MW-03	MW-03	MW-03	MW-04*	MW-04*	MW-04*	MW-05	MW-05	SEEP*	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	990712BIL06GW	991108BIL11GW	000110BIL18GW	990712BIL01GW	991108BIL09GW	000110BIL16GW	991108BIL13GW	000110BIL19GW	000413BIL21GW				
Sample Date	7/12/1999	11/8/1999	1/10/2000	7/12/1999	11/8/1999	1/10/2000	11/8/1999	1/10/2000	4/13/2000				
Sample Depth (Feet btc)	18.21	18.21	18.21	20.29	20.29	20.29	24.87	24.87	0.0				
Medium	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Seep Water				
Total Petroleum Hydrocarbons (µg/L)													
Diesel Range Organics	240 U	240 U	250 U	240 U	**295**	**305**	**1,800**	**1,100**	250 U	--	--	90.0	HH
Residual Range Organics	710 U	710 U	750 U	710 U	710 U	750 U	**1,900**	750 U	500 U	--	--	290	HH
Gasoline Range Organics	100 U	100 U	100 U	100 U	100 U	100 U	**300**	**430**	250 U	--	--	100	HH
Total Herbicides (µg/L)													
2,4,5-T	0.150 U	0.100 U	0.150 U	0.150 U	0.100 U	0.150 U	0.100 U	0.150 U	0.400 U	36.0	Eco	36.0	Eco
2,4,5-TP (Silvex)	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.400 U	--	--	290	HH
2,4-D	1.00 U	0.250 U	1.00 U	1.00 U	0.250 U	1.00 U	0.250 U	1.00 U	0.400 U	4.00	Eco	4.00	Eco
2,4-DB	1.00 U	0.500 U	0.500 U	1.00 U	0.500 U	0.500 U	0.500 U	0.500 U	0.400 U	--	--	290	HH
Dalapon	2.00 U	0.500 U	2.00 U	2.00 U	0.500 U	2.00 U	0.500 U	2.00 U	0.400 U	--	--	1,100	HH
Dicamba	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.400 U	10.0	Eco	10.0	Eco
Dichloroprop	1.00 U	0.250 U	0.250 U	1.00 U	0.250 U	0.250 U	**1.10**	0.250 U	0.400 U	4.00	Eco	4.00	Eco
Dinoseb	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.400 U	0.0500	Eco	0.0500	Eco
MCPA	50.0 U	10.0 U	50.0 U	50.0 U	10.0 U	50.0 U	10.0 U	50.0 U	100 U	2.60	Eco	2.60	Eco
MCPP	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	100 U	--	--	37.0	HH
Total Pesticides (µg/L)													
4,4'-DDD	0.0940 U	0.0940 UJ	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.0940 U	0.100 UJ	0.0400 U	0.000310	HH	0.00100	Eco
4,4'-DDE	0.0940 U	0.0940 UJ	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.0940 U	0.100 UJ	0.0300 U	0.000220	HH	0.00100	Eco
4,4'-DDT	0.0940 U	0.0940 UJ	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.0940 U	0.100 UJ	0.0900 U	0.000220	HH	0.00100	Eco
Aldrin	0.0470 U	0.0470 UJ	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.0470 U	0.0500 UJ	0.0400 U	0.0000490	HH	0.00330	HH
BHC (alpha)	0.0470 U	0.0470 UJ	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.0470 U	0.0500 UJ	0.0200 U	0.00260	HH	0.00900	HH
BHC (beta)	0.0470 U	0.0470 UJ	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.0470 U	0.0500 UJ	0.100 U	0.00910	HH	0.0370	HH
BHC (delta)	0.0470 U	0.0470 UJ	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.0470 U	0.0500 UJ	0.0500 U	0.00260	HH	0.00900	HH
BHC (gamma) Lindane	0.0470 U	0.0470 UJ	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.0470 U	0.0500 UJ	0.0300 U	0.0800	Eco	0.0520	HH
Chlordane (alpha)	0.0470 U	0.0470 UJ	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.0470 U	0.0500 UJ	0.0500 U	0.000800	HH	0.00430	Eco
Chlordane (gamma)	0.0470 U	0.0470 UJ	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.0470 U	0.0500 UJ	0.0200 U	0.000800	HH	0.00430	Eco
Dieldrin	0.0940 U	0.0940 UJ	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.0940 U	0.100 UJ	0.0700 U	0.0000520	HH	0.00350	HH
Endosulfan I	0.0470 U	0.0470 UJ	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.0470 U	0.0500 UJ	0.0300 U	0.0560	Eco	0.0560	Eco
Endosulfan II	0.0940 U	0.0940 UJ	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.0940 U	0.100 UJ	0.0500 U	0.0560	Eco	0.0560	Eco
Endosulfan Sulfate	0.0940 U	0.0940 UJ	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.0940 U	0.100 UJ	0.0700 U	0.0510	Eco	0.0510	Eco
Endrin	0.0940 U	0.0940 UJ	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.0940 U	0.100 UJ	0.0800 U	0.0360	Eco	0.0360	Eco
Endrin Aldehyde	0.0940 U	0.0940 UJ	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.0940 U	0.100 UJ	0.100 U	0.150	Eco	0.150	Eco
Endrin Ketone	0.0940 U	0.0940 UJ	0.100 U	0.0940 U	0.0950 UJ	0.100 U	0.0940 U	0.100 UJ	-	0.0590	HH	11.0	HH
Heptachlor	0.0470 U	0.0470 UJ	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.0470 U	0.0500 UJ	0.0300 U	0.0000790	HH	0.00380	Eco
Heptachlor Epoxide	0.0470 U	0.0470 UJ	0.0500 U	0.0470 U	0.0480 UJ	0.0500 U	0.0470 U	0.0500 UJ	0.0300 U	0.0000390	HH	0.00380	Eco
Methoxychlor	0.470 U	0.470 UJ	0.500 U	0.470 U	0.480 UJ	0.500 U	0.470 U	0.500 UJ	0.500 U	0.0300	Eco	0.0300	Eco
Toxaphene	0.940 U	0.940 UJ	1.00 U	0.940 U	0.950 UJ	1.00 U	0.940 U	1.00 UJ	1.50 U	0.000280	HH	0.00200	Eco

Notes:

µg/L = microgram per liter
mg/L = milligram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-1e
1999/2000 Landfill Supplemental Site Inspection Groundwater Analytical Results
Volatile Organic Compounds
(Page 1 of 2)

Site ID	MW-01	MW-01	MW-01	MW-02	MW-02	MW-02	MW-03	MW-03	MW-03	MW-04*	MW-04*	MW-04*	MW-05	MW-05	SEEP*	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	990713BIL08GW	991108BIL14GW	000110BIL20GW	990712BIL07GW	991108BIL12GW	000110BIL15GW	990712BIL06GW	991108BIL11GW	000110BIL18GW	990712BIL01GW	991108BIL09GW	000110BIL16GW	991108BIL13GW	000110BIL19GW	000413BIL21GW				
Sample Date	7/13/1999	11/8/1999	1/10/2000	7/12/1999	11/8/1999	1/10/2000	7/12/1999	11/8/1999	1/10/2000	7/12/1999	11/8/1999	1/10/2000	11/8/1999	1/10/2000	4/13/2000				
Sample Depth (Feet btc)	27.5	27.5	27.5	29.56	29.56	29.56	18.21	18.21	18.21	20.29	20.29	20.29	24.87	24.87	0.0				
Medium	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Seep Water				
Total Volatile Organic Compounds (µg/L																			
1,1,1,2-Tetrachloroethane	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	186	Eco	0.520	HH
1,1,1-Trichloroethane (TCA)	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	11.0	Eco	11.0	Eco
1,1,2,2-Tetrachloroethane	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.170	HH	0.0670	HH
1,1,2-Trichloroethane	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.590	HH	0.230	HH
1,1-Dichloroethane	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	47.0	Eco	2.30	HH
1,1-Dichloroethene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	25.0	Eco	25.0	Eco
1,1-Dichloropropene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	0.430	HH
1,2,3-Trichlorobenzene	5.00 U	-	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	1.00 U	8.00	Eco	2.30	HH
1,2,3-Trichloropropane	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	0.000720	HH
1,2,4-Trichlorobenzene	5.00 U	-	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	1.00 U	5.00 U	1.00 U	35.0	HH	2.30	HH
1,2,4-Trimethylbenzene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	**5.20**	**1.00**	1.00 U	7.30	Eco	7.30	Eco
1,2-Dibromo-3-chloropropane	3.00 U	-	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	5.00 U	--	--	0.000320	HH
1,2-Dibromoethane (EDB)	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	0.00630	HH
1,2-Dichlorobenzene	2.00 U	-	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1.00 U	14.0	Eco	14.0	Eco
1,2-Dichloroethane (EDC)	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.380	HH	0.140	HH
1,2-Dichloropropane	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.500	HH	0.390	HH
1,3,5-Trimethylbenzene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	7.30	Eco	7.30	Eco
1,3-Dichlorobenzene	2.00 U	-	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1.00 U	71.0	Eco	0.420	HH
1,3-Dichloropropane	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	5,700	Eco	730	HH
1,4-Dichlorobenzene	2.00 U	-	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1.00 U	15.0	Eco	0.420	HH
2,2-Dichloropropane	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.500	HH	0.390	HH
2-Butanone (MEK)	10.0 U	-	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	14,000	Eco	7,100	HH
2-Chloroethylvinylethe	10.0 U	-	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	-	4,760	Eco	4,760	Eco
2-Chlorotoluene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	730	HH
2-Hexanone	10.0 U	-	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	99.0	Eco	47.0	HH
4-Chlorotoluene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	2,600	HH
4-Isopropyltoluene	2.00 U	-	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1.00 U	--	--	--	--
4-Methyl-2-pentanone (MIBK	10.0 U	-	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	170	Eco	170	Eco
Acetone	10.0 U	-	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 UJ	1,500	Eco	1,500	Eco
Benzene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	2.20	HH	0.390	HH
Bromobenzene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	88.0	HH
Bromochloromethane	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.550	HH	0.120	HH
Bromodichloromethane	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.550	HH	0.120	HH
Bromoform	3.00 U	-	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	1.00 U	4.30	HH	7.20	HH
Bromomethane	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	16.0	Eco	8.70	HH
Carbon Disulfide	10.0 U	-	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	1.00 U	0.920	Eco	0.920	Eco
Carbon Tetrachloride	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	**1.40**	1.00 U	1.00 U	1.00 U	0.230	HH	0.190	HH
Chlorobenzene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	50.0	Eco	50.0	Eco
Chloroethane	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	21,000	HH
Chloroform	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	**3.65**	1.00 U	1.00 U	1.00 U	5.70	HH	0.190	HH
Chloromethane	5.00 U	-	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	--	--	190	HH
cis-1,2-Dichloroethene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	590	Eco	360	HH
cis-1,3-Dichloropropene	3.00 U	-	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	1.00 U	0.0550	Eco	0.0550	Eco
Dibromochloromethane	2.00 U	-	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1.00 U	0.400	HH	0.680	HH
Dibromomethane	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	8.20	HH
Dichlorodifluoromethane	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	390	HH
Dichloromethane (Methylene Chloride	5.00 U	-	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 UJ	4.60	HH	4.40	HH
Ethylbenzene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	**1.00**	1.00 U	7.30	Eco	1.40	HH
Hexachlorobutadiene	3.00 U	-	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	1.00 U	0.440	HH	0.860	HH
Isopropylbenzene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	**4.60**	**3.20**	1.00 U	7.30	Eco	7.30	Eco
m,p-Xylenes	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	2.00 U	13.0	Eco	13.0	Eco
Naphthalene	5.00 U	-	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	1.00 U	620	Eco	0.140	HH
n-Butylbenzene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	--	--
n-Propylbenzene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	**2.00**	**1.20**	1.00 U	7.30	Eco	7.30	Eco
o-Xylene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	350	Eco	350	Eco
sec-Butylbenzene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	--	--
Styrene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	72.0	Eco	72.0	Eco
tert-Butylbenzene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	--	--
Tetrachloroethene (PCE)	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	**5.10**	**2.60**	**2.40**	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.690	HH	0.0930	HH
Toluene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	9.80	Eco	9.80	Eco
trans-1,2-Dichloroethene	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	140	HH	110	HH
trans-1,3-Dichloropropene	3.00 U	-	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	1.00 U	0.0550	Eco	0.0550	Eco
Trichloroethene (TCE)	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	2.50	HH	0.0390	HH
Trichlorofluoromethane	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	1,300	HH
Vinyl Acetate	10.0 U	-	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	-	16.0	Eco	16.0	Eco
Vinyl Chloride	1.00 U	-	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.0250	HH	0.0250	HH

Notes:

µg/L = microgram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-1e
1999/2000 Landfill Supplemental Site Inspection Groundwater Analytical Results
Volatile Organic Compounds
(Page 2 of 2)

Site ID	MW-03	MW-03	MW-04*	MW-04*	MW-04*	MW-05	MW-05	SEEP*	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	991108BIL11GW	000110BIL18GW	990712BIL01GW	991108BIL09GW	000110BIL16GW	991108BIL13GW	000110BIL19GW	000413BIL21GW				
Sample Date	11/8/1999	1/10/2000	7/12/1999	11/8/1999	1/10/2000	11/8/1999	1/10/2000	4/13/2000				
Sample Depth (Feet btc)	18.21	18.21	20.29	20.29	20.29	24.87	24.87	0.0				
Medium	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Seep Water				
Total Volatile Organic Compounds (µg/L)												
1,1,1,2-Tetrachloroethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	186	Eco	0.520	HH
1,1,1-Trichloroethane (TCA)	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	11.0	Eco	11.0	Eco
1,1,2,2-Tetrachloroethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.170	HH	0.0670	HH
1,1,2-Trichloroethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.590	HH	0.230	HH
1,1-Dichloroethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	47.0	Eco	2.30	HH
1,1-Dichloroethene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	25.0	Eco	25.0	Eco
1,1-Dichloropropene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	0.430	HH
1,2,3-Trichlorobenzene	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	1.00 U	8.00	Eco	2.30	HH
1,2,3-Trichloropropane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	0.000720	HH
1,2,4-Trichlorobenzene	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	1.00 U	5.00 U	1.00 U	35.0	HH	2.30	HH
1,2,4-Trimethylbenzene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	**5.20**	**1.00**	1.00 U	7.30	Eco	7.30	Eco
1,2-Dibromo-3-chloropropane	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	5.00 U	--	--	0.000320	HH
1,2-Dibromoethane (EDB)	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	0.00630	HH
1,2-Dichlorobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1.00 U	14.0	Eco	14.0	Eco
1,2-Dichloroethane (EDC)	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.380	HH	0.140	HH
1,2-Dichloropropane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.500	HH	0.390	HH
1,3,5-Trimethylbenzene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	7.30	Eco	7.30	Eco
1,3-Dichlorobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1.00 U	71.0	Eco	0.420	HH
1,3-Dichloropropane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	5,700	Eco	730	HH
1,4-Dichlorobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1.00 U	15.0	Eco	0.420	HH
2,2-Dichloropropane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.500	HH	0.390	HH
2-Butanone (MEK)	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	14,000	Eco	7,100	HH
2-Chloroethylvinylether	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	-	4,760	Eco	4,760	Eco
2-Chlorotoluene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	730	HH
2-Hexanone	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	99.0	Eco	47.0	HH
4-Chlorotoluene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	2,600	HH
4-Isopropyltoluene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1.00 U	--	--	--	--
4-Methyl-2-pentanone (MIBK)	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	170	Eco	170	Eco
Acetone	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 UJ	1,500	Eco	1,500	Eco
Benzene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	2.20	HH	0.390	HH
Bromobenzene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	88.0	HH
Bromochloromethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.550	HH	0.120	HH
Bromodichloromethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.550	HH	0.120	HH
Bromoform	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	1.00 U	4.30	HH	7.20	HH
Bromomethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	16.0	Eco	8.70	HH
Carbon Disulfide	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	1.00 U	0.920	Eco	0.920	Eco
Carbon Tetrachloride	1.00 U	1.00 U	1.00 U	1.00 U	**1.40**	1.00 U	1.00 U	1.00 U	0.230	HH	0.190	HH
Chlorobenzene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	50.0	Eco	50.0	Eco
Chloroethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	21,000	HH
Chloroform	1.00 U	1.00 U	1.00 U	1.00 U	**3.65**	1.00 U	1.00 U	1.00 U	5.70	HH	0.190	HH
Chloromethane	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	--	--	190	HH
cis-1,2-Dichloroethene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	590	Eco	360	HH
cis-1,3-Dichloropropene	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	1.00 U	0.0550	Eco	0.0550	Eco
Dibromochloromethane	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1.00 U	0.400	HH	0.680	HH
Dibromomethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	8.20	HH
Dichlorodifluoromethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	390	HH
Dichloromethane (Methylene Chloride)	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 UJ	4.60	HH	4.40	HH
Ethylbenzene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	**1.00**	1.00 U	7.30	Eco	1.40	HH
Hexachlorobutadiene	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	1.00 U	0.440	HH	0.860	HH
Isopropylbenzene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	**4.60**	**3.20**	1.00 U	7.30	Eco	7.30	Eco
m,p-Xylenes	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	2.00 U	13.0	Eco	13.0	Eco
Naphthalene	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	1.00 U	620	Eco	0.140	HH
n-Butylbenzene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	--	--
n-Propylbenzene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	**2.00**	**1.20**	1.00 U	7.30	Eco	7.30	Eco
o-Xylene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	350	Eco	350	Eco
sec-Butylbenzene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	--	--
Styrene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	72.0	Eco	72.0	Eco
tert-Butylbenzene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	--	--
Tetrachloroethene (PCE)	**2.60**	**2.40**	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.690	HH	0.0930	HH
Toluene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	9.80	Eco	9.80	Eco
trans-1,2-Dichloroethene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	140	HH	110	HH
trans-1,3-Dichloropropene	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	1.00 U	0.0550	Eco	0.0550	Eco
Trichloroethene (TCE)	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	2.50	HH	0.0390	HH
Trichlorofluoromethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	--	--	1,300	HH
Vinyl Acetate	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	-	16.0	Eco	16.0	Eco
Vinyl Chloride	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	0.0250	HH	0.0250	HH

Notes:

µg/L = microgram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-1f
1999/2000 Landfill Supplemental Site Inspection Groundwater Analytical Results
Semivolatile Organic Compounds
(Page 1 of 2)

Site ID	MW-01	MW-01	MW-01	MW-02	MW-02	MW-02	MW-03	MW-03	MW-03	MW-04*	MW-04*	MW-04*	MW-05	MW-05	SEEP*	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	990713BIL08GW	991108BIL14GW	000110BIL20GW	990712BIL07GW	991108BIL12GW	000110BIL15GW	990712BIL06GW	991108BIL11GW	000110BIL18GW	990712BIL01GW	991108BIL09GW	000110BIL16GW	991108BIL13GW	000110BIL19GW	000413BIL21GW				
Sample Date	7/13/1999	11/8/1999	1/10/2000	7/12/1999	11/8/1999	1/10/2000	7/12/1999	11/8/1999	1/10/2000	7/12/1999	11/8/1999	1/10/2000	11/8/1999	1/10/2000	4/13/2000				
Sample Depth (Feet btc)	27.5	27.5	27.5	29.56	29.56	29.56	18.21	18.21	18.21	20.29	20.29	20.29	24.87	24.87	0.0				
Medium	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Seep Water				
Semivolatile Organic Compounds (µg/L)																			
1,2,4-Trichlorobenzene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	35.0	HH	2.30	HH
1,2-Dichlorobenzene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	14.0	Eco	14.0	Eco
1,3-Dichlorobenzene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	71.0	Eco	0.420	HH
1,4-Dichlorobenzene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	15.0	Eco	0.420	HH
2,4,5-Trichlorophenol	48.0 U	47.0 U	25.0 U	47.0 U	48.0 U	25.0 U	47.0 U	47.0 U	25.0 U	47.0 U	48.0 U	25.0 U	47.0 U	25.0 U	4.76 U	18.0	Eco	18.0	Eco
2,4,6-Trichlorophenol	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 U	1.40	HH	5.20	HH
2,4-Dichlorophenol	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 U	77.0	HH	110	HH
2,4-Dimethylphenol	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 U	42.0	Eco	42.0	Eco
2,4-Dinitrophenol	48.0 U	47.0 U	25.0 U	47.0 U	48.0 U	25.0 U	47.0 U	47.0 U	25.0 U	47.0 U	48.0 U	25.0 U	47.0 U	25.0 U	9.52 U	19.0	Eco	19.0	Eco
2,4-Dinitrotoluene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	0.110	HH	0.220	HH
2,6-Dinitrotoluene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	230	Eco	37.0	HH
2-Chloronaphthalene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	32.0	Eco	32.0	Eco
2-Chlorophenol	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 U	81.0	HH	180	HH
2-Methylphenol	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	**76.0**	10.0 U	4.76 U	13.0	Eco	13.0	Eco
2-Nitroaniline	48.0 U	47.0 U	25.0 U	47.0 U	48.0 U	25.0 U	47.0 U	47.0 U	25.0 U	47.0 U	48.0 U	25.0 U	47.0 U	25.0 U	4.76 UJ	--	--	370	HH
2-Nitrophenol	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 U	10,000	HH	11,000	HH
3,3'-Dichlorobenzidine	19.0 U	19.0 U	10.0 U	19.0 U	19.0 U	10.0 U	19.0 U	19.0 U	10.0 U	19.0 U	19.0 U	10.0 U	19.0 U	10.0 U	4.76 UJ	0.0210	HH	0.130	HH
3-Nitroaniline	48.0 U	47.0 U	25.0 U	47.0 U	48.0 U	25.0 U	47.0 U	47.0 U	25.0 U	47.0 U	48.0 U	25.0 U	47.0 U	25.0 U	4.76 UJ	--	--	3.40	HH
4,6-Dinitro-2-methylphenol	48.0 U	47.0 U	25.0 U	47.0 U	48.0 U	25.0 U	47.0 U	47.0 U	25.0 U	47.0 U	48.0 U	25.0 U	47.0 U	25.0 U	4.76 U	13.0	HH	2.90	HH
4-Bromophenyl Phenyl Ether	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	1.50	Eco	1.50	Eco
4-Chloro-3-methylphenol	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 U	--	--	3700	HH
4-Chloroaniline	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	50.0	Eco	0.340	HH
4-Chlorophenyl Phenyl Ether	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	--	--	--	--
4-Nitroaniline	48.0 U	47.0 U	25.0 U	47.0 U	48.0 U	25.0 U	47.0 U	47.0 U	25.0 U	47.0 U	48.0 U	25.0 U	47.0 U	25.0 U	4.76 UJ	--	--	3.40	HH
4-Nitrophenol	48.0 U	47.0 U	10.0 U	47.0 U	48.0 U	10.0 U	47.0 U	47.0 U	10.0 U	47.0 U	48.0 U	10.0 U	47.0 U	10.0 U	4.76 U	150	Eco	150	Eco
Aniline	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	2.20	Eco	2.20	Eco
Benzidine	96.0 U	94.0 U	10.0 U	94.0 U	96.0 U	10.0 U	94.0 U	94.0 U	10.0 U	94.0 U	96.0 U	100 U	94.0 U	100 U	4.76 UJ	0.0000860	HH	0.720	HH
Benzoic Acid	48.0 U	47.0 U	10.0 U	47.0 U	48.0 U	10.0 U	47.0 U	47.0 U	10.0 U	47.0 U	48.0 U	10.0 U	**11.0 J**	10.0 U	**5.89**	42.0	Eco	42.0	Eco
Benzyl Alcohol	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	8.60	Eco	8.60	Eco
Bis(2-chloroethoxy)methane	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	--	--	110	HH
Bis(2-chloroethyl) Ether	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	0.0300	HH	0.0120	HH
Bis(2-chloroisopropyl) Ether	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	1,400	HH	--	--
Bis(2-ethylhexyl) Phthalate	9.60 U	48.0 U	**10.0**	9.40 U	19.0 U	**19.0**	9.40 U	9.40 U	10.0 U	9.40 U	**2.70 J**	10.0 U	9.40 U	10.0 U	23.8 UJ	1.20	HH	3.00	Eco
Butyl Benzyl Phthalate	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	19.0	Eco	19.0	Eco
Carbazole	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	--	--	--	--
Dibenzofuran	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	3.70	Eco	3.70	Eco
Diethyl Phthalate	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	210	Eco	210	Eco
Dimethyl Phthalate	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	3.00	Eco	3.00	Eco
Di-n-butyl Phthalate	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	35.0	Eco	35.0	Eco
Di-n-octyl Phthalate	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	1.20	HH	4.10	HH
Hexachlorobenzene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	0.000280	HH	0.000300	Eco
Hexachlorobutadiene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	0.440	HH	0.860	HH
Hexachlorocyclopentadiene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	5.20	Eco	5.20	Eco
Hexachloroethane	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	1.40	HH	4.10	HH
Isophorone	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	35.0	HH	71.0	HH
Nitrobenzene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	17.0	HH	0.120	HH
N-Nitrosodimethylamine	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	0.000690	HH	0.000420	HH
N-Nitrosodi-n-propylamine	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	0.00500	HH	0.00960	HH
N-Nitrosodiphenylamine	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	3.30	HH	14.0	HH
p-cresol (4-Methylphenol)	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	**29.0**	4.76 U	13.0	Eco	13.0	Eco
Pentachlorophenol	9.60 U	9.40 U	25.0 U	9.40 U	9.60 U	25.0 U	9.40 U	9.40 U	25.0 U	9.40 U	9.60 U	25.0 U	9.40 U	25.0 U	4.76 U	0.270	HH	0.470	HH
Phenol	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 U	110	Eco	110	Eco

Table 5-1f
1999/2000 Landfill Supplemental Site Inspection Groundwater Analytical Results
Semivolatile Organic Compounds
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Site ID	MW-01	MW-01	MW-01	MW-02	MW-02	MW-02	MW-03	MW-03	MW-03	MW-04*	MW-04*	MW-04*	MW-05	MW-05	SEEP*	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	990713BIL08GW	991108BIL14GW	000110BIL20GW	990712BIL07GW	991108BIL12GW	000110BIL15GW	990712BIL06GW	991108BIL11GW	000110BIL18GW	990712BIL01GW	991108BIL09GW	000110BIL16GW	991108BIL13GW	000110BIL19GW	000413BIL21GW				
Sample Date	7/13/1999	11/8/1999	1/10/2000	7/12/1999	11/8/1999	1/10/2000	7/12/1999	11/8/1999	1/10/2000	7/12/1999	11/8/1999	1/10/2000	11/8/1999	1/10/2000	4/13/2000				
Sample Depth (Feet btc)	27.5	27.5	27.5	29.56	29.56	29.56	18.21	18.21	18.21	20.29	20.29	20.29	24.87	24.87	0.0				
Medium	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Seep Water				
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/L)																			
2-Methylnaphthalene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	72.2	Eco	72.2	Eco
Acenaphthene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	520	Eco	520	Eco
Acenaphthylene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	307	Eco	0.140	HH
Anthracene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	13.0	Eco	13.0	Eco
Fluorene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	3.90	Eco	3.90	Eco
Naphthalene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	620	Eco	0.140	HH
Phenanthrene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	6.30	Eco	0.140	HH
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/L)																			
Benzo(a)anthracene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	0.00380	HH	0.0270	Eco
Benzo(a)pyrene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	0.00380	HH	0.00290	HH
Benzo(b)fluoranthene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	0.00380	HH	0.0290	HH
Benzo(g,h,i)perylene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	0.380	HH	0.290	HH
Benzo(k)fluoranthene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	0.00380	HH	0.290	HH
Chrysene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	0.00380	HH	2.04	Eco
Dibenz(a,h)anthracene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	0.0180	HH	0.00290	HH
Fluoranthene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	6.16	Eco	6.16	Eco
Indeno(1,2,3-cd)pyrene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	0.00380	HH	0.0290	HH
Pyrene	9.60 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	9.40 U	10.0 U	9.40 U	9.60 U	10.0 U	9.40 U	10.0 U	4.76 UJ	10.1	Eco	10.1	Eco

Notes:

µg/L = microgram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-2a
2001/2002 Phase II Supplimental Landfill Site Inspection Soil Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, Herbicides, and Pesticides
(Page 1 of 4)

Site ID	BIL01TPG	BIL02TPG	BIL03TPG	BIL04TPG	BIL05	BIL06	BIL07	BIL08	BIL09	BIL10	BIL11*	**Selected SLV[1] (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**	**Selected SLV[1] (>3 ft bgs)**	**SLV Source (>3 ft bgs)**
Sample ID	011015BIL01TPG	011015BIL02TPG	011015BIL03TPG	011015BIL04TPG	011016BIL05SS	011016BIL06SS	011016BIL07SS	011016BIL08SS	011016BIL09SS	011016BIL10SS	011016BIL11SS				
Sample Date	10/15/2001	10/15/2001	10/15/2001	10/15/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001				
Sample Depth or Interval (Feet bgs)	0.0-10.0	0.0-10.0	0.0-10.0	0.0-10.0	8.0	8.0	5.0	5.0	6.0	5.0	8.0				
PCB Aroclors (µg/kg dry)															
Aroclor 1016	1.49 U	1.30 U	1.35 U	1.25 U	1.23 U	1.18 U	1.17 U	1.18 U	1.27 U	1.14 U	1.32 U	371	Eco	21,000	HH
Aroclor 1221	6.39 U	5.55 U	5.78 U	5.34 U	5.28 U	5.07 U	5.02 U	5.06 U	5.43 U	4.88 U	5.66 U	371	Eco	540	HH
Aroclor 1232	5.10 U	4.43 U	4.61 U	4.26 U	4.21 U	4.04 U	4.00 U	4.04 U	4.33 U	3.90 U	4.51 U	371	Eco	540	HH
Aroclor 1242	2.73 U	2.37 U	2.47 U	2.28 U	2.25 U	2.16 U	2.14 U	2.16 U	2.32 U	2.08 U	2.41 U	371	Eco	740	HH
Aroclor 1248	**968**	5.89 U	**61.5**	5.66 U	5.60 U	5.38 U	5.32 U	5.37 U	5.76 U	5.18 U	6.00 U	371	Eco	740	HH
Aroclor 1254	2.12 U	1.84 U	1.91 U	1.77 U	1.75 U	**26.7**	1.66 U	1.68 U	1.80 U	1.62 U	**55.3**	371	Eco	740	HH
Aroclor 1260	**26.3**	**22.2**	**87.6**	**12.5**	**10.2 J**	**12.8**	**36.7**	1.68 U	**55.3**	1.62 U	**39.8**	371	Eco	740	HH
Total PCBs as Aroclors (NDs at MDL) [1]	**996 J**	**29.9 J**	**151 J**	**19.9 J**	**17.6 J**	**44.9 J**	**43.7 J**	8.73 U	**62.9 J**	8.42 U	**101 J**	371	Eco	740	HH
Metals (mg/kg dry)															
Aluminum	-	-	-	-	**6,480**	**6,080**	**6,890**	**4,710**	**2,380**	**7,360**	**7,390**	31,400	UPL	990,000	HH
Antimony	-	-	-	-	**0.987**	**0.974**	**8.19**	**0.783**	**2.58**	**1.77**	**7.08**	0.270	Eco	410	HH
Arsenic	-	-	-	-	**4.88**	**4.24**	**3.74**	**3.27**	**1.72**	**7.98**	**7.13**	5.40	UPL	5.40	UPL
Barium	-	-	-	-	**87.4 J**	**116 J**	**110 J**	**99.6 J**	**45.3 J**	**68.4 J**	**154 J**	330	Eco	60,000	HH
Beryllium	-	-	-	-	**0.297 J**	**0.288 J**	**0.222 J**	**0.186 J**	0.182 U	**0.227 J**	**0.296 J**	21.0	Eco	610	HH
Cadmium	-	-	-	-	**1.23**	**1.51**	**2.93**	**1.33**	**1.46**	**0.762**	**2.11**	0.360	Eco	150	HH
Calcium	-	-	-	-	**5,410**	**5,420**	**4,960**	**3,170**	**1,760**	**5,320**	**4,835**	10,400	UPL	10,400	UPL
Chromium	-	-	-	-	**13.7**	**17.6**	**27.0**	**14.0**	**11.0**	**15.5**	**50.1**	28.1	UPL	190	HH
Cobalt	-	-	-	-	**10.1**	**8.81**	**9.81**	**8.85**	**3.99**	**12.4**	**13.3**	19.9	UPL	300	HH
Copper	-	-	-	-	**27.9 J**	**57.9 J**	**120 J**	**17.9 J**	**36.0 J**	**32.5 J**	**98.8 J**	56.7	UPL	12,000	HH
Iron	-	-	-	-	**21,900**	**22,900**	**20,600**	**16,500**	**10,300**	**21,400**	**19,600**	36,900	UPL	720,000	HH
Lead	-	-	-	-	**20.3 J**	**163 J**	**697 J**	**70.7 J**	**966 J**	**157 J**	**584 J**	25.5	UPL	800	HH
Magnesium	-	-	-	-	**5,310**	**4,630**	**4,550**	**3,360**	**1,190**	**6,850**	**4,035**	12,400	UPL	12,400	UPL
Manganese	-	-	-	-	**304 J**	**296 J**	**317 J**	**323 J**	**146 J**	**387 J**	**336 J**	885	UPL	7,200	HH
Mercury	-	-	-	-	**0.0763**	**0.479**	**0.215**	**0.0238**	**1.04**	**0.0520**	**0.271**	0.0660	UPL	93.0	HH
Nickel	-	-	-	-	**14.4 J**	**14.1 J**	**20.3 J**	**13.0 J**	**7.85 J**	**23.3 J**	**26.0 J**	38.0	Eco	6,100	HH
Potassium	-	-	-	-	**367 J**	**456**	**600**	**822**	**336 J**	**493**	**1,145**	2,050	UPL	2,050	UPL
Selenium	-	-	-	-	**0.106 J**	**0.273 J**	0.085 U	0.083 U	0.087 U	**0.300 J**	**0.178 J**	0.520	Eco	5,100	HH
Silver	-	-	-	-	**0.140 J**	**0.220 J**	**1.51**	**0.110 J**	**0.205 J**	**0.169 J**	**0.393 J**	4.20	Eco	1,500	HH
Sodium	-	-	-	-	161 U	156 U	159 U	155 U	163 U	158 U	172 U	341	UPL	341	UPL
Thallium	-	-	-	-	**0.148**	**0.118**	**0.0830 J**	**0.152**	**0.0835 J**	**0.116**	**0.209**	1.00	Eco	0.203	UPL
Vanadium	-	-	-	-	**40.2**	**37.9**	**46.2**	**38.0**	**15.9**	**42.7**	**48.2**	104	UPL	104	UPL
Zinc	-	-	-	-	**105 J**	**331 J**	**401 J**	**194 J**	**95.6 J**	**79.8 J**	**206 J**	71.7	UPL	310,000	HH
Total Petroleum Hydrocarbons (mg/kg dry)															
Diesel Range Organics	**92.7**	**154**	**126**	**273**	**449**	**1,280**	**6,780**	12.3 U	**7,650**	**22.9 J**	**9,735**	23,000	HH	23,000	HH
Residual Range Organics	**403**	**676**	**658**	**682**	**2,840**	**5,900**	**33,000**	25.5 U	**38,600**	**68.5**	**41,900**	40,000	HH	40,000	HH
Gasoline Range Organics	5.61 U	5.03 U	4.98 U	**586 J**	-	-	-	-	-	-	-	13,000	HH	13,000	HH

Table 5-2a
2001/2002 Phase II Supplimental Landfill Site Inspection Soil Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, Herbicides, and Pesticides

Site ID	BIL01TPG	BIL02TPG	BIL03TPG	BIL04TPG	BIL05	BIL06	BIL07	BIL08	BIL09	BIL10	BIL11*	Selected SLV[1] (0-3 ft bgs)	SLV Source (0-3 ft bgs)	Selected SLV[1] (>3 ft bgs)	SLV Source (>3 ft bgs)
Sample ID	011015BIL01TPG	011015BIL02TPG	011015BIL03TPG	011015BIL04TPG	011016BIL05SS	011016BIL06SS	011016BIL07SS	011016BIL08SS	011016BIL09SS	011016BIL10SS	011016BIL11SS				
Sample Date	10/15/2001	10/15/2001	10/15/2001	10/15/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001				
Sample Depth (Feet bgs)	5.0	5.0	5.0	5.0	8.0	8.0	5.0	5.0	6.0	5.0	8.0				
Sample Depth or Interval (Feet bgs)	0.0-10.0	0.0-10.0	0.0-10.0	0.0-10.0	8.0	8.0	5.0	5.0	6.0	5.0	8.0				
Butyltins (µg/kg dry)															
Dibutyltin	0.899 U	0.730 U	0.788 U	**20.0**	0.711 U	0.716 U	-	0.653 U	6.44 U	0.657 U	7.62 U	28,000	Eco	180,000	HH
Monobutyltin	1.98 U	1.61 U	1.74 U	**38.0**	1.57 U	1.58 U	-	1.44 U	14.2 U	1.45 U	16.8 U	28,000	Eco	180,000	HH
Tetrabutyltin	0.694 U	0.564 U	0.609 U	0.579 U	0.549 U	0.553 U	-	0.505 U	4.98 U	0.507 U	5.89 U	28,000	Eco	180,000	HH
Tributyltin	1.43 U	**5.12**	1.25 U	**165**	1.13 U	1.14 U	-	1.04 U	10.3 U	1.05 U	12.1 U	28,000	Eco	180,000	HH
Herbicides (µg/kg dry)															
2,4,5-T	-	-	-	-	-	-	-	-	-	-	-	21.0	Eco	6,200,000	HH
2,4,5-TP (Silvex)	-	-	-	-	-	-	-	-	-	-	-	21.0	Eco	4,900,000	HH
2,4-D	-	-	-	-	-	-	-	-	-	-	-	21.0	Eco	2,400,000	HH
2,4-DB	-	-	-	-	-	-	-	-	-	-	-	21.0	Eco	4,900,000	HH
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	7,000	Eco	180,000,000	HH
Dalapon	-	-	-	-	-	-	-	-	-	-	-	18,000,000	HH	18,000,000	HH
Dicamba	-	-	-	-	-	-	-	-	-	-	-	18,000,000	HH	18,000,000	HH
Dichloroprop	-	-	-	-	-	-	-	-	-	-	-	21.0	Eco	4,900,000	HH
Dinoseb	-	-	-	-	-	-	-	-	-	-	-	620,000	HH	620,000	HH
MCPA	-	-	-	-	-	-	-	-	-	-	-	21.0	Eco	120,000	HH
MCPP	-	-	-	-	-	-	-	-	-	-	-	21.0	Eco	620,000	HH
Pentachlorophenol	-	-	-	-	-	-	-	-	-	-	-	2,100	Eco	13,000	HH
Pesticides (µg/kg dry)															
4,4'-DDD	-	-	-	-	-	-	-	-	-	-	-	21.0	Eco	11,000	HH
4,4'-DDE	-	-	-	-	-	-	-	-	-	-	-	21.0	Eco	7,700	HH
4,4'-DDT	-	-	-	-	-	-	-	-	-	-	-	21.0	Eco	7,700	HH
Aldrin	-	-	-	-	-	-	-	-	-	-	-	4.90	Eco	130	HH
BHC (alpha)	-	-	-	-	-	-	-	-	-	-	-	340	HH	340	HH
BHC (beta)	-	-	-	-	-	-	-	-	-	-	-	960	HH	960	HH
BHC (delta)	-	-	-	-	-	-	-	-	-	-	-	340	HH	340	HH
BHC (gamma) Lindane	-	-	-	-	-	-	-	-	-	-	-	2,000	HH	2,000	HH
Chlordane (technical)	-	-	-	-	-	-	-	-	-	-	-	7,200	HH	7,200	HH
Dieldrin	-	-	-	-	-	-	-	-	-	-	-	4.90	Eco	130	HH
Endosulfan I	-	-	-	-	-	-	-	-	-	-	-	20,000	Eco	1,400,000	HH
Endosulfan II	-	-	-	-	-	-	-	-	-	-	-	20,000	Eco	1,400,000	HH
Endosulfan Sulfate	-	-	-	-	-	-	-	-	-	-	-	20,000	Eco	1,400,000	HH
Endrin	-	-	-	-	-	-	-	-	-	-	-	4.90	Eco	71,000	HH
Endrin Aldehyde	-	-	-	-	-	-	-	-	-	-	-	4.90	Eco	71,000	HH
Endrin Ketone	-	-	-	-	-	-	-	-	-	-	-	4.90	Eco	71,000	HH
Heptachlor	-	-	-	-	-	-	-	-	-	-	-	480	HH	480	HH
Heptachlor Epoxide	-	-	-	-	-	-	-	-	-	-	-	240	HH	240	HH
Methoxychlor	-	-	-	-	-	-	-	-	-	-	-	500,000	Eco	3,100,000	HH
Toxaphene	-	-	-	-	-	-	-	-	-	-	-	2,000	HH	2,000	HH

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed

[1] Only Aroclors 1248, 1254, and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Landfill AOPC soil samples.
-- = SLV for analyte not available
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of combining primary and field duplicate results at this sampling location as described in Section 5.1.
[1] = Screening based on depth of sample with the exception of Gully Test pit samples (Site ID suffix = "TPG") and Mercury Vapor Lamp Test Pit samples (Site ID suffix = "TPM"), which used the minimum SLV for the two depth ranges.

Table 5-2a
2001/2002 Phase II Supplimental Landfill Site Inspection Soil Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, Herbicides, and Pesticides
(Page 3 of 4)

Site ID	BIL13	BIL14	BIL15	BIL16	BIL17	BIL18	BIL19	BIL20	BIL21	BIL22*	BIL28TPM	BIL29TPM	Selected SLV[1] (0-3 ft bgs)	SLV Source (0-3 ft bgs)	Selected SLV[1] (>3 ft bgs)	SLV Source (>3 ft bgs)
Sample ID	011016BIL13SS	011016BIL14SS	011016BIL15SS	011016BIL16SS	011016BIL17SS	011016BIL18SS	011016BIL19SS	011016BIL20SS	011016BIL21SS	011016BIL22SS	011017BIL28TPM	011017BIL29TPM				
Sample Date	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/17/2001	10/17/2001				
Sample Depth or Interval (Feet bgs)	4.0	6.0	8.0	4.0	1.0	2.0	5.0	8.0	5.0	3.0	0.0-10.0	0.0-10.0				
PCB Aroclors (µg/kg dry)																
Aroclor 1016	1.23 U	1.20 U	1.21 U	1.16 U	1.36 U	1.16 U	1.16 U	1.31 U	1.10 U	1.14 U	1.39 U	1.29 U	371	Eco	21,000	HH
Aroclor 1221	5.27 U	5.13 U	5.16 U	4.97 U	5.83 U	4.96 U	4.98 U	5.62 U	4.72 U	4.89 U	5.96 U	5.53 U	371	Eco	540	HH
Aroclor 1232	4.21 U	4.10 U	4.12 U	3.97 U	4.65 U	3.96 U	3.97 U	4.49 U	3.77 U	3.90 U	4.76 U	4.42 U	371	Eco	540	HH
Aroclor 1242	2.25 U	2.19 U	2.20 U	2.12 U	2.49 U	2.12 U	2.12 U	2.40 U	2.01 U	2.09 U	2.54 U	2.36 U	371	Eco	740	HH
Aroclor 1248	5.60 U	5.45 U	5.48 U	5.27 U	6.19 U	5.27 U	5.28 U	5.97 U	5.01 U	5.19 U	6.33 U	5.87 U	371	Eco	740	HH
Aroclor 1254	**499**	1.70 U	1.71 U	1.65 U	**78.6**	**48.4**	**54.9**	1.86 U	**37.2**	**104**	1.98 U	**23.4**	371	Eco	740	HH
Aroclor 1260	**158**	**15.0**	**52.4**	**445**	**68.0**	**39.0**	**74.6**	**2.05 J**	**41.8**	**91.3**	**46.5**	**13.1**	371	Eco	740	HH
Total PCBs as Aroclors (NDs at MDL)[1]	**663 J**	**22.2 J**	**59.6 J**	**452 J**	**153 J**	**92.7 J**	**135 J**	**9.88 J**	**84.0 J**	**200 J**	**54.8 J**	**54.8 J**	371	Eco	740	HH
Metals (mg/kg dry)																
Aluminum	**11,300**	**13,200**	**11,000**	**13,200**	**7,560**	**6,000**	**4,720**	**23,100**	**5,090**	**9,840**	-	-	31,400	UPL	990,000	HH
Antimony	**3.90**	**0.984**	**0.621**	**1.45**	**0.309 J**	**0.810**	**0.699**	**0.526 J**	**0.556 J**	**2.63 J**	-	-	0.270	Eco	410	HH
Arsenic	**5.18**	**2.58**	**1.82**	**4.24**	**2.98**	**4.07**	**2.21**	**2.55**	**1.60**	**5.95**	-	-	5.40	UPL	5.40	UPL
Barium	**113 J**	**77.8 J**	**85.4 J**	**102 J**	**132 J**	**42.6 J**	**36.5 J**	**110 J**	**34.0 J**	**129 J**	-	-	330	Eco	60,000	HH
Beryllium	**0.193 J**	0.167 U	0.162 U	**0.237 J**	0.189 U	0.157 U	0.158 U	**0.254 J**	0.155 U	0.164 U	-	-	21.0	Eco	610	HH
Cadmium	**2.16**	**1.97**	**1.86**	**1.93**	**2.09**	**0.731**	**0.594**	**1.01**	**0.559**	**3.54**	-	-	0.360	Eco	150	HH
Calcium	**6,520**	**4,240**	**4,700**	**5,660**	**4,810**	**6,100**	**3,390**	**6,220**	**4,470**	**10,485**	-	-	10,400	UPL	10,400	UPL
Chromium	**57.2**	**28.1**	**28.2**	**46.0**	**77.6**	**1,950**	**1,920**	**57.0**	**2,300**	**800**	-	-	28.1	UPL	190	HH
Cobalt	**14.1**	**15.3**	**18.9**	**14.9**	**11.3**	**41.0**	**42.3**	**17.5**	**32.4**	**22.3**	-	-	19.9	UPL	300	HH
Copper	**312 J**	**27.4 J**	**28.7 J**	**97.5 J**	**37.1 J**	**37.5 J**	**31.9 J**	**43.2 J**	**29.8 J**	**378 J**	-	-	56.7	UPL	12,000	HH
Iron	**31,100**	**29,800**	**33,000**	**28,100**	**19,200**	**51,000**	**47,300**	**32,200**	**50,700**	**40,150**	-	-	36,900	UPL	720,000	HH
Lead	**488 J**	**57.6 J**	**412 J**	**303 J**	**741 J**	**1,660 J**	**931 J**	**52.7 J**	**912 J**	**1,235 J**	-	-	25.5	UPL	800	HH
Magnesium	**6,410**	**6,010**	**5,260**	**7,340**	**6,070**	**77,700**	**73,000**	**12,000**	**88,300**	**27,250**	-	-	12,400	UPL	12,400	UPL
Manganese	**489 J**	**388 J**	**635 J**	**525 J**	**367 J**	**895 J**	**821 J**	**592 J**	**944 J**	**1,713 J**	-	-	885	UPL	7,200	HH
Mercury	**0.444**	**0.0150 J**	**0.0210**	**0.102**	**0.122**	**0.0475**	**0.0353**	**0.0836**	**0.0354**	**0.0835**	**0.505 J**	**0.552 J**	0.0660	UPL	93.0	HH
Nickel	**32.4 J**	**34.4 J**	**38.3 J**	**27.3 J**	**65.0 J**	**1,610 J**	**1,760 J**	**43.0 J**	**684 J**	**578 J**	-	-	38.0	Eco	6,100	HH
Potassium	**843**	**703**	**441**	**839**	**797**	**322 J**	**214 J**	**830**	**279 J**	**722**	-	-	2,050	UPL	2,050	UPL
Selenium	0.081 U	0.080 U	0.077 U	0.086 U	**0.205 J**	**0.226 J**	**0.184 J**	0.082 U	**0.154 J**	**0.879 J**	-	-	0.520	Eco	5,100	HH
Silver	**1.52**	**0.353 J**	**0.545**	**1.28**	**0.634**	**0.126 J**	**0.119 J**	**0.192 J**	**0.101 J**	**0.743 J**	-	-	4.20	Eco	1,500	HH
Sodium	151 U	150 U	145 U	162 U	169 U	141 U	142 U	**165 J**	139 U	147 U	-	-	341	UPL	341	UPL
Thallium	**0.120**	**0.0994 J**	**0.0892 J**	**0.123**	**0.0953 J**	**0.0578 J**	**0.0361 J**	**0.0930 J**	**0.0442 J**	**0.0829 J**	-	-	1.00	Eco	0.203	UPL
Vanadium	**67.0**	**84.0**	**93.4**	**70.1**	**34.3**	**39.5**	**35.8**	**77.4**	**34.0**	**56.1**	-	-	104	UPL	104	UPL
Zinc	**425 J**	**162 J**	**218 J**	**211 J**	**262 J**	**101 J**	**94.0 J**	**234 J**	**84.5 J**	**1,140 J**	-	-	71.7	UPL	310,000	HH
Total Petroleum Hydrocarbons (mg/kg dry)																
Diesel Range Organics	**198**	13.2 U	**39.2**	**116**	**266**	**422**	**307**	13.9 U	**190**	**101**	**2820**	**5100 J**	23,000	HH	23,000	HH
Residual Range Organics	**1,070**	**31.1 J**	**176**	**834**	**698**	**1,160**	**1,140**	**69.4**	**633**	**448 J**	**12,200**	**23,900**	40,000	HH	40,000	HH
Gasoline Range Organics	4.49 U	4.39 U	4.08 U	4.52 U	4.78 U	**3.28 J**	**2.10 J**	4.70 U	**3.05 J**	4.31 U	**214**	**267**	13,000	HH	13,000	HH
Butyltins (µg/kg dry)																
Dibutyltin	0.720 U	0.657 U	0.691 U	0.685 U	**20.2**	0.741 U	0.653 U	0.758 U	0.567 U	0.685 U	0.790 U	0.754 U	28,000	Eco	180,000	HH
Monobutyltin	1.59 U	1.45 U	1.52 U	1.51 U	**9.08**	1.63 U	1.44 U	1.67 U	1.25 U	1.51 U	1.74 U	1.66 U	28,000	Eco	180,000	HH
Tetrabutyltin	0.556 U	0.507 U	0.534 U	0.529 U	0.600 U	0.573 U	0.505 U	0.585 U	0.438 U	0.529 U	0.611 U	0.582 U	28,000	Eco	180,000	HH
Tributyltin	1.15 U	1.05 U	1.10 U	1.09 U	**9.01**	1.18 U	1.04 U	1.21 U	0.903 U	**15.4**	1.26 U	1.20 U	28,000	Eco	180,000	HH

Table 5-2a
2001/2002 Phase II Supplimental Landfill Site Inspection Soil Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, Herbicides, and Pesticides
(Page 4 of 4)

Site ID	BIL13	BIL14	BIL15	BIL16	BIL17	BIL18	BIL19	BIL20	BIL21	BIL22*	BIL28TPM	BIL29TPM	**Selected SLV[1] (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**	**Selected SLV[1] (>3 ft bgs)**	**SLV Source (>3 ft bgs)**
Sample ID	011016BIL13SS	011016BIL14SS	011016BIL15SS	011016BIL16SS	011016BIL17SS	011016BIL18SS	011016BIL19SS	011016BIL20SS	011016BIL21SS	011016BIL22SS	011017BIL28TPM	011017BIL29TPM				
Sample Date	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/17/2001	10/17/2001				
Sample Depth (Feet bgs)	4.0	6.0	8.0	4.0	1.0	2.0	5.0	8.0	5.0	3.0	5.0	5.0				
Sample Depth or Interval (Feet bgs)	4.0	6.0	8.0	4.0	1.0	2.0	5.0	8.0	5.0	3.0	0.0-10.0	0.0-10.0				
Herbicides (µg/kg dry)																
2,4,5-T	1.74 U	1.63 U	1.55 U	1.66 U	1.79 U	1.61 U	1.46 U	1.74 U	1.48 U	1.54 U	-	-	21.0	Eco	6,200,000	HH
2,4,5-TP (Silvex)	2.55 U	2.38 U	2.27 U	2.43 U	2.61 U	2.35 U	2.14 U	2.55 U	2.17 U	2.25 U	-	-	21.0	Eco	4,900,000	HH
2,4-D	0.659 U	0.614 U	0.585 U	0.627 U	0.675 U	0.608 U	0.520 U	0.658 U	0.560 U	0.581 U	-	-	21.0	Eco	2,400,000	HH
2,4-DB	1.12 U	1.04 U	0.994 U	1.07 U	1.15 U	1.03 U	0.939 U	1.12 U	0.951 U	0.988 U	-	-	21.0	Eco	4,900,000	HH
4-Nitrophenol	1.77 U	1.65 U	1.57 U	1.68 U	1.81 U	1.63 U	1.48 U	1.76 U	1.50 U	1.56 U	-	-	7,000	Eco	180,000,000	HH
Dalapon	2.44 U	2.27 U	2.16 U	2.32 U	2.50 U	2.25 U	2.04 U	2.43 U	2.07 U	2.15 U	-	-	18,000,000	HH	18,000,000	HH
Dicamba	1.94 U	1.81 U	1.72 U	1.85 U	1.99 U	1.79 U	1.63 U	1.94 U	1.65 U	1.71 U	-	-	18,000,000	HH	18,000,000	HH
Dichloroprop	0.851 U	0.793 U	0.755 U	0.810 U	0.871 U	0.785 U	0.713 U	0.849 U	0.722 U	0.750 U	-	-	21.0	Eco	4,900,000	HH
Dinoseb	0.659 U	0.614 U	0.585 U	0.627 U	0.675 U	0.608 U	0.552 U	0.658 U	0.560 U	0.581 U	-	-	620,000	HH	620,000	HH
MCPA	1.20 U	1.12 U	1.07 U	1.15 U	1.23 U	1.11 U	1.01 U	1.20 U	1.02 U	1.06 U	-	-	21.0	Eco	120,000	HH
MCPP	2.19 U	2.04 U	1.94 U	2.08 U	2.24 U	2.02 U	1.83 U	2.18 U	1.86 U	1.93 U	-	-	21.0	Eco	620,000	HH
Pentachlorophenol	0.933 U	0.869 U	0.827 U	0.887 U	0.955 U	0.859 U	0.781 U	0.930 U	0.791 U	0.822 U	-	-	2,100	Eco	13,000	HH
Pesticides (µg/kg dry)																
4,4'-DDD	2.23 U	0.214 U	2.17 U	2.29 U	2.41 U	2.14 U	1.99 U	2.35 U	1.96 U	2.23 U	-	-	21.0	Eco	11,000	HH
4,4'-DDE	2.23 U	0.253 U	2.17 U	2.29 U	2.41 U	2.14 U	1.99 U	2.35 U	1.96 U	2.23 U	-	-	21.0	Eco	7,700	HH
4,4'-DDT	2.23 U	0.285 U	2.17 U	2.29 U	2.41 U	2.14 U	1.99 U	2.35 U	1.96 U	2.23 U	-	-	21.0	Eco	7,700	HH
Aldrin	1.12 U	0.474 U	1.09 U	1.14 U	1.20 U	1.07 U	0.994 U	1.18 U	0.978 U	1.11 U	-	-	4.90	Eco	130	HH
BHC (alpha)	1.12 U	0.341 U	1.09 U	1.14 U	1.20 U	**2.02**	0.994 U	1.18 U	0.978 U	1.11 U	-	-	340	HH	340	HH
BHC (beta)	1.12 U	0.465 U	1.09 U	1.14 U	1.20 U	1.07 U	0.994 U	1.18 U	0.978 U	1.11 U	-	-	960	HH	960	HH
BHC (delta)	1.12 U	0.422 U	1.09 U	1.14 U	1.20 U	1.07 U	0.994 U	1.18 U	0.978 U	1.11 U	-	-	340	HH	340	HH
BHC (gamma) Lindane	1.12 U	0.420 U	1.09 U	1.14 U	1.20 U	1.07 U	0.994 U	1.18 U	0.978 U	1.11 U	-	-	2,000	HH	2,000	HH
Chlordane (technical)	**409**	1.55 U	10.9 U	**53.6 J**	**1,560**	**65.6 J**	9.94 U	11.8 U	**49.4 J**	**92.7 J**	-	-	7,200	HH	7,200	HH
Dieldrin	2.23 U	0.360 U	2.17 U	2.29 U	2.41 U	2.14 U	1.99 U	2.35 U	1.96 U	2.23 U	-	-	4.90	Eco	130	HH
Endosulfan I	1.12 U	0.468 U	1.09 U	1.14 U	1.20 U	1.07 U	0.994 U	1.18 U	0.978 U	1.11 U	-	-	20,000	Eco	1,400,000	HH
Endosulfan II	2.23 U	0.425 U	2.17 U	2.29 U	**8.84 J**	2.14 U	1.99 U	2.35 U	1.96 U	2.23 U	-	-	20,000	Eco	1,400,000	HH
Endosulfan Sulfate	2.23 U	0.400 U	2.17 U	2.29 U	**5.97 J**	2.14 U	1.99 U	2.35 U	1.96 U	2.23 U	-	-	20,000	Eco	1,400,000	HH
Endrin	2.23 U	0.397 U	2.17 U	2.29 U	2.41 U	2.14 U	1.99 U	2.35 U	1.96 U	2.23 U	-	-	4.90	Eco	71,000	HH
Endrin Aldehyde	2.23 U	0.448 U	2.17 U	2.29 U	2.41 U	2.14 U	1.99 U	2.35 U	1.96 U	2.23 U	-	-	4.90	Eco	71,000	HH
Endrin Ketone	2.23 U	0.309 U	2.17 U	2.29 U	2.41 U	2.14 U	1.99 U	2.35 U	1.96 U	2.23 U	-	-	4.90	Eco	71,000	HH
Heptachlor	1.12 U	0.378 U	1.09 U	1.14 U	**2.83**	1.07 U	0.994 U	1.18 U	0.978 U	**3.07**	-	-	480	HH	480	HH
Heptachlor Epoxide	1.12 U	0.401 U	1.09 U	1.14 U	**14.4**	1.07 U	0.994 U	1.18 U	0.978 U	1.11 U	-	-	240	HH	240	HH
Methoxychlor	11.2 U	1.51 U	10.9 U	11.4 U	12.0 U	10.7 U	9.94 U	11.8 U	9.78 U	11.1 U	-	-	500,000	Eco	3,100,000	HH
Toxaphene	112 U	6.89 U	109 U	114 U	120 U	107 U	99.4 U	118 U	97.8 U	111 U	-	-	2,000	HH	2,000	HH

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed

[1] Only Aroclors 1248, 1254, and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Landfill AOPC soil samples.
-- = SLV for analyte not available
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of combining primary and field duplicate results at this sampling location as described in Section 5.1.
[1] = Screening based on depth of sample with the exception of Gully Test pit samples (Site ID suffix = "TPG") and Mercury Vapor Lamp Test Pit samples (Site ID suffix = "TPM"), which used the minimum SLV for the two depth ranges.

Table 5-2b
2001/2002 Phase II Supplimental Landfill Site Inspection Soil Analytical Results
Volatile Organic Compounds
(Page 1 of 2)

Site ID	BIL01TPG	BIL02TPG	BIL03TPG	BIL04TPG	BIL13	BIL14	BIL15	BIL16	**Selected SLV[1] (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**	**Selected SLV[1] (>3 ft bgs)**	**SLV Source (>3 ft bgs)**
Sample ID	011015BIL01TPG	011015BIL02TPG	011015BIL03TPG	011015BIL04TPG	011016BIL13SS	011016BIL14SS	011016BIL15SS	011016BIL16SS				
Sample Date	10/15/2001	10/15/2001	10/15/2001	10/15/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001				
Sample Depth or Interval (Feet bgs)	0.0-10.0	0.0-10.0	0.0-10.0	0.0-10.0	4.0	6.0	8.0	4.0				
Volatile Organic Compounds (µg/kg dry)												
1,1,1,2-Tetrachloroethane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	9,300	HH	9,300	HH
1,1,1-Trichloroethane (TCA)	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	38,000,000	HH	38,000,000	HH
1,1,2,2-Tetrachloroethane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	2,800	HH	2,800	HH
1,1,2-Trichloroethane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	2,700	HH	2,700	HH
1,1-Dichloroethane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	5,900	HH	5,900	HH
1,1-Dichloroethene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	680,000	HH	680,000	HH
1,1-Dichloropropene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	8,100	HH	8,100	HH
1,2,3-Trichlorobenzene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	20,000	Eco	490,000	HH
1,2,3-Trichloropropane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	95.0	HH	95.0	HH
1,2,4-Trichlorobenzene	0.247 UJ	0.226 UJ	0.231 UJ	2,300 U	0.242 UJ	0.212 UJ	0.192 UJ	0.208 UJ	20,000	Eco	99,000	HH
1,2,4-Trimethylbenzene	0.247 U	0.226 U	0.231 U	**14,300**	0.242 U	0.212 U	0.192 U	0.208 U	200,000	Eco	980,000	HH
1,2-Dibromo-3-chloropropane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	69.0	HH	69.0	HH
1,2-Dibromoethane (EDB)	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	140	HH	140	HH
1,2-Dichlorobenzene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	2,260	Eco	19,000,000	HH
1,2-Dichloroethane (EDC)	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	590	HH	590	HH
1,2-Dichloropropane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	4,500	HH	4,500	HH
1,3,5-Trimethylbenzene	0.247 U	0.226 U	0.231 U	**5,410**	0.242 U	0.212 U	0.192 U	0.208 U	150,000	HH	150,000	HH
1,3-Dichlorobenzene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	2,260	Eco	17,000	HH
1,3-Dichloropropane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	20,000,000	HH	20,000,000	HH
1,4-Dichlorobenzene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	17,000	HH	17,000	HH
2,2-Dichloropropane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	4,500	HH	4,500	HH
2-Butanone (MEK)	1,230 U	1.13 U	1.15 U	11,500 U	1.21 U	1.06 U	0.958 U	1.04 U	200,000,000	HH	200,000,000	HH
2-Chlorotoluene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	20,000,000	HH	20,000,000	HH
2-Hexanone	1.24 U	1.13 U	1.15 U	11,500 U	1.21 U	1.06 U	0.958 U	1.04 U	1,250,000	Eco	1,400,000	HH
4-Chlorotoluene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	72,000,000	HH	72,000,000	HH
4-Isopropyltoluene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	**0.457**	200,000	Eco	24,000,000	HH
4-Methyl-2-pentanone (MIBK)	1.24 U	1.13 U	1.15 U	11,500 U	1.21 U	1.06 U	0.958 U	1.04 U	1,250,000	Eco	53,000,000	HH
Acetone	1.24 UJ	1.13 UJ	1.15 UJ	11,500 U	1.21 UJ	1.06 UJ	0.958 UJ	1.04 UJ	1,250,000	Eco	630,000,000	HH
Benzene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	1,200	HH	1,200	HH
Bromobenzene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	1,800,000	HH	1,800,000	HH
Bromochloromethane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	1,900	HH	1,900	HH
Bromodichloromethane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	1,900	HH	1,900	HH
Bromoform	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	360,000	HH	360,000	HH
Bromomethane	0.247 UJ	0.226 UJ	0.231 UJ	2,300 UJ	0.242 UJ	0.212 UJ	0.192 UJ	0.208 UJ	17,000	HH	17,000	HH
Carbon Disulfide	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	1,000,000	Eco	3,700,000	HH
Carbon Tetrachloride	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	630	HH	630	HH
Chlorobenzene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	40,000	Eco	4,300,000	HH
Chloroethane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	61,000,000	HH	61,000,000	HH
Chloroform	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	410	HH	410	HH
Chloromethane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	300,000	HH	300,000	HH
cis-1,2-Dichloroethene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	2,500,000	Eco	3,100,000	HH
cis-1,3-Dichloropropene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	8,100	HH	8,100	HH
Dibromochloromethane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	34,000	HH	34,000	HH
Dibromomethane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	110,000	HH	110,000	HH
Dichlorodifluoromethane	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	**0.221 J**	0.208 U	730,000	Eco	780,000	HH
Dichloromethane (Methylene Chloride)	3.70 U	2.48 U	3.39 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	20,000	HH	20,000	HH
Ethylbenzene	0.247 U	0.226 U	0.231 U	**2,700 J**	0.242 U	0.212 U	0.192 U	0.208 U	2,260	Eco	12,000	HH
Hexachlorobutadiene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	22,000	HH	22,000	HH
Isopropylbenzene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	2,260	Eco	24,000,000	HH
m,p-Xylenes	0.495 U	0.452 U	0.461 U	**9,800**	0.242 U	0.424 U	**0.552 J**	0.416 U	120,000	Eco	2,700,000	HH
Naphthalene	0.247 UJ	0.226 UJ	0.231 UJ	**8,360**	0.242 UJ	0.212 UJ	0.192 UJ	0.208 UJ	23,000	HH	23,000	HH
n-Butylbenzene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	-	-	-	-
n-Propylbenzene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	2,260	Eco	21,000,000	HH
o-Xylene	0.247 U	0.226 U	0.231 U	**4,260 J**	0.242 U	0.212 U	**0.368 J**	0.208 U	1,000	Eco	19,000,000	HH
sec-Butylbenzene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	2,260	Eco	-	-
Styrene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	300,000	Eco	51,000,000	HH
tert-Butylbenzene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	2,260	Eco	-	-
Tetrachloroethene (PCE)	**11.0**	**3.73**	**8.88**	**403,000**	**8.12**	**0.605**	**0.668**	**5.19**	1,600	HH	1,600	HH
Toluene	**3.69**	**0.760**	**1.65**	**133,000**	0.242 U	**0.269 J**	**0.352 J**	0.208 U	200,000	Eco	24,000,000	HH
trans-1,2-Dichloroethene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	200,000	HH	200,000	HH
trans-1,3-Dichloropropene	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	8,100	HH	8,100	HH
Trichloroethene (TCE)	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	130	HH	130	HH
Trichlorofluoromethane	0.247 U	0.226 U	0.231 U	2,300 U	**0.325 J**	0.212 U	0.192 U	0.208 U	730,000	Eco	63,000,000	HH
Vinyl Acetate	1.24 UJ	1.13 UJ	1.15 UJ	11,500 U	1.21 UJ	1.06 UJ	0.958 UJ	1.04 UJ	4,100,000	HH	4,100,000	HH
Vinyl Chloride	0.247 U	0.226 U	0.231 U	2,300 U	0.242 U	0.212 U	0.192 U	0.208 U	2,200	HH	2,200	HH

Notes:
µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available
U = The analyte was not detected at or above the MDL.

UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of combining primary and field duplicate results at this sampling location as described in Section 5.1.

[1] = Screening based on depth of sample with the exception of Gully Test Pit samples (Site ID suffix = "TPG") and Mercury Vapor Lamp Test Pit samples (Site ID suffix = "TPM"). The Mercury Vapor Lamp Test Pit samples were screened against the the minimum SLV for the two depth ranges. The Gully Test Pit COCs were screened against the minimum SLV for the two depth ranges, except for o-xylene, toluene, and PCE which were compared only to >3 ft SLVs due to more recent (2009) surface and subsurface samples that analyzed for a subset of analytes and superceed the Gully Test it data for these analytes.

Table 5-2b
2001/2002 Phase II Supplimental Landfill Site Inspection Soil Analytical Results
Volatile Organic Compounds
(Page 2 of 2)

Site ID	BIL17	BIL18	BIL19	BIL20	BIL21	BIL22*	BIL28TPM	BIL29TPM	**Selected SLV[1] (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**	**Selected SLV[1] (>3 ft bgs)**	**SLV Source (>3 ft bgs)**
Sample ID	011016BIL17SS	011016BIL18SS	011016BIL19SS	011016BIL20SS	011016BIL21SS	011016BIL22SS	011017BIL28TPM	011017BIL29TPM				
Sample Date	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/17/2001	10/17/2001				
Sample Depth or Interval (Feet bgs)	1.0	2.0	5.0	8.0	5.0	3.0	0.0-10.0	0.0-10.0				
Volatile Organic Compounds (µg/kg dry)												
1,1,1,2-Tetrachloroethane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	9,300	HH	9,300	HH
1,1,1-Trichloroethane (TCA)	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	38,000,000	HH	38,000,000	HH
1,1,2,2-Tetrachloroethane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	2,800	HH	2,800	HH
1,1,2-Trichloroethane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	2,700	HH	2,700	HH
1,1-Dichloroethane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	5,900	HH	5,900	HH
1,1-Dichloroethene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	680,000	HH	680,000	HH
1,1-Dichloropropene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	8,100	HH	8,100	HH
1,2,3-Trichlorobenzene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	20,000	Eco	490,000	HH
1,2,3-Trichloropropane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	95.0	HH	95.0	HH
1,2,4-Trichlorobenzene	0.218 UJ	0.220 UJ	0.174 U	0.229 UJ	0.200 UJ	0.212 UJ	255 U	230 U	20,000	Eco	99,000	HH
1,2,4-Trimethylbenzene	0.218 U	0.220 U	0.174 U	0.229 U	**0.230 J**	0.212 U	**1,280**	**672**	200,000	Eco	980,000	HH
1,2-Dibromo-3-chloropropane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	69.0	HH	69.0	HH
1,2-Dibromoethane (EDB)	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	140	HH	140	HH
1,2-Dichlorobenzene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	2,260	Eco	19,000,000	HH
1,2-Dichloroethane (EDC)	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	590	HH	590	HH
1,2-Dichloropropane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	4,500	HH	4,500	HH
1,3,5-Trimethylbenzene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	**493 J**	**326 J**	150,000	HH	150,000	HH
1,3-Dichlorobenzene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	2,260	Eco	17,000	HH
1,3-Dichloropropane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	20,000,000	HH	20,000,000	HH
1,4-Dichlorobenzene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	17,000	HH	17,000	HH
2,2-Dichloropropane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	4,500	HH	4,500	HH
2-Butanone (MEK)	1.09 U	1.10 U	0.872 U	1.15 U	1.00 U	1.06 U	1,270 U	1,150 U	200,000,000	HH	200,000,000	HH
2-Chlorotoluene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	20,000,000	HH	20,000,000	HH
2-Hexanone	1.09 U	1.10 U	0.872 UJ	1.15 U	1.00 U	1.06 U	1,270 U	1,150 U	1,250,000	Eco	1,400,000	HH
4-Chlorotoluene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	72,000,000	HH	72,000,000	HH
4-Isopropyltoluene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	200,000	Eco	24,000,000	HH
4-Methyl-2-pentanone (MIBK)	1.09 U	1.10 U	0.872 U	1.15 U	1.00 U	1.06 U	1,270 U	1,150 U	1,250,000	Eco	53,000,000	HH
Acetone	1.09 UJ	1.10 UJ	0.872 U	1.15 UJ	1.00 UJ	1.06 UJ	1,270 U	1,150 U	1,250,000	Eco	630,000,000	HH
Benzene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	1,200	HH	1,200	HH
Bromobenzene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	1,800,000	HH	1,800,000	HH
Bromochloromethane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	1,900	HH	1,900	HH
Bromodichloromethane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	1,900	HH	1,900	HH
Bromoform	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	360,000	HH	360,000	HH
Bromomethane	0.218 UJ	0.220 UJ	0.174 UJ	0.229 UJ	0.200 UJ	0.212 UJ	255 UJ	230 UJ	17,000	HH	17,000	HH
Carbon Disulfide	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	1,000,000	Eco	3,700,000	HH
Carbon Tetrachloride	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	630	HH	630	HH
Chlorobenzene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	40,000	Eco	4,300,000	HH
Chloroethane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	61,000,000	HH	61,000,000	HH
Chloroform	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	410	HH	410	HH
Chloromethane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	300,000	HH	300,000	HH
cis-1,2-Dichloroethene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	2,500,000	Eco	3,100,000	HH
cis-1,3-Dichloropropene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	8,100	HH	8,100	HH
Dibromochloromethane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	34,000	HH	34,000	HH
Dibromomethane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	110,000	HH	110,000	HH
Dichlorodifluoromethane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	730,000	Eco	780,000	HH
Dichloromethane (Methylene Chloride)	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	20,000	HH	20,000	HH
Ethylbenzene	0.218 U	0.220 U	0.174 U	0.229 U	**0.282 J**	0.212 U	255 U	230 U	2,260	Eco	12,000	HH
Hexachlorobutadiene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	22,000	HH	22,000	HH
Isopropylbenzene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	2,260	Eco	24,000,000	HH
m,p-Xylenes	0.437 U	0.440 U	0.349 U	0.458 U	0.400 U	0.424 U	509 U	460 U	120,000	Eco	2,700,000	HH
Naphthalene	0.218 UJ	0.220 UJ	0.735 UJ	0.229 UJ	0.200 UJ	0.212 UJ	**542**	**504**	23,000	HH	23,000	HH
n-Butylbenzene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	-	-	-	-
n-Propylbenzene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	2,260	Eco	21,000,000	HH
o-Xylene	0.218 U	0.220 U	0.174 U	0.229 U	**0.735**	0.212 U	255 U	230 U	1,000	Eco	19,000,000	HH
sec-Butylbenzene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	2,260	Eco	-	-
Styrene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	300,000	Eco	51,000,000	HH
tert-Butylbenzene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	2,260	Eco	-	-
Tetrachloroethene (PCE)	**1.07**	**0.734**	**1.13**	**3.42**	**0.707**	**3.29**	255 U	230 U	1,600	HH	1,600	HH
Toluene	0.218 U	**0.225 J**	**0.312 J**	**0.984**	**0.376 J**	0.212 U	255 U	230 U	200,000	Eco	24,000,000	HH
trans-1,2-Dichloroethene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	200,000	HH	200,000	HH
trans-1,3-Dichloropropene	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	8,100	HH	8,100	HH
Trichloroethene (TCE)	0.218 U	0.220 U	0.174 UJ	0.229 U	0.200 U	0.212 U	255 U	230 U	130	HH	130	HH
Trichlorofluoromethane	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	730,000	Eco	63,000,000	HH
Vinyl Acetate	1.09 UJ	1.10 UJ	0.872 U	1.15 UJ	1.00 UJ	1.06 UJ	1,270 U	1,150 U	4,100,000	HH	4,100,000	HH
Vinyl Chloride	0.218 U	0.220 U	0.174 U	0.229 U	0.200 U	0.212 U	255 U	230 U	2,200	HH	2,200	HH

Notes:
µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of combining primary and field duplicate results at this sampling location as described in Section 5.1.
[1] = Screening based on depth of sample with the exception of Gully Test Pit samples (Site ID suffix = "TPG") and Mercury Vapor Lamp Test Pit samples (Site ID
The Gully Test Pit COCs were screened against the minimum SLV for the two depth ranges, except for o-xylene, toluene, and PCE which were compared only t
Test it data for these analytes.

Table 5-2c
2001/2002 Phase II Supplimental Landfill Site InspectionSoil Analytical Results
Semivolatile Organic Compounds
(Page 1 of 2)

Site ID	BIL01TPG	BIL02TPG	BIL03TPG	BIL04TPG	BIL13	BIL14	BIL15	BIL16	BIL17	BIL18	BIL19	BIL20	BIL21	BIL22*	BIL28TPM	BIL29TPM	Selected SLV[1] (0-3 ft bgs)	SLV Source (0-3 ft bgs)	Selected SLV[1] (>3 ft bgs)	SLV Source (>3 ft bgs)
Sample ID	011015BIL01TPG	011015BIL02TPG	011015BIL03TPG	011015BIL04TPG	011016BIL13SS	011016BIL14SS	011016BIL15SS	011016BIL16SS	011016BIL17SS	011016BIL18SS	011016BIL19SS	011016BIL20SS	011016BIL21SS	011016BIL22SS	011017BIL28TPM	011017BIL29TPM				
Sample Date	10/15/2001	10/15/2001	10/15/2001	10/15/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/17/2001	10/17/2001				
Sample Depth or Interval (Feet bgs)	0.0-10.0	0.0-10.0	0.0-10.0	0.0-10.0	4.0	6.0	8.0	4.0	1.0	2.0	5.0	8.0	5.0	3.0	0.0-10.0	0.0-10.0				
Semivolatile Organic Compounds (µg/kg)																				
1,2,4-Trichlorobenzene	15.2 U	13.0 U	13.0 U	-	12.9 U	11.2 U	12.0 U	12.4 U	13.0 U	12.0 U	11.4 U	12.2 U	11.0 U	11.8 U	140 U	126 U	20,000	Eco	99,000	HH
1,2-Dichlorobenzene	18.9 U	16.1 U	16.2 U	-	16.0 U	13.9 U	14.9 U	15.3 U	16.1 U	14.9 U	14.2 U	15.1 U	13.6 U	14.6 U	173 U	157 U	2,260	Eco	19,000,000	HH
1,3-Dichlorobenzene	25.6 U	21.9 U	22.0 U	-	21.8 U	19.0 U	20.3 U	20.9 U	21.9 U	20.2 U	19.2 U	20.6 U	18.5 U	19.9 U	236 U	213 U	2,260	Eco	17,000	HH
1,4-Dichlorobenzene	29.3 U	25.0 U	25.1 U	-	24.9 U	21.7 U	23.1 U	23.8 U	25.0 U	23.1 U	22.0 U	23.5 U	21.1 U	22.7 U	269 U	244 U	17,000	HH	17,000	HH
2,4,5-Trichlorophenol	32.9 U	28.1 U	28.3 U	28.3 U	28.0 U	24.4 U	26.0 U	26.8 U	28.1 U	26.0 U	24.7 U	26.4 U	23.8 U	19.5 U	303 U	274 U	4,000	Eco	62,000,000	HH
2,4,6-Trichlorophenol	24.3 U	20.8 U	20.9 U	20.9 U	20.7 U	18.0 U	19.2 U	19.8 U	20.8 U	19.2 U	18.3 U	19.5 U	17.6 U	18.9 U	224 U	203 U	10,000	Eco	200,000	HH
2,4-Dichlorophenol	20.1 U	17.2 U	17.3 U	17.3 U	37.4 U	14.9 U	15.9 U	16.4 U	17.2 U	15.9 U	15.1 U	16.1 U	14.5 U	15.6 U	185 U	198 U	20,000	Eco	1,800,000	HH
2,4-Dimethylphenol	20.1 U	17.2 U	17.3 U	17.3 U	17.1 U	14.9 U	15.9 U	16.4 U	17.2 U	15.9 U	15.1 U	16.1 U	14.5 U	15.6 U	185 U	168 U	20,000	Eco	12,000,000	HH
2,4-Dinitrophenol	-	-	-	-	17.1 UJ	32.5 UJ	34.7 UJ	35.8 UJ	37.5 UJ	34.7 UJ	33.0 UJ	35.2 UJ	31.7 UJ	34.1 UJ	404 U	168 U	20,000	Eco	1,200,000	HH
2,4-Dinitrotoluene	23.8 U	20.3 U	20.4 U	-	20.2 U	17.6 U	18.8 U	19.4 U	20.3 U	18.8 U	17.9 U	19.1 U	17.2 U	18.5 U	219 U	366 U	5,500	HH	5,500	HH
2,6-Dinitrotoluene	32.9 U	28.1 U	28.3 U	-	28.0 UJ	24.4 UJ	26.0 UJ	26.8 UJ	28.1 UJ	26.0 U	24.7 UJ	26.4 UJ	23.8 UJ	25.6 UJ	303 U	259 U	240,000	HH	240,000	HH
2-Chloronaphthalene	5.49 U	4.69 U	4.71 U	-	4.67 U	4.60 U	4.34 U	4.47 U	4.68 U	4.34 U	4.12 U	4.40 U	3.97 U	4.27 U	50.5 U	45.7 U	82,000,000	HH	82,000,000	HH
2-Chlorophenol	27.5 U	23.4 U	23.6 U	23.6 U	23.3 U	20.3 U	21.7 U	22.3 U	23.4 U	21.7 U	20.6 U	22.0 U	19.8 U	21.3 U	252 U	228 U	60,000	Eco	5,100,000	HH
2-Methylphenol	22.0 U	18.8 U	18.9 U	18.9 U	18.7 U	16.2 U	17.4 U	17.9 U	18.7 U	17.4 U	16.5 U	17.6 U	15.9 U	17.1 U	202 U	183 U	50,000	Eco	31,000,000	HH
2-Nitroaniline	23.8 U	20.3 U	20.4 U	-	17.1 U	17.6 U	18.8 U	19.4 U	20.3 U	18.8 U	17.9 U	19.1 U	17.2 U	18.5 U	219 U	198 U	6,000,000	HH	6,000,000	HH
2-Nitrophenol	25.6 U	21.9 U	22.0 U	22.0 U	21.8 U	19.0 U	20.3 U	20.9 U	21.9 U	20.2 U	19.2 U	20.6 U	18.5 U	19.9 U	236 U	213 U	180,000,000	HH	180,000,000	HH
3,3'-Dichlorobenzidine	20.1 U	17.2 U	17.3 U	-	17.1 UJ	14.9 UJ	15.9 UJ	16.4 UJ	17.2 UJ	15.9 UJ	15.1 UJ	16.1 UJ	14.5 UJ	15.6 UJ	185 U	168 U	4,800	HH	4,800	HH
3-Nitroaniline	31.1 U	26.6 U	26.7 U	-	26.5 UJ	23.0 UJ	24.6 UJ	25.3 UJ	26.5 UJ	24.6 UJ	23.4 UJ	25.0 UJ	22.5 UJ	24.2 UJ	286 U	259 U	70,000	Eco	6,000,000	HH
4,6-Dinitro-2-methylphenol	-	-	-	-	57.6 UJ	50.1 UJ	24.6 UJ	55.1 UJ	57.8 UJ	53.5 UJ	50.9 UJ	54.3 UJ	48.9 UJ	52.6 UJ	623 U	564 U	49,000	HH	49,000	HH
4-Bromophenyl Phenyl Ether	24.3 U	20.8 U	20.9 U	-	20.7 U	18.0 U	19.2 U	19.8 U	20.8 U	19.2 U	18.3 U	19.5 U	17.6 U	18.9 U	224 U	203 U	-	-	-	-
4-Chloro-3-methylphenol	20.1 U	17.2 U	17.3 U	17.3 U	17.1 U	14.9 U	15.9 U	16.4 U	17.2 U	15.9 U	15.1 U	16.1 U	14.5 U	15.6 U	185 U	168 U	62,000,000	HH	62,000,000	HH
4-Chloroaniline	17.0 U	14.5 U	14.6 U	-	14.5 U	12.6 U	13.5 U	13.9 U	14.5 U	13.4 U	12.8 U	13.7 U	12.3 U	13.2 U	157 U	142 U	8,600	HH	8,600	HH
4-Chlorophenyl Phenyl Ether	30.8 U	26.3 U	26.4 U	-	26.1 U	22.7 U	24.3 U	25.0 U	26.2 U	24.3 U	23.1 U	24.7 U	22.2 U	23.9 U	283 U	256 U	-	-	-	-
4-Nitroaniline	31.1 U	26.6 U	26.7 U	-	26.5 UJ	23.0 UJ	24.6 UJ	25.3 UJ	26.5 UJ	24.6 UJ	23.4 UJ	25.0 UJ	22.5 UJ	24.2 UJ	286 U	259 U	40,000	Eco	86,000	HH
4-Nitrophenol	34.8 UJ	29.7 UJ	29.9 UJ	29.9 UJ	29.6 UJ	25.7 UJ	27.5 UJ	28.3 UJ	29.7 UJ	27.5 UJ	26.1 UJ	27.9 UJ	25.1 UJ	27.0 UJ	320 U	289 U	7,000	Eco	180,000,000	HH
Aniline	49.4 UJ	156 U	157 U	-	42.0 U	36.6 U	39.1 U	40.2 U	42.2 U	39.0 U	37.1 U	39.6 U	35.7 U	38.4 U	454 U	411 U	200,000	Eco	300,000	HH
Benzidine	34.6 UJ	29.5 UJ	29.7 UJ	-	29.4 UJ	25.6 UJ	27.3 UJ	28.2 UJ	29.5 UJ	27.3 UJ	26.0 UJ	27.7 UJ	25.0 UJ	26.9 UJ	318 U	288 U	55,000	HH	55,000	HH
Benzoic Acid	-	-	-	-	52.9 U	46.0 U	49.2 U	50.6 U	**553**	**191 J**	**301 J**	49.9 U	44.9 U	**300 J**	572 U	518 U	200,000	Eco	2,500,000,000	HH
Benzyl Alcohol	38.4 U	32.5 U	33.0 U	33.0 U	32.7 UJ	28.4 UJ	30.4 UJ	31.3 UJ	32.8 UJ	30.4 UJ	28.9 UJ	30.8 UJ	27.8 UJ	29.9 UJ	353 UJ	320 UJ	2,260	Eco	62,000,000	HH
Bis(2-chloroethoxy)methane	22.0 U	18.8 U	18.9 U	-	18.7 U	16.2 U	17.4 U	17.9 U	18.7 U	17.4 U	16.5 U	17.6 U	15.9 U	17.1 U	202 U	183 U	730,000	Eco	1,800,000	HH
Bis(2-chloroethyl) Ether	35.0 U	29.9 U	30.0 U	-	29.7 U	25.9 U	27.6 U	28.5 U	29.8 U	27.6 U	26.3 U	28.0 U	25.2 U	27.2 U	321 U	291 U	1,000	HH	1,000	HH
Bis(2-chloroisopropyl) Ether	47.6 U	40.6 U	40.9 U	-	40.5 U	35.2 U	37.6 U	38.7 U	40.6 U	37.6 U	35.7 U	38.2 U	34.4 U	37.0 U	438 U	396 U	1,000	HH	1,000	HH
Bis(2-ethylhexyl) Phthalate	**2,670 J**	**3,240 J**	**995 J**	**4,280 J**	**2,370**	**237 J**	**1,170**	**1,160**	**3,960**	**2,030**	**1,720**	**188 J**	**1,510**	**888**	690 UJ	625 UJ	4,500	Eco	150,000	HH
Butyl Benzyl Phthalate	34.8 U	**67.2 J**	29.9 U	-	29.6 U	25.7 U	27.5 U	**152**	**68.7 J**	27.5 U	26.1 U	**35.2 J**	25.1 U	27.0 U	320 U	289 U	450	Eco	910,000	HH
Carbazole	**425 J**	**577 J**	**281 J**	**2,650 J**	**448**	5.28 U	**205**	**128**	**490**	**2,840**	**1,630**	5.73 U	**1,070**	**592**	**707**	59.4 U	2,260	Eco	1,000,000	HH
Dibenzofuran	**67.7 J**	**89.1 J**	**42.4 J**	**810 J**	**94.9 J**	15.7 U	**21.7 J**	**20.9 J**	**67.1 J**	**419**	**214**	17.0 U	**161**	**83.0 J**	195 U	177 U	2.00	Eco	1,000,000	HH
Diethyl Phthalate	31.1 U	26.6 U	26.7 U	-	26.5 U	23.0 U	24.3 U	25.3 U	**73.4 J**	**28.9 J**	23.4 U	25.0 U	**30.4 J**	**31.8 J**	286 U	259 U	100,000	Eco	490,000,000	HH
Dimethyl Phthalate	20.1 U	17.2 U	17.3 U	-	17.1 U	14.9 U	15.9 U	16.4 U	17.2 U	15.9 U	15.1 U	16.1 U	14.5 U	15.6 U	185 U	168 U	150,000	HH	150,000	HH
Di-n-butyl Phthalate	159 U	136 U	137 U	-	135 UJ	118 UJ	126 UJ	130 UJ	136 UJ	126 UJ	120 UJ	128 UJ	115 UJ	124 UJ	1,460 U	1,330 U	450	Eco	62,000,000	HH
Di-n-octyl Phthalate	47.6 UJ	40.6 UJ	40.9 UJ	-	40.5 UJ	35.2 UJ	37.6 UJ	38.7 UJ	40.6 UJ	37.6 UJ	35.7 UJ	38.2 UJ	34.4 UJ	37.0 UJ	438 U	396 U	450	Eco	150,000	HH
Hexachlorobenzene	20.1 U	17.2 U	17.3 U	-	17.1 U	14.9 U	15.9 U	13.4 U	17.2 U	15.9 U	15.1 U	16.1 U	14.5 U	15.6 U	185 U	168 U	1,800	HH	1,800	HH
Hexachlorobutadiene	16.5 U	14.1 U	14.1 U	-	14.0 U	12.2 U	13.0 U	28.3 U	14.1 U	13.0 U	12.4 U	13.2 U	11.9 U	12.8 U	151 U	137 U	22,000	HH	22,000	HH
Hexachlorocyclopentadiene	25.8 U	22.0 U	22.2 U	-	21.9 U	19.1 U	20.4 U	21.0 U	22.0 U	20.4 U	19.4 U	20.7 U	16.6 U	20.0 U	237 UJ	215 UJ	10,000	Eco	3,700,000	HH
Hexachloroethane	34.8 U	29.7 U	29.9 U	-	29.6 U	25.7 U	27.5 U	16.4 U	29.7 U	27.5 U	26.1 U	27.9 U	25.1 U	27.0 U	320 U	289 U	150,000	HH	150,000	HH
Isophorone	25.6 U	21.9 U	22.0 U	-	21.8 U	19.0 U	20.3 U	20.9 U	21.4 U	20.2 U	19.2 U	20.6 U	18.5 U	19.9 U	236 U	213 U	1,800,000	HH	1,800,000	HH
Nitrobenzene	25.1 U	21.4 U	21.5 U	-	21.3 U	18.5 U	19.8 U	20.4 U	21.4 U	19.8 U	18.8 U	20.1 U	18.1 U	19.5 U	231 U	209 U	8,000	Eco	24,000	HH
N-Nitrosodimethylamine	-	-	-	-	17.1 UJ	10.8 UJ	15.9 UJ	16.4 UJ	17.2 UJ	15.9 UJ	15.1 UJ	16.1 UJ	14.5 UJ	15.6 UJ	135 UJ	168 UJ	34.0	HH	34.0	HH
N-Nitrosodi-n-propylamine	20.1 U	17.2 U	17.3 U	-	17.1 U	14.9 U	15.9 U	16.4 U	17.2 U	15.9 U	15.1 U	16.1 U	14.5 U	15.6 U	185 U	168 U	250	HH	250	HH
N-Nitrosodiphenylamine	-	-	-	-	12.5 U	14.9 U	11.6 U	11.9 U	12.5 U	11.6 U	11.0 U	11.7 U	10.6 U	11.4 U	185 U	122 U	20,000	Eco	350,000	HH
p-cresol (4-Methylphenol)	27.1 U	23.1 U	23.3 U	23.3 U	23.0 U	20.0 U	21.4 U	22.0 U	**64.0 J**	21.4 U	20.3 U	21.7 U	19.6 U	21.0 U	249 UJ	225 UJ	-	-	-	-
Pentachlorophenol	38.4 U	32.8 U	33.0 U	33.0 U	32.7 U	28.4 U	30.4 U	31.3 U	**201**	30.4 U	28.9 U	30.8 U	27.8 U	29.9 U	353 U	320 U	2,100	Eco	13,000	HH
Phenol	36.6 U	31.3 U	31.4 U	31.5 U	31.1 U	27.1 U	28.9 U	29.8 U	31.2 U	28.9 U	27.5 U	29.4 U	26.4 U	28.4 U	337 U	305 U	30,000	Eco	180,000,000	HH

Table 5-2c
2001/2002 Phase II Supplimental Landfill Site InspectionSoil Analytical Results
Semivolatile Organic Compounds
(Page 2 of 2)

Site ID	BIL01TPG	BIL02TPG	BIL03TPG	BIL04TPG	BIL13	BIL14	BIL15	BIL16	BIL17	BIL18	BIL19	BIL20	BIL21	BIL22*	BIL28TPM	BIL29TPM	**Selected SLV[1]**	**SLV Source**	**Selected SLV[1]**	**SLV Source**
Sample ID	011015BIL01TPG	011015BIL02TPG	011015BIL03TPG	011015BIL04TPG	011016BIL13SS	011016BIL14SS	011016BIL15SS	011016BIL16SS	011016BIL17SS	011016BIL18SS	011016BIL19SS	011016BIL20SS	011016BIL21SS	011016BIL22SS	011017BIL28TPM	011017BIL29TPM				
Sample Date	10/15/2001	10/15/2001	10/15/2001	10/15/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/17/2001	10/17/2001				
Site ID	BIL01TPG	BIL02TPG	BIL03TPG	BIL04TPG	BIL13	BIL14	BIL15	BIL16	BIL17	BIL18	BIL19	BIL20	BIL21	BIL22*	BIL28TPM	BIL29TPM	**Selected SLV[1] (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**	**Selected SLV[1] (>3 ft bgs)**	**SLV Source (>3 ft bgs)**
Sample ID	011015BIL01TPG	011015BIL02TPG	011015BIL03TPG	011015BIL04TPG	011016BIL13SS	011016BIL14SS	011016BIL15SS	011016BIL16SS	011016BIL17SS	011016BIL18SS	011016BIL19SS	011016BIL20SS	011016BIL21SS	011016BIL22SS	011017BIL28TPM	011017BIL29TPM				
Sample Date	10/15/2001	10/15/2001	10/15/2001	10/15/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/17/2001	10/17/2001				
Sample Depth or Interval (Feet bgs)	0.0-10.0	0.0-10.0	0.0-10.0	0.0-10.0	4.0	6.0	8.0	4.0	1.0	2.0	5.0	8.0	5.0	3.0	0.0-10.0	0.0-10.0				
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)																				
2-Methylnaphthalene	2.86 U	**20.3**	2.45 U	**206 J**	**42.0**	2.11 U	2.26 U	**28.3**	**37.5**	**43.4**	**17.9**	2.29 U	2.06 U	2.22 U	**1,530**	**625**	4,100,000	HH	4,100,000	HH
Acenaphthene	**461**	**616**	**266**	**3,040 J**	**540**	**23.0**	**113**	**87.9**	**323**	**2,530**	6.80 U	7.27 U	**978**	**576**	83.3 U	**168**	19,000,000	HH	19,000,000	HH
Acenaphthylene	7.98 U	**20.3**	6.85 U	**22.0 J**	**65.4**	5.90 U	**27.5**	**35.8**	**78.1**	**111**	5.99 U	6.40 U	**71.4**	**51.4**	73.4 U	66.4 U	23,000	HH	23,000	HH
Anthracene	**1,450**	**1,810**	**891**	**7,550 J**	**872**	**62.3**	**307**	**295**	**773**	**8,440**	**5,640**	3.70 U	**4,650**	**1,780**	**1,750**	**503**	93,000,000	HH	93,000,000	HH
Fluorene	**223**	**349**	**185**	**1,400 J**	**272**	**17.6**	**89.7**	**71.5**	**244**	**1,610**	**977**	6.86 U	**673**	**371**	78.6 U	71.1 U	12,000,000	HH	12,000,000	HH
Naphthalene	**36.6**	**56.3**	7.35 U	**1,710 J**	**82.5**	6.34 U	6.77 U	**34.3**	**78.1**	**176**	**77.0**	6.87 U	**44.9**	**47.8**	**791**	**823**	23,000	HH	23,000	HH
Phenanthrene	**3,560**	**4,280**	**2,240**	**15,600 J**	**3,110**	**194**	**1,240**	**798**	**2,910**	**21,900**	2.93 U	**23.5**	**9,370**	**4,705**	**5,020**	**1,480**	93,000,000	HH	93,000,000	HH
Total LPAHs (KM, capped; NDs at MDL)	NC	NC	NC	NC	NC	NC	NC	NC	**4,406**	**34,767**	NC	NC	NC	**7,531 J**	**7,782 J**	**3,107 J**	29,000	Eco	-	-
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)																				
Benzo(a)anthracene	**6,460**	**8,750**	**4,540**	**13,500 J**	**10,100**	**418**	**3,020**	**4,590**	**9,620**	**28,200**	**31,200**	**173**	**23,100**	**9,420**	**9,780**	92.9 U	2,700	HH	2,700	HH
Benzo(a)pyrene	**7,030**	**8,130**	**6,070**	**12,700 J**	**9,840**	**533**	**3,160**	**3,310**	**10,500**	**34,000**	**19,200**	**135**	**15,800**	**7,695**	**7,100**	35.5 U	270	HH	270	HH
Benzo(g,h,i)perylene	**3,560**	**4,380**	**3,350**	**5,870 J**	**5,060**	**318**	**1,850**	**1,780**	**6,150**	**17,000**	**9,530**	**41.1**	**7,360**	**3,020**	27.8 U	25.1 U	27,000	HH	27,000	HH
Benzofluoranthenes, Total	**10,300 J**	**11,100 J**	**7,480 J**	**16,500 J**	**14,200**	**839**	**5,370**	**7,940**	**14,700**	**31,300**	**8,430**	**197**	**13,900**	**8,490**	**5,100**	**1,080**	2,700	HH	2,700	HH
Chrysene	**6,900**	**8,190**	**5,170**	**13,200 J**	**8,190**	**437**	**2,990**	**3,380**	**8,430**	**35,300 J**	**24,000**	**191 J**	**19,800**	**8,415**	**8,210**	**2,060**	270,000	HH	270,000	HH
Dibenz(a,h)anthracene	**793**	**760**	**498**	**904 J**	**685**	**52.8**	**324**	**280**	**695**	**1,940**	3.20 U	3.42 U	3.08 U	**573**	39.2 U	35.5 U	270	HH	270	HH
Fluoranthene	**11,800**	**16,700**	**10,600**	**33,500 J**	**19,500**	**1,100**	**6,830**	**9,800**	**19,400**	**48,300**	**30,700**	**169**	**25,800**	**17,850**	**13,600**	71.1 U	8,900,000	HH	8,900,000	HH
Indeno(1,2,3-cd)pyrene	**4,610**	**4,240**	**3,790**	**7,660 J**	**6,260**	**382**	**2,140**	**1,990**	**6,990**	**20,000**	**11,300**	**52.8**	**8,930**	**2,033**	39.2 U	35.5 U	2,700	HH	2,700	HH
Pyrene	**14,700**	**20,000**	**12,000**	**33,700 J**	**23,100**	**1,220**	**7,670**	**11,600**	**22,900**	**67,100**	**37,700**	**214**	**31,600**	**24,150**	**15,500**	**2,540**	6,700,000	HH	6,700,000	HH
Total HPAHs (KM, capped; NDs at MDL)	NC	NC	NC	NC	NC	NC	NC	NC	**84,685**	**251,840**	NC	NC	NC	**73,156**	**54,272 J**	**4,750 J**	1,100	Eco	-	-

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
NC = not calculated
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of combining primary and field duplicate results at this sampling location as described in Section 5.1.
[1] = Screening based on depth of sample with the exception of Gully Test Pit samples (Site ID suffix = "TPG") and Mercury Vapor Lamp Test Pit samples (Site ID suffix = "TPM"). The Mercury Vapor Lamp Test Pit samples were screened against the the minimum SLV for the two depth ranges. The Gully Test Pit COCs were screened against the minimum SLV for the two depth ranges, except for LPAHs and HPAHs (excluding 2-Methylnaphthalene) which were compared only to >3 ft SLVs due to more recent (2009) surface and subsurface samples that analyzed for a subset of analytes and superceed the Gully Test Pit data for these analytes.

Table 5-2d
2001/2002 Phase II Supplimental Landfill Site Inspection Soil Analytical Results
Samples from Lead "Hot Spot" Areas

Site ID	BIL24*	BIL26	BIL27	BIL30	BIL31	BIL32	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	011017BIL24SS	011017BIL26SS	011017BIL27SS	011017BIL30SS	011017BIL31SS	011017BIL32SS		
Sample Date	10/17/2001	10/17/2001	10/17/2001	10/17/2001	10/17/2001	10/17/2001		
Sample Depth (Feet bgs)	3	2	3	2.5	2.5	2.5		
Metals (mg/kg)								
Lead	**614 J**	**711 J**	**954 J**	**110 J**	**87.6 J**	**115 J**	25.5	UPL

Notes:

mg/kg = milligram per kilogram
bgs = below ground surface
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed
-- = SLV for analyte not available

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of combining primary and field duplicate results at this sampling location as described in Section 5.1.

Table 5-2e
2001/2002 Phase II Supplimental Landfill Site Inspection Groundwater Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, Herbicides, and Pesticides
(Page 1 of 2)

Site ID	MW-01	MW-02	MW-03	MW-04*	MW-05	MW-06	MW-07	MW-08	MW-09	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	020501BIL02GW	020501BIL03GW	020501BIL05GW	020503BIL06GW	020503BIL09GW	020503BIL08GW	020503BIL10GW	020501BIL01GW	020501BIL04GW				
Sample Date	5/1/2002	5/1/2002	5/1/2002	5/3/2002	5/3/2002	5/3/2002	5/3/2002	5/1/2002	5/1/2002				
Sample Depth (Feet btc)	27.5	29.56	18.21	20.29	24.87	31.06	20.44	58.45	21.08				
Total PCB Aroclors (µg/L)													
Aroclor 1016	0.00222 U	0.00199 U	0.00218 U	0.00206 U	0.00218 U	0.00207 U	0.00233 U	0.00360 U	-	0.0000640	HH	0.0140	Eco
Aroclor 1221	0.00552 U	0.00496 U	0.00542 U	0.00513 U	0.00542 U	0.00515 U	0.00579 U	0.00894 U	-	0.0000640	HH	0.00680	HH
Aroclor 1232	0.00263 U	0.00236 U	0.00258 U	0.00244 U	0.00258 U	0.00245 U	0.00275 U	0.00426 U	-	0.0000640	HH	0.00680	HH
Aroclor 1242	0.00364 U	0.00327 U	0.00358 U	0.00338 U	0.00358 U	0.00340 U	0.00382 U	0.00590 U	-	0.0000640	HH	0.0140	Eco
Aroclor 1248	0.00172 U	0.00155 U	0.00169 U	0.00160 U	0.00169 U	0.00161 U	0.00181 U	0.00279 U	-	0.0000640	HH	0.0140	Eco
Aroclor 1254	0.00222 U	0.00199 U	0.00218 U	0.00206 U	0.00218 U	0.00207 U	0.00233 U	0.00360 U	-	0.0000640	HH	0.0140	Eco
Aroclor 1260	0.00121 U	0.00109 U	0.00119 U	0.00113 U	0.00119 U	0.00113 U	0.00127 U	0.00197 U	-	0.0000640	HH	0.0140	Eco
Total Metals (µg/L)													
Antimony	**1.56 J**	**0.879 J**	3.00 U	**3.89**	**0.798 J**	**1.26 J**	**0.586 J**	**2.98 J**	**0.294 J**	5.60	HH	15.0	HH
Arsenic	**18.9**	**7.00**	**0.138 J**	**2.45**	**3.60**	**9.92**	**17.5**	**1.08**	**0.728 J**	0.0180	HH	0.0380	HH
Barium	**140**	**64.9**	**7.15**	**304**	**50.8**	**139**	**174**	**100**	**128**	1,000	HH	7,300	HH
Beryllium	**0.435 J**	**0.396 J**	0.0142 U	**0.268 J**	0.0142 U	**0.222 J**	**0.344 J**	**0.307 J**	**0.324 J**	-	-	73.0	HH
Cadmium	0.00710 U	0.00710 U	**0.0100 J**	**4.68**	**0.110 J**	0.00710 U	**0.0260 J**	0.00710 U	**1.03**	-	-	18.0	HH
Chromium	**18.5**	**7.43**	1.95 U	**6.01**	1.00 U	**8.64**	**7.51**	**3.36**	**4.73**	-	-	55,000	HH
Copper	**14.3**	**5.08**	**2.34**	**201**	**2.33**	**35.9**	**47.0**	**13.2**	**39.7**	1,300	HH	1,500	HH
Iron	**6,100**	**2,320**	**33.1 J**	**12,200**	**20,600**	**34,000**	**42,900**	**4,560**	**929**	300	HH	26,000	HH
Lead	**7.95**	**2.78**	0.500 U	**78.2**	0.500 U	**3.63**	**4.13**	**1.90**	**1.05**	-	-	15.0	HH
Manganese	**157**	**71.7**	**3.17**	**327**	**2,110**	**2,560**	**2,440**	**411**	**355**	50.0	HH	880	HH
Mercury	0.131 U	0.131 U	0.131 U	0.131 U	0.131 U	0.131 U	0.131 U	0.131 U	0.131 U	-	-	11.0	HH
Nickel	**7.23**	**2.11**	**0.850 J**	**117**	**4.81**	**12.4**	**14.4**	**7.61**	**7.49**	610	HH	730	HH
Selenium	**2.01 J**	0.385 U	0.385 U	0.385 U	0.385 U	**0.530 J**	**0.539 J**	**8.23**	**5.63**	170	HH	180	HH
Silver	**0.154**	0.100 U	0.100 U	**0.658**	0.100 U	**0.108**	**0.131**	**0.0810 J**	0.100 U	-	-	180	HH
Thallium	**0.230 J**	**0.159 J**	**0.159 J**	**0.197 J**	**0.115 J**	**0.230 J**	**0.323 J**	**0.243 J**	**0.166 J**	0.240	HH	2.00	HH
Zinc	**57.6**	**23.7**	**4.27**	**1,745**	**61.6**	**21.5**	**54.8**	**11.2**	**28.9**	7,400	HH	11,000	HH
Total Petroleum Hydrocarbons (µg/L)													
Diesel Range Organics	**122 J**	**131 J**	100 U	**485**	**1,100**	**889**	**567**	**371**	**471**	-	-	90.0	HH
Residual Range Organics	**275 J**	**351 J**	**310 J**	**750**	**1,270**	**1,030**	**708**	**407**	**965**	-	-	290	HH
Gasoline Range Organics	100 U	100 U	100 U	100 U	**63.1 J**	100 U	**281**	100 U	100 U	-	-	100	HH
Total Butyltins (µg/L)													
Dibutyltin	**0.162**	**0.447 J**	**0.0113**	0.00111 U	**0.00501**	**0.0119**	0.00115 U	**0.231**	-	0.0630	Eco	0.0630	Eco
Monobutyltin	**0.0540**	**0.240 J**	**0.00682**	0.00105 U	**0.00449**	**0.00699**	0.00110 U	**0.0189**	-	0.0630	Eco	0.0630	Eco
Tetrabutyltin	0.00119 U	0.00110 U	0.00116 U	0.00111 U	0.00119 U	0.00116 U	0.00115 U	0.00114 U	-	0.0630	Eco	0.0630	Eco
Tributyltin	**0.0233**	**0.0601 J**	**0.0287 J**	0.00156 U	**0.0171**	**0.0213**	0.00163 U	**0.0284**	-	0.0630	Eco	0.0630	Eco

Table 5-2e
2001/2002 Phase II Supplimental Landfill Site Inspection Groundwater Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, Herbicides, and Pesticides
(Page 2 of 2)

Site ID										**Selected Discharge to Surface Water / Bioaccumulation**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID													
Sample Date													
Sample Depth (Feet btc)													
Total Herbicides (µg/L)													
2,4,5-T	0.0566 U	0.0566 U	0.0566 U	0.0566 U	0.0566 U	0.0566 U	0.0566 U	0.0566 U	-	36.0	Eco	36.0	Eco
2,4,5-TP (Silvex)	0.0227 U	0.0227 U	0.0277 U	0.0227 U	0.0227 U	0.0227 U	0.0227 U	0.0227 U	-	-	-	290	HH
2,4-D	0.0296 U	0.0296 U	0.0296 U	0.0296 U	0.0296 U	0.0296 U	0.0296 U	0.0296 U	-	4.00	Eco	4.00	Eco
2,4-DB	0.0557 U	0.0577 U	0.0577 U	0.0577 U	0.0577 U	0.0577 U	0.0577 U	0.0577 U	-	-	-	290	HH
4-Nitrophenol	0.0114 U	0.0114 U	0.0114 U	0.0114 U	0.0114 U	0.0114 U	0.0114 U	**0.840**	-	150	Eco	150	Eco
Dalapon	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	-	-	-	1,100	HH
Dicamba	0.0221 U	0.0221 U	0.0221 U	0.0221 U	0.0221 U	0.0221 U	0.0221 U	0.0221 U	-	10.0	Eco	10.0	Eco
Dichloroprop	0.0114 U	0.0114 U	0.0114 U	0.0114 U	0.0114 U	0.0114 U	0.0114 U	0.0114 U	-	4.00	Eco	4.00	Eco
Dinoseb	0.0292 U	0.0292 U	0.0292 U	0.0292 U	0.0292 U	0.0292 U	0.0292 U	0.0292 U	-	0.0500	Eco	0.0500	Eco
MCPA	0.0114 U	0.0114 U	0.0114 U	0.0114 U	0.0114 U	0.0114 U	0.0114 U	0.0114 U	-	2.60	Eco	2.60	Eco
MCPP	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U	-	-	-	37.0	HH
Pentachlorophenol	0.0259 U	0.0259 U	0.0259 U	0.0259 U	0.0259 U	0.0259 U	0.0259 U	**0.112**	-	0.270	HH	0.470	HH
Total Pesticides (µg/L)													
4,4'-DDD	0.000513 UJ	0.000458 UJ	0.000531 U	0.000473 UJ	0.00227 UJ	0.000517 UJ	0.00208 U	0.000646 UJ	-	0.000310	HH	0.00100	Eco
4,4'-DDE	0.000425 UJ	0.000380 UJ	**0.00246 J**	0.000391 UJ	0.00227 UJ	0.000428 UJ	0.00208 U	0.000535 UJ	-	0.000220	HH	0.00100	Eco
4,4'-DDT	0.000544 UJ	0.000486 UJ	0.000563 U	0.000501 UJ	0.00227 UJ	0.000548 UJ	0.00208 U	0.000685 UJ	-	0.000220	HH	0.00100	Eco
Aldrin	0.000125 UJ	0.000111 UJ	0.000129 U	0.000115 UJ	0.00114 UJ	0.000126 UJ	0.00104 U	0.000157 UJ	-	0.0000490	HH	0.00330	HH
BHC (alpha)	0.000401 UJ	0.000358 UJ	0.000414 U	0.000369 UJ	0.00114 UJ	0.000403 UJ	0.00104 U	0.000505 UJ	-	0.00260	HH	0.00900	HH
BHC (beta)	0.000465 UJ	0.000415 UJ	0.000481 U	0.000428 UJ	0.00114 UJ	0.000468 UJ	0.00104 U	0.000586 UJ	-	0.00910	HH	0.0370	HH
BHC (delta)	0.000256 UJ	0.000228 UJ	0.000264 U	0.000235 UJ	0.00114 UJ	0.000257 UJ	0.00104 U	0.000322 UJ	-	0.00260	HH	0.00900	HH
BHC (gamma) Lindane	0.000784 UJ	0.000700 UJ	0.000811 U	0.000722 UJ	0.00114 UJ	0.000789 UJ	0.00104 U	0.000987 UJ	-	0.0800	Eco	0.0520	HH
Chlordane (technical)	0.00349 UJ	0.00312 UJ	0.00361 U	0.00321 UJ	0.0114 UJ	0.00351 UJ	0.0104 U	0.00439 UJ	-	0.000800	HH	0.00430	Eco
Dieldrin	0.000329 UJ	0.000294 UJ	**0.000982 J**	0.000303 UJ	0.00227 UJ	0.000331 UJ	0.00208 U	0.000414 UJ	-	0.0000520	HH	0.00350	HH
Endosulfan I	0.000543 UJ	0.000485 UJ	0.000562 U	0.000500 UJ	0.00114 UJ	0.000547 UJ	0.00104 U	0.000684 UJ	-	0.0560	Eco	0.0560	Eco
Endosulfan II	0.000412 UJ	0.000368 UJ	0.000426 U	0.000380 UJ	0.00227 UJ	0.000415 UJ	0.00208 U	0.000519 UJ	-	0.0560	Eco	0.0560	Eco
Endosulfan Sulfate	0.000585 UJ	0.000523 UJ	0.000605 U	0.000539 UJ	0.00227 UJ	0.000589 UJ	0.00208 U	0.000737 UJ	-	0.0510	Eco	0.0510	Eco
Endrin	0.000337 UJ	0.000301 UJ	0.000349 U	0.000311 UJ	0.00227 UJ	0.000340 UJ	0.00208 U	0.000425 UJ	-	0.0360	Eco	0.0360	Eco
Endrin Aldehyde	0.00106 UJ	0.000947 UJ	0.00110 U	0.000976 UJ	0.00227 UJ	0.00107 UJ	0.00208 U	0.00134 UJ	-	0.150	Eco	0.150	Eco
Endrin Ketone	0.000376 UJ	0.000335 UJ	0.000388 U	0.000346 UJ	0.00227 UJ	0.000378 UJ	0.00208 U	0.000473 UJ	-	0.0590	HH	11.0	HH
Heptachlor	0.000821 UJ	0.000733 UJ	0.000848 U	0.000756 UJ	0.00114 UJ	0.000826 UJ	0.00104 U	0.00103 UJ	-	0.0000790	HH	0.00380	Eco
Heptachlor Epoxide	0.000407 UJ	0.000364 UJ	0.000421 U	0.000375 UJ	0.00114 UJ	0.000410 UJ	0.00104 U	0.000513 UJ	-	0.0000390	HH	0.00380	Eco
Methoxychlor	0.000585 UJ	0.000522 UJ	0.000605 U	0.000539 UJ	0.0114 UJ	0.000589 UJ	0.0104 U	0.000737 UJ	-	0.0300	Eco	0.0300	Eco
Toxaphene	0.0127 UJ	0.0113 UJ	0.0131 U	0.0117 UJ	0.114 UJ	0.0128 UJ	0.104 U	0.0160 UJ	-	0.000280	HH	0.00200	Eco

Notes:

µg/L = microgram per liter
mg/L = milligram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-2f
2001/2002 Phase II Supplimental Landfill Site Inspection
Groundwater Analytical Results
Volatile Organic Compounds
(Page 1 of 2)

Site ID	MW-01	MW-02	MW-03	MW-04*	Selected Discharge to Surface Water / Bioaccumulation SLV	SLV Source	Selected Direct Contact SLV	SLV Source
Sample ID	020501BIL02GW	020501BIL03GW	020501BIL05GW	020503BIL06GW				
Sample Date	5/1/2002	5/1/2002	5/1/2002	5/3/2002				
Sample Depth (Feet btc)	27.5	29.56	18.21	20.29				
Total Volatile Organic Compounds (µg/L)								
1,1,1,2-Tetrachloroethane	0.500 U	0.500 U	0.500 U	0.500 U	186	Eco	0.520	HH
1,1,1-Trichloroethane (TCA)	0.500 U	0.500 U	0.500 U	0.500 U	11.0	Eco	11.0	Eco
1,1,2,2-Tetrachloroethane	0.500 U	0.500 U	0.500 U	0.500 U	0.170	HH	0.0670	HH
1,1,2-Trichloroethane	0.500 U	0.500 U	0.500 U	0.500 U	0.590	HH	0.230	HH
1,1-Dichloroethane	0.500 U	0.500 U	0.500 U	0.500 U	47.0	Eco	2.30	HH
1,1-Dichloroethene	0.500 U	0.500 U	0.500 U	0.500 U	25.0	Eco	25.0	Eco
1,1-Dichloropropene	0.500 U	0.500 U	0.500 U	0.500 U	-	-	0.430	HH
1,2,3-Trichlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	8.00	Eco	2.30	HH
1,2,3-Trichloropropane	0.500 U	0.500 U	0.500 U	0.500 U	-	-	0.000720	HH
1,2,4-Trichlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	35.0	HH	2.30	HH
1,2,4-Trimethylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	7.30	Eco	7.30	Eco
1,2-Dibromo-3-chloropropane	0.500 U	0.500 U	0.500 U	0.500 U	-	-	0.000320	HH
1,2-Dibromoethane (EDB)	0.500 U	0.500 U	0.500 U	0.500 U	-	-	0.00630	HH
1,2-Dichlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	14.0	Eco	14.0	Eco
1,2-Dichloroethane (EDC)	0.500 U	0.500 U	0.500 U	0.500 U	0.380	HH	0.140	HH
1,2-Dichloropropane	0.500 U	0.500 U	0.500 U	0.500 U	0.500	HH	0.390	HH
1,3,5-Trimethylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	7.30	Eco	7.30	Eco
1,3-Dichlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	71.0	Eco	0.420	HH
1,3-Dichloropropane	0.500 U	0.500 U	0.500 U	0.500 U	5,700	Eco	730	HH
1,4-Dichlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	15.0	Eco	0.420	HH
2,2-Dichloropropane	0.500 U	0.500 U	0.500 U	0.500 U	0.500	HH	0.390	HH
2-Butanone (MEK)	-	-	-	-	14,000	Eco	7,100	HH
2-Chlorotoluene	0.500 U	0.500 U	0.500 U	0.500 U	-	-	730	HH
2-Hexanone	2.50 U	2.50 U	2.50 U	2.50 U	99.0	Eco	47.0	HH
4-Chlorotoluene	0.500 U	0.500 U	0.500 U	0.500 U	-	-	2,600	HH
4-Isopropyltoluene	0.500 U	0.500 U	0.500 U	0.500 U	-	-	-	-
4-Methyl-2-pentanone (MIBK)	2.50 U	2.50 U	2.50 U	2.50 U	170	Eco	170	Eco
Acetone	2.50 U	2.50 U	2.50 U	2.50 U	1,500	Eco	1,500	Eco
Benzene	0.500 U	0.500 U	0.500 U	0.500 U	2.20	HH	0.390	HH
Bromobenzene	0.500 U	0.500 U	0.500 U	0.500 U	-	-	88.0	HH
Bromochloromethane	0.500 U	0.500 U	0.500 U	0.500 U	0.550	HH	0.120	HH
Bromodichloromethane	0.500 U	0.500 U	0.500 U	0.500 U	0.550	HH	0.120	HH
Bromoform	0.500 U	0.500 U	0.500 U	0.500 U	4.30	HH	7.20	HH
Bromomethane	1.00 U	1.00 U	1.00 U	1.00 U	16.0	Eco	8.70	HH
Carbon Disulfide	0.500 U	0.500 U	0.500 U	0.500 U	0.920	Eco	0.920	Eco
Carbon Tetrachloride	0.500 U	0.500 U	0.500 U	0.500 U	0.230	HH	0.190	HH
Chlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	50.0	Eco	50.0	Eco
Chloroethane	0.500 U	0.500 U	0.500 U	0.500 U	-	-	21,000	HH
Chloroform	0.500 U	0.500 U	0.500 U	**1.78**	5.70	HH	0.190	HH
Chloromethane	0.500 U	0.500 U	0.500 U	0.500 U	-	-	190	HH
cis-1,2-Dichloroethene	0.500 U	0.500 U	0.500 U	0.500 U	590	Eco	360	HH
cis-1,3-Dichloropropene	0.500 U	0.500 U	0.500 U	0.500 U	0.0550	Eco	0.0550	Eco
Dibromochloromethane	0.500 U	0.500 U	0.500 U	0.500 U	0.400	HH	0.680	HH
Dibromomethane	0.500 U	0.500 U	0.500 U	0.500 U	-	-	8.20	HH
Dichlorodifluoromethane	0.500 U	0.500 U	0.500 U	0.500 U	-	-	390	HH
Dichloromethane (Methylene Chloride)	0.500 U	0.500 U	0.500 U	0.500 U	4.60	HH	4.40	HH
Ethylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	7.30	Eco	1.40	HH
Hexachlorobutadiene	0.500 U	0.500 U	0.500 U	0.500 U	0.440	HH	0.860	HH
Isopropylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	7.30	Eco	7.30	Eco
m,p-Xylenes	1.00 U	1.00 U	1.00 U	1.00 U	13.0	Eco	13.0	Eco
Naphthalene	0.500 U	0.500 U	0.500 U	0.500 U	620	Eco	0.140	HH
n-Butylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	-	-	-	-
n-Propylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	7.30	Eco	7.30	Eco
o-Xylene	0.500 U	0.500 U	0.500 U	0.500 U	350	Eco	350	Eco
sec-Butylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	-	-	-	-
Styrene	0.500 U	0.500 U	0.500 U	0.500 U	72.0	Eco	72.0	Eco
tert-Butylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	-	-	-	-
Tetrachloroethene (PCE)	0.500 U	0.500 U	**8.78**	0.500 U	0.690	HH	0.0930	HH
Toluene	0.500 U	0.500 U	0.500 U	0.500 U	9.80	Eco	9.80	Eco
trans-1,2-Dichloroethene	0.500 U	0.500 U	0.500 U	0.500 U	140	HH	110	HH
trans-1,3-Dichloropropene	0.500 U	0.500 U	0.500 U	0.500 U	0.0550	Eco	0.0550	Eco
Trichloroethene (TCE)	0.500 U	0.500 U	0.500 U	0.500 U	2.50	HH	0.0390	HH
Trichlorofluoromethane	0.500 U	0.500 U	0.500 U	0.500 U	-	-	1,300	HH
Vinyl Acetate	2.50 U	2.50 U	2.50 U	2.50 U	16.0	Eco	16.0	Eco
Vinyl Chloride	0.500 U	0.500 U	0.500 U	0.500 U	0.0250	HH	0.0250	HH

Notes:

µg/L = microgram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-2f
2001/2002 Phase II Supplimental Landfill Site Inspection
Groundwater Analytical Results
Volatile Organic Compounds
(Page 2 of 2)

Site ID	MW-05	MW-06	MW-07	MW-08	MW-09	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	020503BIL09GW	020503BIL08GW	020503BIL10GW	020501BIL01GW	020501BIL04GW				
Sample Date	5/3/2002	5/3/2002	5/3/2002	5/1/2002	5/1/2002				
Sample Depth (Feet btc)	24.87	31.06	20.44	58.45	21.08				
Total Volatile Organic Compounds (µg/L)									
1,1,1,2-Tetrachloroethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	186	Eco	0.520	HH
1,1,1-Trichloroethane (TCA)	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	11.0	Eco	11.0	Eco
1,1,2,2-Tetrachloroethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.170	HH	0.0670	HH
1,1,2-Trichloroethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.590	HH	0.230	HH
1,1-Dichloroethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	47.0	Eco	2.30	HH
1,1-Dichloroethene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	25.0	Eco	25.0	Eco
1,1-Dichloropropene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	0.430	HH
1,2,3-Trichlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	8.00	Eco	2.30	HH
1,2,3-Trichloropropane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	0.000720	HH
1,2,4-Trichlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	35.0	HH	2.30	HH
1,2,4-Trimethylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	7.30	Eco	7.30	Eco
1,2-Dibromo-3-chloropropane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	0.000320	HH
1,2-Dibromoethane (EDB)	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	0.00630	HH
1,2-Dichlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	14.0	Eco	14.0	Eco
1,2-Dichloroethane (EDC)	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.380	HH	0.140	HH
1,2-Dichloropropane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500	HH	0.390	HH
1,3,5-Trimethylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	7.30	Eco	7.30	Eco
1,3-Dichlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	71.0	Eco	0.420	HH
1,3-Dichloropropane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	5,700	Eco	730	HH
1,4-Dichlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	15.0	Eco	0.420	HH
2,2-Dichloropropane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500	HH	0.390	HH
2-Butanone (MEK)	-	-	2.50 U	-	-	14,000	Eco	7,100	HH
2-Chlorotoluene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	730	HH
2-Hexanone	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	99.0	Eco	47.0	HH
4-Chlorotoluene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	2,600	HH
4-Isopropyltoluene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	-	-
4-Methyl-2-pentanone (MIBK)	2.50 U	2.50 U	2.50 U	**3.04 J**	2.50 U	170	Eco	170	Eco
Acetone	**14.7**	2.50 U	**8.39**	**14.4**	**15.4**	1,500	Eco	1,500	Eco
Benzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	2.20	HH	0.390	HH
Bromobenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	88.0	HH
Bromochloromethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.550	HH	0.120	HH
Bromodichloromethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.550	HH	0.120	HH
Bromoform	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	4.30	HH	7.20	HH
Bromomethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	16.0	Eco	8.70	HH
Carbon Disulfide	0.500 U	0.500 U	0.500 U	0.500 U	**3.95**	0.920	Eco	0.920	Eco
Carbon Tetrachloride	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.230	HH	0.190	HH
Chlorobenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	50.0	Eco	50.0	Eco
Chloroethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	21,000	HH
Chloroform	0.500 U	0.500 U	0.500 U	0.500 U	**0.609 J**	5.70	HH	0.190	HH
Chloromethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	190	HH
cis-1,2-Dichloroethene	0.500 U	0.500 U	**0.791 J**	0.500 U	0.500 U	590	Eco	360	HH
cis-1,3-Dichloropropene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.0550	Eco	0.0550	Eco
Dibromochloromethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.400	HH	0.680	HH
Dibromomethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	8.20	HH
Dichlorodifluoromethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	390	HH
Dichloromethane (Methylene Chloride)	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	4.60	HH	4.40	HH
Ethylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	7.30	Eco	1.40	HH
Hexachlorobutadiene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.440	HH	0.860	HH
Isopropylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	7.30	Eco	7.30	Eco
m,p-Xylenes	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	13.0	Eco	13.0	Eco
Naphthalene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	620	Eco	0.140	HH
n-Butylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	-	-
n-Propylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	7.30	Eco	7.30	Eco
o-Xylene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	350	Eco	350	Eco
sec-Butylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	-	-
Styrene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	72.0	Eco	72.0	Eco
tert-Butylbenzene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	-	-
Tetrachloroethene (PCE)	0.500 U	0.500 U	0.500 U	0.500 U	**1.95**	0.690	HH	0.0930	HH
Toluene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	9.80	Eco	9.80	Eco
trans-1,2-Dichloroethene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	140	HH	110	HH
trans-1,3-Dichloropropene	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.0550	Eco	0.0550	Eco
Trichloroethene (TCE)	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	2.50	HH	0.0390	HH
Trichlorofluoromethane	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	-	-	1,300	HH
Vinyl Acetate	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	16.0	Eco	16.0	Eco
Vinyl Chloride	**0.531 J**	0.500 U	**0.507 J**	0.500 U	0.500 U	0.0250	HH	0.0250	HH

Notes:
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Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
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bold = analyte detected above MDL.
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* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-2g
2001/2002 Phase II Supplimental Landfill Site Inspection Groundwater Analytical Results
Semivolatile Organic Compounds
(Page 1 of 2)

Site ID	MW-01	MW-02	MW-03	MW-04*	Selected Discharge to Surface Water / Bioaccumulation SLV	SLV Source	Selected Direct Contact SLV	SLV Source
Sample ID	020501BIL02GW	020501BIL03GW	020501BIL05GW	020503BIL06GW				
Sample Date	5/1/2002	5/1/2002	5/1/2002	5/3/2002				
Sample Depth (Feet btc)	27.5	29.56	18.21	20.29				
Total Semivolatile Organic Compounds (µg/L)								
1,2,4-Trichlorobenzene	0.0183 U	0.0197 U	0.0183 U	0.0100 U	35.0	HH	2.30	HH
1,2-Dichlorobenzene	0.0183 U	0.0197 U	0.0183 U	0.0160 U	14.0	Eco	14.0	Eco
1,3-Dichlorobenzene	0.0195 U	0.0209 U	0.0195 U	0.0170 U	71.0	Eco	0.420	HH
1,4-Dichlorobenzene	0.0172 U	0.0185 U	**0.0601 J**	0.0150 U	15.0	Eco	0.420	HH
2,4,5-Trichlorophenol	0.0126 U	0.0135 U	0.0126 U	0.0110 U	18.0	Eco	18.0	Eco
2,4,6-Trichlorophenol	0.0138 U	0.0148 U	0.0137 U	0.0120 U	1.40	HH	5.20	HH
2,4-Dichlorophenol	0.0172 U	0.0185 U	0.0172 U	0.0150 U	77.0	HH	110	HH
2,4-Dimethylphenol	0.0172 U	0.0185 U	0.0172 U	0.0150 U	42.0	Eco	42.0	Eco
2,4-Dinitrophenol	0.0344 U	0.0369 U	0.0344 U	0.0300 U	19.0	Eco	19.0	Eco
2,4-Dinitrotoluene	0.0149 U	0.0160 U	0.0149 U	0.0130 U	0.110	HH	0.220	HH
2,6-Dinitrotoluene	0.0229 U	0.0246 U	0.0229 U	0.0200 U	230	Eco	37.0	HH
2-Chloronaphthalene	0.00172 U	0.00185 U	0.00172 U	0.00150 U	32.0	Eco	32.0	Eco
2-Chlorophenol	0.0195 U	0.0209 U	0.0195 U	0.0170 U	81.0	HH	180	HH
2-Methylphenol	0.0275 U	0.0296 U	0.0275 U	0.0240 U	13.0	Eco	13.0	Eco
2-Nitroaniline	0.0206 U	0.0222 U	0.0206 U	0.0180 U	-	-	370	HH
2-Nitrophenol	0.0252 U	0.0271 U	0.0252 U	0.0220 U	10,000	HH	11,000	HH
3,3'-Dichlorobenzidine	0.0413 U	0.0443 U	0.0412 U	0.0360 U	0.0210	HH	0.130	HH
3-Nitroaniline	0.0378 U	0.0406 U	0.0378 U	0.0330 U	-	-	3.40	HH
4,6-Dinitro-2-methylphenol	0.0252 U	0.0271 U	0.0252 U	0.0220 U	13.0	HH	2.90	HH
4-Bromophenyl Phenyl Ether	0.0138 U	0.0148 U	0.0137 U	0.0120 U	1.50	Eco	1.50	Eco
4-Chloro-3-methylphenol	0.0619 U	0.0665 U	0.0619 U	0.0540 U	-	-	3700	HH
4-Chloroaniline	0.0447 U	0.0480 U	0.0447 U	0.0390 U	50.0	Eco	0.340	HH
4-Chlorophenyl Phenyl Ether	0.0172 U	0.0185 U	0.0172 U	0.0150 U	-	-	-	-
4-Nitroaniline	0.0241 U	0.0259 U	0.0241 U	0.0210 U	-	-	3.40	HH
4-Nitrophenol	0.0333 U	0.0357 U	0.0332 U	0.0290 U	150	Eco	150	Eco
Aniline	0.0573 U	0.0000616 U	0.0573 U	0.0500 U	2.20	Eco	2.20	Eco
Benzidine	0.0275 U	0.0296 U	0.0275 U	0.0240 U	0.0000860	HH	0.720	HH
Benzoic Acid	0.0229 U	0.0246 U	0.0229 U	0.0200 U	42.0	Eco	42.0	Eco
Benzyl Alcohol	0.0367 U	0.0394 U	0.0367 U	0.0320 U	8.60	Eco	8.60	Eco
Bis(2-chloroethoxy)methane	0.0206 U	0.0222 U	0.0206 U	0.0180 U	-	-	110	HH
Bis(2-chloroethyl) Ether	0.0218 U	0.0234 U	0.0218 U	0.0190 U	0.0300	HH	0.0120	HH
Bis(2-chloroisopropyl) Ether	0.0241 U	0.0259 U	0.0241 U	0.0210 U	1,400	HH	-	-
Bis(2-ethylhexyl) Phthalate	0.0745 U	0.0800 U	0.0745 U	**1.79**	1.20	HH	3.00	Eco
Butyl Benzyl Phthalate	0.214 U	0.230 U	0.214 U	0.187 U	19.0	Eco	19.0	Eco
Carbazole	0.00321 U	0.00345 U	0.00321 U	0.00280 U	-	-	-	-
Dibenzofuran	0.0161 U	0.0172 U	0.0160 U	0.0140 U	3.70	Eco	3.70	Eco
Diethyl Phthalate	0.0665 U	0.0714 U	0.0664 U	**0.192**	210	Eco	210	Eco
Dimethyl Phthalate	0.0183 U	0.0197 U	0.0183 U	0.0160 U	3.00	Eco	3.00	Eco
Di-n-butyl Phthalate	0.265 U	0.284 U	0.265 U	0.231 U	35.0	Eco	35.0	Eco
Di-n-octyl Phthalate	0.0390 U	0.0419 U	0.0389 U	**2.85**	1.20	HH	4.10	HH
Hexachlorobenzene	0.0229 U	0.0248 U	0.0229 U	0.0200 U	0.000280	HH	0.000300	Eco
Hexachlorobutadiene	0.0333 U	0.0357 U	0.0332 U	0.0290 U	0.440	HH	0.860	HH
Hexachlorocyclopentadiene	0.0298 U	0.0320 U	0.0298 U	0.0260 U	5.20	Eco	5.20	Eco
Hexachloroethane	0.0459 U	0.0493 U	0.0458 U	0.0400 U	1.40	HH	4.10	HH
Isophorone	**0.282**	**0.116 J**	0.0206 U	0.0180 U	35.0	HH	71.0	HH
Nitrobenzene	0.0516 U	0.0554 U	0.0515 U	0.0450 U	17.0	HH	0.120	HH
N-Nitrosodimethylamine	0.0378 U	0.0123 U	0.0378 U	0.0330 U	0.000690	HH	0.000420	HH
N-Nitrosodi-n-propylamine	0.0241 U	0.0259 U	0.0241 U	0.0210 U	0.00500	HH	0.00960	HH
N-Nitrosodiphenylamine	0.0115 U	0.0406 U	0.0115 U	0.0100 U	3.30	HH	14.0	HH
p-cresol (4-Methylphenol)	0.0264 U	0.0283 U	0.0263 U	0.0230 U	-	-	-	-
Pentachlorophenol	0.0195 U	0.0209 U	0.0195 U	0.0170 U	0.270	HH	0.470	HH
Phenol	0.0367 U	0.0394 U	0.0367 U	0.0320 U	110	Eco	110	Eco
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/L)								
2-Methylnaphthalene	**0.0385 J**	0.0185 U	0.0172 U	**0.233 J**	72.2	Eco	72.2	Eco
Acenaphthene	0.00183 U	0.00197 U	0.00183 U	0.00160 U	520	Eco	520	Eco
Acenaphthylene	0.00172 U	0.00185 U	0.00172 U	0.00150 U	307	Eco	0.140	HH
Anthracene	**0.0589**	0.00185 U	0.00172 U	0.00150 U	13.0	Eco	13.0	Eco
Fluorene	0.00161 U	0.00172 U	0.00160 U	0.00140 U	3.90	Eco	3.90	Eco
Naphthalene	**0.157**	0.00271 U	0.00252 U	**0.0400**	620	Eco	0.140	HH
Phenanthrene	**0.0800**	0.00271 U	0.00252 U	**0.211**	6.30	Eco	0.140	HH
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/L)								
Benzo(a)anthracene	0.00505 U	0.00542 U	0.00504 U	0.00440 U	0.00380	HH	0.0270	Eco
Benzo(a)pyrene	0.00539 U	0.00579 U	0.00538 U	0.00470 U	0.00380	HH	0.00290	HH
Benzo(g,h,i)perylene	0.00390 U	0.00419 U	0.00389 U	0.00340 U	0.380	HH	0.290	HH
Benzofluoranthenes, Total	0.00436 U	0.00468 U	0.00435 U	0.00380 U	0.00380	HH	0.01400	Eco
Chrysene	0.00287 U	0.00308 U	0.00286 U	0.00250 U	0.00380	HH	2.04	Eco
Dibenz(a,h)anthracene	0.00310 U	0.00333 U	0.00309 U	0.00270 U	0.0180	HH	0.00290	HH
Fluoranthene	0.00218 U	0.00234 U	0.00218 U	0.00190 U	6.16	Eco	6.16	Eco
Indeno(1,2,3-cd)pyrene	0.00344 U	0.00369 U	0.00344 U	0.00300 U	0.00380	HH	0.0290	HH
Pyrene	0.00161 U	0.00172 U	0.00160 U	0.00140 U	10.1	Eco	10.1	Eco

Notes:

µg/L = microgram per liter
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Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-2g
2001/2002 Phase II Supplimental Landfill Site Inspection Groundwater Analytical Results
Semivolatile Organic Compounds
(Page 2 of 2)

Site ID	MW-05	MW-06	MW-07	MW-08	MW-09	Selected Discharge to Surface Water / Bioaccumulation SLV	SLV Source	Selected Direct Contact SLV	SLV Source
Sample ID	020503BIL09GW	020503BIL08GW	020503BIL10GW	020501BIL01GW	020501BIL04GW				
Sample Date	5/3/2002	5/3/2002	5/3/2002	5/1/2002	5/1/2002				
Sample Depth (Feet btc)	24.87	31.06	20.44	58.45	21.08				
Total Semivolatile Organic Compounds (µg/L)									
1,2,4-Trichlorobenzene	0.0179 U	0.184 U	0.0170 U	0.0160 UJ	0.227 U	35.0	HH	2.30	HH
1,2-Dichlorobenzene	0.0179 U	0.184 U	0.0170 U	0.0160 UJ	0.227 U	14.0	Eco	14.0	Eco
1,3-Dichlorobenzene	0.0191 U	0.196 U	0.0181 U	0.0170 UJ	0.241 U	71.0	Eco	0.420	HH
1,4-Dichlorobenzene	**0.0258 J**	0.173 U	0.0160 U	0.0150 UJ	0.213 U	15.0	Eco	0.420	HH
2,4,5-Trichlorophenol	0.0123 U	0.127 U	0.0117 U	0.0110 U	0.156 U	18.0	Eco	18.0	Eco
2,4,6-Trichlorophenol	0.0135 U	0.138 U	0.0128 U	0.0120 U	0.170 U	1.40	HH	5.20	HH
2,4-Dichlorophenol	0.0168 U	0.173 U	0.0160 U	0.0150 U	0.213 U	77.0	HH	110	HH
2,4-Dimethylphenol	0.0168 U	0.173 U	0.0160 U	0.0150 U	0.213 U	42.0	Eco	42.0	Eco
2,4-Dinitrophenol	0.0336 U	0.345 U	0.0319 U	0.0300 U	0.426 U	19.0	Eco	19.0	Eco
2,4-Dinitrotoluene	0.0146 U	0.150 U	0.0138 U	0.0130 UJ	0.185 U	0.110	HH	0.220	HH
2,6-Dinitrotoluene	0.0224 U	0.230 U	0.0213 U	0.0200 UJ	0.284 U	230	Eco	37.0	HH
2-Chloronaphthalene	0.00168 U	0.0173 U	0.00160 U	0.00150 UJ	0.0213 U	32.0	Eco	32.0	Eco
2-Chlorophenol	0.0191 U	0.196 U	0.0181 U	0.0170 U	0.241 U	81.0	HH	180	HH
2-Methylphenol	0.0269 U	0.276 U	0.0256 U	0.0240 U	0.341 U	13.0	Eco	13.0	Eco
2-Nitroaniline	0.0202 U	0.207 U	0.0192 U	0.0180 UJ	0.256 U	-	-	370	HH
2-Nitrophenol	0.0247 U	0.253 U	0.0234 U	0.0220 U	0.313 U	10,000	HH	11,000	HH
3,3'-Dichlorobenzidine	0.0404 U	0.414 U	0.0383 U	0.0360 UJ	0.511 U	0.0210	HH	0.130	HH
3-Nitroaniline	0.0370 U	0.380 U	0.0351 U	0.0330 UJ	0.469 U	-	-	3.40	HH
4,6-Dinitro-2-methylphenol	0.0247 U	0.253 U	0.0234 U	0.0220 U	0.313 U	13.0	HH	2.90	HH
4-Bromophenyl Phenyl Ether	0.0135 U	0.138 U	0.0128 U	0.0120 UJ	0.284 U	1.50	Eco	1.50	Eco
4-Chloro-3-methylphenol	0.0605 U	0.621 U	0.0575 U	0.0539 U	0.767 U	-	-	3700	HH
4-Chloroaniline	0.0437 U	0.449 U	0.0415 U	0.0390 UJ	0.554 U	50.0	Eco	0.340	HH
4-Chlorophenyl Phenyl Ether	0.0168 U	0.173 U	0.0160 U	0.0150 UJ	0.213 U	-	-	-	-
4-Nitroaniline	0.0235 U	0.242 U	0.0224 U	0.0210 UJ	0.298 U	-	-	3.40	HH
4-Nitrophenol	0.0325 U	-	0.0309 U	0.0290 U	0.412 U	150	Eco	150	Eco
Aniline	0.0561 U	0.575 U	0.0532 U	0.0500 UJ	0.710 U	2.20	Eco	2.20	Eco
Benzidine	0.0269 U	0.276 U	0.0252 U	0.0240 UJ	0.341 U	0.0000860	HH	0.720	HH
Benzoic Acid	0.0224 U	0.230 U	0.0213 U	0.0200 UJ	0.284 U	42.0	Eco	42.0	Eco
Benzyl Alcohol	0.0359 U	0.398 U	0.0341 U	0.0320 U	0.455 U	8.60	Eco	8.60	Eco
Bis(2-chloroethoxy)methane	0.0202 U	0.207 U	0.0192 U	0.0180 UJ	0.256 U	-	-	110	HH
Bis(2-chloroethyl) Ether	0.0213 U	0.219 U	0.0202 U	0.0190 UJ	0.270 U	0.0300	HH	0.0120	HH
Bis(2-chloroisopropyl) Ether	0.0235 U	0.242 U	0.0224 U	0.0210 UJ	0.298 U	1,400	HH	-	-
Bis(2-ethylhexyl) Phthalate	0.0729 U	0.748 U	0.0692 U	0.0649 UJ	0.923 U	1.20	HH	3.00	Eco
Butyl Benzyl Phthalate	0.210 U	2.15 U	0.199 U	0.187 UJ	2.66 U	19.0	Eco	19.0	Eco
Carbazole	0.00314 U	0.0322 U	0.00298 U	0.00280 UJ	0.0398 U	-	-	-	-
Dibenzofuran	0.0157 U	0.161 U	0.0149 U	0.0140 UJ	0.199 U	3.70	Eco	3.70	Eco
Diethyl Phthalate	0.0650 U	**1.90**	0.0618 U	0.0579 UJ	**1.03 J**	210	Eco	210	Eco
Dimethyl Phthalate	0.0179 U	0.184 U	0.0170 U	**0.235 J**	0.227 U	3.00	Eco	3.00	Eco
Di-n-butyl Phthalate	0.259 U	2.66 U	0.246 U	0.231 UJ	3.28 U	35.0	Eco	35.0	Eco
Di-n-octyl Phthalate	0.0381 U	**5.29**	0.0362 U	0.0340 UJ	**7.08**	1.20	HH	4.10	HH
Hexachlorobenzene	0.0224 U	0.230 U	0.0213 U	0.0200 UJ	0.284 U	0.000280	HH	0.000300	Eco
Hexachlorobutadiene	0.0325 U	0.334 U	0.0309 U	0.0290 UJ	0.412 U	0.440	HH	0.860	HH
Hexachlorocyclopentadiene	0.0291 U	0.229 U	0.0277 U	0.0260 UJ	0.369 U	5.20	Eco	5.20	Eco
Hexachloroethane	0.0448 U	0.460 U	0.0426 U	0.0400 UJ	0.568 U	1.40	HH	4.10	HH
Isophorone	0.0202 U	0.207 U	0.0192 U	0.0180 UJ	0.256 U	35.0	HH	71.0	HH
Nitrobenzene	0.0504 U	0.518 U	0.0479 U	0.0450 UJ	0.639 U	17.0	HH	0.120	HH
N-Nitrosodimethylamine	0.0370 U	0.380 U	0.0351 U	0.00330 UJ	0.469 U	0.000690	HH	0.000420	HH
N-Nitrosodi-n-propylamine	0.0235 U	0.242 U	0.0224 U	0.0210 UJ	0.298 U	0.00500	HH	0.00960	HH
N-Nitrosodiphenylamine	0.0112 U	0.115 U	0.0106 U	0.00999 UJ	0.142 U	3.30	HH	14.0	HH
p-cresol (4-Methylphenol)	0.0258 U	0.265 U	0.0245 U	0.0230 U	0.327 U	-	-	-	-
Pentachlorophenol	0.0191 U	0.196 U	0.0181 U	0.0170 U	0.241 U	0.270	HH	0.470	HH
Phenol	0.0359 U	**0.382 J**	0.0341 U	0.0320 U	0.455 U	110	Eco	110	Eco
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/L)									
2-Methylnaphthalene	0.0168 U	0.173 U	**0.0939 J**	0.0150 UJ	**0.360 J**	72.2	Eco	72.2	Eco
Acenaphthene	**0.111**	0.0184 U	0.00170 U	0.00160 UJ	**0.239**	520	Eco	520	Eco
Acenaphthylene	0.00168 U	0.0173 U	0.00160 U	0.00150 UJ	0.0213 U	307	Eco	0.140	HH
Anthracene	0.00168 U	0.0173 U	0.00160 U	0.00150 UJ	0.0213 U	13.0	Eco	13.0	Eco
Fluorene	0.00157 U	0.0161 U	0.00149 U	0.00140 UJ	0.0199 U	3.90	Eco	3.90	Eco
Naphthalene	**0.101**	0.0253 U	0.00234 U	0.00220 UJ	0.0313 U	620	Eco	0.140	HH
Phenanthrene	0.00247 U	0.0253 U	0.00234 U	0.00220 UJ	0.0313 U	6.30	Eco	0.140	HH
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/L)									
Benzo(a)anthracene	*0.00493 U*	*0.0506 U*	*0.00426 U*	*0.00440 UJ*	*0.0625 U*	0.00380	HH	0.0270	Eco
Benzo(a)pyrene	0.00527 U	0.0541 U	0.00501 U	0.00470 UJ	0.0668 U	0.00380	HH	0.00290	HH
Benzo(g,h,i)perylene	*0.00381 U*	*0.0391 U*	*0.00362 U*	*0.00340 UJ*	*0.0483 U*	0.380	HH	0.290	HH
Benzofluoranthenes, Total	0.00426 U	0.0437 U	0.00405 U	0.00380 UJ	0.0540 U	0.00380	HH	0.01400	Eco
Chrysene	*0.00280 U*	*0.0288 U*	*0.00266 U*	*0.00250 UJ*	*0.0355 U*	0.00380	HH	2.04	Eco
Dibenz(a,h)anthracene	0.00303 U	0.0311 U	0.00288 U	0.00270 UJ	0.0384 U	0.0180	HH	0.00290	HH
Fluoranthene	0.00213 U	0.0219 U	0.00202 U	0.00190 UJ	0.0270 U	6.16	Eco	6.16	Eco
Indeno(1,2,3-cd)pyrene	0.00336 U	0.0345 U	0.00319 U	0.00300 UJ	0.0426 U	0.00380	HH	0.0290	HH
Pyrene	0.00157 U	0.0161 U	0.00149 U	0.00140 UJ	0.0199 U	10.1	Eco	10.1	Eco

Notes:

µg/L = microgram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-3a
2007 Upland Source Evaluation Soil Analytical Results
PCB Aroclors, Metals, and Pesticides

Site ID	BIL01USE	BIL02USE	BIL03USE	BIL04USE	BIL05USE	BIL06USE	BIL07USE	BIL08USE	BIL09USE	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	070410BIL01SS	070410BIL02SS	070410BIL03SS	070410BIL04SS	070410BIL05SS	070410BIL06SS	070410BIL07SS	070410BIL08SS	070410BIL09SS		
Sample Date	4/10/2007	4/10/2007	4/10/2007	4/10/2007	4/10/2007	4/10/2007	4/10/2007	4/10/2007	4/10/2007		
Sample Depth (Feet bgs)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
PCB Aroclors (µg/kg dry)											
Aroclor 1016	*3.90 U*	*3.90 U*	*3.90 U*	*3.90 U*	*4.00 U*	*3.90 U*	*3.90 U*	*4.00 U*	*3.80 U*	371	Eco
Aroclor 1221	*3.90 U*	*3.90 U*	*3.90 U*	*3.90 U*	*4.00 U*	*3.90 U*	*3.90 U*	*4.00 U*	*3.80 U*	371	Eco
Aroclor 1232	*3.90 U*	*3.90 U*	*3.90 U*	*3.90 U*	*4.00 U*	*3.90 U*	*3.90 U*	*4.00 U*	*3.80 U*	371	Eco
Aroclor 1242	*3.90 U*	*3.90 U*	*3.90 U*	*3.90 U*	*4.00 U*	*3.90 U*	*3.90 U*	*4.00 U*	*3.80 U*	371	Eco
Aroclor 1248	3.90 U	3.90 U	3.90 U	3.90 U	4.00 U	3.90 U	3.90 U	4.00 U	3.80 U	371	Eco
Aroclor 1254	**26.0**	**27.0**	**19.0**	**8.30**	4.00 U	19.0 U	**49.0**	**24.0**	**5.50**	371	Eco
Aroclor 1260	**50.0**	**24.0**	**31.0 J**	**33.0**	**12.0**	**92.0**	**74.0**	**42.0**	**19.0**	371	Eco
Total PCBs as Aroclors (NDs at MDL)[1]	**79.9 J**	**54.9 J**	**53.9 J**	**45.2 J**	**20.0 J**	**115 J**	**127 J**	**70.0 J**	**28.3 J**	371	Eco
Metals (mg/kg dry)											
Aluminum	**17,400 J**	**19,100 J**	**17,400 J**	**10,500 J**	**10,800 J**	**11,200 J**	**14,800 J**	**15,500 J**	**16,000 J**	31,400	UPL
Antimony	0.300 UJ	0.200 UJ	0.200 UJ	0.200 UJ	0.200 UJ	0.200 UJ	0.300 UJ	0.300 UJ	0.300 UJ	0.270	Eco
Arsenic	**5.10**	**6.10**	**6.20**	**3.70**	**3.30**	**4.00**	**3.20**	**3.70**	**4.50**	5.40	UPL
Barium	**136**	**99.3**	**95.1**	**115**	**120**	**115**	**107**	**97.8**	**130**	330	Eco
Beryllium	**0.400**	**0.400**	**0.500**	**0.300**	**0.300**	**0.300**	**0.300**	**0.400**	**0.400**	21.0	Eco
Cadmium	**0.540**	**0.660**	**0.940**	**0.570**	**0.570**	**1.30**	**0.720**	**0.670**	**1.70**	0.360	Eco
Calcium	**6,920**	**6,680**	**6,710**	**4,770**	**4,500**	**4,380**	**6,060**	**5,840**	**5,410**	10,400	UPL
Chromium	**28.6**	**30.1**	**23.0**	**15.6**	**16.1**	**16.9**	**801**	**117**	**22.0**	28.1	UPL
Cobalt	**15.3 J**	**9.60 J**	**11.5 J**	**6.60 J**	**6.40 J**	**8.30 J**	**22.7 J**	**10.7 J**	**8.50 J**	19.9	UPL
Copper	**54.9**	**45.7**	**45.4**	**28.4**	**24.4**	**60.5**	**41.3**	**52.1**	**39.1**	56.7	UPL
Iron	**28,000 J**	**28,000 J**	**32,100 J**	**19,600 J**	**19,600 J**	**20,500 J**	**38,800 J**	**26,400 J**	**25,100 J**	36,900	UPL
Lead	**119 J**	**147 J**	**131 J**	**51.0 J**	**49.0 J**	**148 J**	**680 J**	**174 J**	**127 J**	25.5	UPL
Magnesium	**6,500**	**6,160**	**6,950**	**4,260**	**4,330**	**4,830**	**35,100**	**9,550**	**5,580**	12,400	UPL
Manganese	**405 J**	**408 J**	**450 J**	**273 J**	**263 J**	**284 J**	**614 J**	**391 J**	**366 J**	885	UPL
Mercury	**0.190**	**0.290**	**0.0700**	**0.0700**	**0.230**	**0.320**	**0.130**	**0.100**	**0.110**	0.0660	UPL
Nickel	**30.0**	**21.0**	**20.0**	**15.0**	**15.0**	**15.0**	**570**	**72.0**	**21.0**	38.0	Eco
Potassium	**1,280**	**1,220**	**1,360**	**1,480**	**1,570**	**1,400**	**1,060**	**1,210**	**1,870**	2,050	UPL
Selenium	**0.300**	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.300 U	0.300 U	0.300 U	0.520	Eco
Silver	**0.300**	**0.300**	**0.200**	0.200 U	**0.400**	**0.500**	0.300 U	0.300 U	0.300 U	4.20	Eco
Sodium	**530**	**570**	**530**	**460**	**480**	**430**	**420**	**550**	**560**	341	UPL
Thallium	0.300 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.300 U	0.300 U	0.300 U	1.00	Eco
Vanadium	**48.6**	**56.3**	**53.3**	**36.3**	**36.0**	**36.0**	**34.8**	**44.8**	**42.6**	104	UPL
Zinc	**151**	**143**	**157**	**138**	**144**	**221**	**194**	**180**	**189**	71.7	UPL
Pesticides (µg/kg dry)											
4,4'-DDD	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	3.80 U	2.00 U	1.90 U	21.0	Eco
4,4'-DDE	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	3.80 U	2.00 U	1.90 U	21.0	Eco
4,4'-DDT	**13.0**	**14.0**	**14.0**	5.00 U	2.00 U	**23.0**	**28.0**	**17.0**	**6.40**	21.0	Eco
Aldrin	0.990 U	0.980 U	0.980 U	0.980 U	0.990 U	0.980 U	1.90 U	0.990 U	0.970 U	4.90	Eco
BHC (alpha)	0.990 U	0.980 U	0.980 U	0.980 U	0.990 U	0.980 U	1.90 U	0.990 U	0.970 U	340	HH
BHC (beta)	0.990 U	0.980 U	0.980 U	6.80 U	0.990 U	0.980 U	12.0 U	3.50 U	0.970 U	960	HH
BHC (delta)	0.990 U	0.980 U	0.980 U	0.980 U	0.990 U	0.980 U	1.90 U	0.990 U	0.970 U	340	HH
BHC (gamma) Lindane	0.990 U	0.980 U	0.980 U	0.980 U	0.990 U	0.980 U	1.90 U	0.990 U	0.970 U	2,000	HH
Chlordane (alpha)	5.50 U	2.40 U	0.980 U	0.980 U	0.990 U	0.980 U	1.90 U	3.60 U	0.970 U	7,200	HH
Chlordane (gamma)	5.10 U	0.980 U	0.980 U	3.00 U	0.990 U	0.980 U	14.0 U	4.30 U	0.970 U	7,200	HH
Dieldrin	**2.10**	2.00 U	2.00 U	2.00 U	2.00 U	4.00 U	8.00 U	2.00 U	1.90 U	4.90	Eco
Endosulfan I	0.990 U	0.980 U	0.980 U	0.980 U	0.990 U	0.980 U	1.90 U	0.990 U	0.970 U	20,000	Eco
Endosulfan II	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	3.80 U	2.00 U	1.90 U	20,000	Eco
Endosulfan Sulfate	2.00 U	2.00 U	8.00 U	2.00 U	2.00 U	2.00 U	3.80 U	2.00 U	1.90 U	20,000	Eco
Endrin	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	10.0 U	2.00 U	1.90 U	4.90	Eco
Endrin Aldehyde	2.00 U	2.00 U	10.0 U	5.50 U	2.00 U	5.40 U	5.80 U	5.10 U	1.90 U	4.90	Eco
Endrin Ketone	2.00 U	5.30 U	2.00 U	2.00 U	2.00 U	2.00 U	17.0 U	2.00 U	1.90 U	4.90	Eco
Heptachlor	0.990 U	0.980 U	0.980 U	0.980 U	0.990 U	0.980 U	1.90 U	0.990 U	0.970 U	480	HH
Heptachlor Epoxide	0.990 U	0.980 U	0.980 U	0.980 U	0.990 U	0.980 U	1.90 U	0.990 U	0.970 U	240	HH
Methoxychlor	9.90 U	9.80 U	9.80 U	9.80 U	9.90 U	9.80 U	19.0 U	9.90 U	9.70 U	500,000	Eco
Toxaphene	99.0 U	98.0 U	98.0 U	98.0 U	99.0 U	98.0 U	190 U	99.0 U	97.0 U	2,000	HH

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value

[1] Only Aroclors 1248, 1254, and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Landfill AOPC soil samples.
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed
-- = SLV for analyte not available
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV

Table 5-3b
2007 Upland Source Evaluation Soil Analytical Results
Semivolatile Organic Compounds

Site ID	BIL01USE	BIL02USE	BIL03USE	BIL04USE	BIL05USE	BIL06USE	BIL07USE	BIL08USE	BIL09USE	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	070410BIL01SS	070410BIL02SS	070410BIL03SS	070410BIL04SS	070410BIL05SS	070410BIL06SS	070410BIL07SS	070410BIL08SS	070410BIL09SS		
Sample Date	4/10/2007	4/10/2007	4/10/2007	4/10/2007	4/10/2007	4/10/2007	4/10/2007	4/10/2007	4/10/2007		
Sample Depth (Feet bgs)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
Semivolatile Organic Compounds (µg/kg dry)											
1,2,4-Trichlorobenzene	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	20,000	Eco
1,2-Dichlorobenzene	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	2,260	Eco
1,3-Dichlorobenzene	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	2,260	Eco
1,4-Dichlorobenzene	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	17,000	HH
2,4,5-Trichlorophenol	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	4,000	Eco
2,4,6-Trichlorophenol	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	10,000	Eco
2,4-Dichlorophenol	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	20,000	Eco
2,4-Dimethylphenol	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	20,000	Eco
2,4-Dinitrophenol	200 U	200 U	200 U	200 U	200 U	200 U	590 U	200 U	200 U	20,000	Eco
2,4-Dinitrotoluene	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	5,500	HH
2,6-Dinitrotoluene	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	240,000	HH
2-Chloronaphthalene	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	82,000,000	HH
2-Chlorophenol	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	60,000	Eco
2-Methylphenol	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	50,000	Eco
2-Nitroaniline	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	6,000,000	HH
2-Nitrophenol	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	180,000,000	HH
3,3'-Dichlorobenzidine	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	4,800	HH
3-Nitroaniline	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	70,000	Eco
4,6-Dinitro-2-methylphenol	200 U	200 U	200 U	200 U	200 U	200 U	590 U	200 U	200 U	49,000	HH
4-Bromophenyl Phenyl Ether	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	-	-
4-Chloro-3-methylphenol	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	62,000,000	HH
4-Chloroaniline	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	8,600	HH
4-Chlorophenyl Phenyl Ether	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	-	-
4-Nitroaniline	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	40,000	Eco
4-Nitrophenol	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	7,000	Eco
Benzoic Acid	200 U	200 U	200 U	200 U	200 U	**130 J**	590 U	200 U	**140 J**	200,000	Eco
Benzyl Alcohol	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	**14.0 J**	2,260	Eco
Bis(2-chloroethoxy)methane	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	730,000	Eco
Bis(2-chloroethyl) Ether	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	1,000	HH
Bis(2-chloroisopropyl) Ether	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	1,000	HH
Bis(2-ethylhexyl) Phthalate	**140**	**140**	**170**	**97.0**	**92.0**	**150**	**420**	**280**	**140**	4,500	Eco
Butyl Benzyl Phthalate	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	450	Eco
Carbazole	**14.0 J**	**21.0**	**18.0 J**	**78.0**	20.0 U	**21.0**	**210**	**35.0**	**16.0 J**	2,260	Eco
Dibenzofuran	20.0 U	20.0 U	20.0 U	**31.0**	20.0 U	20.0 U	**36.0 J**	20.0 U	20.0 U	2.00	Eco
Diethyl Phthalate	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	100,000	Eco
Dimethyl Phthalate	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	150,000	HH
Di-n-butyl Phthalate	20.0 U	20.0 U	20.0 U	**99.0**	**15.0 J**	**1,800**	59.0 U	20.0 U	**70.0**	450	Eco
Di-n-octyl Phthalate	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	450	Eco
Hexachlorobenzene	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	1,800	HH
Hexachlorobutadiene	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	22,000	HH
Hexachlorocyclopentadiene	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	10,000	Eco
Hexachloroethane	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	150,000	HH
Isophorone	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	1,800,000	HH
Nitrobenzene	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	8,000	Eco
N-Nitrosodimethylamine	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	34.0	HH
N-Nitrosodi-n-propylamine	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	250	HH
N-Nitrosodiphenylamine	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	20,000	Eco
p-cresol (4-Methylphenol)	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	50,000	Eco
Pentachlorophenol	99.0 U	98.0 U	98.0 U	99.0 U	99.0 U	99.0 U	300 U	98.0 U	99.0 U	2,100	Eco
Phenol	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	30,000	Eco
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)											
2-Methylnaphthalene	20.0 U	20.0 U	20.0 U	**11.0 J**	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	4,100,000	HH
Acenaphthene	**16.0 J**	**23.0**	**15.0 J**	**170**	20.0 U	**24.0**	**270**	**46.0**	20.0 U	19,000,000	HH
Acenaphthylene	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	23,000	HH
Anthracene	**35.0**	**65.0**	**30.0**	**180**	**15.0 J**	**34.0**	**740**	**110**	**30.0**	93,000,000	HH
Fluorene	20.0 U	**12.0 J**	20.0 U	**73.0**	20.0 U	**13.0 J**	**140**	**24.0**	**10.0 J**	12,000,000	HH
Naphthalene	20.0 U	20.0 U	20.0 U	**20.0**	20.0 U	20.0 U	59.0 U	20.0 U	20.0 U	23,000	HH
Phenanthrene	**180**	**300**	**200**	**1,500**	**66.0**	**180**	**3,000**	**550**	**160**	93,000,000	HH
Total LPAHs (KM, capped; NDs at MDL)	**279 J**	**424 J**	**290 J**	**1,963 J**	**141 J**	**277 J**	**4,268 J**	**770 J**	**230 J**	29,000	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)											
Benzo(a)anthracene	**530**	**960**	**330**	**1,000**	**78.0**	**250**	**4,500**	**1,000**	**180**	2,700	HH
Benzo(a)pyrene	**600**	**1,200**	**360**	**1,600**	**85.0**	**240**	**6,200**	**1,300**	**140**	270	HH
Benzo(b)fluoranthene	**680**	**1,200**	**420**	**1,600**	**110**	**310**	**8,200**	**1,500**	**170**	2,700	HH
Benzo(g,h,i)perylene	**280**	**530**	**210**	**870**	**67.0**	**160**	**1,800**	**480**	**75.0**	27,000	HH
Benzo(k)fluoranthene	**450**	**1,100**	**310**	**1,200**	**77.0**	**220**	**2,500**	**990**	**130**	27,000	HH
Chrysene	**670**	**1,200**	**450**	**1,300**	**96.0**	**280**	**5,900**	**1,400**	**190**	270,000	HH
Dibenz(a,h)anthracene	**71.0**	**150**	**55.0**	**240**	**29.0**	**76.0**	**730**	**160**	**18.0 J**	270	HH
Fluoranthene	**1,300**	**2,100**	**580**	**2,700**	**150**	**460**	**14,000**	**2,800**	**300**	8,900,000	HH
Indeno(1,2,3-cd)pyrene	**270**	**510**	**200**	**780**	**58.0**	**160**	**2,100**	**530**	**74.0**	2,700	HH
Pyrene	**1,200**	**2,400**	**730**	**3,100**	**130**	**360**	**9,100**	**2,900**	**240 J**	6,700,000	HH
Total HPAHs (KM, capped; NDs at MDL)	**6,051**	**11,350**	**3,645**	**14,390**	**880.0**	**2,516**	**55,030**	**13,060**	**1,517 J**	1,100	Eco

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed
-- = SLV for analyte not available
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV

Table 5-4a
2002 Sandblast Preliminary Assessment/Site Inspection Soil Analytical Results
Drum Storage Area
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, Herbicides, and Pesticides
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Site ID	DSA01	DSA02	DSA03	DSA04	DSA05	DSA06	DSA07	DSA08	DSA09	DSA10	DSA11*	DSA12*	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	011204DSA01SS	011204DSA02SS	011204DSA03SS	011204DSA04SS	011204DSA05SS	011204DSA06SS	011204DSA07SS	011204DSA08SS	011204DSA09SS	011204DSA10SS	011204DSA11SS	011204DSA12SS		
Sample Date	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001		
Sample Depth (Feet bgs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
PCB Aroclors (µg/kg dry)														
Aroclor 1016	1.20 U	1.09 U	1.22 U	1.24 U	1.08 U	1.22 U	1.14 U	1.09 U	1.22 U	1.19 U	1.21 U	1.25 U	371	Eco
Aroclor 1221	5.13 U	4.66 U	5.23 U	5.29 U	4.63 U	5.22 U	4.87 U	4.68 U	5.21 U	5.10 U	5.19 U	5.51 U	371	Eco
Aroclor 1232	4.09 U	3.72 U	4.18 U	4.22 U	3.69 U	4.17 U	3.89 U	3.73 U	4.16 U	4.07 U	4.15 U	4.28 U	371	Eco
Aroclor 1242	2.19 U	1.99 U	2.23 U	2.26 U	1.97 U	2.23 U	2.08 U	2.00 U	2.22 U	2.17 U	2.22 U	2.29 U	371	Eco
Aroclor 1248	5.44 U	4.94 U	5.55 U	5.62 U	4.91 U	5.54 U	5.17 U	4.96 U	5.53 U	5.41 U	5.51 U	5.70 U	371	Eco
Aroclor 1254	1.70 U	1.54 U	1.73 U	1.75 U	1.53 U	1.73 U	1.61 U	1.55 U	1.73 U	1.69 U	1.72 U	1.78 U	371	Eco
Aroclor 1260	**2.00 J**	1.54 U	**2.23 J**	**2.08 J**	**7.79 J**	**16.8**	1.61 U	1.55 U	**2.12 J**	**2.48 J**	**21.1**	**8.30 J**	371	Eco
Total PCBs as Aroclors (NDs at MDL)[1]	**3.70 J**	3.08 U	**3.96 J**	**3.83 J**	**9.32 J**	**18.5 J**	3.22 U	3.10 U	**3.85 J**	**4.17 J**	**22.7 J**	**10.1 J**	371	Eco
Metals (mg/kg dry)														
Aluminum	**4,160 J**	**5,570 J**	**5,440 J**	**7,310 J**	**5,840 J**	**5,860 J**	**5,180 J**	**6,020 J**	**6,350 J**	**5,550 J**	**4,710 J**	**9,340 J**	31,400	UPL
Antimony	2.99 U	2.83 U	3.38 U	**1.83 J**	**1.65 J**	3.08 U	2.96 U	3.19 U	3.29 U	3.11 U	**5.08**	3.17 U	0.270	Eco
Arsenic	**4.42**	**3.82**	**5.75**	**3.70**	**6.74**	**8.19**	**53.7**	**7.24**	**6.86**	**7.39**	**42.7**	**6.99**	5.40	UPL
Barium	**35.5**	**129**	**89.6**	**67.3**	**27.7**	**63.9**	**73.4**	**49.9**	**49.6**	**65.2**	**61.0**	**82.4**	330	Eco
Beryllium	0.180 U	**0.169 J**	0.182 U	**0.193 J**	0.169 U	**0.179 J**	0.160 U	**0.229 J**	0.177 U	0.168 U	0.169 U	**0.236 J**	21.0	Eco
Cadmium	**0.897**	**0.836**	**1.50**	**0.741**	**0.779**	**1.05**	**0.676**	**0.962**	**0.908**	**0.963**	**1.42**	**1.23**	0.360	Eco
Calcium	**2,980 J**	**4,240 J**	**3,430**	**3,620 J**	**4,180 J**	**4,940 J**	**2,910 J**	**4,550 J**	**4,110 J**	**4,430 J**	**7,315 J**	**4,610 J**	10,400	UPL
Chromium	**8.14**	**5.46**	**10.6 J**	**12.2**	**54.1**	**8.30**	**12.8**	**10.1**	**7.46**	**17.2**	**1,365**	**48.8**	28.1	UPL
Cobalt	**9.99**	**12.1**	**8.75**	**8.45**	**12.7**	**11.1**	**9.09**	**13.5**	**12.1**	**13.6**	**23.7**	**12.6**	19.9	UPL
Copper	**17.0**	**16.1**	**26.8**	**21.9**	**27.4**	**24.9**	**54.9**	**21.6**	**16.0**	**13.2**	**158**	**42.9**	56.7	UPL
Iron	**18,600**	**21,700**	**16,800 J**	**18,100**	**28,600**	**20,600**	**18,500**	**25,300**	**25,200**	**24,100**	**40,450**	**22,150**	36,900	UPL
Lead	**42.7**	**13.8**	**43.8 J**	**14.8**	**29.9**	**37.6**	**8.58**	**114**	**35.8**	**37.8**	**344**	**144**	25.5	UPL
Magnesium	**2,690 J**	**3,510 J**	**4,350 J**	**4,140 J**	**6,150 J**	**2,980 J**	**2,310 J**	**3,790 J**	**4,120 J**	**4,510 J**	**42,250 J**	**5,600 J**	12,400	UPL
Manganese	**270 J**	**385 J**	**234 J**	**235 J**	**289 J**	**367 J**	**259 J**	**484 J**	**313 J**	**324 J**	**711 J**	**464 J**	885	UPL
Mercury	**0.170**	**0.0951**	**0.0325 J**	**0.0313 J**	**0.0525**	0.0306 U	**0.0616**	0.0256 U	**0.294**	**0.393**	**0.0818**	**0.0389 J**	0.0660	UPL
Nickel	**4.79**	**5.73**	**13.6 J**	**12.1**	**23.5**	**6.81**	**6.22**	**7.71**	**5.79**	**10.4**	**477**	**33.3**	38.0	Eco
Potassium	**669**	**716**	**445 J**	**515**	**348 J**	**822**	**751**	**857**	**475**	**722**	**476 J**	**684**	2,050	UPL
Selenium	0.385 U	0.365 U	0.435 U	0.370 U	0.405 U	**0.478 J**	0.381 U	0.411 U	0.423 U	0.401 U	0.403 U	**0.424 J**	0.520	Eco
Silver	**0.149 J**	**0.149 J**	**0.198 J**	**0.162 J**	**0.119 J**	**0.155 J**	**0.103 J**	**0.145 J**	**0.142 J**	**0.165 J**	**0.214 J**	**0.163 J**	4.20	Eco
Sodium	162 U	137 U	163 U	139 U	152 U	149 U	143 U	154 U	159 U	150 U	151 U	153 U	341	UPL
Thallium	**0.239 J**	**0.136 J**	**0.229 J**	**0.105 J**	**0.0691 J**	**0.0913 J**	**0.117 J**	**0.122 J**	**0.102 J**	**0.150 J**	**0.0771 J**	**0.0969 J**	1.00	Eco
Vanadium	**41.6**	**47.9**	**39.4**	**42.9**	**69.0**	**41.6**	**37.9**	**49.4**	**64.2**	**69.7**	**30.5**	**52.6**	104	UPL
Zinc	**30.3 J**	**34.7 J**	**46.1**	**45.9 J**	**85.3 J**	**53.7 J**	**32.6 J**	**39.9 J**	**39.8 J**	**38.6 J**	**552 J**	**96.8 J**	71.7	UPL
Petroleum Hydrocarbons (mg/kg dry)														
Diesel Range Organics	**34.4**	13.4 U	13.6 U	13.1 U	13.5 U	**21.0 J**	**13.5 J**	12.5 U	**16.0 J**	**22.7 J**	**91.0**	**51.3**	23,000	HH
Residual Range Organics	**191**	26.9 U	**55.6**	**34.7 J**	**28.0 J**	**125**	26.9 U	24.9 U	**38.2 J**	**66.9**	**378**	**115**	40,000	HH
Gasoline Range Organics	4.35 U	4.18 U	4.43 U	4.26 U	4.03 U	4.55 U	4.34 U	4.23 U	4.60 U	**3.49 J**	4.41 U	4.46 U	13,000	HH
Butyltins (µg/kg dry)														
Dibutyltin	-	-	-	-	-	-	-	-	-	-	**74.3**	-	28,000	Eco
Monobutyltin	-	-	-	-	-	-	-	-	-	-	**55.6**	-	28,000	Eco
Tetrabutyltin	-	-	-	-	-	-	-	-	-	-	0.471 U	-	28,000	Eco
Tributyltin	-	-	-	-	-	-	-	-	-	-	**409**	-	28,000	Eco

Table 5-4a
2002 Sandblast Preliminary Assessment/Site Inspection Soil Analytical Results
Drum Storage Area
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, Herbicides, and Pesticides
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Site ID	DSA01	DSA02	DSA03	DSA04	DSA05	DSA06	DSA07	DSA08	DSA09	DSA10	DSA11*	DSA12*	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	011204DSA01SS	011204DSA02SS	011204DSA03SS	011204DSA04SS	011204DSA05SS	011204DSA06SS	011204DSA07SS	011204DSA08SS	011204DSA09SS	011204DSA10SS	011204DSA11SS	011204DSA12SS		
Sample Date	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001		
Sample Depth (Feet bgs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Herbicides (µg/kg dry)														
2,4,5-T	1.36 U	1.37 U	1.54 U	1.50 U	1.26 U	1.52 U	1.34 U	1.53 U	1.32 U	1.47 U	1.58 U	1.56 U	21.0	Eco
2,4,5-TP (Silvex)	1.98 U	2.00 U	2.26 U	2.20 U	1.84 U	2.22 U	1.96 U	2.24 U	1.93 U	2.15 U	2.31 U	2.29 U	21.0	Eco
2,4-D	0.512 U	0.516 U	0.582 U	5.68 U	0.476 U	0.573 U	0.506 U	0.579 U	0.499 U	0.556 U	0.596 U	0.591 U	21.0	Eco
2,4-DB	0.871 U	0.878 U	0.990 U	0.568 U	0.809 U	0.974 U	0.860 U	0.985 U	0.849 U	0.946 U	1.01 U	1.00 U	21.0	Eco
4-Nitrophenol	1.37 U	1.38 U	1.56 U	1.52 U	1.27 U	1.53 U	1.35 U	1.55 U	1.34 U	1.49 U	1.60 U	1.58 U	7,000	Eco
Dalapon	1.89 U	1.91 U	2.15 U	2.10 U	1.76 U	2.12 U	1.87 U	2.14 U	1.85 U	2.06 U	2.20 U	2.18 U	18,000,000	HH
Dicamba	1.51 U	1.52 U	1.71 U	1.67 U	1.40 U	1.69 U	1.49 U	1.71 U	1.47 U	1.64 U	1.76 U	1.74 U	18,000,000	HH
Dichloroprop	0.662 U	0.667 U	0.752 U	0.733 U	0.614 U	0.740 U	0.653 U	0.748 U	0.645 U	0.718 U	0.770 U	0.763 U	21.0	Eco
Dinoseb	0.512 U	0.516 U	0.582 U	0.568 U	0.476 U	0.573 U	0.506 U	0.579 U	0.499 U	0.556 U	0.596 U	0.591 U	620,000	HH
MCPA	0.936 U	0.943 U	1.06 U	1.04 U	0.868 U	1.05 U	0.923 U	1.06 U	0.912 U	1.02 U	1.09 U	1.08 U	21.0	Eco
MCPP	1.70 U	1.71 U	1.93 U	1.88 U	1.58 U	1.90 U	1.68 U	1.92 U	1.66 U	1.85 U	1.98 U	1.96 U	21.0	Eco
Pentachlorophenol	0.725 U	0.730 U	0.824 U	0.803 U	0.673 U	0.810 U	0.715 U	0.819 U	0.706 U	0.787 U	0.843 U	0.836 U	2,100	Eco
Pesticides (µg/kg dry)														
4,4'-DDD	0.192 U	0.207 U	0.217 U	0.201 U	0.185 U	0.219 U	0.201 U	0.209 U	0.203 U	0.206 U	0.386 U	2.25 U	21.0	Eco
4,4'-DDE	0.227 U	0.245 U	0.257 U	**0.604 J**	0.219 U	0.260 U	0.238 U	0.247 U	0.240 U	0.243 U	0.457 U	**2.44 J**	21.0	Eco
4,4'-DDT	**0.436 J**	0.275 U	**3.09**	**4.39**	**0.478 J**	0.292 U	0.268 U	0.278 U	0.270 U	0.274 U	0.514 U	**22.2 J**	21.0	Eco
Aldrin	0.425 U	0.458 U	0.482 U	0.446 U	0.410 U	0.487 U	0.446 U	0.436 U	0.450 U	0.456 U	0.856 U	1.12 U	4.90	Eco
BHC (alpha)	0.306 U	0.330 U	0.347 U	0.321 U	0.295 U	0.350 U	0.321 U	0.333 U	0.324 U	0.329 U	0.617 U	1.12 U	340	HH
BHC (beta)	0.417 U	0.450 U	0.473 U	0.438 U	0.402 U	0.477 U	0.438 U	0.454 U	0.441 U	0.448 U	0.840 U	1.12 U	960	HH
BHC (delta)	0.378 UJ	0.408 UJ	0.429 UJ	0.397 UJ	0.365 UJ	0.433 U	0.397 U	0.412 U	0.400 U	0.406 U	0.762 U	1.12 U	340	HH
BHC (gamma) Lindane	0.377 U	0.406 U	0.427 U	0.395 U	0.363 U	0.431 U	0.395 U	0.410 U	0.398 U	**2.17**	0.759 U	1.12 U	2,000	HH
Chlordane (technical)	1.39 U	1.50 U	1.57 U	1.46 U	1.34 U	1.59 U	1.46 U	1.51 U	1.47 U	1.49 U	2.79 U	11.2 U	7,200	HH
Dieldrin	0.323 U	0.348 U	**0.823 J**	**0.428 J**	0.312 U	0.370 U	0.339 U	0.352 U	0.342 U	0.347 U	0.651 U	2.25 U	4.90	Eco
Endosulfan I	0.420 U	0.452 U	0.476 U	0.441 U	0.405 U	0.480 U	0.440 U	0.457 U	0.444 U	0.450 U	0.845 U	1.12 U	20,000	Eco
Endosulfan II	0.381 U	0.411 U	0.432 U	0.400 U	0.367 U	0.436 U	0.400 U	0.415 U	0.403 U	0.409 U	**0.960 J**	2.25 U	20,000	Eco
Endosulfan Sulfate	**0.577 J**	0.387 U	0.406 U	0.377 U	0.346 U	0.410 U	0.376 U	0.390 U	0.379 U	0.385 U	0.722 U	2.25 U	20,000	Eco
Endrin	0.356 UJ	0.383 UJ	0.403 UJ	0.373 UJ	0.343 UJ	0.407 U	0.373 U	0.387 U	0.376 U	0.382 U	0.716 U	2.25 U	4.90	Eco
Endrin Aldehyde	0.402 U	0.433 U	0.455 U	**2.02 J**	0.387 U	0.460 U	0.422 U	0.437 U	0.425 U	0.431 U	0.809 U	2.25 U	4.90	Eco
Endrin Ketone	0.277 U	0.299 U	0.314 U	0.291 U	0.367 U	0.317 U	0.291 U	0.301 U	0.293 U	**1.87 J**	**2.53 J**	**3.61 J**	4.90	Eco
Heptachlor	0.339 U	0.366 U	0.385 U	0.356 U	0.327 U	0.388 U	0.356 U	0.369 U	0.359 U	0.364 U	0.683 U	1.12 U	480	HH
Heptachlor Epoxide	0.360 U	0.388 U	0.408 U	0.378 U	0.347 U	0.412 U	0.378 U	0.392 U	0.381 U	0.386 U	0.725 U	1.12 U	240	HH
Methoxychlor	1.36 U	1.46 U	1.54 U	1.42 U	1.31 U	1.55 U	1.42 U	1.48 U	1.44 U	1.46 U	2.73 U	11.2 U	500,000	Eco
Toxaphene	6.18 U	6.66 U	7.00 U	6.48 U	5.95 U	7.07 U	6.48 U	6.72 U	6.53 U	6.63 U	12.4 U	112 U	2,000	HH

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit

[1] Only Aroclors 1254 and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Sandlbast Area AOPC soil samples.
- = Not Analyzed
-- = SLV for analyte not available
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-4b
2002 Sandblast Preliminary Assessment/Site Inspection Soil Analytical Results
Drum Storage and Sandblast Areas
Volatile Organic Compounds
(Page 1 of 2)

Site ID	DSA01	DSA02	DSA03	DSA04	DSA05	DSA06	Selected SLV (0-3 ft bgs)	SLV Source (0-3 ft bgs)
Sample ID	011204DSA01SS	011204DSA02SS	011204DSA03SS	011204DSA04SS	011204DSA05SS	011204DSA06SS		
Sample Date	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001		
Sample Depth (Feet bgs)	0.0	0.0	0.0	0.0	0.0	0.0		
Volatile Organic Compounds (µg/kg dry)								
1,1,1,2-Tetrachloroethane	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	9,300	HH
1,1,1-Trichloroethane (TCA)	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	38,000,000	HH
1,1,2,2-Tetrachloroethane	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	2,800	HH
1,1,2-Trichloroethane	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	2,700	HH
1,1-Dichloroethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	5,900	HH
1,1-Dichloroethene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	680,000	HH
1,1-Dichloropropene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	8,100	HH
1,2,3-Trichlorobenzene	2.00 U	2.00 U	3.00 U	2.00 U	2.00 U	2.00 U	20,000	Eco
1,2,3-Trichloropropane	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	95.0	HH
1,2,4-Trichlorobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	20,000	Eco
1,2,4-Trimethylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	200,000	Eco
1,2-Dibromo-3-chloropropane	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	69.0	HH
1,2-Dibromoethane (EDB)	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	140	HH
1,2-Dichlorobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,260	Eco
1,2-Dichloroethane (EDC)	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	590	HH
1,2-Dichloropropane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	4,500	HH
1,3,5-Trimethylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	150,000	HH
1,3-Dichlorobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,260	Eco
1,3-Dichloropropane	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	20,000,000	HH
1,4-Dichlorobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	17,000	HH
2,2-Dichloropropane	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	4,500	HH
2-Butanone (MEK)	15.0 U	15.0 U	15.0 U	15.0 U	15.0 U	15.0 U	200,000,000	HH
2-Chlorotoluene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	20,000,000	HH
2-Hexanone	10.0 UJ	10.0 UJ	10.0 UJ	10.0 UJ	10.0 UJ	10.0 UJ	1,250,000	Eco
4-Chlorotoluene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	72,000,000	HH
4-Isopropyltoluene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	200,000	Eco
4-Methyl-2-pentanone (MIBK)	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	1,250,000	Eco
Acetone	15.0 U	15.0 U	15.0 U	15.0 U	15.0 U	15.0 U	1,250,000	Eco
Benzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,200	HH
Bromobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,800,000	HH
Bromochloromethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1,900	HH
Bromodichloromethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1,900	HH
Bromoform	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	360,000	HH
Bromomethane	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	17,000	HH
Carbon Disulfide	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	1,000,000	Eco
Carbon Tetrachloride	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	630	HH
Chlorobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	40,000	Eco
Chloroethane	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	61,000,000	HH
Chloroform	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	410	HH
Chloromethane	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	300,000	HH
cis-1,2-Dichloroethene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,500,000	Eco
cis-1,3-Dichloropropene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	8,100	HH
Dibromochloromethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	34,000	HH
Dibromomethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	110,000	HH
Dichlorodifluoromethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	730,000	Eco
Dichloromethane (Methylene Chloride)	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	20,000	HH
Ethylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,260	Eco
Hexachlorobutadiene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	22,000	HH
Isopropylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,260	Eco
m,p-Xylenes	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	120,000	Eco
Naphthalene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	23,000	HH
n-Butylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	-	-
n-Propylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,260	Eco
o-Xylene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,000	Eco
sec-Butylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,260	Eco
Styrene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	300,000	Eco
tert-Butylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,260	Eco
Tetrachloroethene (PCE)	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,600	HH
Toluene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	200,000	Eco
trans-1,2-Dichloroethene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	200,000	HH
trans-1,3-Dichloropropene	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	8,100	HH
Trichloroethene (TCE)	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	130	HH
Trichlorofluoromethane	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	730,000	Eco
Vinyl Acetate	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	4,100,000	HH
Vinyl Chloride	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,200	HH

Notes:

µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed

-- = SLV for analyte not available
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-4b
2002 Sandblast Preliminary Assessment/Site Inspection Soil Analytical Results
Drum Storage and Sandblast Areas
Volatile Organic Compounds
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Site ID	DSA07	DSA08	DSA09	DSA10	DSA11*	DSA12*	SBB18	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	011204DSA07SS	011204DSA08SS	011204DSA09SS	011204DSA10SS	011204DSA11SS	011204DSA12SS	011205SBB20SS		
Sample Date	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/5/2001		
Sample Depth (Feet bgs)	0.0	0.0	0.0	0.0	0.0	0.0	2.5		
Volatile Organic Compounds (µg/kg dry)									
1,1,1,2-Tetrachloroethane	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	1,200 U	9,300	HH
1,1,1-Trichloroethane (TCA)	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1,800 U	38,000,000	HH
1,1,2,2-Tetrachloroethane	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	2,500 U	2,800	HH
1,1,2-Trichloroethane	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	2,500 U	2,700	HH
1,1-Dichloroethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	2,500 U	5,900	HH
1,1-Dichloroethene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	3,000 U	680,000	HH
1,1-Dichloropropene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	2,500 U	8,100	HH
1,2,3-Trichlorobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,800 U	20,000	Eco
1,2,3-Trichloropropane	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	2,800 U	95.0	HH
1,2,4-Trichlorobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,800 U	20,000	Eco
1,2,4-Trimethylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	**12,000**	200,000	Eco
1,2-Dibromo-3-chloropropane	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3,800 U	69.0	HH
1,2-Dibromoethane (EDB)	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	1,800 U	140	HH
1,2-Dichlorobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,500 U	2,260	Eco
1,2-Dichloroethane (EDC)	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1,800 U	590	HH
1,2-Dichloropropane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	2,500 U	4,500	HH
1,3,5-Trimethylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	**6,500**	150,000	HH
1,3-Dichlorobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,800 U	2,260	Eco
1,3-Dichloropropane	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	2,500 U	20,000,000	HH
1,4-Dichlorobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,500 U	17,000	HH
2,2-Dichloropropane	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,500 U	4,500	HH
2-Butanone (MEK)	15.0 U	15.0 U	15.0 U	15.0 U	15.0 U	15.0 U	12,000 U	200,000,000	HH
2-Chlorotoluene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,800 U	20,000,000	HH
2-Hexanone	10.0 UJ	10.0 UJ	10.0 UJ	10.0 UJ	10.0 UJ	10.0 UJ	7,500 U	1,250,000	Eco
4-Chlorotoluene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,800 U	72,000,000	HH
4-Isopropyltoluene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,800 U	200,000	Eco
4-Methyl-2-pentanone (MIBK)	10.0 U	10.0 U	10.0 U	10.0 U	2.00 U	10.0 U	10,000 U	1,250,000	Eco
Acetone	15.0 U	15.0 U	15.0 U	15.0 U	15.0 U	15.0 U	10,000 U	1,250,000	Eco
Benzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,500 U	1,200	HH
Bromobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,800 U	1,800,000	HH
Bromochloromethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1,900 U	1,900	HH
Bromodichloromethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	2,500 U	1,900	HH
Bromoform	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	2,500 U	360,000	HH
Bromomethane	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	6,200 UJ	17,000	HH
Carbon Disulfide	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	2,500 UJ	1,000,000	Eco
Carbon Tetrachloride	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1,500 U	630	HH
Chlorobenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,500 U	40,000	Eco
Chloroethane	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	6,200 UJ	61,000,000	HH
Chloroform	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1,800 U	410	HH
Chloromethane	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	5,000 UJ	300,000	HH
cis-1,2-Dichloroethene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,500 U	2,500,000	Eco
cis-1,3-Dichloropropene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	2,500 U	8,100	HH
Dibromochloromethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	2,500 U	34,000	HH
Dibromomethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	2,800 U	110,000	HH
Dichlorodifluoromethane	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	4,200 U	730,000	Eco
Dichloromethane (Methylene Chloride)	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	2.00 U	1,200 U	20,000	HH
Ethylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,800 U	2,260	Eco
Hexachlorobutadiene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,800 U	22,000	HH
Isopropylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	3,000 U	2,260	Eco
m,p-Xylenes	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	**7,400**	120,000	Eco
Naphthalene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,500 U	23,000	HH
n-Butylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,800 U	-	-
n-Propylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,800 U	2,260	Eco
o-Xylene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	**3,200 J**	1,000	Eco
sec-Butylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,800 U	2,260	Eco
Styrene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2,500 U	300,000	Eco
tert-Butylbenzene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,800 U	2,260	Eco
Tetrachloroethene (PCE)	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	**3.10 J**	**420,000**	1,600	HH
Toluene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	**39,000**	200,000	Eco
trans-1,2-Dichloroethene	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	3,000 U	200,000	HH
trans-1,3-Dichloropropene	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	3.00 U	1,800 U	8,100	HH
Trichloroethene (TCE)	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	**3,200 J**	130	HH
Trichlorofluoromethane	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	1,800 UJ	730,000	Eco
Vinyl Acetate	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	6,200 U	4,100,000	HH
Vinyl Chloride	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	3,800 U	2,200	HH

Notes:
µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed

-- = SLV for analyte not available
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-4c
2002 Sandblast Preliminary Assessment/Site Inspection Soil Analytical Results
Drum Storage Area
Semivolatile Organic Compounds
(Page 1 of 2)

Site ID	DSA01	DSA02	DSA03	DSA04	DSA05	DSA06	Selected SLV (0-3 ft bgs)	SLV Source (0-3 ft bgs)
Sample ID	011204DSA01SS	011204DSA02SS	011204DSA03SS	011204DSA04SS	011204DSA05SS	011204DSA06SS		
Sample Date	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001		
Sample Depth (Feet bgs)	0.0	0.0	0.0	0.0	0.0	0.0		
Semivolatile Organic Compounds (µg/kg dry)								
1,2,4-Trichlorobenzene	1.02 U	0.972 U	1.09 U	1.17 U	1.16 U	1.24 U	20,000	Eco
1,2-Dichlorobenzene	1.26 U	1.21 U	1.35 U	1.46 U	1.43 U	1.54 U	2,260	Eco
1,3-Dichlorobenzene	1.72 U	1.64 U	1.84 U	1.98 U	1.95 U	2.09 U	2,260	Eco
1,4-Dichlorobenzene	1.96 U	1.87 U	2.10 U	2.26 U	2.23 U	2.39 U	17,000	HH
2,4,5-Trichlorophenol	2.21 U	2.11 U	2.36 U	2.54 U	2.51 U	2.68 U	4,000	Eco
2,4,6-Trichlorophenol	1.63 UJ	1.56 UJ	1.74 UJ	1.88 UJ	1.85 UJ	1.98 UJ	10,000	Eco
2,4-Dichlorophenol	1.35 U	1.29 U	1.44 U	1.56 U	1.53 U	1.64 U	20,000	Eco
2,4-Dimethylphenol	1.35 U	1.29 U	1.44 U	1.56 U	1.53 U	1.64 U	20,000	Eco
2,4-Dinitrophenol	2.95 U	2.81 U	3.15 U	3.39 U	3.34 U	3.58 U	20,000	Eco
2,4-Dinitrotoluene	1.60 U	1.52 U	1.70 U	1.84 U	1.81 U	1.94 U	5,500	HH
2,6-Dinitrotoluene	2.21 UJ	2.11 UJ	2.36 UJ	2.54 UJ	2.51 UJ	2.68 UJ	240,000	HH
2-Chloronaphthalene	0.368 U	0.351 U	0.393 U	0.424 U	0.418 U	0.447 U	82,000,000	HH
2-Chlorophenol	1.84 U	1.76 U	1.97 U	2.12 U	2.09 U	2.24 U	60,000	Eco
2-Methylphenol	1.47 U	1.40 U	1.57 U	1.70 U	1.67 U	1.79 U	50,000	Eco
2-Nitroaniline	1.60 U	1.52 U	1.70 U	1.84 U	1.81 U	1.94 U	6,000,000	HH
2-Nitrophenol	1.72 U	1.64 U	1.84 U	1.98 U	1.95 U	2.09 U	180,000,000	HH
3,3'-Dichlorobenzidine	1.35 U	1.29 U	1.44 U	1.56 U	1.53 U	1.64 U	4,800	HH
3-Nitroaniline	2.09 U	1.99 U	2.23 U	2.40 U	2.37 U	2.53 U	70,000	Eco
4,6-Dinitro-2-methylphenol	1.51 U	4.33 U	4.85 U	5.23 U	5.15 U	5.52 U	49,000	HH
4-Bromophenyl Phenyl Ether	1.63 U	1.56 U	1.74 U	1.88 U	1.85 U	1.98 U	-	-
4-Chloro-3-methylphenol	1.35 U	1.29 U	1.44 U	1.56 U	1.53 U	1.64 U	62,000,000	HH
4-Chloroaniline	1.14 U	1.09 U	1.22 U	1.31 U	1.30 U	1.39 U	8,600	HH
4-Chlorophenyl Phenyl Ether	2.06 U	1.97 U	2.20 U	2.37 U	2.34 U	2.50 U	-	-
4-Nitroaniline	2.09 U	1.99 U	2.23 U	2.40 U	2.37 U	2.53 U	40,000	Eco
4-Nitrophenol	2.33 U	2.22 U	2.49 U	2.69 U	2.65 U	2.83 U	7,000	Eco
Aniline	6.14 U	5.85 U	6.56 U	7.07 U	6.96 U	7.45 U	200,000	Eco
Benzidine	2.32 UJ	2.21 UJ	2.48 UJ	2.67 UJ	2.63 UJ	2.82 UJ	55,000	HH
Benzoic Acid	**88.5 J**	**38.5 J**	4.46 U	**50.6 J**	**40.8 J**	**26.7 J**	200,000	Eco
Benzyl Alcohol	2.58 U	2.46 U	2.75 U	2.97 U	2.92 U	3.13 U	2,260	Eco
Bis(2-chloroethoxy)methane	1.47 U	1.40 U	1.57 U	1.70 U	1.67 U	1.79 U	730,000	Eco
Bis(2-chloroethyl) Ether	2.34 UJ	2.24 UJ	2.50 UJ	2.70 UJ	2.66 UJ	2.85 UJ	1,000	HH
Bis(2-chloroisopropyl) Ether	3.19 UJ	3.04 UJ	3.41 UJ	3.68 UJ	3.62 UJ	3.88 UJ	1,000	HH
Bis(2-ethylhexyl) Phthalate	61.7 UJ	29.3 U	48.1 UJ	35.3 U	**1,040**	160 UJ	4,500	Eco
Butyl Benzyl Phthalate	2.33 U	2.22 U	2.49 U	2.69 U	**9.05 J**	2.83 U	450	Eco
Carbazole	4.79 U	4.57 U	5.11 U	5.51 U	5.43 U	5.81 U	2,260	Eco
Dibenzofuran	1.42 U	**1.40 J**	1.52 U	1.64 U	**1.67 J**	**2.24 J**	2.00	Eco
Diethyl Phthalate	2.09 U	1.99 U	2.23 U	2.40 U	2.37 U	2.53 U	100,000	Eco
Dimethyl Phthalate	1.35 U	1.29 U	1.44 U	1.56 U	1.53 U	1.64 U	150,000	HH
Di-n-butyl Phthalate	61.4 UJ	58.5 UJ	65.6 UJ	70.7 UJ	141 UJ	130 UJ	450	Eco
Di-n-octyl Phthalate	3.19 U	3.04 U	3.41 U	3.68 U	3.62 U	3.88 U	450	Eco
Hexachlorobenzene	1.35 U	1.29 U	1.44 U	1.56 U	1.53 U	1.64 U	1,800	HH
Hexachlorobutadiene	1.10 U	1.05 U	1.18 U	1.27 U	1.25 U	1.34 U	22,000	HH
Hexachlorocyclopentadiene	1.73 UJ	1.65 UJ	1.85 UJ	1.99 UJ	1.96 UJ	2.10 UJ	10,000	Eco
Hexachloroethane	2.33 U	2.22 U	2.49 U	2.69 U	2.65 U	2.83 U	150,000	HH
Isophorone	1.72 U	1.64 U	1.84 U	1.98 U	1.95 U	2.09 U	1,800,000	HH
Nitrobenzene	1.68 U	1.60 U	1.80 U	1.94 U	1.91 U	2.04 U	8,000	Eco
N-Nitrosodimethylamine	1.35 U	1.29 U	1.05 U	1.56 U	1.53 U	1.64 U	34.0	HH
N-Nitrosodi-n-propylamine	1.35 U	1.29 U	1.44 U	1.56 U	1.53 U	1.64 U	250	HH
N-Nitrosodiphenylamine	0.982 U	0.937 U	1.44 U	1.13 U	1.11 U	1.19 U	20,000	Eco
p-cresol (4-Methylphenol)	1.82 U	1.73 U	1.94 U	2.09 U	2.06 U	2.21 U	-	-
Pentachlorophenol	2.58 UJ	2.46 UJ	2.75 UJ	2.97 UJ	2.92 UJ	3.13 UJ	2,100	Eco
Phenol	2.45 U	2.34 U	2.62 U	2.83 U	2.79 U	2.98 U	30,000	Eco
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)								
2-Methylnaphthalene	0.191 U	0.183 U	0.205 U	0.221 U	0.217 U	**2.98**	4,100,000	HH
Acenaphthene	0.607 U	**6.44**	0.649 U	0.700 U	**4.46**	0.738 U	19,000,000	HH
Acenaphthylene	0.535 U	0.510 U	**3.67**	0.616 U	0.607 U	0.650 U	23,000	HH
Anthracene	**1.72**	**4.21**	**5.25**	0.356 U	**9.19**	**11.3**	93,000,000	HH
Fluorene	0.573 U	**2.46**	**3.02**	0.660 U	**3.06**	**7.01**	12,000,000	HH
Naphthalene	0.574 U	0.548 U	**1.70**	0.662 U	**1.95**	**4.17**	23,000	HH
Phenanthrene	**5.64**	**19.4**	**21.8**	**5.80**	**31.3**	**49.8**	93,000,000	HH
Total LPAHs (KM, capped; NDs at MDL)	**9.50 J**	**33.5 J**	**36.1 J**	**8.79 J**	**50.6 J**	**73.6 J**	29,000	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)								
Benzo(a)anthracene	0.749 U	**15.0**	**15.6**	**3.96**	**66.6**	**29.5**	2,700	HH
Benzo(a)pyrene	**10.2**	**20.4**	**20.3**	**7.49**	**151**	**43.5**	270	HH
Benzo(g,h,i)perylene	0.202 U	**9.72**	0.216 U	0.233 U	**107**	0.246 U	27,000	HH
Benzofluoranthenes, Total	**13.5**	**26.3**	**35.8**	**10.2**	**175**	**74.2**	2,700	HH
Chrysene	**6.50**	**16.3**	**22.8**	**6.36**	**68.4**	**45.9**	270,000	HH
Dibenz(a,h)anthracene	0.286 U	0.273 U	0.306 U	0.329 U	**25.8**	0.347 U	270	HH
Fluoranthene	**8.47**	**31.6**	**35.4**	**10.0**	**75.9**	**62.9**	8,900,000	HH
Indeno(1,2,3-cd)pyrene	0.286 U	**11.1**	**14.3**	**3.68**	**97.8**	0.347 U	2,700	HH
Pyrene	**11.0**	**31.0**	**32.3**	**10.0**	**83.8**	**68.6**	6,700,000	HH
Total HPAHs (KM, capped; NDs at MDL)	**37.0 J**	**135 J**	**141 J**	**42.0 J**	**676**	**251 J**	1,100	Eco

Notes:

µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed

-- = SLV for analyte not available
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-4c
2002 Sandblast Preliminary Assessment/Site Inspection Soil Analytical Results
Drum Storage Area
Semivolatile Organic Compounds
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Site ID	DSA07	DSA08	DSA09	DSA10	DSA11*	DSA12*	SBB18	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	011204DSA07SS	011204DSA08SS	011204DSA09SS	011204DSA10SS	011204DSA11SS	011204DSA12SS	011205SBB20SS		
Sample Date	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/5/2001		
Sample Depth (Feet bgs)	0.0	0.0	0.0	0.0	0.0	0.0	2.5		
Semivolatile Organic Compounds (µg/kg dry)									
1,2,4-Trichlorobenzene	1.08 U	1.01 U	1.20 U	12.1 U	10.6 U	1.32 U	-	20,000	Eco
1,2-Dichlorobenzene	1.34 U	1.26 U	1.49 U	15.1 U	13.1 U	1.64 U	-	2,260	Eco
1,3-Dichlorobenzene	1.82 U	1.71 U	2.02 U	20.5 U	17.8 U	2.22 U	-	2,260	Eco
1,4-Dichlorobenzene	2.08 U	1.95 U	2.31 U	23.4 U	20.4 U	2.54 U	-	17,000	HH
2,4,5-Trichlorophenol	2.34 U	2.20 U	2.60 U	26.3 UJ	25.9 U	2.86 U	-	4,000	Eco
2,4,6-Trichlorophenol	1.73 UJ	1.63 UJ	1.92 UJ	19.5 UJ	19.1 UJ	2.11 UJ	-	10,000	Eco
2,4-Dichlorophenol	1.43 U	1.34 U	1.59 U	16.1 UJ	15.8 U	1.75 U	-	20,000	Eco
2,4-Dimethylphenol	1.43 U	1.34 U	1.59 U	16.1 UJ	15.8 U	1.75 U	-	20,000	Eco
2,4-Dinitrophenol	3.12 U	2.93 U	3.46 U	35.1 UJ	34.5 U	3.81 U	-	20,000	Eco
2,4-Dinitrotoluene	1.69 U	1.59 U	1.88 U	19.0 U	16.5 U	2.07 U	-	5,500	HH
2,6-Dinitrotoluene	2.34 UJ	2.20 UJ	2.60 UJ	26.3 UJ	22.9 UJ	2.86 UJ	-	240,000	HH
2-Chloronaphthalene	0.390 U	0.367 U	0.433 U	4.39 U	3.82 U	0.477 U	-	82,000,000	HH
2-Chlorophenol	1.95 U	1.83 U	2.17 U	21.9 UJ	21.5 U	2.38 U	-	60,000	Eco
2-Methylphenol	1.56 U	1.47 U	1.73 U	17.6 UJ	17.2 U	1.91 U	-	50,000	Eco
2-Nitroaniline	1.69 U	1.59 U	1.88 U	19.0 U	16.5 U	2.07 U	-	6,000,000	HH
2-Nitrophenol	1.82 U	1.71 U	2.02 U	20.5 UJ	20.1 U	2.22 U	-	180,000,000	HH
3,3'-Dichlorobenzidine	1.43 U	1.34 U	1.59 U	16.1 U	14.0 U	1.75 U	-	4,800	HH
3-Nitroaniline	2.21 U	2.08 U	2.45 U	24.9 U	21.6 U	2.70 U	-	70,000	Eco
4,6-Dinitro-2-methylphenol	4.81 U	4.52 U	5.34 U	54.1 UJ	53.2 U	5.88 U	-	49,000	HH
4-Bromophenyl Phenyl Ether	1.73 U	1.63 U	1.92 U	19.5 U	16.9 U	2.11 U	-	-	-
4-Chloro-3-methylphenol	1.43 U	1.34 U	1.59 U	16.1 UJ	15.8 U	1.75 U	-	62,000,000	HH
4-Chloroaniline	1.21 U	1.14 U	1.34 U	13.6 U	11.8 U	1.48 U	-	8,600	HH
4-Chlorophenyl Phenyl Ether	2.19 U	2.05 U	2.43 U	24.6 U	21.4 U	2.67 U	-	-	-
4-Nitroaniline	2.21 U	2.08 U	2.45 U	24.9 U	21.6 U	2.70 U	-	40,000	Eco
4-Nitrophenol	2.47 U	2.32 U	2.74 U	27.8 UJ	27.3 U	3.02 U	-	7,000	Eco
Aniline	6.50 U	6.11 U	7.22 U	73.2 U	63.7 U	7.95 U	-	200,000	Eco
Benzidine	2.46 UJ	2.31 UJ	2.73 UJ	27.7 UJ	24.1 UJ	3.00 UJ	-	55,000	HH
Benzoic Acid	4.42 U	4.15 U	**15.3 J**	49.7 U	43.3 U	5.40 U	-	200,000	Eco
Benzyl Alcohol	2.73 U	2.57 U	3.03 U	30.7 U	26.7 U	3.34 U	-	2,260	Eco
Bis(2-chloroethoxy)methane	1.56 U	1.47 U	1.73 U	17.6 U	15.3 U	1.91 U	-	730,000	Eco
Bis(2-chloroethyl) Ether	2.48 UJ	2.33 UJ	2.76 UJ	27.9 UJ	24.3 UJ	3.04 UJ	-	1,000	HH
Bis(2-chloroisopropyl) Ether	3.38 UJ	3.18 UJ	3.75 UJ	38.0 UJ	33.1 UJ	4.13 UJ	-	1,000	HH
Bis(2-ethylhexyl) Phthalate	32.5 U	88.6 UJ	151 UJ	366 U	**20,100**	**1,500**	**21,600 J**	4,500	Eco
Butyl Benzyl Phthalate	2.47 U	**3.67 J**	2.74 U	27.8 U	**125 J**	**15.7 J**	-	450	Eco
Carbazole	5.07 U	4.77 U	5.63 UJ	57.1 U	**157 J**	**240 J**	-	2,260	Eco
Dibenzofuran	1.51 U	1.42 U	**3.03 J**	17.0 U	**35.4 J**	**141 J**	**485 J**	2.00	Eco
Diethyl Phthalate	2.21 U	2.08 U	2.45 U	24.9 U	21.6 U	2.70 U	-	100,000	Eco
Dimethyl Phthalate	1.43 U	1.34 U	1.59 U	16.1 U	14.0 U	1.75 U	-	150,000	HH
Di-n-butyl Phthalate	65.0 UJ	61.1 UJ	72.2 UJ	127 UJ	637 UJ	131 UJ	-	450	Eco
Di-n-octyl Phthalate	3.38 U	3.18 U	**11.3 J**	38.0 U	33.1 U	**31.0**	-	450	Eco
Hexachlorobenzene	1.43 U	1.34 U	1.59 U	16.1 U	14.0 U	1.75 U	-	1,800	HH
Hexachlorobutadiene	1.17 U	1.10 U	1.30 U	13.2 U	11.5 U	1.43 U	-	22,000	HH
Hexachlorocyclopentadiene	1.83 UJ	1.72 UJ	2.04 UJ	20.6 UJ	17.9 UJ	2.24 UJ	-	10,000	Eco
Hexachloroethane	2.47 U	2.32 U	2.74 U	27.8 U	24.2 U	3.02 U	-	150,000	HH
Isophorone	1.82 U	1.71 U	2.02 U	20.5 U	17.8 U	2.22 U	-	1,800,000	HH
Nitrobenzene	1.78 U	1.67 U	1.98 U	20.0 U	17.4 U	2.18 U	-	8,000	Eco
N-Nitrosodimethylamine	1.43 U	1.34 U	1.59 U	16.1 U	14.0 U	1.75 U	-	34.0	HH
N-Nitrosodi-n-propylamine	1.43 U	1.34 U	1.59 U	16.1 U	14.0 U	1.75 U	-	250	HH
N-Nitrosodiphenylamine	1.04 U	0.977 U	1.15 U	11.7 U	10.2 U	1.27 U	-	20,000	Eco
p-cresol (4-Methylphenol)	1.93 U	1.81 U	2.14 U	21.7 UJ	21.3 U	2.35 U	-	-	-
Pentachlorophenol	2.73 UJ	2.57 UJ	3.03 UJ	30.7 UJ	30.2 UJ	3.34 UJ	-	2,100	Eco
Phenol	2.60 U	2.44 U	2.89 U	29.3 UJ	28.7 U	3.18 U	-	30,000	Eco
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)									
2-Methylnaphthalene	0.203 U	0.191 U	0.225 U	2.28 U	**22.9**	**150**	**124 J**	4,100,000	HH
Acenaphthene	**2.60**	**2.81**	**15.4**	**29.3**	**132**	**470**	**3,200 J**	19,000,000	HH
Acenaphthylene	0.567 U	0.533 U	0.629 U	6.38 U	**27.6**	**87.7**	**295 J**	23,000	HH
Anthracene	**2.08**	**2.20**	**18.0**	**80.5**	**304**	**822**	**2,040 J**	93,000,000	HH
Fluorene	**1.69**	**1.83**	**7.65**	**24.9**	**94.6**	**463**	**779 J**	12,000,000	HH
Naphthalene	0.609 U	0.572 U	0.676 U	6.85 U	**26.9**	**227**	**256 J**	23,000	HH
Phenanthrene	**11.3**	**13.6**	**59.0**	**345**	**1,054**	**3,020**	**6,550 J**	93,000,000	HH
Total LPAHs (KM, capped; NDs at MDL)	**18.8 J**	**21.5 J**	**101 J**	**492 J**	**1,639**	**5,089**	**13,120 J**	29,000	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)									
Benzo(a)anthracene	**7.28**	**16.5**	**46.3**	**398**	**1,640**	**1,325**	**12,300 J**	2,700	HH
Benzo(a)pyrene	**14.0**	**25.4**	**52.0**	**435**	**2,045**	**1,580**	**11,700 J**	270	HH
Benzo(g,h,i)perylene	**6.89**	**13.7**	**21.2**	**195**	**1,015**	**559**	**3,350 J**	27,000	HH
Benzofluoranthenes, Total	**17.8**	**36.3**	**72.2**	**682**	**2,835**	**1,850**	**16,300 J**	2,700	HH
Chrysene	**9.89**	**20.3**	**56.6**	**465**	**1,640**	**1,620**	**12,000 J**	270,000	HH
Dibenz(a,h)anthracene	0.303 U	0.285 U	0.336 U	3.41 U	**418**	**216**	**1,080 J**	270	HH
Fluoranthene	**19.0**	**27.2**	**98.2**	**806**	**2,290**	**2,610**	**28,600 J**	8,900,000	HH
Indeno(1,2,3-cd)pyrene	**7.02**	**14.3**	**21.1**	**202**	**998**	**547**	**4,170 J**	2,700	HH
Pyrene	**21.2**	**35.1**	**106**	**844**	**2,480**	**3,485**	**32,000 J**	6,700,000	HH
Total HPAHs (KM, capped; NDs at MDL)	**85.6 J**	**153 J**	**402 J**	**3,348 J**	**12,525**	**11,941**	**105,200 J**	1,100	Eco

Notes:
µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed

-- = SLV for analyte not available
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-4d
2002 Sandblast Preliminary Assessment/Site Inspection Soil and Sandblast Grit Analytical Results
Sandblast Area
PCB Aroclors, Metals, Petroleum Hydrocarbons, and Butyltins
(Page 1 of 2)

Site ID	SBB01*	SBB03	SBB04	SBB05	SBB06	SBB07*	SBB09	SBB10	SBB11	SBB12	SBB13	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	011205SBB01SBG	011205SBB03SBG	011205SBB04SBG	011205SBB05SBG	011205SBB06SBG	011205SBB07SBG	011205SBB09SBG	011205SBB10SBG	011205SBB11SBG	011205SBB12SBG	011205SBB13SBG		
Sample Date	12/5/2001	12/5/2001	12/5/2001	12/5/2001	12/5/2001	12/5/2001	12/5/2001	12/5/2001	12/5/2001	12/5/2001	12/5/2001		
Sample Depth (Feet bgs)	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	2.0		
Medium	Sandblast Grit	Sandblast Grit	Sandblast Grit	Sandblast Grit	Sandblast Grit	Sandblast Grit	Sandblast Grit	Sandblast Grit	Sandblast Grit	Sandblast Grit	Soil		
PCB Aroclors (µg/kg dry)													
Aroclor 1016	1.28 U	1.23 U	1.19 U	1.29 U	1.25 U	1.43 U	1.22 U	1.18 U	1.17 U	1.24 U	1.41 U	371	Eco
Aroclor 1221	5.50 U	5.26 U	5.08 U	5.53 U	5.37 U	6.14 U	5.23 U	5.04 U	5.02 U	5.32 U	6.04 U	371	Eco
Aroclor 1232	4.39 U	4.20 U	4.06 U	4.42 U	4.29 U	4.90 U	4.17 U	4.02 U	4.00 U	4.24 U	4.82 U	371	Eco
Aroclor 1242	2.35 U	2.25 U	2.17 U	2.36 U	2.29 U	2.62 U	2.23 U	2.15 U	2.14 U	2.27 U	2.58 U	371	Eco
Aroclor 1248	5.84 U	5.59 U	5.40 U	5.87 U	5.70 U	6.52 U	5.55 U	5.35 U	5.32 U	5.64 U	6.41 U	371	Eco
Aroclor 1254	1.82 U	1.74 U	1.68 U	1.83 U	1.78 U	2.03 U	1.73 U	1.67 U	1.66 U	1.76 U	2.00 U	371	Eco
Aroclor 1260	**6.44 J**	**30.6**	**17.7**	**23.7**	**15.5**	**5.79 J**	**81.8**	**26.0**	**52.1**	**202**	2.00 U	371	Eco
Total PCBs as Aroclors (NDs at MDL) [1]	**8.26 J**	**32.3 J**	**19.4 J**	**25.5 J**	**17.3 J**	**7.81 J**	**83.5 J**	**27.7 J**	**53.8 J**	**204 J**	4.00 U	371	Eco
Metals (mg/kg dry)													
Aluminum	**2,465 J**	**5,190**	**4,640 J**	**5,690 J**	**2,350**	**7,620**	**1,660**	**1,530**	**2,440**	**4,020**	**14,100**	31,400	UPL
Antimony	3.16 U	**2.71 J**	3.29 U	3.54 U	**1.92 J**	**2.60 J**	**1.28 J**	**1.81 J**	**2.74 J**	**13.7**	**1.20 J**	0.270	Eco
Arsenic	**2.37**	**4.70**	**5.93**	**3.04**	**0.866 J**	**5.12**	**2.12**	**6.02**	**4.64**	**6.24**	**6.24**	5.40	UPL
Barium	**22.4**	**119**	**58.2**	**97.0**	**27.7**	**70.9**	**16.2**	**27.2**	**44.4**	**78.2**	**59.6**	330	Eco
Beryllium	0.170 U	0.176 U	0.177 U	0.191 U	0.159 U	**0.218 J**	0.166 U	0.173 U	0.179 U	0.177 U	**0.525**	21.0	Eco
Cadmium	**0.717**	**1.04**	**0.663**	**0.649**	**0.470 J**	**1.04**	**0.895**	**2.14**	**1.45**	**2.19**	**1.02**	0.360	Eco
Calcium	**1,840 J**	**2,720**	**2,590 J**	**2,700 J**	**1,310**	**5,055**	**863**	**1,700**	**2,500**	**2,750**	**7,470**	10,400	UPL
Chromium	**1,215**	**536**	**358**	**69.7**	**880**	**127**	**67.4**	**637**	**648**	**705**	**21.7**	28.1	UPL
Cobalt	**25.0**	**14.9**	**9.44**	**7.97**	**16.3**	**11.9**	**2.52**	**17.4**	**14.3**	**15.1**	**19.7**	19.9	UPL
Copper	**32.2**	**58.1**	**28.6**	**25.0**	**25.0**	**56.2**	**23.1**	**82.8**	**73.7**	**183**	**73.7**	56.7	UPL
Iron	**32,300**	**25,200**	**19,700**	**17,300**	**22,100**	**21,800**	**10,100**	**44,500**	**39,500**	**39,400**	**41,500**	36,900	UPL
Lead	**124**	**1,200 J**	**262**	**300**	**501 J**	**119 J**	**502 J**	**272 J**	**415 J**	**863 J**	**19.3 J**	25.5	UPL
Magnesium	**43,500 J**	**19,800**	**14,000 J**	**4,000 J**	**31,400**	**6,175**	**1,370**	**19,500**	**18,600**	**13,900**	**9.75 J**	12,400	UPL
Manganese	**509 J**	**448**	**285 J**	**290 J**	**392**	**392**	**171**	**536**	**518**	**464**	**631**	885	UPL
Mercury	0.0301 U	**0.0404 J**	**0.0423 J**	0.0300 U	**0.0425**	**0.0461 J**	0.0269 U	0.0285 U	**0.0380 J**	**0.0425**	0.0338 U	0.0660	UPL
Nickel	**1,015**	**382**	**130**	**55.3**	**597**	**93.8**	**28.8**	**844**	**296**	**347**	**27.8**	38.0	Eco
Potassium	**138 J**	**918**	**338 J**	**894**	**173 J**	**601**	**172 J**	**144 J**	**236 J**	**323 J**	**464 J**	2,050	UPL
Selenium	0.407 U	**0.704 J**	0.424 U	0.456 U	0.380 U	**0.656 J**	**0.670 J**	0.412 U	0.428 U	0.422 U	**0.678 J**	0.520	Eco
Silver	**0.0667 J**	**0.212 J**	**0.0976 J**	**0.155 J**	**0.114 J**	**0.143 J**	**0.0627 J**	**0.102 J**	**0.139 J**	**0.259 J**	**0.174 J**	4.20	Eco
Sodium	153 U	157 U	159 U	171 U	143 U	166 U	149 U	155 U	161 U	158 U	**196 J**	341	UPL
Thallium	**0.0622 J**	**0.0681 J**	**0.0987 J**	**0.0802 J**	**0.0551 J**	**0.101 J**	0.0487 U	0.0505 U	**0.0687 J**	**0.0557 J**	**0.147 J**	1.00	Eco
Vanadium	**21.1**	**29.2**	**27.0**	**34.4**	**12.5**	**47.7**	**6.89**	**21.9**	**30.0**	**47.7**	**73.7**	104	UPL
Zinc	**84.1 J**	**229**	**113 J**	**83.0 J**	**112**	**107**	**129**	**120**	**176**	**328**	**50.3**	71.7	UPL
Petroleum Hydrocarbons (mg/kg dry)													
Diesel Range Organics	**94.0**	**31.6**	**33.4**	**19.5 J**	**63.1**	**22.1 J**	**30.3**	**66.4**	**46.4**	**53.4**	**22.1 J**	23,000	HH
Residual Range Organics	**388**	**224**	**177**	**165**	**469**	**106**	**328**	**448**	**321**	**511**	**124**	40,000	HH
Gasoline Range Organics	-	-	-	-	-	-	-	-	-	-	-	13,000	HH
Butyltins (µg/kg dry)													
Dibutyltin	0.589 U	**37.4**	0.653 U	0.755 U	0.695 U	0.842 U	0.721 U	0.582 U	0.683 U	0.651 U	0.786 U	28,000	Eco
Monobutyltin	1.30 U	1.40 U	**24.0**	1.66 U	1.53 U	1.86 U	1.59 U	1.28 U	1.51 U	1.43 U	1.73 U	28,000	Eco
Tetrabutyltin	0.455 U	0.492 U	0.505 U	0.583 U	0.537 U	0.651 U	0.557 U	0.449 U	0.528 U	0.503 U	0.607 U	28,000	Eco
Tributyltin	0.938 U	**45.4**	**38.9**	1.20 U	1.11 U	1.34 U	1.15 U	0.926 U	1.09 U	1.04 U	1.25 U	28,000	Eco

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit

[1] Only Aroclors 1254 and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Sandlbast Area AOPC soil samples.
- = Not Analyzed
-- = SLV for analyte not available
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-4d
2002 Sandblast Preliminary Assessment/Site Inspection Soil and Sandblast Grit Analytical Results
Sandblast Area
PCB Aroclors, Metals, Petroleum Hydrocarbons, and Butyltins
(Page 2 of 2)

Site ID	SBB14	SBB15	SBB15	SBB16	SBB16	SBB17	SBB17	SBB18	SBB18	SBB23	SBB24	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	011205SBB14SBG	011205SBB15SBG	011205SBB21SS	011205SBB16SBG	011206SBB22ss	011205SBB17SBG	011205SBB19SS	011205SBB18SBG	011205SBB20SS	011206SBB23SBG	011206SBB24SBG		
Sample Date	12/5/2001	12/5/2001	12/5/2001	12/5/2001	12/6/2001	12/5/2001	12/5/2001	12/5/2001	12/5/2001	12/6/2001	12/6/2001		
Sample Depth (Feet bgs)	2.0	0.0-0.5	1.0	0.0-0.5	1.5	0.0-0.5	3.0	0.0-0.5	2.5	0.0-0.5	0.0-0.5		
Medium	Sandblast Grit	Sandbl	Soil	Sandblast Grit	Soil	Sandblast Grit	Soil	Sandblast Grit	Soil	Sandblast Grit	Sandblast Grit		
PCB Aroclors (µg/kg dry)													
Aroclor 1016	1.24 U	1.09 U	1.22 U	1.18 U	1.33 U	1.23 U	1.38 U	1.20 U	1.45 U	1.32 U	1.28 U	371	Eco
Aroclor 1221	5.32 U	4.66 U	5.21 U	5.07 U	5.70 U	5.28 U	5.89 U	5.15 U	6.21 U	5.67 U	5.49 U	371	Eco
Aroclor 1232	4.24 U	3.72 U	4.16 U	4.05 U	4.55 U	4.21 U	4.70 U	4.11 U	4.95 U	4.53 U	4.38 U	371	Eco
Aroclor 1242	2.27 U	1.99 U	2.23 U	2.16 U	2.43 U	2.25 U	2.51 U	2.20 U	2.65 U	2.42 U	2.34 U	371	Eco
Aroclor 1248	5.64 U	4.95 U	5.54 U	5.39 U	6.05 U	5.60 U	6.26 U	5.46 U	6.59 U	6.02 U	5.82 U	371	Eco
Aroclor 1254	1.76 U	1.54 U	1.73 U	1.68 U	1.89 U	1.75 U	1.95 U	1.70 U	2.06 U	1.88 U	1.82 U	371	Eco
Aroclor 1260	**4.95 J**	**64.0**	**20.8**	**193**	**13.4**	**18.7**	**4.17 J**	**17.4**	2.06 U	**7.09 J**	**6.95 J**	371	Eco
Total PCBs as Aroclors (NDs at MDL) [1]	**6.71 J**	**65.5 J**	**22.5 J**	**195 J**	**15.3 J**	**20.5 J**	**6.12 J**	**19.1 J**	4.12 U	**8.97 J**	**8.77 J**	371	Eco
Metals (mg/kg dry)													
Aluminum	**7,570**	**1,830**	**7,130**	**2,390**	**8,430**	**4,880**	**9,760**	**7,650**	**16,000 J**	**1,590**	**2,130**	31,400	UPL
Antimony	**1.19 J**	**1.14 J**	**0.510 J**	**1.13 J**	**0.832 J**	**0.858 J**	**1.06 J**	**9.51**	4.01 U	**0.406 J**	**0.249 J**	0.270	Eco
Arsenic	**3.14**	**0.794 J**	**3.91**	**2.89**	**4.51**	**1.52**	**4.80**	**80.9**	**1.64**	**0.981 J**	0.159 U	5.40	UPL
Barium	**73.6**	**26.0**	**59.4**	**63.1**	**51.0**	**54.7**	**82.1**	**118**	**112**	**10.7**	**12.3**	330	Eco
Beryllium	**0.184 J**	0.147 U	**0.351 J**	0.155 U	**0.318 J**	0.191 U	**0.482 J**	0.181 U	**0.598**	0.175 U	0.168 U	21.0	Eco
Cadmium	**1.26**	**2.61**	**0.613**	**1.04**	**1.27**	**0.677**	**0.978**	**1.42**	**0.867**	**0.429 J**	**0.305 J**	0.360	Eco
Calcium	**5,360**	**1,170**	**4,300**	**1,070**	**5,310**	**2,630**	**4,460**	**15,100**	**7,670 J**	**1,180**	**1,520**	10,400	UPL
Chromium	**55.9**	**1,100**	**21.9**	**783**	**51.8**	**625**	**53.4**	**533**	**25.1**	**931**	**1,320**	28.1	UPL
Cobalt	**11.6**	**13.9**	**11.5**	**13.7**	**12.1**	**15.0**	**15.1**	**19.3**	**16.3**	**20.3**	**21.6**	19.9	UPL
Copper	**58.3**	**23.4**	**45.7**	**36.7**	**57.0**	**25.1**	**45.3**	**319**	**65.7**	**18.8**	**15.8**	56.7	UPL
Iron	**22,500**	**24,200**	**19,000**	**22,800**	**22,600**	**22,200**	**19,800**	**39,000**	**33,600**	**22,700**	**27,900**	36,900	UPL
Lead	**508 J**	**280 J**	**134 J**	**783 J**	**390 J**	**516 J**	**31.9 J**	**258 J**	**31.2**	**67.5 J**	**51.5 J**	25.5	UPL
Magnesium	**5,850**	**32,600**	**5,160**	**22,000**	**6,660**	**22,300**	**5,480**	**19,600**	**11,400 J**	**33,500**	**47,500**	12,400	UPL
Manganese	**281**	**413**	**399**	**350**	**372**	**408**	**323**	**674**	**585 J**	**362**	**493**	885	UPL
Mercury	**0.0363**	0.0281 U	**0.0406 J**	**0.0335 J**	**0.0560**	**0.0345 J**	**0.0341 J**	0.0275 U	**0.153**	0.0263 U	0.0285 U	0.0660	UPL
Nickel	**33.4**	**444**	**18.8**	**586**	**32.2**	**399**	**40.7**	**321**	**23.9**	**1,060**	**617**	38.0	Eco
Potassium	**636**	**74.9 J**	**551**	**105 J**	**566**	**330 J**	**602**	**1,020**	**644**	**91.4 J**	**116 J**	2,050	UPL
Selenium	**0.558 J**	0.351 U	**0.511 J**	**0.586 J**	**0.642 J**	0.455 U	**0.835 J**	**0.675 J**	0.517 U	**0.453 J**	0.401 U	0.520	Eco
Silver	**0.165 J**	0.0440 U	**0.0882 J**	**0.0596 J**	**0.117 J**	**0.0813 J**	**0.265 J**	**0.268 J**	**0.146 J**	0.0524 U	0.0503 U	4.20	Eco
Sodium	**173 J**	132 U	158 U	139 U	171 U	171 U	195 U	163 U	**219 J**	157 U	150 U	341	UPL
Thallium	**0.118 J**	0.0429 U	**0.0915 J**	0.0455 U	**0.0981 J**	0.0558 U	**0.129 J**	**0.114 J**	**0.110 J**	0.0511 U	0.0490 U	1.00	Eco
Vanadium	**54.6**	**12.7**	**36.9**	**8.66**	**33.0**	**25.3**	**53.5**	**34.4**	**72.4**	**14.4**	**16.1**	104	UPL
Zinc	**74.5**	**1,160**	**58.2**	**230**	**94.2**	**145**	**62.6**	**703**	**77.6 J**	**56.1**	**57.9**	71.7	UPL
Petroleum Hydrocarbons (mg/kg dry)													
Diesel Range Organics	**39.8**	**740**	**972**	**107**	**23.6 J**	**45.7**	**21.2 J**	**69.0**	**1,440**	**92.0**	**97.9**	23,000	HH
Residual Range Organics	**369**	**325**	**158**	**1,340**	**98.4**	**328**	**45.6 J**	**523**	**641**	**639**	**607**	40,000	HH
Gasoline Range Organics	-	-	-	-	-	-	-	-	-	-	-	13,000	HH
Butyltins (µg/kg dry)													
Dibutyltin	0.613 U	-	-	**64.5**	0.799 U	0.706 U	0.769 U	**210 J**	0.850 U	0.738 U	0.709 U	28,000	Eco
Monobutyltin	1.35 U	-	-	**8.78**	1.76 U	**8.00**	1.69 U	**108 J**	1.87 U	1.63 U	1.56 U	28,000	Eco
Tetrabutyltin	0.473 U	-	-	0.531 U	0.618 U	0.546 U	0.594 U	**3.99 J**	0.657 U	0.571 U	0.548 U	28,000	Eco
Tributyltin	0.975 U	-	-	**23.6**	1.27 U	**39.2**	1.22 U	**1,860 J**	1.35 U	1.18 U	1.13 U	28,000	Eco

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
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[1] Only Aroclors 1254 and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Sandlbast Area AOPC soil samples.
- = Not Analyzed
-- = SLV for analyte not available
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-4e
2002 Sandblast Preliminary Assessment/Site Inspection Soil Analytical Results
Transformer Release Area
PCB Aroclors, Metals, Petroleum Hydrocarbons, and Butyltins

Site ID	TRA01	TRA01	TRA02	TRA03	TRA03	TRA04	TRA05	TRA05	TRA06*	TRA07	TRA07	TRA09*	TRA11	TRA12	Selected SLV (0-3 ft bgs)	SLV Source (0-3 ft bgs)
Sample ID	011204TRA01SS	011204TRA14SS	011204TRA02SS	011204TRA03SS	011204TRA13SS	011204TRA04SS	011204TRA05SS	011206TRA16ss	011204TRA06SS	011204TRA07SS	011206TRA15ss	011204TRA09SS	011204TRA11SS	011204TRA12SS		
Sample Date	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/4/2001	12/6/2001	12/4/2001	12/4/2001	12/6/2001	12/4/2001	12/4/2001	12/4/2001		
Sample Depth (Feet bgs)	0.0-1.0	3.0	0.0-1.0	0.0-1.0	1.8	0.0-1.0	0.0-1.0	2.5	0.0-1.0	0.0-1.0	2.0	0.0-1.0	0.0-1.0	0.0-1.0		
PCB Aroclors (µg/kg dry)																
Aroclor 1016	1.20 U	1.38 U	1.16 U	1.22 U	1.28 U	1.25 U	1.25 U	1.28 U	1.28 U	1.31 U	1.24 U	1.32 U	1.27 U	1.27 U	371	Eco
Aroclor 1221	5.16 U	5.91 U	4.98 U	5.24 U	5.49 U	5.37 U	5.34 U	5.47 U	5.49 U	5.61 U	5.33 U	5.67 U	5.42 U	5.44 U	371	Eco
Aroclor 1232	4.12 U	4.72 U	3.98 U	4.18 U	4.39 U	4.28 U	4.26 U	4.36 U	4.39 U	4.48 U	4.25 U	4.52 U	4.33 U	4.35 U	371	Eco
Aroclor 1242	2.20 U	2.52 U	2.13 U	2.24 U	2.34 U	2.29 U	2.28 U	2.33 U	2.22 U	2.39 U	2.27 U	2.42 U	2.31 U	2.32 U	371	Eco
Aroclor 1248	5.47 U	6.28 U	5.29 U	5.57 U	5.83 U	5.70 U	5.67 U	5.80 U	5.83 U	5.95 U	5.66 U	6.02 U	5.75 U	5.78 U	371	Eco
Aroclor 1254	1.71 U	1.96 U	1.65 U	1.74 U	1.82 U	1.78 U	1.77 U	1.81 U	1.82 U	1.86 U	1.76 U	1.88 U	1.80 U	1.80 U	371	Eco
Aroclor 1260	**23.5**	1.96 U	**42.2**	**43.2**	**2.64 J**	**98.8**	**121**	1.81 U	**65.8**	**21.7**	**4.42 J**	**26.8**	**282**	**96.2**	371	Eco
Total PCBs as Aroclors (NDs at MDL)[1]	**25.2 J**	3.92 U	**43.9 J**	**44.9 J**	**4.46 J**	**101 J**	**123 J**	3.62 U	**67.6 J**	**23.6 J**	**6.18 J**	**28.7 J**	**284 J**	**98.0 J**	371	Eco
Metals (mg/kg dry)																
Aluminum	**5,280 J**	**8,170 J**	**2,260 J**	**2,370 J**	**6,280 J**	**2,560 J**	**2,800 J**	**8,620 J**	**1,915 J**	**6,350 J**	**9,320 J**	**8,905 J**	**3,090 J**	**2,590 J**	31,400	UPL
Antimony	**1.75 J**	**1.15 J**	2.83 U	**1.74 J**	**1.10 J**	**2.56 J**	**1.52 J**	3.33 U	**2.14 J**	**1.86 J**	3.01 U	**5.74 J**	**2.42 J**	3.43 U	0.270	Eco
Arsenic	**3.03**	**7.58**	**2.08**	**4.69**	**7.73**	**9.57**	**2.37**	**7.64**	**9.73**	**5.83**	**9.29**	**12.0**	**8.15**	**2.87**	5.40	UPL
Barium	**60.3**	**69.8**	**34.0**	**27.7**	**50.4**	**45.5**	**29.3**	**72.0**	**40.1**	**55.1**	**60.2**	**86.2**	**54.1**	**35.7**	330	Eco
Beryllium	0.162 U	**0.295 J**	0.153 U	0.157 U	**0.248 J**	0.176 U	0.171 U	**0.380 J**	0.168 U	0.190 U	**0.369 J**	**0.241 J**	0.190 U	0.185 U	21.0	Eco
Cadmium	**0.824**	**1.16**	**1.19**	**0.750**	**0.646**	**1.82**	**1.04**	**0.853**	**1.27**	**1.55**	**0.801**	**1.76**	**2.53**	**1.07**	0.360	Eco
Calcium	**2,970**	**5,530**	**1,760**	**1,830**	**4,600**	**2,230**	**1,800**	**5,650**	**2,760**	**3,490**	**5,970**	**4,610**	**2,680**	**2,610**	10,400	UPL
Chromium	**43.2 J**	**27.1 J**	**25.6 J**	**171 J**	**38.2 J**	**560 J**	**70.1 J**	**19.0 J**	**518 J**	**104 J**	**14.8 J**	**205 J**	**749 J**	**123 J**	28.1	UPL
Cobalt	**7.28**	**13.5**	**4.63**	**7.46**	**10.8**	**12.1**	**5.20**	**14.1**	**11.7**	**10.8**	**15.1**	**14.2**	**13.8**	**6.95**	19.9	UPL
Copper	**24.6**	**42.7**	**37.9**	**25.8**	**31.1**	**116**	**26.9**	**37.9**	**96.4**	**52.4**	**42.6**	**68.3**	**68.4**	**29.6**	56.7	UPL
Iron	**15,900 J**	**22,700 J**	**15,500 J**	**17,200 J**	**19,100 J**	**46,500 J**	**15,500 J**	**22,900 J**	**34,400 J**	**24,400 J**	**23,700 J**	**30,950 J**	**30,000 J**	**15,800 J**	36,900	UPL
Lead	**1,080 J**	**767 J**	**612 J**	**193 J**	**75.4 J**	**462 J**	**627 J**	**30.2 J**	**273 J**	**639 J**	**17.5 J**	**547 J**	**358 J**	**346 J**	25.5	UPL
Magnesium	**3,240 J**	**5,670 J**	**1,630 J**	**6,880 J**	**5,620 J**	**15,300 J**	**2,770 J**	**6,860 J**	**15,800 J**	**7,250 J**	**7,540 J**	**9,860 J**	**23,000 J**	**5,110 J**	12,400	UPL
Manganese	**206 J**	**475 J**	**226 J**	**211 J**	**350 J**	**558 J**	**229 J**	**531 J**	**426 J**	**386 J**	**418 J**	**603 J**	**529 J**	**198 J**	885	UPL
Mercury	0.0230 U	**0.0518**	0.0277 U	0.0283 U	**0.0329 J**	**0.0666**	**0.105**	**0.0254 J**	**0.0440**	**0.105**	0.0297 U	**0.0672**	**0.0301 J**	0.0268 U	0.0660	UPL
Nickel	**22.1 J**	**20.7 J**	**15.9 J**	**74.4 J**	**21.0 J**	**269 J**	**33.9 J**	**18.0 J**	**262 J**	**44.7 J**	**16.6 J**	**96.7 J**	**247 J**	**60.2 J**	38.0	Eco
Potassium	**268 J**	**509**	**137 J**	**119 J**	**363 J**	**158 J**	**144 J**	**499**	**145 J**	**331 J**	**564**	**386 J**	**186 J**	**225 J**	2,050	UPL
Selenium	0.39 U	0.46 U	**0.384 J**	0.38 U	0.43 U	0.42 U	0.41 U	**0.501 J**	**0.403 J**	**0.675 J**	0.39 U	**0.649 J**	0.45 U	0.44 U	0.520	Eco
Silver	**0.138 J**	**0.156 J**	**0.0840 J**	**0.0837 J**	**0.105 J**	**0.101 J**	**0.0847 J**	**0.159 J**	**0.110 J**	**0.173 J**	**0.141 J**	**0.167 J**	**0.118 J**	**0.0880 J**	4.20	Eco
Sodium	**419**	174 U	137 U	141 U	**183 J**	158 U	154 U	**267**	151 U	171 U	**249**	164 U	171 U	166 U	341	UPL
Thallium	**0.0803 J**	**0.152 J**	0.045 U	**0.0477 J**	**0.103 J**	0.052 U	**0.0519 J**	**0.255 J**	0.049 U	**0.145 J**	**0.156 J**	**0.0872 J**	0.056 U	0.054 U	1.00	Eco
Vanadium	**38.7**	**49.8**	**17.0**	**23.4**	**36.8**	**28.8**	**24.8**	**46.0**	**24.0**	**46.4**	**49.5**	**48.3**	**29.7**	**30.4**	104	UPL
Zinc	**82.7**	**85.4**	**121**	**75.6**	**69.6**	**211**	**91.9**	**47.8**	**175**	**190**	**45.6**	**259**	**211**	**119**	71.7	UPL
Petroleum Hydrocarbons (mg/kg dry)																
Diesel Range Organics	**30.3**	**70.6**	**70.4**	**59.3**	14.6 U	**54.7**	**48.2**	14.2 U	**39.7**	**35.1**	14.9 U	**16.1 J**	**122**	**40.9**	23,000	HH
Residual Range Organics	**168**	**1,280**	**550**	**1,010**	**35.0 J**	**453**	**525**	**29.8 J**	**301**	**195**	29.7 U	**140**	**276**	**407**	40,000	HH
Gasoline Range Organics	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13,000	HH
Butyltins (µg/kg dry)																
Dibutyltin	0.65 U	0.80 U	0.58 U	0.58 U	0.76 U	0.70 U	0.68 U	0.77 U	**44.8**	0.69 U	0.72 U	0.67 U	**63.5**	0.78 U	28,000	Eco
Monobutyltin	1.03 U	1.77 U	1.29 U	0.92 U	1.67 U	1.54 U	1.49 U	1.71 U	**10.5**	1.10 U	1.59 U	1.48 U	**8.91**	1.73 U	28,000	Eco
Tetrabutyltin	0.50 U	0.62 U	0.45 U	0.45 U	0.59 U	0.54 U	0.52 U	0.60 U	0.51 U	0.54 U	0.56 U	0.52 U	0.60 U	0.61 U	28,000	Eco
Tributyltin	1.43 U	1.28 U	0.93 U	1.27 U	1.21 U	1.11 U	1.49 U	1.23 U	**427**	1.53 U	1.15 U	1.15 U	**65.8**	1.25 U	28,000	Eco

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit

[1] Only Aroclors 1254 and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Sandlbast Area AOPC soil samples.
- = Not Analyzed
-- = SLV for analyte not available
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-5a
2004 Sandblast Supplemental Site Inspection Soil and Sandblast Grit Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, and Pesticides
(Page 1 of 3)

Site ID	DP10	DP11*	DP12	DP5	DP6	DP7*	DP8	DP9	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**	**Selected SLV (>3 ft bgs)**	**SLV Source (>3 ft bgs)**
Sample ID	041118SGA10SS	041118SGA11SS	041118SGA13SS	041116SGA02SS	041117SGA04SS	041117SGA05SS	041117SGA08SS	041117SGA09SS				
Sample Date	11/17/2004	11/17/2004	11/17/2004	11/16/2004	11/17/2004	11/17/2004	11/17/2004	11/17/2004				
Sample Depth (Feet bgs)	9.0-12.0	7.5-9.5	6.5-9.5	21.0-23.0	15.0-17.0	14.0-16.5	13.0-15.0	14.0-17.0				
Medium	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil				
PCB Aroclors (µg/kg dry)												
Aroclor 1016	-	-	-	2.61 U	2.85 U	2.76 U	2.65 U	3.00 U	371	Eco	21,000	HH
Aroclor 1221	-	-	-	2.61 U	2.85 U	2.76 U	2.65 U	3.00 U	371	Eco	540	HH
Aroclor 1232	-	-	-	2.61 U	2.85 U	2.76 U	2.65 U	3.00 U	371	Eco	540	HH
Aroclor 1242	-	-	-	2.61 U	2.85 U	2.76 U	2.65 U	3.00 U	371	Eco	740	HH
Aroclor 1248	-	-	-	2.61 U	2.85 U	2.76 U	2.65 U	3.00 U	371	Eco	740	HH
Aroclor 1254	-	-	-	1.43 U	1.57 U	1.51 U	1.45 U	1.65 U	371	Eco	740	HH
Aroclor 1260	-	-	-	1.43 U	1.57 U	1.51 U	1.45 U	1.65 U	371	Eco	740	HH
Total PCBs as Aroclors (NDs at MDL) [1]	-	-	-	2.86 U	3.14 U	3.02 U	2.90 U	3.30 U	371	Eco	740	HH
Metals (mg/kg dry)												
Aluminum	**15,600**	**13,600**	**17,000**	**10,200**	**12,900**	**11,550**	**7,460**	**12,500**	31,400	UPL	990,000	HH
Antimony	**0.194 J**	**0.218 J**	**0.285**	**0.256**	**0.228 J**	**0.433 J**	**0.107 J**	**0.184 J**	0.270	Eco	410	HH
Arsenic	**2.66**	**3.68**	**4.20**	**7.28**	**6.75**	**9.83 J**	**1.32**	**4.83**	5.40	UPL	5.40	UPL
Barium	**41.8**	**101**	**108**	**77.7**	**97.3**	**91.5**	**48.8**	**89.0**	330	Eco	60,000	HH
Beryllium	**0.314**	**0.371**	**0.372**	**0.454**	**0.379**	**0.380**	**0.258**	**0.488**	21.0	Eco	610	HH
Cadmium	0.0135 U	0.0130 U	0.0140 U	0.0125 U	0.0150 U	0.0135 U	0.0121 U	0.0143 U	0.360	Eco	150	HH
Calcium	**6,150**	**3,930**	**4,410**	**5,700**	**7,420**	**7,155**	**3,860**	**7,410**	10,400	UPL	10,400	UPL
Chromium	**23.6**	**20.1**	**26.4**	**19.0 J**	**19.9**	**21.3 J**	**10.5**	**20.3**	28.1	UPL	190	HH
Cobalt	**18.7**	**14.6**	**15.7**	**13.5**	**13.5**	**15.5 J**	**11.4**	**14.6**	19.9	UPL	300	HH
Copper	**67.6**	**30.0**	**33.5**	**47.4**	**51.6**	**51.9**	**26.7**	**53.3 J**	56.7	UPL	12,000	HH
Iron	**30,200**	**22,200**	**26,500**	**23,700**	**25,300**	**23,800**	**17,000**	**27,000**	36,900	UPL	720,000	HH
Lead	**6.06**	**5.24**	**5.70**	**6.23**	**5.35**	**6.64**	**2.60**	**5.37**	25.5	UPL	800	HH
Magnesium	**13,600**	**5,125**	**7,540**	**5,770**	**8,010**	**7,130**	**5,280**	**8,660**	12,400	UPL	12,400	UPL
Manganese	**500**	**411**	**818**	**423**	**481**	**439**	**380**	**599**	885	UPL	7,200	HH
Mercury	**0.0301**	**0.0203 J**	**0.0534**	**0.0362**	**0.0201 J**	**0.0544**	**0.0215 J**	**0.0209 J**	0.0660	UPL	93.0	HH
Nickel	**24.4**	**15.4**	**29.0**	**17.4**	**19.5**	**21.7**	**12.7**	**22.4**	38.0	Eco	6,100	HH
Potassium	**377**	**705**	**546**	**544**	**773**	**634**	**550**	**670**	2,050	UPL	2,050	UPL
Selenium	**0.343**	**0.324**	**0.316**	**0.407**	**0.322**	**0.602 J**	**0.180 J**	**0.302**	0.520	Eco	5,100	HH
Silver	**0.103 J**	**0.144 J**	**0.122 J**	**0.136 J**	**0.149 J**	**0.158 J**	**0.114 J**	**0.109 J**	4.20	Eco	1,500	HH
Sodium	**119**	12.4 U	**114 J**	11.9 U	**96.9 J**	**141**	11.5 U	**187 J**	341	UPL	341	UPL
Thallium	**0.0940 J**	**0.135 J**	**0.216 J**	**0.130 J**	**0.157 J**	**0.180 J**	**0.0765 J**	**0.145 J**	1.00	Eco	0.203	UPL
Vanadium	**53.3**	**65.0**	**72.2**	**54.3**	**60.3**	**57.9 J**	**45.0**	**52.2**	104	UPL	104	UPL
Zinc	**53.9**	**44.9**	**50.6**	**46.3**	**54.1**	**53.3**	**35.1**	**54.1**	71.7	UPL	310,000	HH
Petroleum Hydrocarbons (mg/kg dry)												
Diesel Range Organics	5.69 U	5.57 U	5.56 U	5.31 U	5.44 U	5.50 U	5.14 U	5.89 U	23,000	HH	23,000	HH
Residual Range Organics	11.3 U	11.1 U	11.1 U	10.6 U	10.9 U	11.0 U	10.2 U	11.7 U	40,000	HH	40,000	HH
Gasoline Range Organics	0.136 U	4.72 U	4.85 U	4.63 U	4.83 U	4.73 U	4.32 U	4.79 U	13,000	HH	13,000	HH
Butyltins (µg/kg dry)												
Dibutyltin	-	-	-	**5.73**	**7.75 J**	**16.6 J**	**28.3 J**	**3.62 J**	28,000	Eco	180,000	HH
Monobutyltin	-	-	-	**11.1**	**6.28 J**	**7.43 J**	**13.0 J**	**8.89 J**	28,000	Eco	180,000	HH
Tetrabutyltin	-	-	-	0.846 U	0.913 U	0.877 U	0.843 U	0.930 U	28,000	Eco	180,000	HH
Tributyltin	-	-	-	1.04 U	1.12 U	1.08 U	**2.58 J**	1.14 U	28,000	Eco	180,000	HH
Pesticides (µg/kg dry)												
4,4'-DDD	-	-	-	0.222 U	0.241 U	0.222 U	0.217 U	0.250 U	21.0	Eco	11,000	HH
4,4'-DDE	-	-	-	0.218 U	0.236 U	0.218 U	0.213 U	0.245 U	21.0	Eco	7,700	HH
4,4'-DDT	-	-	-	0.256 U	0.278 U	0.256 U	0.250 U	0.288 U	21.0	Eco	7,700	HH
Aldrin	-	-	-	0.112 U	0.122 U	0.112 U	0.110 U	0.126 U	4.90	Eco	130	HH
BHC (alpha)	-	-	-	0.109 U	0.118 U	0.109 U	0.107 U	0.122 U	340	HH	340	HH
BHC (beta)	-	-	-	0.121 U	0.131 U	0.121 U	0.118 U	0.136 U	960	HH	960	HH
BHC (delta)	-	-	-	0.109 U	0.118 U	0.109 U	0.107 U	0.122 U	340	HH	340	HH
BHC (gamma) Lindane	-	-	-	0.131 U	0.142 U	0.131 U	0.128 U	0.147 U	2,000	HH	2,000	HH
Chlordane (alpha)	-	-	-	0.118 U	0.128 U	0.117 U	0.115 U	0.132 U	7,200	HH	7,200	HH
Chlordane (gamma)	-	-	-	0.132 U	0.143 U	0.132 U	0.129 U	0.148 U	7,200	HH	7,200	HH
Dieldrin	-	-	-	0.264 U	0.287 U	0.264 U	0.259 U	0.298 U	4.90	Eco	130	HH
Endosulfan I	-	-	-	0.122 U	0.132 U	0.122 U	0.119 U	0.137 U	20,000	Eco	1,400,000	HH
Endosulfan II	-	-	-	0.278 U	0.302 U	0.277 U	0.272 U	0.312 U	20,000	Eco	1,400,000	HH
Endosulfan Sulfate	-	-	-	0.520 U	0.565 U	0.520 U	0.509 U	0.585 U	20,000	Eco	1,400,000	HH
Endrin	-	-	-	0.136 U	0.148 U	0.136 U	0.133 U	0.153 U	4.90	Eco	71,000	HH
Endrin Aldehyde	-	-	-	0.631 U	0.686 U	0.631 U	0.618 U	0.710 U	4.90	Eco	71,000	HH
Endrin Ketone	-	-	-	0.122 U	0.132 U	0.122 U	0.119 U	0.137 U	4.90	Eco	71,000	HH
Heptachlor	-	-	-	0.109 U	0.118 U	0.109 U	0.107 U	0.122 U	480	HH	480	HH
Heptachlor Epoxide	-	-	-	0.149 U	0.162 U	0.149 U	0.146 U	0.168 U	240	HH	240	HH
Methoxychlor	-	-	-	0.157 U	0.170 U	0.157 U	0.153 U	0.176 U	500,000	Eco	3,100,000	HH
Toxaphene	-	-	-	10.9 U	11.8 U	10.9 U	10.7 U	12.2 U	2,000	HH	2,000	HH

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mg/kg = milligram per kilogram
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bold = analyte detected above MDL.
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2004 Sandblast Supplemental Site Inspection Soil and Sandblast Grit Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, and Pesticides
(Page 2 of 3)

Site ID	HA1*	HA10	HA11	HA11	HA12	HA2	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**	**Selected SLV (>3 ft bgs)**	**SLV Source (>3 ft bgs)**
Sample ID	041122SGA14SS	041123SGA29SS	041123SGA30SS	041123SGA31SS	041123SGA33SS	041122SGA16SS				
Sample Date	11/22/2004	11/23/2004	11/23/2004	11/23/2004	11/23/2004	11/22/2004				
Sample Depth (Feet bgs)	0.5	0.5	1.0	3.0	4.0	0.5				
Medium	Soil	Soil	Soil	Soil	Soil	Soil				
PCB Aroclors (µg/kg dry)										
Aroclor 1016	3.41 U	2.90 U	3.48 U	3.47 U	-	3.01 U	371	Eco	21,000	HH
Aroclor 1221	3.41 U	2.90 U	3.48 U	3.47 U	-	3.01 U	371	Eco	540	HH
Aroclor 1232	3.41 U	2.90 U	3.48 U	3.47 U	-	3.01 U	371	Eco	540	HH
Aroclor 1242	3.41 U	2.90 U	3.48 U	3.47 U	-	3.01 U	371	Eco	740	HH
Aroclor 1248	3.41 U	2.90 U	3.48 U	3.47 U	-	3.01 U	371	Eco	740	HH
Aroclor 1254	1.87 U	1.59 U	1.91 U	1.91 U	-	1.65 U	371	Eco	740	HH
Aroclor 1260	**8.54 J**	1.59 U	**6.40 J**	1.91 U	-	**4.11 J**	371	Eco	740	HH
Total PCBs as Aroclors (NDs at MDL) [1]	**10.4 J**	3.18 U	**8.31 J**	3.82 U	-	**5.76 J**	371	Eco	740	HH
Metals (mg/kg dry)										
Aluminum	**11,390**	**3,770**	**15,000**	**23,100**	**14,600**	**7,100**	31,400	UPL	990,000	HH
Antimony	**0.316**	**0.0895 J**	**0.893**	**0.245 J**	**1.70**	**0.164 J**	0.270	Eco	410	HH
Arsenic	**4.44**	**0.613**	**3.26**	**3.05**	**8.22**	**0.936**	5.40	UPL	5.40	UPL
Barium	**100**	**49.2**	**112**	**123**	**104**	**64.1**	330	Eco	60,000	HH
Beryllium	**0.304**	**0.131 J**	**0.349**	**0.385**	**0.378**	**0.260**	21.0	Eco	610	HH
Cadmium	0.0127 U	0.0127 U	0.0129 U	0.0148 U	0.0133 U	0.0123 U	0.360	Eco	150	HH
Calcium	**6,245**	**3,740**	**10,200**	**9,860**	**7,090**	**4,390**	10,400	UPL	10,400	UPL
Chromium	**19.3**	**5.27**	**221**	**29.8**	**55.4**	**6.19**	28.1	UPL	190	HH
Cobalt	**15.9**	**11.0**	**16.0**	**19.7**	**14.7**	**14.0**	19.9	UPL	300	HH
Copper	**47.6**	**16.7**	**64.0**	**66.4**	**77.6**	**21.3**	56.7	UPL	12,000	HH
Iron	**28,450**	**19,400**	**33,300**	**35,200**	**27,600**	**23,200**	36,900	UPL	720,000	HH
Lead	**128**	**9.71**	**49.1**	**8.61**	**21.5**	**46.3**	25.5	UPL	800	HH
Magnesium	**7,850**	**2,600**	**9,110**	**13,900**	**7,590**	**3,900**	12,400	UPL	12,400	UPL
Manganese	**554**	**301**	**611**	**816**	**582**	**459**	885	UPL	7,200	HH
Mercury	**0.0149 J**	**0.0268**	**0.0359**	**0.0131 J**	**0.0219**	0.00528 U	0.0660	UPL	93.0	HH
Nickel	**20.2**	**5.35**	**58.6**	**26.9**	**28.3**	**6.81**	38.0	Eco	6,100	HH
Potassium	**787**	**360**	**627**	**615**	**654**	**778**	2,050	UPL	2,050	UPL
Selenium	**0.272**	**0.255 J**	**0.284**	**0.330**	**0.277**	**0.289**	0.520	Eco	5,100	HH
Silver	**0.123**	**0.0870**	**0.107**	**0.154**	**0.170**	**0.120**	4.20	Eco	1,500	HH
Sodium	12.1 U	12.1 U	12.3 U	**278**	12.7 U	11.7 U	341	UPL	341	UPL
Thallium	**0.116 J**	**0.0463 J**	**0.135 J**	**0.110 J**	**0.102 J**	**0.101 J**	1.00	Eco	0.203	UPL
Vanadium	**58.9**	**52.7**	**69.6**	**89.1**	**68.7**	**61.9**	104	UPL	104	UPL
Zinc	**88.0**	**31.1**	**90.9**	**58.5**	**120**	**103**	71.7	UPL	310,000	HH
Petroleum Hydrocarbons (mg/kg dry)										
Diesel Range Organics	**24.7 J**	**7.30 J**	-	5.74 U	5.53 U	5.03 U	23,000	HH	23,000	HH
Residual Range Organics	**216**	**153**	-	11.4 U	11.0 U	10.0 U	40,000	HH	40,000	HH
Gasoline Range Organics	4.68 U	0.121 U	-	**132**	4.89 U	4.37 U	13,000	HH	13,000	HH
Butyltins (µg/kg dry)										
Dibutyltin	0.831 U	0.763 U	-	0.887 U	-	0.774 U	28,000	Eco	180,000	HH
Monobutyltin	**6.26 J**	**3.45 J**	-	0.632 U	-	**4.08 J**	28,000	Eco	180,000	HH
Tetrabutyltin	0.853 U	0.783 U	-	0.910 U	-	0.795 U	28,000	Eco	180,000	HH
Tributyltin	1.05 U	0.963 U	-	1.12 U	-	0.977 U	28,000	Eco	180,000	HH
Pesticides (µg/kg dry)										
4,4'-DDD	0.236 U	0.200 U	0.255 U	0.256 U	-	0.208 U	21.0	Eco	11,000	HH
4,4'-DDE	0.231 U	0.196 U	0.250 U	0.251 U	-	0.204 U	21.0	Eco	7,700	HH
4,4'-DDT	**5.27**	0.230 U	0.294 U	0.295 U	-	0.240 U	21.0	Eco	7,700	HH
Aldrin	0.119 U	0.101 U	0.129 U	0.129 U	-	0.105 U	4.90	Eco	130	HH
BHC (alpha)	0.116 U	0.0981 U	0.125 U	0.126 U	-	0.102 U	340	HH	340	HH
BHC (beta)	2.09 U	0.109 U	0.139 U	0.139 U	-	1.87 U	960	HH	960	HH
BHC (delta)	0.116 U	0.0981 U	0.125 U	0.126 U	-	0.102 U	340	HH	340	HH
BHC (gamma) Lindane	0.139 U	0.118 U	0.150 U	0.151 U	-	0.122 U	2,000	HH	2,000	HH
Chlordane (alpha)	0.125 U	0.106 U	0.135 U	0.136 U	-	0.110 U	7,200	HH	7,200	HH
Chlordane (gamma)	0.140 U	0.119 U	0.151 U	0.152 U	-	0.123 U	7,200	HH	7,200	HH
Dieldrin	0.281 U	0.238 U	0.304 U	0.305 U	-	0.248 U	4.90	Eco	130	HH
Endosulfan I	0.129 U	0.110 U	0.140 U	0.141 U	-	0.114 U	20,000	Eco	1,400,000	HH
Endosulfan II	0.295 U	0.250 U	0.319 U	0.320 U	-	0.260 U	20,000	Eco	1,400,000	HH
Endosulfan Sulfate	0.553 U	0.469 U	0.598 U	0.600 U	-	0.488 U	20,000	Eco	1,400,000	HH
Endrin	0.145 U	0.123 U	0.156 U	0.157 U	-	0.128 U	4.90	Eco	71,000	HH
Endrin Aldehyde	0.671 U	0.569 U	0.725 U	0.728 U	-	0.592 U	4.90	Eco	71,000	HH
Endrin Ketone	0.129 U	0.110 U	0.140 U	0.141 U	-	0.114 U	4.90	Eco	71,000	HH
Heptachlor	0.116 U	0.0981 U	0.125 U	0.126 U	-	0.102 U	480	HH	480	HH
Heptachlor Epoxide	0.158 U	0.134 U	0.171 U	**0.634 J**	-	0.140 U	240	HH	240	HH
Methoxychlor	0.166 U	0.141 U	0.180 U	0.181 U	-	0.147 U	500,000	Eco	3,100,000	HH
Toxaphene	11.6 U	9.81 U	12.5 U	12.6 U	-	10.2 U	2,000	HH	2,000	HH

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed

[1] Only Aroclors 1254 and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Sandlbast Area AOPC soil samples.
-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-5a
2004 Sandblast Supplemental Site Inspection Soil and Sandblast Grit Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, and Pesticides
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Site ID	HA3	HA4	HA5	HA6	HA7*	HA8	HA9	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**	**Selected SLV (>3 ft bgs)**	**SLV Source (>3 ft bgs)**
Sample ID	041122SGA17SS	041122SGA21SS	041122SGA23SS	041122SGA24SG	041122SGA25SG	041122SGA27SG	041123SGA28SS				
Sample Date	11/22/2004	11/22/2004	11/22/2004	11/22/2004	11/22/2004	11/22/2004	11/23/2004				
Sample Depth (Feet bgs)	0.5	3.0	3.0	0.0	0.0	0.0	0.5				
Medium	Soil	Soil	Soil	Sandblast Grit	Sandblast Grit	Sandblast Grit	Soil				
PCB Aroclors (µg/kg dry)											
Aroclor 1016	3.23 U	-	-	-	-	-	3.15 U	371	Eco	21,000	HH
Aroclor 1221	3.23 U	-	-	-	-	-	3.15 U	371	Eco	540	HH
Aroclor 1232	3.23 U	-	-	-	-	-	3.15 U	371	Eco	540	HH
Aroclor 1242	3.23 U	-	-	-	-	-	3.15 U	371	Eco	740	HH
Aroclor 1248	3.23 U	-	-	-	-	-	3.15 U	371	Eco	740	HH
Aroclor 1254	1.77 U	-	-	-	-	-	1.73 U	371	Eco	740	HH
Aroclor 1260	**26.1**	-	-	-	-	-	**11.9**	371	Eco	740	HH
Total PCBs as Aroclors (NDs at MDL)[1]	**27.9 J**	-	-	-	-	-	**13.6 J**	371	Eco	740	HH
Metals (mg/kg dry)											
Aluminum	**3,010**	**15,300**	**12,400**	-	-	-	**8,730**	31,400	UPL	990,000	HH
Antimony	**1.11**	**0.495**	**0.319**	-	-	-	**0.441**	0.270	Eco	410	HH
Arsenic	**4.97**	**2.30**	**4.99**	-	-	-	**3.85**	5.40	UPL	5.40	UPL
Barium	**20.9**	**106**	**110**	-	-	-	**86.0**	330	Eco	60,000	HH
Beryllium	**0.0587 J**	**0.387**	**0.433**	-	-	-	**0.243 J**	21.0	Eco	610	HH
Cadmium	**0.0561 J**	0.0143 U	0.0153 U	-	-	-	0.0122 U	0.360	Eco	150	HH
Calcium	**1,980**	**7,030**	**6,040**	-	-	-	**4,960**	10,400	UPL	10,400	UPL
Chromium	**16.1**	**35.4**	**21.1**	**2,650**	**2,305**	**2,480**	**18.2**	28.1	UPL	190	HH
Cobalt	**4.60**	**14.2**	**11.7**	-	-	-	**11.6**	19.9	UPL	300	HH
Copper	**27.4**	**63.6**	**40.2**	-	-	-	**31.0**	56.7	UPL	12,000	HH
Iron	**22,200 J**	**26,700**	**24,700**	-	-	-	**22,700**	36,900	UPL	720,000	HH
Lead	**3,260**	**19.2**	**9.39**	**117**	**68.4**	**66.6**	**354**	25.5	UPL	800	HH
Magnesium	**1,350**	**8,760**	**6,610**	-	-	-	**6,000**	12,400	UPL	12,400	UPL
Manganese	**167**	**366**	**317**	-	-	-	**345**	885	UPL	7,200	HH
Mercury	**0.0114 J**	**0.0804**	**0.0349**	-	-	-	**0.0163 J**	0.0660	UPL	93.0	HH
Nickel	**10.9**	**50.7**	**17.3**	-	-	-	**20.4**	38.0	Eco	6,100	HH
Potassium	**273**	**576**	**1,200**	-	-	-	**433**	2,050	UPL	2,050	UPL
Selenium	0.0781 U	**0.299**	**0.209 J**	-	-	-	**0.175 J**	0.520	Eco	5,100	HH
Silver	**0.0571**	**0.110**	**0.147**	-	-	-	**0.110**	4.20	Eco	1,500	HH
Sodium	12.3 U	**371**	14.6 U	-	-	-	11.7 U	341	UPL	341	UPL
Thallium	**0.0288 J**	**0.164 J**	**0.125 J**	-	-	-	**0.0922 J**	1.00	Eco	0.203	UPL
Vanadium	**28.7**	**71.0**	**59.4**	-	-	-	**55.1**	104	UPL	104	UPL
Zinc	**72.1**	**56.0**	**59.0**	-	-	-	**86.7**	71.7	UPL	310,000	HH
Petroleum Hydrocarbons (mg/kg dry)											
Diesel Range Organics	**1,090 J**	**1,280**	**6.44 J**	-	-	-	5.02 U	23,000	HH	23,000	HH
Residual Range Organics	**1,980 J**	**189**	12.1 U	-	-	-	10.0 U	40,000	HH	40,000	HH
Gasoline Range Organics	4.55 U	**3,960 J**	5.00 U	-	-	-	4.42 U	13,000	HH	13,000	HH
Butyltins (µg/kg dry)											
Dibutyltin	**3.53 J**	-	-	0.710 U	0.813 U	0.805 U	**3.93**	28,000	Eco	180,000	HH
Monobutyltin	**4.90 J**	-	-	0.506 U	0.579 U	0.573 U	0.570 U	28,000	Eco	180,000	HH
Tetrabutyltin	0.842 U	-	-	0.729 U	0.835 U	0.826 U	0.821 U	28,000	Eco	180,000	HH
Tributyltin	**1.65 J**	-	-	0.896 U	**2.53 J**	1.02 U	1.01 U	28,000	Eco	180,000	HH
Pesticides (µg/kg dry)											
4,4'-DDD	0.223 U	-	-	-	-	-	0.220 U	21.0	Eco	11,000	HH
4,4'-DDE	**0.835 J**	-	-	-	-	-	**1.70 J**	21.0	Eco	7,700	HH
4,4'-DDT	**9.83**	-	-	-	-	-	**3.39**	21.0	Eco	7,700	HH
Aldrin	0.113 U	-	-	-	-	-	0.111 U	4.90	Eco	130	HH
BHC (alpha)	0.109 U	-	-	-	-	-	0.108 U	340	HH	340	HH
BHC (beta)	3.78 U	-	-	-	-	-	**0.952 J**	960	HH	960	HH
BHC (delta)	**3.03 J**	-	-	-	-	-	0.108 U	340	HH	340	HH
BHC (gamma) Lindane	**9.68 J**	-	-	-	-	-	0.129 U	2,000	HH	2,000	HH
Chlordane (alpha)	0.118 U	-	-	-	-	-	0.116 U	7,200	HH	7,200	HH
Chlordane (gamma)	0.132 U	-	-	-	-	-	0.130 U	7,200	HH	7,200	HH
Dieldrin	0.266 U	-	-	-	-	-	0.262 U	4.90	Eco	130	HH
Endosulfan I	0.123 U	-	-	-	-	-	0.121 U	20,000	Eco	1,400,000	HH
Endosulfan II	**1.99 J**	-	-	-	-	-	0.275 U	20,000	Eco	1,400,000	HH
Endosulfan Sulfate	0.523 U	-	-	-	-	-	0.515 U	20,000	Eco	1,400,000	HH
Endrin	0.137 U	-	-	-	-	-	0.135 U	4.90	Eco	71,000	HH
Endrin Aldehyde	0.635 U	-	-	-	-	-	0.625 U	4.90	Eco	71,000	HH
Endrin Ketone	0.123 U	-	-	-	-	-	0.121 U	4.90	Eco	71,000	HH
Heptachlor	0.109 U	-	-	-	-	-	0.108 U	480	HH	480	HH
Heptachlor Epoxide	0.150 U	-	-	-	-	-	0.148 U	240	HH	240	HH
Methoxychlor	0.158 U	-	-	-	-	-	0.155 U	500,000	Eco	3,100,000	HH
Toxaphene	10.9 U	-	-	-	-	-	10.8 U	2,000	HH	2,000	HH

Notes:
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Eco = Ecological
HH = Human Health
MDL = method detection limit
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bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV

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Table 5-5b
2004 Sandblast Supplemental Site Inspection Soil Analytical Results
Volatile Organic Compounds
(Page 1 of 3)

Site ID	DP10	DP11*	DP12	DP5	DP6	DP7*	DP8	DP9	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**	**Selected SLV (>3 ft bgs)**	**SLV Source (>3 ft bgs)**
Sample ID	041118SGA10SS	041118SGA11SS	041118SGA13SS	041116SGA02SS	041117SGA04SS	041117SGA05SS	041117SGA08SS	041117SGA09SS				
Sample Date	11/17/2004	11/17/2004	11/17/2004	11/16/2004	11/17/2004	11/17/2004	11/17/2004	11/17/2004				
Sample Depth (Feet bgs)	9.0-12.0	7.5-9.5	6.5-9.5	21.0-23.0	15.0-17.0	14.0-16.5	13.0-15.0	14.0-17.0				
Medium	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil				
Volatile Organic Compounds (µg/kg dry)												
1,1,1,2-Tetrachloroethane	0.0444 U	0.0600 U	0.0607 U	0.0907 U	0.136 U	0.130 U	0.124 U	0.0979 U	9,300	HH	9,300	HH
1,1,1-Trichloroethane (TCA)	0.0651 U	0.0881 U	**0.0969 J**	0.133 U	0.199 U	0.191 U	0.181 U	0.144 U	38,000,000	HH	38,000,000	HH
1,1,2,2-Tetrachloroethane	0.0639 U	0.0864 U	0.0875 U	0.131 U	0.195 U	0.187 U	0.178 U	0.141 U	2,800	HH	2,800	HH
1,1,2-Trichloroethane	0.0901 U	0.122 U	0.123 U	0.184 U	0.275 U	0.264 U	0.251 U	0.199 U	2,700	HH	2,700	HH
1,1-Dichloroethane	0.0573 U	0.0775 U	0.0784 U	0.117 U	0.175 U	0.168 U	0.160 U	0.126 U	5,900	HH	5,900	HH
1,1-Dichloroethene	0.442 U	0.599 U	0.606 U	0.904 U	1.35 U	1.30 U	1.23 U	0.976 U	680,000	HH	680,000	HH
1,1-Dichloropropene	0.906 U	1.23 U	1.24 U	1.85 U	2.77 U	2.66 U	2.53 U	2.00 U	8,100	HH	8,100	HH
1,2,3-Trichlorobenzene	0.108 U	0.146 U	0.148 U	0.221 U	0.330 U	0.317 U	0.301 U	0.238 U	20,000	Eco	490,000	HH
1,2,3-Trichloropropane	0.0758 U	0.103 U	0.104 U	0.155 U	0.232 U	0.222 U	0.211 U	0.167 U	95.0	HH	95.0	HH
1,2,4-Trichlorobenzene	0.110 U	0.149 U	0.151 UJ	0.225 U	0.337 U	0.323 U	0.307 U	0.243 U	20,000	Eco	99,000	HH
1,2,4-Trimethylbenzene	0.0479 U	0.0648 U	0.0655 U	0.0978 U	0.146 U	0.140 U	0.133 U	0.106 U	200,000	Eco	980,000	HH
1,2-Dibromo-3-chloropropane	0.135 U	0.183 U	0.185 U	0.276 U	0.413 U	0.396 U	0.376 U	0.298 U	69.0	HH	69.0	HH
1,2-Dibromoethane (EDB)	0.0576 U	0.0780 U	0.0789 U	0.118 U	0.176 U	0.169 U	0.161 U	0.127 U	140	HH	140	HH
1,2-Dichlorobenzene	0.0576 U	0.0780 U	0.0789 U	0.118 U	0.176 U	0.169 U	0.161 U	0.127 U	2,260	Eco	19,000,000	HH
1,2-Dichloroethane (EDC)	0.0879 U	0.119 U	0.120 U	0.180 U	0.269 U	0.258 U	0.245 U	0.194 U	590	HH	590	HH
1,2-Dichloropropane	0.0429 U	0.0580 U	0.0587 U	0.0876 U	0.131 U	0.126 U	0.120 U	0.0946 U	4,500	HH	4,500	HH
1,3,5-Trimethylbenzene	0.0432 U	0.0585 U	0.0592 U	0.0883 U	0.132 U	0.127 U	0.120 U	0.0954 U	150,000	HH	150,000	HH
1,3-Dichlorobenzene	0.0391 U	0.0530 U	0.0536 U	0.0800 U	0.120 U	0.115 U	0.109 U	0.0864 U	2,260	Eco	17,000	HH
1,3-Dichloropropane	0.0608 U	0.0823 U	0.0833 U	0.124 U	0.186 U	0.178 U	0.169 U	0.134 U	20,000,000	HH	20,000,000	HH
1,4-Dichlorobenzene	0.0552 U	0.0748 U	0.0756 UJ	0.113 U	0.169 U	0.162 U	0.154 U	0.122 UJ	17,000	HH	17,000	HH
2,2-Dichloropropane	0.0765 U	0.103 U	0.105 U	0.156 U	0.234 U	0.224 U	0.213 U	0.169 U	4,500	HH	4,500	HH
2-Butanone (MEK)	2.08 U	2.81 U	2.84 U	4.24 U	6.34 U	6.09 U	5.79 U	4.58 U	200,000,000	HH	200,000,000	HH
2-Chlorotoluene	0.0491 U	0.0665 U	0.0673 U	0.100 U	0.150 U	0.144 U	0.137 U	0.108 U	20,000,000	HH	20,000,000	HH
2-Hexanone	1.24 U	1.67 U	1.69 U	2.53 U	3.78 U	3.63 U	3.45 U	2.73 U	1,250,000	Eco	1,400,000	HH
4-Chlorotoluene	0.0939 U	0.127 U	0.129 U	0.192 U	0.287 U	0.276 U	0.262 U	0.207 U	72,000,000	HH	72,000,000	HH
4-Isopropyltoluene	0.0634 U	0.0858 U	0.0868 U	0.130 U	0.194 U	0.186 U	0.177 U	0.140 U	200,000	Eco	24,000,000	HH
4-Methyl-2-pentanone (MIBK)	0.719 U	0.973 U	0.985 U	1.47 U	2.20 U	2.11 U	2.00 U	1.59 U	1,250,000	Eco	53,000,000	HH
Acetone	2.93 U	15.4 U	7.77 U	31.2 U	8.94 U	28.1 U	35.8 U	6.46 U	1,250,000	Eco	630,000,000	HH
Benzene	1.13 U	**0.506 J**	1.55 U	2.32 U	**0.631 J**	3.33 U	3.16 U	2.50 U	1,200	HH	1,200	HH
Bromobenzene	0.0450 U	0.0610 U	0.0617 U	0.0920 U	0.138 U	0.132 U	0.126 U	0.0994 U	1,800,000	HH	1,800,000	HH
Bromochloromethane	0.0520 U	0.0703 U	0.0711 U	0.106 U	0.159 U	0.152 U	0.145 U	0.115 U	1,900	HH	1,900	HH
Bromodichloromethane	0.0701 U	0.0949 U	0.0960 U	0.143 U	0.214 U	0.206 U	0.195 U	0.155 U	1,900	HH	1,900	HH
Bromoform	0.0702 U	0.0950 U	0.0961 U	0.144 U	0.215 U	0.206 U	0.196 U	0.155 U	360,000	HH	360,000	HH
Bromomethane	0.398 UJ	0.539 UJ	0.545 UJ	0.814 UJ	1.22 UJ	1.17 UJ	1.11 UJ	0.879 UJ	17,000	HH	17,000	HH
Carbon Disulfide	0.313 U	0.424 U	0.429 U	**1.04 J**	0.957 U	0.978 U	3.16 U	0.691 U	1,000,000	Eco	3,700,000	HH
Carbon Tetrachloride	0.0955 U	0.129 U	0.131 U	0.195 U	0.292 U	**0.528 J**	0.266 U	0.211 U	630	HH	630	HH
Chlorobenzene	0.0504 U	0.0682 U	0.0690 U	0.103 U	0.154 U	0.148 U	0.140 U	0.111 U	40,000	Eco	4,300,000	HH
Chloroethane	0.650 U	0.880 U	0.890 U	1.33 U	1.99 U	1.91 U	1.81 U	1.43 U	61,000,000	HH	61,000,000	HH
Chloroform	0.0603 U	0.0817 U	0.0826 U	0.123 U	0.184 U	0.177 U	0.168 U	0.133 U	410	HH	410	HH
Chloromethane	0.397 U	0.537 U	0.544 U	0.811 U	1.21 U	1.17 U	1.11 U	0.876 U	300,000	HH	300,000	HH
cis-1,2-Dichloroethene	0.102 U	**58.5**	**4.95**	0.209 U	**0.410 J**	0.300 U	**1.54 J**	**0.628 J**	2,500,000	Eco	3,100,000	HH
cis-1,3-Dichloropropene	0.0414 U	0.0560 U	0.0567 U	0.0846 U	0.127 U	0.122 U	0.115 U	0.0914 U	8,100	HH	8,100	HH
Dibromochloromethane	0.0732 U	0.0990 U	0.100 U	0.150 U	0.224 U	0.215 U	0.204 U	0.161 U	34,000	HH	34,000	HH
Dibromomethane	0.0735 U	0.0995 U	0.101 U	0.150 U	0.225 U	0.216 U	0.205 U	0.162 U	110,000	HH	110,000	HH
Dichlorodifluoromethane	**0.0630 J**	**0.0850 J**	0.0635 U	**0.162 J**	0.142 U	**0.467 J**	0.129 U	**0.132 J**	730,000	Eco	780,000	HH
Dichloromethane (Methylene Chloride)	0.186 U	0.252 U	0.255 U	**1.14 J**	0.569 U	**13.8**	0.519 U	2.50 U	20,000	HH	20,000	HH
Ethylbenzene	1.13 U	1.54 U	0.0384 U	2.32 U	3.47 U	3.33 U	3.16 U	2.50 U	2,260	Eco	12,000	HH
Hexachlorobutadiene	0.0665 U	0.0900 U	0.0910 U	0.136 U	0.203 U	0.195 U	0.185 U	0.147 U	22,000	HH	22,000	HH
Isopropylbenzene	0.0423 U	0.0573 U	0.0579 U	0.0865 U	0.129 U	0.124 U	0.118 U	0.0934 U	2,260	Eco	24,000,000	HH
m,p-Xylenes	2.27 U	0.129 U	3.11 U	4.64 U	6.93 U	0.281 U	6.32 U	5.01 U	120,000	Eco	2,700,000	HH
Naphthalene	0.467 U	0.633 U	0.640 U	0.955 U	1.43 U	1.37 U	1.30 U	1.03 U	23,000	HH	23,000	HH
n-Butylbenzene	0.105 U	0.142 U	0.144 U	0.215 U	0.321 U	0.308 U	0.293 U	0.232 U	-	-	-	-
n-Propylbenzene	0.0532 U	0.0720 U	0.0728 U	0.109 U	0.163 U	0.156 U	0.148 U	0.117 U	2,260	Eco	21,000,000	HH
o-Xylene	1.13 U	0.0515 U	1.55 U	2.32 U	**0.184 J**	3.33 U	3.16 U	2.50 U	1,000	Eco	19,000,000	HH
sec-Butylbenzene	0.0442 U	0.0599 U	0.0606 U	0.0904 U	0.135 U	0.130 U	0.123 U	0.0976 U	2,260	Eco	-	-
Styrene	0.0272 U	0.0368 U	0.0373 U	2.32 U	0.0832 U	0.0799 U	0.0759 U	0.0601 U	300,000	Eco	51,000,000	HH
tert-Butylbenzene	0.0273 U	0.0370 U	0.0374 U	0.0559 U	0.0836 U	0.0802 U	0.0762 U	0.0603 U	2,260	Eco	-	-
Tetrachloroethene (PCE)	**0.235 J**	**54.0**	**14.4**	0.234 U	0.350 U	0.336 U	**0.437 J**	0.253 U	1,600	HH	1,600	HH
Toluene	1.13 U	1.54 U	1.55 U	2.32 U	**5.20**	3.33 U	3.16 U	2.50 U	200,000	Eco	24,000,000	HH
trans-1,2-Dichloroethene	0.284 U	0.384 U	0.388 U	0.580 U	0.867 U	0.832 U	0.790 U	0.626 U	200,000	HH	200,000	HH
trans-1,3-Dichloropropene	0.0514 U	0.0696 U	0.0704 U	0.105 U	0.157 U	0.151 U	0.143 U	0.113 U	8,100	HH	8,100	HH
Trichloroethene (TCE)	**0.374 J**	**24.5**	**4.06**	**0.0809 J**	**0.298 J**	**0.150 J**	**0.108 J**	**0.230 J**	130	HH	130	HH
Trichlorofluoromethane	0.397 U	0.537 U	0.544 U	0.811 U	1.21 U	1.17 U	1.11 U	0.876 U	730,000	Eco	63,000,000	HH
Vinyl Acetate	1.15 U	1.55 U	1.57 U	2.34 U	3.50 U	3.36 U	3.19 U	2.53 U	4,100,000	HH	4,100,000	HH
Vinyl Chloride	0.211 U	0.286 U	0.289 U	0.431 U	0.645 U	0.619 U	0.588 U	0.466 U	2,200	HH	2,200	HH

Notes:
µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-5b
2004 Sandblast Supplemental Site Inspection Soil Analytical Results
Volatile Organic Compounds
(Page 2 of 3)

Site ID	HA1*	HA10	HA11	HA11	HA12	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**	**Selected SLV (>3 ft bgs)**	**SLV Source (>3 ft bgs)**
Sample ID	041122SGA14SS	041123SGA29SS	041123SGA30SS	041123SGA31SS	041123SGA33SS				
Sample Date	11/22/2004	11/23/2004	11/23/2004	11/23/2004	11/23/2004				
Sample Depth (Feet bgs)	0.5	0.5	1.0	3.0	4.0				
Medium	Soil	Soil	Soil	Soil	Soil				
Volatile Organic Compounds (µg/kg dry)									
1,1,1,2-Tetrachloroethane	0.0575 U	0.0536 U	0.0656 U	0.0934 U	0.0473 U	9,300	HH	9,300	HH
1,1,1-Trichloroethane (TCA)	0.0844 U	0.0787 U	0.0963 U	0.137 U	0.0694 U	38,000,000	HH	38,000,000	HH
1,1,2,2-Tetrachloroethane	0.0828 U	0.0771 U	0.0944 U	0.135 U	0.0680 U	2,800	HH	2,800	HH
1,1,2-Trichloroethane	0.117 U	0.109 U	0.133 U	0.190 U	0.0960 U	2,700	HH	2,700	HH
1,1-Dichloroethane	0.0743 U	0.0692 U	0.0847 U	0.121 U	0.0610 U	5,900	HH	5,900	HH
1,1-Dichloroethene	0.574 U	0.534 U	0.654 U	0.932 U	0.471 U	680,000	HH	680,000	HH
1,1-Dichloropropene	1.18 U	1.09 U	1.34 U	1.91 U	0.966 U	8,100	HH	8,100	HH
1,2,3-Trichlorobenzene	0.140 U	0.130 U	0.160 U	0.227 U	0.115 U	20,000	Eco	490,000	HH
1,2,3-Trichloropropane	0.0983 U	0.0915 U	0.112 U	0.160 U	0.0807 U	95.0	HH	95.0	HH
1,2,4-Trichlorobenzene	0.143 U	0.133 U	0.163 U	0.232 U	0.117 U	20,000	Eco	99,000	HH
1,2,4-Trimethylbenzene	**0.523 J**	0.0578 U	**0.252 J**	0.101 U	0.0510 U	200,000	Eco	980,000	HH
1,2-Dibromo-3-chloropropane	0.175 UJ	0.163 UJ	0.200 UJ	0.284 UJ	0.144 UJ	69.0	HH	69.0	HH
1,2-Dibromoethane (EDB)	0.0747 U	0.0696 U	0.0852 U	0.121 U	0.0614 U	140	HH	140	HH
1,2-Dichlorobenzene	0.0747 U	0.0696 U	0.0852 U	0.121 U	0.0614 U	2,260	Eco	19,000,000	HH
1,2-Dichloroethane (EDC)	0.114 U	0.106 U	0.130 U	0.185 U	0.0937 U	590	HH	590	HH
1,2-Dichloropropane	0.0556 U	0.0518 U	0.0634 U	0.0903 U	0.0457 U	4,500	HH	4,500	HH
1,3,5-Trimethylbenzene	**0.0929 J**	0.0522 U	0.0639 U	0.0910 U	0.0460 U	150,000	HH	150,000	HH
1,3-Dichlorobenzene	0.0507 U	0.0473 U	0.0579 U	0.0824 U	0.0417 U	2,260	Eco	17,000	HH
1,3-Dichloropropane	0.0788 U	0.0734 U	0.0899 U	0.128 U	0.0648 U	20,000,000	HH	20,000,000	HH
1,4-Dichlorobenzene	0.0716 U	0.0667 U	0.0817 U	0.116 U	0.0589 U	17,000	HH	17,000	HH
2,2-Dichloropropane	0.0991 U	0.0924 U	0.113 U	0.161 U	0.0815 U	4,500	HH	4,500	HH
2-Butanone (MEK)	17.8 U	10.7 U	19.3 U	29.2 U	10.6 U	200,000,000	HH	200,000,000	HH
2-Chlorotoluene	0.0637 U	0.0593 U	0.0726 U	0.103 U	0.0523 U	20,000,000	HH	20,000,000	HH
2-Hexanone	1.60 U	1.49 U	1.83 U	2.60 U	1.32 U	1,250,000	Eco	1,400,000	HH
4-Chlorotoluene	0.122 U	0.113 U	0.139 U	0.198 U	0.100 U	72,000,000	HH	72,000,000	HH
4-Isopropyltoluene	**0.0833 J**	0.0766 U	**0.152 J**	**1.11 J**	0.0676 U	200,000	Eco	24,000,000	HH
4-Methyl-2-pentanone (MIBK)	0.933 U	0.869 U	1.06 U	1.52 U	0.766 U	1,250,000	Eco	53,000,000	HH
Acetone	95.4 U	144 U	329 U	292 U	76.6 U	1,250,000	Eco	630,000,000	HH
Benzene	1.47 U	1.37 U	**0.474 J**	**0.514 J**	**0.396 J**	1,200	HH	1,200	HH
Bromobenzene	0.0584 U	0.0544 U	0.0666 U	0.0949 U	0.0480 U	1,800,000	HH	1,800,000	HH
Bromochloromethane	0.0674 U	0.0628 U	0.0768 U	0.109 U	0.0554 U	1,900	HH	1,900	HH
Bromodichloromethane	0.0909 U	0.0847 U	0.104 U	0.148 U	0.0747 U	1,900	HH	1,900	HH
Bromoform	0.0911 UJ	0.0848 UJ	0.104 UJ	0.148 UJ	0.0748 UJ	360,000	HH	360,000	HH
Bromomethane	0.516 U	0.481 U	0.589 U	0.839 U	1.21 U	17,000	HH	17,000	HH
Carbon Disulfide	0.406 U	0.378 U	**0.549 J**	0.660 U	0.334 U	1,000,000	Eco	3,700,000	HH
Carbon Tetrachloride	0.124 U	0.115 U	0.141 U	0.201 U	0.102 U	630	HH	630	HH
Chlorobenzene	0.0653 U	0.0608 U	0.0745 U	0.106 U	0.0537 U	40,000	Eco	4,300,000	HH
Chloroethane	0.843 U	0.785 U	0.961 U	1.37 U	0.693 U	61,000,000	HH	61,000,000	HH
Chloroform	0.0783 U	0.0729 U	0.0892 U	0.127 U	0.0643 U	410	HH	410	HH
Chloromethane	0.515 U	0.480 U	0.587 U	0.836 U	0.423 U	300,000	HH	300,000	HH
cis-1,2-Dichloroethene	0.132 U	0.123 U	0.151 U	0.215 U	0.109 U	2,500,000	Eco	3,100,000	HH
cis-1,3-Dichloropropene	0.0537 U	0.0500 U	0.0612 U	0.0872 U	0.0441 U	8,100	HH	8,100	HH
Dibromochloromethane	0.0949 U	0.0884 U	0.108 U	0.154 U	0.0780 U	34,000	HH	34,000	HH
Dibromomethane	0.0953 U	0.0888 U	0.109 U	0.155 U	0.0783 U	110,000	HH	110,000	HH
Dichlorodifluoromethane	0.0602 U	0.0560 U	0.0686 U	0.0977 U	0.0494 U	730,000	Eco	780,000	HH
Dichloromethane (Methylene Chloride)	1.47 U	4.35 U	5.38 U	9.54 U	2.14 U	20,000	HH	20,000	HH
Ethylbenzene	1.47 U	1.37 U	1.68 U	2.39 U	1.21 U	2,260	Eco	12,000	HH
Hexachlorobutadiene	0.0862 U	0.0803 U	0.0983 U	0.140 U	0.0708 U	22,000	HH	22,000	HH
Isopropylbenzene	0.0549 U	0.0511 U	0.0626 U	0.0891 U	0.0451 U	2,260	Eco	24,000,000	HH
m,p-Xylenes	2.94 U	2.74 U	3.35 U	4.78 U	2.42 U	120,000	Eco	2,700,000	HH
Naphthalene	0.606 U	0.565 U	0.691 U	0.985 U	0.498 U	23,000	HH	23,000	HH
n-Butylbenzene	0.136 U	0.127 U	0.155 U	0.221 U	0.112 U	-	-	-	-
n-Propylbenzene	0.0690 U	0.0643 U	0.0787 U	0.112 U	0.0567 U	2,260	Eco	21,000,000	HH
o-Xylene	1.47 U	0.0411 U	1.68 U	2.39 U	1.21 U	1,000	Eco	19,000,000	HH
sec-Butylbenzene	0.0574 U	0.0534 U	0.0654 U	0.0932 U	0.0471 U	2,260	Eco	-	-
Styrene	1.47 U	1.37 U	0.0403 U	2.39 U	1.21 U	300,000	Eco	51,000,000	HH
tert-Butylbenzene	0.0355 U	0.0330 U	0.0404 U	0.0576 U	0.0291 U	2,260	Eco	-	-
Tetrachloroethene (PCE)	**0.162 J**	0.138 U	0.169 U	0.241 U	**0.950 J**	1,600	HH	1,600	HH
Toluene	1.47 U	1.37 U	**0.786 J**	**1.33 J**	1.21 U	200,000	Eco	24,000,000	HH
trans-1,2-Dichloroethene	0.368 U	0.343 U	0.419 U	0.597 U	0.302 U	200,000	HH	200,000	HH
trans-1,3-Dichloropropene	0.0666 U	0.0621 U	0.0760 U	0.108 U	0.0547 U	8,100	HH	8,100	HH
Trichloroethene (TCE)	**0.171 J**	0.0440 U	0.0538 U	0.0767 U	**0.0450 J**	130	HH	130	HH
Trichlorofluoromethane	0.515 U	0.480 U	0.587 U	0.836 U	0.423 U	730,000	Eco	63,000,000	HH
Vinyl Acetate	1.49 U	1.38 U	1.69 U	2.41 U	1.22 U	4,100,000	HH	4,100,000	HH
Vinyl Chloride	0.274 U	0.255 U	0.312 U	0.444 U	0.225 U	2,200	HH	2,200	HH

Notes:
µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-5b
2004 Sandblast Supplemental Site Inspection Soil Analytical Results
Volatile Organic Compounds
(Page 3 of 3)

Site ID	HA2	HA3	HA4	HA5	HA9	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**	**Selected SLV (>3 ft bgs)**	**SLV Source (>3 ft bgs)**
Sample ID	041122SGA16SS	041122SGA17SS	041122SGA21SS	041122SGA23SS	041123SGA28SS				
Sample Date	11/22/2004	11/22/2004	11/22/2004	11/22/2004	11/23/2004				
Sample Depth (Feet bgs)	0.5	0.5	3.0	3.0	0.5				
Medium	Soil	Soil	Soil	Soil	Soil				
Volatile Organic Compounds (µg/kg dry)									
1,1,1,2-Tetrachloroethane	0.0443 U	0.0610 U	0.0553 U	0.0957 U	0.0553 U	9,300	HH	9,300	HH
1,1,1-Trichloroethane (TCA)	0.0650 U	0.0896 U	0.0812 U	0.140 U	0.0812 U	38,000,000	HH	38,000,000	HH
1,1,2,2-Tetrachloroethane	0.0638 U	0.0879 U	0.0797 U	0.138 U	0.0796 U	2,800	HH	2,800	HH
1,1,2-Trichloroethane	0.0899 U	0.124 U	0.112 U	0.194 U	0.112 U	2,700	HH	2,700	HH
1,1-Dichloroethane	0.0572 U	0.0788 U	0.0715 U	0.124 U	0.0714 U	5,900	HH	5,900	HH
1,1-Dichloroethene	0.442 U	0.609 U	0.552 U	0.954 U	0.551 U	680,000	HH	680,000	HH
1,1-Dichloropropene	0.905 U	1.25 U	1.13 U	1.95 U	1.13 U	8,100	HH	8,100	HH
1,2,3-Trichlorobenzene	0.108 U	0.149 U	0.135 U	0.233 U	0.135 U	20,000	Eco	490,000	HH
1,2,3-Trichloropropane	0.0756 U	0.104 U	0.0946 U	0.163 U	0.0945 U	95.0	HH	95.0	HH
1,2,4-Trichlorobenzene	0.110 U	0.152 U	0.137 U	0.238 U	0.137 U	20,000	Eco	99,000	HH
1,2,4-Trimethylbenzene	0.0478 U	0.0658 U	**14,300**	**3.96**	**0.215 J**	200,000	Eco	980,000	HH
1,2-Dibromo-3-chloropropane	0.135 UJ	0.186 UJ	0.168 UJ	0.291 UJ	0.168 UJ	69.0	HH	69.0	HH
1,2-Dibromoethane (EDB)	0.0575 U	0.0793 U	0.0719 U	0.124 U	0.0718 U	140	HH	140	HH
1,2-Dichlorobenzene	0.0575 U	0.0793 U	0.0719 U	0.124 U	0.0718 U	2,260	Eco	19,000,000	HH
1,2-Dichloroethane (EDC)	0.0878 U	0.121 U	0.110 U	0.190 U	0.110 U	590	HH	590	HH
1,2-Dichloropropane	0.0428 U	0.0590 U	0.0535 U	0.0925 U	0.0535 U	4,500	HH	4,500	HH
1,3,5-Trimethylbenzene	**0.0435 J**	**0.125 J**	**219**	**1.83 J**	0.0539 U	150,000	HH	150,000	HH
1,3-Dichlorobenzene	0.0391 U	0.0538 U	0.0488 U	0.0844 U	0.0488 U	2,260	Eco	17,000	HH
1,3-Dichloropropane	0.0607 U	0.0836 U	0.0759 U	0.131 U	0.0758 U	20,000,000	HH	20,000,000	HH
1,4-Dichlorobenzene	0.0551 U	0.0760 U	0.0689 U	0.119 U	0.0689 U	17,000	HH	17,000	HH
2,2-Dichloropropane	0.0763 U	0.105 U	0.0954 U	0.165 U	0.0953 U	4,500	HH	4,500	HH
2-Butanone (MEK)	14.4 U	19.8 U	2.59 U	4.48 U	8.89 U	200,000,000	HH	200,000,000	HH
2-Chlorotoluene	0.0490 U	0.0676 U	0.0613 U	0.106 U	0.0612 U	20,000,000	HH	20,000,000	HH
2-Hexanone	1.23 U	1.70 U	1.54 U	2.67 U	1.54 U	1,250,000	Eco	1,400,000	HH
4-Chlorotoluene	0.0938 U	0.129 U	0.117 U	0.203 U	0.117 U	72,000,000	HH	72,000,000	HH
4-Isopropyltoluene	**2.63**	**0.196 J**	**161**	**0.912 J**	**0.253 J**	200,000	Eco	24,000,000	HH
4-Methyl-2-pentanone (MIBK)	0.718 U	0.989 U	0.897 U	1.55 U	0.896 U	1,250,000	Eco	53,000,000	HH
Acetone	173 U	389 U	146 U	65.5 U	89.1 U	1,250,000	Eco	630,000,000	HH
Benzene	1.13 U	1.56 U	1.42 U	**0.600 J**	1.41 U	1,200	HH	1,200	HH
Bromobenzene	0.0450 U	0.0619 U	0.0562 U	0.0971 U	0.0561 U	1,800,000	HH	1,800,000	HH
Bromochloromethane	0.0519 U	0.0715 U	0.0648 U	0.112 U	0.0648 U	1,900	HH	1,900	HH
Bromodichloromethane	0.0700 U	0.0964 U	0.0875 U	0.151 U	0.0874 U	1,900	HH	1,900	HH
Bromoform	0.0701 UJ	0.0966 UJ	0.0876 UJ	0.151 UJ	0.0875 UJ	360,000	HH	360,000	HH
Bromomethane	0.397 U	0.548 U	1.42 U	0.859 U	0.496 U	17,000	HH	17,000	HH
Carbon Disulfide	0.313 U	0.431 U	1.42 U	0.675 U	0.390 U	1,000,000	Eco	3,700,000	HH
Carbon Tetrachloride	0.0953 U	0.131 U	0.119 U	0.206 U	0.119 U	630	HH	630	HH
Chlorobenzene	0.0503 U	0.0693 U	0.0628 U	0.109 U	0.0628 U	40,000	Eco	4,300,000	HH
Chloroethane	0.649 U	0.894 U	0.811 U	1.40 U	0.810 U	61,000,000	HH	61,000,000	HH
Chloroform	0.0602 U	0.0830 U	0.0753 U	0.130 U	0.0752 U	410	HH	410	HH
Chloromethane	0.396 U	0.546 U	0.495 U	0.856 U	0.495 U	300,000	HH	300,000	HH
cis-1,2-Dichloroethene	0.102 U	0.140 U	**120**	0.220 U	0.127 U	2,500,000	Eco	3,100,000	HH
cis-1,3-Dichloropropene	0.0413 U	0.0570 U	0.0517 U	0.0893 U	0.0516 U	8,100	HH	8,100	HH
Dibromochloromethane	0.0730 U	0.101 U	0.0913 U	0.158 U	0.0912 U	34,000	HH	34,000	HH
Dibromomethane	0.0734 U	0.101 U	0.0917 U	0.159 U	0.0916 U	110,000	HH	110,000	HH
Dichlorodifluoromethane	0.0463 U	0.0638 U	0.0579 U	0.100 U	0.0578 U	730,000	Eco	780,000	HH
Dichloromethane (Methylene Chloride)	2.27 U	2.46 U	6.37 U	5.63 U	2.43 U	20,000	HH	20,000	HH
Ethylbenzene	1.13 U	1.56 U	**37.4**	2.45 U	1.41 U	2,260	Eco	12,000	HH
Hexachlorobutadiene	0.0664 U	0.0914 U	0.0829 U	0.143 U	0.0829 U	22,000	HH	22,000	HH
Isopropylbenzene	0.0422 U	0.0582 U	**47.3**	0.0913 U	0.0527 U	2,260	Eco	24,000,000	HH
m,p-Xylenes	2.26 U	3.12 U	**40.0**	4.89 U	2.83 U	120,000	Eco	2,700,000	HH
Naphthalene	0.467 U	0.643 U	**19.5**	**2.04 J**	0.583 U	23,000	HH	23,000	HH
n-Butylbenzene	0.105 U	0.144 U	0.131 U	0.227 U	0.131 U	-	-	-	-
n-Propylbenzene	0.0531 U	0.0732 U	**122**	**0.409 J**	0.0663 U	2,260	Eco	21,000,000	HH
o-Xylene	1.13 U	1.56 U	**57.1**	**0.197 J**	1.41 U	1,000	Eco	19,000,000	HH
sec-Butylbenzene	0.0442 U	0.0609 U	**90.2**	**0.435 J**	0.0551 U	2,260	Eco	-	-
Styrene	1.13 U	1.56 U	0.0340 U	2.45 U	1.41 U	300,000	Eco	51,000,000	HH
tert-Butylbenzene	0.0273 U	0.0376 U	0.0341 U	0.0590 U	0.0341 U	2,260	Eco	-	-
Tetrachloroethene (PCE)	0.114 U	0.158 U	**9,410**	**5.84**	0.143 U	1,600	HH	1,600	HH
Toluene	1.13 U	1.56 U	**4.78**	2.45 U	1.41 U	200,000	Eco	24,000,000	HH
trans-1,2-Dichloroethene	0.283 U	0.390 U	**2.28**	0.612 U	0.354 U	200,000	HH	200,000	HH
trans-1,3-Dichloropropene	0.0513 U	0.0707 U	0.0641 U	0.111 U	0.0641 U	8,100	HH	8,100	HH
Trichloroethene (TCE)	**0.0667 J**	**0.0655 J**	**6,080**	**1.35 J**	**0.0614 J**	130	HH	130	HH
Trichlorofluoromethane	0.396 U	0.546 U	0.495 U	0.856 U	0.495 U	730,000	Eco	63,000,000	HH
Vinyl Acetate	1.14 U	1.58 U	1.43 U	2.47 U	1.43 U	4,100,000	HH	4,100,000	HH
Vinyl Chloride	0.211 U	0.290 U	0.263 U	0.455 U	0.263 U	2,200	HH	2,200	HH

Notes:

µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-5c
2004 Sandblast Supplemental Site Inspection Soil Analytical Results
Semivolatile Organic Compounds
(Page 1 of 3)

Site ID	DP10	DP11*	DP12	DP5	DP6	DP7*	DP8	DP9	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**	**Selected SLV (>3 ft bgs)**	**SLV Source (>3 ft bgs)**
Sample ID	041118SGA10SS	041118SGA11SS	041118SGA13SS	041116SGA02SS	041117SGA04SS	041117SGA05SS	041117SGA08SS	041117SGA09SS				
Sample Date	11/17/2004	11/17/2004	11/17/2004	11/16/2004	11/17/2004	11/17/2004	11/17/2004	11/17/2004				
Sample Depth (Feet bgs)	9.0-12.0	7.5-9.5	6.5-9.5	21.0-23.0	15.0-17.0	14.0-16.5	13.0-15.0	14.0-17.0				
Medium	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil				
Semivolatile Organic Compounds (µg/kg dry)												
1,2,4-Trichlorobenzene	1.04 U	1.02 U	1.03 UJ	0.998 U	1.00 U	0.981 U	0.935 U	1.01 U	20,000	Eco	99,000	HH
1,2-Dichlorobenzene	0.836 U	0.815 U	0.824 U	0.798 U	0.802 U	0.785 U	0.748 U	0.811 U	2,260	Eco	19,000,000	HH
1,3-Dichlorobenzene	1.05 U	1.02 U	1.03 U	1.00 U	1.01 U	0.985 U	0.939 U	1.02 U	2,260	Eco	17,000	HH
1,4-Dichlorobenzene	1.03 U	1.01 U	1.02 UJ	0.988 U	0.993 U	0.972 U	0.927 U	1.00 UJ	17,000	HH	17,000	HH
2,4,5-Trichlorophenol	0.955 U	0.931 U	0.941 U	0.912 U	0.917 U	0.897 U	0.855 U	0.927 U	4,000	Eco	62,000,000	HH
2,4,6-Trichlorophenol	0.973 U	0.949 U	0.959 U	0.930 U	0.934 U	0.914 U	0.872 U	0.945 U	10,000	Eco	200,000	HH
2,4-Dichlorophenol	1.09 U	1.06 U	1.08 U	1.04 U	1.05 U	1.03 U	0.977 U	1.06 U	20,000	Eco	1,800,000	HH
2,4-Dimethylphenol	0.941 UJ	0.918 UJ	0.928 UJ	0.899 UJ	0.904 UJ	0.884 UJ	0.843 UJ	0.914 UJ	20,000	Eco	12,000,000	HH
2,4-Dinitrophenol	8.60 U	8.39 U	8.48 U	8.22 U	8.26 U	8.08 U	7.70 U	8.35 U	20,000	Eco	1,200,000	HH
2,4-Dinitrotoluene	2.09 U	2.04 U	2.06 UJ	2.00 U	2.01 U	1.97 U	1.87 U	2.03 U	5,500	HH	5,500	HH
2,6-Dinitrotoluene	1.32 U	1.28 U	1.30 U	1.26 U	1.26 U	1.24 U	1.18 U	1.28 U	240,000	HH	240,000	HH
2-Chloronaphthalene	0.831 U	0.810 U	0.819 U	0.793 U	0.797 U	0.780 U	0.744 U	0.806 U	82,000,000	HH	82,000,000	HH
2-Chlorophenol	0.828 U	0.808 U	0.816 U	0.791 U	0.795 U	0.778 U	0.742 U	0.804 U	60,000	Eco	5,100,000	HH
2-Methylphenol	1.16 U	1.13 U	1.15 U	1.11 U	1.12 U	1.09 U	1.04 U	1.13 U	50,000	Eco	31,000,000	HH
2-Nitroaniline	0.668 U	0.652 U	0.659 U	0.638 U	0.641 U	0.628 U	0.598 U	0.649 U	6,000,000	HH	6,000,000	HH
2-Nitrophenol	1.40 U	1.37 U	1.38 U	1.34 U	1.35 U	1.32 U	1.26 U	1.36 U	180,000,000	HH	180,000,000	HH
3,3'-Dichlorobenzidine	5.34 U	5.21 U	5.26 U	5.10 U	5.13 U	5.02 U	4.78 U	5.18 U	4,800	HH	4,800	HH
3-Nitroaniline	3.61 U	3.52 U	3.55 U	3.44 U	3.46 U	3.39 U	3.23 U	3.50 U	70,000	Eco	6,000,000	HH
4,6-Dinitro-2-methylphenol	2.22 U	2.16 U	2.18 U	2.12 U	2.13 U	2.08 U	1.98 U	2.15 U	49,000	HH	49,000	HH
4-Bromophenyl Phenyl Ether	2.26 U	2.21 U	2.23 U	2.16 U	2.17 U	2.13 U	2.03 U	2.20 U	-	-	-	-
4-Chloro-3-methylphenol	1.10 U	1.07 U	1.08 U	1.05 U	1.05 U	1.03 U	0.984 U	1.07 U	62,000,000	HH	62,000,000	HH
4-Chloroaniline	1.14 U	1.12 U	1.13 U	1.09 U	1.10 U	1.08 U	1.02 U	1.11 U	8,600	HH	8,600	HH
4-Chlorophenyl Phenyl Ether	2.65 U	2.58 U	2.61 U	2.53 U	2.54 U	2.49 U	2.37 U	2.57 U	-	-	-	-
4-Nitroaniline	5.05 UJ	4.92 UJ	4.97 UJ	4.82 UJ	4.84 UJ	4.74 UJ	4.52 UJ	4.90 UJ	40,000	Eco	86,000	HH
4-Nitrophenol	10.1 U	9.83 U	9.93 U	9.63 U	9.67 U	9.47 U	9.02 U	9.78 U	7,000	Eco	180,000,000	HH
Aniline	2.3 U	2.2 U	2.2 U	2.2 U	2.2 U	2.1 U	2.0 U	2.2 U	200,000	Eco	300,000	HH
Benzidine	3.47 U	3.38 U	3.42 U	3.31 U	3.33 U	3.26 U	3.11 U	3.37 U	55,000	HH	55,000	HH
Benzoic Acid	19.7 U	19.2 U	19.4 U	18.8 U	18.9 U	18.5 U	17.6 U	19.1 U	200,000	Eco	2,500,000,000	HH
Benzyl Alcohol	2.45 U	2.39 U	2.41 U	2.34 U	2.35 U	2.30 U	2.19 U	2.38 U	2,260	Eco	62,000,000	HH
Bis(2-chloroethoxy)methane	2.36 U	2.30 U	2.33 U	2.26 U	2.27 U	2.22 U	2.12 U	2.29 U	730,000	Eco	1,800,000	HH
Bis(2-chloroethyl) Ether	1.93 U	1.88 U	1.90 U	1.85 U	1.85 U	1.81 U	1.73 U	1.88 U	1,000	HH	1,000	HH
Bis(2-chloroisopropyl) Ether	9.83 U	9.59 U	9.69 U	9.39 U	9.44 U	9.24 U	8.80 U	9.54 U	1,000	HH	1,000	HH
Bis(2-ethylhexyl) Phthalate	**32.1**	**75.0 J**	**6.67 J**	**11.2 J**	**10.9 J**	**147**	**266**	**44.1**	4,500	Eco	150,000	HH
Butyl Benzyl Phthalate	2.63 U	2.57 U	2.60 U	2.52 U	2.53 U	2.47 U	2.36 U	2.56 U	450	Eco	910,000	HH
Carbazole	2.45 U	2.39 U	2.41 U	2.34 U	2.35 U	2.30 U	2.19 U	2.38 U	2,260	Eco	1,000,000	HH
Dibenzofuran	0.569 U	0.555 U	0.560 U	0.543 U	0.546 U	0.534 U	0.509 U	0.552 U	2.00	Eco	1,000,000	HH
Diethyl Phthalate	4.44 U	4.33 U	4.38 U	4.24 U	4.26 U	4.17 U	3.98 U	4.31 U	100,000	Eco	490,000,000	HH
Dimethyl Phthalate	2.41 U	2.35 U	2.38 U	2.30 U	2.32 U	2.27 U	2.16 U	2.34 U	150,000	HH	150,000	HH
Di-n-butyl Phthalate	12.3 U	2.18 U	2.21 U	2.14 U	11.8 U	11.6 U	11.0 U	11.9 U	450	Eco	62,000,000	HH
Di-n-octyl Phthalate	2.26 U	2.21 U	2.23 U	2.16 U	**7.06 J**	**4.40 J**	2.03 U	2.20 U	450	Eco	150,000	HH
Hexachlorobenzene	0.651 U	0.635 U	0.642 U	0.622 U	0.625 U	0.612 U	0.583 U	0.632 U	1,800	HH	1,800	HH
Hexachlorobutadiene	0.900 U	0.877 U	0.887 U	0.859 U	0.864 U	0.845 U	0.805 U	0.873 U	22,000	HH	22,000	HH
Hexachlorocyclopentadiene	0.976 U	0.952 U	0.962 U	0.932 U	0.937 U	0.917 U	0.874 U	0.947 U	10,000	Eco	3,700,000	HH
Hexachloroethane	2.08 U	2.03 U	2.05 U	1.99 U	2.00 U	1.95 U	1.86 U	2.02 U	150,000	HH	150,000	HH
Isophorone	0.620 U	0.605 U	0.611 U	0.592 U	0.595 U	0.583 U	0.555 U	0.602 U	1,800,000	HH	1,800,000	HH
Nitrobenzene	3.70 U	3.61 U	3.65 U	3.54 U	3.56 U	3.48 U	3.32 U	3.60 U	8,000	Eco	24,000	HH
N-Nitrosodimethylamine	3.75 U	3.66 U	3.70 U	3.58 U	3.60 U	3.53 U	3.36 U	3.64 U	34.0	HH	34.0	HH
N-Nitrosodi-n-propylamine	1.65 U	1.61 U	1.63 U	1.58 U	1.58 U	1.55 U	1.48 U	1.60 U	250	HH	250	HH
N-Nitrosodiphenylamine	0.704 U	0.687 U	0.694 U	0.672 U	0.676 U	0.661 U	0.630 U	0.683 U	20,000	Eco	350,000	HH
p-cresol (4-Methylphenol)	1.45 U	1.42 U	1.43 U	1.39 U	1.39 U	1.36 U	1.30 U	1.41 U	-	-	-	-
Pentachlorophenol	2.39 UJ	2.33 UJ	2.35 UJ	2.28 UJ	2.29 UJ	2.24 UJ	2.14 UJ	2.32 UJ	2,100	Eco	13,000	HH
Phenol	0.890 U	0.868 U	0.877 U	0.850 U	0.854 U	0.836 U	0.797 U	0.864 U	30,000	Eco	180,000,000	HH
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)												
2-Methylnaphthalene	0.640 U	0.624 U	0.631 U	0.611 U	**7.98 J**	0.601 U	0.573 U	0.621 U	4,100,000	HH	4,100,000	HH
Acenaphthene	0.631 U	0.616 U	0.622 U	0.603 U	0.606 U	0.593 U	0.565 U	0.613 U	19,000,000	HH	19,000,000	HH
Acenaphthylene	0.725 U	0.707 U	0.714 U	0.692 U	0.696 U	0.681 U	0.649 U	0.704 U	23,000	HH	23,000	HH
Anthracene	0.468 U	0.456 U	0.461 U	0.447 U	0.449 U	0.439 U	0.419 U	0.454 U	93,000,000	HH	93,000,000	HH
Fluorene	0.795 U	0.775 U	0.784 U	0.759 U	0.763 U	0.747 U	0.712 U	0.772 U	12,000,000	HH	12,000,000	HH
Naphthalene	1.09 U	1.06 U	1.07 U	1.04 U	**4.24**	1.02 U	0.976 U	1.06 U	23,000	HH	23,000	HH
Phenanthrene	0.731 U	0.713 U	0.720 U	0.698 U	0.702 U	0.687 U	**1.82 J**	0.710 U	93,000,000	HH	93,000,000	HH
Total LPAHs (KM, capped; NDs at MDL)	NC	NC	NC	NC	NC	NC	NC	NC	29,000	Eco	-	-
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)												
Benzo(a)anthracene	1.24 U	1.21 U	1.23 U	1.19 U	1.19 U	1.17 U	1.11 U	1.21 U	2,700	HH	2,700	HH
Benzo(a)pyrene	0.779 U	0.760 U	0.768 U	0.744 U	0.748 U	**1.32 J**	0.697 U	0.756 U	270	HH	270	HH
Benzo(g,h,i)perylene	0.592 U	0.577 U	0.583 U	0.565 U	0.568 U	0.556 U	0.530 U	0.575 U	27,000	HH	27,000	HH
Benzofluoranthenes, Total	1.11 U	1.09 U	1.10 U	1.06 U	1.07 U	**2.72 J**	**2.97 J**	1.08 U	2,700	HH	2,700	HH
Chrysene	0.880 U	0.858 U	0.867 U	0.840 U	0.845 U	0.827 U	0.788 U	0.854 U	270,000	HH	270,000	HH
Dibenz(a,h)anthracene	0.764 U	0.745 U	0.753 U	0.730 U	0.734 U	0.718 U	0.684 U	0.742 U	270	HH	270	HH
Fluoranthene	1.24 U	1.21 U	1.23 U	1.19 U	1.19 U	**3.53**	**3.90**	1.21 U	8,900,000	HH	8,900,000	HH
Indeno(1,2,3-cd)pyrene	0.561 U	0.547 U	0.553 U	0.536 U	0.539 U	0.527 U	**0.511 J**	0.545 U	2,700	HH	2,700	HH
Pyrene	0.418 U	0.408 U	0.412 U	0.400 U	**3.71**	**3.31**	**2.60**	0.406 U	6,700,000	HH	6,700,000	HH
Total HPAHs (KM, capped; NDs at MDL)	NC	NC	NC	NC	NC	NC	NC	NC	1,100	Eco	-	-

Notes:
µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-5c
2004 Sandblast Supplemental Site Inspection Soil Analytical Results
Semivolatile Organic Compounds
(Page 2 of 3)

Site ID	HA1*	HA10	HA11	HA11	HA12	Selected SLV (0-3 ft bgs)	SLV Source (0-3 ft bgs)	Selected SLV (>3 ft bgs)	SLV Source (>3 ft bgs)
Sample ID	041122SGA14SS	041123SGA29SS	041123SGA30SS	041123SGA31SS	041123SGA33SS				
Sample Date	11/22/2004	11/23/2004	11/23/2004	11/23/2004	11/23/2004				
Sample Depth (Feet bgs)	0.5	0.5	1.0	3.0	4.0				
Medium	Soil	Soil	Soil	Soil	Soil				
Semivolatile Organic Compounds (µg/kg dry)									
1,2,4-Trichlorobenzene	0.987 U	0.880 U	1.05 U	1.07 U	1.01 U	20,000	Eco	99,000	HH
1,2-Dichlorobenzene	0.790 U	0.703 U	0.837 U	0.857 U	0.808 U	2,260	Eco	19,000,000	HH
1,3-Dichlorobenzene	0.991 U	0.883 U	1.05 U	1.08 U	1.01 U	2,260	Eco	17,000	HH
1,4-Dichlorobenzene	0.978 U	0.871 U	1.04 U	1.06 U	1.00 U	17,000	HH	17,000	HH
2,4,5-Trichlorophenol	0.902 U	0.804 U	0.956 U	0.980 U	0.923 U	4,000	Eco	62,000,000	HH
2,4,6-Trichlorophenol	0.920 U	0.819 U	0.975 U	0.999 U	0.941 U	10,000	Eco	200,000	HH
2,4-Dichlorophenol	1.03 U	0.919 U	1.09 U	1.12 U	1.06 U	20,000	Eco	1,800,000	HH
2,4-Dimethylphenol	0.890 UJ	0.793 UJ	0.943 UJ	0.966 UJ	0.910 UJ	20,000	Eco	12,000,000	HH
2,4-Dinitrophenol	8.13 U	7.24 U	8.61 U	8.82 U	8.32 U	20,000	Eco	1,200,000	HH
2,4-Dinitrotoluene	1.98 U	1.76 U	2.09 U	2.15 U	2.02 U	5,500	HH	5,500	HH
2,6-Dinitrotoluene	1.24 U	1.11 U	1.32 U	1.35 U	1.27 U	240,000	HH	240,000	HH
2-Chloronaphthalene	0.785 U	0.699 U	0.832 U	0.852 U	0.803 U	82,000,000	HH	82,000,000	HH
2-Chlorophenol	0.783 U	0.697 U	0.829 U	0.850 U	0.801 U	60,000	Eco	5,100,000	HH
2-Methylphenol	1.10 U	0.978 U	1.16 U	1.19 U	1.12 U	50,000	Eco	31,000,000	HH
2-Nitroaniline	0.631 U	0.563 U	0.669 U	0.685 U	0.646 U	6,000,000	HH	6,000,000	HH
2-Nitrophenol	1.33 U	1.18 U	1.40 U	1.44 U	1.36 U	180,000,000	HH	180,000,000	HH
3,3'-Dichlorobenzidine	5.05 U	4.50 U	5.35 U	5.48 U	5.16 U	4,800	HH	4,800	HH
3-Nitroaniline	3.41 U	3.04 U	3.61 U	3.70 U	3.49 U	70,000	Eco	6,000,000	HH
4,6-Dinitro-2-methylphenol	2.09 U	1.86 U	2.22 U	2.27 U	2.14 U	49,000	HH	49,000	HH
4-Bromophenyl Phenyl Ether	2.14 U	1.91 U	2.27 U	2.32 U	2.19 U	-	-	-	-
4-Chloro-3-methylphenol	1.04 U	0.925 U	1.10 U	1.13 U	1.06 U	62,000,000	HH	62,000,000	HH
4-Chloroaniline	1.08 U	0.963 U	1.15 U	1.17 U	1.11 U	8,600	HH	8,600	HH
4-Chlorophenyl Phenyl Ether	2.50 U	2.23 U	2.65 U	2.71 U	2.56 U	-	-	-	-
4-Nitroaniline	4.77 U	4.25 U	5.05 U	5.18 U	4.88 U	40,000	Eco	86,000	HH
4-Nitrophenol	9.52 U	8.48 U	10.1 U	10.3 U	9.74 U	7,000	Eco	180,000,000	HH
Aniline	2.14 U	1.91 U	2.27 U	2.32 U	2.19 U	200,000	Eco	300,000	HH
Benzidine	3.28 U	2.92 U	3.48 U	3.56 U	3.35 U	55,000	HH	55,000	HH
Benzoic Acid	**108 J**	16.6 U	**27.3 J**	20.2 U	19.0 U	200,000	Eco	2,500,000,000	HH
Benzyl Alcohol	2.31 U	2.06 U	2.45 U	2.51 U	2.37 U	2,260	Eco	62,000,000	HH
Bis(2-chloroethoxy)methane	2.23 UJ	1.99 UJ	2.37 UJ	2.42 UJ	2.28 UJ	730,000	Eco	1,800,000	HH
Bis(2-chloroethyl) Ether	1.83 U	1.63 U	1.93 U	1.98 U	1.87 U	1,000	HH	1,000	HH
Bis(2-chloroisopropyl) Ether	9.29 U	8.28 U	9.85 U	10.1 U	9.50 U	1,000	HH	1,000	HH
Bis(2-ethylhexyl) Phthalate	**1,035**	1.90 U	**332**	2.31 U	**542**	4,500	Eco	150,000	HH
Butyl Benzyl Phthalate	**39.7 J**	2.22 U	2.64 U	2.70 U	2.55 U	450	Eco	910,000	HH
Carbazole	**19.4**	2.06 U	**9.49 J**	2.51 U	2.37 U	2,260	Eco	1,000,000	HH
Dibenzofuran	**2.48 J**	0.479 U	0.569 U	0.583 U	0.550 U	2.00	Eco	1,000,000	HH
Diethyl Phthalate	4.20 U	3.74 U	4.45 U	4.56 U	4.29 U	100,000	Eco	490,000,000	HH
Dimethyl Phthalate	2.28 U	2.03 U	2.42 U	2.47 U	2.33 U	150,000	HH	150,000	HH
Di-n-butyl Phthalate	2.16 UJ	1.89 UJ	2.24 UJ	13.1 UJ	19.0 UJ	450	Eco	62,000,000	HH
Di-n-octyl Phthalate	**127**	1.91 U	**61.6**	2.32 U	**88.1**	450	Eco	150,000	HH
Hexachlorobenzene	0.615 U	0.548 U	0.652 U	0.668 U	0.629 U	1,800	HH	1,800	HH
Hexachlorobutadiene	0.850 U	0.757 U	0.901 U	0.923 U	0.870 U	22,000	HH	22,000	HH
Hexachlorocyclopentadiene	0.922 U	0.822 U	0.977 U	1.00 U	0.943 U	10,000	Eco	3,700,000	HH
Hexachloroethane	1.97 U	1.75 U	2.08 U	2.13 U	2.01 U	150,000	HH	150,000	HH
Isophorone	0.586 U	0.522 U	0.621 U	0.636 U	0.600 U	1,800,000	HH	1,800,000	HH
Nitrobenzene	3.50 U	3.12 U	3.71 U	3.80 U	3.58 U	8,000	Eco	24,000	HH
N-Nitrosodimethylamine	3.55 U	3.16 U	3.76 U	3.85 U	3.63 U	34.0	HH	34.0	HH
N-Nitrosodi-n-propylamine	1.56 U	1.39 U	1.65 U	1.69 U	1.59 U	250	HH	250	HH
N-Nitrosodiphenylamine	0.665 U	0.593 U	0.705 U	0.722 U	0.680 U	20,000	Eco	350,000	HH
p-cresol (4-Methylphenol)	1.37 U	1.22 U	1.45 U	1.49 U	1.40 U	-	-	-	-
Pentachlorophenol	2.26 U	2.01 U	2.39 U	2.45 U	2.31 U	2,100	Eco	13,000	HH
Phenol	0.841 U	0.749 U	0.891 U	0.913 U	0.860 U	30,000	Eco	180,000,000	HH
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)									
2-Methylnaphthalene	**4.84 J**	0.539 U	0.641 U	0.656 U	**2.64 J**	4,100,000	HH	4,100,000	HH
Acenaphthene	**10.9**	0.531 U	**5.88**	0.648 U	**8.09**	19,000,000	HH	19,000,000	HH
Acenaphthylene	**4.33**	0.610 U	0.726 U	0.744 U	0.701 U	23,000	HH	23,000	HH
Anthracene	**14.7**	0.394 U	**8.55**	0.480 U	**6.41**	93,000,000	HH	93,000,000	HH
Fluorene	**8.53**	0.669 U	**7.13**	0.816 U	0.768 U	12,000,000	HH	12,000,000	HH
Naphthalene	**4.11**	0.918 U	**2.50**	1.12 U	1.05 U	23,000	HH	23,000	HH
Phenanthrene	**116 J**	**7.86**	**24.8**	0.750 U	**18.3**	93,000,000	HH	93,000,000	HH
Total LPAHs (KM, capped; NDs at MDL)	**158 J**	**11.0 J**	**49.6 J**	4.56 U	NC	29,000	Eco	-	-
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)									
Benzo(a)anthracene	**183 J**	1.05 U	**48.3 J**	1.28 U	**26.5 J**	2,700	HH	2,700	HH
Benzo(a)pyrene	**160**	0.656 U	**40.4**	0.799 U	**28.9**	270	HH	270	HH
Benzo(g,h,i)perylene	**94.6 J**	0.498 U	**29.8 J**	0.607 U	**18.9 J**	27,000	HH	27,000	HH
Benzofluoranthenes, Total	**290**	0.939 U	**73.4**	1.14 U	**39.0**	2,700	HH	2,700	HH
Chrysene	**225**	0.741 U	**85.8**	0.903 U	**32.7**	270,000	HH	270,000	HH
Dibenz(a,h)anthracene	**34.2 J**	0.643 U	**1.23 J**	0.784 U	0.739 U	270	HH	270	HH
Fluoranthene	**218**	1.05 U	**52.7**	1.28 U	**41.6**	8,900,000	HH	8,900,000	HH
Indeno(1,2,3-cd)pyrene	**83.6 J**	0.472 U	**26.5 J**	0.576 U	**15.3 J**	2,700	HH	2,700	HH
Pyrene	**367 J**	0.352 U	**51.6**	0.429 U	**44.8**	6,700,000	HH	6,700,000	HH
Total HPAHs (KM, capped; NDs at MDL)	**1,364 J**	5.46 U	**336 J**	6.66 U	NC	1,100	Eco	-	-

Notes:

µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-5c
2004 Sandblast Supplemental Site Inspection Soil Analytical Results
Semivolatile Organic Compounds
(Page 3 of 3)

Site ID	HA2	HA3	HA4	HA5	HA9	Selected SLV (0-3 ft bgs)	SLV Source (0-3 ft bgs)	Selected SLV (>3 ft bgs)	SLV Source (>3 ft bgs)
Sample ID	041122SGA16SS	041122SGA17SS	041122SGA21SS	041122SGA23SS	041123SGA28SS				
Sample Date	11/22/2004	11/22/2004	11/22/2004	11/22/2004	11/23/2004				
Sample Depth (Feet bgs)	0.5	0.5	3.0	3.0	0.5				
Medium	Soil	Soil	Soil	Soil	Soil				
Semivolatile Organic Compounds (µg/kg dry)									
1,2,4-Trichlorobenzene	0.895 U	9.57 U	1.07 U	1.06 U	0.939 U	20,000	Eco	99,000	HH
1,2-Dichlorobenzene	0.716 U	7.65 U	0.859 U	0.850 U	0.751 U	2,260	Eco	19,000,000	HH
1,3-Dichlorobenzene	0.898 U	9.60 U	1.08 U	1.07 U	0.942 U	2,260	Eco	17,000	HH
1,4-Dichlorobenzene	0.887 U	9.48 U	1.06 U	1.05 U	0.930 U	17,000	HH	17,000	HH
2,4,5-Trichlorophenol	0.818 U	8.75 U	0.981 U	0.971 U	0.858 U	4,000	Eco	62,000,000	HH
2,4,6-Trichlorophenol	0.834 U	8.92 U	1.00 U	0.990 U	0.875 U	10,000	Eco	200,000	HH
2,4-Dichlorophenol	0.935 U	10.0 U	1.12 U	1.11 U	0.981 U	20,000	Eco	1,800,000	HH
2,4-Dimethylphenol	0.807 UJ	8.62 U	0.967 U	0.957 UJ	0.846 UJ	20,000	Eco	12,000,000	HH
2,4-Dinitrophenol	7.37 U	78.8 U	8.84 U	8.75 U	7.73 U	20,000	Eco	1,200,000	HH
2,4-Dinitrotoluene	1.79 U	19.2 UJ	2.15 U	2.13 U	1.88 U	5,500	HH	5,500	HH
2,6-Dinitrotoluene	1.13 U	12.1 U	1.35 U	1.34 U	1.18 U	240,000	HH	240,000	HH
2-Chloronaphthalene	0.712 U	7.61 U	0.853 U	0.845 U	0.746 U	82,000,000	HH	82,000,000	HH
2-Chlorophenol	0.710 U	7.59 U	0.851 U	0.842 U	0.744 U	60,000	Eco	5,100,000	HH
2-Methylphenol	0.995 U	10.6 U	1.19 U	1.18 U	1.04 U	50,000	Eco	31,000,000	HH
2-Nitroaniline	0.573 U	6.12 U	0.687 U	0.680 U	0.600 U	6,000,000	HH	6,000,000	HH
2-Nitrophenol	1.20 U	12.8 U	1.44 U	1.43 U	1.26 U	180,000,000	HH	180,000,000	HH
3,3'-Dichlorobenzidine	4.58 U	48.9 U	5.49 U	5.43 U	4.80 U	4,800	HH	4,800	HH
3-Nitroaniline	3.09 U	33.0 U	3.70 U	3.67 U	3.24 U	70,000	Eco	6,000,000	HH
4,6-Dinitro-2-methylphenol	1.90 U	20.3 U	2.28 U	2.25 U	1.99 U	49,000	HH	49,000	HH
4-Bromophenyl Phenyl Ether	1.94 U	20.7 U	2.33 U	2.30 U	2.03 U	-	-	-	-
4-Chloro-3-methylphenol	0.942 U	10.1 UJ	1.13 U	1.12 U	0.987 U	62,000,000	HH	62,000,000	HH
4-Chloroaniline	0.981 U	10.5 U	1.18 U	1.16 U	1.03 U	8,600	HH	8,600	HH
4-Chlorophenyl Phenyl Ether	2.27 U	24.2 U	2.72 U	2.69 U	2.38 U	-	-	-	-
4-Nitroaniline	4.32 U	46.2 UJ	5.18 U	5.13 U	4.53 U	40,000	Eco	86,000	HH
4-Nitrophenol	8.64 U	92.3 UJ	10.4 U	10.3 U	9.05 U	7,000	Eco	180,000,000	HH
Aniline	1.94 U	20.7 U	2.33 U	2.30 U	2.03 U	200,000	Eco	300,000	HH
Benzidine	2.97 U	31.8 U	3.57 U	3.53 U	3.12 U	55,000	HH	55,000	HH
Benzoic Acid	**175 J**	180 U	20.2 U	20.0 U	17.7 U	200,000	Eco	2,500,000,000	HH
Benzyl Alcohol	2.10 U	22.4 U	2.52 U	2.49 U	**7.81**	2,260	Eco	62,000,000	HH
Bis(2-chloroethoxy)methane	2.02 UJ	21.6 U	2.43 U	2.40 UJ	2.12 UJ	730,000	Eco	1,800,000	HH
Bis(2-chloroethyl) Ether	1.66 U	17.7 U	1.99 U	1.97 U	1.74 U	1,000	HH	1,000	HH
Bis(2-chloroisopropyl) Ether	8.42 U	90.1 U	10.1 U	10.0 U	8.83 U	1,000	HH	1,000	HH
Bis(2-ethylhexyl) Phthalate	**174**	**2,220 J**	**19,800**	**127**	**220**	4,500	Eco	150,000	HH
Butyl Benzyl Phthalate	21.1 U	24.1 U	**31.7 J**	2.68 U	2.37 U	450	Eco	910,000	HH
Carbazole	**24.0**	**524**	2.52 U	2.49 U	**4.56 J**	2,260	Eco	1,000,000	HH
Dibenzofuran	**3.61 J**	**76.6**	**123**	0.578 U	**0.996 J**	2.00	Eco	1,000,000	HH
Diethyl Phthalate	3.81 U	40.7 U	4.56 U	4.52 U	3.99 U	100,000	Eco	490,000,000	HH
Dimethyl Phthalate	2.07 U	22.1 U	2.48 U	2.45 U	2.17 U	150,000	HH	150,000	HH
Di-n-butyl Phthalate	1.92 UJ	**73.7 J**	**23.9**	2.28 UJ	11.1 U	450	Eco	62,000,000	HH
Di-n-octyl Phthalate	1.94 U	20.7 U	2.33 U	**22.9 J**	**16.1 J**	450	Eco	150,000	HH
Hexachlorobenzene	0.558 U	5.96 U	0.669 U	0.662 U	0.585 U	1,800	HH	1,800	HH
Hexachlorobutadiene	0.771 U	8.24 U	0.924 U	0.915 U	0.808 U	22,000	HH	22,000	HH
Hexachlorocyclopentadiene	0.836 U	8.94 U	1.00 U	0.993 U	0.877 U	10,000	Eco	3,700,000	HH
Hexachloroethane	1.78 U	19.0 U	2.14 U	2.12 U	1.87 U	150,000	HH	150,000	HH
Isophorone	0.531 U	5.68 U	0.637 U	0.631 U	0.557 U	1,800,000	HH	1,800,000	HH
Nitrobenzene	3.17 U	33.9 U	3.81 U	3.77 U	3.33 U	8,000	Eco	24,000	HH
N-Nitrosodimethylamine	3.22 U	34.4 U	3.86 U	3.82 U	3.37 U	34.0	HH	34.0	HH
N-Nitrosodi-n-propylamine	1.41 U	15.1 U	1.69 U	1.68 U	1.48 U	250	HH	250	HH
N-Nitrosodiphenylamine	0.603 U	6.45 U	0.723 U	0.716 U	0.632 U	20,000	Eco	350,000	HH
p-cresol (4-Methylphenol)	1.24 U	13.3 U	1.49 U	1.48 U	**2.46 J**	-	-	-	-
Pentachlorophenol	2.05 U	21.9 UJ	2.45 U	2.43 U	2.14 U	2,100	Eco	13,000	HH
Phenol	0.762 U	8.15 U	0.914 U	0.905 U	0.799 U	30,000	Eco	180,000,000	HH
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)									
2-Methylnaphthalene	**2.53 J**	**31.8**	0.657 U	0.651 U	**1.29 J**	4,100,000	HH	4,100,000	HH
Acenaphthene	**16.1**	**296**	**328**	0.642 U	**5.41**	19,000,000	HH	19,000,000	HH
Acenaphthylene	**4.65**	**54.7**	**9.14**	0.737 U	**1.39 J**	23,000	HH	23,000	HH
Anthracene	**21.3**	**832**	**447**	0.476 U	**5.03**	93,000,000	HH	93,000,000	HH
Fluorene	**10.5**	**278**	**164**	0.809 U	0.714 U	12,000,000	HH	12,000,000	HH
Naphthalene	0.934 U	**78.2**	1.12 U	**2.04 J**	**2.56**	23,000	HH	23,000	HH
Phenanthrene	**115**	**3,250**	**1,580**	**2.47 J**	**38.2**	93,000,000	HH	93,000,000	HH
Total LPAHs (KM, capped; NDs at MDL)	**168 J**	**4,789**	**2,529 J**	**6.41 J**	**53.3 J**	29,000	Eco	-	-
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)									
Benzo(a)anthracene	**114 J**	**6,440**	**2,030**	1.26 U	**62.3 J**	2,700	HH	2,700	HH
Benzo(a)pyrene	**108**	**6,470**	**1,970**	0.792 U	**74.1**	270	HH	270	HH
Benzo(g,h,i)perylene	**61.9 J**	**3,830**	**914**	**4.33 J**	**66.4 J**	27,000	HH	27,000	HH
Benzofluoranthenes, Total	**212**	**12,100**	**3,040**	**7.70**	**135**	2,700	HH	2,700	HH
Chrysene	**129**	**7,590**	**1,910**	0.895 U	**75.3**	270,000	HH	270,000	HH
Dibenz(a,h)anthracene	**25.4 J**	**1,430**	**347**	0.777 U	**16.5 J**	270	HH	270	HH
Fluoranthene	**216**	**20,700**	**4,330**	**6.29**	**71.9**	8,900,000	HH	8,900,000	HH
Indeno(1,2,3-cd)pyrene	**60.8 J**	**3,910**	**939**	**3.52 J**	**49.8 J**	2,700	HH	2,700	HH
Pyrene	**217**	**21,900**	**5,470 J**	**9.14**	**79.3**	6,700,000	HH	6,700,000	HH
Total HPAHs (KM, capped; NDs at MDL)	**932 J**	**72,270**	**17,910 J**	**26.4 J**	**496 J**	1,100	Eco	-	-

Notes:

µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-5d
2004 Sandblast Supplemental Site Inspection Groundwater Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, Pesticides, and General Chemistry Parameters
(Page 1 of 2)

Site ID	DP1	DP10	DP11	DP12	DP12	DP2	DP3*	DP4	DP5*	DP7	DP9	Selected Discharge to Surface Water / Bioaccumulation	SLV Source	Selected Direct Contact SLV	SLV Source
Sample ID	041116SGA01GW	041118SGA06GW	041119SGA12GW	041119SGA11GW	041122SGA11GW	041117SGA02GW	041117SGA03GW	041117SGA05GW	041118SGA07GW	041119SGA09GW	041119SGA10GW				
Sample Date	11/16/2004	11/17/2004	11/19/2004	11/19/2004	11/22/2004	11/17/2004	11/17/2004	11/17/2004	11/17/2004	11/19/2004	11/19/2004				
Sample Depth (Feet bgs)	12.0-17.0	7.8-12.8	7.0-17.0	7.8-17.8	7.8-17.8	12.0-17.0	11.0-16.0	13.0-18.0	18.5-28.5	12.9-17.9	10.0-20.0				
Total PCB Aroclors (µg/L)															
Aroclor 1016	0.00226 U	-	-	-	-	0.00216 U	0.00207 U	0.00244 U	0.00208 U	0.00206 U	0.00237 U	0.0000640	HH	0.0140	Eco
Aroclor 1221	0.00226 U	-	-	-	-	0.00216 U	0.00207 U	0.00244 U	0.00208 U	0.00206 U	0.00237 U	0.0000640	HH	0.00680	HH
Aroclor 1232	0.00226 U	-	-	-	-	0.00216 U	0.00207 U	0.00244 U	0.00208 U	0.00206 U	0.00237 U	0.0000640	HH	0.00680	HH
Aroclor 1242	0.00226 U	-	-	-	-	0.00216 U	0.00207 U	0.00244 U	0.00208 U	0.00206 U	0.00237 U	0.0000640	HH	0.0140	Eco
Aroclor 1248	0.00226 U	-	-	-	-	0.00216 U	0.00207 U	0.00244 U	0.00208 U	0.00206 U	0.00237 U	0.0000640	HH	0.0140	Eco
Aroclor 1254	0.00248 U	-	-	-	-	0.00238 U	0.00228 U	0.00269 U	0.00228 U	0.00227 U	0.00261 U	0.0000640	HH	0.0140	Eco
Aroclor 1260	0.00248 U	-	-	-	-	0.00238 U	0.00228 U	0.00269 U	0.00228 U	0.00227 U	0.00261 U	0.0000640	HH	0.0140	Eco
Total Metals (µg/L)															
Aluminum	**12,400**	**6,730**	**17,900**	-	**17,500**	**2,250**	**93.7 J**	**1,080**	**280**	**494**	**74.2 J**	-	-	37,000	HH
Antimony	**0.898**	**0.362 J**	**1.57**	-	**0.233 J**	**0.934**	**0.476 J**	**0.586**	0.500 U	**0.477 J**	**0.317 J**	5.60	HH	15.0	HH
Arsenic	**4.61**	**1.87**	**7.70**	-	**0.262 J**	**2.50**	**0.978**	**1.17**	**0.114 J**	0.102 U	0.102 U	0.0180	HH	0.0380	HH
Barium	**83.7**	**26.2**	**97.8**	-	**70.2**	**12.5**	**3.76**	**11.7**	**24.9**	**16.2**	**8.99**	1,000	HH	7,300	HH
Beryllium	**0.307 J**	**0.157 J**	**0.219 J**	-	**0.785**	0.0782 U	0.0782 U	0.0782 U	0.0782 U	0.0782 U	0.0782 U	-	-	73.0	HH
Cadmium	0.0247 U	0.0247 U	0.0247 U	-	0.0247 U	0.0247 U	0.0247 U	0.0247 U	0.0247 U	0.0247 U	0.0247 U	-	-	18.0	HH
Calcium	**33,700**	**32,400**	**22,000**	-	**24,400**	**22,800**	**24,850**	**18,300**	**32,850**	**32,900**	**31,100**	-	-	-	-
Chromium	**10.7**	**16.2**	**21.5**	-	**31.8**	**9.37**	**4.65**	**8.08**	**4.74**	**2.61**	**5.26**	-	-	55,000	HH
Cobalt	**6.46**	**5.71**	**13.1**	-	**2.78 J**	**1.68 J**	0.770 U	0.770 U	**3.75 J**	0.770 U	0.770 U	-	-	11.0	HH
Copper	**36.5**	**19.0**	**43.4**	-	**204**	**7.29**	**1.38**	**3.80**	**2.55**	**3.84**	**1.44 J**	1,300	HH	1,500	HH
Iron	**16,500**	**9,820**	**25,900**	-	**23,700**	**3,220**	**84.4 J**	**1,290**	**546**	**613**	14.0 U	300	HH	26,000	HH
Lead	**5.01**	**2.58**	**6.82**	-	**13.7**	**1.08**	0.500 U	**0.652**	0.500 U	0.500 U	**0.0580 J**	-	-	15.0	HH
Magnesium	**11,800**	**15,400**	**14,400**	-	**8,700**	**6,130**	**5,835**	**5,130**	**10,400**	**9,310**	**8,300**	-	-	-	-
Manganese	**219**	**182**	**489**	-	**473**	**68.2**	**2.10 J**	**22.7**	**709**	**73.8**	**9.11**	50.0	HH	880	HH
Mercury	**0.0760 J**	0.0530 U	0.0530 U	-	0.0530 U	**0.100 J**	0.0530 U	0.0530 U	0.0530 U	0.0530 U	0.0530 U	-	-	11.0	HH
Nickel	**8.96 J**	**7.94 J**	**21.4**	-	**10.8**	**2.45 J**	0.370 U	**1.16 J**	**3.27 J**	**1.39 J**	**1.02 J**	610	HH	730	HH
Potassium	**2,050**	**1,050**	**3,210**	-	**2,150**	**898 J**	**916 J**	**1,520**	**1,540**	**2,060**	**2,260**	-	-	-	-
Selenium	**2.06**	**1.21**	**1.27**	-	**1.29**	**0.904**	**1.09**	**0.895**	**1.70**	**2.04**	**0.815**	170	HH	180	HH
Silver	**0.241**	**0.0690 J**	**0.166**	-	**0.376**	**0.0450 J**	0.0188 U	**0.0280 J**	**0.0195 J**	**0.0330 J**	**0.0270 J**	-	-	180	HH
Sodium	**10,700**	**8,240**	**42,900**	-	**21,400**	**6,350**	**6,445**	**6,420**	**10,750**	**7,160**	**8,630**	-	-	-	-
Thallium	**0.0920 J**	**0.0490 J**	**0.146 J**	-	**0.0530 J**	**0.0570 J**	0.0292 U	0.0292 U	**0.0855 J**	**0.0430 J**	0.0292 U	0.240	HH	2.00	HH
Vanadium	**31.5**	**22.8**	**47.0**	-	**77.6**	**9.25 J**	**2.43 J**	**5.40 J**	**2.08 J**	**3.35 J**	**1.82 J**	-	-	2.60	HH
Zinc	**30.7**	**19.9**	**44.4**	-	**21.2**	**8.58 J**	**3.87 J**	**6.88 J**	**5.19 J**	**4.19 J**	**2.88 J**	7,400	HH	11,000	HH
Dissolved Metals (µg/L)															
Aluminum	**277**	**7.06 J**	**28.4 J**	-	**1,370**	**15.1 J**	**5.88 J**	5.88 U	5.88 U	5.88 U	**12.5 J**	87.0	Eco	87.0	Eco
Antimony	**0.305 J**	**0.207 J**	**1.67**	-	**0.339 J**	**0.326 J**	**0.297 J**	**0.253 J**	**0.209 J**	**0.302 J**	**0.149 J**	5.60	HH	15.0	HH
Arsenic	**0.650**	**1.34**	**1.36**	-	**0.262 J**	**1.01**	**1.15**	**1.19**	**0.700**	**0.570**	**1.06**	0.0180	HH	0.0380	HH
Barium	**7.63**	**7.55**	**15.0**	-	**11.2**	**3.39**	**3.52**	**5.91**	**20.7**	**11.5**	**7.98**	4.00	Eco	4.00	Eco
Beryllium	0.0782 U	0.0782 U	0.0782 U	-	0.0782 U	0.0782 U	0.0782 U	0.0782 U	0.0782 U	0.0782 U	0.0782 U	5.30	Eco	5.30	Eco
Cadmium	0.0247 U	0.0247 U	0.0247 U	-	0.0247 U	**0.0300 J**	0.0247 U	0.0247 U	0.0247 U	0.0247 U	0.0247 U	0.250	Eco	0.250	Eco
Calcium	**28,000**	**30,400**	**16,800**	-	**10,800**	**22,200**	**25,350**	**18,500**	**29,650**	**34,100**	**31,300**	116,000	Eco	116,000	Eco
Chromium	**1.94**	**3.83**	**3.48**	-	**4.29**	**1.69**	**1.85**	**0.838**	**2.93**	**3.12**	**3.48**	74.0	Eco	74.0	Eco
Cobalt	**2.48 J**	**1.21 J**	**3.23 J**	-	**5.08**	**1.42 J**	**1.53 J**	0.770 U	**4.65 J**	**2.26 J**	0.770 U	23.0	Eco	11.0	HH
Copper	**1.12 J**	0.500 U	1.00 U	-	**4.38**	**0.752 J**	**0.804 J**	**0.782 J**	**0.958 J**	1.23 U	**1.08 J**	9.00	Eco	9.00	Eco
Iron	**228**	14.0 U	**37.3 J**	-	**476**	14.0 U	14.0 U	14.0 U	**105 J**	14.0 U	14.0 U	300	HH	1,000	Eco
Lead	**0.0960 J**	**0.0270 J**	0.500 U	-	**0.378 J**	**0.0350 J**	**0.0260 J**	0.0240 U	**0.0310 J**	0.500 U	0.500 U	2.50	Eco	2.50	Eco
Magnesium	**7,650**	**12,000**	**5,230**	-	**3,310**	**5,350**	**6,055**	**4,940**	**9,470**	**9,550**	**8,270**	82,000	Eco	82,000	Eco
Manganese	**92.3**	**16.7**	**106**	-	**31.3**	**9.85**	**1.71 J**	**4.63**	**587**	**59.6**	**6.87**	50.0	HH	120	Eco
Mercury	**0.0600 J**	0.0530 U	0.0530 U	-	0.0530 U	0.0530 U	0.0530 U	0.0530 U	**0.0550 J**	0.0530 U	0.0530 U	0.770	Eco	0.770	Eco
Nickel	**0.403 J**	0.370 U	10.0 U	-	**0.880 J**	0.370 U	0.370 U	0.370 U	**2.10 J**	10.0 U	10.0 U	52.0	Eco	52.0	Eco
Potassium	**1,050**	**604 J**	**2,210**	-	**1,610**	**527 J**	**720 J**	**1,230**	**1,115**	**2,080**	**1,880**	53,000	Eco	53,000	Eco
Selenium	**0.797**	**0.819**	**0.605**	-	**0.328 J**	**0.383 J**	**0.597**	**0.235 J**	**1.25**	**1.30**	**0.654**	5.00	Eco	5.00	Eco
Silver	**0.0470 J**	**0.0270 J**	0.0188 U	-	**0.0790 J**	**0.0270 J**	**0.0265 J**	**0.0340 J**	**0.0265 J**	0.0188 U	**0.0240 J**	0.120	Eco	0.120	Eco
Sodium	**10,900**	**8,530**	**47,700**	-	**26,400**	**6,860**	**7,135**	**6,560**	**11,700**	**7,240**	**9,110**	680,000	Eco	680,000	Eco
Thallium	0.0292 U	0.0292 U	**0.0310 J**	-	0.0292 U	0.0292 U	0.0292 U	0.0292 U	**0.0855 J**	**0.0460 J**	0.0292 U	0.240	HH	2.00	HH
Vanadium	**1.00 J**	**0.582 J**	10.0 U	-	**2.61 J**	**1.02 J**	**1.45 J**	**1.46 J**	0.488 U	10.0 U	10.0 U	20.0	Eco	2.60	HH
Zinc	**2.00 J**	2.00 U	2.00 U	-	**3.48 J**	2.00 U	2.00 U	2.00 U	**2.04 J**	**2.47 J**	2.00 U	120	Eco	120	Eco

Table 5-5d
2004 Sandblast Supplemental Site Inspection Groundwater Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, Pesticides, and General Chemistry Parameters
(Page 2 of 2)

Site ID	DP1	DP10	DP11	DP12	DP12	DP2	DP3*	DP4	DP5*	DP7	DP9	**Selected Discharge to Surface Water / Bioaccumulation**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	041116SGA01GW	041118SGA06GW	041119SGA12GW	041119SGA11GW	041122SGA11GW	041117SGA02GW	041117SGA03GW	041117SGA05GW	041118SGA07GW	041119SGA09GW	041119SGA10GW				
Sample Date	11/16/2004	11/17/2004	11/19/2004	11/19/2004	11/22/2004	11/17/2004	11/17/2004	11/17/2004	11/17/2004	11/19/2004	11/19/2004				
Sample Depth (Feet bgs)	12.0-17.0	7.8-12.8	7.0-17.0	7.8-17.8	7.8-17.8	12.0-17.0	11.0-16.0	13.0-18.0	18.5-28.5	12.9-17.9	10.0-20.0				
Total Petroleum Hydrocarbons (µg/L)															
Diesel Range Organics	-	74.7 U	-	-	-	-	-	-	89.7 U	87.0 U	76.8 U	-	-	90.0	HH
Residual Range Organics	-	92.5 U	-	-	-	-	-	-	111 U	**113 J**	95.2 U	-	-	290	HH
Gasoline Range Organics	-	**14.7 J**	**20.9 J**	13.0 U	-	-	-	-	13.0 U	13.0 U	13.0 UJ	-	-	100	HH
Total Butyltins (µg/L)															
Dibutyltin	0.000287 U	-	-	-	-	0.000236 U	0.000231 U	0.000248 U	-	-	-	0.0630	Eco	0.0630	Eco
Monobutyltin	0.000142 U	-	-	-	-	**0.00671 J**	0.000114 U	**0.00520 J**	-	-	-	0.0630	Eco	0.0630	Eco
Tetrabutyltin	0.000748 U	-	-	-	-	0.000615 U	0.000600 U	0.000645 U	-	-	-	0.0630	Eco	0.0630	Eco
Tributyltin	0.000552 U	-	-	-	-	0.000454 U	**0.00285 J**	**0.00435 J**	-	-	-	0.0630	Eco	0.0630	Eco
Total Pesticides (µg/L)															
4,4'-DDD	-	-	-	-	-	-	-	-	0.000453 U	0.000512 U	0.000575 U	0.000310	HH	0.00100	Eco
4,4'-DDE	-	-	-	-	-	-	-	-	0.000375 U	0.000424 U	0.000476 U	0.000220	HH	0.00100	Eco
4,4'-DDT	-	-	-	-	-	-	-	-	0.000480 U	0.000543 U	0.000609 U	0.000220	HH	0.00100	Eco
Aldrin	-	-	-	-	-	-	-	-	0.000110 U	0.000124 U	0.000140 U	0.0000490	HH	0.00330	HH
BHC (alpha)	-	-	-	-	-	-	-	-	0.000354 U	0.000400 U	0.000449 U	0.00260	HH	0.00900	HH
BHC (beta)	-	-	-	-	-	-	-	-	0.000411 U	0.000464 U	0.000521 U	0.00910	HH	0.0370	HH
BHC (delta)	-	-	-	-	-	-	-	-	0.000226 U	0.000255 U	0.000286 U	0.00260	HH	0.00900	HH
BHC (gamma) Lindane	-	-	-	-	-	-	-	-	**0.000930 J**	**0.00232**	**0.00249 J**	0.0800	Eco	0.0520	HH
Chlordane (alpha)	-	-	-	-	-	-	-	-	0.000339 U	0.000383 U	0.000429 U	0.000800	HH	0.00430	Eco
Chlordane (gamma)	-	-	-	-	-	-	-	-	0.000461 U	0.000521 U	0.000584 U	0.000800	HH	0.00430	Eco
Dieldrin	-	-	-	-	-	-	-	-	0.000290 U	0.000328 U	0.000368 U	0.0000520	HH	0.00350	HH
Endosulfan I	-	-	-	-	-	-	-	-	0.000480 U	0.000542 U	0.000608 U	0.0560	Eco	0.0560	Eco
Endosulfan II	-	-	-	-	-	-	-	-	0.00192 U	0.000411 U	0.000462 U	0.0560	Eco	0.0560	Eco
Endosulfan Sulfate	-	-	-	-	-	-	-	-	0.000517 U	0.000584 U	0.000655 U	0.0510	Eco	0.0510	Eco
Endrin	-	-	-	-	-	-	-	-	0.000298 U	0.000337 U	0.000378 U	0.0360	Eco	0.0360	Eco
Endrin Aldehyde	-	-	-	-	-	-	-	-	0.000936 U	0.00106 U	0.00119 U	0.150	Eco	0.150	Eco
Endrin Ketone	-	-	-	-	-	-	-	-	0.000332 U	0.000375 U	0.000421 U	0.0590	HH	11.0	HH
Heptachlor	-	-	-	-	-	-	-	-	0.000724 U	0.000819 U	0.000919 U	0.0000790	HH	0.00380	Eco
Heptachlor Epoxide	-	-	-	-	-	-	-	-	0.000360 U	0.000407 U	0.000456 U	0.0000390	HH	0.00380	Eco
Methoxychlor	-	-	-	-	-	-	-	-	**0.000983 J**	0.000584 U	**0.00521 J**	0.0300	Eco	0.0300	Eco
Toxaphene	-	-	-	-	-	-	-	-	0.0112 U	0.0127 U	0.0142 U	0.000280	HH	0.00200	Eco
General Chemistry Parameters (mg/L)															
Carbon, Total Organic	**1.67**	**1.41**	-	-	-	**1.84**	**1.49**	**1.51**	**2.41**	**1.80**	**1.84**	-	-	-	-
Total Suspended Solids	**232**	**494**	**457**	**944**	-	**17.0**	2.00 U	**18.0**	**22.0**	**7.00**	2.00 U	-	-	-	-

Notes:

µg/L = microgram per liter
mg/L = milligram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-5e
2004 Sandblast Supplemental Site Inspection Groundwater Analytical Results
Volatile Organic Compounds
(Page 1 of 2)

Site ID	DP1	DP10	DP11	DP12	DP2	Selected Discharge to Surface Water / Bioaccumulation SLV	SLV Source	Selected Direct Contact SLV	SLV Source
Sample ID	041116SGA01GW	041118SGA06GW	041119SGA12GW	041119SGA11GW	041117SGA02GW				
Sample Date	11/16/2004	11/17/2004	11/19/2004	11/19/2004	11/17/2004				
Sample Depth (Feet bgs)	12.0-17.0	7.8-12.8	7.0-17.0	7.8-17.8	12.0-17.0				
Total Volatile Organic Compounds (µg/L)									
1,1,1,2-Tetrachloroethane	0.0528 UJ	0.0528 U	0.0528 U	0.0528 U	0.0528 U	186	Eco	0.520	HH
1,1,1-Trichloroethane (TCA)	**0.104 J**	0.0477 U	**0.509 J**	**0.0997 J**	0.0477 U	11.0	Eco	11.0	Eco
1,1,2,2-Tetrachloroethane	0.0680 UJ	0.0680 U	0.0680 U	0.0680 U	0.0680 U	0.170	HH	0.0670	HH
1,1,2-Trichloroethane	0.0627 UJ	0.0627 U	0.0627 U	0.0627 U	0.0627 U	0.590	HH	0.230	HH
1,1-Dichloroethane	**0.0555 J**	0.0360 U	**0.173 J**	0.0360 U	0.0360 U	47.0	Eco	2.30	HH
1,1-Dichloroethene	0.0595 UJ	0.0595 U	**0.0624 J**	0.0595 U	0.0595 U	25.0	Eco	25.0	Eco
1,1-Dichloropropene	0.0695 UJ	0.0695 U	0.0695 U	0.0695 U	0.0695 U	-	-	0.430	HH
1,2,3-Trichlorobenzene	0.0605 UJ	0.0605 U	0.0605 U	0.0605 U	0.0605 U	8.00	Eco	2.30	HH
1,2,3-Trichloropropane	0.123 UJ	0.123 U	0.123 U	0.123 U	0.123 U	-	-	0.000720	HH
1,2,4-Trichlorobenzene	0.0513 UJ	1.0000 U	0.0513 U	0.05 U	0.0513 U	35.0	HH	2.30	HH
1,2,4-Trimethylbenzene	**0.0485 J**	**0.0317 J**	0.0283 U	**0.0415 J**	0.0283 U	7.30	Eco	7.30	Eco
1,2-Dibromo-3-chloropropane	0.222 UJ	0.222 U	0.222 U	0.222 U	0.222 U	-	-	0.000320	HH
1,2-Dibromoethane (EDB)	0.0637 UJ	0.0637 U	0.0637 U	0.0637 U	0.0637 U	-	-	0.00630	HH
1,2-Dichlorobenzene	0.0383 UJ	0.0383 U	0.0383 U	0.0383 U	0.0383 U	14.0	Eco	14.0	Eco
1,2-Dichloroethane (EDC)	0.0533 UJ	0.0533 U	0.0533 U	0.0533 U	0.0533 U	0.380	HH	0.140	HH
1,2-Dichloropropane	0.0380 UJ	0.0380 U	0.0380 U	0.0380 U	0.0380 U	0.500	HH	0.390	HH
1,3,5-Trimethylbenzene	**0.0297 J**	0.0249 U	0.0249 U	0.0249 U	0.0249 U	7.30	Eco	7.30	Eco
1,3-Dichlorobenzene	0.0599 UJ	0.0599 U	0.0599 U	0.0599 U	0.0599 U	71.0	Eco	0.420	HH
1,3-Dichloropropane	0.0738 UJ	0.0738 U	0.0738 U	0.0738 U	0.0738 U	5,700	Eco	730	HH
1,4-Dichlorobenzene	0.0180 UJ	0.0180 U	0.0180 U	0.0180 U	0.0180 U	15.0	Eco	0.420	HH
2,2-Dichloropropane	0.0487 UJ	0.0487 U	0.0487 U	0.0487 U	**0.130 J**	0.500	HH	0.390	HH
2-Butanone (MEK)	1.71 UJ	1.71 U	1.71 U	1.71 U	1.71 U	14,000	Eco	7,100	HH
2-Chlorotoluene	0.0857 UJ	0.0857 U	0.0857 U	0.0857 U	0.0857 U	-	-	730	HH
2-Hexanone	0.99 UJ	0.993 U	0.993 U	0.993 U	0.993 U	99.0	Eco	47.0	HH
4-Chlorotoluene	0.0491 UJ	0.0491 U	0.0491 U	0.0491 U	0.0491 U	-	-	2,600	HH
4-Isopropyltoluene	0.0397 UJ	0.0397 U	0.0397 U	0.0397 U	0.0397 U	-	-	-	-
4-Methyl-2-pentanone (MIBK)	0.31 UJ	0.309 U	0.309 U	0.309 U	0.309 U	170	Eco	170	Eco
Acetone	1.20 UJ	1.20 U	**1.59 J**	**3.88 J**	1.20 U	1,500	Eco	1,500	Eco
Benzene	**0.0579 J**	**0.0545 J**	**0.137 J**	**0.0800 J**	0.0417 U	2.20	HH	0.390	HH
Bromobenzene	0.0475 UJ	0.0475 U	0.0475 U	0.0475 U	0.0475 U	-	-	88.0	HH
Bromochloromethane	0.0573 UJ	0.0573 U	0.0573 U	0.0573 U	0.0573 U	0.550	HH	0.120	HH
Bromodichloromethane	0.0785 UJ	0.0785 U	0.0785 U	0.0785 U	0.0785 U	0.550	HH	0.120	HH
Bromoform	0.0830 UJ	0.0830 U	0.0830 U	**0.151 J**	0.0830 U	4.30	HH	7.20	HH
Bromomethane	0.0748 UJ	1.00 U	1.00 U	1.00 U	1.00 U	16.0	Eco	8.70	HH
Carbon Disulfide	**0.0619 J**	0.0494 U	1.00 U	1.00 U	0.0494 U	0.920	Eco	0.920	Eco
Carbon Tetrachloride	0.0970 UJ	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.230	HH	0.190	HH
Chlorobenzene	0.0376 UJ	0.0376 U	0.0376 U	0.0376 U	0.0376 U	50.0	Eco	50.0	Eco
Chloroethane	0.187 UJ	0.187 U	0.187 U	0.187 U	0.187 U	-	-	21,000	HH
Chloroform	0.0717 UJ	0.0717 U	0.0717 U	0.0717 U	**0.174 J**	5.70	HH	0.190	HH
Chloromethane	0.110 UJ	0.110 U	0.110 U	0.110 U	0.110 U	-	-	190	HH
cis-1,2-Dichloroethene	**3.76 J**	0.0433 U	**150 J**	**4.86**	**0.693 J**	590	Eco	360	HH
cis-1,3-Dichloropropene	0.0301 UJ	0.0301 U	0.0301 U	0.0301 U	0.0301 U	0.0550	Eco	0.0550	Eco
Dibromochloromethane	0.0539 UJ	0.0539 U	0.0539 U	0.0539 U	0.0539 U	0.400	HH	0.680	HH
Dibromomethane	0.0864 UJ	0.0864 U	0.0864 U	0.0864 U	0.0864 U	-	-	8.20	HH
Dichlorodifluoromethane	0.0575 UJ	0.0575 U	0.0575 U	0.0575 U	0.0575 U	-	-	390	HH
Dichloromethane (Methylene Chloride)	0.0752 UJ	0.0752 U	1.00 U	0.0752 U	0.0752 U	4.60	HH	4.40	HH
Ethylbenzene	0.0226 UJ	**0.0400 J**	**0.0357 J**	**0.0447 J**	0.0226 U	7.30	Eco	1.40	HH
Hexachlorobutadiene	0.152 UJ	0.152 U	0.152 U	0.152 U	0.152 U	0.440	HH	0.860	HH
Isopropylbenzene	**0.0197 J**	0.0165 U	0.0165 U	0.0165 U	0.0165 U	7.30	Eco	7.30	Eco
m,p-Xylenes	**0.132 J**	**0.131 J**	0.0718 U	**0.132 J**	0.0718 U	13.0	Eco	13.0	Eco
Naphthalene	0.0317 UJ	1.00 U	0.0317 U	1.00 U	1.00 U	620	Eco	0.140	HH
n-Butylbenzene	0.0603 UJ	0.0603 U	0.0603 U	0.0603 U	0.0603 U	-	-	-	-
n-Propylbenzene	0.0356 UJ	0.0356 U	0.0356 U	0.0356 U	0.0356 U	7.30	Eco	7.30	Eco
o-Xylene	**0.0735 J**	**0.0503 J**	0.0265 U	**0.0486 J**	0.0265 U	350	Eco	350	Eco
sec-Butylbenzene	0.0358 UJ	0.0358 U	0.0358 U	0.0358 U	0.0358 U	-	-	-	-
Styrene	0.0279 UJ	0.0279 U	0.0279 U	0.0279 U	0.0279 U	72.0	Eco	72.0	Eco
tert-Butylbenzene	0.0535 UJ	0.0535 U	0.0535 U	0.0535 U	0.0535 U	-	-	-	-
Tetrachloroethene (PCE)	**5.08 J**	**0.584 J**	**54.5**	**9.44**	**1.76**	0.690	HH	0.0930	HH
Toluene	**0.221 J**	**0.289 J**	**0.177 J**	**0.154 J**	1.00 U	9.80	Eco	9.80	Eco
trans-1,2-Dichloroethene	0.0584 UJ	0.0584 U	**1.09**	0.0584 U	0.0584 U	140	HH	110	HH
trans-1,3-Dichloropropene	0.0539 UJ	0.0539 U	0.0539 U	0.0539 U	0.0539 U	0.0550	Eco	0.0550	Eco
Trichloroethene (TCE)	**2.03 J**	0.0641 U	**43.7**	**2.95**	**0.597 J**	2.50	HH	0.0390	HH
Trichlorofluoromethane	0.0620 UJ	0.0620 U	0.0620 U	0.0620 U	0.0620 U	-	-	1,300	HH
Vinyl Acetate	1.01 UJ	0.320 U	0.320 U	0.320 U	0.320 U	16.0	Eco	16.0	Eco
Vinyl Chloride	0.0604 UJ	0.0604 U	**0.132 J**	0.0604 U	0.0604 U	0.0250	HH	0.0250	HH

Notes:
µg/L = microgram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-5e
2004 Sandblast Supplemental Site Inspection Groundwater Analytical Results
Volatile Organic Compounds
(Page 2 of 2)

Site ID	DP3*	DP4	DP5*	DP7	DP9	Selected Discharge to Surface Water / Bioaccumulation SLV	SLV Source	Selected Direct Contact SLV	SLV Source
Sample ID	041117SGA03GW	041117SGA05GW	041118SGA07GW	041119SGA09GW	041119SGA10GW				
Sample Date	11/17/2004	11/17/2004	11/17/2004	11/19/2004	11/19/2004				
Sample Depth (Feet bgs)	11.0-16.0	13.0-18.0	18.5-28.5	12.9-17.9	10.0-20.0				
Total Volatile Organic Compounds (µg/L)									
1,1,1,2-Tetrachloroethane	0.0528 U	0.0528 U	0.0528 U	0.0528 U	0.0528 U	186	Eco	0.520	HH
1,1,1-Trichloroethane (TCA)	**0.0701 J**	0.0477 U	**2.23**	**0.127 J**	**0.137 J**	11.0	Eco	11.0	Eco
1,1,2,2-Tetrachloroethane	0.0680 U	0.0680 U	0.0680 U	0.0680 U	0.0680 U	0.170	HH	0.0670	HH
1,1,2-Trichloroethane	0.0627 U	0.0627 U	0.0627 U	0.0627 U	0.0627 U	0.590	HH	0.230	HH
1,1-Dichloroethane	0.0360 U	0.0360 U	**2.52**	**0.0982 J**	**0.178 J**	47.0	Eco	2.30	HH
1,1-Dichloroethene	0.0595 U	0.0595 U	**1.17**	0.0595 U	0.0595 U	25.0	Eco	25.0	Eco
1,1-Dichloropropene	0.0695 U	0.0695 U	0.0695 U	0.0695 U	0.0695 U	-	-	0.430	HH
1,2,3-Trichlorobenzene	0.0605 U	0.0605 U	0.0605 U	0.0605 U	0.0605 U	8.00	Eco	2.30	HH
1,2,3-Trichloropropane	0.123 U	0.123 U	0.123 U	0.123 U	0.123 U	-	-	0.000720	HH
1,2,4-Trichlorobenzene	0.0513 U	0.0513 U	0.0513 U	0.0513 U	0.0513 UJ	35.0	HH	2.30	HH
1,2,4-Trimethylbenzene	0.0283 U	0.0283 U	0.0283 U	0.0283 U	0.0283 U	7.30	Eco	7.30	Eco
1,2-Dibromo-3-chloropropane	0.222 U	0.222 U	0.222 U	0.222 U	0.222 U	-	-	0.000320	HH
1,2-Dibromoethane (EDB)	0.0637 U	0.0637 U	0.0637 U	0.0637 U	0.0637 U	-	-	0.00630	HH
1,2-Dichlorobenzene	0.0383 U	0.0383 U	0.0383 U	0.0383 U	0.0383 U	14.0	Eco	14.0	Eco
1,2-Dichloroethane (EDC)	0.0533 U	0.0533 U	0.0533 U	0.0533 U	0.0533 U	0.380	HH	0.140	HH
1,2-Dichloropropane	0.0380 U	0.0380 U	0.0380 U	0.0380 U	0.0380 U	0.500	HH	0.390	HH
1,3,5-Trimethylbenzene	0.0249 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U	7.30	Eco	7.30	Eco
1,3-Dichlorobenzene	0.0599 U	0.0599 U	0.0599 U	0.0599 U	0.0599 U	71.0	Eco	0.420	HH
1,3-Dichloropropane	0.0738 U	0.0738 U	0.0738 U	0.0738 U	0.0738 U	5,700	Eco	730	HH
1,4-Dichlorobenzene	0.0180 U	0.0180 U	0.0180 U	0.0180 U	0.0180 U	15.0	Eco	0.420	HH
2,2-Dichloropropane	**0.117 J**	0.0487 U	0.0487 U	**0.179 J**	0.0487 U	0.500	HH	0.390	HH
2-Butanone (MEK)	1.71 U	1.71 U	1.71 U	1.71 U	1.71 U	14,000	Eco	7,100	HH
2-Chlorotoluene	0.0857 U	0.0857 U	0.0857 U	0.0857 U	0.0857 U	-	-	730	HH
2-Hexanone	0.993 U	0.993 U	0.993 U	0.993 U	0.993 U	99.0	Eco	47.0	HH
4-Chlorotoluene	0.0491 U	0.0491 U	0.0491 U	0.0491 U	0.0491 U	-	-	2,600	HH
4-Isopropyltoluene	0.0397 U	0.0397 U	0.0397 U	0.0397 U	0.0397 U	-	-	-	-
4-Methyl-2-pentanone (MIBK)	0.309 U	0.309 U	0.309 U	0.309 U	0.309 U	170	Eco	170	Eco
Acetone	1.20 U	1.20 U	**1.22 J**	1.20 U	1.20 U	1,500	Eco	1,500	Eco
Benzene	0.0417 U	0.0417 U	**0.0621 J**	0.0417 U	**0.0546 J**	2.20	HH	0.390	HH
Bromobenzene	0.0475 U	0.0475 U	0.0475 U	0.0475 U	0.0475 U	-	-	88.0	HH
Bromochloromethane	0.0573 U	0.0573 U	0.0573 U	0.0573 U	0.0573 U	0.550	HH	0.120	HH
Bromodichloromethane	0.0785 U	0.0785 U	0.0785 U	0.0785 U	0.0785 U	0.550	HH	0.120	HH
Bromoform	0.0830 U	0.0830 U	0.0830 U	0.0830 U	0.0830 U	4.30	HH	7.20	HH
Bromomethane	0.0748 U	1.00 U	1.00 U	1.00 U	1.00 U	16.0	Eco	8.70	HH
Carbon Disulfide	0.0494 U	0.0494 U	1.00 U	1.00 U	0.0494 U	0.920	Eco	0.920	Eco
Carbon Tetrachloride	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.230	HH	0.190	HH
Chlorobenzene	0.0376 U	0.0376 U	0.0376 U	0.0376 U	0.0376 U	50.0	Eco	50.0	Eco
Chloroethane	0.187 U	0.187 U	0.187 U	0.187 U	0.187 U	-	-	21,000	HH
Chloroform	0.0717 U	0.0717 U	**0.0907 J**	0.0717 U	0.0717 U	5.70	HH	0.190	HH
Chloromethane	0.110 U	0.110 U	0.110 U	0.110 U	0.110 U	-	-	190	HH
cis-1,2-Dichloroethene	**0.842 J**	**0.0948 J**	**341**	**4.54**	**10.1**	590	Eco	360	HH
cis-1,3-Dichloropropene	0.0301 U	0.0301 U	0.0301 U	0.0301 U	0.0301 U	0.0550	Eco	0.0550	Eco
Dibromochloromethane	0.0539 U	0.0539 U	0.0539 U	0.0539 U	0.0539 U	0.400	HH	0.680	HH
Dibromomethane	0.0864 U	0.0864 U	0.0864 U	0.0864 U	0.0864 U	-	-	8.20	HH
Dichlorodifluoromethane	0.0575 U	0.0575 U	0.0575 U	0.0575 U	0.0575 U	-	-	390	HH
Dichloromethane (Methylene Chloride)	0.0752 U	0.0752 U	0.0752 U	1.00 U	0.0752 U	4.60	HH	4.40	HH
Ethylbenzene	0.0226 U	1.00 U	**0.0403 J**	0.0226 U	0.0226 U	7.30	Eco	1.40	HH
Hexachlorobutadiene	0.152 U	0.152 U	0.152 U	0.152 U	0.152 U	0.440	HH	0.860	HH
Isopropylbenzene	0.0165 U	0.0165 U	0.0165 U	0.0165 U	0.0165 U	7.30	Eco	7.30	Eco
m,p-Xylenes	0.0718 U	0.0718 U	**0.0823 J**	0.0718 U	0.0718 U	13.0	Eco	13.0	Eco
Naphthalene	0.0317 U	**0.0359 J**	1.00 U	**0.0452 J**	0.0317 U	620	Eco	0.140	HH
n-Butylbenzene	0.0603 U	0.0603 U	0.0603 U	0.0603 U	0.0603 U	-	-	-	-
n-Propylbenzene	0.0356 U	0.0356 U	0.0356 U	0.0356 U	0.0356 U	7.30	Eco	7.30	Eco
o-Xylene	0.0265 U	0.0265 U	**0.0304 J**	0.0265 U	0.0265 U	350	Eco	350	Eco
sec-Butylbenzene	0.0358 U	0.0358 U	0.0358 U	0.0358 U	0.0358 U	-	-	-	-
Styrene	0.0279 U	0.0279 U	0.0279 U	0.0279 U	0.0279 U	72.0	Eco	72.0	Eco
tert-Butylbenzene	0.0535 U	0.0535 U	0.0535 U	0.0535 U	0.0535 U	-	-	-	-
Tetrachloroethene (PCE)	**1.14**	**0.336 J**	**3.70**	**0.411 J**	**1.09**	0.690	HH	0.0930	HH
Toluene	1.00 U	1.00 U	**0.299 J**	0.0588 U	**0.0917 J**	9.80	Eco	9.80	Eco
trans-1,2-Dichloroethene	0.0584 U	0.0584 U	**1.80**	0.0584 U	**0.0955 J**	140	HH	110	HH
trans-1,3-Dichloropropene	0.0539 U	0.0539 U	0.0539 U	0.0539 U	0.0539 U	0.0550	Eco	0.0550	Eco
Trichloroethene (TCE)	**0.342 J**	**0.0904 J**	**2.12**	**0.121 J**	**0.534 J**	2.50	HH	0.0390	HH
Trichlorofluoromethane	0.0620 U	0.0620 U	0.0620 U	0.0620 U	0.0620 U	-	-	1,300	HH
Vinyl Acetate	0.320 U	0.320 U	0.320 U	0.320 U	0.320 U	16.0	Eco	16.0	Eco
Vinyl Chloride	0.0604 U	0.0604 U	**0.611 J**	0.0604 U	0.0604 U	0.0250	HH	0.0250	HH

Notes:

µg/L = microgram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-5f
2004 Sandblast Supplemental Site Inspection Groundwater Analytical Results
Total Semivolatile Organic Compounds

Site ID	DP1	DP10	DP11	DP2	DP3*	DP4	DP5*	DP7	DP9	Selected Discharge to Surface Water / Bioaccumulation SLV	SLV Source	Selected Direct Contact SLV	SLV Source
Sample ID	041116SGA01GW	041118SGA06GW	041122SGA12GW	041117SGA02GW	041117SGA03GW	041117SGA05GW	041118SGA07GW	041119SGA09GW	041119SGA10GW				
Sample Date	11/16/2004	11/17/2004	11/22/2004	11/17/2004	11/17/2004	11/17/2004	11/17/2004	11/19/2004	11/19/2004				
Sample Depth (Feet bgs)	12.0-17.0	7.8-12.8	7.0-17.0	12.0-17.0	11.0-16.0	13.0-18.0	18.5-28.5	12.9-17.9	10.0-20.0				
Total Semivolatile Organic Compounds (µg/L)													
1,2,4-Trichlorobenzene	0.0135 U	0.0123 UJ	0.0122 U	0.0123 U	0.0127 U	0.0129 U	0.0121 U	0.0151 U	0.0117 UJ	35.0	HH	2.30	HH
1,2-Dichlorobenzene	0.0305 U	0.0279 U	0.0276 U	0.0278 U	0.0287 U	0.0291 U	0.0273 U	0.0340 U	0.0264 U	14.0	Eco	14.0	Eco
1,3-Dichlorobenzene	0.0403 U	0.0368 U	0.0364 U	0.0367 U	0.0379 U	0.0385 U	0.0361 U	0.0449 U	0.0349 U	71.0	Eco	0.420	HH
1,4-Dichlorobenzene	0.0347 U	0.0317 U	0.0314 U	0.0316 U	0.0326 U	0.0331 U	0.0311 U	0.0387 U	0.0300 U	15.0	Eco	0.420	HH
2,4,5-Trichlorophenol	0.0487 UJ	0.0444 UJ	0.0440 UJ	0.0443 UJ	-	-	-	0.0542 UJ	0.0421 UJ	18.0	Eco	18.0	Eco
2,4,6-Trichlorophenol	0.0353 UJ	0.0322 UJ	0.0319 UJ	0.0321 UJ	-	-	-	0.0393 UJ	0.0305 UJ	1.40	HH	5.20	HH
2,4-Dichlorophenol	0.0204 UJ	0.0186 UJ	0.0185 UJ	0.0186 UJ	-	-	-	0.0228 UJ	0.0177 UJ	77.0	HH	110	HH
2,4-Dimethylphenol	0.201 UJ	0.183 UJ	0.182 UJ	0.183 UJ	-	-	-	0.224 UJ	0.174 UJ	42.0	Eco	42.0	Eco
2,4-Dinitrophenol	0.227 UJ	0.207 UJ	0.206 UJ	0.207 UJ	-	-	-	0.253 UJ	0.197 UJ	19.0	Eco	19.0	Eco
2,4-Dinitrotoluene	0.0631 U	0.0575 U	0.0570 U	0.0573 U	0.0592 U	0.0602 U	0.0564 U	0.0703 U	0.0545 U	0.110	HH	0.220	HH
2,6-Dinitrotoluene	0.0418 U	0.0381 U	0.0377 U	0.0380 U	0.0392 U	0.0398 U	0.0374 U	0.0465 U	0.0361 U	230	Eco	37.0	HH
2-Chloronaphthalene	0.00527 U	0.00481 U	0.00477 U	0.00480 U	0.00495 U	0.00503 U	0.00472 U	0.00588 U	0.00456 U	32.0	Eco	32.0	Eco
2-Chlorophenol	0.0463 UJ	0.0422 UJ	0.0418 UJ	0.0421 UJ	-	-	-	0.0515 UJ	0.0400 UJ	81.0	HH	180	HH
2-Methylphenol	0.0430 UJ	0.0392 UJ	0.0388 UJ	0.0391 UJ	-	-	-	0.0479 UJ	0.0371 UJ	13.0	Eco	13.0	Eco
2-Nitroaniline	0.0329 U	0.0300 U	0.0297 U	0.0299 U	0.0309 U	0.0313 U	0.0294 U	0.0366 U	0.0284 U	-	-	370	HH
2-Nitrophenol	0.0470 UJ	0.0429 UJ	0.0425 UJ	0.0428 UJ	-	-	-	0.0524 UJ	0.0406 UJ	10,000	HH	11,000	HH
3,3'-Dichlorobenzidine	0.206 U	0.188 U	0.186 U	0.187 U	0.193 U	0.196 U	0.184 U	0.229 U	0.178 U	0.0210	HH	0.130	HH
3-Nitroaniline	0.0621 U	0.0566 U	0.0561 U	0.0564 U	0.0583 U	0.0592 U	0.0556 U	0.0692 U	0.0537 U	-	-	3.40	HH
4,6-Dinitro-2-methylphenol	0.341 UJ	0.311 UJ	0.308 UJ	0.310 UJ	-	-	-	0.379 UJ	0.294 UJ	13.0	HH	2.90	HH
4-Bromophenyl Phenyl Ether	0.0241 U	0.0219 U	0.0217 U	0.0219 U	0.0226 U	0.0230 U	0.0215 U	0.0268 U	0.0208 U	1.50	Eco	1.50	Eco
4-Chloro-3-methylphenol	0.0268 UJ	0.0244 UJ	0.0242 UJ	0.0244 UJ	-	-	-	0.0299 UJ	0.0232 UJ	-	-	3700	HH
4-Chloroaniline	0.0795 U	0.0724 U	0.0718 U	0.0722 U	0.0746 U	0.0758 U	0.0711 U	0.0885 UJ	0.0687 UJ	50.0	Eco	0.340	HH
4-Chlorophenyl Phenyl Ether	0.0354 U	0.0323 U	0.0320 U	0.0322 U	0.0332 U	0.0338 U	0.0317 U	0.0394 U	0.0306 U	-	-	-	-
4-Nitroaniline	0.0426 U	0.0389 U	0.0385 U	0.0388 U	0.0400 U	0.0407 U	0.0382 U	0.0475 U	0.0368 U	-	-	3.40	HH
4-Nitrophenol	0.130 UJ	0.118 UJ	0.117 UJ	0.118 UJ	-	-	-	0.144 UJ	0.112 UJ	150	Eco	150	Eco
Aniline	0.330 U	0.031 U	0.298 U	0.300 U	0.310 U	0.314 U	0.295 U	0.367 U	0.285 U	2.20	Eco	2.20	Eco
Benzidine	1.10 UJ	1.00 UJ	0.993 UJ	0.999 UJ	1.03 UJ	1.05 UJ	0.983 UJ	1.22 U	0.950 U	0.0000860	HH	0.720	HH
Benzoic Acid	0.147 UJ	0.134 UJ	0.133 UJ	0.134 UJ	-	-	-	0.164 UJ	0.127 UJ	42.0	Eco	42.0	Eco
Benzyl Alcohol	0.0467 UJ	**0.0500 J**	0.0422 UJ	0.0425 UJ	-	-	**0.0523 J**	0.0520 UJ	0.0404 UJ	8.60	Eco	8.60	Eco
Bis(2-chloroethoxy)methane	0.0199 U	0.0181 U	0.0180 U	0.0181 U	0.0187 U	0.0190 U	0.0178 U	0.0222 U	0.0172 U	-	-	110	HH
Bis(2-chloroethyl) Ether	0.0356 U	0.0325 U	0.0322 U	0.0324 U	0.0334 U	0.0340 U	0.0319 U	0.0397 U	0.0308 U	0.0300	HH	0.0120	HH
Bis(2-chloroisopropyl) Ether	0.0471 U	0.0430 U	0.0426 U	0.0429 U	0.0443 U	0.0450 U	0.0422 U	0.0525 U	0.0407 U	1,400	HH	-	-
Bis(2-ethylhexyl) Phthalate	0.419 U	0.382 U	0.378 U	**0.408 J**	0.393 U	0.399 U	0.375 U	0.466 U	0.362 U	1.20	HH	3.00	Eco
Butyl Benzyl Phthalate	**0.120 J**	**0.171 J**	**0.228 J**	**0.173 J**	**0.131 J**	0.102 U	**0.141 J**	0.119 U	0.285 U	19.0	Eco	19.0	Eco
Carbazole	0.0238 U	0.0217 U	0.0215 U	0.0217 U	0.0224 U	0.0227 U	0.0213 U	0.0266 U	0.0206 U	-	-	-	-
Dibenzofuran	**0.0237 J**	0.0205 U	0.0204 U	0.0205 U	0.0212 U	0.0215 U	0.0202 U	**0.0421 J**	0.0195 U	3.70	Eco	3.70	Eco
Diethyl Phthalate	0.0612 U	0.0558 U	0.0553 U	0.0556 U	0.0575 U	0.0584 U	0.0548 U	0.0682 U	0.0529 U	210	Eco	210	Eco
Dimethyl Phthalate	0.0429 U	0.0391 U	0.0387 U	0.0390 U	0.0402 U	0.0409 U	0.0383 U	0.0477 U	0.0370 U	3.00	Eco	3.00	Eco
Di-n-butyl Phthalate	**0.180 J**	**0.239**	0.608 U	**0.129 J**	**0.170 J**	**0.100 J**	**0.153 J**	0.245 U	0.190 U	35.0	Eco	35.0	Eco
Di-n-octyl Phthalate	0.0300 U	0.0274 U	0.0271 U	0.0273 U	0.0282 U	0.0286 U	0.0268 U	0.0334 U	0.0259 U	1.20	HH	4.10	HH
Hexachlorobenzene	0.0275 U	0.0251 U	0.0248 U	0.0250 U	0.0258 U	0.0262 U	0.0246 U	0.0306 U	0.0237 U	0.000280	HH	0.000300	Eco
Hexachlorobutadiene	0.0162 U	0.0147 U	0.0146 U	0.0147 U	0.0152 U	0.0154 U	0.0145 U	0.0180 U	0.0140 U	0.440	HH	0.860	HH
Hexachlorocyclopentadiene	0.341 U	0.311 U	0.308 UJ	0.310 U	0.320 U	0.325 U	0.305 U	0.379 UJ	0.294 UJ	5.20	Eco	5.20	Eco
Hexachloroethane	0.0419 U	0.0382 U	0.0378 U	0.0381 U	0.0393 U	0.0399 U	0.0375 U	0.0466 U	0.0362 U	1.40	HH	4.10	HH
Isophorone	0.0311 U	0.0284 U	0.0281 U	0.0283 U	0.0292 U	0.0297 U	0.0278 U	**0.0842 J**	**0.0486 J**	35.0	HH	71.0	HH
Nitrobenzene	0.0571 U	0.0521 U	0.0516 U	0.0519 U	0.0537 U	0.0545 U	0.0511 U	0.0636 U	0.0494 U	17.0	HH	0.120	HH
N-Nitrosodimethylamine	1.10 UJ	1.00 UJ	0.993 U	0.999 UJ	1.03 UJ	1.05 UJ	0.983 UJ	1.22 U	0.950 U	0.000690	HH	0.000420	HH
N-Nitrosodi-n-propylamine	0.0405 U	0.0370 U	0.0366 U	0.0369 U	0.0381 U	0.0387 U	0.0363 U	0.0452 U	0.0350 U	0.00500	HH	0.00960	HH
N-Nitrosodiphenylamine	0.00934 U	0.00852 U	0.00844 U	0.00849 U	0.00877 U	0.00891 U	0.00836 U	0.0104 U	0.00807 U	3.30	HH	14.0	HH
p-cresol (4-Methylphenol)	0.0485 UJ	0.0442 UJ	0.0438 UJ	0.0441 UJ	-	-	-	0.0540 UJ	0.0419 UJ	-	-	-	-
Pentachlorophenol	0.220 UJ	0.200 UJ	0.199 UJ	0.200 UJ	-	-	-	0.245 UJ	0.190 UJ	0.270	HH	0.470	HH
Phenol	**0.0276 J**	**0.0291 J**	0.00457 UJ	**0.0228 J**	**0.0192 J**	**0.0111 J**	-	0.00563 UJ	0.00437 UJ	110	Eco	110	Eco
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/L)													
2-Methylnaphthalene	**0.0683 J**	**0.153**	0.0148 U	0.0149 U	**0.0195 J**	**0.0210 J**	**0.0258 J**	**0.114**	0.0142 U	72.2	Eco	72.2	Eco
Acenaphthene	**0.0173 J**	**0.00812 J**	0.00338 U	0.00340 U	**0.00547 J**	0.00356 U	**0.00811 J**	**0.0230 J**	0.00323 U	520	Eco	520	Eco
Acenaphthylene	0.00264 U	0.00240 U	0.00238 U	0.00240 U	0.00248 U	0.00252 U	0.00236 U	0.00294 U	0.00228 U	307	Eco	0.140	HH
Anthracene	0.00209 U	0.00190 U	0.00189 U	0.00190 U	0.00196 U	0.00199 U	0.00187 U	**0.0126 J**	0.00180 U	13.0	Eco	13.0	Eco
Fluorene	**0.0210 J**	**0.00982 J**	0.00169 U	**0.00584 J**	**0.00835 J**	0.00178 U	**0.0157 J**	**0.0351**	0.00161 U	3.90	Eco	3.90	Eco
Naphthalene	0.0191 UJ	0.0174 UJ	**0.0222 J**	0.0174 U	**0.0254 J**	**0.0359 J**	0.0171 U	**0.0452 J**	0.0165 U	620	Eco	0.140	HH
Phenanthrene	**0.0198 J**	**0.0140 J**	**0.00759 J**	**0.0111 J**	**0.00975 J**	**0.00795 J**	**0.00849 J**	**0.144**	0.00351 U	6.30	Eco	0.140	HH
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/L)													
Benzo(a)anthracene	0.00571 U	0.00521 U	0.00516 U	0.00519 U	0.00537 U	0.00545 U	0.00511 U	0.00636 U	0.00494 U	0.00380	HH	0.0270	Eco
Benzo(a)pyrene	0.00363 U	0.00331 U	0.00328 U	0.00330 U	0.00341 U	0.00346 U	0.00324 U	**0.00895 J**	0.00313 U	0.00380	HH	0.00290	HH
Benzo(g,h,i)perylene	0.00560 U	0.00511 U	0.00506 U	0.00509 U	0.00526 U	0.00535 U	0.00501 U	0.00624 U	0.00484 U	0.380	HH	0.290	HH
Benzofluoranthenes, Total	0.0131 U	0.0119 U	0.0118 U	0.0119 U	0.0123 U	0.0125 U	0.0117 U	**0.0173 J**	0.0113 U	0.00380	HH	0.01400	Eco
Chrysene	0.00923 U	0.00842 U	0.00834 U	0.00839 U	0.00867 U	0.00881 U	0.00826 U	0.0103 U	0.00798 U	0.00380	HH	2.04	Eco
Dibenz(a,h)anthracene	0.00341 U	0.00311 U	0.00308 U	0.00310 U	0.00320 U	0.00325 U	0.00305 U	**0.00671 J**	0.00294 U	0.0180	HH	0.00290	HH
Fluoranthene	0.00626 U	0.00571 U	0.00566 U	0.00569 U	0.00588 U	0.00597 U	0.00560 U	**0.0311**	0.00541 U	6.16	Eco	6.16	Eco
Indeno(1,2,3-cd)pyrene	0.00308 UJ	0.00281 UJ	0.00278 U	0.00280 UJ	0.00289 UJ	0.00294 UJ	0.00275 UJ	**0.00797 J**	0.00266 U	0.00380	HH	0.0290	HH
Pyrene	0.00319 U	0.00291 U	0.00288 U	**0.00317 J**	**0.00329 J**	0.00304 U	0.00285 U	**0.0261**	0.00275 U	10.1	Eco	10.1	Eco

Notes:

µg/L = microgram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-5g
2004 Sandblast Supplemental Site Inspection Groundwater Analytical Results
Dissolved Semivolatile Organic Compounds

Site ID	DP1	DP10	DP2	DP3*	DP4	DP5*	DP7	DP9	Selected Discharge to Surface Water / Bioaccumulation SLV	SLV Source	Selected Direct Contact SLV	SLV Source
Sample ID	041116SGA01GW	041118SGA06GW	041117SGA02GW	041117SGA03GW	041117SGA05GW	041118SGA07GW	041119SGA09GW	041119SGA10GW				
Sample Date	11/16/2004	11/17/2004	11/17/2004	11/17/2004	11/17/2004	11/17/2004	11/19/2004	11/19/2004				
Sample Depth (Feet bgs)	12.0-17.0	7.8-12.8	12.0-17.0	11.0-16.0	13.0-18.0	18.5-28.5	12.9-17.9	10.0-20.0				
Dissolved Semivolatile Organic Compounds (µg/L)												
1,2,4-Trichlorobenzene	0.0123 U	0.0125 U	0.0129 U	0.0127 U	0.0120 U	0.0121 U	0.0134 U	0.0139 UJ	35.0	HH	2.30	HH
1,2-Dichlorobenzene	0.0279 U	0.0282 U	0.0292 U	0.0287 U	0.0272 U	0.0273 U	0.0303 U	0.0313 U	14.0	Eco	14.0	Eco
1,3-Dichlorobenzene	0.0368 U	0.0373 U	0.0385 U	0.0379 U	0.0359 U	0.0361 U	0.0400 U	0.0413 U	71.0	Eco	0.420	HH
1,4-Dichlorobenzene	0.0317 U	0.0321 U	0.0332 U	0.0326 U	0.0310 U	0.0311 U	0.0344 U	0.0356 U	15.0	Eco	0.420	HH
2,4,5-Trichlorophenol	-	-	0.0465 U	0.0457 UJ	-	-	-	0.0499 UJ	18.0	Eco	18.0	Eco
2,4,6-Trichlorophenol	-	-	0.0337 U	0.0331 UJ	-	-	-	0.0361 UJ	1.40	HH	5.20	HH
2,4-Dichlorophenol	-	-	0.0195 U	0.0192 UJ	-	-	-	0.0209 UJ	77.0	HH	110	HH
2,4-Dimethylphenol	-	-	0.192 U	0.189 UJ	-	-	-	0.206 UJ	42.0	Eco	42.0	Eco
2,4-Dinitrophenol	-	-	0.217 U	0.214 UJ	-	-	-	0.233 UJ	19.0	Eco	19.0	Eco
2,4-Dinitrotoluene	0.0576 U	0.0583 U	0.0602 U	0.0592 U	0.0562 U	0.0564 U	0.0625 U	0.0646 U	0.110	HH	0.220	HH
2,6-Dinitrotoluene	0.0381 U	0.0386 U	0.0399 U	0.0392 U	0.0372 U	0.0374 U	0.0414 U	0.0428 U	230	Eco	37.0	HH
2-Chloronaphthalene	0.00481 U	0.00487 U	0.00504 U	0.00495 U	0.00470 U	0.00472 U	0.00523 U	0.00541 U	32.0	Eco	32.0	Eco
2-Chlorophenol	-	-	0.0442 U	0.0434 UJ	-	-	-	0.0474 UJ	81.0	HH	180	HH
2-Methylphenol	-	-	0.0410 U	0.0404 UJ	-	-	-	0.0440 UJ	13.0	Eco	13.0	Eco
2-Nitroaniline	0.0300 U	0.0304 U	0.0314 U	0.0309 U	0.0293 U	0.0294 U	0.0326 U	0.0337 U	-	-	370	HH
2-Nitrophenol	-	-	0.0449 U	0.0442 UJ	-	-	-	0.0482 UJ	10,000	HH	11,000	HH
3,3'-Dichlorobenzidine	0.188 U	0.190 U	0.196 U	0.193 U	0.183 U	0.184 U	0.204 U	0.211 U	0.0210	HH	0.130	HH
3-Nitroaniline	0.0567 U	0.0574 U	0.0593 U	0.0583 U	0.0553 U	0.0556 U	0.0615 U	0.0636 U	-	-	3.40	HH
4,6-Dinitro-2-methylphenol	-	-	0.325 U	0.320 UJ	-	-	-	0.349 UJ	13.0	HH	2.90	HH
4-Bromophenyl Phenyl Ether	0.0220 U	0.0222 U	0.0230 U	0.0226 U	0.0214 U	0.0215 U	0.0239 U	0.0247 U	1.50	Eco	1.50	Eco
4-Chloro-3-methylphenol	-	-	0.0256 U	0.0252 UJ	-	-	-	0.0275 UJ	-	-	3700	HH
4-Chloroaniline	0.0725 U	0.0734 U	0.0759 U	0.0746 U	0.0708 U	0.0711 U	0.0788 UJ	0.0814 UJ	50.0	Eco	0.340	HH
4-Chlorophenyl Phenyl Ether	0.0323 U	0.0327 U	0.0338 U	0.0332 U	0.0315 U	0.0317 U	0.0351 U	0.0363 U	-	-	-	-
4-Nitroaniline	0.0389 U	0.0394 U	0.0407 U	0.0400 U	0.0380 U	0.0382 U	0.0423 U	0.0437 U	-	-	3.40	HH
4-Nitrophenol	-	-	0.124 U	0.122 UJ	-	-	-	0.133 UJ	150	Eco	150	Eco
Benzidine	1.00 UJ	1.02 UJ	1.05 UJ	1.03 UJ	0.979 UJ	0.983 UJ	1.09 U	1.13 U	0.0000860	HH	0.720	HH
Benzoic Acid	-	-	0.141 U	0.138 UJ	-	**0.317 J**	-	0.151 UJ	42.0	Eco	42.0	Eco
Benzyl Alcohol	-	-	0.0446 U	0.0439 UJ	-	-	-	0.0479 UJ	8.60	Eco	8.60	Eco
Bis(2-chloroethoxy)methane	0.0182 U	0.0184 U	0.0190 U	0.0187 U	0.0177 U	0.0178 U	0.0197 U	0.0204 U	-	-	110	HH
Bis(2-chloroethyl) Ether	0.0325 U	0.0329 U	0.0340 U	0.0334 U	0.0317 U	0.0319 U	0.0353 U	0.0365 U	0.0300	HH	0.0120	HH
Bis(2-chloroisopropyl) Ether	0.0430 U	0.0436 U	0.0450 U	0.0443 U	0.0420 U	0.0422 U	0.0467 U	0.0483 U	1,400	HH	-	-
Bis(2-ethylhexyl) Phthalate	0.382 U	0.387 U	0.400 U	0.393 U	0.373 U	0.375 U	0.415 U	0.429 U	1.20	HH	3.00	Eco
Butyl Benzyl Phthalate	**0.117 J**	**0.108 J**	**0.154 J**	**0.155 J**	**0.135 J**	**0.137 J**	0.327 U	0.338 U	19.0	Eco	19.0	Eco
Carbazole	0.0218 U	0.0220 U	0.0228 U	0.0224 U	0.0213 U	0.0213 U	0.0236 U	0.0244 U	-	-	-	-
Dibenzofuran	0.0206 U	0.0208 U	0.0215 U	0.0212 U	0.0201 U	0.0202 U	0.0223 U	0.0231 U	3.70	Eco	3.70	Eco
Diethyl Phthalate	**0.0585 J**	0.0565 U	0.0584 U	0.0575 U	0.0546 U	0.0548 U	**0.101 J**	**0.0687 J**	210	Eco	210	Eco
Dimethyl Phthalate	0.0391 U	0.0396 U	0.0409 U	0.0402 U	0.0382 U	0.0383 U	0.0425 U	0.0439 U	3.00	Eco	3.00	Eco
Di-n-butyl Phthalate	**0.130 J**	**0.124 J**	**0.207 J**	**0.177 J**	**0.148 J**	**0.157 J**	0.218 U	0.275 U	35.0	Eco	35.0	Eco
Di-n-octyl Phthalate	0.0274 U	0.0277 U	0.0286 U	0.0282 U	0.0267 U	0.0268 U	0.0297 U	0.0307 U	1.20	HH	4.10	HH
Hexachlorobenzene	0.0251 U	0.0254 U	0.0262 U	0.0258 U	0.0245 U	0.0246 U	0.0272 U	0.0282 U	0.000280	HH	0.000300	Eco
Hexachlorobutadiene	0.0147 U	0.0149 U	0.0154 U	0.0152 U	0.0144 U	0.0145 U	0.0160 U	0.0166 U	0.440	HH	0.860	HH
Hexachlorocyclopentadiene	0.311 U	0.315 U	0.325 U	0.320 U	0.304 U	0.305 U	0.338 UJ	0.349 UJ	5.20	Eco	5.20	Eco
Hexachloroethane	0.0382 U	0.0387 U	0.0400 U	0.0393 U	0.0373 U	0.0375 U	0.0415 U	0.0429 U	1.40	HH	4.10	HH
Isophorone	0.0284 U	0.0287 U	0.0297 U	0.0292 U	0.0277 U	0.0278 U	**0.0782 J**	**0.0483 J**	35.0	HH	71.0	HH
Nitrobenzene	0.0522 U	0.0528 U	0.0546 U	0.0537 U	0.0509 U	0.0511 U	0.0566 U	0.0586 U	17.0	HH	0.120	HH
N-Nitrosodimethylamine	1.00 UJ	1.02 UJ	1.05 UJ	1.03 UJ	0.979 UJ	0.983 UJ	1.09 U	1.13 U	0.000690	HH	0.000420	HH
N-Nitrosodi-n-propylamine	0.0370 U	0.0375 U	0.0387 U	0.0381 U	0.0361 UJ	0.0363 U	0.0402 U	0.0416 U	0.00500	HH	0.00960	HH
N-Nitrosodiphenylamine	0.00853 U	0.00863 U	0.00892 U	0.00877 U	0.00833 U	0.00836 U	0.00926 U	0.00957 U	3.30	HH	14.0	HH
p-cresol (4-Methylphenol)	-	-	0.0463 U	0.0455 UJ	-	-	-	0.0497 UJ	-	-	-	-
Pentachlorophenol	-	-	0.210 U	0.206 UJ	-	-	-	0.225 UJ	0.270	HH	0.470	HH
Phenol	-	-	0.00483 U	**0.0192 J**	**0.00999 J**	-	-	**0.0248 J**	110	Eco	110	Eco
Dissolved Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/L)												
2-Methylnaphthalene	**0.0158 J**	**0.280**	**0.193**	**0.0176 J**	**0.0369 J**	0.0147 U	**0.0203 J**	0.0168 U	72.2	Eco	72.2	Eco
Acenaphthene	**0.00491 J**	0.00345 U	**0.0104 J**	**0.00547 J**	0.00333 U	0.00334 U	**0.0348**	**0.0175 J**	520	Eco	520	Eco
Acenaphthylene	0.00241 U	0.00244 U	**0.00361 J**	0.00248 U	0.00235 U	0.00236 U	0.00261 U	0.00270 U	307	Eco	0.140	HH
Anthracene	0.00191 U	0.00193 U	0.00199 U	0.00196 U	0.00186 U	0.00187 U	0.00207 U	0.00214 U	13.0	Eco	13.0	Eco
Fluorene	**0.00731 J**	**0.00691 J**	**0.0116 J**	**0.00654 J**	**0.00714 J**	0.00167 U	0.00185 U	0.00191 U	3.90	Eco	3.90	Eco
Naphthalene	**0.0399 J**	**0.200**	**0.151**	**0.0350 J**	**0.186**	**0.0289 J**	0.0190 U	0.0196 U	620	Eco	0.140	HH
Phenanthrene	**0.00957 J**	**0.00801 J**	**0.0190 J**	**0.0111 J**	**0.0157 J**	**0.00427 J**	0.00403 U	0.00417 U	6.30	Eco	0.140	HH
Dissolved High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/L)												
Benzo(a)anthracene	0.00522 U	0.00528 U	0.00546 U	0.00537 U	0.00509 U	0.00511 U	0.00566 U	0.00586 U	0.00380	HH	0.0270	Eco
Benzo(a)pyrene	0.00331 U	0.00335 U	0.00346 U	0.00341 U	0.00323 U	0.00324 U	**0.00714 J**	0.00372 U	0.00380	HH	0.00290	HH
Benzo(g,h,i)perylene	0.00512 U	0.00518 U	0.00535 U	0.00526 U	0.00500 U	0.00501 U	0.00556 U	0.00574 U	0.380	HH	0.290	HH
Benzofluoranthenes, Total	0.0119 U	0.0121 U	0.0125 U	0.0123 U	0.0117 U	0.0117 U	0.0130 U	0.0134 U	0.00380	HH	0.01400	Eco
Chrysene	0.00843 U	0.00853 U	0.00881 U	0.00867 U	0.00823 U	0.00826 U	0.00915 U	0.00946 U	0.00380	HH	2.04	Eco
Dibenz(a,h)anthracene	0.00311 U	0.00315 U	0.00325 U	0.00320 U	0.00304 U	0.00305 U	**0.00381 J**	0.00349 U	0.0180	HH	0.00290	HH
Fluoranthene	0.00572 U	0.00579 U	0.00598 U	0.00588 U	0.00558 U	0.00560 U	0.00621 U	0.00642 U	6.16	Eco	6.16	Eco
Indeno(1,2,3-cd)pyrene	0.00281 UJ	0.00284 UJ	0.00294 UJ	0.00289 UJ	0.00274 UJ	0.00275 UJ	**0.00630 J**	0.00315 U	0.00380	HH	0.0290	HH
Pyrene	0.00291 U	0.00294 U	0.00304 U	0.00299 U	0.00284 U	0.00285 U	0.00316 U	0.00327 U	10.1	Eco	10.1	Eco

Notes:

µg/L = microgram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-6
2002 Pistol Range Preliminary Assessment/Site Investigation Soil Analytical Results
Metals in mg/kg

			Analyte	Antimony	Arsenic	Copper	Lead	Mercury	Nickel	Zinc
			Selected SLV (0-3 ft bgs)	0.270	5.40	56.7	25.5	0.0660	38.0	71.7
			SLV Source (0-3 ft bgs)	Eco	UPL	UPL	UPL	UPL	Eco	UPL
Site ID	**Sample ID**	**Sample Date**	**Depth** (Feet bgs)							
PFR01	021119PFR01SS	11/19/2002	0.0-0.5	-	-	**52.3**	**185**	0.0500 U	**24.0 J**	**164**
PFR01	021119PFR02SS	11/19/2002	1.0-1.5	-	-	**46.8**	**37.0**	0.0600 U	**21.0 J**	**95.0**
PFR03	021119PFR03SS	11/19/2002	0.0-0.5	6.00 UJ	6.00 U	**46.8 J**	**758**	0.0500 U	**21.0 J**	**199**
PFR04	021119PFR04SS	11/19/2002	0.0-0.5	-	-	**46.0**	**84.0**	0.0600 U	**26.0 J**	**95.0**
PFR04	021119PFR05SS	11/19/2002	1.0-1.5	-	-	**50.2**	**30.0**	0.0600 U	**26.0 J**	**74.0**
PFR06	021119PFR06SS	11/19/2002	0.0-0.5	-	-	**38.7**	**124**	0.0500 U	**20.0 J**	**121**
PFR06	021119PFR07SS	11/19/2002	1.0-1.5	-	-	**46.4**	**160**	0.0600 U	**23.0 J**	**140**
PFR08	021119PFR08SS	11/19/2002	0.0-0.5	-	-	**37.6**	**269**	0.0600 U	**19.0 J**	**168**
PFR08	021119PFR09SS	11/19/2002	1.0-1.5	-	-	**53.1**	**48.0**	0.0500 U	**25.0 J**	**80.0**
PFR10	021119PFR10SS	11/19/2002	0.0-0.5	-	-	**46.5**	**78.0**	0.0600 U	**32.0 J**	**106**
PFR12	021119PFR12SS	11/19/2002	0.0-0.5	-	-	-	**81.0**	-	-	-
PFR12	021119PFR13SS	11/19/2002	1.0-1.5	-	-	-	**42.0**	-	-	-
PFR14	021119PFR14SS	11/19/2002	0.0-0.5	-	-	-	**98.0**	-	-	-
PFR14	021119PFR15SS	11/19/2002	1.0-1.5	-	-	-	**16.0**	-	-	-
PFR16	021119PFR16SS	11/19/2002	0.0-0.5	-	-	-	**52.0**	-	-	-
PFR17*	021119PFR17SS	11/19/2002	0.0-0.5	-	-	-	**36.5**	-	-	-
PFR17	021119PFR19SS	11/19/2002	1.0-1.5	-	-	-	**11.0**	-	-	-
PFR20*	021119PFR20SS	11/19/2002	0.0-0.5	-	-	-	**78.0**	-	-	-
PFR22	021119PFR22SS	11/19/2002	0.0-0.5	-	-	-	**39.0**	-	-	-
PFR22	021119PFR23SS	11/19/2002	1.0-1.5	-	-	-	**18.0**	-	-	-
PFR24	021119PFR24SS	11/19/2002	0.0-0.5	-	-	-	**60.0**	-	-	-
PFR25	021119PFR25SS	11/19/2002	0.0-0.5	-	-	-	**56.0**	-	-	-
PFR25	021119PFR26SS	11/19/2002	1.0-1.5	-	-	-	**24.0**	-	-	-
PFR27*	021119PFR27SS	11/19/2002	0.0-0.5	-	-	-	**45.0**	-	-	-
PFR29	021119PFR29SS	11/19/2002	0.0-0.5	-	-	-	**95.0**	-	-	-
PFR29	021119PFR30SS	11/19/2002	1.0-1.5	-	-	-	**57.0**	-	-	-
PFR31	021119PFR31SS	11/19/2002	0.0-0.5	-	-	-	**93.0**	-	-	-
PFR32	021119PFR32SS	11/19/2002	0.0-0.5	-	-	-	**59.0**	-	-	-
PFR32	021119PFR33SS	11/19/2002	1.0-1.5	-	-	-	**25.0**	-	-	-
PFR34	021119PFR34SS	11/19/2002	0.0-0.5	-	-	-	**156**	-	-	-
PFR35	021119PFR35SS	11/19/2002	0.0-0.5	-	-	-	**176**	-	-	-
PFR35	021119PFR37SS	11/19/2002	1.0-1.5	-	-	-	**21.0**	-	-	-
PFR38	021119PFR38SS	11/19/2002	0.0-0.5	-	-	-	**171**	-	-	-
PFR39	021119PFR39SS	11/19/2002	0.0-0.5	-	-	-	**527**	-	-	-
PFR39	021119PFR40SS	11/19/2002	1.0-1.5	-	-	-	**573**	-	-	-
PFR41	021119PFR41SS	11/19/2002	0.0-0.5	-	-	-	**733**	-	-	-
PFR42	021119PFR42SS	11/19/2002	0.0-0.5	-	-	-	**266**	-	-	-
PFR42	021119PFR43SS	11/19/2002	1.0-1.5	-	-	-	**43.0**	-	-	-
PFR44	021121PFR44SS	11/21/2002	0.0-0.5	-	-	-	**756**	-	-	-
PFR45	021121PFR45SS	11/21/2002	0.0-0.5	-	-	-	**761**	-	-	-
PFR45	021121PFR46SS	11/21/2002	1.0-1.5	-	-	-	**694**	-	-	-
PFR47	021121PFR47SS	11/21/2002	0.0-0.5	-	-	-	**543**	-	-	-
PFR48	021121PFR48SS	11/21/2002	0.0-0.5	5.00 UJ	5.00 U	**16.5 J**	**915**	-	-	-
PFR48	021121PFR49SS	11/21/2002	1.0-1.5	5.00 UJ	5.00 U	**19.0 J**	**835**	-	-	-
PFR50	021121PFR50SS	11/21/2002	0.0-0.5	5.00 UJ	5.00 U	**18.3 J**	**817**	-	-	-
PFR50	021121PFR51SS	11/21/2002	1.0-1.5	5.00 UJ	5.00 U	**15.6 J**	**1,110**	-	-	-
PFR52*	021121PFR52SS	11/21/2002	0.0-0.5	-	-	-	**60.5**	-	-	-
PFR52	021121PFR54SS	11/21/2002	1.0-1.5	-	-	-	**61.0**	-	-	-
PFR55	021121PFR55SS	11/21/2002	0.0-0.5	-	-	-	**46.0**	-	-	-
PFR56	021121PFR56SS	11/21/2002	0.0-0.5	-	-	-	**391**	-	-	-
PFR56	021121PFR57SS	11/21/2002	1.0-1.5	-	-	-	**410**	-	-	-
PFR58	021121PFR58SS	11/21/2002	0.0-0.5	-	-	-	**31.0**	-	-	-
PFR59	021121PFR59SS	11/21/2002	0.0-0.5	-	-	-	**19.0**	-	-	-
PFR60	021121PFR60SS	11/21/2002	0.0-0.5	-	-	-	**22.0**	-	-	-
PFR60	021121PFR61SS	11/21/2002	1.0-1.5	-	-	-	**28.0**	-	-	-
PFR62	021121PFR62SS	11/21/2002	0.0-0.5	-	-	-	**30.0**	-	-	-
PFR63	021121PFR63SS	11/21/2002	0.0-0.5	-	-	-	**15.0**	-	-	-
PFR63	021121PFR64SS	11/21/2002	1.0-1.5	-	-	-	**10.0**	-	-	-
PFR65*	021121PFR65SS	11/21/2002	0.0-0.5	-	-	-	**7.50**	0.0500 U	-	-
PFR67*	021121PFR67SS	11/21/2002	0.0-0.5	-	-	-	**29.5**	0.0600 U	-	-
PFR69*	021121PFR69SS	11/21/2002	0.0-0.5	-	-	-	**32.0**	0.0400 U	-	-
PFR71*	021121PFR71SS	11/21/2002	0.0-0.5	-	-	-	**26.0**	0.0600 U	-	-
PFR73	021121PFR73SS	11/21/2002	0.0-0.5	-	-	-	**45.0**	-	-	-

Notes:

mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 5-7
2002 Bulb Slope Reconnaissance Investigation Soil Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, and General Chemistry Parameters

Site ID	AREA A04	AREA A05	AREA B06	AREA B07	AREA C01	AREA C02*	AREA C08	AREA C09	PILE #3 BANK #1	PILE #3 BANK #2	PILE #3 BANK #3	PILE #3 BANK #4	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	021120BSA04SS	021120BSA05SS	021120BSB06SS	021120BSB07SS	021120BSC01SS	021120BSC02SS	021120BSC08SS	021120BSC09SS	020419P3B1SD	020419P3B2SD	020419P3B3SD	020419P3B4SD		
Sample Date	11/20/2002	11/20/2002	11/20/2002	11/20/2002	11/20/2002	11/20/2002	11/20/2002	11/20/2002	4/19/2002	4/19/2002	4/19/2002	4/19/2002		
Sample Depth (Feet bgs)	0.17-0.33	0.17-0.33	0.17-0.33	0.17-0.33	0.08-0.25	0.17-0.33	0.17-0.33	0.17-0.33	0.0	0.0	0.0	0.0		
PCB Aroclors (µg/kg)														
Aroclor 1016	20.0 U	19.0 U	19.0 U	20.0 U	20.0 U	19.0 U	20.0 U	20.0 U	67.0 U	67.0 U	67.0 U	67.0 U	371	Eco
Aroclor 1221	40.0 U	39.0 U	38.0 U	39.0 U	39.0 U	38.0 U	39.0 U	40.0 U	134 U	134 U	134 U	134 U	371	Eco
Aroclor 1232	20.0 U	19.0 U	19.0 U	20.0 U	20.0 U	19.0 U	20.0 U	20.0 U	67.0 U	67.0 U	67.0 U	67.0 U	371	Eco
Aroclor 1242	20.0 U	19.0 U	19.0 U	20.0 U	20.0 U	19.0 U	20.0 U	20.0 U	67.0 U	67.0 U	67.0 U	67.0 U	371	Eco
Aroclor 1248	20.0 U	19.0 U	19.0 U	20.0 U	20.0 U	19.0 U	20.0 U	20.0 U	67.0 U	67.0 U	67.0 U	67.0 U	371	Eco
Aroclor 1254	20.0 U	19.0 U	19.0 U	20.0 U	20.0 U	19.0 U	20.0 U	20.0 U	67.0 U	67.0 U	67.0 U	67.0 U	371	Eco
Aroclor 1260	**78.0**	**37.0**	**160**	**35.0**	**27.0**	19.0 U	**51.0**	20.0 U	67.0 U	**76.1**	67.0 U	**251**	371	Eco
Total PCBs as Aroclors (NDs at MDL)[1]	**78.0**	**37.0**	**160**	**35.0**	**27.0**	19.0 U	**51.0**	20.0 U	67.0 U	**76.1**	67.0 U	**251**	371	Eco
Metals (mg/kg)														
Lead	**234**	**202**	**444**	**170**	**67.0**	**47.5**	**142**	**25.0**	**196**	**247**	**289**	**597**	25.5	UPL
Mercury	**0.380**	**0.740**	**0.500**	**0.180**	**0.0600**	**0.0850**	**0.0500**	**0.130**	**0.150**	**0.584**	**0.452**	**1.54**	0.0660	UPL
Petroleum Hydrocarbons (mg/kg)														
Diesel Range Organics	**30.0**	**170**	**79.0**	**32.0**	**11.0**	**18.0**	**33.0**	**8.30**	-	-	-	-	23,000	HH
Residual Range Organics	**180**	**410**	**160**	**200**	**52.0**	**67.5**	**100**	**44.0**	-	-	-	-	40,000	HH
General Chemistry Parameters (mg/kg)														
Carbon, Total Organic	**54,200**	**69,200**	**43,600**	**38,900**	**24,400**	**17,200**	**19,400**	**18,100**	-	-	-	-	-	-
Solids, Total	**908,000**	**918,000**	**819,000**	**793,000**	**747,000**	**714,000**	**768,000**	**700,000**	**723,000**	**692,000**	**800,000**	**855,000**	-	-

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
ND = non detect
SLV = screening level value
UPL = Reference Area Upper Prediction Limit

[1] Only Aroclor 1260 was included in summing Total PCBs as Aroclors because all other aroclors were undected in Bulb Slope AOPC soil samples.
- = Not Analyzed
-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-1
Upland OU and River OU Enumeration of Samples Included in the
Bradford Island Remedial Investigation

Upland OU	Matrix									
	Soil (0-1 ft)	Soil (0-3 ft)	Soil (0-10 ft)	Soil (>10 ft)	Soil Gas	Groundwater	Groundwater - DP	Seep Water	Surface Water	Lagoon Sediment
Bulb Slope AOPC	**12**	**-**	-	-	-	-	-	-	-	-
Landfill AOPC	**32**	**44**	**58**	-	-	**57**	-	**5**	4	-
Pistol Range AOPC	**65**	**-**	-	-	-	-	**2**	-	-	**5**
Sandblast AOPC	**85**	**118**	**121**	**6**	5	**20**	**12**	**-**	-	**-**
Reference Area	**14**	**-**	-	-	-	**4**	-	-	-	-

River OU	Matrix						
	Sediment	Tissue					Surface Water
		Crayfish	Sculpin	Smallmouth Bass	Clam	Largescale Sucker	
Forebay	**19**	17	**17**	19	**19**	**1**	5
Forebay - Pre-Sediment Removal	5	-	-	-	4	-	-
Forebay - Eagle Creek	2	-	-	-	-	-	-
Forebay - Goose Island	**2**	1	**1**	-	1	-	-
Downstream	6	-	-	-	-	-	-
Reference	**18**	20	**18**	19	18	-	5

Notes:

Analytical suites are not the same for all samples

The number of samples listed in this table include both the samples used in this RI Report from the Historical Investigations (Section 5) and Recent Investigations (Section 6).

- = no samples collected in this area for this matrix

Table 6-10a
Post-Removal Forebay Area Crayfish Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 1 of 3)

Area	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	Selected SLV	SLV Source
Site ID	P01-CF	P02-CF	P03-CF	P04-CF	P05-CF	P06-CF		
Sample ID	08021901CF	08021902CF	08022003CF	08021904CF	08021505CF	08021406CF		
Sample Date	2/19/2008	2/19/2008	2/20/2008	2/19/2008	2/15/2008	2/14/2008		
Percent Lipds	1.2	1.7	0.62	0.55	1.4	1.1		
PCB Aroclors (µg/kg wet)								
Aroclor 1016	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	0.570	HH
Aroclor 1221	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	0.570	HH
Aroclor 1232	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	0.570	HH
Aroclor 1242	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	0.570	HH
Aroclor 1248	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	0.570	HH
Aroclor 1254	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	19.0 U	0.570	HH
Aroclor 1260	1.90 U	1.90 U	1.90 U	8.60 U	7.10 U	17.0 U	0.570	HH
Aroclor 1262	2.50 U	2.50 U	2.50 U	2.50 U	9.80 U	10.0 U	0.570	HH
Aroclor 1268	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	0.570	HH
Total PCBs as Aroclors (NDs at MDL) [1]	2.60 U	2.60 U	2.60 U	8.60 U	9.80 U	19.0 U	0.570	HH
PCB Dioxin-Like Congeners (µg/kg wet)								
PCB 77	**0.00376**	-	-	**0.00654**	**0.0148**	**0.0207**	0.0760	HH
PCB 81	0.000239 EMPC	-	-	**0.000446**	0.000823 EMPC	**0.00132**	0.0250	HH
PCB 105	**0.0146**	-	-	**0.0931**	**0.0566**	0.0863 EMPC	0.250	HH
PCB 114	**0.00661**	-	-	**0.351**	**0.355**	**0.804**	0.250	HH
PCB 118	**0.206**	-	-	**3.52**	**6.34**	**14.0**	0.250	HH
PCB 123	**0.00475**	-	-	**0.247**	**0.206**	**0.460**	0.250	HH
PCB 126	**0.000800**	-	-	0.00351 U	**0.00360**	**0.00783**	0.0000760	HH
PCB 156	**0.0382 C**	-	-	**2.28 C**	**1.62 C**	**3.91 C**	0.250	HH
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**						0.250	HH
PCB 167	**0.0230**	-	-	**1.18**	**0.629**	**1.53**	0.250	HH
PCB 169	0.000597 U	-	-	0.00295 U	0.00180 U	0.00120 U	0.000250	HH
PCB 189	**0.00269**	-	-	**0.0683**	**0.0414**	**0.0821**	0.250	HH
Total PCBs as Congeners (KM, capped)	**1.44 J**	-	-	**16.8 J**	**16.9 J**	**42.6 J**	0.570	HH
Metals (mg/kg wet)								
Aluminum	**94.3**	**157**	**96.6**	**106**	**149**	**139**	--	--
Antimony	**0.0210**	**0.0160**	**0.0500**	**0.0160**	**0.0630**	**0.133**	--	--
Arsenic	**0.610**	**0.680**	**0.420**	**0.550**	**0.640**	**0.520**	0.000760	HH
Barium	**72.2**	**75.6**	**68.5**	**62.1**	**84.3**	**80.4**	--	--
Beryllium	**0.00300 J**	**0.00380 J**	**0.00310 J**	**0.00410 J**	**0.00370 J**	**0.00330 J**	--	--
Cadmium	**0.193**	**0.210**	**0.101**	**0.129**	**0.137**	**0.149**	0.150	Eco
Chromium	**0.700**	**0.200**	**0.300**	**0.700**	**1.20**	**0.800**	--	--
Cobalt	**0.209**	**0.241**	**0.192**	**0.232**	**0.239**	**0.223**	--	--
Copper	**22.2 J**	**36.0 J**	**19.7 J**	**17.3 J**	**26.5 J**	**26.1 J**	--	--
Lead	**0.292 J**	**0.795 J**	**0.732 J**	**0.566 J**	**2.66 J**	**0.653 J**	0.120	Eco
Mercury	**0.0232**	**0.0218**	**0.0190**	**0.0167**	**0.0239**	**0.0251**	0.0490	HH
Methyl Mercury	**0.0370**	**0.0250**	**0.0310**	**0.0340**	**0.0360**	**0.0350**	--	--
Nickel	**4.83**	**4.48**	**4.31**	**4.72**	**5.34**	**4.68**	--	--
Thallium	**0.0177**	**0.0292**	**0.0149**	**0.0195**	**0.0258**	**0.0236**	--	--
Vanadium	**0.400**	**0.600**	**0.400**	**0.400**	**0.500**	**0.500**	--	--
Zinc	**23.2 J**	**21.0 J**	**19.3 J**	**21.6 J**	**22.8 J**	**21.6 J**	--	--
Semivolatile Organic Compounds (µg/kg wet)								
Bis(2-ethylhexyl) Phthalate	66.0 U	-	-	66.0 U	**67.0 J**	**67.0 J**	81.9	HH
Butyl Benzyl Phthalate	7.30 U	-	-	7.30 U	7.30 U	7.30 U	310	Eco
Carbazole	9.10 U	-	-	9.10 U	9.10 U	9.10 U	-	-
Di-n-butyl Phthalate	16.0 U	-	-	180 U	16.0 U	16.0 U	626	Eco
Di-n-octyl Phthalate	11.0 U	-	-	11.0 U	11.0 U	11.0 U	626	Eco
p-cresol (4-Methylphenol)	7.70 U	-	-	7.70 U	7.70 U	7.70 U	-	-
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)								
Acenaphthene	0.110 U	-	-	0.110 U	**0.140 J**	**0.260 J**	15,000	HH
Anthracene	**0.0850 J**	-	-	0.0650 U	**0.160 J**	0.0650 U	15,000	HH
Fluorene	**0.160 J**	-	-	0.150 U	**0.150 J**	**0.210 J**	15,000	HH
Phenanthrene	**0.470**	-	-	0.360 U	**0.620**	**0.790**	15,000	HH
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)								
Benzo(a)anthracene	**0.280 J**	-	-	0.0660 U	**0.290 J**	0.0660 U	1.57	HH
Benzo(a)pyrene	0.0810 U	-	-	**0.120 J**	0.0810 U	0.0810 U	0.157	HH
Benzo(b)fluoranthene	0.0700 U	-	-	0.0700 U	**0.100 J**	0.0700 U	1.57	HH
Benzo(g,h,i)perylene	0.0730 U	-	-	0.0730 U	0.0730 U	0.0730 U	15.7	HH
Benzo(k)fluoranthene	0.0560 U	-	-	0.0560 U	**0.110 J**	0.0560 U	15.7	HH
Chrysene	0.0760 U	-	-	0.0760 U	**0.200 J**	0.0760 U	157	HH
Dibenz(a,h)anthracene	0.0590 U	-	-	0.0590 U	0.0590 U	0.0590 U	0.157	HH
Fluoranthene	**0.260 J**	-	-	**0.210 J**	**0.400 J**	**0.540**	19,000	Eco
Indeno(1,2,3-cd)pyrene	0.0640 U	-	-	0.0640 U	0.0640 U	0.0640 U	1.57	HH
Pyrene	**0.270 J**	-	-	**0.170 J**	**0.410 J**	**0.470 J**	1,000	Eco

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
RDL = reported detection limit
- = Not Analyzed
-- = SLV for analyte not available
ND = Non Detect

[1] The crayfish Total PCBs as Aroclors is shown as the maximum MDL because all aroclors were undected in Forebay crayfish samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-10a
Post-Removal Forebay Area Crayfish Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 2 of 3)

Area	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	**Selected SLV**	**SLV Source**
Site ID	P07-CF	P08-CF	P13-CF	P14-CF	P15-CF	P16-CF		
Sample ID	08021407CF	08021408CF	08021413CF	08022014CF	08021915CF	08022216CF		
Sample Date	2/14/2008	2/14/2008	2/14/2008	2/20/2008	2/19/2008	2/22/2008		
Percent Lipds	0.61	0.74	0.82	0.58	0.87	1.1		
PCB Aroclors (µg/kg wet)								
Aroclor 1016	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	0.570	HH
Aroclor 1221	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	0.570	HH
Aroclor 1232	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	0.570	HH
Aroclor 1242	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	0.570	HH
Aroclor 1248	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	0.570	HH
Aroclor 1254	1.90 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	0.570	HH
Aroclor 1260	4.00 U	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U	0.570	HH
Aroclor 1262	2.60 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	0.570	HH
Aroclor 1268	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	0.570	HH
Total PCBs as Aroclors (NDs at MDL) [1]	4.00 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	0.570	HH
PCB Dioxin-Like Congeners (µg/kg wet)								
PCB 77	**0.0105**	**0.00433**	**0.00211**	**0.00174**	**0.00438**	**0.00514**	0.0760	HH
PCB 81	0.000361 U	0.000228 U	0.000215 U	0.000125 U	0.000273 U	0.000289 U	0.0250	HH
PCB 105	**0.134**	**0.0347**	0.00489 EMPC	0.00367 EMPC	**0.00746**	**0.0132**	0.250	HH
PCB 114	**0.121**	**0.0484**	**0.00370**	**0.00569**	**0.00407**	**0.00661**	0.250	HH
PCB 118	**4.40**	**0.847**	**0.0955**	**0.112**	**0.122**	**0.248**	0.250	HH
PCB 123	**0.0690**	**0.0302**	**0.00242**	**0.00581**	**0.00337**	**0.00682**	0.250	HH
PCB 126	0.00260 U	0.00130 U	**0.000306**	**0.000238**	**0.000468**	0.00110 U	0.0000760	HH
PCB 156	**0.655 C**	**0.211 C**	**0.0138 C**	**0.0263 C**	**0.0169 C**	**0.0280 C**	0.250	HH
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**						0.250	HH
PCB 167	**0.222**	**0.0971**	**0.00853**	**0.0228**	**0.0121**	**0.0215**	0.250	HH
PCB 169	0.00222 U	0.000487 U	0.000249 U	0.000257 U	0.000350 U	0.000539 U	0.000250	HH
PCB 189	**0.0160**	**0.00548**	**0.00117**	0.00162 EMPC	**0.00126**	0.00155 EMPC	0.250	HH
Total PCBs as Congeners (KM, capped)	**12.4 J**	**3.12 J**	**0.591 J**	**0.825 J**	**0.816 J**	**1.34 J**	0.570	HH
Metals (mg/kg wet)								
Aluminum	**71.4**	**114**	**92.8**	**92.8**	**100**	**78.3**	--	--
Antimony	**0.0150**	**0.0200**	**0.0110 J**	**0.00900 J**	**0.0110 J**	**0.0390**	--	--
Arsenic	**0.380**	**0.460**	**0.390**	**0.390**	**0.420**	**0.460**	0.000760	HH
Barium	**64.9**	**55.5**	**59.2**	**51.7**	**73.0**	**58.3**	--	--
Beryllium	**0.00260 J**	**0.00340 J**	**0.00260 J**	**0.00310 J**	**0.00300 J**	**0.00170 J**	--	--
Cadmium	**0.0870**	**0.0740**	**0.0650**	**0.0730**	**0.0830**	**0.0620**	0.150	Eco
Chromium	**0.500**	**0.800**	**0.600**	**0.700**	**1.00**	**0.300**	--	--
Cobalt	**0.211**	**0.236**	**0.213**	**0.247**	**0.245**	**0.262**	--	--
Copper	**15.5 J**	**20.3 J**	**15.6 J**	**18.8 J**	**18.9 J**	**14.8 J**	--	--
Lead	**0.334 J**	**0.649 J**	**0.130 J**	**0.0980 J**	**0.140 J**	**1.41 J**	0.120	Eco
Mercury	**0.0221**	**0.0215**	**0.0263**	**0.0244**	**0.0207**	**0.0208**	0.0490	HH
Methyl Mercury	**0.0290**	**0.0290**	**0.0340**	**0.0330**	**0.0250**	**0.0300**	--	--
Nickel	**5.35**	**4.83**	**4.96**	**4.71**	**4.80**	**4.41**	--	--
Thallium	**0.0117**	**0.0155**	**0.0146**	**0.0166**	**0.0166**	**0.0194**	--	--
Vanadium	**0.300**	**0.400**	**0.400**	**0.500**	**0.500**	**0.400**	--	--
Zinc	**19.5 J**	**20.9 J**	**19.9 J**	**21.4 J**	**20.3 J**	**16.9 J**	--	--
Semivolatile Organic Compounds (µg/kg wet)								
Bis(2-ethylhexyl) Phthalate	66.0 U	**110 J**	66.0 U	66.0 U	66.0 U	**88.0 J**	81.9	HH
Butyl Benzyl Phthalate	7.30 U	7.30 U	7.30 U	7.30 U	7.30 U	7.30 U	310	Eco
Carbazole	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	-	-
Di-n-butyl Phthalate	58.0 U	16.0 U	39.0 U	48.0 U	16.0 U	16.0 U	626	Eco
Di-n-octyl Phthalate	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	626	Eco
p-cresol (4-Methylphenol)	7.70 U	7.70 U	7.70 U	7.70 U	7.70 U	7.70 U	-	-
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)								
Acenaphthene	0.110 U	**0.130 J**	0.110 U	**0.140 J**	**0.200 J**	0.110 U	15,000	HH
Anthracene	0.0650 U	**0.0690 J**	0.0650 U	0.0650 U	**0.130 J**	0.0650 U	15,000	HH
Fluorene	0.150 U	**0.150 J**	0.150 U	0.150 U	**0.180 J**	0.150 U	15,000	HH
Phenanthrene	0.360 U	**0.510**	0.360 U	**0.460 J**	**0.860**	**0.510**	15,000	HH
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)								
Benzo(a)anthracene	**0.230 J**	**0.260 J**	**0.260 J**	**0.270 J**	**0.350 J**	0.0660 U	1.57	HH
Benzo(a)pyrene	0.0810 U	0.0810 U	0.0810 U	0.0810 U	**0.170 J**	0.0810 U	0.157	HH
Benzo(b)fluoranthene	**0.0960 J**	**0.0980 J**	**0.110 J**	**0.140 J**	**0.220 J**	0.0700 U	1.57	HH
Benzo(g,h,i)perylene	0.0730 U	0.0730 U	**0.160 J**	**0.0980 J**	**0.390 J**	0.0730 U	15.7	HH
Benzo(k)fluoranthene	**0.0860 J**	**0.0980 J**	**0.0970 J**	**0.110 J**	**0.160 J**	0.0560 U	15.7	HH
Chrysene	**0.100 J**	**0.120 J**	0.0760 U	**0.140 J**	**0.310 J**	0.0760 U	157	HH
Dibenz(a,h)anthracene	0.0590 U	0.0590 U	0.0590 U	0.0590 U	0.0590 U	0.0590 U	0.157	HH
Fluoranthene	**0.170 J**	**0.260 J**	**0.230 J**	**0.300 J**	**0.750**	**0.360 J**	19,000	Eco
Indeno(1,2,3-cd)pyrene	0.0640 U	0.0640 U	0.0640 U	**0.160 J**	**0.180 J**	0.0640 U	1.57	HH
Pyrene	**0.160 J**	**0.290 J**	**0.280 J**	**0.340 J**	**1.20**	**0.280 J**	1,000	Eco

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
RDL = reported detection limit
- = Not Analyzed
-- = SLV for analyte not available
ND = Non Detect

[1] The crayfish Total PCBs as Aroclors is shown as the maximum MDL because all aroclors were undected in Forebay crayfish samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-10a
Post-Removal Forebay Area Crayfish Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 3 of 3)

Area	Forebay	Forebay	Forebay	Forebay	Forebay	**Selected SLV**	**SLV Source**
Site ID	P17-CF	P18-CF	P19-CF	P20-CF	P21-CF		
Sample ID	08021917CF	08021918CF	08021919CF	08021920CF	08021921CF		
Sample Date	2/19/2008	2/19/2008	2/19/2008	2/19/2008	2/19/2008		
Percent Lipds	0.48	0.73	0.93	0.71	0.72		
PCB Aroclors (µg/kg wet)							
Aroclor 1016	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	0.570	HH
Aroclor 1221	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	0.570	HH
Aroclor 1232	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	0.570	HH
Aroclor 1242	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	0.570	HH
Aroclor 1248	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	0.570	HH
Aroclor 1254	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	0.570	HH
Aroclor 1260	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U	0.570	HH
Aroclor 1262	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	0.570	HH
Aroclor 1268	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	0.570	HH
Total PCBs as Aroclors (NDs at MDL) [1]	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	0.570	HH
PCB Dioxin-Like Congeners (µg/kg wet)							
PCB 77	**0.00157**	**0.00412**	**0.00267**	**0.00338**	**0.00366**	0.0760	HH
PCB 81	0.000164 U	0.000313 EMPC	0.000218 U	**0.000211**	**0.000250**	0.0250	HH
PCB 105	**0.00636**	**0.00737**	**0.0111**	**0.0110**	**0.0127**	0.250	HH
PCB 114	**0.00214**	**0.00610**	0.00261 EMPC	**0.00361**	**0.00389**	0.250	HH
PCB 118	**0.0824**	**0.173**	**0.111**	**0.152**	**0.156**	0.250	HH
PCB 123	**0.00211**	**0.00506**	0.00311 EMPC	**0.00362**	**0.00400**	0.250	HH
PCB 126	0.000397 U	**0.000469**	0.000650 U	0.000748 U	0.000547 U	0.0000760	HH
PCB 156	**0.0136 C**	**0.0257 C**	**0.0139 C**	**0.0192 C**	**0.0191 C**	0.250	HH
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**					0.250	HH
PCB 167	**0.0118**	**0.0177**	**0.0120**	**0.0141**	**0.0144**	0.250	HH
PCB 169	0.000167 U	0.000254 U	0.000240 U	0.000298 U	0.000265 U	0.000250	HH
PCB 189	**0.000926**	**0.00158**	**0.000923**	0.00109 EMPC	**0.00123**	0.250	HH
Total PCBs as Congeners (KM, capped)	**0.536 J**	**1.12 J**	**0.766 J**	**0.911 J**	**0.967 J**	0.570	HH
Metals (mg/kg wet)							
Aluminum	**109**	**85.6**	**97.9**	**103**	**103**	--	--
Antimony	**0.0280**	**0.0190**	**0.0180**	**0.0100 J**	**0.0110 J**	--	--
Arsenic	**0.410**	**0.410**	**0.500**	**0.440**	**0.460**	0.000760	HH
Barium	**54.1**	**59.9**	**71.8**	**64.8**	**55.3**	--	--
Beryllium	**0.00380 J**	**0.00240 J**	**0.00350 J**	**0.00330 J**	**0.00340 J**	--	--
Cadmium	**0.0620**	**0.0610**	**0.128**	**0.118**	**0.0810**	0.150	Eco
Chromium	**0.600**	**0.700**	**0.800**	**0.600**	**0.700**	--	--
Cobalt	**0.245**	**0.235**	**0.227**	**0.237**	**0.261**	--	--
Copper	**10.5 J**	**13.0 J**	**20.4 J**	**17.4 J**	**20.0 J**	--	--
Lead	**0.754 J**	**0.577 J**	**0.249 J**	**0.0990 J**	**0.106 J**	0.120	Eco
Mercury	**0.0215**	**0.0206**	**0.0214**	**0.0157**	**0.0315**	0.0490	HH
Methyl Mercury	**0.0290**	**0.0280**	**0.0260**	**0.0270**	**0.0400**	--	--
Nickel	**5.09**	**4.62**	**4.75**	**4.44**	**4.49**	--	--
Thallium	**0.0152**	**0.0148**	**0.0214**	**0.0192**	**0.0167**	--	--
Vanadium	**0.500**	**0.400**	**0.400**	**0.400**	**0.400**	--	--
Zinc	**18.5 J**	**19.2 J**	**20.8 J**	**19.9 J**	**21.7 J**	--	--
Semivolatile Organic Compounds (µg/kg wet)							
Bis(2-ethylhexyl) Phthalate	66.0 U	66.0 U	66.0 U	66.0 U	66.0 U	81.9	HH
Butyl Benzyl Phthalate	7.30 U	7.30 U	7.30 U	7.30 U	7.30 U	310	Eco
Carbazole	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	-	-
Di-n-butyl Phthalate	76.0 U	16.0 U	16.0 U	37.0 U	38.0 U	626	Eco
Di-n-octyl Phthalate	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	626	Eco
p-cresol (4-Methylphenol)	7.70 U	7.70 U	7.70 U	7.70 U	7.70 U	-	-
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)							
Acenaphthene	0.110 U	0.110 U	**0.210 J**	**0.110 J**	0.110 U	15,000	HH
Anthracene	0.0650 U	0.0650 U	0.0650 U	0.0650 U	0.0650 U	15,000	HH
Fluorene	0.150 U	0.150 U	0.150 U	0.150 U	0.150 U	15,000	HH
Phenanthrene	**0.420 J**	**0.420 J**	0.360 U	0.360 U	**0.440 J**	15,000	HH
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)							
Benzo(a)anthracene	**0.250 J**	**0.270 J**	**0.230 J**	0.0660 U	0.0660 U	1.57	HH
Benzo(a)pyrene	0.0810 U	0.0810 U	0.0810 U	0.0810 U	**0.160 J**	0.157	HH
Benzo(b)fluoranthene	0.0700 U	0.0700 U	0.0700 U	0.0700 U	**0.240 J**	1.57	HH
Benzo(g,h,i)perylene	0.0730 U	0.0730 U	0.0730 U	0.0730 U	**0.170 J**	15.7	HH
Benzo(k)fluoranthene	0.0560 U	0.0560 U	0.0560 U	0.0560 U	**0.150 J**	15.7	HH
Chrysene	**0.0850 J**	**0.110 J**	**0.0820 J**	0.0760 U	0.0760 U	157	HH
Dibenz(a,h)anthracene	0.0590 U	0.0590 U	0.0590 U	0.0590 U	0.0590 U	0.157	HH
Fluoranthene	**0.320 J**	**0.450 J**	**0.250 J**	**0.230 J**	**0.500**	19,000	Eco
Indeno(1,2,3-cd)pyrene	0.0640 U	0.0640 U	0.0640 U	0.0640 U	**0.180 J**	1.57	HH
Pyrene	**0.290 J**	**0.450 J**	**0.230 J**	**0.200 J**	**0.380 J**	1,000	Eco

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
RDL = reported detection limit
- = Not Analyzed
-- = SLV for analyte not available
ND = Non Detect

[1] The crayfish Total PCBs as Aroclors is shown as the maximum MDL because all aroclors were undected in Forebay crayfish samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-10b
Post-Removal Reference Area Crayfish Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 1 of 3)

Area	Reference	Reference	Reference	Reference	Reference	Reference
Site ID	P100-CF	P105-CF	P22-CF	P33-CF	P38/42-CF	P38-CF
Sample ID	080312100CF	080314105CF	08022622CF	08022233CF	08021838/42CF	08021838CF
Sample Date	3/12/2002	3/14/2002	2/26/2008	2/26/2008	2/18/2008	2/18/2008
Percent Lipds	0.76	0.70	0.48	0.68	-	0.44
PCB Aroclors (µg/kg wet)						
Aroclor 1016	2.40 U	3.00 U	2.40 U	2.40 U	-	4.60 U
Aroclor 1221	2.60 U	3.30 U	2.60 U	2.60 U	-	5.00 U
Aroclor 1232	2.30 U	2.90 U	2.30 U	2.30 U	-	4.40 U
Aroclor 1242	2.20 U	2.80 U	2.20 U	2.20 U	-	4.30 U
Aroclor 1248	0.510 U	0.640 U	0.510 U	0.510 U	-	0.980 U
Aroclor 1254	1.80 U	2.30 U	1.80 U	1.80 U	-	3.50 U
Aroclor 1260	1.90 U	2.40 U	1.90 U	1.90 U	-	3.70 U
Aroclor 1262	2.50 U	3.20 U	2.50 U	2.50 U	-	4.80 U
Aroclor 1268	2.00 U	2.50 U	2.00 U	2.00 U	-	3.90 U
Total PCBs as Aroclors (NDs at MDL) [1]	2.60 U	3.30 U	2.60 U	2.60 U	-	5.00 U
PCB Dioxin-Like Congeners (µg/kg wet)						
PCB 77	**0.00402**	-	**0.00130**	**0.00239**	**0.00288**	-
PCB 81	0.000193 EMPC	-	0.000135 U	**0.000176**	0.000175 U	-
PCB 105	**0.0118**	-	**0.00197**	**0.00762**	**0.00898**	-
PCB 114	**0.00458**	-	**0.00262**	**0.00320**	**0.00292**	-
PCB 118	**0.149**	-	**0.0526**	**0.0953**	**0.107**	-
PCB 123	**0.00417**	-	**0.00193**	**0.00271**	**0.00245**	-
PCB 126	**0.000481**	-	0.000207 U	0.000273 U	**0.000377**	-
PCB 156	**0.0244 C**	-	**0.0143 C**	**0.0147 C**	**0.0127 C**	-
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**					
PCB 167	**0.0180**	-	**0.00980**	**0.00944**	**0.00888**	-
PCB 169	0.000325 U	-	0.000180 U	0.000158 U	0.000126 U	-
PCB 189	**0.00165**	-	**0.00124**	**0.000956**	**0.000767**	-
Total PCBs as Congeners (KM, capped)	**0.946 J**	-	**0.366 J**	**0.634 J**	**0.719 J**	-
Metals (mg/kg wet)						
Aluminum	**124 J**	**94.2 J**	**134 J**	**73.8 J**	-	**115 J**
Antimony	**0.0120 J**	**0.00800 J**	**0.00900 J**	**0.0200**	-	**0.0130 J**
Arsenic	**0.349**	**0.378**	**0.343**	**0.363**	-	**0.275**
Barium	**65.8**	**40.2**	**54.8**	**44.7**	-	**61.2**
Beryllium	**0.00320 J**	**0.00310 J**	**0.00260 J**	**0.00330 J**	-	**0.00370 J**
Cadmium	**0.121**	**0.0760**	**0.0460**	**0.0480**	-	**0.0560**
Chromium	**0.780**	**0.120 J**	**1.23**	**0.310**	-	**0.170 J**
Cobalt	**0.280**	**0.261**	**0.336**	**0.372**	-	**0.347**
Copper	**17.6 J**	**19.6 J**	**16.8 J**	**13.9 J**	-	**13.9 J**
Lead	**0.541**	**0.183**	**0.201**	**0.282**	-	**0.317**
Mercury	**0.0183 J**	**0.0169 J**	**0.0142 J**	**0.0137 J**	-	**0.0172 J**
Methyl Mercury	**0.0264**	**0.0364**	**0.0295**	**0.0367**	-	**0.0239**
Nickel	**2.15**	**1.28**	**2.51**	**1.12**	-	**1.43**
Thallium	**0.0200**	**0.0140**	**0.0214**	**0.0214**	-	**0.0236**
Vanadium	**0.425**	**0.378**	**0.715**	**0.658**	-	**0.637**
Zinc	**19.7**	**20.6**	**18.5**	**18.0**	-	**21.4**
Semivolatile Organic Compounds (µg/kg wet)						
Bis(2-ethylhexyl) Phthalate	66.0 U	-	66.0 U	**70.0 J**	-	**69.0 J**
Butyl Benzyl Phthalate	7.30 U	-	7.30 U	7.30 U	-	7.30 U
Carbazole	9.10 U	-	9.10 U	9.10 U	-	9.10 U
Di-n-butyl Phthalate	39.0 U	-	80.0 U	50.0 U	-	92.0 U
Di-n-octyl Phthalate	11.0 U	-	**32.0 J**	11.0 U	-	11.0 U
p-cresol (4-Methylphenol)	7.70 U	-	7.70 U	7.70 U	-	7.70 U
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)						
Acenaphthene	0.110 U	-	0.110 U	0.110 U	-	0.110 U
Anthracene	0.0650 U	-	0.0650 U	0.0650 U	-	0.0650 U
Fluorene	0.150 U	-	0.150 U	0.150 U	-	0.150 U
Phenanthrene	0.360 U	-	0.360 U	**0.460 J**	-	0.360 U
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)						
Benzo(a)anthracene	0.0660 U	-	0.0660 U	0.0660 U	-	0.0660 U
Benzo(a)pyrene	0.0810 U	-	0.0810 U	0.0810 U	-	0.0810 U
Benzo(b)fluoranthene	0.0700 U	-	0.0700 U	0.0700 U	-	0.0700 U
Benzo(g,h,i)perylene	0.0730 U	-	0.0730 U	0.0730 U	-	0.0730 U
Benzo(k)fluoranthene	0.0560 U	-	0.0560 U	0.0560 U	-	0.0560 U
Chrysene	0.0760 U	-	0.0760 U	0.0760 U	-	0.0760 U
Dibenz(a,h)anthracene	0.0590 U	-	0.0590 U	0.0590 U	-	0.0590 U
Fluoranthene	0.490 U	-	0.490 U	0.490 U	-	0.500 U
Indeno(1,2,3-cd)pyrene	0.0640 U	-	0.0640 U	0.0640 U	-	0.0640 U
Pyrene	0.490 U	-	0.490 U	0.490 U	-	0.500 U

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
RDL = reported detection limit
ND = Non Detect
- = Not Analyzed
bold = analyte detected above MDL/RDL.
J = The reported value is an estimate.

[1] The crayfish Total PCBs as Aroclors is shown as the maximum MDL because all aroclors were undected in Reference Area crayfish samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

Table 6-10b
Post-Removal Reference Area Crayfish Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 2 of 3)

Area	Reference	Reference	Reference	Reference	Reference	Reference	Reference
Site ID	P42-CF	P72-CF	P73-CF	P74-CF	P75-CF	P76-CF	P78-CF
Sample ID	08022842CF	08030372CF	08030373CF	08030374CF	08030375CF	08030376CF	08030378CF
Sample Date	2/28/2008	3/3/2008	3/3/2008	3/3/2008	3/3/2008	3/3/2008	3/3/2008
Percent Lipds	1.0	0.80	1.0	0.55	0.37	0.70	0.82
PCB Aroclors (µg/kg wet)							
Aroclor 1016	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U
Aroclor 1221	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U
Aroclor 1232	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U
Aroclor 1242	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U
Aroclor 1248	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U
Aroclor 1254	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U	1.80 U
Aroclor 1260	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U
Aroclor 1262	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U
Aroclor 1268	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U
Total PCBs as Aroclors [1]	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U
PCB Dioxin-Like Congeners (µg/kg wet)							
PCB 77	-	**0.00262**	**0.00329**	**0.00299**	**0.00257**	**0.00187**	**0.00209**
PCB 81	-	0.000169 U	0.000161 EMPC	**0.000167**	0.000194 U	0.000127 U	0.000104 U
PCB 105	-	**0.00357**	**0.00603**	**0.0127**	**0.0106**	**0.00301**	**0.00334**
PCB 114	-	**0.00369**	**0.00351**	**0.00390**	**0.00364**	**0.00252**	**0.00236**
PCB 118	-	**0.0958**	**0.111**	**0.138**	**0.157**	**0.0636**	**0.0697**
PCB 123	-	**0.00247**	**0.00307**	**0.00376**	**0.00372**	**0.00196**	**0.00205**
PCB 126	-	**0.000450**	**0.000455**	0.000376 U	0.00196 U	0.000231 U	0.000267 U
PCB 156	-	**0.0173 C**	**0.0169 C**	**0.0188 C**	**0.0222 C**	**0.0123 C**	**0.0130 C**
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**						
PCB 167	-	**0.0106**	**0.0106**	**0.0136**	**0.0167**	**0.00846**	**0.00816**
PCB 169	-	0.0000992 U	0.000154 U	0.000103 U	0.000171 U	0.000105 U	0.0000911 U
PCB 189	-	**0.00133**	**0.00119**	**0.00104**	**0.00125**	**0.000851**	**0.000907**
Total PCBs as Congeners (KM, capped)	-	**0.692 J**	**0.735 J**	**0.774 J**	**0.952 J**	**0.456 J**	**0.496 J**
Metals (mg/kg wet)							
Aluminum	**115 J**	**221 J**	**141 J**	**131 J**	**137 J**	**110 J**	**177 J**
Antimony	**0.0390**	**0.0310**	**0.0260**	**0.0120 J**	**0.00800 J**	**0.0230**	**0.0150**
Arsenic	**0.397**	**0.636**	**0.460**	**0.420**	**0.287**	**0.356**	**0.401**
Barium	**53.4**	**120**	**70.7**	**47.7**	**47.4**	**85.7**	**81.4**
Beryllium	**0.00320 J**	**0.00610 J**	**0.00310 J**	**0.00390 J**	**0.00290 J**	**0.00260 J**	**0.00340 J**
Cadmium	**0.0720**	**0.201**	**0.0840**	**0.0840**	**0.0670**	**0.116**	**0.102**
Chromium	**0.470**	**0.590**	**0.280 J**	**0.140 J**	0.130 U	**0.160 J**	**0.280 J**
Cobalt	**0.339**	**0.387**	**0.358**	**0.397**	**0.297**	**0.248**	**0.356**
Copper	**18.2 J**	**33.2 J**	**19.3 J**	**18.3 J**	**13.1 J**	**17.6 J**	**19.8 J**
Lead	**1.04**	**1.55**	**0.597**	**0.0900**	**0.0560**	**0.503**	**0.683**
Mercury	**0.0151 J**	**0.0206 J**	**0.0246 J**	**0.0169 J**	**0.0176 J**	**0.0195 J**	**0.0153 J**
Methyl Mercury	**0.0211**	**0.0299**	**0.0219**	**0.0258**	**0.0268**	**0.0296**	**0.0301**
Nickel	**1.57**	**2.24**	**1.36**	**1.18**	**0.992**	**1.30**	**1.33**
Thallium	**0.0240**	**0.0318**	**0.0192**	**0.0234**	**0.0198**	**0.0158**	**0.0219**
Vanadium	**0.711**	**0.733**	**0.593**	**0.710**	**0.570**	**0.346**	**0.494**
Zinc	**21.1**	**36.5**	**22.0**	**22.3**	**20.4**	**20.9**	**22.1**
Semivolatile Organic Compounds (µg/kg wet)							
Bis(2-ethylhexyl) Phthalate	**87.0 J**	66.0 U	66.0 U	66.0 U	66.0 U	66.0 U	66.0 U
Butyl Benzyl Phthalate	7.30 U	7.30 U	7.30 U	7.30 U	7.30 U	7.30 U	7.30 U
Carbazole	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U
Di-n-butyl Phthalate	16.0 U	16.0 U	16.0 U	110 U	79.0 U	16.0 U	45.0 U
Di-n-octyl Phthalate	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
p-cresol (4-Methylphenol)	7.70 U	7.70 U	7.70 U	7.70 U	7.70 U	7.70 U	7.70 U
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)							
Acenaphthene	0.110 U	**0.190 J**	0.110 U	0.110 U	0.110 U	0.110 U	0.110 U
Anthracene	0.0650 U	**0.190 J**	0.0650 U	0.0650 U	0.0650 U	0.0650 U	0.0650 U
Fluorene	0.150 U	**0.250 J**	0.150 U	0.150 U	0.150 U	0.150 U	0.150 U
Phenanthrene	0.360 U	**0.450 J**	0.360 U	0.360 U	0.360 U	0.360 U	**0.590**
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)							
Benzo(a)anthracene	0.0660 U	**0.400 J**	0.0660 U	**0.310 J**	0.0660 U	0.0660 U	0.0660 U
Benzo(a)pyrene	0.0810 U	**0.120 J**	0.0810 U	0.0810 U	0.0810 U	0.0810 U	0.0810 U
Benzo(b)fluoranthene	0.0700 U	**0.230 J**	0.0700 U	**0.200 J**	0.0700 U	0.0700 U	0.0700 U
Benzo(g,h,i)perylene	0.0730 U	0.480 U	0.0730 U	0.500 U	0.0730 U	0.0730 U	0.0730 U
Benzo(k)fluoranthene	0.0560 U	**0.200 J**	0.0560 U	**0.180 J**	0.0560 U	0.0560 U	0.0560 U
Chrysene	**0.0910 J**	**0.270 J**	0.0760 U	**0.260 J**	0.0760 U	0.0760 U	0.0760 U
Dibenz(a,h)anthracene	0.0590 U	**0.160 J**	0.0590 U	**0.120 J**	0.0590 U	0.0590 U	0.0590 U
Fluoranthene	0.500 U	0.480 U	0.500 U	0.500 U	0.480 U	0.490 U	0.490 U
Indeno(1,2,3-cd)pyrene	0.0640 U	**0.180 J**	0.0640 U	**0.130 J**	0.0640 U	0.0640 U	0.0640 U
Pyrene	0.500 U	0.480 U	0.500 U	0.500 U	0.480 U	0.490 U	0.490 U

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
RDL = reported detection limit
ND = Non Detect
- = Not Analyzed
bold = analyte detected above MDL/RDL.
J = The reported value is an estimate.

[1] The crayfish Total PCBs as Aroclors is shown as the maximum MDL because all aroclors were undected in Reference Area crayfish samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

Table 6-10b
Post-Removal Reference Area Crayfish Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 3 of 3)

Area	Reference	Reference	Reference	Reference	Reference	Reference	Reference
Site ID	P79-CF	P82-CF	P90-CF	P91-CF	P92-CF	P94-CF	P98-CF
Sample ID	08030379CF	08030382CF	08031290CF	08031291CF	08031292CF	08031294CF	08031298CF
Sample Date	3/3/2008	3/3/2008	3/12/2008	3/12/2008	3/12/2008	3/12/2008	3/12/2008
Percent Lipds	1.2	0.70	0.23	0.81	0.56	0.50	0.42
PCB Aroclors (µg/kg wet)							
Aroclor 1016	2.40 U	2.40 U	2.40 U	4.80 U	2.40 U	2.40 U	2.40 U
Aroclor 1221	2.60 U	2.60 U	2.60 U	5.20 U	2.60 U	2.60 U	2.60 U
Aroclor 1232	2.30 U	2.30 U	2.30 U	4.60 U	2.30 U	2.30 U	2.30 U
Aroclor 1242	2.20 U	2.20 U	2.20 U	4.40 U	2.20 U	2.20 U	2.20 U
Aroclor 1248	0.510 U	0.510 U	0.510 U	1.10 U	0.510 U	0.510 U	0.510 U
Aroclor 1254	1.80 U	1.80 U	1.80 U	3.60 U	1.80 U	1.80 U	1.80 U
Aroclor 1260	1.90 U	1.90 U	1.90 U	3.80 U	1.90 U	1.90 U	1.90 U
Aroclor 1262	2.50 U	2.50 U	2.50 U	5.00 U	2.50 U	2.50 U	2.50 U
Aroclor 1268	2.00 U	2.00 U	2.00 U	4.00 U	2.00 U	2.00 U	2.00 U
Total PCBs as Aroclors [1]	2.60 U	2.60 U	2.60 U	5.20 U	2.60 U	2.60 U	2.60 U
PCB Dioxin-Like Congeners (µg/kg wet)							
PCB 77	**0.00349**	**0.00466**	**0.00187**	**0.00380**	**0.00190**	**0.00274**	**0.00228**
PCB 81	0.000162 U	0.000250 EMPC	0.000204 U	0.000188 U	0.000401 U	0.000151 U	0.000146 EMPC
PCB 105	**0.00799**	**0.0248**	**0.0155**	**0.0143**	**0.00225**	**0.00400**	**0.00433**
PCB 114	**0.00356**	**0.00815**	**0.00471**	**0.00417**	**0.00286**	**0.00302**	**0.00347**
PCB 118	**0.122**	**0.323**	**0.264**	**0.163**	**0.0697**	**0.112**	**0.101**
PCB 123	**0.00326**	**0.00736**	**0.00645**	**0.00372**	**0.00226**	**0.00291**	**0.00300**
PCB 126	**0.000530**	0.000792 U	0.000329 U	**0.000402**	0.000275 U	0.000243 EMPC	0.000261 EMPC
PCB 156	**0.0188 C**	**0.0391 C**	**0.0296 C**	**0.0204 C**	**0.0151 C**	**0.0167 C**	**0.0201 C**
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**						
PCB 167	**0.0112**	**0.0301**	**0.0273**	**0.0134**	**0.00947**	**0.0123**	**0.0166**
PCB 169	0.000114 U	0.000200 U	0.000223 U	0.000237 U	0.000301 U	0.000307 U	0.0000971 U
PCB 189	**0.00131**	**0.00220**	**0.00129**	0.00114 EMPC	**0.00131**	**0.000936**	**0.00132**
Total PCBs as Congeners (KM, capped)	**0.876 J**	**1.94 J**	**1.12 J**	**1.02 J**	**0.498 J**	**0.650 J**	**0.609 J**
Metals (mg/kg wet)							
Aluminum	**167 J**	**196 J**	**157 J**	**124 J**	**160 J**	**101 J**	**71.2 J**
Antimony	**0.0150**	**0.00800 J**	**0.00700 J**	**0.00600 J**	**0.00800 J**	**0.0190**	**0.0110 J**
Arsenic	**0.458**	**0.404**	**0.280**	**0.459**	**0.360**	**0.338**	**0.308**
Barium	**89.0**	**74.5**	**49.0**	**78.2**	**83.3**	**79.4**	**68.6**
Beryllium	**0.00400 J**	**0.00420 J**	**0.00390 J**	**0.00310 J**	**0.00400 J**	**0.00270 J**	**0.00330 J**
Cadmium	**0.129**	**0.0690**	**0.0520**	**0.0890**	**0.147**	**0.112**	**0.119**
Chromium	**0.530**	**0.780**	**1.06**	**0.310**	**0.530**	**0.530**	**0.570**
Cobalt	**0.350**	**0.395**	**0.338**	**0.439**	**0.298**	**0.258**	**0.224**
Copper	**28.0 J**	**17.4 J**	**12.2 J**	**18.6 J**	**19.5 J**	**14.6 J**	**13.3 J**
Lead	**0.387**	**0.151**	**0.153**	**0.0890**	**0.244**	**0.416**	**0.364**
Mercury	**0.0105 J**	**0.0181 J**	**0.0190 J**	**0.0185 J**	**0.0221 J**	**0.0182 J**	**0.0173 J**
Methyl Mercury	**0.0254**	**0.0333**	**0.0344**	**0.0221**	**0.0201**	**0.0200**	**0.0181**
Nickel	**1.87**	**2.42**	**3.44**	**1.82**	**2.00**	**1.85**	**2.36**
Thallium	**0.0216**	**0.0254**	**0.0147**	**0.0370**	**0.0197**	**0.0195**	**0.0158**
Vanadium	**0.557**	**0.754**	**0.703**	**0.804**	**0.509**	**0.355**	**0.261**
Zinc	**24.0**	**21.6**	**22.4**	**20.2**	**20.9**	**19.0**	**18.6**
Semivolatile Organic Compounds (µg/kg wet)							
Bis(2-ethylhexyl) Phthalate	66.0 U	66.0 U	66.0 U	66.0 U	**76.0 J**	66.0 U	66.0 U
Butyl Benzyl Phthalate	7.30 U	**15.0 J**	**18.0 J**	7.30 U	7.30 U	7.30 U	**31.0 J**
Carbazole	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U
Di-n-butyl Phthalate	16.0 U	70.0 U	73.0 U	40.0 U	38.0 U	55.0 U	57.0 U
Di-n-octyl Phthalate	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
p-cresol (4-Methylphenol)	7.70 U	7.70 U	7.70 U	7.70 U	7.70 U	7.70 U	7.70 U
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)							
Acenaphthene	**0.120 J**	**0.130 J**	0.110 U	0.110 U	0.110 U	0.110 U	0.110 U
Anthracene	0.0650 U	**0.0980 J**	0.0650 U	0.0650 U	0.0650 U	0.0650 U	0.0650 U
Fluorene	0.150 U	**0.180 J**	0.150 U	0.150 U	0.150 U	0.150 U	0.150 U
Phenanthrene	**0.510**	**0.580**	0.360 U	0.360 U	0.360 U	0.360 U	0.360 U
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)							
Benzo(a)anthracene	0.0660 U	0.0660 U	0.0660 U	0.0660 U	0.0660 U	0.0660 U	0.0660 U
Benzo(a)pyrene	0.0810 U	0.0810 U	0.0810 U	0.0810 U	0.0810 U	0.0810 U	0.0810 U
Benzo(b)fluoranthene	0.0700 U	0.0700 U	**0.0820 J**	0.0700 U	0.0700 U	0.0700 U	**0.0860 J**
Benzo(g,h,i)perylene	0.0730 U	0.0730 U	0.0730 U	0.0730 U	0.0730 U	0.0730 U	0.490 U
Benzo(k)fluoranthene	0.0560 U	0.0560 U	**0.0720 J**	0.0560 U	0.0560 U	0.0560 U	**0.0920 J**
Chrysene	0.0760 U	0.0760 U	**0.110 J**	0.0760 U	0.0760 U	0.0760 U	**0.120 J**
Dibenz(a,h)anthracene	0.0590 U	0.0590 U	0.0590 U	0.0590 U	0.0590 U	0.0590 U	**0.0720 J**
Fluoranthene	0.490 U	0.490 U	0.450 U	0.500 U	0.500 U	0.490 U	0.490 U
Indeno(1,2,3-cd)pyrene	0.0640 U	0.0640 U	0.0640 U	0.0640 U	0.0640 U	0.0640 U	**0.0870 J**
Pyrene	0.490 U	0.490 U	0.450 U	0.500 U	0.500 U	0.490 U	0.490 U

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
RDL = reported detection limit
ND = Non Detect
- = Not Analyzed
bold = analyte detected above MDL/RDL.
J = The reported value is an estimate.

[1] The crayfish Total PCBs as Aroclors is shown as the maximum MDL because all aroclors were undected in Reference Area crayfish samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

Table 6-11a
Post-Removal Forebay Area Sculpin Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, and Metals
(Page 1 of 2)

Area	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	**Selected SLV**	**SLV Source**
Site ID	SF-01	SF-02	SF-03	SF-04	SF-05	SF-06	SF-07	SF-08		
Sample ID	F-1	F-2	F-3	F-4	F-5	F-6	F-7	F-8		
Sample Date	9/17/2008	9/17/2008	9/17/2008	9/17/2008	10/22/2008	9/19/2008	10/21/2008	9/17/2008		
Percent Lipids	3.59	4.83	3.94	2.56	4.38	7.69	4.62	4.05		
PCB Aroclors (µg/kg wet)										
Aroclor 1016	2.40 U	2.40 U	12.0 U	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	35.0	Eco
Aroclor 1221	2.60 U	2.60 U	13.0 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	35.0	Eco
Aroclor 1232	2.30 U	2.30 U	12.0 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	35.0	Eco
Aroclor 1242	2.20 U	2.20 U	11.0 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	35.0	Eco
Aroclor 1248	0.510 U	0.510 U	2.60 U	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	35.0	Eco
Aroclor 1254	13.0 U	43.0 U	**1,700**	**470**	**130**	130 U	28.0 U	20.0 U	35.0	Eco
Aroclor 1260	1.90 U	36.0 U	9.50 U	1.90 U	1.90 U	82.0 U	1.90 U	1.90 U	35.0	Eco
Aroclor 1262	2.50 U	2.50 U	13.0 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	35.0	Eco
Aroclor 1268	2.00 U	2.00 U	10.0 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	35.0	Eco
Total PCBs as Aroclors (NDs at MDLs) [1]	13.0 U	43.0 U	**1700**	**470**	**130**	130 U	28.0 U	20.0 U	35.0	Eco
PCB Dioxin-Like Congeners (µg/kg wet)										
PCB 77	**0.0108**	**0.0199**	**0.443**	**0.111**	**0.0400**	**0.0487**	**0.0128**	**0.0298**	0.160	Eco
PCB 81	0.000449 EMPC	0.000807 EMPC	0.295 U	0.00950 U	0.00523 U	0.00388 U	0.000553 U	**0.00145**	0.0800	Eco
PCB 105	**0.383**	**0.881**	**269**	**38.2**	**21.4**	**5.13**	**0.600**	**0.752**	20.0	Eco
PCB 114	**0.0448**	**0.162**	**19.9**	**3.51**	**2.89**	**0.356**	**0.0553**	**0.0734**	20.0	Eco
PCB 118	**1.63**	**6.70**	**757**	**111**	**86.9**	**19.3**	**2.43**	**3.00**	20.0	Eco
PCB 123	**0.0229**	**0.0610**	**11.8**	**1.66**	**0.920**	**0.268**	**0.0326**	**0.0376**	20.0	Eco
PCB 126	**0.00321**	**0.00731**	0.405 EMPC	**0.0540**	**0.0291**	**0.0117**	**0.00435**	**0.00597**	0.00580	Eco
PCB 156	**0.306 C**	**1.22 C**	**118 C**	**21.9 C**	**25.4 C**	**2.02 C**	**0.340 C**	**0.428 C**	20.0	Eco
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**								20.0	Eco
PCB 167	**0.0979**	**0.322**	**30.8**	**5.23**	**3.52**	**0.766**	**0.116**	**0.140**	20.0	Eco
PCB 169	0.00246 U	0.00704 U	0.164 U	0.0232 U	0.0288 U	0.00551 U	**0.00365**	0.00363 U	0.0200	Eco
PCB 189	**0.0128**	**0.0881**	**2.48**	**0.400**	**0.501**	**0.0437**	**0.0135**	**0.0157**	20.0	Eco
Total PCBs as Congeners (KM, capped)	**14.9 J**	**48.8 J**	**4773 J**	**915 J**	**559 J**	**141 J**	**22.9 J**	**26.1 J**	35.0	Eco
Metals (mg/kg wet)										
Arsenic	**0.289**	**0.334**	**0.272**	**0.435**	**0.308**	**0.421**	**0.232**	**0.332**	6.60	Eco
Cadmium	**0.0148**	**0.0183**	**0.0224**	**0.0279**	**0.0140**	**0.00720**	**0.0194**	**0.0134**	0.150	Eco
Lead	**0.0750**	**0.0740**	**0.0546**	**0.0499**	**0.136**	0.0214 U	**0.0393**	**0.0813**	0.120	Eco
Mercury	**0.114 J**	**0.240 J**	**0.308 J**	**0.122 J**	**0.143 J**	**0.0327 J**	**0.188 J**	**0.131 J**	0.0740	Eco

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
RDL = reported detection limit
- = Not Analyzed
-- = SLV for analyte not available
ND = Non Detect

[1] Only Aroclor 1254 was included in summing sculpin Total PCBs as Aroclors because all other aroclors were undected in Forebay sculpin samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV

Table 6-11a
Post-Removal Forebay Area Sculpin Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, and Metals
(Page 2 of 2)

Area	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	**Selected SLV**	**SLV Source**
Site ID	SF-09	SF-10	SF-11	SF-12	SF-13	SF-14	SF-15	SF-16	SF-17		
Sample ID	F-9	F-10	F-11	F-12	F-13	F-14	F-15	F-16	F-17		
Sample Date	9/19/2008	10/21/2008	9/17/2008	2/22/2008	2/22/2008	10/22/2008	10/21/2008	10/21/2008	10/21/2008		
Percent Lipids	4.22	3.15	4.85	4.39	1.51	3.69	1.88	3.23	4.24		
PCB Aroclors (µg/kg wet)											
Aroclor 1016	2.40 U	2.40 U	2.40 U	14.0 UJ	8.20 UJ	2.40 U	2.40 U	2.40 U	2.40 U	35.0	Eco
Aroclor 1221	2.60 U	2.60 U	2.60 U	27.0 UJ	69.0 UJ	2.60 U	2.60 U	2.60 U	2.60 U	35.0	Eco
Aroclor 1232	2.30 U	2.30 U	2.30 U	38.0 UJ	62.0 UJ	2.30 U	2.30 U	2.30 U	2.30 U	35.0	Eco
Aroclor 1242	2.20 U	2.20 U	2.20 U	23.0 UJ	35.0 UJ	2.20 U	2.20 U	2.20 U	2.20 U	35.0	Eco
Aroclor 1248	0.510 U	0.510 U	0.510 U	13.0 UJ	6.70 UJ	0.510 U	0.510 U	0.510 U	0.510 U	35.0	Eco
Aroclor 1254	27.0 U	19.0 U	28.0 U	23.0 UJ	35.0 UJ	29.0 U	27.0 U	37.0 U	32.0 U	35.0	Eco
Aroclor 1260	13.0 U	1.90 U	1.90 U	38.0 UJ	6.50 UJ	1.90 U	1.90 U	1.90 U	1.90 U	35.0	Eco
Aroclor 1262	2.50 U	2.50 U	2.50 U	9.30 UJ	8.60 UJ	2.50 U	2.50 U	2.50 U	2.50 U	35.0	Eco
Aroclor 1268	2.00 U	2.00 U	2.00 U	7.50 UJ	6.90 UJ	2.00 U	2.00 U	2.00 U	2.00 U	35.0	Eco
Total PCBs as Aroclors (NDs at MDLs) [1]	27.0 U	19.0 U	28.0 U	23.0 UJ	35.0 UJ	29.0 U	27.0 U	37.0 U	32.0 U	35.0	Eco
PCB Dioxin-Like Congeners (µg/kg wet)											
PCB 77	**0.0114**	**0.0143**	**0.0142**	**0.0292 J**	**0.00431 J**	**0.0153**	**0.00464**	**0.0187**	**0.0154**	0.160	Eco
PCB 81	0.000382 EMPC	0.000524 U	0.000710 EMPC	0.000818 UJ	0.000225 UJ	0.000756 U	0.000278 U	0.000846 EMPC	0.00111 U	0.0800	Eco
PCB 105	**0.325**	**0.652**	**0.527**	**1.21 J**	**0.303 J**	**0.997**	**0.549**	**0.530**	**1.57**	20.0	Eco
PCB 114	**0.0327**	**0.0478**	**0.0682**	**0.0638 J**	**0.0212 J**	**0.0818**	**0.0488**	**0.239**	**0.128**	20.0	Eco
PCB 118	**1.36**	**2.09**	**2.88**	**3.84 J**	**0.870 J**	**3.75**	**1.86**	**7.34**	**4.80**	20.0	Eco
PCB 123	**0.0214**	**0.0241**	**0.0394**	**0.0303 J**	0.0128 EMPC	**0.0487**	**0.0196**	**0.160**	**0.0566**	20.0	Eco
PCB 126	**0.00321**	**0.00420**	**0.00550**	**0.0102 J**	**0.00239 J**	**0.00632**	**0.00290**	**0.00726**	**0.00596**	0.00580	Eco
PCB 156	**0.179 C**	**0.337 C**	**0.414 C**	**0.283 C J**	**0.123 C J**	**0.485 C**	**0.381 C**	**1.55 C**	**0.759 C**	20.0	Eco
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**									20.0	Eco
PCB 167	**0.0716**	**0.0935**	**0.165**	**0.131 J**	**0.0432 J**	**0.179**	**0.0875**	**0.671**	**0.193**	20.0	Eco
PCB 169	0.00218 U	0.00322 U	0.00479 U	0.00405 UJ	0.00145 UJ	0.00562 U	0.00369 U	0.00416 U	0.00370 U	0.0200	Eco
PCB 189	**0.00813**	**0.0136**	**0.0209**	**0.00962 J**	**0.00586 J**	**0.0158**	**0.0205**	**0.0413**	**0.0248**	20.0	Eco
Total PCBs as Congeners (KM, capped)	**12.3 J**	**23.1 J**	**24.1 J**	**39.6 J**	**9.87 J**	**35.3 J**	**19.4 J**	**35.6 J**	**40.7 J**	35.0	Eco
Metals (mg/kg wet)											
Arsenic	**0.243**	**0.407**	**0.269**	**0.402**	**0.280**	**0.401**	**0.243**	**0.244**	**0.184**	6.60	Eco
Cadmium	**0.0165**	**0.0135**	**0.0121**	**0.0162**	**0.0453**	**0.0194**	**0.0325**	**0.0214**	**0.0272**	0.150	Eco
Lead	**0.0833**	**0.0459**	**0.0334**	**0.0876**	**0.306**	**0.0315**	**0.0313**	**0.0918**	**0.0384**	0.120	Eco
Mercury	**0.162 J**	**0.0655 J**	**0.210 J**	**0.0543 J**	**0.0525 J**	**0.125 J**	**0.221 J**	**0.298 J**	**0.110 J**	0.0740	Eco

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
RDL = reported detection limit
- = Not Analyzed
-- = SLV for analyte not available
ND = Non Detect

[1] Only Aroclor 1254 was included in summing sculpin Total PCBs as Aroclors because all other aroclors were undected in Forebay sculpin samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV

Table 6-11b
Post-Removal Reference Area Sculpin Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, and Metals
(Page 1 of 2)

Area	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
Site ID	SR-01	SR-02	SR-03	SR-04	SR-05	SR-06	SR-07	SR-08	SR-09
Sample ID	R-1	R-2	R-3	R-4	R-5	R-6	R-7	R-8	R-9
Sample Date	7/23/2008	7/24/2008	3/14/2008	10/9/2008	7/24/2008	2/26/2008	3/10/2008	10/9/2008	7/24/2008
Percent Lipids	3.5	3.7	2.3	4.3	5.0	1.9	4.2	3.2	5.0
PCB Aroclors (µg/kg wet)									
Aroclor 1016	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U
Aroclor 1221	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U
Aroclor 1232	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U
Aroclor 1242	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U
Aroclor 1248	45.0 U	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U
Aroclor 1254	1.80 U	17.0 U	19.0 U	21.0 U	23.0 U	22.0 U	17.0 U	39.0 U	19.0 U
Aroclor 1260	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U
Aroclor 1262	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U
Aroclor 1268	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U
Total PCBs as Aroclors (NDs at MDLs) [1]	45.0 U	17.0 U	19.0 U	21.0 U	23.0 U	22.0 U	17.0 U	39.0 U	19.0 U
PCB Dioxin-Like Congeners (µg/kg wet)									
PCB 77	**0.0114**	**0.0129**	**0.0107**	**0.0138**	**0.0217**	**0.00519**	**0.00981 J**	**0.0139**	**0.0132**
PCB 81	0.000938 EMPC	0.00140 EMPC	0.00136 EMPC	0.000689 EMPC	0.00198 EMPC	0.000711 U	0.00141 EMPC	0.00119 EMPC	0.00104 EMPC
PCB 105	**0.505**	**0.685**	**0.972**	**0.455**	**1.04**	**0.358**	**0.591 J**	**0.593**	**0.531**
PCB 114	**0.0320**	**0.0471**	**0.0821**	**0.0272**	**0.0716**	**0.0250**	**0.0392 J**	**0.0376**	**0.0347**
PCB 118	**1.54**	**2.18**	**3.87**	**1.27**	**3.49**	**1.05**	**1.71 J**	**1.79**	**1.72**
PCB 123	**0.0202**	**0.0258**	**0.0445**	**0.0214**	**0.0453**	**0.0153**	**0.0255 J**	**0.0216**	**0.0232**
PCB 126	**0.00306**	**0.00364**	**0.00462**	**0.00254**	**0.00589**	**0.00272**	**0.00397 J**	**0.00340**	0.00335 EMPC
PCB 156	**0.183 C**	**0.239 C**	**0.464 C**	**0.148 C**	**0.438 C**	**0.140 C**	**0.187 C J**	**0.192 C**	**0.178 C**
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**								
PCB 167	**0.0708**	**0.0912**	**0.175**	**0.0606**	**0.149**	**0.0519**	**0.0770 J**	**0.0739**	**0.0811**
PCB 169	0.00336 U	0.00403 U	0.00777 U	0.00214 U	0.00756 U	0.00290 U	0.00395 UJ	0.00294 U	0.00384 U
PCB 189	**0.00691**	**0.00859**	0.000318 U	**0.00520**	**0.0172**	**0.00598**	**0.00673 J**	**0.00640**	**0.00593**
Total PCBs as Congeners (KM, capped)	**16.8 J**	**21.9 J**	**37.5 J**	**15.9 J**	**38.3 J**	**12.2 J**	**19.2 J**	**18.1 J**	**18.4 J**
Metals (mg/kg wet)									
Arsenic	**0.323**	**0.449**	**0.418**	**0.302**	**0.484**	**0.323**	**0.239**	**0.294**	**0.311**
Cadmium	**0.0244**	**0.0128**	**0.0158**	**0.0135**	**0.0114**	**0.0204**	**0.00970**	**0.0112**	**0.00870**
Lead	**0.0453**	**0.0526**	**0.0249**	**0.0239**	**0.0280**	**0.0370**	**0.0532**	**0.0402**	**0.0319**
Mercury	**0.0757 J**	**0.0694 J**	**0.0908 J**	**0.0889 J**	**0.102 J**	**0.102 J**	**0.0683 J**	**0.137 J**	**0.0533 J**

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
ND = Non Detect
RDL = reported detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

[1] The sculpin Total PCBs as Aroclors is shown as the maximum MDL because all aroclors were undected in Reference Area sculpin samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

Table 6-11b
Post-Removal Reference Area Sculpin Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, and Metals
(Page 2 of 2)

Area	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
Site ID	SR-10	SR-11	SR-12	SR-13	SR-14	SR-15	SR-16	SR-17	SR-18
Sample ID	R-10	R-11	R-12	R-13	R-14	R-15	R-16	R-17	R-18
Sample Date	7/23/2008	3/3/2008	10/9/2008	7/23/2008	10/10/2008	10/9/2008	10/10/2008	10/9/2008	7/24/2008
Percent Lipids	5.5	3.3	4.1	3.6	4.9	2.9	4.1	5.5	3.4
PCB Aroclors (µg/kg wet)									
Aroclor 1016	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U	2.40 U
Aroclor 1221	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U
Aroclor 1232	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U	2.30 U
Aroclor 1242	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U
Aroclor 1248	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U
Aroclor 1254	28.0 U	24.0 U	13.0 U	36.0 U	20.0 U	35.0 U	38.0 U	30.0 U	44.0 U
Aroclor 1260	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U
Aroclor 1262	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U
Aroclor 1268	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U
Total PCBs as Aroclors (NDs at MDLs) [1]	28.0 U	24.0 U	13.0 U	36.0 U	20.0 U	35.0 U	38.0 U	30.0 U	44.0 U
PCB Dioxin-Like Congeners (µg/kg wet)									
PCB 77	**0.0178**	**0.0138**	**0.0177**	**0.0213**	**0.0194**	**0.0160**	**0.0140**	**0.0259**	**0.0132**
PCB 81	0.00139 EMPC	0.00142 EMPC	0.000998 EMPC	0.00156 EMPC	0.00157 EMPC	0.00149 EMPC	0.000829 EMPC	0.00221 EMPC	0.00122 EMPC
PCB 105	**0.692**	**0.937**	**0.828**	**0.885**	**0.614**	**0.694**	**0.442**	**0.908**	**0.717**
PCB 114	**0.0478**	**0.0683**	**0.0544**	**0.0605**	**0.0403**	**0.0644**	**0.0337**	**0.0578**	**0.0439**
PCB 118	**2.19**	**3.13**	**2.80**	**2.79**	**1.92**	**3.11**	**1.61**	**2.85**	**1.93**
PCB 123	**0.0298**	**0.0358**	**0.0333**	**0.0470**	0.0320 EMPC	**0.0423**	**0.0219**	**0.0402**	**0.0313**
PCB 126	**0.00380**	**0.00519**	**0.00593**	**0.00483**	**0.00520**	**0.00493**	**0.00313**	**0.00552**	**0.00391**
PCB 156	**0.270 C**	**0.374 C**	**0.322 C**	**0.402 C**	**0.203 C**	**0.402 C**	**0.193 C**	**0.350 C**	**0.257 C**
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**								
PCB 167	**0.101**	**0.142**	**0.136**	**0.170**	**0.0968**	**0.146**	**0.0910**	**0.139**	**0.0992**
PCB 169	0.00456 U	0.00586 U	0.00384 U	0.00505 U	0.00366 U	0.00929 U	0.00488 U	0.00712 U	0.00467 U
PCB 189	**0.00963**	**0.0142**	**0.0115**	**0.00974**	**0.00690**	**0.0154**	**0.00820**	**0.0110 EMPC**	**0.00920**
Total PCBs as Congeners (KM, capped)	**24.0 J**	**32.4 J**	**27.5 J**	**31.5 J**	**22.3 J**	**27.2 J**	**17.3 J**	**30.5 J**	**24.2 J**
Metals (mg/kg wet)									
Arsenic	**0.473**	**0.370**	**0.484**	**0.427**	**0.398**	**0.350**	**0.355**	**0.461**	**0.407**
Cadmium	**0.0169**	**0.0156**	**0.0116**	**0.0146**	**0.0141**	**0.0154**	**0.0264**	**0.0176**	**0.0130**
Lead	**0.0252**	**0.0758**	0.0214 U	**0.0347**	**0.0312**	**0.0268**	**0.0314**	**0.0286**	**0.0341**
Mercury	**0.0790 J**	**0.112 J**	**0.0880 J**	**0.0922 J**	**0.0448 J**	**0.141 J**	**0.0902 J**	**0.0554 J**	**0.0862 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
ND = Non Detect
RDL = reported detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

[1] The sculpin Total PCBs as Aroclors is shown as the maximum MDL because all aroclors were undected in Reference Area sculpin samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

Table 6-12a
Post-Removal Forebay Area Surface Water Analytical Results for High-Volume XAD Device Samples
PCB Aroclors, PCB Dioxin-Like Congeners, and Semivolatile Organic Compounds
(Page 1 of 2)

Area	Forebay			Forebay			Forebay			**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Site ID	P52			P53			P54						
Sample ID	08021252XAD			08022453XAD			08021354XAD						
Sample Date	2/12/2008			2/24/2008			2/13/2008						
Preparation Fraction	Column	Filter	Column+ Filter (ND=RDL/MDL)	Column	Filter	Column+ Filter (ND=RDL/MDL)	Column	Filter	Column+ Filter (ND=RDL/MDL)				
PCB Dioxin-Like Congeners (pg/L)													
PCB 77	0.0330 U	0.0310 U	0.0640 U	0.0770 EMPC	**0.0560**	**0.133 J**	0.0330 U	**0.0460**	**0.0790 J**	--	--	5,200	HH
PCB 81	0.00980 U	0.00450 U	0.0143 U	0.00590 U	0.00520 U	0.0111 U	0.00640 U	0.00600 U	0.0124 U	--	--	5,200	HH
PCB 105	**0.119**	**0.221**	**0.340**	**0.163**	**0.339**	**0.502**	**0.114**	**0.332**	**0.446**	--	--	5,200	HH
PCB 114	0.0120 U	0.0170 U	0.0290 U	0.00900 U	0.0200 U	0.0290 U	0.00800 U	0.0250 U	0.0330 U	--	--	100	HH
PCB 118	**0.360**	**0.518**	**0.878**	**0.499**	**1.07**	**1.57**	**0.325**	**0.947**	**1.27**	--	--	5,200	HH
PCB 123	0.00700 U	0.0130 U	0.0200 U	0.00900 EMPC	0.0170 U	0.0260 U	0.00370 U	0.0180 U	0.0217 U	--	--	5,200	HH
PCB 126	0.00540 U	0.00410 U	0.00950 U	0.00600 U	0.00570 U	0.0117 U	0.00420 U	0.0112 U	0.0154 U	--	--	5.20	HH
PCB 156	0.0260 C U	**0.0850 C**	**0.111 C J**	**0.0360 C**	**0.319 C**	**0.355 C**	0.0230 C U	**0.359 C**	**0.382 C J**	--	--	1,000	HH
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**									--	--	1,000	HH
PCB 167	**0.0140**	**0.0330**	**0.0470**	**0.0130**	**0.139**	**0.152**	**0.0100**	**0.148**	**0.158**	--	--	52,000	HH
PCB 169	0.00290 U	0.00170 U	0.00460 U	0.00140 U	0.00660 U	0.00800 U	0.00210 U	0.00880 U	0.0109 U	--	--	52.0	HH
PCB 189	0.00400 U	0.00700 U	0.0110 U	0.00220 U	**0.0640**	**0.0662 J**	0.00250 U	0.0900 EMPC	0.0925 U	--	--	5,200	HH
Total PCBs as Congeners (KM, capped)	**97.7 J**	**14.7 J**	**112 J**	**153 J**	**55.7 J**	**209 J**	**95.7 J**	**61.2 J**	**157 J**	64.0	HH	14,000	Eco
Semivolatile Organic Compounds (ng/L)													
Bis(2-ethylhexyl) Phthalate	11.8 U	4.51 U	16.3 U	10.5 U	3.74 U	14.2 U	8.77 U	4.63 U	13.4 U	1,200	HH	3,000	Eco
Butyl Benzyl Phthalate	0.418 U	0.198 U	0.616 U	0.316 U	0.157 U	0.473 U	2.29 U	0.155 U	2.45 U	19,000	Eco	19,000	Eco
Di-n-butyl Phthalate	1.97 U	0.266 U	2.24 U	0.800 U	0.281 U	1.08 U	0.925 U	0.247 U	1.17 U	35,000	Eco	35,000	Eco
Di-n-octyl Phthalate	0.314 U	0.249 U	0.563 U	0.154 U	0.0960 U	0.250 U	0.852 U	0.160 U	1.01 U	1,200	HH	4,100	HH
Low Molecular Weight PAHs (LPAHs) (ng/L)													
Acenaphthene	**0.706**	0.0329 U	**0.739 J**	**1.12**	0.0282 U	**1.15 J**	**0.894**	0.015 U	**0.909 J**	520,000	Eco	520,000	Eco
Anthracene	0.0754 U	**0.0317**	**0.107 J**	0.0787 U	**0.0267**	**0.105 J**	0.0569 U	**0.0288**	**0.0857 J**	13,000	Eco	13,000	Eco
Phenanthrene	**1.39**	0.0919 U	**1.48 J**	**1.27**	0.107 U	**1.38 J**	**1.50**	0.105 U	**1.61 J**	6,300	Eco	140	HH
High Molecular Weight PAHs (HPAHs) (ng/L)													
Benzo(a)anthracene	0.0116 U	0.0519 U	0.0635 U	0.00830 EMPC	0.0288 U	0.0371 U	**0.0083**	0.0475 U	**0.0558 J**	3.80	HH	27.0	Eco
Benzo(a)pyrene	0.0246 U	0.0441 U	0.0687 U	0.0151 U	0.0467 U	0.0618 U	0.0269 U	0.0457 U	0.0726 U	3.80	HH	2.90	HH
Benzo(b)fluoranthene	0.0173 U	**0.0713**	**0.0886 J**	0.0107 U	0.0333 U	0.0440 U	0.0182 U	0.0774 EMPC	0.0956 U	3.80	HH	29.0	HH
Benzo(g,h,i)perylene	0.0118 U	0.0390 U	0.0508 U	0.0139 U	0.0241 U	0.0380 U	0.0098 U	0.0523 U	0.0621 U	380	HH	290	HH
Benzo(j,k)flouranthenes	0.0185 U	0.0430 U	0.0615 U	0.0115 U	0.0318 U	0.0433 U	0.0208 U	0.0497 U	0.0705 U	3.80	HH	14.0	Eco
Chrysene	**0.0512**	0.0844 U	**0.136 J**	**0.0385**	0.0626 U	**0.101 J**	**0.0494**	**0.113**	**0.162 J**	3.80	HH	2,040	Eco
Dibenz(a,h)anthracene	0.0211 U	0.0187 U	0.0398 U	0.0190 U	0.0250 U	0.0440 U	0.0142 U	0.0395 U	0.0537 U	18.0	HH	2.90	HH
Fluoranthene	0.516 U	**0.143**	**0.659 J**	0.538 U	**0.120**	**0.658 J**	0.561 U	**0.194**	**0.755 J**	6,160	Eco	6,160	Eco
Indeno(1,2,3-cd)pyrene	0.0127 U	0.0459 U	0.0586 U	0.0148 U	0.0308 U	0.0456 U	0.0101 U	0.0365 U	0.0466 U	3.80	HH	29.0	HH

Notes:
ng/L = Nanogram per liter
pg/L = Picogram per liter
Eco = Ecological
HH = Human Health
MDL = Method detection limit
ND = Non Detect
RDL = reported detection limit
SLV = Screening level value
- = Result not available or not calculated

-- = SLV for analyte not available
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-12a
Post-Removal Forebay Area Surface Water Analytical Results for High-Volume XAD Device Samples
PCB Aroclors, PCB Dioxin-Like Congeners, and Semivolatile Organic Compounds
(Page 2 of 2)

Area	Forebay			Forebay			**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Site ID	P55			P56						
Sample ID	08022555XAD			08022156XAD						
Sample Date	2/25/2008			2/21/2008						
Preparation Fraction	Column	Filter	Column+ Filter (ND=RDL/MDL)	Column	Filter	Column+ Filter (ND=RDL/MDL)				
PCB Dioxin-Like Congeners (pg/L)										
PCB 77	0.0480 EMPC	0.0390 U	0.0870 U	0.0290 U	**0.0510**	**0.0800 J**	--	--	5,200	HH
PCB 81	0.00600 U	0.00730 U	0.0133 U	0.00760 U	0.00840 U	0.0160 U	--	--	5,200	HH
PCB 105	**0.147**	**0.339**	**0.486**	**0.119**	**0.421**	**0.540**	--	--	5,200	HH
PCB 114	0.0150 U	0.0210 U	0.0360 U	0.0100 U	0.0200 U	0.0300 U	--	--	100	HH
PCB 118	**0.448**	**0.825**	**1.27**	**0.361**	**1.07**	**1.43**	--	--	5,200	HH
PCB 123	0.00600 U	0.0150 U	0.0210 U	0.0100 EMPC	0.0230 U	0.0330 U	--	--	5,200	HH
PCB 126	0.00600 U	0.00460 U	0.0106 U	0.00570 U	0.00590 U	0.0116 U	--	--	5.20	HH
PCB 156	0.0280 C U	**0.110 C**	**0.138 C J**	0.0230 C U	**0.101 C**	**0.124 C J**	--	--	1,000	HH
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**						--	--	1,000	HH
PCB 167	0.0140 U	**0.0490**	**0.0630 J**	0.0110 EMPC	**0.0440**	**0.0550 J**	--	--	52,000	HH
PCB 169	0.00230 U	0.00400 U	0.00630 U	0.00180 U	0.00240 U	0.00420 U	--	--	52.0	HH
PCB 189	0.00220 U	0.00600 U	0.00820 U	0.00180 U	0.00800 U	0.00980 U	--	--	5,200	HH
Total PCBs as Congeners (KM, capped)	**154 J**	**22.6 J**	**177 J**	**138 J**	**26.4 J**	**164 J**	64.0	HH	14,000	Eco
Semivolatile Organic Compounds (ng/L)										
Bis(2-ethylhexyl) Phthalate	7.92 U	3.47 U	11.4 U	6.52 U	3.41 U	9.93 U	1,200	HH	3,000	Eco
Butyl Benzyl Phthalate	0.273 U	0.150 U	0.423 U	0.260 U	0.181 U	0.441 U	19,000	Eco	19,000	Eco
Di-n-butyl Phthalate	0.574 U	0.200 U	0.774 U	0.562 U	0.303 U	0.865 U	35,000	Eco	35,000	Eco
Di-n-octyl Phthalate	0.126 U	0.208 U	0.334 U	0.110 U	0.139 U	0.249 U	1,200	HH	4,100	HH
Low Molecular Weight PAHs (LPAHs) (ng/L)										
Acenaphthene	**1.26**	0.0191 U	**1.28 J**	**1.03**	0.0275 U	**1.06 J**	520,000	Eco	520,000	Eco
Anthracene	0.103 U	**0.0181**	**0.121 J**	0.0797 U	**0.0316**	**0.111 J**	13,000	Eco	13,000	Eco
Phenanthrene	**1.28**	0.0660 U	**1.35 J**	**1.39**	**0.188**	**1.58**	6,300	Eco	140	HH
High Molecular Weight PAHs (HPAHs) (ng/L)										
Benzo(a)anthracene	**0.0152**	0.0299 U	**0.0451 J**	**0.0120**	0.0480 U	**0.0600 J**	3.80	HH	27.0	Eco
Benzo(a)pyrene	0.0164 U	0.0221 U	0.0385 U	0.0131 U	0.0582 U	0.0713 U	3.80	HH	2.90	HH
Benzo(b)fluoranthene	0.0110 U	0.0422 U	0.0532 U	0.00920 EMPC	**0.0825**	**0.0917 J**	3.80	HH	29.0	HH
Benzo(g,h,i)perylene	0.0194 U	0.0289 U	0.0483 U	0.0195 U	0.0410 U	0.0605 U	380	HH	290	HH
Benzo(j,k)flouranthenes	0.0122 U	0.0376 U	0.0498 U	0.0100 U	0.0443 U	0.0543 U	3.80	HH	14.0	Eco
Chrysene	**0.0514**	0.0728 U	**0.124 J**	**0.0464**	**0.125**	**0.171 J**	3.80	HH	2,040	Eco
Dibenz(a,h)anthracene	0.0212 U	0.0232 U	0.0444 U	0.0107 U	0.0240 U	0.0347 U	18.0	HH	2.90	HH
Fluoranthene	0.562 U	**0.112**	**0.674 J**	0.572 U	**0.212**	**0.784 J**	6,160	Eco	6,160	Eco
Indeno(1,2,3-cd)pyrene	0.0200 U	0.0293 U	0.0493 U	0.0202 U	0.0367 U	0.0569 U	3.80	HH	29.0	HH

Notes:
ng/L = Nanogram per liter
pg/L = Picogram per liter
Eco = Ecological
HH = Human Health
MDL = Method detection limit
ND = Non Detect
RDL = reported detection limit
SLV = Screening level value
- = Result not available or not calculated

-- = SLV for analyte not available
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-12b
Post-Removal Reference Area Surface Water Analytical Results for High-Volume XAD Device Samples
PCB Aroclors, PCB Dioxin-Like Congeners, and Semivolatile Organic Compounds
(Page 1 of 2)

Area	Reference			Reference			Reference		
Site ID	P57			P58			P59		
Sample ID	08022757XAD			08030758XAD			08022959XAD		
Sample Date	2/27/2008			3/7/2008			2/29/2008		
Preparation Fraction	Column	Filter	Column+ Filter (ND=RDL/MDL)	Column	Filter	Column+ Filter (ND=RDL/MDL)	Column	Filter	Column+ Filter (ND=RDL/MDL)
PCB Dioxin-Like Congeners (pg/L)									
PCB 77	**0.0470**	0.0320 U	**0.0790 J**	**0.0920**	**0.0470**	**0.139**	0.0430 U	0.0390 U	0.0820 U
PCB 81	0.00730 U	0.00550 U	0.0128 U	0.00700 U	0.00430 U	0.0113 U	0.00700 U	0.00470 U	0.0117 U
PCB 105	**0.125**	**0.262**	**0.387**	**0.178**	**0.282**	**0.460**	**0.149**	**0.297**	**0.446**
PCB 114	0.0110 U	0.0140 U	0.0250 U	0.0110 U	0.0200 U	0.0310 U	0.0170 U	0.0170 U	0.0340 U
PCB 118	**0.378**	**0.743**	**1.12**	**0.593**	**0.932**	**1.53**	**0.489**	**0.884**	**1.37**
PCB 123	0.00700 U	0.0170 U	0.0240 U	0.0140 U	0.0190 U	0.0330 U	0.00900 U	0.0200 U	0.0290 U
PCB 126	0.00680 U	0.00550 U	0.0123 U	0.00600 U	0.00700 U	0.0130 U	0.00390 U	0.00630 U	0.0102 U
PCB 156	0.0260 C U	**0.0850 C**	**0.111 C**	0.0360 C U	**0.0940 C**	**0.130 C**	0.0320 C U	**0.0990 C**	**0.131 C**
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**								
PCB 167	0.0130 U	**0.0410**	**0.0540**	0.0180 U	**0.0570**	**0.0750**	0.0150 U	**0.0560**	**0.0710**
PCB 169	0.00300 U	0.00170 U	0.00470 U	0.00240 U	0.00340 U	0.00580 U	0.00100 U	0.00200 U	0.00300 U
PCB 189	0.00360 U	0.00500 U	0.00860 U	0.00210 U	0.00400 U	0.00610 U	0.00200 U	0.00600 U	0.00800 U
Total PCBs as Congeners (KM, capped)	**154 J**	**24.3 J**	**178 J**	**109 J**	**21.2 J**	**130 J**	**149 J**	**22.8 J**	**172 J**
Semivolatile Organic Compounds (ng/L)									
Bis(2-ethylhexyl) Phthalate	17.0 U	2.76 U	19.8 U	15.5 U	6.76 U	22.3 U	9.13 U	2.75 U	11.9 U
Butyl Benzyl Phthalate	0.450 U	0.203 U	0.653 U	0.501 U	5.47 U	5.97 U	0.322 U	0.158 U	0.480 U
Di-n-butyl Phthalate	0.657 U	0.290 U	0.947 U	0.733 U	0.548 U	1.28 U	0.642 U	0.243 U	0.885 U
Di-n-octyl Phthalate	0.187 U	0.129 U	0.316 U	0.202 U	1.09 U	1.29 U	0.155 U	0.120 U	0.275 U
Low Molecular Weight PAHs (LPAHs) (ng/L)									
Acenaphthene	**1.28**	0.0161 U	**1.30 J**	**0.862**	0.0262 U	**0.888 J**	**2.41**	0.0213 U	**2.43 J**
Anthracene	0.0846 U	**0.0109**	**0.0955 J**	0.0687 U	**0.0194**	**0.0881 J**	0.133 U	**0.0172**	**0.150 J**
Phenanthrene	**1.26**	0.0571 U	**1.32 J**	**1.20**	0.0877 U	**1.29 J**	**1.52**	0.0722 U	**1.59 J**
High Molecular Weight PAHs (HPAHs) (ng/L)									
Benzo(a)anthracene	0.00930 EMPC	0.0205 U	0.0298 U	0.0177 U	0.0209 U	0.0386 U	**0.0162**	0.0276 U	**0.0438 J**
Benzo(a)pyrene	0.0171 U	0.0195 U	0.0366 U	0.0146 U	0.0226 U	0.0372 U	0.0204 U	0.0300 U	0.0504 U
Benzo(b)fluoranthene	0.0120 U	0.0235 U	0.0355 U	0.0100 U	0.0230 U	0.0330 U	0.0146 U	0.0327 U	0.0473 U
Benzo(g,h,i)perylene	0.0199 U	0.0254 U	0.0453 U	0.0121 U	0.0174 U	0.0295 U	0.0148 U	0.0224 U	0.0372 U
Benzo(j,k)flouranthenes	0.0136 U	0.0222 U	0.0358 U	0.0110 U	0.0209 U	0.0319 U	0.0159 U	0.0326 U	0.0485 U
Chrysene	**0.0393**	0.0450 U	**0.0843 J**	**0.0482**	0.0588 U	**0.107 J**	**0.0457**	0.0731 U	**0.119 J**
Dibenz(a,h)anthracene	0.0179 U	0.0224 U	0.0403 U	0.0215 U	0.0289 U	0.0504 U	0.0163 U	0.0182 U	0.0345 U
Fluoranthene	0.485 U	0.0793 U	0.564 U	0.591 U	**0.101**	**0.692 J**	**0.626**	**0.129**	**0.755 J**
Indeno(1,2,3-cd)pyrene	0.0222 U	0.0276 U	0.0498 U	0.0128 U	0.0187 U	0.0315 U	0.0164 U	0.0147 U	0.0311 U

Notes:
ng/L = Nanogram per liter
pg/L = Picogram per liter
MDL = Method detection limit
ND = Non Detect
RDL = reported detection limit
- = Result not available or not calculated
J = The reported value is an estimate.

KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.

Table 6-12b
Post-Removal Reference Area Surface Water Analytical Results for High-Volume XAD Device Samples
PCB Aroclors, PCB Dioxin-Like Congeners, and Semivolatile Organic Compounds
(Page 2 of 2)

Area	Reference			Reference		
Site ID	P60			P61		
Sample ID	08030460XAD			08030661XAD		
Sample Date	3/4/2008			3/6/2008		
Preparation Fraction	Column	Filter	Column+ Filter (ND=RDL/MDL)	Column	Filter	Column+ Filter (ND=RDL/MDL)
PCB Dioxin-Like Congeners (pg/L)						
PCB 77	0.0410 U	**0.0570**	**0.0980**	**0.0800**	**0.0710**	**0.151**
PCB 81	0.00620 U	0.00470 U	0.0109 U	0.00660 U	0.00570 U	0.0123 U
PCB 105	**0.144**	**0.3270**	**0.471**	**0.160**	**0.403**	**0.563**
PCB 114	0.0100 U	0.0200 U	0.0300 U	0.00900 U	0.0220 U	0.0310 U
PCB 118	**0.553**	**1.080**	**1.63**	**0.552**	**1.22**	**1.77**
PCB 123	0.0140 U	0.0260 U	0.0400 U	0.0110 U	0.0260 U	0.0370 U
PCB 126	0.00410 U	0.0080 U	0.0121 U	0.00700 U	0.00800 U	0.0150 U
PCB 156	C 0.0300 U	**0.115 C**	**0.145 C**	0.0340 C U	**0.104 C**	**0.138 C**
PCB 157						
PCB 167	0.0160 U	**0.0700**	**0.0860**	0.0180 U	**0.0600**	**0.0780**
PCB 169	0.00160 U	0.00320 U	0.00480 U	0.00140 U	0.00240 U	0.00380 U
PCB 189	0.00200 U	0.00400 U	0.00600 U	0.00140 U	0.00500 U	0.00640 U
Total PCBs as Congeners (KM, capped)	**146 J**	**26.7 J**	**172 J**	**123 J**	**25.6 J**	**148 J**
Semivolatile Organic Compounds (ng/L)						
Bis(2-ethylhexyl) Phthalate	5.77 U	13.0 U	18.8 U	8.37 U	5.01 U	13.4 U
Butyl Benzyl Phthalate	0.299 U	0.452 U	0.751 U	0.263 U	0.402 U	0.665 U
Di-n-butyl Phthalate	0.626 U	0.595 U	1.22 U	0.517 U	0.324 U	0.841 U
Di-n-octyl Phthalate	0.0990 U	0.285 U	0.384 U	0.0910 U	0.180 U	0.271 U
Low Molecular Weight PAHs (LPAHs) (ng/L)						
Acenaphthene	**1.57**	0.0328 U	**1.60 J**	**0.971**	0.0141 U	**0.985 J**
Anthracene	0.0804 U	**0.0218**	**0.102 J**	0.0594 U	**0.0238**	**0.0832 J**
Phenanthrene	**1.46**	0.108 U	**1.57 J**	**1.23**	0.114 U	**1.34 J**
High Molecular Weight PAHs (HPAHs) (ng/L)						
Benzo(a)anthracene	**0.0159**	0.0374 U	**0.0533 J**	**0.0115**	0.0376 U	**0.0491 J**
Benzo(a)pyrene	0.0172 U	0.0392 U	0.0564 U	0.0131 U	0.0405 U	0.0536 U
Benzo(b)fluoranthene	0.0114 U	**0.0555**	**0.0669 J**	0.00870 U	**0.0512**	**0.0599 J**
Benzo(g,h,i)perylene	0.0163 U	0.0344 U	0.0507 U	0.0203 U	0.0400 U	0.0603 U
Benzo(j,k)flouranthenes	0.0124 U	0.0344 U	0.0468 U	0.00930 U	0.0551 U	0.0644 U
Chrysene	**0.0661**	0.0832 U	**0.149 J**	**0.0562**	0.0930 U	**0.149 J**
Dibenz(a,h)anthracene	0.0147 U	0.0224 U	0.0371 U	0.0179 U	0.0221 U	0.0400 U
Fluoranthene	**0.630**	**0.139**	**0.769**	**0.620**	**0.163**	**0.783**
Indeno(1,2,3-cd)pyrene	0.0182 U	0.0328 U	0.0510 U	0.0222 U	0.0417 U	0.0639 U

Notes:
ng/L = Nanogram per liter
pg/L = Picogram per liter
MDL = Method detection limit
ND = Non Detect
RDL = reported detection limit
- = Result not available or not calculated
J = The reported value is an estimate.

KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.

Table 6-12c
Post-Removal Forebay Surface Water Analytical Results for Grab Samples
Metals, Petroleum Hydrocarbons, and General Chemistry Parameters

Area	Forebay	Forebay	Forebay	Forebay	Forebay	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Site ID	P52	P53	P54	P55	P56				
Sample ID	08021252SW	08022453SW	08021354SW	08022555SW	08022156SW				
Sample Date	2/12/2008	2/24/2008	2/13/2008	2/25/2008	2/21/2008				
Total Metals (µg/L)									
Aluminum	145 U	**91.0**	152 U	**99.0**	**141**	--	--	37000	HH
Antimony	7.00 U	7.00 U	7.00 U	50.0 U	7.00 U	5.6	HH	15	HH
Arsenic	**0.810**	**0.930**	**0.880**	**0.920**	**1.01**	0.018	HH	0.038	HH
Barium	**22.0**	**25.0**	**23.0**	**24.0**	**27.0**	1000	HH	7300	HH
Beryllium	**0.00900**	0.0200 U	**0.00300**	0.0200 U	0.0200 U	--	--	73	HH
Cadmium	**0.0130**	**0.0170 J**	**0.00900**	**0.0190 J**	**0.0130 J**	--	--	18	HH
Chromium	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	--	--	55000	HH
Cobalt	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	--	--	11	HH
Copper	**0.670**	**0.670**	**0.670**	**0.790**	**0.720**	1300	HH	1500	HH
Lead	**0.0790**	**0.175**	**0.0870**	**0.108**	**0.140**	--	--	15	HH
Mercury	0.0300 U	0.0300 U	0.0300 U	0.0300 U	0.0300 U	--	--	11	HH
Nickel	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	610	HH	730	HH
Thallium	**0.0330**	**0.0260**	**0.0310**	**0.0280**	**0.0280**	0.24	HH	2	HH
Vanadium	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	--	--	2.6	HH
Zinc	7.00 U	7.00 U	7.00 U	7.00 U	7.00 U	7400	HH	11000	HH
Dissolved Metals (µg/L)									
Aluminum	50 U	20.0 U	50.0 U	20.0 U	20.0 U	87	Eco	87	Eco
Antimony	7.00 U	7.00 U	7.00 U	50.0 U	7.00 U	5.6	HH	15	HH
Arsenic	**0.720**	**0.890**	**0.820**	**0.940**	**0.890**	0.018	HH	0.038	HH
Barium	**21.0**	**24.0**	**22.0**	**23.0**	**24.0**	4	Eco	4	Eco
Beryllium	**0.00300**	0.0200 U	**0.00400**	0.0200 U	0.0200 U	5.3	Eco	5.3	Eco
Cadmium	**0.00800**	0.00700 U	0.00800 U	0.00700 U	**0.0100 J**	0.25	Eco	0.25	Eco
Chromium	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	74	Eco	74	Eco
Cobalt	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	23	Eco	11	HH
Copper	**0.520**	**0.450**	**0.440**	**0.480**	**0.460**	9	Eco	9	Eco
Lead	**0.0360**	**0.0220**	0.00300 U	**0.0140 J**	0.00900 U	2.5	Eco	2.5	Eco
Mercury	0.0300 U	0.0300 U	0.0300 U	0.0300 U	0.0300 U	0.77	Eco	0.77	Eco
Nickel	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	52	Eco	52	Eco
Thallium	**0.0300**	**0.0240**	**0.0310**	**0.0230**	**0.0240**	0.24	HH	2	HH
Vanadium	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	20	Eco	2.6	HH
Zinc	**7.50**	7.00 U	7.00 U	7.00 U	7.00 U	120	Eco	120	Eco
Total Petroleum Hydrocarbons (µg/L)									
Diesel Range Organics	**15.0 J**	11.0 U	**15.0 J**	11.0 U	11.0 U	--	--	90	HH
Residual Range Organics	110 U	100 U	120 U	100 U	19.0 U	--	--	290	HH
Dissolved Petroleum Hydrocarbons (µg/L)									
Diesel Range Organics	**15.0 J**	**14.0 J**	**28.0 J**	**46.0 J**	**18.0 J**	--	--	90	HH
Residual Range Organics	110 U	19.0 U	120 U	100 U	100 U	--	--	290	HH
General Chemistry Parameters (mg/L)									
Total Chloride	**3.20**	**4.20**	**2.90**	**3.30**	**3.30**	230	Eco	230	Eco
Total Sulfate	**13.3**	**14.7**	**13.8**	**14.7**	**14.9**	--	--	--	--
Total Nitrate+Nitrite Nitrogen	**0.200**	**0.300**	**0.200**	**0.200**	**0.200**	--	--	10	HH
Total Organic Carbon	**1.90**	**1.80**	**1.80**	**1.90**	**1.70**	--	--	--	--
Dissolved Organic Carbon	**2.10**	**1.80**	**1.80**	**1.70**	**1.80**	--	--	--	--

Notes:

µg/L = Microgram per liter
mg/L = Milligram per liter
Eco = Ecological
HH = Human Health
MDL = Method detection limit
SLV = Screening level value
- = Result not available

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV

Table 6-12d
Reference Area Surface Water Analytical Results for Grab Samples
Metals, Petroleum Hydrocarbons, and General Chemistry Parameters

Area	Reference	Reference	Reference	Reference	Reference
Site ID	P57*	P58	P59	P60	P61
Sample ID	08022757SW	08030758SW	08022959SW	08030460SW	08030661SW
Sample Date	2/27/2008	3/7/2008	2/29/2008	3/4/2008	3/6/2008
Total Metals (µg/L)					
Aluminum	**91.0**	**118**	**123**	**100**	**115**
Antimony	7.00 U	7.00 U	7.00 U	**9.30 J**	7.00 U
Arsenic	**0.910**	1.05 U	**1.22**	**1.25**	**1.22**
Barium	**21.0**	**22.1**	**25.0**	**25.3**	**25.6**
Beryllium	0.0200 U	0.00800 U	**0.0210**	**0.00900 J**	**0.0110 J**
Cadmium	**0.0100 J**	0.0200 U	**0.0210**	0.0200 U	0.0200 U
Chromium	2.00 U	2.00 U	2.00 U	2.00 U	**2.00 J**
Cobalt	**2.00 J**	2.00 U	2.00 U	2.00 U	2.00 U
Copper	**0.605**	**0.770**	**0.710**	**0.760**	**0.830**
Lead	**0.0580**	**0.203**	**0.0910**	**0.0770**	**0.0920**
Mercury	0.0300 U	0.0300 U	0.0300 U	0.0300 U	0.0300 U
Nickel	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U
Thallium	**0.0205**	0.0200 U	0.0370 U	0.0240 U	0.0270 U
Vanadium	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Zinc	7.00 U	7.00 U	7.00 U	7.00 U	7.00 U
Dissolved Metals (µg/L)					
Aluminum	**27.0 J**	20.0 U	20.0 U	20.0 U	20.0 U
Antimony	7.00 U	7.00 U	7.00 U	7.00 U	7.00 U
Arsenic	**0.935**	1.15 U	**1.26**	1.10 U	1.14 U
Barium	**21.5**	**22.2**	**23.5**	**23.3**	**23.5**
Beryllium	0.0200 U	0.00800 U	0.00800 U	0.00800 U	0.00800 U
Cadmium	0.00700 U	0.00500 U	0.00500 U	0.00500 U	0.00500 U
Chromium	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U
Cobalt	**2.20 J**	2.00 U	2.00 U	2.00 U	2.00 U
Copper	**0.450**	**0.550**	**0.550**	**0.600**	**0.610**
Lead	**0.0140 J**	**0.0150**	0.0090 U	0.00900 U	**0.0240**
Mercury	0.0300 U	0.0300 U	0.0300 U	0.0300 U	0.0300 U
Nickel	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U
Thallium	**0.0185 J**	**0.0200**	0.0240 U	0.0200 U	0.0200 U
Vanadium	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Zinc	7.00 U	7.00 U	7.00 U	7.00 U	7.00 U
Total Petroleum Hydrocarbons (µg/L)					
Diesel Range Organics	11.0 U	12.0 U	**13.0 J**	**14.0 J**	**19.0 J**
Residual Range Organics	100 U	20 U	**24 J**	**22 J**	**71 J**
Dissolved Petroleum Hydrocarbons (µg/L)					
Diesel Range Organics	11.0 U	12.0 U	11.0 U	**13.0 J**	12.0 U
Residual Range Organics	100 U	21 U	**24 J**	**20 J**	**21 J**
General Chemistry Parameters (mg/L)					
Total Chloride	**3.30**	**3.20**	**3.50**	**3.50**	**3.30**
Total Sulfate	**14.0**	**13.9**	**14.5**	**14.3**	**14.5**
Total Nitrate+Nitrite Nitrogen	**0.200**	**0.250**	**0.290**	**0.300**	**0.310**
Total Organic Carbon	**1.70**	**1.90**	**1.80**	**2.00**	**2.10**
Dissolved Organic Carbon	**1.70**	**1.80**	**1.80**	**1.80**	**2.30**

Notes:

µg/L = Microgram per liter
mg/L Milligram per liter
MDL = Method detection limit
- = Result not available
J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-13a
Goose Island Area Crayfish, Sculpin, and Clam Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds

Area	Forebay - Goose Island	Forebay - Goose Island	Forebay - Goose Island	**Selected SLV (Crayfish)**	**SLV Source (Crayfish)**	**Selected SLV (Sculpin and Clam)**	**SLV Source (Sculpin and Clam)**
Site ID	P110	P110	P110				
Sample ID	090429110CF	090429110SC	090429110TC				
Sample Date	4/29/2009	4/29/2009	4/29/2009				
Percent Lipds	0.62	4.2	3.0				
Medium	Crayfish Tissue	Sculpin Tissue	Clam Tissue				
PCB Aroclors (µg/kg wet)							
Aroclor 1016	2.40 U	-	6.10 UJ	0.570	HH	35.0	Eco
Aroclor 1221	2.60 U	-	5.90 UJ	0.570	HH	35.0	Eco
Aroclor 1232	2.30 U	-	9.70 UJ	0.570	HH	35.0	Eco
Aroclor 1242	2.20 U	-	6.60 UJ	0.570	HH	35.0	Eco
Aroclor 1248	0.510 U	-	5.20 UJ	0.570	HH	35.0	Eco
Aroclor 1254	1.80 U	-	14.0 UJ	0.570	HH	35.0	Eco
Aroclor 1260	1.90 U	-	6.30 UJ	0.570	HH	35.0	Eco
Aroclor 1262	2.50 U	-	3.20 UJ	0.570	HH	35.0	Eco
Aroclor 1268	2.00 U	-	2.00 UJ	0.570	HH	35.0	Eco
Total PCBs as Aroclors (NDs at MDL) [1]	2.60 U	-	14.0 UJ	0.570	HH	35.0	Eco
PCB Dioxin-Like Congeners (µg/kg wet)							
PCB 77	**0.00226**	**0.00799**	**0.0337**	0.0760	HH	0.160	Eco
PCB 81	0.000145 U	0.000882 EMPC	0.00217 EMPC	0.0250	HH	0.0800	Eco
PCB 105	**0.00624**	**0.362**	**0.352**	0.250	HH	20.0	Eco
PCB 114	**0.00235**	**0.0220**	**0.0228**	0.250	HH	20.0	Eco
PCB 118	**0.0870**	**0.872**	**1.59**	0.250	HH	20.0	Eco
PCB 123	**0.00256**	**0.0163**	**0.0280**	0.250	HH	20.0	Eco
PCB 126	0.000261 EMPC	**0.00315**	**0.00307**	0.0000760	HH	0.00580	Eco
PCB 156	**0.0133 C**	**0.106 C**	**0.0969 C**	0.250	HH	20.0	Eco
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**			0.250	HH	20.0	Eco
PCB 167	**0.0112**	**0.0348**	**0.0925**	0.250	HH	20.0	Eco
PCB 169	0.000164 U	0.00131 U	0.00108 U	0.000250	HH	0.0200	Eco
PCB 189	**0.000662**	**0.00383**	**0.00157**	0.250	HH	20.0	Eco
Total PCBs as Congeners (KM, capped)	**0.587 J**	**8.14 J**	**21.4 J**	0.570	HH	35.0	Eco
Metals (mg/kg wet)							
Aluminum	**147**	-	**75.5**	--	--	--	--
Antimony	**0.00800 J**	-	0.00100 U	--	--	--	--
Arsenic	**0.303**	-	**1.59**	0.000760	HH	6.60	Eco
Barium	**57.0**	-	**1.66**	--	--	--	--
Beryllium	**0.00400 J**	-	**0.00200 J**	--	--	--	--
Cadmium	**0.0769**	-	**0.243**	0.150	Eco	0.150	Eco
Chromium	**0.190**	-	**0.492**	--	--	--	--
Cobalt	**0.391**	-	**0.0996**	--	--	--	--
Copper	**15.5**	-	**6.75**	--	--	--	--
Lead	**0.471**	-	**0.0615**	0.120	Eco	0.120	Eco
Mercury	**0.0359 J**	-	**0.0163 J**	0.0490	HH	0.0740	Eco
Methyl Mercury	-	-	-	--	--	--	--
Nickel	**1.21**	-	**0.221**	--	--	--	--
Thallium	**0.0128**	-	**0.00650**	--	--	--	--
Vanadium	**0.729**	-	**0.253**	--	--	--	--
Zinc	**20.3**	-	**20.5**	--	--	--	--
Semivolatile Organic Compounds (µg/kg wet)							
Bis(2-ethylhexyl) Phthalate	66.0 U	-	66.0 U	81.9	HH	1,760	Eco
Butyl Benzyl Phthalate	7.30 U	-	7.30 U	310	Eco	310	Eco
Carbazole	7.70 U	-	7.70 U	-	-	--	--
Di-n-butyl Phthalate	140 U	-	170 U	626	Eco	626	Eco
Di-n-octyl Phthalate	11.0 U	-	11.0 U	626	Eco	626	Eco
p-cresol (4-Methylphenol)	11.0 U	-	**29.0 J**	-	-	--	--
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)							
Acenaphthene	0.500 U	-	**0.680**	15,000	HH	19,000	Eco
Anthracene	**0.430 J**	-	**1.20**	15,000	HH	19,000	Eco
Fluorene	**0.510**	-	**1.80**	15,000	HH	19,000	Eco
Phenanthrene	**0.820**	-	**10.0**	15,000	HH	19,000	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)							
Benzo(a)anthracene	0.500 U	-	**3.40**	1.57	HH	1,000	Eco
Benzo(a)pyrene	0.0610 U	-	**0.750**	0.157	HH	1,000	Eco
Benzo(b)fluoranthene	**0.150 J**	-	**2.20**	1.57	HH	1,000	Eco
Benzo(g,h,i)perylene	**0.110 J**	-	**0.740**	15.7	HH	1,000	Eco
Benzo(k)fluoranthene	**0.110 J**	-	**1.30**	15.7	HH	1,000	Eco
Chrysene	0.200 U	-	**2.50**	157	HH	1,000	Eco
Dibenz(a,h)anthracene	0.0450 U	-	**0.480 J**	0.157	HH	1,000	Eco
Fluoranthene	0.500 U	-	**18.0**	19,000	Eco	19,000	Eco
Indeno(1,2,3-cd)pyrene	**0.150 J**	-	**0.890**	1.57	HH	1,000	Eco
Pyrene	0.500 U	-	**5.40**	1,000	Eco	1,000	Eco

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
RDL = reported detection limit
- = Not Analyzed
-- = SLV for analyte not available
ND = Non Detect
J = The reported value is an estimate.

[1] Only Aroclor 1254 was included in summing clam Total PCBs as Aroclors because all other aroclors were undected in Forebay clam samples.
The crayfish Total PCBs as Aroclors is shown as the maximum MDL because all aroclors were undected in Forebay crayfish samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-13b
Mouth of Eagle Creek and Goose Island Area Sediment Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, Petroleum Hydrocarbons, Semivolatile Organic Compounds, General Chemistry Parameters, and Grain Size

Area	Forebay - Eagle Creek	Forebay - Eagle Creek	Forebay - Goose Island	Forebay - Goose Island	**Selected SLV**	**SLV Source**
Site ID	P43	P44	P110	P111		
Sample ID	08032043SD	08032044SD	090427110SD	090429111SD		
Sample Date	3/20/2008	3/20/2008	4/27/2009	4/29/2009		
PCB Aroclors (µg/kg dry)						
Aroclor 1016	1.70 U	1.70 U	2.50 U	2.70 U	0.0480	HH
Aroclor 1221	1.70 U	1.70 U	2.50 U	2.70 U	0.0480	HH
Aroclor 1232	1.70 U	1.70 U	2.50 U	2.70 U	0.0480	HH
Aroclor 1242	1.70 U	1.70 U	2.50 U	2.70 U	0.0480	HH
Aroclor 1248	**76.0**	1.70 U	2.50 U	2.70 U	0.0480	HH
Aroclor 1254	1.70 U	1.70 U	2.50 U	**9.90 J**	0.0480	HH
Aroclor 1260	1.70 U	1.70 U	2.50 UJ	2.70 UJ	0.0480	HH
Aroclor 1262	1.70 U	1.70 U	-	-	0.0480	HH
Aroclor 1268	1.70 U	1.70 U	-	-	0.0480	HH
Total PCBs as Aroclors (NDs at MDL) [1]	**77.7 J**	3.40 U	5.00 U	**12.6 J**	0.0480	HH
PCB Dioxin-Like Congeners (µg/kg dry)						
PCB 77	-	-	**0.00285**	**0.00353**	0.00640	HH
PCB 81	-	-	**0.000135**	0.000150 EMPC	0.00210	HH
PCB 105	-	-	**0.0249**	**0.0277**	0.0210	HH
PCB 114	-	-	**0.00129**	**0.00137**	0.0210	HH
PCB 118	-	-	**0.0657**	**0.0695**	0.0260	HH
PCB 123	-	-	**0.000963**	0.000970 EMPC	0.0260	HH
PCB 126	-	-	0.000255 EMPC	0.000419 EMPC	0.00000620	HH
PCB 156	-	-	**0.00850 C**	**0.0104 C**	0.0260	HH
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**				0.0260	HH
PCB 167	-	-	**0.00402**	**0.00381**	0.0260	HH
PCB 169	-	-	0.000241 U	0.000250 U	0.0000210	HH
PCB 189	-	-	**0.000615**	**0.000869**	0.140	HH
Total PCBs as Congeners (KM, capped)	-	-	**1.20 J**	**1.34 J**	0.0480	HH
Metals (mg/kg dry)						
Aluminum	**16,300**	**18,000**	**17,100**	**18,800**	38,000	UPL
Antimony	**0.0400 J**	**0.0800 J**	**0.440**	**0.580**	3.00	Eco
Arsenic	**0.680**	**3.23**	**4.00**	**4.25**	6.00	Eco
Barium	**74.4**	**110**	**112**	**131**	315	UPL
Beryllium	**0.353**	**0.371**	**0.561**	**0.505**	0.847	UPL
Cadmium	0.0750 U	0.131 U	**0.887**	**1.17**	0.674	UPL
Chromium	**20.2**	**23.5**	**20.6**	**21.6**	37.0	Eco
Cobalt	**11.0**	**9.93**	**11.6**	**11.2**	15.2	UPL
Copper	**16.6**	**24.8**	**32.6**	**34.2**	55.6	UPL
Lead	**4.19**	**10.9**	**13.1**	**13.6**	35.0	Eco
Mercury	**0.00700**	**0.0290**	**0.181**	**0.179**	0.214	UPL
Nickel	**19.9**	**15.6**	**19.4**	**18.1**	21.2	UPL
Thallium	0.0560 U	0.156 U	**0.272**	**0.435**	0.354	UPL
Vanadium	**70.3**	**62.5**	**61.5**	**59.3**	70.6	UPL
Zinc	**52.7**	**65.1**	**115**	**148**	123	Eco
Petroleum Hydrocarbons (mg/kg dry)						
Diesel Range Organics	**2.90 J**	**13.0 J**	**53.0 J**	**49.0 J**	--	--
Residual Range Organics	150 U	150 U	**480**	**410**	--	--
Semivolatile Organic Compounds (µg/kg dry)						
Bis(2-ethylhexyl) Phthalate	200 U	200 U	**13.0 J**	**9.90 J**	750	Eco
Butyl Benzyl Phthalate	9.90 U	9.90 U	1.80 U	1.90 U	110	Eco
Carbazole	1.30 U	**2.20 J**	1.60 U	1.70 U	140	Eco
Di-n-butyl Phthalate	9.90 U	11.0 U	**10.0 J**	**5.60 J**	110	Eco
Di-n-octyl Phthalate	1.20 U	1.20 U	1.50 U	1.60 U	110	Eco
p-cresol (4-Methylphenol)	2.90 U	2.90 U	**8.50 J**	3.70 U	--	--
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)						
Acenaphthene	1.00 U	1.00 U	1.20 U	1.30 U	*290*	*Eco*
Anthracene	1.40 U	**2.60 J**	1.70 U	1.80 U	57.0	Eco
Fluorene	1.70 U	1.70 U	2.10 U	2.20 U	*77.0*	*Eco*
Phenanthrene	**2.30 J**	**6.50 J**	**3.80 J**	**4.60 J**	42.0	Eco
Total LPAHs (KM, capped; NDs at MDL)	**6.40 J**	**11.8 J**	**8.80 J**	**9.90 J**	76.0	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)						
Benzo(a)anthracene	1.40 U	**6.60 J**	**4.20 J**	**7.80 J**	32.0	Eco
Benzo(a)pyrene	1.60 U	**7.10 J**	**8.70 J**	**13.0 J**	32.0	Eco
Benzo(b)fluoranthene	2.50 U	**11.0**	**6.50 J**	**15.0**	27.0	Eco
Benzo(g,h,i)perylene	2.30 U	**5.00 J**	**5.60 J**	**9.90 J**	300	Eco
Benzo(k)fluoranthene	2.50 U	**3.40 J**	3.00 U	**4.10 J**	27.0	Eco
Chrysene	**1.80 J**	**13.0**	**5.80 J**	**11.0 J**	57.0	Eco
Dibenz(a,h)anthracene	2.20 U	2.20 U	2.70 U	2.80 U	33.0	Eco
Fluoranthene	2.20 U	**11.0**	**7.30 J**	**9.60 J**	111	Eco
Indeno(1,2,3-cd)pyrene	1.90 U	**4.60 J**	**5.00 J**	**7.10 J**	17.0	Eco
Pyrene	**3.40 J**	**17.0**	**7.20 J**	**8.80 J**	53.0	Eco
Total HPAHs (KM, capped; NDs at MDL)	**17.2 J**	**80.9 J**	**55.7 J**	**89.1 J**	193	Eco
Total Polycyclic Aromatic Hydrodarbons (PAHs) (µg/kg dry)						
Total PAHs (KM, capped; NDs at MDL)	**19.5 J**	**90.8 J**	**60.1 J**	**96.1 J**	1600	Eco
General Chemistry Parameters (mg/kg dry) and Grain Size (%)						
Carbon, Total Organic	**2,300**	**5,700**	**25,600**	**11,000**	--	--
Gravel (>2.00 mm)	**15.2**	**37.4**	**5.84**	**1.94**	--	--
Sand, Very Coarse (1.00 - 2.00 mm)	**10.9**	**9.70**	**7.41**	**1.77**	--	--
Sand, Coarse (0.50 - 1.00 mm)	**27.7**	**13.3**	**5.99**	**1.31**	--	--
Sand, Medium (0.25 - 0.50 mm)	**27.5**	**13.9**	**5.74**	**2.04**	--	--
Sand, Fine (0.125 - 0.25 mm)	**14.5**	**14.6**	**7.56**	**5.34**	--	--
Sand, Very Fine (0.0625 - 0.125 mm)	**2.23**	**5.84**	**8.44**	**14.3**	--	--
Silt (0.039 - 0.0625 mm)	**2.00**	**6.09**	**42.9**	**59.6**	--	--
Clay (<0.039 mm)	**0.470**	**0.920**	**11.8**	**10.3**	--	--

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
ND = Non Detect
SLV = screening level value
RDL = reported detection limit
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed
-- = SLV for analyte not available

[1] Only Aroclors 1248 and 1254 were included in summing sediment Total PCBs as Aroclors because all other aroclors were undected in Forebay sediment
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-14
Post-Removal Downstream Area Sediment Analytical Results
PCB Aroclors, PCB Congeners, Metals, Petroleum Hydrocarbons, Semivolatile Organic Compounds, General Chemistry Parameters, and Grain Size

Area	Downstream	Downstream	Downstream	Downstream	Downstream	Downstream	**Selected SLV**	**SLV Source**
Site ID	P46	P47	P48	P49	P50	P51		
Sample ID	08031046SD	08031047SD	08031048SD	08031049SD	08031150SD	08031151SD		
Sample Date	3/10/2008	3/10/2008	3/10/2008	3/10/2008	3/11/2008	3/11/2008		
PCB Aroclors (µg/kg dry)								
Aroclor 1016	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1221	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1232	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1242	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1248	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1254	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1260	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1262	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1268	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Total PCBs as Aroclors (NDs at MDL) [1]	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
PCB Dioxin-Like Congeners (µg/kg dry)								
PCB 77	0.000259 EMPC	0.000531 EMPC	**0.000478**	**0.00160**	**0.00201**	**0.000573**	0.00640	HH
PCB 81	0.0000831 U	0.0000707 U	0.0000492 U	**0.000260**	0.000100 U	0.0000981 U	0.00210	HH
PCB 105	**0.00179**	**0.00626**	**0.00426**	**0.00943**	**0.0197**	**0.00398**	0.0210	HH
PCB 114	0.0000976 U	**0.000383**	**0.000239**	**0.000650**	**0.000957**	**0.000315**	0.0210	HH
PCB 118	**0.00409**	**0.0132**	**0.00918**	**0.0167**	**0.0456**	**0.0109**	0.0260	HH
PCB 123	0.000168 EMPC	**0.000271**	**0.000130**	**0.000497**	**0.000874**	**0.000226**	0.0260	HH
PCB 126	0.000113 U	0.0000805 U	0.0000787 U	0.000171 U	**0.000211**	0.0000962 U	0.00000620	HH
PCB 156	0.000604 EMPC	**0.00182 C**	0.00139 C EMPC	**0.00289 C**	**0.00625 C**	**0.00174 C**	0.0260	HH
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**						0.0260	HH
PCB 167	**0.000320**	**0.000697**	**0.000554**	**0.00103**	**0.00261**	**0.000765**	0.0260	HH
PCB 169	0.0000697 U	0.0000894 U	0.0000630 U	0.0000900 U	0.000154 U	0.0000837 U	0.0000210	HH
PCB 189	0.0000733 U	0.000115 EMPC	**0.0000970**	**0.000254**	**0.000596**	**0.000140**	0.140	HH
Total PCBs as Congeners (KM, capped)	**0.0880 J**	**0.215 J**	**0.173 J**	**0.418 J**	**0.917 J**	**0.213 J**	0.0480	HH
Metals (mg/kg dry)								
Aluminum	**20,700**	**10,600**	**11,100**	**10,600**	**18,800**	**21,600**	38,000	UPL
Antimony	**0.240 J**	**0.0600 J**	**0.0800 J**	**0.120 J**	**0.230 J**	**0.400 J**	3.00	Eco
Arsenic	**5.84**	**3.72**	**2.48**	**2.80**	**3.25**	**5.71**	6.00	Eco
Barium	**161**	**96.5**	**99.0**	**124**	**172**	**140**	315	UPL
Beryllium	**0.444**	**0.288**	**0.286**	**0.300**	**0.472**	**0.513**	0.847	UPL
Cadmium	**0.209**	**0.290**	**0.229**	**0.345**	**0.791**	**0.308**	0.674	UPL
Chromium	**25.0**	**16.1**	**20.1**	**19.7**	**22.8**	**29.9**	37.0	Eco
Cobalt	**10.1**	**7.05**	**6.93**	**8.06**	**8.53**	**11.5**	15.2	UPL
Copper	**20.0**	**12.5**	**13.3**	**14.5**	**20.9**	**24.1**	55.6	UPL
Lead	**8.18**	**8.50**	**6.67**	**11.6**	**12.7**	**9.00**	35.0	Eco
Mercury	**0.0340**	**0.0330**	**0.0690**	**0.0480**	**0.136**	**0.0580**	0.214	UPL
Nickel	**12.5**	**13.2**	**13.0**	**13.6**	**14.1**	**15.2**	21.2	UPL
Thallium	**0.163**	**0.165**	0.130 U	**0.205**	**0.234**	**0.178**	0.354	UPL
Vanadium	**65.0**	**43.8**	**44.6**	**47.4**	**49.8**	**73.5**	70.6	UPL
Zinc	**67.7**	**79.6**	**56.7**	**105**	**117**	**70.5**	123	Eco
Petroleum Hydrocarbons (mg/kg dry)								
Diesel Range Organics	**8.20 J**	**8.10 J**	**8.70 J**	**5.90 J**	**21.0**	**25.0**	--	--
Residual Range Organics	140 U	140 U	150 U	**41.0 J**	180 U	150 U	--	--
Semivolatile Organic Compounds (µg/kg dry)								
Bis(2-ethylhexyl) Phthalate	200 U	200 U	200 U	200 U	200 U	200 U	750	Eco
Butyl Benzyl Phthalate	1.50 U	1.50 U	1.50 U	9.90 U	1.50 U	1.50 U	110	Eco
Carbazole	1.30 U	1.30 U	1.30 U	1.30 U	**1.60 J**	1.30 U	140	Eco
Di-n-butyl Phthalate	11.0 U	11.0 U	14.0 U	10.0 U	9.90 U	9.80 U	110	Eco
Di-n-octyl Phthalate	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U	110	Eco
p-cresol (4-Methylphenol)	2.90 U	2.90 U	2.90 U	2.90 U	**130**	**3.40 J**	--	--
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)								
Acenaphthene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	290	Eco
Anthracene	**2.70 J**	1.40 U	1.40 U	1.40 U	**3.10 J**	**1.60 J**	57.0	Eco
Fluorene	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	77.0	Eco
Phenanthrene	**4.80 J**	1.30 U	1.30 U	**2.20 J**	**4.90 J**	**4.00 J**	42.0	Eco
Total LPAHs (KM, capped; NDs at MDL)	**10.2 J**	5.40 U	5.40 U	**6.30 J**	**10.7 J**	**8.30 J**	76.0	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)								
Benzo(a)anthracene	**9.60 J**	**1.70 J**	**1.80 J**	**3.30 J**	**12.0**	**3.70 J**	32.0	Eco
Benzo(a)pyrene	**11.0**	**1.90 J**	1.60 U	**4.30 J**	**14.0**	**4.50 J**	32.0	Eco
Benzo(b)fluoranthene	**9.70 J**	2.50 U	2.50 U	**4.50 J**	**16.0**	**3.30 J**	27.0	Eco
Benzo(g,h,i)perylene	**5.80 J**	2.30 U	2.30 U	**2.80 J**	**6.80 J**	2.30 U	300	Eco
Benzo(k)fluoranthene	**4.20 J**	2.50 U	2.50 U	2.50 U	**6.50 J**	2.50 U	27.0	Eco
Chrysene	**9.60 J**	**1.60 J**	1.40 U	**3.50 J**	**18.0**	**3.40 J**	57.0	Eco
Dibenz(a,h)anthracene	2.20 U	2.20 U	2.20 U	2.20 U	**2.30 J**	2.20 U	33.0	Eco
Fluoranthene	**20.0**	**2.90 J**	2.20 U	**4.30 J**	**22.0**	**6.20 J**	111	Eco
Indeno(1,2,3-cd)pyrene	**6.30 J**	1.90 U	1.90 U	**2.80 J**	**8.20 J**	1.90 U	17.0	Eco
Pyrene	**20.0**	**2.60 J**	**1.80 J**	**4.60 J**	**21.0**	**6.40 J**	53.0	Eco
Total HPAHs (KM, capped; NDs at MDL)	**98.4 J**	**19.2 J**	**16.0 J**	**34.5 J**	**127 J**	**35.1 J**	193	Eco
Total Polycyclic Aromatic Hydrodarbons (PAHs) (µg/kg dry)								
Total PAHs (KM, capped; NDs at MDL)	**107 J**	**21.4 J**	**16.8 J**	**37.5 J**	**137 J**	**40.6 J**	1600	Eco
General Chemistry Parameters (mg/kg dry) and Grain Size (%)								
Carbon, Total Organic	**3,600**	**3,400**	**3,600**	**7,500**	**11,500**	**5,200**	--	--
Gravel (>2.00 mm)	**0.0600**	**0.640**	**1.66**	**0.530**	**1.53**	**4.58**	--	--
Sand, Very Coarse (1.00 - 2.00 mm)	**0.160**	**2.42**	**1.03**	**0.380**	**2.02**	**6.61**	--	--
Sand, Coarse (0.50 - 1.00 mm)	**0.330**	**15.6**	**1.57**	**0.630**	**2.86**	**10.3**	--	--
Sand, Medium (0.25 - 0.50 mm)	**11.6**	**43.8**	**31.1**	**6.31**	**2.92**	**24.4**	--	--
Sand, Fine (0.125 - 0.25 mm)	**65.3**	**26.7**	**35.6**	**66.4**	**10.2**	**30.1**	--	--
Sand, Very Fine (0.0625 - 0.125 mm)	**20.6**	**3.89**	**9.19**	**16.2**	**35.7**	**9.35**	--	--
Silt (0.039 - 0.0625 mm)	**0.0200**	**8.13**	**15.1**	**5.33**	**39.1**	**9.71**	--	--
Clay (<0.039 mm)	**8.74**	**0.440**	**1.97**	**1.31**	**5.76**	**1.22**	--	--

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
ND = Non Detect
RDL = reported detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed
-- = SLV for analyte not available

[1] Total PCBs as Aroclors is shown as the maximum MDL because all aroclors were undected in Downstream sediment samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-2a
2009 Landfill Soil Analytical Results
Volatile and Semivolatile Organic Compounds, Total Solids, and Grain Size

Site ID	L-01	L-01	L-02	L-02	L-03	L-03	L-04*	L-04	LF-EUA	Selected SLV (0-3 ft bgs)	SLV Source (0-3 ft bgs)
Sample ID	090129-L-L1-0-1So	090129-L-L1-1-3So	090129-L-L2-0-1So	090129-L-L2-1-3So	090129-L-L3-0-1So	090129-L-L3-1-3So	090129-L-L4-0-1So	090129-L-L4-1-3So	090319-LF-EUA-So		
Sample Date	1/29/2009	1/29/2009	1/29/2009	1/29/2009	1/29/2009	1/29/2009	1/29/2009	1/29/2009	3/19/2009		
Sample Depth (Feet bgs)	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0	0.0-0.17		
Volatile Organic Compounds (µg/kg dry)											
o-Xylene	0.0950 U	0.0590 U	0.0590 U	0.0590 U	0.0590 U	0.0590 U	0.0620 U	0.0590 U	-	1,000	Eco
Tetrachloroethene (PCE)	**2.90 J**	**25.0 J**	**1.50 J**	**19.0 J**	**5.90 J**	**2.80 J**	**9.70 J**	**27.0 J**	-	1,600	HH
Toluene	**1.30 J**	**3.90 J**	**0.350 J**	**0.900 J**	**0.690 J**	**0.170 J**	**1.46 J**	**1.80 J**	-	200,000	Eco
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)											
Acenaphthene	**66.0**	**170**	**220**	**1,900**	**700**	**360**	**1,160**	**420**	-	19,000,000	HH
Acenaphthylene	**3.40**	**12.0**	**15.0**	**41.0**	**13.0**	**15.0**	**19.0**	**13.0**	-	23,000	HH
Anthracene	**99.0**	**400**	**650**	**2,100**	**880**	**900**	**1,070**	**740**	-	93,000,000	HH
Fluorene	**33.0**	**99.0**	**130**	**630**	**340**	**210**	**510**	**240**	-	12,000,000	HH
Naphthalene	**5.00**	**22.0**	**14.0**	**140**	**49.0**	**49.0**	**79.0**	**57.0**	-	23,000	HH
Phenanthrene	**350**	**1,500**	**2,000**	**7,400**	**3,400**	**2,800**	**4,200**	**2,800**	-	93,000,000	HH
Total LPAHs (KM, capped; NDs at MDL)	**556**	**2,203**	**3,029**	**12,211**	**5,382**	**4,334**	**7,043**	**4,270**	-	29,000	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)											
Benzo(a)anthracene	**690**	**4,500**	**4,100**	**11,000**	**4,500**	**4,800**	**4,500**	**4,800**	-	2,700	HH
Benzo(a)pyrene	**820**	**5,800**	**4,700**	**16,000**	**5,900**	**5,800**	**5,800**	**6,200**	-	270	HH
Benzo(b)fluoranthene	**990**	**7,100**	**5,700**	**16,000**	**6,400**	**6,500**	**6,500**	**7,200**	-	2,700	HH
Benzo(g,h,i)perylene	**460**	**3,300**	**2,500**	**9,500**	**3,300**	**3,100**	**3,250**	**3,500**	-	27,000	HH
Benzo(k)fluoranthene	**310**	**2,400**	**2,000**	**5,900**	**2,300**	**2,400**	**2,300**	**2,500**	-	27,000	HH
Chrysene	**790**	**5,000**	**4,900**	**14,000**	**5,000**	**5,400**	**5,150**	**5,600**	-	270,000	HH
Dibenz(a,h)anthracene	**130**	**970**	**710**	**2,300**	**1,000**	**900**	**900**	**1,100**	-	270	HH
Fluoranthene	**1,200**	**7,700**	**7,000**	**21,000**	**8,200**	**8,700**	**8,700**	**8,600**	-	8,900,000	HH
Indeno(1,2,3-cd)pyrene	**620**	**4,500**	**3,500**	**13,000**	**4,600**	**4,400**	**4,450**	**4,900**	-	2,700	HH
Pyrene	**1,200**	**7,500**	**6,700**	**21,000**	**7,900**	**9,400**	**8,150**	**8,600**	-	6,700,000	HH
Total HPAHs (KM, capped; NDs at MDL)	**7,210**	**48,770**	**41,810**	**129,700**	**49,100**	**51,400**	**49,700**	**53,000**	-	1,100	Eco
Total Solids (mg/kg) and Grain Size (%)											
Solids, Total	**750,000**	**820,000**	**807,000**	**835,000**	**833,000**	**836,000**	**828,000**	**858,000**	**667,000**	-	-
Gravel (>2.00 mm)	-	-	-	-	-	-	-	-	**52.6**	-	-
Sand, Very Coarse (1.00 - 2.00 mm)	-	-	-	-	-	-	-	-	**7.81**	-	-
Sand, Coarse (0.50 - 1.00 mm)	-	-	-	-	-	-	-	-	**5.66**	-	-
Sand, Medium (0.25 - 0.50 mm)	-	-	-	-	-	-	-	-	**6.07**	-	-
Sand, Fine (0.125 - 0.25 mm)	-	-	-	-	-	-	-	-	**7.17**	-	-
Sand, Very Fine (0.0625 - 0.125 mm)	-	-	-	-	-	-	-	-	**6.05**	-	-
Silt (0.039 - 0.0625 mm)	-	-	-	-	-	-	-	-	**16.6**	-	-
Clay (<0.039 mm)	-	-	-	-	-	-	-	-	**2.88**	-	-

Notes:

µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-2b
2008-2009 Landfill AOPC Quarterly Groundwater Analytical Results
Metals, Petroleum Hydrocarbons, Butyltins, Volatile Organic Compounds, Semivolatile Organic Compounds, and General Chemistry Parameters
(Page 1 of 3)

Site ID	MW-01	MW-01	MW-01	MW-01	MW-02	MW-02	MW-02	MW-02	MW-03	MW-03	MW-03	MW-03	MW-04	MW-04	MW-04	MW-04	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	080416MW1 GW	080718MW1GW	081024MW1GW	090115MW1GW	080416MW2 GW	080715MW2GW	081022MW2GW	090113MW2GW	080417MW3 GW	080717MW3GW	081023MW3GW	090113MW3GW	080417MW4 GW	080717MW4GW	081023MW4GW	090114MW4GW				
Sample Date	4/16/2008	7/18/2008	10/24/2008	1/15/2009	4/16/2008	7/15/2008	10/22/2008	1/13/2009	4/17/2008	7/17/2008	10/23/2008	1/13/2009	4/17/2008	7/17/2008	10/23/2008	1/14/2009				
Sample Depth (Feet btc)	25	28	31	31	27	27	27	28	16	19	20	19	27	26	23	18				
Sample Depth (Feet btc)	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater				
Total Metals (µg/L)																				
Arsenic	**21.3**	**19.6**	**16.2**	**15.8**	**6.93**	**9.06**	**8.81**	**8.20**	**0.350 J**	**0.400 J**	**0.520**	0.500 U	**0.550**	**0.300 J**	**0.340 J**	0.500 U	0.0180	HH	0.0380	HH
Iron	**75.5**	**7,910**	**2,620**	**4,710**	**185**	**178**	**174**	**198**	**112**	57.8 U	**9.40 J**	60.6 U	**746**	**14,700**	**28,100**	**156**	300	HH	26,000	HH
Lead	**0.558**	**6.36**	**1.70**	**1.44**	**0.397**	**0.556**	**0.343**	**0.377**	**0.154**	0.0560 U	0.0200 U	**0.0400**	**26.9**	**4.96**	**1.65**	**7.45**	-	-	15.0	HH
Manganese	**3.85**	**291**	**69.0**	**77.6**	**6.74**	**4.50 J**	**2.50**	**3.25**	**6.25**	**4.20 J**	**0.810**	**2.07**	**53.2**	**780**	**1,260**	**36.8**	50.0	HH	880	HH
Mercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.0	HH
Dissolved Metals (µg/L)																				
Arsenic	**19.3**	**18.3**	-	**14.2**	**7.98**	**9.11**	**8.54**	**8.30**	0.500 U	**0.220 J**	**0.640**	0.500 U	0.500 U	**0.410 J**	**0.370 J**	0.500 U	0.0180	HH	0.0380	HH
Calcium	**42,000**	-	-	-	**9,510**	-	-	-	**12,300**	-	-	-	**98,000**	-	-	-	116,000	Eco	116,000	Eco
Iron	**14.6 J**	**534**	-	20.0 U	**20.1**	20.0 U	**7.50 J**	20.0 U	**5.80 J**	4.00 U	4.00 U	20.0 U	**8.80 J**	**13,200**	**29,600**	27.7 U	300	HH	1,000	Eco
Lead	**0.281**	**0.536**	-	**0.0160 J**	0.00900 U	0.0520 U	0.0230 U	**0.0270 J**	**0.0120 J**	0.0300 U	0.0200 U	0.00600 U	**3.50**	**1.62**	**0.372**	**3.16**	2.50	Eco	2.50	Eco
Magnesium	**2,810**	-	-	-	**1,210**	-	-	-	**4,200**	-	-	-	**7,550**	-	-	-	82,000	Eco	82,000	Eco
Manganese	**0.280**	**22.8**	-	**11.3**	**0.120**	**1.10 J**	0.400 U	**0.330**	**0.550**	**0.400 J**	0.400 U	**0.450**	**53.1**	**737**	**1,340**	**37.1**	50.0	HH	120	Eco
Mercury	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.770	Eco	0.770	Eco
Potassium	**4,620**	-	-	-	**5,020**	-	-	-	**808 J**	-	-	-	**3,750**	-	-	-	53,000	Eco	53,000	Eco
Sodium	**355,000**	-	-	-	**77,400**	-	-	-	**4,100**	-	-	-	**4,040**	-	-	-	680,000	Eco	680,000	Eco
Total Petroleum Hydrocarbons (µg/L)																				
Diesel Range Organics	12.0 U	-	**480**	-	110 U	110 U	13.0 U	**19.0 J**	110 U	110 U	**13.0 J**	**23.0 J**	120 U	**130**	**120**	**210**	-	-	90.0	HH
Residual Range Organics	21.0 U	-	**200**	-	110 U	110 U	120 U	**57.0 J**	110 U	110 U	110 U	**51.0 J**	110 U	140 U	**160**	**160**	-	-	290	HH
Gasoline Range Organics	13.0 U	13.0 U	**14.0 J**	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	**18.0 J**	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	-	-	100	HH
Total Butyltins (µg/L)																				
Dibutyltin	0.00810 U	-	-	-	0.00810 U	0.00730 U	0.00730 U	0.00730 U	**0.0150 J**	**0.0910 J**	0.00730 U	0.00730 U	0.00810 U	**0.110 J**	0.00730 U	0.00730 U	0.0630	Eco	0.0630	Eco
Monobutyltin	0.0110 U	-	-	-	0.0110 U	**0.0290 J**	0.0290 U	0.0290 U	0.0110 U	0.0290 UJ	0.0290 U	0.0290 U	0.0110 U	0.0290 UJ	0.0290 U	0.0290 U	0.0630	Eco	0.0630	Eco
Total Volatile Organic Compounds (µg/L)																				
Chloroform	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	**2.20**	**0.100 J**	0.0820 U	**3.70**	5.70	HH	0.190	HH
Tetrachloroethene (PCE)	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	**6.80**	**7.20**	**5.90**	**5.70**	**0.250 J**	0.0970 U	0.0970 U	**0.230 J**	0.690	HH	0.0930	HH
Vinyl Chloride	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	**0.410 J**	**0.330 J**	0.0440 U	0.0250	HH	0.0250	HH
Total Semivolatile Organic Compounds (µg/L)																				
1,4-Dichlorobenzene	0.0310 U	-	-	-	0.0290 U	0.0290 U	0.0310 UJ	0.0330 U	0.0300 U	0.0320 U	0.0300 UJ	0.0300 U	0.0310 U	0.0290 U	0.0300 UJ	0.0340 U	15.0	Eco	0.420	HH
4-Nitrophenol	0.300 U	-	-	-	0.280 U	0.280 U	0.300 U	0.320 U	0.290 U	0.310 U	0.290 U	0.290 U	0.300 U	0.280 U	0.290 U	0.330 U	150	Eco	150	Eco
Phenanthrene	0.0230 U	-	-	-	0.0220 U	0.0220 U	0.0240 U	0.0250 U	0.0230 U	0.0240 U	0.0230 U	0.0230 U	0.0240 U	0.0220 U	0.0230 U	0.0260 U	6.30	Eco	0.140	HH
Phenol	0.0660 U	-	-	-	0.0630 U	0.0630 U	0.0680 U	0.0700 U	0.0650 U	0.0690 U	0.0650 U	0.0650 U	0.0670 U	0.0630 U	0.0640 U	0.0740 U	110	Eco	110	Eco
General Chemistry Parameters (mg/L)																				
Dissolved Bromide	**0.0720 J**	-	-	-	0.0100 U	-	-	-	0.0100 U	-	-	-	0.0100 U	-	-	-	-	-	-	-
Dissolved Chloride	**5.30**	-	-	-	**3.80**	-	-	-	**0.900**	-	-	-	**1.60**	-	-	-	230	Eco	230	Eco
Dissolved Fluoride	**0.500**	-	-	-	**0.0600 J**	-	-	-	0.200 U	-	-	-	**0.121 J**	-	-	-	-	-	1.50	HH
Dissolved Sulfate	**708**	-	-	-	**93.8**	-	-	-	**4.20**	-	-	-	**7.70**	-	-	-	-	-	-	-
Dissolved Ammonia	0.0500 U	-	-	-	0.0500 U	-	-	-	**0.100**	-	-	-	0.0500 U	-	-	-	-	-	-	-
Dissolved Nitrate+Nitrite	**0.470**	-	-	-	**0.0260 J**	-	-	-	**0.570**	-	-	-	**0.320**	-	-	-	-	-	10.0	HH
Total Organic Carbon	**2.80**	-	-	-	**1.30**	-	-	-	**1.80**	-	-	-	**3.90**	-	-	-	-	-	-	-
Dissolved Organic Carbon	**2.80**	-	-	-	**1.30**	-	-	-	**1.70**	-	-	-	**4.10 J**	-	-	-	-	-	-	-
Dissolved Bicarbonate as CaCO3	**66.0**	-	-	-	**96.0**	-	-	-	**44.0**	-	-	-	**287**	-	-	-	-	-	-	-
Dissolved Carbonate as CaCO3	1.00 U	-	-	-	1.00 U	-	-	-	1.00 U	-	-	-	1.00 U	-	-	-	-	-	-	-

Notes:

µg/L = microgram per liter
mg/L = milligram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-2b
2008-2009 Landfill AOPC Quarterly Groundwater Analytical Results
Metals, Petroleum Hydrocarbons, Butyltins, Volatile Organic Compounds, Semivolatile Organic Compounds, and General Chemistry Parameters
(Page 2 of 3)

Site ID	MW-05	MW-05	MW-05	MW-05	MW-06	MW-06*	MW-06*	MW-06*	MW-07*	MW-07	MW-07	MW-07	MW-08	MW-08	MW-08	MW-08	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	080416MW5 GW	080716MW5GW	081022MW5GW	090114MW5GW	080417MW6 GW	080716MW6GW	081022MW6GW	090114MW6GW	080416MW7 GW	080717MW07GW	081021MW7GW	090112MW7GW	080418MW8GW	080716MW8GW	081023MW8GW	090115MW8GW				
Sample Date	4/16/2008	7/16/2008	10/22/2008	1/14/2009	4/17/2008	7/16/2008	10/22/2008	1/14/2009	4/16/2008	7/17/2008	10/21/2008	1/12/2009	4/18/2008	7/16/2008	10/23/2008	1/15/2009				
Sample Depth (Feet btc)	30	30	30	32	28	28	28	30	28	30	20	20	58	55.5	55	57				
Sample Depth (Feet btc)	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater				
Total Metals (µg/L)																				
Arsenic	**2.65**	**2.85**	**4.16**	**2.30**	**2.69**	**3.21**	**3.50**	**2.90**	**15.9**	**16.8**	**17.4**	**18.7**	**6.86**	**5.76**	**5.40**	**7.20**	0.0180	HH	0.0380	HH
Iron	**19,300**	**21,500**	**25,100**	**21,300**	**25,100**	**23,800**	**25,850**	**28,150**	**29,000**	**30,700**	**36,600**	**35,700**	**854**	**631**	33.7 U	**112**	300	HH	26,000	HH
Lead	**0.442**	0.0740 U	0.0680 U	**0.102**	**0.0560**	0.0300 U	0.0200 U	0.00600 U	**0.272**	0.136 U	0.0380 U	**0.129**	**0.463**	**0.540**	**0.338**	**0.140**	-	-	15.0	HH
Manganese	**2,210**	**2,460**	**2,840**	**4,220**	**3,280**	**2,930**	**3,110**	**5,385**	**1,445**	**1,710**	**2,000**	**3,300**	**265**	**173**	**172**	**270**	50.0	HH	880	HH
Mercury	-	-	0.0500 U	-	-	-	0.0500 U	-	-	-	0.0500 U	-	**0.0300 J**	-	-	-	-	-	11.0	HH
Dissolved Metals (µg/L)																				
Arsenic	**2.52**	**2.97**	**3.68**	**2.30**	**2.33**	**3.18**	**3.54**	**2.90**	**10.7**	**14.7**	**15.7**	**16.7**	**7.92**	**5.65**	**5.24**	**7.10**	0.0180	HH	0.0380	HH
Calcium	**66,300**	-	-	-	**76,600**	-	-	-	**43,100**	-	-	-	**172,000**	-	-	-	116,000	Eco	116,000	Eco
Iron	**18,800**	**19,800**	**24,400**	**19,900**	**24,200**	**22,750**	**25,650**	**27,150**	**25,650**	**27,900**	**35,400**	**33,800**	**5.80 J**	20.0 U	**8.90 J**	4.00 U	300	HH	1,000	Eco
Lead	**0.0140 J**	0.0300 U	0.0200 U	**0.0130 J**	**0.0170 J**	0.00600 U	0.00600 U	0.00600 U	0.00900 U	0.00600 U	0.0200 U	0.0300 U	0.00900 U	0.0460 U	**0.227**	**0.0130 J**	2.50	Eco	2.50	Eco
Magnesium	**21,800**	-	-	-	**25,800**	-	-	-	**16,850**	-	-	-	**13,000**	-	-	-	82,000	Eco	82,000	Eco
Manganese	**2,200**	**2,360**	**2,760**	**3,790**	**3,200**	**3,015**	**3,115**	**5,545**	**1,455**	**1,650**	**1,940**	**3,410**	**238**	**151**	**172**	**266**	50.0	HH	120	Eco
Mercury	-	-	0.0500 U	-	-	-	0.0500 U	-	-	-	0.0500 U	-	0.0300 U	-	-	-	0.770	Eco	0.770	Eco
Potassium	**7,310**	-	-	-	**7,240**	-	-	-	**3,195**	-	-	-	**12,900**	-	-	-	53,000	Eco	53,000	Eco
Sodium	**15,400**	-	-	-	**41,300**	-	-	-	**7,340**	-	-	-	**740,000**	-	-	-	680,000	Eco	680,000	Eco
Total Petroleum Hydrocarbons (µg/L)																				
Diesel Range Organics	**490**	**980**	**730**	**970**	**360**	**465**	**395**	**515**	110 U	110 U	**97.0 J**	**77.0 J**	**15.0 J**	**110**	**440**	**53.0 J**	-	-	90.0	HH
Residual Range Organics	**180**	**370**	**260**	**330**	120 U	**230**	170 U	**140**	110 U	110 U	130 U	**80.0 J**	22.0 U	100 U	**150**	**52.0 J**	-	-	290	HH
Gasoline Range Organics	**120 J**	**110 J**	**32.0 J**	**90.0 J**	**30.0 J**	**35.5 J**	**30.0 J**	**29.5 J**	**13.0 J**	13.0 U	13.0 U	13.0 U	13.0 U	**14.0 J**	**13.0 J**	13.0 U	-	-	100	HH
Total Butyltins (µg/L)																				
Dibutyltin	0.00810 U	0.00730 U	0.00730 U	0.00730 U	0.00810 U	0.00730 U	0.00730 U	0.00730 U	0.00810 U	**0.130 J**	0.00730 U	0.00730 U	0.00810 U	0.00730 U	0.00730 U	**0.0130 J**	0.0630	Eco	0.0630	Eco
Monobutyltin	0.0110 U	0.0290 U	0.0290 U	0.0290 U	0.0110 U	0.0290 U	0.0290 U	0.0290 U	0.0110 U	0.0290 UJ	0.0290 U	0.0290 U	0.0290 U	0.0290 U	0.0290 U	0.0290 U	0.0630	Eco	0.0630	Eco
Total Volatile Organic Compounds (µg/L)																				
Chloroform	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	5.70	HH	0.190	HH
Tetrachloroethene (PCE)	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.0970 U	0.690	HH	0.0930	HH
Vinyl Chloride	**0.180 J**	**0.310 J**	**0.390 J**	**0.250 J**	**0.160 J**	**0.170 J**	**0.160 J**	**0.205 J**	**0.955**	**0.880**	**0.340 J**	**0.680**	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0250	HH	0.0250	HH
Total Semivolatile Organic Compounds (µg/L)																				
1,4-Dichlorobenzene	0.0290 U	0.0290 U	0.0290 UJ	0.0290 U	0.0290 U	0.0290 U	0.0310 UJ	0.0300 U	0.0310 U	0.0290 U	0.0320 U	0.0310 U	0.0330 U	0.0290 U	0.0290 UJ	0.0290 U	15.0	Eco	0.420	HH
4-Nitrophenol	0.280 U	0.280 U	0.280 U	0.280 U	0.280 U	0.280 U	0.300 U	0.290 U	0.300 U	0.280 U	0.310 U	0.300 U	0.320 U	0.280 U	0.280 U	0.280 U	150	Eco	150	Eco
Phenanthrene	**0.210**	**0.300**	0.0220 U	0.0220 U	0.0220 U	0.0220 U	0.0230 U	0.0230 U	0.0240 U	0.0220 U	0.0240 U	0.0240 U	0.0250 U	0.0220 U	**3.90**	0.0220 U	6.30	Eco	0.140	HH
Phenol	0.0630 U	0.0630 U	0.0630 U	0.0630 U	0.0630 U	0.0630 U	0.0660 U	0.0640 U	0.0670 U	0.0630 U	0.0690 U	0.0670 U	0.0710 U	0.0630 U	0.0630 U	0.0630 U	110	Eco	110	Eco
General Chemistry Parameters (mg/L)																				
Dissolved Bromide	**0.0200 J**	-	-	-	**0.0290 J**	-	-	-	0.0100 U	-	-	-	**0.0490 J**	-	-	-	-	-	-	-
Dissolved Chloride	**4.70**	-	-	-	**22.6**	-	-	-	**1.40**	-	-	-	**13.5**	-	-	-	230	Eco	230	Eco
Dissolved Fluoride	**0.120 J**	-	-	-	**0.200**	-	-	-	**0.300**	-	-	-	0.0120 U	-	-	-	-	-	1.50	HH
Dissolved Sulfate	**1.70**	-	-	-	**13.7**	-	-	-	**1.30**	-	-	-	**1,790**	-	-	-	-	-	-	-
Dissolved Ammonia	**1.51**	-	-	-	**1.16**	-	-	-	**0.690**	-	-	-	**0.300**	-	-	-	-	-	-	-
Dissolved Nitrate+Nitrite	0.00500 UJ	-	-	-	**0.150**	-	-	-	0.00500 U	-	-	-	0.00500 U	-	-	-	-	-	10.0	HH
Total Organic Carbon	**9.40**	-	-	-	**9.30**	-	-	-	**7.05**	-	-	-	**2.80**	-	-	-	-	-	-	-
Dissolved Organic Carbon	**8.70 J**	-	-	-	**9.30**	-	-	-	**7.55 J**	-	-	-	**2.90**	-	-	-	-	-	-	-
Dissolved Bicarbonate as CaCO3	**305**	-	-	-	**356**	-	-	-	**196**	-	-	-	**44.0**	-	-	-	-	-	-	-
Dissolved Carbonate as CaCO3	1.00 U	-	-	-	1.00 U	-	-	-	1.00 U	-	-	-	1.00 U	-	-	-	-	-	-	-

Notes:

µg/L = microgram per liter
mg/L = milligram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-2b
2008-2009 Landfill AOPC Quarterly Groundwater Analytical Results
Metals, Petroleum Hydrocarbons, Butyltins, Volatile Organic Compounds, Semivolatile Organic Compounds, and General Chemistry Parameters
(Page 3 of 3)

Site ID	MW-09	MW-09	S2	S2	S2	S2	S4	S4	S4	S4	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	080417MW9GW	090114MW9GW	08041852SP	08041852SW	090111S2SP	090111S2SW	08041754 SP	08041754 SW	090111S4SP	090111S4SW				
Sample Date	4/17/2008	1/14/2009	4/18/2008	4/18/2008	1/11/2009	1/11/2009	4/17/2008	4/17/2008	1/11/2009	1/11/2009				
Sample Depth (Feet btc)	15.5	15	0.0	1.0	0.0	0.5	0.0	1.0	0.0	0.5				
Sample Depth (Feet btc)	Groundwater	Groundwater	Seep Water	Surface Water	Seep Water	Surface Water	Seep Water	Surface Water	Seep Water	Surface Water				
Total Metals (µg/L)														
Arsenic	0.720 U	0.500 U	1.01 U	1.10 U	**0.500**	**0.900**	**12.8**	**1.17**	**1.10**	**0.800**	0.0180	HH	0.0380	HH
Iron	**2,550**	**532**	**5,300**	**251**	**433**	**167**	**121,000**	**446**	**271**	**188**	300	HH	26,000	HH
Lead	**0.718**	**0.871**	**2.23**	**0.243**	**0.342**	**0.105**	**25.7**	**0.407**	**0.113**	**0.289**	-	-	15.0	HH
Manganese	**103**	**10.4**	**75.0**	**11.1**	**15.5**	**6.37**	**3,240**	**13.6**	**8.90**	**5.90**	50.0	HH	880	HH
Mercury	**0.0300 J**	-	**0.0300 J**	0.0300 U	-	-	-	-	-	-	-	-	11.0	HH
Dissolved Metals (µg/L)														
Arsenic	**1.40**	0.500 U	0.520 U	**1.01**	**0.500**	**0.800**	**1.00**	**0.870**	**1.00**	**0.800**	0.0180	HH	0.0380	HH
Calcium	**11,600**	-	**22,600**	**20,500**	-	-	**76,400**	**19,900**	-	-	116,000	Eco	116,000	Eco
Iron	**176**	20.0 U	**14.9 J**	4.00 U	20.0 U	20.0 U	**9.70 J**	**9.20 J**	20.0 U	20.0 U	300	HH	1,000	Eco
Lead	**0.107**	**0.0440**	**0.0650**	**0.0160 J**	0.0300 U	**0.0100 J**	**0.0180 J**	0.00900 U	**0.00800 J**	**0.0100 J**	2.50	Eco	2.50	Eco
Magnesium	**2,560**	-	**5,070**	**6,330**	-	-	**16,600**	**6,190**	-	-	82,000	Eco	82,000	Eco
Manganese	**48.9**	**10.4**	**5.41**	**0.490**	0.160 U	**1.01**	**1.99**	**0.560**	0.140 U	**0.930**	50.0	HH	120	Eco
Mercury	0.0300 U	-	0.0300 U	0.0300 U	-	-	-	-	-	-	0.770	Eco	0.770	Eco
Potassium	**2,680**	-	**771 J**	**1,490 J**	-	-	**4,160**	**1,510 J**	-	-	53,000	Eco	53,000	Eco
Sodium	**11,800**	-	**19,700**	**7,900**	-	-	**6,680**	**7,630**	-	-	680,000	Eco	680,000	Eco
Total Petroleum Hydrocarbons (µg/L)														
Diesel Range Organics	**65.0 J**	**110 J**	13.0 U	12.0 U	**29.0 J**	**26.0 J**	120 U	120 U	**130**	**30.0 J**	-	-	90.0	HH
Residual Range Organics	**130**	**130**	23.0 U	20.0 U	110 U	100 U	120 U	120 U	**130**	100 U	-	-	290	HH
Gasoline Range Organics	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	-	-	100	HH
Total Butyltins (µg/L)														
Dibutyltin	0.00810 U	0.00730 U	0.00810 U	0.00810 U	0.00730 U	0.00730 U	0.00810 U	0.00810 U	0.00730 U	0.00730 U	0.0630	Eco	0.0630	Eco
Monobutyltin	0.0290 U	0.0290 U	0.0290 U	0.0290 U	0.0290 U	0.0290 U	0.0110 U	0.0110 U	0.0290 U	0.0290 U	0.0630	Eco	0.0630	Eco
Total Volatile Organic Compounds (µg/L)														
Chloroform	**0.220 J**	**0.450 J**	0.0820 U	0.0820 U	0.0820 U	0.0820 U	**0.740**	0.0820 U	**2.80**	0.0820 U	5.70	HH	0.190	HH
Tetrachloroethene (PCE)	**2.60**	**4.80**	**0.150 J**	0.0970 U	0.0970 U	0.0970 U	**1.70**	0.0970 U	**4.40**	0.0970 U	0.690	HH	0.0930	HH
Vinyl Chloride	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0250	HH	0.0250	HH
Total Semivolatile Organic Compounds (µg/L)														
1,4-Dichlorobenzene	0.0290 U	0.0310 U	0.0330 U	0.0290 U	0.0300 U	0.0290 U	0.0290 U	0.0310 U	0.0300 U	0.0290 U	15.0	Eco	0.420	HH
4-Nitrophenol	0.280 U	0.300 U	0.320 U	0.280 U	0.290 U	0.280 U	0.280 U	0.300 U	0.290 U	0.280 U	150	Eco	150	Eco
Phenanthrene	0.0220 U	0.0240 U	0.0250 U	0.0220 U	0.0230 U	0.0220 U	0.0220 U	0.0230 U	0.0230 U	0.0220 U	6.30	Eco	0.140	HH
Phenol	0.0630 U	0.0670 U	0.0710 U	0.0630 U	0.0650 U	0.0630 U	0.0630 U	0.0660 U	0.0640 U	0.0630 U	110	Eco	110	Eco
General Chemistry Parameters (mg/L)														
Dissolved Bromide	0.0100 U	-	0.0100 U	0.0100 U	-	-	0.0100 U	0.0100 U	-	-	-	-	-	-
Dissolved Chloride	**0.900**	-	**1.10**	**3.70**	-	-	**1.60**	**3.70**	-	-	230	Eco	230	Eco
Dissolved Fluoride	0.0120 U	-	**0.0310 J**	**0.147 J**	-	-	**0.0930 J**	**0.150 J**	-	-	-	-	1.50	HH
Dissolved Sulfate	**16.2**	-	**13.6**	**14.5**	-	-	**20.4**	**14.4**	-	-	-	-	-	-
Dissolved Ammonia	**0.0800**	-	0.0500 U	0.0500 U	-	-	0.0500 U	0.0500 U	-	-	-	-	-	-
Dissolved Nitrate+Nitrite	**0.00700 J**	-	**1.11**	**0.360**	-	-	**0.180**	**0.440**	-	-	-	-	10.0	HH
Total Organic Carbon	**4.50**	-	**2.50**	**2.10**	-	-	**3.40**	**2.00**	-	-	-	-	-	-
Dissolved Organic Carbon	**6.10 J**	-	**2.50**	**2.30 J**	-	-	**3.50 J**	**2.10 J**	-	-	-	-	-	-
Dissolved Bicarbonate as CaCO3	**46.0**	-	**102**	**76.0**	-	-	**256**	**76.0**	-	-	-	-	-	-
Dissolved Carbonate as CaCO3	1.00 U	-	1.00 U	1.00 U	-	-	1.00 U	1.00 U	-	-	-	-	-	-

Notes:
µg/L = microgram per liter
mg/L = milligram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-3a
2009 Sandblast Area AOPC - Laydown Area Soil Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, Pesticides, and General Chemistry Parameters
(Page 1 of 2)

Site ID	LD-01	LD-01	LD-02	LD-02	LD-03	LD-03	LD-04	LD-04	LD-05	LD-05	LD-06	LD-07	LD-08	LD-09	LD-10	LD-11*	Selected SLV (0-3 ft bgs)	SLV Source (0-3 ft bgs)
Sample ID	090320-LD-1So-0-1	090320-LD-1So-1-3	090320-LD-2So-0-1	090320-LD-2So-1-3	090320-LD-3So-0-1	090320-LD-3So-1-3	090320-LD-4So-0-1	090320-LD-4So-1-3	090320-LD-5So-0-1	090320-LD-5So-1-3	090319-LD-6-So	090319-LD-7-So	090319-LD-8-So	090319-LD-9-So	090319-LD-10-So	090319-LD-11-So		
Sample Date	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/19/2009	3/19/2009	3/19/2009	3/19/2009	3/19/2009	3/19/2009		
Sample Depth (Feet bgs)	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0	0.0-0.17	0.0-0.17	0.0-0.17	0.0-0.17	0.0-0.17	0.0-0.17		
PCB Aroclors (µg/kg dry)																		
Aroclor 1016	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	11.0 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	11.0 U	2.10 U	371	Eco
Aroclor 1221	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	11.0 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	11.0 U	2.10 U	371	Eco
Aroclor 1232	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	11.0 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	11.0 U	2.10 U	371	Eco
Aroclor 1242	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	11.0 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	11.0 U	2.10 U	371	Eco
Aroclor 1248	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	11.0 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	11.0 U	2.10 U	371	Eco
Aroclor 1254	700	23.0	280	16.0	160	11.0	2.10 U	2.10 U	1,500	230	2.10 U	2.10 U	2.10 U	2.10 U	1,700	475	371	Eco
Aroclor 1260	690	22.0	130	18.0	160	11.0	2.10 U	2.10 U	480	130	50.0	660 J	2.10 U	7.50 J	440	215	371	Eco
Aroclor 1262	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	11.0 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	11.0 U	2.10 U	371	Eco
Aroclor 1268	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	11.0 U	2.10 U	2.10 U	2.10 U	2.10 U	2.10 U	11.0 U	2.10 U	371	Eco
Total PCBs as Aroclors (NDs at MDL) [1]	1390	45.0	410	34.0	320	22.0	4.20 U	4.20 U	1980	360	52.1 J	662 J	4.20 U	9.60 J	2140	690	371	Eco
Metals (mg/kg dry)																		
Aluminum	10,100	15,400	12,200	16,200	9,960	15,600	12,200	15,000	16,100	17,400	6,360	12,100	24,300	18,600	12,800	21,100	31,400	UPL
Antimony	1.72 J	0.140 J	1.07 J	0.0900 J	0.310 J	0.0800 J	0.130 J	0.0700 J	0.560 J	0.170 J	0.360 U	0.540 J	0.160 U	0.170 U	0.830 J	0.455 J	0.270	Eco
Arsenic	5.89	7.26	5.79	5.30	2.96	5.70	3.86	6.44	5.04	5.80	1.86	5.50	4.81	4.22	15.0	7.63	5.40	UPL
Barium	95.3	103	114	91.3	70.4	85.1	111	93.7	113	138	72.3	93.6	109	101	104	133	330	Eco
Beryllium	0.240 J	0.470 J	0.260 J	0.530 J	0.320 J	0.370 J	0.350 J	0.410 J	0.370 J	0.500 J	0.230 J	0.290 J	0.630 J	0.520 J	0.280 J	0.505 J	21.0	Eco
Cadmium	6.45	0.259	7.92	0.154	1.31	0.134	0.235	0.0770	17.3	0.383	0.379	4.88	0.146	0.276	3.98	7.73	0.360	Eco
Calcium	5,060 J	7,120 J	5,240 J	7,850 J	5,290 J	8,080 J	6,400 J	7,470 J	7,290 J	9,030 J	4,520 J	7,610 J	10,700 J	9,680 J	5,520 J	8,840 J	10,400	UPL
Chromium	94.9 J	19.5 J	49.5 J	17.3 J	33.3 J	15.4 J	12.0 J	16.8 J	35.7 J	29.3 J	169 J	33.1 J	18.6 J	22.5 J	129 J	80.7 J	28.1	UPL
Cobalt	12.8	16.1	13.4	15.6	10.0	15.9	10.6	14.4	13.3	18.4	10.6	12.5	15.7	16.2	12.7	18.6	19.9	UPL
Copper	189 J	60.6 J	195 J	60.5 J	103 J	55.4 J	32.6 J	51.7 J	165 J	64.8 J	30.8 J	73.7 J	71.4 J	57.2 J	298 J	158 J	56.7	UPL
Iron	44,800	29,000	42,400	29,900	26,700	28,000	28,000	27,200	40,400	32,500	28,400	33,100	33,000	30,800	39,300	41,400	36,900	UPL
Lead	765	26.5	963	11.6	233	18.7	279	13.4	311	34.9	591	988	15.4	80.1	408	95.8	25.5	UPL
Magnesium	6,250	8,060	5,590	8,920	5,020	9,490	6,020	8,140	7,470	10,700	8,260	6,070	13,700	10,300	7,100	10,600	12,400	UPL
Manganese	526	512	614	466	391	460	360	430	500	487	342	526	789	678	508	598	885	UPL
Mercury	0.497	0.0470	0.267	0.0330	0.0940	0.0400	0.0170 J	0.0570	0.723	0.106	0.0480	0.0370	0.0650	0.0490	0.358	0.124	0.0660	UPL
Nickel	57.7 J	20.4 J	41.5 J	20.8 J	26.3 J	25.2 J	16.7 J	19.4 J	42.2 J	35.3 J	61.8 J	26.3 J	24.4 J	24.3 J	71.9 J	57.0 J	38.0	Eco
Potassium	610	895	636	809	429	705	630	860	835	1,010	580	1,230	1,480	1,250	827	1,100	2,050	UPL
Selenium	0.800 J	0.700 J	0.900 J	0.800 J	0.500 J	0.600 J	0.800 J	0.600 J	0.600 J	0.700 J	0.500 U	0.600 J	0.600 J	0.700 J	0.800 J	0.750 J	0.520	Eco
Silver	0.376	0.0700 J	0.406	0.0550 J	0.135	0.0450 J	0.0660	0.0520 J	0.431	0.0650	0.107	0.148	0.0740	0.0880	0.270	0.128	4.20	Eco
Sodium	413	391	391	382	373	547	453	365	470	461	269	285	350	444	433	459	341	UPL
Thallium	0.0790	0.115	0.0940	0.0940	0.0580	0.104	0.0830	0.126	0.0920	0.108	0.0340	0.104	0.112	0.120	0.212	0.124	1.00	Eco
Vanadium	67.7	68.1	74.0	66.6	68.9	63.4	84.7	69.4	75.0	77.5	67.3	65.0	62.4	75.0	72.9	80.0	104	UPL
Zinc	377 J	61.6 J	456 J	59.4 J	164 J	58.8 J	56.6 J	50.0 J	210 J	75.2 J	132 J	548 J	65.5 J	70.2 J	412 J	219 J	71.7	UPL
Petroleum Hydrocarbons (mg/kg dry)																		
Diesel Range Organics	260	6.30 J	410	7.50 J	85.0	50.0	5.90 J	5.90 J	160	14.0 J	61.0	170	3.60 J	13.0 J	260	38.5	23,000	HH
Residual Range Organics	1,300	25.0 J	2,300	23.0 J	860	82.0 J	21.0 J	16.0 J	270	52.0 J	290	430	30.0 J	85.0 J	1,200	170	40,000	HH
Gasoline Range Organics	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	1.60 J	3.40 J	1.50 U	1.50 U	3.10 J	1.50 U	13,000	HH
Butyltins (µg/kg dry)																		
Dibutyltin	5.80	0.290 U	4.80	0.280 U	2.50	0.290 U	0.270 U	0.270 U	1.20 J	0.300 U	5.70	13.0	0.310 U	0.800 J	3.40	0.290 U	28,000	Eco
Monobutyltin	2.20	0.250 U	1.60	0.250 U	0.570 J	0.250 U	0.240 U	0.240 U	1.10 J	0.260 U	2.10	2.10	0.270 U	0.420 J	2.50	0.900 J	28,000	Eco
Tributyltin	3.00	0.360 U	1.80	0.350 U	0.340 U	0.360 U	0.340 U	0.340 U	0.340 U	0.370 U	36.0	0.440 U	0.390 U	0.400 U	3.10	0.360 U	28,000	Eco

Table 6-3a
2009 Sandblast Area AOPC - Laydown Area Soil Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, Pesticides, and General Chemistry Parameters
(Page 2 of 2)

Site ID	LD-01	LD-01	LD-02	LD-02	LD-03	LD-03	LD-04	LD-04	LD-05	LD-05	LD-06	LD-07	LD-08	LD-09	LD-10	LD-11*	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	090320-LD-1So-0-1	090320-LD-1So-1-3	090320-LD-2So-0-1	090320-LD-2So-1-3	090320-LD-3So-0-1	090320-LD-3So-1-3	090320-LD-4So-0-1	090320-LD-4So-1-3	090320-LD-5So-0-1	090320-LD-5So-1-3	090319-LD-6-So	090319-LD-7-So	090319-LD-8-So	090319-LD-9-So	090319-LD-10-So	090319-LD-11-So		
Sample Date	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/19/2009	3/19/2009	3/19/2009	3/19/2009	3/19/2009	3/19/2009		
Sample Depth (Feet bgs)	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0	0.0-0.17	0.0-0.17	0.0-0.17	0.0-0.17	0.0-0.17	0.0-0.17		
Pesticides (µg/kg dry)																		
4,4'-DDD	1.90 U	0.110 U	0.640 U	0.140 U	**0.690 J**	0.570 U	0.110 U	0.110 U	3.40 U	0.200 U	**0.990 J**	10.0 U	0.110 U	0.110 U	5.00 U	0.550 U	21.0	Eco
4,4'-DDE	5.00 U	0.190 U	7.80 U	0.640 U	4.40 U	1.00 U	0.110 U	0.110 U	5.10 U	0.970 U	0.610 U	5.00 U	0.110 U	**0.610 J**	0.550 U	1.70 U	21.0	Eco
4,4'-DDT	**130**	**3.00**	**28.0**	**2.80**	**24.0**	**2.40**	**0.840 J**	0.170 U	**140**	**27.0**	5.10 U	78.0 U	0.270 U	**1.80**	**140**	**53.0**	21.0	Eco
Aldrin	**4.40 J**	0.160 U	1.00 U	0.160 U	0.980 U	0.160 U	0.160 U	0.160 U	0.800 U	0.160 U	0.800 U	5.00 U	0.160 U	0.160 U	5.00 U	0.160 U	4.90	Eco
BHC (alpha)	0.550 U	0.110 U	1.00 U	0.110 U	0.110 U	0.110 U	0.110 U	0.110 U	0.550 U	0.110 U	0.550 U	0.550 U	0.110 U	0.110 U	0.550 U	0.110 U	340	HH
BHC (beta)	0.900 U	0.180 U	0.180 U	0.180 U	0.180 U	0.180 U	0.180 U	0.180 U	0.900 U	0.180 U	0.900 U	0.900 U	0.180 U	0.180 U	0.900 U	0.180 U	960	HH
BHC (delta)	0.380 U	0.0740 U	0.490 U	0.0740 U	0.200 U	0.0740 U	0.0740 U	0.0740 U	0.370 U	0.0740 U	0.370 U	0.370 U	0.0740 U	0.0740 U	5.00 U	0.0740 U	340	HH
BHC (gamma) Lindane	0.400 U	0.0800 U	1.00 U	0.0800 U	0.980 U	0.0800 U	0.0800 U	0.0800 U	0.400 U	**0.200 J**	0.400 U	5.00 U	0.0800 U	0.120 U	37.0 U	0.0800 U	2,000	HH
Chlordane (alpha)	**1.50 J**	0.100 U	0.470 U	0.100 U	**0.660 J**	0.100 U	0.100 U	0.100 U	0.810 U	0.100 U	**0.860 J**	0.800 U	0.100 U	0.100 U	5.00 U	0.100 U	7,200	HH
Chlordane (gamma)	**40.0**	**0.760 J**	**12.0**	**0.890 J**	**7.60**	**0.610 J**	0.0900 U	0.0900 U	**86.0**	**9.20**	5.00 U	9.90 U	0.0900 U	1.00 U	**97.0**	**19.5**	7,200	HH
Dieldrin	8.70 U	1.00 U	3.90 U	1.00 U	1.90 U	1.00 U	0.140 U	0.140 U	31.0 U	3.60 U	0.700 U	18.0 U	0.140 U	1.00 U	31.0 U	5.70 U	4.90	Eco
Endosulfan I	5.00 U	0.0630 U	1.00 U	**0.260 J**	**2.20**	**0.140 J**	0.0630 U	0.0630 U	9.50 U	**2.00**	0.740 U	5.00 U	0.0660 U	0.0630 U	8.30 U	**6.45**	20,000	Eco
Endosulfan II	5.60 U	0.140 U	8.40 U	0.140 U	0.980 U	0.290 U	0.140 U	0.140 U	4.90 U	0.970 U	0.700 U	5.00 U	0.140 U	0.140 U	5.00 U	1.00 U	20,000	Eco
Endosulfan Sulfate	2.50 U	0.110 U	**1.80**	0.110 U	0.980 U	0.110 U	0.110 U	0.110 U	**0.630 J**	0.110 U	**1.70 J**	5.00 U	0.110 U	0.110 U	**3.30 J**	0.110 U	20,000	Eco
Endrin	5.00 U	0.0940 U	1.10 U	1.00 U	0.980 U	0.0940 U	0.0940 U	0.0940 U	**17.0**	**2.10**	0.470 U	6.80 U	0.0940 U	0.0940 U	**15.0**	**3.00 J**	4.90	Eco
Endrin Aldehyde	9.60 U	0.220 U	2.80 U	0.160 U	1.10 U	0.170 U	0.120 U	0.120 U	**16.0**	**1.90**	0.600 U	5.00 U	0.120 U	0.120 U	**11.0**	**4.40**	4.90	Eco
Endrin Ketone	20.0 U	1.00 U	2.90 U	1.00 U	2.70 U	0.170 U	0.0930 U	0.0930 U	**13.0**	0.690 U	5.00 U	21.0 U	0.0930 U	0.190 U	8.50 U	1.10 U	4.90	Eco
Heptachlor	0.600 U	0.120 U	0.530 U	0.120 U	**0.180 J**	0.120 U	0.120 U	0.120 U	4.90 U	0.120 U	0.600 U	**2.90 J**	0.120 U	0.120 U	5.00 U	0.120 U	480	HH
Heptachlor Epoxide	5.00 U	0.0840 U	1.50 U	0.0970 U	0.980 U	0.130 U	0.0840 U	0.0840 U	0.870 U	0.350 U	0.420 U	0.420 U	0.0840 U	0.0840 U	0.420 U	1.00 U	240	HH
Methoxychlor	6.90 U	0.190 U	**1.20**	1.00 U	**1.00**	0.190 U	0.190 U	0.190 U	4.90 U	0.970 U	2.00 U	5.10 U	0.190 U	0.190 U	4.40 U	1.00 U	500,000	Eco
Toxaphene	2,200 U	50.0 U	230 U	44.0 U	180 U	31.0 U	4.80 U	4.80 U	2,900 U	330 U	110 U	980 U	19.0 U	17.0 U	1,700 U	440 U	2,000	HH
General Chemistry Parameters (mg/kg)																		
Carbon, Total Organic	**29,900**	**3,000**	**35,900**	**1,300**	**17,600**	**1,300**	**1,000**	**1,100**	**7,400**	**1,500**	**13,200**	**26,600**	**9,500**	**30,600**	**52,800**	**9,550**	-	-
Solids, Total	**836,000**	**831,000**	**824,000**	**850,000**	**867,000**	**838,000**	**901,000**	**878,000**	**860,000**	**789,000**	**859,000**	**694,000**	**768,000**	**737,000**	**871,000**	**854,000**	-	-

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit

[1] Only Aroclors 1254 and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Sandlbast Area AOPC soil samples.
- = Not Analyzed
-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-3b
2009 Sandblast Area AOPC - Laydown Area Soil Analytical Results
Volatile Organic Compounds
(Page 1 of 2)

Site ID	LD-01	LD-01	LD-02	LD-02	LD-03	LD-03	LD-04	LD-04	Selected SLV (0-3 ft bgs)	SLV Source (0-3 ft bgs)
Sample ID	090320-LD-1So-0-1	090320-LD-1So-1-3	090320-LD-2So-0-1	090320-LD-2So-1-3	090320-LD-3So-0-1	090320-LD-3So-1-3	090320-LD-4So-0-1	090320-LD-4So-1-3		
Sample Date	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009		
Sample Depth (Feet bgs)	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0		
Volatile Organic Compounds (µg/kg dry)										
1,1,1,2-Tetrachloroethane	0.190 U	0.180 U	0.180 U	0.180 U	0.210 U	0.180 U	0.180 U	0.180 U	9,300	HH
1,1,1-Trichloroethane (TCA)	0.160 U	0.150 U	0.150 U	0.150 U	0.170 U	0.150 U	0.150 U	0.150 U	38,000,000	HH
1,1,2,2-Tetrachloroethane	0.0940 U	0.0890 U	0.0890 U	0.0890 U	0.110 U	0.0890 U	0.0890 U	0.0890 U	2,800	HH
1,1,2-Trichloroethane	0.0930 U	0.0880 U	0.0880 U	0.0880 U	0.100 U	0.0880 U	0.0880 U	0.0880 U	2,700	HH
1,1-Dichloroethane	0.0510 U	0.0480 U	0.0480 U	0.0480 U	0.0550 U	0.0480 U	0.0480 U	0.0480 U	5,900	HH
1,1-Dichloroethene	0.0740 U	0.0700 U	0.0700 U	0.0700 U	0.0800 U	0.0700 U	0.0700 U	0.0700 U	680,000	HH
1,1-Dichloropropene	0.160 U	0.150 U	0.150 U	0.150 U	0.170 U	0.150 U	0.150 U	0.150 U	8,100	HH
1,2,3-Trichlorobenzene	0.150 U	0.140 U	0.140 U	0.140 U	0.160 U	0.140 U	0.140 U	0.140 U	20,000	Eco
1,2,3-Trichloropropane	0.290 U	0.270 U	0.270 U	0.270 U	0.310 U	0.270 U	0.270 U	0.270 U	95.0	HH
1,2,4-Trichlorobenzene	0.240 U	0.220 U	0.220 U	0.220 U	0.250 U	0.220 U	0.220 U	0.220 U	20,000	Eco
1,2,4-Trimethylbenzene	**0.110 J**	0.0930 U	0.0930 U	**0.110 J**	0.110 U	**0.0980 J**	0.0930 U	0.0930 U	200,000	Eco
1,2-Dibromo-3-chloropropane	0.830 U	0.780 U	0.780 U	0.780 U	0.890 U	0.780 U	0.780 U	0.780 U	69.0	HH
1,2-Dibromoethane (EDB)	0.210 U	0.190 U	0.190 U	0.190 U	0.220 U	0.190 U	0.190 U	0.190 U	140	HH
1,2-Dichlorobenzene	0.0670 U	0.0630 U	0.0630 U	0.0630 U	0.0720 U	0.0630 U	0.0630 U	0.0630 U	2,260	Eco
1,2-Dichloroethane (EDC)	0.0570 U	0.0540 U	0.0540 U	0.0540 U	0.0620 U	0.0540 U	0.0540 U	0.0540 U	590	HH
1,2-Dichloropropane	0.0690 U	0.0650 U	0.0650 U	0.0650 U	0.0740 U	0.0650 U	0.0650 U	0.0650 U	4,500	HH
1,3,5-Trimethylbenzene	0.0430 U	0.0400 U	0.0400 U	0.0400 U	0.0460 U	0.0400 U	0.0400 U	0.0400 U	150,000	HH
1,3-Dichlorobenzene	0.0740 U	0.0700 U	0.0700 U	0.0700 U	0.0800 U	0.0700 U	0.0700 U	0.0700 U	2,260	Eco
1,3-Dichloropropane	0.0630 U	0.0590 U	0.0590 U	0.0590 U	0.0670 U	0.0590 U	0.0590 U	0.0590 U	20,000,000	HH
1,4-Dichlorobenzene	0.110 U	0.100 U	0.100 U	0.100 U	0.120 U	0.100 U	0.100 U	0.100 U	17,000	HH
2,2-Dichloropropane	0.110 U	0.100 U	0.100 U	0.100 U	0.120 U	0.100 U	0.100 U	0.100 U	4,500	HH
2-Butanone (MEK)	1.70 U	**4.30 J**	**12.0 J**	1.60 U	**4.90 J**	**2.40 J**	1.60 U	1.60 U	200,000,000	HH
2-Chlorotoluene	0.0540 U	0.0510 U	0.0510 U	0.0510 U	0.0580 U	0.0510 U	0.0510 U	0.0510 U	20,000,000	HH
2-Hexanone	0.830 U	0.780 U	0.780 U	0.780 U	0.890 U	0.780 U	0.780 U	0.780 U	1,250,000	Eco
4-Chlorotoluene	0.0980 U	0.0920 U	0.0920 U	0.0920 U	0.110 U	0.0920 U	0.0920 U	0.0920 U	72,000,000	HH
4-Isopropyltoluene	0.0880 U	0.0830 U	0.0830 U	0.0830 U	0.0940 U	0.0830 U	0.0830 U	0.0830 U	200,000	Eco
4-Methyl-2-pentanone (MIBK)	0.260 U	0.240 U	**0.330 J**	0.240 U	0.280 U	0.240 U	0.240 U	0.240 U	1,250,000	Eco
Acetone	**88.0**	**54.0**	**160**	**9.90 J**	**67.0**	**22.0**	**7.90 J**	**10.0 J**	1,250,000	Eco
Benzene	**0.490 J**	0.140 U	**0.340 J**	0.140 U	**0.180 J**	0.140 U	**0.210 J**	0.140 U	1,200	HH
Bromobenzene	0.0980 U	0.0920 U	0.0920 U	0.0920 U	0.110 U	0.0920 U	0.0920 U	0.0920 U	1,800,000	HH
Bromochloromethane	0.270 U	0.250 U	0.250 U	0.250 U	0.290 U	0.250 U	0.250 U	0.250 U	1,900	HH
Bromodichloromethane	0.0470 U	0.0440 U	0.0440 U	0.0440 U	0.0500 U	0.0440 U	0.0440 U	0.0440 U	1,900	HH
Bromoform	0.270 U	0.250 U	0.250 U	0.250 U	0.290 U	0.250 U	0.250 U	0.250 U	360,000	HH
Bromomethane	0.450 U	0.420 U	**0.480 J**	0.420 U	0.480 U	0.420 U	**4.40 J**	0.420 U	17,000	HH
Carbon Disulfide	**0.180 J**	**0.490 J**	**0.180 J**	**0.590 J**	**0.240 J**	**2.70 J**	**1.60 J**	**0.580 J**	1,000,000	Eco
Carbon Tetrachloride	0.0830 U	0.0780 U	0.0780 U	0.0780 U	0.0890 U	0.0780 U	0.0780 U	0.0780 U	630	HH
Chlorobenzene	0.0570 U	0.0540 U	0.0540 U	0.0540 U	0.0620 U	0.0540 U	0.0540 U	0.0540 U	40,000	Eco
Chloroethane	0.320 U	0.300 U	0.300 U	0.300 U	0.340 U	0.300 U	0.300 U	0.300 U	61,000,000	HH
Chloroform	0.0510 U	0.0480 U	0.0480 U	0.0480 U	0.0550 U	0.0480 U	0.0480 U	0.0480 U	410	HH
Chloromethane	0.0610 U	0.0570 U	0.0570 U	0.0570 U	0.0650 U	0.0570 U	0.0570 U	0.0570 U	300,000	HH
cis-1,2-Dichloroethene	0.0860 U	0.0810 U	0.0810 U	0.0810 U	0.0920 U	0.0810 U	0.0810 U	0.0810 U	2,500,000	Eco
cis-1,3-Dichloropropene	0.0330 U	0.0310 U	0.0310 U	0.0310 U	0.0360 U	0.0310 U	0.0310 U	0.0310 U	8,100	HH
Dibromochloromethane	0.170 U	0.160 U	0.160 U	0.160 U	0.190 U	0.160 U	0.160 U	0.160 U	34,000	HH
Dibromomethane	0.190 U	0.180 U	0.180 U	0.180 U	0.210 U	0.180 U	0.180 U	0.180 U	110,000	HH
Dichlorodifluoromethane	0.0760 U	0.0720 U	0.0720 U	0.0720 U	0.0820 U	0.0720 U	0.0720 U	0.0720 U	730,000	Eco
Dichloromethane (Methylene Chloride)	**0.280 J**	**0.280 J**	**0.370 J**	**0.300 J**	**0.460 J**	**0.630 J**	0.140 U	**0.310 J**	20,000	HH
Ethylbenzene	0.0440 U	0.0410 U	0.0410 U	0.0410 U	0.0470 U	0.0410 U	0.0410 U	0.0410 U	2,260	Eco
Hexachlorobutadiene	0.180 U	0.170 U	0.170 U	0.170 U	0.200 U	0.170 U	0.170 U	0.170 U	22,000	HH
Isopropylbenzene	0.0330 U	0.0310 U	0.0310 U	0.0310 U	0.0360 U	0.0310 U	0.0310 U	0.0310 U	2,260	Eco
m,p-Xylenes	0.0990 U	0.0930 U	0.0930 U	0.0930 U	0.110 U	0.0930 U	0.0930 U	0.0930 U	120,000	Eco
Naphthalene	0.340 U	0.320 U	0.320 U	0.320 U	0.370 U	0.320 U	**0.500 J**	0.320 U	23,000	HH
n-Butylbenzene	0.0930 U	0.0880 U	0.0880 U	0.0880 U	0.100 U	0.0880 U	0.0880 U	0.0880 U	-	-
n-Propylbenzene	0.0660 U	0.0620 U	0.0620 U	0.0620 U	0.0710 U	0.0620 U	0.0620 U	0.0620 U	2,260	Eco
o-Xylene	0.0630 U	0.0590 U	0.0590 U	0.0590 U	0.0670 U	0.0590 U	0.0590 U	0.0590 U	1,000	Eco
sec-Butylbenzene	0.0690 U	0.0650 U	0.0650 U	0.0650 U	0.0740 U	0.0650 U	0.0650 U	0.0650 U	2,260	Eco
Styrene	0.0810 U	0.0760 U	0.0760 U	0.0760 U	0.0860 U	0.0760 U	0.0760 U	0.0760 U	300,000	Eco
tert-Butylbenzene	0.0570 U	0.0540 U	0.0540 U	0.0540 U	0.0620 U	0.0540 U	0.0540 U	0.0540 U	2,260	Eco
Tetrachloroethene (PCE)	0.130 U	0.120 U	0.120 U	0.120 U	0.140 U	0.120 U	0.120 U	0.120 U	1,600	HH
Toluene	**0.460 J**	**0.110 J**	**0.340 J**	**0.120 J**	**0.240 J**	**0.150 J**	0.0440 U	**0.140 J**	200,000	Eco
trans-1,2-Dichloroethene	0.0510 U	0.0480 U	0.0480 U	0.0480 U	0.0550 U	0.0480 U	0.0480 U	0.0480 U	200,000	HH
trans-1,3-Dichloropropene	0.110 U	0.100 U	0.100 U	0.100 U	0.120 U	0.100 U	0.100 U	0.100 U	8,100	HH
Trichloroethene (TCE)	0.140 U	0.130 U	0.130 U	0.130 U	0.150 U	0.130 U	0.130 U	0.130 U	130	HH
Trichlorofluoromethane	0.0570 U	0.0540 U	0.0540 U	0.0540 U	0.0620 U	0.0540 U	0.0540 U	0.0540 U	730,000	Eco
Vinyl Acetate	0.640 U	0.600 U	0.600 U	0.600 U	0.680 U	0.600 U	0.600 U	0.600 U	4,100,000	HH
Vinyl Chloride	0.0610 U	0.0570 U	0.0570 U	0.0570 U	0.0650 U	0.0570 U	0.0570 U	0.0570 U	2,200	HH

Notes:

µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-3b
2009 Sandblast Area AOPC - Laydown Area Soil Analytical Results
Volatile Organic Compounds
(Page 2 of 2)

Site ID	LD-05	LD-05	LD-06	LD-07	LD-08	LD-09	LD-10	LD-11*	Selected SLV (0-3 ft bgs)	SLV Source (0-3 ft bgs)
Sample ID	090320-LD-5So-0-1	090320-LD-5So-1-3	090319-LD-6-So	090319-LD-7-So	090319-LD-8-So	090319-LD-9-So	090319-LD-10-So	090319-LD-11-So		
Sample Date	3/20/2009	3/20/2009	3/19/2009	3/19/2009	3/19/2009	3/19/2009	3/19/2009	3/19/2009		
Sample Depth (Feet bgs)	0.0-1.0	1.0-3.0	0.0-0.17	0.0-0.17	0.0-0.17	0.0-0.17	0.0-0.17	0.0-0.17		
Volatile Organic Compounds (µg/kg dry)										
1,1,1,2-Tetrachloroethane	0.180 U	0.190 U	0.190 U	0.220 U	0.200 U	0.220 U	0.240 U	0.230 U	9,300	HH
1,1,1-Trichloroethane (TCA)	**0.580 J**	0.160 U	0.160 U	0.180 U	0.170 U	0.190 U	0.200 U	**0.490 J**	38,000,000	HH
1,1,2,2-Tetrachloroethane	0.0890 U	0.0920 U	0.0920 U	0.110 U	0.0990 U	0.110 U	0.120 U	0.120 U	2,800	HH
1,1,2-Trichloroethane	0.0880 U	0.0910 U	0.0910 U	0.110 U	0.0970 U	0.110 U	0.120 U	0.120 U	2,700	HH
1,1-Dichloroethane	**0.290 J**	0.0500 U	0.0500 U	0.0580 U	0.0530 U	0.0590 U	0.0620 U	0.0610 U	5,900	HH
1,1-Dichloroethene	0.0700 U	0.0730 U	0.0720 U	0.0840 U	0.0780 U	0.0860 U	0.0910 U	0.0880 U	680,000	HH
1,1-Dichloropropene	0.150 U	0.160 U	0.160 U	0.180 U	0.170 U	0.190 U	0.200 U	0.190 U	8,100	HH
1,2,3-Trichlorobenzene	0.140 U	0.150 U	0.150 U	0.170 U	0.160 U	0.180 U	0.190 U	0.180 U	20,000	Eco
1,2,3-Trichloropropane	0.270 U	0.280 U	0.280 U	0.330 U	0.300 U	0.330 U	0.350 U	0.340 U	95.0	HH
1,2,4-Trichlorobenzene	0.220 U	0.230 U	0.230 U	0.270 U	0.250 U	0.270 U	0.290 U	0.280 U	20,000	Eco
1,2,4-Trimethylbenzene	**0.260 J**	**0.160 J**	**0.380 J**	**0.190 J**	**0.240 J**	0.120 U	0.120 U	**0.205 J**	200,000	Eco
1,2-Dibromo-3-chloropropane	0.780 U	0.810 U	0.810 U	0.940 U	0.860 U	0.960 U	1.10 U	0.980 U	69.0	HH
1,2-Dibromoethane (EDB)	0.190 U	0.200 U	0.200 U	0.230 U	0.210 U	0.240 U	0.250 U	0.240 U	140	HH
1,2-Dichlorobenzene	0.0630 U	0.0650 U	0.0650 U	0.0760 U	0.0700 U	0.0770 U	0.0820 U	0.0790 U	2,260	Eco
1,2-Dichloroethane (EDC)	0.0540 U	0.0560 U	0.0560 U	0.0650 U	0.0600 U	0.0660 U	0.0700 U	0.0680 U	590	HH
1,2-Dichloropropane	0.0650 U	0.0670 U	0.0670 U	0.0780 U	0.0720 U	0.0800 U	0.0840 U	0.0820 U	4,500	HH
1,3,5-Trimethylbenzene	**0.0930 J**	0.0420 U	**0.100 J**	0.0480 U	0.0450 U	0.0490 U	0.0520 U	0.0510 U	150,000	HH
1,3-Dichlorobenzene	0.0700 U	0.0730 U	0.0720 U	0.0840 U	0.0780 U	0.0860 U	0.0910 U	0.0880 U	2,260	Eco
1,3-Dichloropropane	0.0590 U	0.0610 U	0.0610 U	0.0710 U	0.0650 U	0.0720 U	0.0760 U	0.0740 U	20,000,000	HH
1,4-Dichlorobenzene	**0.160 J**	**0.140 J**	0.110 U	0.120 U	0.120 U	0.130 U	0.130 U	0.130 U	17,000	HH
2,2-Dichloropropane	0.100 U	0.110 U	0.110 U	0.120 U	0.120 U	0.130 U	0.130 U	0.130 U	4,500	HH
2-Butanone (MEK)	**13.0 J**	**2.30 J**	**14.0 J**	**13.0 J**	**12.0 J**	**15.0 J**	**32.0**	**8.80 J**	200,000,000	HH
2-Chlorotoluene	0.0510 U	0.0530 U	0.0530 U	0.0620 U	0.0570 U	0.0630 U	0.0660 U	0.0640 U	20,000,000	HH
2-Hexanone	0.780 U	0.810 U	0.810 U	0.940 U	0.860 U	0.960 U	1.10 U	0.980 U	1,250,000	Eco
4-Chlorotoluene	0.0920 U	0.0950 U	0.0950 U	0.120 U	0.110 U	0.120 U	0.120 U	0.120 U	72,000,000	HH
4-Isopropyltoluene	**0.350 J**	0.0860 U	**1.60 J**	**0.340 J**	**0.290 J**	**12.0 J**	**0.900 J**	0.110 U	200,000	Eco
4-Methyl-2-pentanone (MIBK)	**0.550 J**	0.250 U	**0.690 J**	**0.500 J**	0.270 U	0.300 U	**0.670 J**	**0.510 J**	1,250,000	Eco
Acetone	**150**	**18.0 J**	**150**	**180**	**150**	**250**	**330**	**124**	1,250,000	Eco
Benzene	**0.450 J**	0.150 U	**1.20 J**	**0.540 J**	**0.310 J**	0.220 U	**0.700 J**	**0.390 J**	1,200	HH
Bromobenzene	0.0920 U	0.0950 U	0.0950 U	0.120 U	0.110 U	0.120 U	0.120 U	0.120 U	1,800,000	HH
Bromochloromethane	0.250 U	0.260 U	0.260 U	0.300 U	0.280 U	0.310 U	0.330 U	0.320 U	1,900	HH
Bromodichloromethane	0.0440 U	0.0460 U	0.0460 U	0.0530 U	0.0490 U	0.0540 U	0.0570 U	0.0560 U	1,900	HH
Bromoform	0.250 U	0.260 U	0.260 U	0.300 U	0.280 U	0.310 U	0.330 U	0.320 U	360,000	HH
Bromomethane	**0.500 J**	**0.840 J**	0.440 U	**0.530 J**	**0.570 J**	0.520 U	0.550 U	0.530 U	17,000	HH
Carbon Disulfide	**0.530 J**	**1.40 J**	**1.60 J**	**0.750 J**	**6.90**	**0.830 J**	**0.360 J**	**0.715 J**	1,000,000	Eco
Carbon Tetrachloride	0.0780 U	0.0810 U	0.0810 U	0.0940 U	0.0860 U	0.0960 U	0.110 U	0.0980 U	630	HH
Chlorobenzene	0.0540 U	0.0560 U	0.0560 U	0.0650 U	0.0600 U	0.0660 U	0.0700 U	0.0680 U	40,000	Eco
Chloroethane	0.300 U	0.310 U	0.310 U	0.360 U	0.340 U	0.370 U	0.390 U	0.380 U	61,000,000	HH
Chloroform	0.0480 U	0.0500 U	0.0500 U	0.0580 U	0.0530 U	0.0590 U	0.0620 U	0.0610 U	410	HH
Chloromethane	0.0570 U	0.0590 U	0.0590 U	0.0690 U	0.0630 U	0.0700 U	0.0740 U	0.0720 U	300,000	HH
cis-1,2-Dichloroethene	0.0810 U	0.0840 U	0.0840 U	0.0970 U	0.0900 U	0.0990 U	0.110 U	0.110 U	2,500,000	Eco
cis-1,3-Dichloropropene	0.0310 U	0.0320 U	0.0320 U	0.0380 U	0.0350 U	0.0380 U	0.0400 U	0.0390 U	8,100	HH
Dibromochloromethane	0.160 U	0.170 U	0.170 U	0.200 U	0.180 U	0.200 U	0.210 U	0.210 U	34,000	HH
Dibromomethane	0.180 U	0.190 U	0.190 U	0.220 U	0.200 U	0.220 U	0.240 U	0.230 U	110,000	HH
Dichlorodifluoromethane	**16.0**	0.0750 U	**0.260 J**	0.0870 U	0.0800 U	0.0880 U	0.0930 U	**0.695 J**	730,000	Eco
Dichloromethane (Methylene Chloride)	**0.770 J**	**0.480 J**	0.150 U	**0.390 J**	**0.500 J**	0.180 U	**0.240 J**	**0.430 J**	20,000	HH
Ethylbenzene	**0.180 J**	**0.0720 J**	**0.320 J**	**0.0720 J**	**0.0770 J**	0.0500 U	0.0530 U	**0.100 J**	2,260	Eco
Hexachlorobutadiene	0.170 U	0.180 U	0.180 U	0.210 U	0.190 U	0.210 U	0.220 U	0.220 U	22,000	HH
Isopropylbenzene	0.0310 U	0.0320 U	0.0320 U	0.0380 U	0.0350 U	0.0380 U	0.0400 U	0.0390 U	2,260	Eco
m,p-Xylenes	**0.410 J**	**0.150 J**	**0.440 J**	**0.140 J**	**0.140 J**	0.120 U	0.120 U	**0.250 J**	120,000	Eco
Naphthalene	**1.50 J**	**0.520 J**	**0.850 J**	**0.540 J**	**0.470 J**	0.390 U	0.420 U	**0.550 J**	23,000	HH
n-Butylbenzene	0.0880 U	0.0910 U	**0.0920 J**	0.110 U	0.0970 U	0.110 U	0.120 U	0.120 U	-	-
n-Propylbenzene	0.0620 U	0.0640 U	**0.150 J**	0.0750 U	0.0690 U	0.0760 U	0.0800 U	0.0780 U	2,260	Eco
o-Xylene	**0.180 J**	0.0610 U	**0.170 J**	0.0710 U	0.0650 U	0.0720 U	0.0760 U	0.0740 U	1,000	Eco
sec-Butylbenzene	0.0650 U	0.0670 U	0.0670 U	0.0780 U	0.0720 U	0.0800 U	0.0840 U	0.0820 U	2,260	Eco
Styrene	0.0760 U	0.0790 U	0.0790 U	0.0910 U	0.0840 U	0.0930 U	0.0980 U	0.0960 U	300,000	Eco
tert-Butylbenzene	0.0540 U	0.0560 U	0.0560 U	0.0650 U	0.0600 U	0.0660 U	0.0700 U	0.0680 U	2,260	Eco
Tetrachloroethene (PCE)	0.120 U	0.130 U	0.130 U	0.150 U	0.140 U	0.150 U	0.160 U	0.160 U	1,600	HH
Toluene	**0.630 J**	**0.360 J**	**1.50 J**	**0.800 J**	**0.630 J**	**5.80 J**	**0.990 J**	**0.415 J**	200,000	Eco
trans-1,2-Dichloroethene	0.0480 U	0.0500 U	0.0500 U	0.0580 U	0.0530 U	0.0590 U	0.0620 U	0.0610 U	200,000	HH
trans-1,3-Dichloropropene	0.100 U	0.110 U	0.110 U	0.120 U	0.120 U	0.130 U	0.130 U	0.130 U	8,100	HH
Trichloroethene (TCE)	0.130 U	0.140 U	0.140 U	0.160 U	0.150 U	0.160 U	0.170 U	0.170 U	130	HH
Trichlorofluoromethane	0.0540 U	0.0560 U	0.0560 U	0.0650 U	0.0600 U	0.0660 U	0.0700 U	0.0680 U	730,000	Eco
Vinyl Acetate	0.600 U	0.620 U	0.620 U	0.720 U	0.670 U	0.740 U	0.780 U	0.760 U	4,100,000	HH
Vinyl Chloride	0.0570 U	0.0590 U	0.0590 U	0.0690 U	0.0630 U	0.0700 U	0.0740 U	0.0720 U	2,200	HH

Notes:

µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-3c
2009 Sandblast Area AOPC - Laydown Area Soil Analytical Results
Semivolatile Organic Compounds
(Page 1 of 2)

Site ID	LD-01	LD-01	LD-02	LD-02	LD-03	LD-03	LD-04	LD-04	Selected SLV (0-3 ft bgs)	SLV Source (0-3 ft bgs)
Sample ID	090320-LD-1So-0-1	090320-LD-1So-1-3	090320-LD-2So-0-1	090320-LD-2So-1-3	090320-LD-3So-0-1	090320-LD-3So-1-3	090320-LD-4So-0-1	090320-LD-4So-1-3		
Sample Date	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009	3/20/2009		
Sample Depth (Feet bgs)	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0	0.0-1.0	1.0-3.0		
Semivolatile Organic Compounds (µg/kg dry)										
1,2,4-Trichlorobenzene	38.0 U	1.50 U	38.0 U	1.50 U	38.0 U	1.50 U	1.50 U	1.50 U	20,000	Eco
1,2-Dichlorobenzene	33.0 U	1.30 U	33.0 U	1.30 U	33.0 U	1.30 U	1.30 U	1.30 U	2,260	Eco
1,3-Dichlorobenzene	40.0 U	1.60 U	40.0 U	1.60 U	40.0 U	1.60 U	1.60 U	1.60 U	2,260	Eco
1,4-Dichlorobenzene	48.0 U	1.90 U	48.0 U	1.90 U	48.0 U	1.90 U	1.90 U	1.90 U	17,000	HH
2,4,5-Trichlorophenol	75.0 U	3.00 U	75.0 U	3.00 U	75.0 U	3.00 U	3.00 U	3.00 U	4,000	Eco
2,4,6-Trichlorophenol	45.0 U	1.80 U	45.0 U	1.80 U	45.0 U	1.80 U	1.80 U	1.80 U	10,000	Eco
2,4-Dichlorophenol	45.0 U	1.80 U	45.0 U	1.80 U	45.0 U	1.80 U	1.80 U	1.80 U	20,000	Eco
2,4-Dimethylphenol	140 U	5.50 U	140 U	5.50 U	140 U	5.50 U	5.50 U	5.50 U	20,000	Eco
2,4-Dinitrophenol	900 U	36.0 U	900 U	36.0 U	900 U	36.0 U	36.0 U	36.0 U	20,000	Eco
2,4-Dinitrotoluene	70.0 U	2.80 U	70.0 U	2.80 U	70.0 U	2.80 U	2.80 U	2.80 U	5,500	HH
2,6-Dinitrotoluene	70.0 U	2.80 U	70.0 U	2.80 U	70.0 U	2.80 U	2.80 U	2.80 U	240,000	HH
2-Chloronaphthalene	90.0 U	3.60 U	90.0 U	3.60 U	90.0 U	3.60 U	3.60 U	3.60 U	82,000,000	HH
2-Chlorophenol	43.0 U	1.70 U	43.0 U	1.70 U	43.0 U	1.70 U	1.70 U	1.70 U	60,000	Eco
2-Methylphenol	85.0 U	3.40 U	85.0 U	3.40 U	85.0 U	3.40 U	3.40 U	3.40 U	50,000	Eco
2-Nitroaniline	68.0 U	2.70 U	68.0 U	2.70 U	68.0 U	2.70 U	2.70 U	2.70 U	6,000,000	HH
2-Nitrophenol	65.0 U	2.60 U	65.0 U	2.60 U	65.0 U	2.60 U	2.60 U	2.60 U	180,000,000	HH
3,3'-Dichlorobenzidine	93.0 U	3.70 U	93.0 U	3.70 U	93.0 U	3.70 U	3.70 U	3.70 U	4,800	HH
3-Nitroaniline	65.0 U	2.60 U	65.0 U	2.60 U	65.0 U	2.60 U	2.60 U	2.60 U	70,000	Eco
4,6-Dinitro-2-methylphenol	43.0 U	1.70 U	43.0 U	1.70 U	43.0 U	1.70 U	1.70 U	1.70 U	49,000	HH
4-Bromophenyl Phenyl Ether	35.0 U	1.40 U	35.0 U	1.40 U	35.0 U	1.40 U	1.40 U	1.40 U	-	-
4-Chloro-3-methylphenol	53.0 U	2.10 U	53.0 U	2.10 U	53.0 U	2.10 U	2.10 U	2.10 U	62,000,000	HH
4-Chloroaniline	53.0 U	2.10 U	53.0 U	2.10 U	53.0 U	2.10 U	2.10 U	2.10 U	8,600	HH
4-Chlorophenyl Phenyl Ether	50.0 U	2.00 U	50.0 U	2.00 U	50.0 U	2.00 U	2.00 U	2.00 U	-	-
4-Nitroaniline	85.0 U	3.40 U	85.0 U	3.40 U	85.0 U	3.40 U	3.40 U	3.40 U	40,000	Eco
4-Nitrophenol	750 U	30.0 U	750 U	30.0 U	750 U	30.0 U	30.0 U	30.0 U	7,000	Eco
Aniline	38.0 U	1.50 U	38.0 U	1.50 U	38.0 U	1.50 U	1.50 U	1.50 U	200,000	Eco
Benzoic Acid	2,400 U	96.0 U	2,400 U	96.0 U	2,400 U	96.0 U	96.0 U	96.0 U	200,000	Eco
Benzyl Alcohol	93.0 U	3.70 U	93.0 U	3.70 U	93.0 U	3.70 U	3.70 U	3.70 U	2,260	Eco
Bis(2-chloroethoxy)methane	33.0 U	1.30 U	33.0 U	1.30 U	33.0 U	1.30 U	1.30 U	1.30 U	730,000	Eco
Bis(2-chloroethyl) Ether	60.0 U	2.40 U	60.0 U	2.40 U	60.0 U	2.40 U	2.40 U	2.40 U	1,000	HH
Bis(2-chloroisopropyl) Ether	30.0 U	1.20 U	30.0 U	1.20 U	30.0 U	1.20 U	1.20 U	1.20 U	1,000	HH
Bis(2-ethylhexyl) Phthalate	**7,600**	**360**	**9,200**	**39.0 J**	**3,500**	**170**	**170**	**15.0 J**	4,500	Eco
Butyl Benzyl Phthalate	38.0 U	1.50 U	38.0 U	1.50 U	38.0 U	1.50 U	1.50 U	1.50 U	450	Eco
Carbazole	**270**	**2.20 J**	**280**	**6.50 J**	**530**	**9.20**	**1.40 J**	1.30 U	2,260	Eco
Dibenzofuran	**69.0 J**	1.30 U	**45.0 J**	**3.30 J**	**220**	**1.90 J**	1.30 U	1.30 U	2.00	Eco
Diethyl Phthalate	88.0 U	3.50 U	88.0 U	3.50 U	88.0 U	3.50 U	3.50 U	3.50 U	100,000	Eco
Dimethyl Phthalate	45.0 U	1.80 U	45.0 U	1.80 U	45.0 U	1.80 U	1.80 U	1.80 U	150,000	HH
Di-n-butyl Phthalate	**180 J**	**28.0**	**130 J**	2.60 U	65.0 U	**3.70 J**	2.60 U	2.60 U	450	Eco
Di-n-octyl Phthalate	30.0 U	1.20 U	30.0 U	1.20 U	30.0 U	1.20 U	1.20 U	1.20 U	450	Eco
Hexachlorobenzene	53.0 U	2.10 U	53.0 U	2.10 U	53.0 U	2.10 U	2.10 U	2.10 U	1,800	HH
Hexachlorobutadiene	35.0 U	1.40 U	35.0 U	1.40 U	35.0 U	1.40 U	1.40 U	1.40 U	22,000	HH
Hexachlorocyclopentadiene	380 U	15.0 U	380 U	15.0 U	380 U	15.0 U	15.0 U	15.0 U	10,000	Eco
Hexachloroethane	55.0 U	2.20 U	55.0 U	2.20 U	55.0 U	2.20 U	2.20 U	2.20 U	150,000	HH
Isophorone	40.0 U	1.60 U	40.0 U	1.60 U	40.0 U	1.60 U	1.60 U	1.60 U	1,800,000	HH
Nitrobenzene	50.0 U	2.00 U	50.0 U	2.00 U	50.0 U	2.00 U	2.00 U	2.00 U	8,000	Eco
N-Nitrosodimethylamine	160 U	6.10 U	160 U	6.10 U	160 U	6.10 U	6.10 U	6.10 U	34.0	HH
N-Nitrosodi-n-propylamine	80.0 U	3.20 U	80.0 U	3.20 U	80.0 U	3.20 U	3.20 U	3.20 U	250	HH
N-Nitrosodiphenylamine	55.0 U	2.20 U	55.0 U	2.20 U	55.0 U	2.20 U	2.20 U	2.20 U	20,000	Eco
p-cresol (4-Methylphenol)	73.0 U	2.90 U	73.0 U	2.90 U	73.0 U	2.90 U	2.90 U	2.90 U	50,000	Eco
Pentachlorophenol	220 U	8.50 U	220 U	8.50 U	220 U	8.50 U	8.50 U	8.50 U	2,100	Eco
Phenol	48.0 U	**2.40 J**	48.0 U	**35.0**	48.0 U	1.90 U	**2.00 J**	**3.00 J**	30,000	Eco
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)										
2-Methylnaphthalene	**40.0 J**	1.20 U	**40.0 J**	**3.30 J**	**43.0 J**	1.20 U	1.20 U	1.20 U	4,100,000	HH
Acenaphthene	**160 J**	**1.10 J**	**140 J**	**9.00**	**430**	**4.10 J**	**1.50 J**	1.00 U	19,000,000	HH
Acenaphthylene	35.0 U	1.40 U	**37.0 J**	1.40 U	35.0 U	1.40 U	1.40 U	1.40 U	23,000	HH
Anthracene	**330**	**1.80 J**	**280**	**14.0**	**780**	**11.0**	**2.00 J**	1.40 U	93,000,000	HH
Fluorene	**130 J**	1.70 U	**120 J**	**9.70**	**380**	**3.80 J**	1.70 U	1.70 U	12,000,000	HH
Naphthalene	**66.0 J**	1.30 U	**69.0 J**	**6.30 J**	**62.0 J**	**2.20 J**	1.30 U	1.30 U	23,000	HH
Phenanthrene	**1,900**	**15.0**	**1,900**	**71.0**	**4,000**	**59.0**	**16.0**	1.30 U	93,000,000	HH
Total LPAHs (KM, capped; NDs at MDL)	**2,621 J**	**21.2 J**	**2,546 J**	**111 J**	**5,687 J**	**81.5 J**	**23.5 J**	8.10 U	29,000	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)										
Benzo(a)anthracene	**1,500**	**15.0**	**2,700**	**37.0**	**2,100**	**71.0**	**27.0**	1.40 U	2,700	HH
Benzo(a)pyrene	**1,400**	**19.0**	**2,800**	**35.0**	**1,900**	**72.0**	**38.0**	1.60 U	270	HH
Benzo(b)fluoranthene	**2,000**	**27.0**	**4,100**	**45.0**	**2,600**	**100**	**53.0**	2.50 U	2,700	HH
Benzo(g,h,i)perylene	**950**	**21.0**	**2,000**	**33.0**	**1,100**	**54.0**	**42.0**	2.30 U	27,000	HH
Benzo(k)fluoranthene	**770**	**10.0**	**1,400**	**16.0**	**880**	**36.0**	**19.0**	2.50 U	27,000	HH
Chrysene	**1,900**	**21.0**	**3,500**	**42.0**	**2,300**	**85.0**	**39.0**	**1.80 J**	270,000	HH
Dibenz(a,h)anthracene	**270**	**4.40 J**	**640**	**7.00**	**350**	**15.0**	**9.70**	2.20 U	270	HH
Fluoranthene	**3,100**	**29.0**	**4,700**	**71.0**	**5,000**	**130**	**36.0**	2.20 U	8,900,000	HH
Indeno(1,2,3-cd)pyrene	**1,100**	**16.0**	**2,200**	**25.0**	**1,300**	**55.0**	**35.0**	1.90 U	2,700	HH
Pyrene	**2,800**	**29.0**	**4,400**	**76.0**	**4,200**	**120**	**47.0**	**2.10 J**	6,700,000	HH
Total HPAHs (KM, capped; NDs at MDL)	**15,790**	**191 J**	**28,440**	**387**	**21,730**	**738**	**346**	**16.5 J**	1,100	Eco

Notes:

µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-3c
2009 Sandblast Area AOPC - Laydown Area Soil Analytical Results
Semivolatile Organic Compounds
(Page 2 of 2)

Site ID	LD-05	LD-05	LD-06	LD-07	LD-08	LD-09	LD-10	LD-11*	Selected SLV (0-3 ft bgs)	SLV Source (0-3 ft bgs)
Sample ID	090320-LD-5So-0-1	090320-LD-5So-1-3	090319-LD-6-So	090319-LD-7-So	090319-LD-8-So	090319-LD-9-So	090319-LD-10-So	090319-LD-11-So		
Sample Date	3/20/2009	3/20/2009	3/19/2009	3/19/2009	3/19/2009	3/19/2009	3/19/2009	3/19/2009		
Sample Depth (Feet bgs)	0.0-1.0	1.0-3.0	0.0-0.17	0.0-0.17	0.0-0.17	0.0-0.17	0.0-0.17	0.0-0.17		
Semivolatile Organic Compounds (µg/kg dry)										
1,2,4-Trichlorobenzene	1.50 U	1.50 U	15.0 U	15.0 U	1.50 U	1.50 U	15.0 U	1.50 U	20,000	Eco
1,2-Dichlorobenzene	1.30 U	1.30 U	13.0 U	13.0 U	1.30 U	1.30 U	13.0 U	1.30 U	2,260	Eco
1,3-Dichlorobenzene	1.60 U	1.60 U	16.0 U	16.0 U	1.60 U	1.60 U	16.0 U	1.60 U	2,260	Eco
1,4-Dichlorobenzene	1.90 U	1.90 U	19.0 U	19.0 U	1.90 U	1.90 U	19.0 U	1.90 U	17,000	HH
2,4,5-Trichlorophenol	3.00 U	3.00 U	30.0 U	30.0 U	3.00 U	3.00 U	30.0 U	3.00 U	4,000	Eco
2,4,6-Trichlorophenol	1.80 U	1.80 U	18.0 U	18.0 U	1.80 U	1.80 U	18.0 U	1.80 U	10,000	Eco
2,4-Dichlorophenol	1.80 U	1.80 U	18.0 U	18.0 U	1.80 U	1.80 U	18.0 U	1.80 U	20,000	Eco
2,4-Dimethylphenol	5.50 U	5.50 U	55.0 U	55.0 U	5.50 U	5.50 U	55.0 U	5.50 U	20,000	Eco
2,4-Dinitrophenol	36.0 U	36.0 U	360 U	360 U	36.0 U	36.0 U	360 U	36.0 U	20,000	Eco
2,4-Dinitrotoluene	2.80 U	2.80 U	28.0 U	28.0 U	2.80 U	2.80 U	28.0 U	2.80 U	5,500	HH
2,6-Dinitrotoluene	2.80 U	2.80 U	28.0 U	28.0 U	2.80 U	2.80 U	28.0 U	2.80 U	240,000	HH
2-Chloronaphthalene	3.60 U	3.60 U	36.0 U	36.0 U	3.60 U	3.60 U	36.0 U	3.60 U	82,000,000	HH
2-Chlorophenol	1.70 U	1.70 U	17.0 U	17.0 U	1.70 U	1.70 U	17.0 U	1.70 U	60,000	Eco
2-Methylphenol	3.40 U	3.40 U	34.0 U	34.0 U	3.40 U	3.40 U	34.0 U	3.40 U	50,000	Eco
2-Nitroaniline	2.70 U	2.70 U	27.0 U	27.0 U	2.70 U	2.70 U	27.0 U	2.70 U	6,000,000	HH
2-Nitrophenol	2.60 U	2.60 U	26.0 U	26.0 U	2.60 U	2.60 U	26.0 U	2.60 U	180,000,000	HH
3,3'-Dichlorobenzidine	3.70 U	3.70 U	37.0 U	37.0 U	3.70 U	3.70 U	37.0 U	3.70 U	4,800	HH
3-Nitroaniline	2.60 U	2.60 U	26.0 U	26.0 U	2.60 U	2.60 U	26.0 U	2.60 U	70,000	Eco
4,6-Dinitro-2-methylphenol	1.70 U	1.70 U	17.0 U	17.0 U	1.70 U	1.70 U	17.0 U	1.70 U	49,000	HH
4-Bromophenyl Phenyl Ether	1.40 U	1.40 U	14.0 U	14.0 U	1.40 U	1.40 U	14.0 U	1.40 U	-	-
4-Chloro-3-methylphenol	2.10 U	2.10 U	21.0 U	21.0 U	2.10 U	2.10 U	21.0 U	2.10 U	62,000,000	HH
4-Chloroaniline	2.10 U	2.10 U	21.0 U	21.0 U	2.10 U	2.10 U	21.0 U	2.10 U	8,600	HH
4-Chlorophenyl Phenyl Ether	2.00 U	2.00 U	20.0 U	20.0 U	2.00 U	2.00 U	20.0 U	2.00 U	-	-
4-Nitroaniline	3.40 U	3.40 U	34.0 U	34.0 U	3.40 U	3.40 U	34.0 U	3.40 U	40,000	Eco
4-Nitrophenol	30.0 U	30.0 U	300 U	300 U	30.0 U	30.0 U	300 U	30.0 U	7,000	Eco
Aniline	1.50 U	1.50 U	15.0 U	15.0 U	1.50 U	1.50 U	15.0 U	1.50 U	200,000	Eco
Benzoic Acid	96.0 U	96.0 U	**980 J**	960 U	96.0 U	**100 J**	960 U	**120 J**	200,000	Eco
Benzyl Alcohol	3.70 U	3.70 U	37.0 U	37.0 U	3.70 U	3.70 U	37.0 U	3.70 U	2,260	Eco
Bis(2-chloroethoxy)methane	1.30 U	1.30 U	13.0 U	13.0 U	1.30 U	1.30 U	13.0 U	1.30 U	730,000	Eco
Bis(2-chloroethyl) Ether	2.40 U	2.40 U	24.0 U	24.0 U	2.40 U	2.40 U	24.0 U	2.40 U	1,000	HH
Bis(2-chloroisopropyl) Ether	1.20 U	1.20 U	12.0 U	12.0 U	1.20 U	1.20 U	12.0 U	1.20 U	1,000	HH
Bis(2-ethylhexyl) Phthalate	**980**	**320**	**9,900**	**13,000**	**260**	**630**	**13,000**	**895**	4,500	Eco
Butyl Benzyl Phthalate	1.50 U	1.50 U	15.0 U	15.0 U	1.50 U	1.50 U	15.0 U	1.50 U	450	Eco
Carbazole	**46.0**	**9.50**	**150**	**240**	**2.60 J**	**22.0**	**130**	**32.5**	2,260	Eco
Dibenzofuran	**10.0**	**1.80 J**	**59.0 J**	**58.0 J**	1.30 U	**4.50 J**	**38.0 J**	**7.80 J**	2.00	Eco
Diethyl Phthalate	3.50 U	3.50 U	35.0 U	35.0 U	3.50 U	3.50 U	35.0 U	**8.80 J**	100,000	Eco
Dimethyl Phthalate	1.80 U	1.80 U	**32.0 J**	**30.0 J**	1.80 U	1.80 U	**41.0 J**	1.80 U	150,000	HH
Di-n-butyl Phthalate	**46.0**	**22.0**	**130**	**52.0 J**	**7.60 J**	**6.10 J**	**280**	**165**	450	Eco
Di-n-octyl Phthalate	1.20 U	1.20 U	12.0 U	12.0 U	1.20 U	1.20 U	12.0 U	1.20 U	450	Eco
Hexachlorobenzene	2.10 U	2.10 U	21.0 U	21.0 U	2.10 U	2.10 U	21.0 U	2.10 U	1,800	HH
Hexachlorobutadiene	1.40 U	1.40 U	14.0 U	14.0 U	1.40 U	1.40 U	14.0 U	1.40 U	22,000	HH
Hexachlorocyclopentadiene	15.0 U	15.0 U	150 U	150 U	15.0 U	15.0 U	150 U	15.0 U	10,000	Eco
Hexachloroethane	2.20 U	2.20 U	22.0 U	22.0 U	2.20 U	2.20 U	22.0 U	2.20 U	150,000	HH
Isophorone	1.60 U	1.60 U	16.0 U	16.0 U	1.60 U	1.60 U	16.0 U	1.60 U	1,800,000	HH
Nitrobenzene	2.00 U	2.00 U	20.0 U	20.0 U	2.00 U	2.00 U	20.0 U	2.00 U	8,000	Eco
N-Nitrosodimethylamine	6.10 U	6.10 U	61.0 U	61.0 U	6.10 U	6.10 U	61.0 U	6.10 U	34.0	HH
N-Nitrosodi-n-propylamine	3.20 U	3.20 U	32.0 U	32.0 U	3.20 U	3.20 U	32.0 U	3.20 U	250	HH
N-Nitrosodiphenylamine	2.20 U	2.20 U	**27.0 J**	22.0 U	2.20 U	2.20 U	22.0 U	2.20 U	20,000	Eco
p-cresol (4-Methylphenol)	2.90 U	2.90 U	29.0 U	29.0 U	2.90 U	2.90 U	29.0 U	2.90 U	50,000	Eco
Pentachlorophenol	**11.0 J**	8.50 U	85.0 U	85.0 U	8.50 U	8.50 U	85.0 U	**32.0 J**	2,100	Eco
Phenol	**3.70 J**	1.90 U	19.0 U	19.0 U	1.90 U	1.90 U	19.0 U	1.90 U	30,000	Eco
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)										
2-Methylnaphthalene	**6.90**	1.20 U	**29.0 J**	**27.0 J**	1.20 U	**2.80 J**	**36.0 J**	**7.60 J**	4,100,000	HH
Acenaphthene	**30.0**	**4.70 J**	**210**	**110**	1.00 U	**14.0**	**99.0 J**	**20.0**	19,000,000	HH
Acenaphthylene	**4.60 J**	1.40 U	**15.0 J**	**31.0 J**	1.40 U	**2.60 J**	**25.0 J**	**3.15 J**	23,000	HH
Anthracene	**90.0**	**13.0**	**220**	**270**	**2.90 J**	**29.0**	**170**	**55.0**	93,000,000	HH
Fluorene	**29.0**	**5.20 J**	**130**	**130**	1.70 U	**13.0**	**75.0 J**	**17.5**	12,000,000	HH
Naphthalene	**8.90**	**4.00 J**	**78.0 J**	**41.0 J**	**3.90 J**	**6.70 J**	**45.0 J**	**8.75 J**	23,000	HH
Phenanthrene	**460**	**79.0**	**1,100**	**1,800**	**16.0**	**180**	**810**	**260**	93,000,000	HH
Total LPAHs (KM, capped; NDs at MDL)	**623 J**	**107 J**	**1,753 J**	**2,382 J**	**25.8 J**	**245 J**	**1,224 J**	**364 J**	29,000	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)										
Benzo(a)anthracene	**530**	**96.0**	**960**	**1,800**	**16.0**	**190**	**660**	**275**	2,700	HH
Benzo(a)pyrene	**450**	**86.0**	**1,100**	**1,600**	**17.0**	**200**	**670**	**265**	270	HH
Benzo(b)fluoranthene	**640**	**120**	**1,500**	**2,600**	**25.0**	**290**	**1,100**	**365**	2,700	HH
Benzo(g,h,i)perylene	**280**	**54.0**	**820**	**1,100**	**11.0**	**120**	**440**	**165**	27,000	HH
Benzo(k)fluoranthene	**220**	**45.0**	**560**	**860**	**8.30 J**	**89.0**	**360**	**125**	27,000	HH
Chrysene	**620**	**120**	**1,100**	**2,100**	**20.0**	**220**	**870**	**305**	270,000	HH
Dibenz(a,h)anthracene	**91.0**	**18.0**	**240**	**350**	2.20 U	**38.0**	**130**	**47.0**	270	HH
Fluoranthene	**1,100**	**170**	**1,700**	**3,300**	**31.0**	**350**	**1,300**	**555**	8,900,000	HH
Indeno(1,2,3-cd)pyrene	**320**	**60.0**	**880**	**1,200**	**12.0**	**130**	**450**	**180**	2,700	HH
Pyrene	**950**	**150**	**1,600**	**2,800**	**28.0**	**310**	**1,300**	**500**	6,700,000	HH
Total HPAHs (KM, capped; NDs at MDL)	**5,201**	**919**	**10,460**	**17,710**	**171 J**	**1,937**	**7,280**	**2,782**	1,100	Eco

Notes:

µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-3d
2009 Sandblast Area AOPC - Soil Analytical Results
Lead

Location	Sample ID	Sample Date	Sample Grain Size	Sample Interval (feet bgs)	Lead
Metals by EPA Method 6010B (mg/kg dry)					
SB-01	090127-SB-SB1-0-1So	1/27/2009	<250um	0.0-1.0	**398**
SB-01	090127-SB-SB1-0-1So	1/27/2009	<2mm	0.0-1.0	**258**
SB-01	090127-SB-SB1-1-3So	1/27/2009	<250um	1.0-3.0	**16.2**
SB-01	090127-SB-SB1-1-3So	1/27/2009	<2mm	1.0-3.0	**13.9**
SB-02	090127-SB-SB2-0-1So	1/27/2009	<250um	0.0-1.0	**220**
SB-02	090127-SB-SB2-0-1So	1/27/2009	<2mm	0.0-1.0	**176**
SB-02	090127-SB-SB2-1-3So	1/27/2009	<250um	1.0-3.0	**12.0**
SB-02	090127-SB-SB2-1-3So	1/27/2009	<2mm	1.0-3.0	**8.10 J**
SB-03	090127-SB-SB3-0-1So	1/27/2009	<250um	0.0-1.0	**921**
SB-03	090127-SB-SB3-0-1So	1/27/2009	<2mm	0.0-1.0	**768**
SB-03	090127-SB-SB3-1-3So	1/27/2009	<250um	1.0-3.0	**44.8**
SB-03	090127-SB-SB3-1-3So	1/27/2009	<2mm	1.0-3.0	**25.2**
SB-04	090127-SB-SB4-0-1So	1/27/2009	<250um	0.0-1.0	**90.8**
SB-04	090127-SB-SB4-0-1So	1/27/2009	<2mm	0.0-1.0	**52.7**
SB-04	090127-SB-SB4-1-3So	1/27/2009	<250um	1.0-3.0	**9.5 J**
SB-04	090127-SB-SB4-1-3So	1/27/2009	<2mm	1.0-3.0	**6.90 J**
SB-05	090127-SB-SB5-0-1So	1/27/2009	<250um	0.0-1.0	**525**
SB-05	090127-SB-SB5-0-1So	1/27/2009	<2mm	0.0-1.0	**451**
SB-05	090127-SB-SB5-1-3So	1/27/2009	<250um	1.0-3.0	**738**
SB-05	090127-SB-SB5-1-3So	1/27/2009	<2mm	1.0-3.0	**426**
SB-06*	090127-SB-SB6-0-1So	1/27/2009	<250um	0.0-1.0	**90.6**
SB-06*	090127-SB-SB6-0-1So	1/27/2009	<2mm	0.0-1.0	**42.4**
SB-06	090127-SB-SB6-1-3So	1/27/2009	<250um	1.0-3.0	**6.80 J**
SB-06	090127-SB-SB6-1-3So	1/27/2009	<2mm	1.0-3.0	**6.50 J**
SB-07	090127-SB-SB7-0-1So	1/27/2009	<250um	0.0-1.0	**99.4**
SB-07	090127-SB-SB7-0-1So	1/27/2009	<2mm	0.0-1.0	**90.0**
SB-07	090127-SB-SB7-1-3So	1/27/2009	<250um	1.0-3.0	**6.60 J**
SB-07	090127-SB-SB7-1-3So	1/27/2009	<2mm	1.0-3.0	**14.8**
SB-08	090127-SB-SB8-0-1So	1/27/2009	<250um	0.0-1.0	**53.9**
SB-08	090127-SB-SB8-0-1So	1/27/2009	<2mm	0.0-1.0	**27.5**
SB-08	090127-SB-SB8-1-3So	1/27/2009	<250um	1.0-3.0	**7.90 J**
SB-08	090127-SB-SB8-1-3So	1/27/2009	<2mm	1.0-3.0	**6.70 J**
Selected SLV (0-3 ft bgs)					**25.5**

Notes:
mg/kg = milligram per kilogram
bgs = below ground surface
MDL = Method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
The source for the selected lead SLV is the Reference area UPL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-3e
2009 Sandblast Area AOPC - Erodibility Study Surface Soil Grab Sample Analytical Results
Petroleum Hydrocarbons and Volatile Organic Compounds

Site ID	SB-EUA-02	SB-EUA-04	SB-EUA-06	SB-EUA-08	SB-EUB-02	SB-EUB-03	SB-EUB-12	SB-EUB-15	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	090318-SB-EUA-2So	090318-SB-EUA-4So	090318-SB-EUA-6So	090318-SB-EUA-8So	090318-SB-EUB-2So	090318-SB-EUB-3So	090318-SB-EUB-12So	090318-SB-EUB-15So		
Sample Date	3/18/2009	3/18/2009	3/18/2009	3/18/2009	3/18/2009	3/18/2009	3/18/2009	3/18/2009		
Sample Depth (Feet bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.17	0.0-0.17		
Petroleum Hydrocarbons (mg/kg dry)										
Gasoline Range Organics	1.50 U	**3.20 J**	**2.10 J**	**1.80 J**	1.50 U	1.50 U	1.50 U	**2.90 J**	13,000	HH
Volatile Organic Compounds (µg/kg dry)										
1,1,1,2-Tetrachloroethane	9.40 U	0.190 U	0.190 U	0.210 U	0.200 U	0.240 U	0.210 U	0.210 U	9,300	HH
1,1,1-Trichloroethane (TCA)	4.30 U	0.160 U	0.160 U	0.180 U	0.170 U	0.200 U	0.170 U	0.180 U	38,000,000	HH
1,1,2,2-Tetrachloroethane	7.40 U	0.0900 U	0.0930 U	0.110 U	0.0990 U	0.120 U	0.110 U	0.110 U	2,800	HH
1,1,2-Trichloroethane	7.90 U	0.0890 U	0.0920 U	0.110 U	0.0980 U	0.120 U	0.100 U	0.110 U	2,700	HH
1,1-Dichloroethane	9.30 U	0.0490 U	0.0510 U	0.0560 U	0.0540 U	0.0630 U	0.0550 U	0.0560 U	5,900	HH
1,1-Dichloroethene	7.30 U	0.0710 U	0.0740 U	0.0820 U	0.0780 U	0.0920 U	0.0800 U	0.0810 U	680,000	HH
1,1-Dichloropropene	9.40 U	0.160 U	0.160 U	0.180 U	0.170 U	0.200 U	0.170 U	0.180 U	8,100	HH
1,2,3-Trichlorobenzene	12.0 U	0.150 U	0.150 U	0.170 U	0.160 U	0.190 U	0.160 U	0.170 U	20,000	Eco
1,2,3-Trichloropropane	17.0 U	0.280 U	0.290 U	0.320 U	0.300 U	0.360 U	0.310 U	0.320 U	95.0	HH
1,2,4-Trichlorobenzene	6.50 U	0.230 U	0.230 U	0.260 U	0.250 U	0.290 U	0.250 U	0.260 U	20,000	Eco
1,2,4-Trimethylbenzene	3.70 U	**0.280 J**	**0.180 J**	**0.230 J**	**0.160 J**	**0.220 J**	**0.240 J**	0.110 U	200,000	Eco
1,2-Dibromo-3-chloropropane	140 U	0.790 U	0.820 U	0.910 U	0.870 U	1.10 U	0.890 U	0.900 U	69.0	HH
1,2-Dibromoethane (EDB)	6.90 U	0.200 U	0.200 U	0.230 U	0.220 U	0.250 U	0.220 U	0.220 U	140	HH
1,2-Dichlorobenzene	6.60 U	0.0640 U	0.0660 U	0.0740 U	0.0700 U	0.0830 U	0.0720 U	0.0730 U	2,260	Eco
1,2-Dichloroethane (EDC)	9.70 U	0.0550 U	0.0570 U	0.0630 U	0.0600 U	0.0710 U	0.0620 U	0.0630 U	590	HH
1,2-Dichloropropane	11.0 U	0.0660 U	0.0680 U	0.0760 U	0.0720 U	0.0850 U	0.0740 U	0.0750 U	4,500	HH
1,3,5-Trimethylbenzene	6.50 U	0.0410 U	0.0420 U	0.0470 U	0.0450 U	0.0530 U	0.0460 U	0.0460 U	150,000	HH
1,3-Dichlorobenzene	6.10 U	0.0710 U	0.0740 U	0.0820 U	0.0780 U	0.0920 U	0.0800 U	0.0810 U	2,260	Eco
1,3-Dichloropropane	5.30 U	0.0600 U	0.0620 U	0.0690 U	0.0660 U	0.0770 U	0.0670 U	0.0680 U	20,000,000	HH
1,4-Dichlorobenzene	5.70 U	0.110 U	0.110 U	0.120 U	0.120 U	0.140 U	0.120 U	0.120 U	17,000	HH
2,2-Dichloropropane	9.50 U	0.110 U	0.110 U	0.120 U	0.120 U	0.140 U	0.120 U	0.120 U	4,500	HH
2-Butanone (MEK)	290 U	**21.0 J**	**5.00 J**	**32.0**	**9.90 J**	**39.0**	**50.0**	**32.0**	200,000,000	HH
2-Chlorotoluene	4.90 U	0.0520 U	0.0540 U	0.0600 U	0.0570 U	0.0670 U	0.0580 U	0.0590 U	20,000,000	HH
2-Hexanone	170 U	**5.50 J**	0.820 U	**4.70 J**	0.870 U	1.10 U	**8.80 J**	0.900 U	1,250,000	Eco
4-Chlorotoluene	5.50 U	0.0930 U	0.0960 U	0.110 U	0.110 U	0.120 U	0.110 U	0.110 U	72,000,000	HH
4-Isopropyltoluene	6.10 U	0.0840 U	0.0870 U	0.0970 U	**2.50 J**	**0.480 J**	0.0940 U	**0.990 J**	200,000	Eco
4-Methyl-2-pentanone (MIBK)	460 U	**0.770 J**	0.260 U	**0.790 J**	0.270 U	0.320 U	**1.20 J**	0.280 U	1,250,000	Eco
Acetone	230 U	**170**	**47.0**	**290**	**98.0**	**350**	**540**	**270**	1,250,000	Eco
Benzene	5.70 U	0.300 U	**0.160 J**	**0.470 J**	**0.200 J**	0.380 U	**1.00 J**	0.230 U	1,200	HH
Bromobenzene	8.20 U	0.0930 U	0.0960 U	0.110 U	0.110 U	0.120 U	0.110 U	0.110 U	1,800,000	HH
Bromochloromethane	9.40 U	0.260 U	0.270 U	0.300 U	0.280 U	0.330 U	0.290 U	0.290 U	1,900	HH
Bromodichloromethane	6.20 U	0.0450 U	0.0460 U	0.0520 U	0.0490 U	0.0580 U	0.0500 U	0.0510 U	1,900	HH
Bromoform	13.0 U	0.260 U	0.270 U	0.300 U	0.280 U	0.330 U	0.290 U	0.290 U	360,000	HH
Bromomethane	29.0 U	0.430 U	**5.00 J**	0.490 U	**1.20 J**	0.550 U	0.480 U	0.490 U	17,000	HH
Carbon Disulfide	7.40 U	**0.680 J**	**0.670 J**	**1.00 J**	**0.620 J**	**0.940 J**	**0.960 J**	**0.700 J**	1,000,000	Eco
Carbon Tetrachloride	11.0 U	0.0790 U	0.0820 U	0.0910 U	0.0870 U	0.110 U	0.0890 U	0.0900 U	630	HH
Chlorobenzene	6.60 U	0.0550 U	0.0570 U	0.0630 U	0.0600 U	0.0710 U	0.0620 U	0.0630 U	40,000	Eco
Chloroethane	24.0 U	0.310 U	0.320 U	0.350 U	0.340 U	0.400 U	0.340 U	0.350 U	61,000,000	HH
Chloroform	**19.0 J**	0.0490 U	0.0510 U	**0.260 J**	0.0540 U	0.0630 U	**0.290 J**	0.0560 U	410	HH
Chloromethane	8.70 U	0.0580 U	**0.250 J**	0.0670 U	**0.230 J**	0.0750 U	0.0650 U	0.0660 U	300,000	HH
cis-1,2-Dichloroethene	**12.0 J**	0.0820 U	0.0850 U	0.0950 U	0.0900 U	0.110 U	0.0920 U	0.0940 U	2,500,000	Eco
cis-1,3-Dichloropropene	8.30 U	0.0320 U	0.0330 U	0.0370 U	0.0350 U	0.0410 U	0.0360 U	0.0360 U	8,100	HH
Dibromochloromethane	9.10 U	0.170 U	0.170 U	0.190 U	0.180 U	0.210 U	0.190 U	0.190 U	34,000	HH
Dibromomethane	18.0 U	0.190 U	0.190 U	0.210 U	0.200 U	0.240 U	0.210 U	0.210 U	110,000	HH
Dichlorodifluoromethane	**94.0**	0.0730 U	0.0760 U	0.0840 U	0.0800 U	0.0940 U	0.0820 U	0.0830 U	730,000	Eco
Dichloromethane (Methylene Chloride)	**460**	**0.390 J**	**0.330 J**	**0.550 J**	0.160 U	0.190 U	0.160 U	0.170 U	20,000	HH
Ethylbenzene	6.10 U	**0.110 J**	0.0430 U	**0.100 J**	0.0460 U	0.0540 U	**0.200 J**	0.0480 U	2,260	Eco
Hexachlorobutadiene	15.0 U	0.180 U	0.180 U	0.200 U	0.190 U	0.230 U	0.200 U	0.200 U	22,000	HH
Isopropylbenzene	6.10 U	0.0320 U	0.0330 U	0.0370 U	0.0350 U	0.0410 U	0.0360 U	0.0360 U	2,260	Eco
m,p-Xylenes	13.0 U	**0.190 J**	0.0980 U	**0.240 J**	0.110 U	0.130 U	**0.360 J**	0.110 U	120,000	Eco
Naphthalene	7.90 U	**0.540 J**	0.340 U	0.380 U	0.360 U	0.420 U	**0.450 J**	0.370 U	23,000	HH
n-Butylbenzene	6.50 U	0.0890 U	0.0920 U	0.110 U	0.0980 U	0.120 U	0.100 U	0.110 U	-	-
n-Propylbenzene	5.70 U	0.0630 U	0.0650 U	0.0730 U	0.0690 U	0.0810 U	0.0710 U	0.0720 U	2,260	Eco
o-Xylene	6.90 U	0.0600 U	0.0620 U	0.0690 U	0.0660 U	0.0770 U	0.0670 U	0.0680 U	1,000	Eco
sec-Butylbenzene	6.50 U	0.0660 U	0.0680 U	0.0760 U	0.0720 U	0.0850 U	0.0740 U	0.0750 U	2,260	Eco
Styrene	6.10 U	0.0770 U	0.0800 U	0.0890 U	0.0850 U	0.100 U	0.0860 U	0.0880 U	300,000	Eco
tert-Butylbenzene	4.30 U	0.0550 U	0.0570 U	0.0630 U	0.0600 U	0.0710 U	0.0620 U	0.0630 U	2,260	Eco
Tetrachloroethene (PCE)	8.30 U	0.130 U	0.130 U	0.140 U	0.140 U	0.160 U	0.140 U	0.140 U	1,600	HH
Toluene	6.10 U	**0.770 J**	**0.240 J**	**1.30 J**	**0.550 J**	**0.860 J**	**1.20 J**	**0.760 J**	200,000	Eco
trans-1,2-Dichloroethene	9.90 U	0.0490 U	0.0510 U	0.0560 U	0.0540 U	0.0630 U	0.0550 U	0.0560 U	200,000	HH
trans-1,3-Dichloropropene	12.0 U	0.110 U	0.110 U	0.120 U	0.120 U	0.140 U	0.120 U	0.120 U	8,100	HH
Trichloroethene (TCE)	13.0 U	0.140 U	0.140 U	0.160 U	0.150 U	0.170 U	0.150 U	0.150 U	130	HH
Trichlorofluoromethane	11.0 U	0.0550 U	0.0570 U	0.0630 U	0.0600 U	0.0710 U	0.0620 U	0.0630 U	730,000	Eco
Vinyl Acetate	52.0 U	0.610 U	0.630 U	0.700 U	0.670 U	0.790 U	0.680 U	0.690 U	4,100,000	HH
Vinyl Chloride	13.0 U	0.0580 U	0.0600 U	0.0670 U	0.0640 U	0.0750 U	0.0650 U	0.0660 U	2,200	HH

Notes:
µg/kg = microgram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV

Table 6-3f
2009 Sandblast Area AOPC - Erodibility Study Surface Soil Composite Sample Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Butyltins, Pesticides, General Chemistry Parameters, and Grain Size

Site ID	SB-EUA*	SB-EUB	**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Sample ID	090318-SB-EUA-So	090318-SB-EUB-So		
Sample Date	3/18/2009	3/18/2009		
Sample Depth (Feet bgs)	0.0-0.17	0.0-0.17		
PCB Aroclors (µg/kg dry)				
Aroclor 1016	2.10 U	2.10 U	371	Eco
Aroclor 1221	2.10 U	2.10 U	371	Eco
Aroclor 1232	2.10 U	2.10 U	371	Eco
Aroclor 1242	2.10 U	2.10 U	371	Eco
Aroclor 1248	2.10 U	2.10 U	371	Eco
Aroclor 1254	2.10 U	2.10 U	371	Eco
Aroclor 1260	**27.0**	**67.0**	371	Eco
Aroclor 1262	2.10 U	2.10 U	371	Eco
Aroclor 1268	2.10 U	2.10 U	371	Eco
Total PCBs as Aroclors (NDs at MDL) [1]	**29.1 J**	**69.1 J**	371	Eco
Metals (mg/kg dry)				
Aluminum	**13,000**	**8,050**	31,400	UPL
Antimony	**0.220 J**	**0.340 J**	0.270	Eco
Arsenic	**5.91**	**5.94**	5.40	UPL
Barium	**108**	**75.8**	330	Eco
Beryllium	**0.350 J**	**0.240 J**	21.0	Eco
Cadmium	**0.458**	**1.06**	0.360	Eco
Calcium	**5,920 J**	**4,400 J**	10,400	UPL
Chromium	**108 J**	**162 J**	28.1	UPL
Cobalt	**13.4**	**10.9**	19.9	UPL
Copper	**46.4 J**	**71.6 J**	56.7	UPL
Iron	**30,800**	**27,700**	36,900	UPL
Lead	**302**	**319**	25.5	UPL
Magnesium	**8,140**	**7,350**	12,400	UPL
Manganese	**479**	**369**	885	UPL
Mercury	**0.0390**	**0.0330**	0.0660	UPL
Nickel	**57.5 J**	**74.9 J**	38.0	Eco
Potassium	**1,110**	**643**	2,050	UPL
Selenium	**0.650 J**	**0.500 J**	0.520	Eco
Silver	**0.127**	**0.175**	4.20	Eco
Sodium	**310**	**264**	341	UPL
Thallium	**0.117**	**0.0670**	1.00	Eco
Vanadium	**69.8**	**59.3**	104	UPL
Zinc	**123 J**	**203 J**	71.7	UPL
Petroleum Hydrocarbons (mg/kg dry)				
Diesel Range Organics	**33.0 J**	**69.0**	23,000	HH
Residual Range Organics	**400**	**1,000**	40,000	HH
Gasoline Range Organics	-	-	13,000	HH
Butyltins (µg/kg dry)				
Dibutyltin	**6.70**	**9.10**	28,000	Eco
Monobutyltin	**8.25**	**3.20**	28,000	Eco
Tributyltin	**12.8**	**3.20**	28,000	Eco
Pesticides (µg/kg dry)				
4,4'-DDD	0.110 U	0.300 U	21.0	Eco
4,4'-DDE	**0.440 J**	**0.250 J**	21.0	Eco
4,4'-DDT	**4.40**	**10.0**	21.0	Eco
Aldrin	0.160 U	0.160 U	4.90	Eco
BHC (alpha)	0.110 U	0.110 U	340	HH
BHC (beta)	0.180 U	0.660 U	960	HH
BHC (delta)	0.140 U	**0.0780 J**	340	HH
BHC (gamma) Lindane	0.0800 U	1.30 U	2,000	HH
Chlordane (alpha)	0.100 U	0.100 U	7,200	HH
Chlordane (gamma)	0.630 U	0.660 U	7,200	HH
Dieldrin	0.140 U	0.810 U	4.90	Eco
Endosulfan I	0.110 U	0.660 U	20,000	Eco
Endosulfan II	0.140 U	**0.240 J**	20,000	Eco
Endosulfan Sulfate	0.110 U	**0.770**	20,000	Eco
Endrin	0.0940 U	0.660 U	4.90	Eco
Endrin Aldehyde	0.630 U	0.700 U	4.90	Eco
Endrin Ketone	0.630 U	2.90 U	4.90	Eco
Heptachlor	**0.185 J**	**0.380 J**	480	HH
Heptachlor Epoxide	0.0840 U	0.180 U	240	HH
Methoxychlor	0.630 U	1.50 U	500,000	Eco
Toxaphene	43.0 U	190 U	2,000	HH
General Chemistry Parameters (mg/kg) and Grain Size (%)				
Carbon, Total Organic	**25,400**	**36,200**	-	-
Solids, Total	**752,000**	**755,000**	-	-
Gravel (>2.00 mm)	**27.8**	**34.2**	-	-
Sand, Very Coarse (1.00 - 2.00 mm)	**6.48**	**5.89**	-	-
Sand, Coarse (0.50 - 1.00 mm)	**4.98**	**5.83**	-	-
Sand, Medium (0.25 - 0.50 mm)	**7.38**	**7.18**	-	-
Sand, Fine (0.125 - 0.25 mm)	**10.7**	**10.3**	-	-
Sand, Very Fine (0.0625 - 0.125 mm)	**7.53**	**7.71**	-	-
Silt (0.039 - 0.0625 mm)	**31.2**	**25.1**	-	-
Clay (<0.039 mm)	**6.62**	**5.16**	-	-

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed
-- = SLV for analyte not available

[1] Only Aroclors 1254 and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Sandlbast Area AOPC soil samples.
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-3g
2009 Sandblast Area AOPC - Erodibility Study Surface Soil Composite Sample Analytical Results
Semivolatile Organic Compounds

Site ID	SB-EUA*	SB-EUB	Selected SLV (0-3 ft bgs)	SLV Source (0-3 ft bgs)
Sample ID	090318-SB-EUA-So	090318-SB-EUB-So		
Sample Date	3/18/2009	3/18/2009		
Sample Depth (Feet bgs)	0.0-0.17	0.0-0.17		
Semivolatile Organic Compounds (µg/kg dry)				
1,2,4-Trichlorobenzene	38.0 U	75.0 U	20,000	Eco
1,2-Dichlorobenzene	33.0 U	65.0 U	2,260	Eco
1,3-Dichlorobenzene	40.0 U	80.0 U	2,260	Eco
1,4-Dichlorobenzene	48.0 U	95.0 U	17,000	HH
2,4,5-Trichlorophenol	75.0 U	150 U	4,000	Eco
2,4,6-Trichlorophenol	45.0 U	90.0 U	10,000	Eco
2,4-Dichlorophenol	45.0 U	90.0 U	20,000	Eco
2,4-Dimethylphenol	140 U	280 U	20,000	Eco
2,4-Dinitrophenol	900 U	1,800 U	20,000	Eco
2,4-Dinitrotoluene	70.0 U	140 U	5,500	HH
2,6-Dinitrotoluene	70.0 U	140 U	240,000	HH
2-Chloronaphthalene	90.0 U	180 U	82,000,000	HH
2-Chlorophenol	43.0 U	85.0 U	60,000	Eco
2-Methylphenol	85.0 U	170 U	50,000	Eco
2-Nitroaniline	68.0 U	140 U	6,000,000	HH
2-Nitrophenol	65.0 U	130 U	180,000,000	HH
3,3'-Dichlorobenzidine	93.0 U	190 U	4,800	HH
3-Nitroaniline	65.0 U	130 U	70,000	Eco
4,6-Dinitro-2-methylphenol	43.0 U	85.0 U	49,000	HH
4-Bromophenyl Phenyl Ether	35.0 U	70.0 U	-	-
4-Chloro-3-methylphenol	53.0 U	110 U	62,000,000	HH
4-Chloroaniline	53.0 U	110 U	8,600	HH
4-Chlorophenyl Phenyl Ether	50.0 U	100 U	-	-
4-Nitroaniline	85.0 U	170 U	40,000	Eco
4-Nitrophenol	750 U	1,500 U	7,000	Eco
Aniline	38.0 U	75.0 U	200,000	Eco
Benzoic Acid	2,400 U	4,800 U	200,000	Eco
Benzyl Alcohol	93.0 U	190 U	2,260	Eco
Bis(2-chloroethoxy)methane	33.0 U	65.0 U	730,000	Eco
Bis(2-chloroethyl) Ether	60.0 U	120 U	1,000	HH
Bis(2-chloroisopropyl) Ether	30.0 U	60.0 U	1,000	HH
Bis(2-ethylhexyl) Phthalate	**58,000**	**260,000**	4,500	Eco
Butyl Benzyl Phthalate	38.0 U	75.0 U	450	Eco
Carbazole	**37.5 J**	**91.0 J**	2,260	Eco
Dibenzofuran	33.0 U	65.0 U	2.00	Eco
Diethyl Phthalate	88.0 U	180 U	100,000	Eco
Dimethyl Phthalate	45.0 U	90.0 U	150,000	HH
Di-n-butyl Phthalate	65.0 U	130 U	450	Eco
Di-n-octyl Phthalate	30.0 U	60.0 U	450	Eco
Hexachlorobenzene	53.0 U	110 U	1,800	HH
Hexachlorobutadiene	35.0 U	70.0 U	22,000	HH
Hexachlorocyclopentadiene	380 U	750 U	10,000	Eco
Hexachloroethane	55.0 U	110 U	150,000	HH
Isophorone	40.0 U	80.0 U	1,800,000	HH
Nitrobenzene	50.0 U	100 U	8,000	Eco
N-Nitrosodimethylamine	160 U	310 U	34.0	HH
N-Nitrosodi-n-propylamine	80.0 U	160 U	250	HH
N-Nitrosodiphenylamine	55.0 U	110 U	20,000	Eco
p-cresol (4-Methylphenol)	73.0 U	150 U	50,000	Eco
Pentachlorophenol	220 U	430 U	2,100	Eco
Phenol	48.0 U	95.0 U	30,000	Eco
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)				
2-Methylnaphthalene	30.0 U	60.0 U	4,100,000	HH
Acenaphthene	**34.5 J**	**68.0 J**	19,000,000	HH
Acenaphthylene	35.0 U	70.0 U	23,000	HH
Anthracene	**53.5 J**	**150 J**	93,000,000	HH
Fluorene	43.0 U	85.0 U	12,000,000	HH
Naphthalene	33.0 U	65.0 U	23,000	HH
Phenanthrene	**360**	**940**	93,000,000	HH
Total LPAHs (KM, capped; NDs at MDL)	**549 J**	**1,356 J**	29,000	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)				
Benzo(a)anthracene	**455**	**1,200**	2,700	HH
Benzo(a)pyrene	**435**	**1,000**	270	HH
Benzo(b)fluoranthene	**645**	**1,600**	2,700	HH
Benzo(g,h,i)perylene	**270**	**590**	27,000	HH
Benzo(k)fluoranthene	**230**	**570**	27,000	HH
Chrysene	**575**	**1,500**	270,000	HH
Dibenz(a,h)anthracene	**95.5 J**	**220 J**	270	HH
Fluoranthene	**825**	**2,100**	8,900,000	HH
Indeno(1,2,3-cd)pyrene	**300**	**690**	2,700	HH
Pyrene	**775**	**1,900**	6,700,000	HH
Total HPAHs (KM, capped; NDs at MDL)	**4,606 J**	**11,370 J**	1,100	Eco

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-3h
2008-2009 Sandblast Area AOPC Quarterly Groundwater Analytical Results
Metals, Petroleum Hydrocarbons, Butyltins, Polycyclic Aromatic Hydrodarbons, and General Chemistry Parameters
(Page 1 of 2)

Site ID	MW-11*	MW-11	MW-11*	MW-11*	MW-12	MW-12	MW-12	MW-12	MW-13	MW-13*	MW-13	MW-13	MW-14	MW-14	MW-14	MW-14	MW-15	MW-15	MW-15	MW-15	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	080415MW11GW	080715MW11GW	081020MW11GW	090112MW11GW	080415MW12GW	080715MW12GW	081021MW12GW	090113MW12GW	080414MW13GW	080714MW13GW	081020MW13GW	090112MW13GW	080414MW14GW	080714MW14GW	081021MW14GW	090113MW14GW	080414MW15GW	080714MW15GW	081021MW15GW	090113MW15GW				
Sample Date	4/15/2008	7/15/2008	10/20/2008	1/12/2009	4/15/2008	7/15/2008	10/21/2008	1/13/2009	4/14/2008	7/14/2008	10/20/2008	1/12/2009	4/14/2008	7/14/2008	10/21/2008	1/13/2009	4/14/2008	7/14/2008	10/21/2008	1/13/2009				
Sample Depth (Feet btc)	31	31	31	31	28	21	26	26	31	31	31	30	18	18	18	18	17	17	17	17				
Total Metals (µg/L)																								
Arsenic	**11.6**	**1.13**	**0.690**	**0.600**	**0.610**	**0.760**	**0.710**	**0.600**	**1.86**	**0.785**	**0.860**	**1.00**	**0.790**	**1.02**	**1.12**	**1.00**	**0.540**	**0.750**	**0.590**	**0.600**	0.0180	HH	0.0380	HH
Iron	**1,500**	**179**	**88.9**	**148**	50.4 U	**108**	**14.1 J**	20.0 U	55.6 U	**222**	**312**	**265**	**188**	**25.7**	**12.9 J**	43.2 U	**163**	**190**	**36.8**	**90.6**	300	HH	26,000	HH
Vanadium	**5.90 J**	**0.860**	**0.315**	**0.365**	**1.10 J**	**1.27**	**0.960**	**1.43**	**1.00 J**	0.200 U	0.0700 U	**0.130 J**	**1.80 J**	**1.64**	**2.00**	**1.72**	**1.40 J**	**1.68**	**1.30**	**1.57**	-	-	2.60	HH
Dissolved Metals (µg/L)																								
Arsenic	**8.99**	**1.11**	**0.610**	**0.550**	**0.610**	**0.870**	**0.620**	**0.800**	**1.79**	**0.780**	**0.900**	**0.900**	**0.840**	**1.01**	**0.970**	**0.900**	**0.510**	**0.630**	**0.620**	**0.600**	0.0180	HH	0.0380	HH
Calcium	**6,690**	-	-	-	**30,900**	-	-	-	**44,300**	-	-	-	**22,700**	-	-	-	**28,200**	-	-	-	116,000	Eco	116,000	Eco
Iron	4.00 U	**52.5**	20.0 U	20.0 U	4.00 U	**7.10 J**	20.0 U	20.0 U	**12.4 J**	**202**	**270**	**202**	4.00 U	4.00 U	4.00 U	20.0 U	**6.40 J**	4.00 U	4.00 U	20.0 U	300	HH	1,000	Eco
Magnesium	**883**	-	-	-	**8,430**	-	-	-	**14,000**	-	-	-	**6,140**	-	-	-	**7,120**	-	-	-	82,000	Eco	82,000	Eco
Potassium	**2,610**	-	-	-	**2,260**	-	-	-	**1,480 J**	-	-	-	**1,170 J**	-	-	-	**782 J**	-	-	-	53,000	Eco	53,000	Eco
Sodium	**89,400**	-	-	-	**13,400**	-	-	-	**18,400**	-	-	-	**6,860**	-	-	-	**7,620**	-	-	-	680,000	Eco	680,000	Eco
Vanadium	**3.10 J**	0.690 U	**0.205 J**	**0.145 J**	0.800 U	**1.05**	**0.820**	**1.17**	**1.10 J**	0.200 U	0.0700 U	0.0700 U	**1.10 J**	**1.68**	**1.98**	**1.64**	**0.900 J**	**1.19**	**1.22**	**1.41**	20.0	Eco	2.60	HH
Total Petroleum Hydrocarbons (µg/L)																								
Diesel Range Organics	12.0 U	**18.0 J**	11.0 U	110 U	120 U	**17.0 J**	12.0 U	12.0 U	12.0 U	100 U	12.0 U	120 U	11.0 U	100 U	12.0 U	13.0 U	13.0 U	110 U	12.0 U	120 U	-	-	90.0	HH
Residual Range Organics	20.0 U	110 U	19.0 U	110 U	22.0 U	110 U	21.0 U	110 U	20.0 U	100 U	21.0 U	120 U	19.0 U	100 U	20.0 U	120 U	22.0 U	110 U	20.0 U	120 U	-	-	290	HH
Gasoline Range Organics	**13.5 J**	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	**15.0 J**	**23.5 J**	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	-	-	100	HH
Total Butyltins (µg/L)																								
Monobutyltin	**0.0260 J**	0.0290 U	0.0290 U	0.0290 U	0.0110 U	0.0290 U	0.0290 U	0.0290 U	**0.0140 J**	0.0290 U	0.0290 U	0.0290 U	0.0110 U	0.0290 U	0.0290 U	0.0290 U	0.0110 U	0.0290 U	0.0290 U	0.0290 U	0.0630	Eco	0.0630	Eco
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/L)																								
Phenanthrene	0.0230 U	0.0220 U	0.0220 U	0.0220 U	0.0230 U	0.0220 U	0.0220 U	0.0220 U	**0.0840 J**	0.0220 U	0.0220 U	0.0240 U	0.0240 U	0.0220 U	0.0220 U	0.0250 U	0.0230 U	0.0240 U	0.0220 U	0.0240 U	6.30	Eco	0.140	HH
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/L)																								
Benzo(b)fluoranthene	0.0180 U	0.0170 U	0.0170 U	0.0170 U	**0.0180 J**	0.0170 U	0.0170 U	0.0170 U	0.0200 U	0.0170 U	0.0170 U	0.0190 U	0.0190 U	0.0170 U	0.0170 U	0.0200 U	0.0180 U	0.0190 U	0.0170 U	0.0190 U	0.00380	HH	0.0290	HH
Benzo(k)fluoranthene	0.0250 U	0.0240 U	0.0240 U	0.0240 U	0.0250 U	0.0240 U	0.0240 U	0.0240 U	0.0270 U	0.0240 U	0.0240 U	0.0260 U	0.0260 U	0.0240 U	0.0240 U	0.0280 U	0.0250 U	0.0270 U	0.0240 U	0.0260 U	0.00380	HH	0.290	HH
General Chemistry Parameters (mg/L)																								
Dissolved Bromide	**0.0140 J**	-	-	-	**0.0160 J**	-	-	-	0.0100 U	-	-	-	0.0100 U	-	-	-	0.0100 U	-	-	-	-	-	-	-
Dissolved Chloride	**2.50**	-	-	-	**4.40**	-	-	-	**3.00**	-	-	-	**2.10**	-	-	-	**2.40**	-	-	-	230	Eco	230	Eco
Dissolved Fluoride	**0.200**	-	-	-	**0.0820 J**	-	-	-	**0.0690 J**	-	-	-	**0.0550 J**	-	-	-	**0.0510 J**	-	-	-	-	-	1.50	HH
Dissolved Sulfate	**25.0**	-	-	-	**10.1**	-	-	-	**14.5**	-	-	-	**13.1**	-	-	-	**13.1**	-	-	-	-	-	-	-
Dissolved Ammonia	**0.0650 J**	-	-	-	**0.0500 J**	-	-	-	**0.100**	-	-	-	**0.0400 J**	-	-	-	**0.0300 J**	-	-	-	-	-	-	-
Dissolved Nitrate+Nitrite	**0.0185 J**	-	-	-	**0.110**	-	-	-	**0.00700 J**	-	-	-	**0.200**	-	-	-	**0.0260 J**	-	-	-	-	-	10.0	HH
Total Organic Carbon	**1.00**	-	-	-	**1.90**	-	-	-	**0.800**	-	-	-	**0.800**	-	-	-	**1.00**	-	-	-	-	-	-	-
Dissolved Organic Carbon	**1.80 J**	-	-	-	**1.70**	-	-	-	**0.700**	-	-	-	**2.50 J**	-	-	-	**1.00**	-	-	-	-	-	-	-
Dissolved Carbonate as CaCO3	**38.0 J**	-	-	-	1.00 U	-	-	-	1.00 U	-	-	-	1.00 U	-	-	-	1.00 U	-	-	-	-	-	-	-

Notes:

µg/L = microgram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-3h
2008-2009 Sandblast Area AOPC Quarterly Groundwater Analytical Results
Metals, Petroleum Hydrocarbons, Butyltins, Polycyclic Aromatic Hydrodarbons, and General Chemistry Parameters
(Page 2 of 2)

Site ID	MW-13	MW-13	MW-14	MW-14	MW-14	MW-14	MW-15	MW-15	MW-15	MW-15	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	081020MW13GW	090112MW13GW	080414MW14GW	080714MW14GW	081021MW14GW	090113MW14GW	080414MW15GW	080714MW15GW	081021MW15GW	090113MW15GW				
Sample Date	10/20/2008	1/12/2009	4/14/2008	7/14/2008	10/21/2008	1/13/2009	4/14/2008	7/14/2008	10/21/2008	1/13/2009				
Sample Depth (Feet btc)	31	30	18	18	18	18	17	17	17	17				
Total Metals (µg/L)														
Arsenic	**0.860**	**1.00**	**0.790**	**1.02**	**1.12**	**1.00**	**0.540**	**0.750**	**0.590**	**0.600**	0.0180	HH	0.0380	HH
Iron	**312**	**265**	**188**	**25.7**	**12.9 J**	43.2 U	**163**	**190**	**36.8**	**90.6**	300	HH	26,000	HH
Vanadium	0.0700 U	**0.130 J**	**1.80 J**	**1.64**	**2.00**	**1.72**	**1.40 J**	**1.68**	**1.30**	**1.57**	-	-	2.60	HH
Dissolved Metals (µg/L)														
Arsenic	**0.900**	**0.900**	**0.840**	**1.01**	**0.970**	**0.900**	**0.510**	**0.630**	**0.620**	**0.600**	0.0180	HH	0.0380	HH
Calcium	-	-	**22,700**	-	-	-	**28,200**	-	-	-	116,000	Eco	116,000	Eco
Iron	**270**	**202**	4.00 U	4.00 U	4.00 U	20.0 U	**6.40 J**	4.00 U	4.00 U	20.0 U	300	HH	1,000	Eco
Magnesium	-	-	**6,140**	-	-	-	**7,120**	-	-	-	82,000	Eco	82,000	Eco
Potassium	-	-	**1,170 J**	-	-	-	**782 J**	-	-	-	53,000	Eco	53,000	Eco
Sodium	-	-	**6,860**	-	-	-	**7,620**	-	-	-	680,000	Eco	680,000	Eco
Vanadium	0.0700 U	0.0700 U	**1.10 J**	**1.68**	**1.98**	**1.64**	**0.900 J**	**1.19**	**1.22**	**1.41**	20.0	Eco	2.60	HH
Total Petroleum Hydrocarbons (µg/L)														
Diesel Range Organics	12.0 U	120 U	11.0 U	100 U	12.0 U	13.0 U	13.0 U	110 U	12.0 U	120 U	-	-	90.0	HH
Residual Range Organics	21.0 U	120 U	19.0 U	100 U	20.0 U	120 U	22.0 U	110 U	20.0 U	120 U	-	-	290	HH
Gasoline Range Organics	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U	-	-	100	HH
Total Butyltins (µg/L)														
Monobutyltin	0.0290 U	0.0290 U	0.0110 U	0.0290 U	0.0290 U	0.0290 U	0.0110 U	0.0290 U	0.0290 U	0.0290 U	0.0630	Eco	0.0630	Eco
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/L)														
Phenanthrene	0.0220 U	0.0240 U	0.0240 U	0.0220 U	0.0220 U	0.0250 U	0.0230 U	0.0240 U	0.0220 U	0.0240 U	6.30	Eco	0.140	HH
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/L)														
Benzo(b)fluoranthene	0.0170 U	0.0190 U	0.0190 U	0.0170 U	0.0170 U	0.0200 U	0.0180 U	0.0190 U	0.0170 U	0.0190 U	0.00380	HH	0.0290	HH
Benzo(k)fluoranthene	0.0240 U	0.0260 U	0.0260 U	0.0240 U	0.0240 U	0.0280 U	0.0250 U	0.0270 U	0.0240 U	0.0260 U	0.00380	HH	0.290	HH
General Chemistry Parameters (mg/L)														
Dissolved Bromide	-	-	0.0100 U	-	-	-	0.0100 U	-	-	-	-	-	-	-
Dissolved Chloride	-	-	**2.10**	-	-	-	**2.40**	-	-	-	230	Eco	230	Eco
Dissolved Fluoride	-	-	**0.0550 J**	-	-	-	**0.0510 J**	-	-	-	-	-	1.50	HH
Dissolved Sulfate	-	-	**13.1**	-	-	-	**13.1**	-	-	-	-	-	-	-
Dissolved Ammonia	-	-	**0.0400 J**	-	-	-	**0.0300 J**	-	-	-	-	-	-	-
Dissolved Nitrate+Nitrite	-	-	**0.200**	-	-	-	**0.0260 J**	-	-	-	-	-	10.0	HH
Total Organic Carbon	-	-	**0.800**	-	-	-	**1.00**	-	-	-	-	-	-	-
Dissolved Organic Carbon	-	-	**2.50 J**	-	-	-	**1.00**	-	-	-	-	-	-	-
Dissolved Carbonate as CaCO3	-	-	1.00 U	-	-	-	1.00 U	-	-	-	-	-	-	-

Notes:

µg/L = microgram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-3i
2008-2009 Sandblast Area AOPC Quarterly Groundwater Analytical Results
Volatile Organic Compounds
(Page 1 of 3)

Site ID	MW-11*	MW-11	MW-11*	MW-11*	MW-12	MW-12	Selected Discharge to Surface Water / Bioaccumulation SLV	SLV Source	Selected Direct Contact SLV	SLV Source
Sample ID	080415MW11GW	080715MW11GW	081020MW11GW	090112MW11GW	080415MW12GW	080715MW12GW				
Sample Date	4/15/2008	7/15/2008	10/20/2008	1/12/2009	4/15/2008	7/15/2008				
Sample Depth (Feet btc)	31	31	31	31	28	21				
Total Volatile Organic Compounds (µg/L)										
1,1,1,2-Tetrachloroethane	0.0450 U	-	-	-	0.0450 U	-	186	Eco	0.520	HH
1,1,1-Trichloroethane (TCA)	0.0620 U	-	-	-	**1.90**	-	11.0	Eco	11.0	Eco
1,1,2,2-Tetrachloroethane	0.0880 U	-	-	-	0.0880 U	-	0.170	HH	0.0670	HH
1,1,2-Trichloroethane	0.0940 U	-	-	-	0.0940 U	-	0.590	HH	0.230	HH
1,1-Dichloroethane	0.0590 U	-	-	-	**5.00**	-	47.0	Eco	2.30	HH
1,1-Dichloroethene	0.100 U	-	-	-	**2.10**	-	25.0	Eco	25.0	Eco
1,1-Dichloropropene	0.0620 U	-	-	-	0.0620 U	-	-	-	0.430	HH
1,2,3-Trichlorobenzene	0.0840 U	-	-	-	0.0840 U	-	8.00	Eco	2.30	HH
1,2,3-Trichloropropane	0.240 U	-	-	-	0.240 U	-	-	-	0.000720	HH
1,2,4-Trichlorobenzene	0.180 U	-	-	-	0.180 U	-	35.0	HH	2.30	HH
1,2,4-Trimethylbenzene	0.0620 U	-	-	-	0.0620 U	-	7.30	Eco	7.30	Eco
1,2-Dibromo-3-chloropropane	0.500 U	-	-	-	0.500 U	-	-	-	0.000320	HH
1,2-Dibromoethane (EDB)	0.0720 U	-	-	-	0.0720 U	-	-	-	0.00630	HH
1,2-Dichlorobenzene	0.0690 U	-	-	-	0.0690 U	-	14.0	Eco	14.0	Eco
1,2-Dichloroethane (EDC)	0.0660 U	-	-	-	0.0660 U	-	0.380	HH	0.140	HH
1,2-Dichloropropane	0.0620 U	-	-	-	0.0620 U	-	0.500	HH	0.390	HH
1,3,5-Trimethylbenzene	0.0660 U	-	-	-	0.0660 U	-	7.30	Eco	7.30	Eco
1,3-Dichlorobenzene	0.0820 U	-	-	-	0.0820 U	-	71.0	Eco	0.420	HH
1,3-Dichloropropane	0.0570 U	-	-	-	0.0570 U	-	5,700	Eco	730	HH
1,4-Dichlorobenzene	0.0840 U	-	-	-	0.0840 U	-	15.0	Eco	0.420	HH
2,2-Dichloropropane	0.0830 U	0.0830 U	0.0830 U	0.0830 U	0.0830 U	0.420 U	0.500	HH	0.390	HH
2-Butanone (MEK)	2.30 U	-	-	-	2.30 U	-	14,000	Eco	7,100	HH
2-Chlorotoluene	0.0790 U	-	-	-	0.0790 U	-	-	-	730	HH
2-Hexanone	2.40 U	-	-	-	2.40 U	-	99.0	Eco	47.0	HH
4-Chlorotoluene	0.0570 U	-	-	-	0.0570 U	-	-	-	2,600	HH
4-Isopropyltoluene	0.0700 U	-	-	-	0.0700 U	-	-	-	-	-
4-Methyl-2-pentanone (MIBK)	1.40 U	-	-	-	1.40 U	-	170	Eco	170	Eco
Acetone	3.00 U	-	-	-	3.00 U	-	1,500	Eco	1,500	Eco
Benzene	0.0620 U	-	-	-	0.0620 U	-	2.20	HH	0.390	HH
Bromobenzene	0.0660 U	-	-	-	0.0660 U	-	-	-	88.0	HH
Bromochloromethane	0.0990 U	-	-	-	0.0990 U	-	0.550	HH	0.120	HH
Bromodichloromethane	0.0550 U	-	-	-	0.0550 U	-	0.550	HH	0.120	HH
Bromoform	0.0990 U	-	-	-	0.0990 U	-	4.30	HH	7.20	HH
Bromomethane	0.120 U	-	-	-	0.120 U	-	16.0	Eco	8.70	HH
Carbon Disulfide	**0.255 J**	-	-	-	**0.200 J**	-	0.920	Eco	0.920	Eco
Carbon Tetrachloride	0.0480 U	-	-	-	0.0480 U	-	0.230	HH	0.190	HH
Chlorobenzene	0.0640 U	-	-	-	0.0640 U	-	50.0	Eco	50.0	Eco
Chloroethane	0.130 U	-	-	-	0.130 U	-	-	-	21,000	HH
Chloroform	**0.180 J**	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.410 U	5.70	HH	0.190	HH
Chloromethane	0.110 U	-	-	-	0.110 U	-	-	-	190	HH
cis-1,2-Dichloroethene	0.0660 U	0.0660 U	0.0660 U	0.0660 U	**550**	**660**	590	Eco	360	HH
cis-1,3-Dichloropropene	0.0550 U	-	-	-	0.0550 U	-	0.0550	Eco	0.0550	Eco
Dibromochloromethane	0.0720 U	-	-	-	0.0720 U	-	0.400	HH	0.680	HH
Dibromomethane	0.120 U	-	-	-	0.120 U	-	-	-	8.20	HH
Dichlorodifluoromethane	0.0750 U	-	-	-	0.0750 U	-	-	-	390	HH
Dichloromethane (Methylene Chloride)	**0.175 J**	-	-	-	0.0840 U	-	4.60	HH	4.40	HH
Ethylbenzene	0.0680 U	-	-	-	0.0680 U	-	7.30	Eco	1.40	HH
Hexachlorobutadiene	0.150 U	-	-	-	0.150 U	-	0.440	HH	0.860	HH
Isopropylbenzene	0.0760 U	-	-	-	0.0760 U	-	7.30	Eco	7.30	Eco
m,p-Xylenes	0.110 U	-	-	-	0.110 U	-	13.0	Eco	13.0	Eco
Naphthalene	0.0960 U	-	-	-	0.0960 U	-	620	Eco	0.140	HH
n-Butylbenzene	0.0850 U	-	-	-	0.0850 U	-	-	-	-	-
n-Propylbenzene	0.00590 U	-	-	-	0.00590 U	-	7.30	Eco	7.30	Eco
o-Xylene	0.0680 U	-	-	-	0.0680 U	-	350	Eco	350	Eco
sec-Butylbenzene	0.0710 U	-	-	-	0.0710 U	-	-	-	-	-
Styrene	0.0770 U	-	-	-	0.0770 U	-	72.0	Eco	72.0	Eco
tert-Butylbenzene	0.0590 U	-	-	-	0.0590 U	-	-	-	-	-
Tetrachloroethene (PCE)	0.0970 U	0.0970 U	0.0970 U	0.0970 U	**5.10**	**5.10**	0.690	HH	0.0930	HH
Toluene	**0.510 J**	-	-	-	**0.580**	-	9.80	Eco	9.80	Eco
trans-1,2-Dichloroethene	0.0690 U	-	-	-	**1.70**	-	140	HH	110	HH
trans-1,3-Dichloropropene	0.0750 U	-	-	-	0.0750 U	-	0.0550	Eco	0.0550	Eco
Trichloroethene (TCE)	0.0730 U	0.0730 U	0.0730 U	0.0730 U	**3.20**	**3.00**	2.50	HH	0.0390	HH
Trichlorofluoromethane	0.0990 U	-	-	-	0.0990 U	-	-	-	1,300	HH
Vinyl Acetate	0.910 U	-	-	-	0.910 U	-	16.0	Eco	16.0	Eco
Vinyl Chloride	0.0440 U	0.0440 U	0.0440 U	0.0440 U	**4.10**	**0.900 J**	0.0250	HH	0.0250	HH

Notes:

µg/L = microgram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-3i
2008-2009 Sandblast Area AOPC Quarterly Groundwater Analytical Results
Volatile Organic Compounds
(Page 2 of 3)

Site ID	MW-12	MW-12	MW-13	MW-13*	MW-13	MW-13	MW-14	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	081021MW12GW	090113MW12GW	080414MW13GW	080714MW13GW	081020MW13GW	090112MW13GW	080414MW14GW				
Sample Date	10/21/2008	1/13/2009	4/14/2008	7/14/2008	10/20/2008	1/12/2009	4/14/2008				
Sample Depth (Feet btc)	26	26	31	31	31	30	18				
Total Volatile Organic Compounds (µg/L)											
1,1,1,2-Tetrachloroethane	-	-	0.0450 U	-	-	-	0.0450 U	186	Eco	0.520	HH
1,1,1-Trichloroethane (TCA)	-	-	0.0620 U	-	-	-	**0.220 J**	11.0	Eco	11.0	Eco
1,1,2,2-Tetrachloroethane	-	-	0.0880 U	-	-	-	0.0880 U	0.170	HH	0.0670	HH
1,1,2-Trichloroethane	-	-	0.0940 U	-	-	-	0.0940 U	0.590	HH	0.230	HH
1,1-Dichloroethane	-	-	0.0590 U	-	-	-	**0.320 J**	47.0	Eco	2.30	HH
1,1-Dichloroethene	-	-	0.100 U	-	-	-	0.100 U	25.0	Eco	25.0	Eco
1,1-Dichloropropene	-	-	0.0620 U	-	-	-	0.0620 U	-	-	0.430	HH
1,2,3-Trichlorobenzene	-	-	0.0840 U	-	-	-	0.0840 U	8.00	Eco	2.30	HH
1,2,3-Trichloropropane	-	-	0.240 U	-	-	-	0.240 U	-	-	0.000720	HH
1,2,4-Trichlorobenzene	-	-	0.180 U	-	-	-	0.180 U	35.0	HH	2.30	HH
1,2,4-Trimethylbenzene	-	-	0.0620 U	-	-	-	0.0620 U	7.30	Eco	7.30	Eco
1,2-Dibromo-3-chloropropane	-	-	0.500 U	-	-	-	0.500 U	-	-	0.000320	HH
1,2-Dibromoethane (EDB)	-	-	0.0720 U	-	-	-	0.0720 U	-	-	0.00630	HH
1,2-Dichlorobenzene	-	-	0.0690 U	-	-	-	0.0690 U	14.0	Eco	14.0	Eco
1,2-Dichloroethane (EDC)	-	-	0.0660 U	-	-	-	0.0660 U	0.380	HH	0.140	HH
1,2-Dichloropropane	-	-	0.0620 U	-	-	-	0.0620 U	0.500	HH	0.390	HH
1,3,5-Trimethylbenzene	-	-	0.0660 U	-	-	-	0.0660 U	7.30	Eco	7.30	Eco
1,3-Dichlorobenzene	-	-	0.0820 U	-	-	-	0.0820 U	71.0	Eco	0.420	HH
1,3-Dichloropropane	-	-	0.0570 U	-	-	-	0.0570 U	5,700	Eco	730	HH
1,4-Dichlorobenzene	-	-	0.0840 U	-	-	-	0.0840 U	15.0	Eco	0.420	HH
2,2-Dichloropropane	0.210 U	0.210 U	0.0830 U	0.0830 U	0.0830 U	0.0830 U	0.0830 U	0.500	HH	0.390	HH
2-Butanone (MEK)	-	-	2.30 U	-	-	-	2.30 U	14,000	Eco	7,100	HH
2-Chlorotoluene	-	-	0.0790 U	-	-	-	0.0790 U	-	-	730	HH
2-Hexanone	-	-	2.40 U	-	-	-	2.40 U	99.0	Eco	47.0	HH
4-Chlorotoluene	-	-	0.0570 U	-	-	-	0.0570 U	-	-	2,600	HH
4-Isopropyltoluene	-	-	0.0700 U	-	-	-	0.0700 U	-	-	-	-
4-Methyl-2-pentanone (MIBK)	-	-	1.40 U	-	-	-	1.40 U	170	Eco	170	Eco
Acetone	-	-	3.00 U	-	-	-	3.00 U	1,500	Eco	1,500	Eco
Benzene	-	-	0.0620 U	-	-	-	0.0620 U	2.20	HH	0.390	HH
Bromobenzene	-	-	0.0660 U	-	-	-	0.0660 U	-	-	88.0	HH
Bromochloromethane	-	-	0.0990 U	-	-	-	0.0990 U	0.550	HH	0.120	HH
Bromodichloromethane	-	-	0.0550 U	-	-	-	0.0550 U	0.550	HH	0.120	HH
Bromoform	-	-	0.0990 U	-	-	-	0.0990 U	4.30	HH	7.20	HH
Bromomethane	-	-	0.120 U	-	-	-	0.120 U	16.0	Eco	8.70	HH
Carbon Disulfide	-	-	**0.170 J**	-	-	-	**0.120 J**	0.920	Eco	0.920	Eco
Carbon Tetrachloride	-	-	0.0480 U	-	-	-	0.0480 U	0.230	HH	0.190	HH
Chlorobenzene	-	-	0.0640 U	-	-	-	0.0640 U	50.0	Eco	50.0	Eco
Chloroethane	-	-	0.130 U	-	-	-	0.130 U	-	-	21,000	HH
Chloroform	0.210 U	0.210 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	5.70	HH	0.190	HH
Chloromethane	-	-	0.110 U	-	-	-	0.110 U	-	-	190	HH
cis-1,2-Dichloroethene	**600**	**530**	**2.00**	**2.10**	**2.50**	**2.40**	**46.0**	590	Eco	360	HH
cis-1,3-Dichloropropene	-	-	0.0550 U	-	-	-	0.0550 U	0.0550	Eco	0.0550	Eco
Dibromochloromethane	-	-	0.0720 U	-	-	-	0.0720 U	0.400	HH	0.680	HH
Dibromomethane	-	-	0.120 U	-	-	-	0.120 U	-	-	8.20	HH
Dichlorodifluoromethane	-	-	0.0750 U	-	-	-	0.0750 U	-	-	390	HH
Dichloromethane (Methylene Chloride)	-	-	0.0840 U	-	-	-	0.0840 U	4.60	HH	4.40	HH
Ethylbenzene	-	-	0.0680 U	-	-	-	0.0680 U	7.30	Eco	1.40	HH
Hexachlorobutadiene	-	-	0.150 U	-	-	-	0.150 U	0.440	HH	0.860	HH
Isopropylbenzene	-	-	0.0760 U	-	-	-	0.0760 U	7.30	Eco	7.30	Eco
m,p-Xylenes	-	-	0.110 U	-	-	-	0.110 U	13.0	Eco	13.0	Eco
Naphthalene	-	-	0.0960 U	-	-	-	0.0960 U	620	Eco	0.140	HH
n-Butylbenzene	-	-	0.0850 U	-	-	-	0.0850 U	-	-	-	-
n-Propylbenzene	-	-	0.00590 U	-	-	-	0.00590 U	7.30	Eco	7.30	Eco
o-Xylene	-	-	0.0680 U	-	-	-	0.0680 U	350	Eco	350	Eco
sec-Butylbenzene	-	-	0.0710 U	-	-	-	0.0710 U	-	-	-	-
Styrene	-	-	0.0770 U	-	-	-	0.0770 U	72.0	Eco	72.0	Eco
tert-Butylbenzene	-	-	0.0590 U	-	-	-	0.0590 U	-	-	-	-
Tetrachloroethene (PCE)	**6.20**	**5.80**	**0.360 J**	**0.470 J**	**0.660**	**0.710**	**1.50**	0.690	HH	0.0930	HH
Toluene	-	-	**0.260 J**	-	-	-	**0.640**	9.80	Eco	9.80	Eco
trans-1,2-Dichloroethene	-	-	0.0690 U	-	-	-	**0.110 J**	140	HH	110	HH
trans-1,3-Dichloropropene	-	-	0.0750 U	-	-	-	0.0750 U	0.0550	Eco	0.0550	Eco
Trichloroethene (TCE)	**3.40**	**3.00**	**1.90**	**2.95**	**3.40**	**3.10**	**0.820**	2.50	HH	0.0390	HH
Trichlorofluoromethane	-	-	0.0990 U	-	-	-	0.0990 U	-	-	1,300	HH
Vinyl Acetate	-	-	0.910 U	-	-	-	0.910 U	16.0	Eco	16.0	Eco
Vinyl Chloride	**0.480 J**	**1.60**	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0250	HH	0.0250	HH

Notes:
µg/L = microgram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
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bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-3i
2008-2009 Sandblast Area AOPC Quarterly Groundwater Analytical Results
Volatile Organic Compounds
(Page 3 of 3)

Site ID	MW-14	MW-14	MW-14	MW-15	MW-15	MW-15	MW-15	**Selected Discharge to Surface Water / Bioaccumulation SLV**	**SLV Source**	**Selected Direct Contact SLV**	**SLV Source**
Sample ID	080714MW14GW	081021MW14GW	090113MW14GW	080414MW15GW	080714MW15GW	081021MW15GW	090113MW15GW				
Sample Date	7/14/2008	10/21/2008	1/13/2009	4/14/2008	7/14/2008	10/21/2008	1/13/2009				
Sample Depth (Feet btc)	18	18	18	17	17	17	17				
Total Volatile Organic Compounds (µg/L)											
1,1,1,2-Tetrachloroethane	-	-	-	0.0450 U	-	-	-	186	Eco	0.520	HH
1,1,1-Trichloroethane (TCA)	-	-	-	0.0620 U	-	-	-	11.0	Eco	11.0	Eco
1,1,2,2-Tetrachloroethane	-	-	-	0.0880 U	-	-	-	0.170	HH	0.0670	HH
1,1,2-Trichloroethane	-	-	-	0.0940 U	-	-	-	0.590	HH	0.230	HH
1,1-Dichloroethane	-	-	-	0.0590 U	-	-	-	47.0	Eco	2.30	HH
1,1-Dichloroethene	-	-	-	0.100 U	-	-	-	25.0	Eco	25.0	Eco
1,1-Dichloropropene	-	-	-	0.0620 U	-	-	-	-	-	0.430	HH
1,2,3-Trichlorobenzene	-	-	-	0.0840 U	-	-	-	8.00	Eco	2.30	HH
1,2,3-Trichloropropane	-	-	-	0.240 U	-	-	-	-	-	0.000720	HH
1,2,4-Trichlorobenzene	-	-	-	0.180 U	-	-	-	35.0	HH	2.30	HH
1,2,4-Trimethylbenzene	-	-	-	0.0620 U	-	-	-	7.30	Eco	7.30	Eco
1,2-Dibromo-3-chloropropane	-	-	-	0.500 U	-	-	-	-	-	0.000320	HH
1,2-Dibromoethane (EDB)	-	-	-	0.0720 U	-	-	-	-	-	0.00630	HH
1,2-Dichlorobenzene	-	-	-	0.0690 U	-	-	-	14.0	Eco	14.0	Eco
1,2-Dichloroethane (EDC)	-	-	-	0.0660 U	-	-	-	0.380	HH	0.140	HH
1,2-Dichloropropane	-	-	-	0.0620 U	-	-	-	0.500	HH	0.390	HH
1,3,5-Trimethylbenzene	-	-	-	0.0660 U	-	-	-	7.30	Eco	7.30	Eco
1,3-Dichlorobenzene	-	-	-	0.0820 U	-	-	-	71.0	Eco	0.420	HH
1,3-Dichloropropane	-	-	-	0.0570 U	-	-	-	5,700	Eco	730	HH
1,4-Dichlorobenzene	-	-	-	0.0840 U	-	-	-	15.0	Eco	0.420	HH
2,2-Dichloropropane	0.0830 U	0.0830 U	0.0830 U	0.0830 U	0.0830 U	0.0830 U	0.0830 U	0.500	HH	0.390	HH
2-Butanone (MEK)	-	-	-	2.30 U	-	-	-	14,000	Eco	7,100	HH
2-Chlorotoluene	-	-	-	0.0790 U	-	-	-	-	-	730	HH
2-Hexanone	-	-	-	2.40 U	-	-	-	99.0	Eco	47.0	HH
4-Chlorotoluene	-	-	-	0.0570 U	-	-	-	-	-	2,600	HH
4-Isopropyltoluene	-	-	-	0.0700 U	-	-	-	-	-	-	-
4-Methyl-2-pentanone (MIBK)	-	-	-	1.40 U	-	-	-	170	Eco	170	Eco
Acetone	-	-	-	3.00 U	-	-	-	1,500	Eco	1,500	Eco
Benzene	-	-	-	0.0620 U	-	-	-	2.20	HH	0.390	HH
Bromobenzene	-	-	-	0.0660 U	-	-	-	-	-	88.0	HH
Bromochloromethane	-	-	-	0.0990 U	-	-	-	0.550	HH	0.120	HH
Bromodichloromethane	-	-	-	0.0550 U	-	-	-	0.550	HH	0.120	HH
Bromoform	-	-	-	0.0990 U	-	-	-	4.30	HH	7.20	HH
Bromomethane	-	-	-	0.120 U	-	-	-	16.0	Eco	8.70	HH
Carbon Disulfide	-	-	-	**0.120 J**	-	-	-	0.920	Eco	0.920	Eco
Carbon Tetrachloride	-	-	-	0.0480 U	-	-	-	0.230	HH	0.190	HH
Chlorobenzene	-	-	-	0.0640 U	-	-	-	50.0	Eco	50.0	Eco
Chloroethane	-	-	-	0.130 U	-	-	-	-	-	21,000	HH
Chloroform	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	0.0820 U	5.70	HH	0.190	HH
Chloromethane	-	-	-	0.110 U	-	-	-	-	-	190	HH
cis-1,2-Dichloroethene	**10.0**	**0.620**	**50.0**	**0.440 J**	**0.170 J**	**0.0800 J**	0.0660 U	590	Eco	360	HH
cis-1,3-Dichloropropene	-	-	-	0.0550 U	-	-	-	0.0550	Eco	0.0550	Eco
Dibromochloromethane	-	-	-	0.0720 U	-	-	-	0.400	HH	0.680	HH
Dibromomethane	-	-	-	0.120 U	-	-	-	-	-	8.20	HH
Dichlorodifluoromethane	-	-	-	0.0750 U	-	-	-	-	-	390	HH
Dichloromethane (Methylene Chloride)	-	-	-	0.0840 U	-	-	-	4.60	HH	4.40	HH
Ethylbenzene	-	-	-	0.0680 U	-	-	-	7.30	Eco	1.40	HH
Hexachlorobutadiene	-	-	-	0.150 U	-	-	-	0.440	HH	0.860	HH
Isopropylbenzene	-	-	-	0.0760 U	-	-	-	7.30	Eco	7.30	Eco
m,p-Xylenes	-	-	-	0.110 U	-	-	-	13.0	Eco	13.0	Eco
Naphthalene	-	-	-	0.0960 U	-	-	-	620	Eco	0.140	HH
n-Butylbenzene	-	-	-	0.0850 U	-	-	-	-	-	-	-
n-Propylbenzene	-	-	-	0.00590 U	-	-	-	7.30	Eco	7.30	Eco
o-Xylene	-	-	-	0.0680 U	-	-	-	350	Eco	350	Eco
sec-Butylbenzene	-	-	-	0.0710 U	-	-	-	-	-	-	-
Styrene	-	-	-	0.0770 U	-	-	-	72.0	Eco	72.0	Eco
tert-Butylbenzene	-	-	-	0.0590 U	-	-	-	-	-	-	-
Tetrachloroethene (PCE)	**1.10**	**0.380 J**	**1.80**	**1.80**	**1.60**	**2.10**	**1.10**	0.690	HH	0.0930	HH
Toluene	-	-	-	**0.230 J**	-	-	-	9.80	Eco	9.80	Eco
trans-1,2-Dichloroethene	-	-	-	0.0690 U	-	-	-	140	HH	110	HH
trans-1,3-Dichloropropene	-	-	-	0.0750 U	-	-	-	0.0550	Eco	0.0550	Eco
Trichloroethene (TCE)	**0.610**	**0.140 J**	**0.890**	**0.270 J**	**0.230 J**	**0.250 J**	0.0730 U	2.50	HH	0.0390	HH
Trichlorofluoromethane	-	-	-	0.0990 U	-	-	-	-	-	1,300	HH
Vinyl Acetate	-	-	-	0.910 U	-	-	-	16.0	Eco	16.0	Eco
Vinyl Chloride	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0440 U	0.0250	HH	0.0250	HH

Notes:
µg/L = microgram per liter
btc = below top of well casing
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-3j
2009 Sandblast Area AOPC Soil Gas Analytical Results
Volatile Organic Compounds

Site ID	SB-10	SB-11	SB-12*	SB-13	SB-14	Selected SLV	SLV Source
Sample ID	090126-SB-SB10-3_5-4SG	090126-SB-SB11-3_5-4SG	090126-SB-SB12-3_5-4SG	090126-SB-SB13-3_5-4SG	090126-SB-SB14-3_5-4SG		
Sample Date	1/26/2009	1/26/2009	1/26/2009	1/26/2009	1/26/2009		
Sample Depth (Feet bgs)	3.5-4.0	3.5-4.0	3.5-4.0	3.5-4.0	3.5-4.0		
Total Volatile Organic Compounds (µg/m^3)							
1,1,1-Trichloroethane (TCA)	**8.10 J**	**13.0**	**98.0 J**	**5.20 J**	**16.0 J**	22,000,000	HH
1,1,2,2-Tetrachloroethane	1.90 U	2.70 U	110 U	5.80 U	6.00 U	210	HH
1,1,2-Trichloroethane	2.00 U	2.90 U	110 U	6.20 U	6.30 U	770	HH
1,1-Dichloroethane	0.980 U	1.40 U	56.0 U	3.00 U	3.10 U	7,700	HH
1,1-Dichloroethene	0.840 U	1.20 U	48.0 U	2.60 U	2.70 U	880,000	HH
1,2,4-Trichlorobenzene	12.0 U	17.0 U	660 U	36.0 U	37.0 U	8,800	HH
1,2,4-Trimethylbenzene	**95.0**	**930**	**18,500**	**2,000**	**270**	31,000	HH
1,2-Dibromoethane (EDB)	1.20 U	1.70 U	66.0 U	3.60 U	3.70 U	20.0	HH
1,2-Dichlorobenzene	1.60 U	2.40 U	93.0 U	5.10 U	5.20 U	880,000	HH
1,2-Dichloroethane (EDC)	0.860 U	1.20 U	49.0 U	2.70 U	2.70 U	470	HH
1,2-Dichloropropane	0.980 U	1.40 U	56.0 U	3.00 U	3.10 U	1,200	HH
1,3,5-Trimethylbenzene	**30.0**	**240**	**6,250**	**610**	**68.0**	26,000	HH
1,3-Butadiene	**10.0**	**2.20 J**	23.0 U	**12.0**	**210**	410	HH
1,3-Dichlorobenzene	1.80 U	2.60 U	100 U	5.60 U	5.80 U	1,100	HH
1,4-Dichlorobenzene	1.80 U	2.60 U	100 U	5.60 U	5.80 U	1,100	HH
1,4-Dioxane	**1.10 J**	1.10 U	43.0 U	2.40 U	2.40 U	1,600	HH
2,2,4-Trimethylpentane	**1.80 J**	1.20 U	48.0 U	2.60 U	2.70 U	31,000	HH
2-Butanone (MEK)	**31.0**	1.70 U	66.0 U	3.60 U	**16.0**	22,000,000	HH
2-Hexanone	2.40 U	3.40 U	130 U	7.30 U	7.50 U	130,000	HH
2-Propanol	1.50 U	2.20 U	84.0 U	4.60 U	4.80 U	31,000,000	HH
3-Chloropropene	2.60 U	3.90 U	150 U	8.20 U	8.50 U	2,000	HH
4-Ethyltoluene	**85.0**	**260**	**9,150**	**680**	**74.0**	22,000,000	HH
4-Methyl-2-pentanone (MIBK)	**2.10 J**	1.10 U	42.0 U	2.30 U	2.40 U	13,000,000	HH
Acetone	**97.0**	21.0 U	86.0 U	4.70 U	**83.0**	140,000,000	HH
alpha-Chlorotoluene	1.60 U	2.30 U	89.0 U	4.90 U	5.00 U	250	HH
Benzene	**18.0**	**2.10 J**	27.0 U	**7.00 J**	**85.0**	1,600	HH
Bromodichloromethane	0.610 U	0.890 U	34.0 U	1.90 U	1.90 U	330	HH
Bromoform	3.10 U	4.60 U	180 U	9.70 U	10.0 U	11,000	HH
Bromomethane	1.40 U	2.00 U	80.0 U	4.40 U	4.50 U	22,000	HH
Carbon Disulfide	4.70 U	**1.80 J**	27.0 U	**5.90 J**	**42.0**	3,100,000	HH
Carbon Tetrachloride	1.10 U	1.70 U	65.0 U	3.50 U	3.60 U	820	HH
Chlorobenzene	1.10 U	1.60 U	63.0 U	3.50 U	3.60 U	220,000	HH
Chloroethane	0.640 U	0.930 U	36.0 U	2.00 U	2.00 U	44,000,000	HH
Chloroform	**0.750 J**	1.10 U	42.0 U	2.30 U	2.40 U	530	HH
Chloromethane	0.940 U	1.40 U	53.0 U	2.90 U	3.00 U	390,000	HH
cis-1,2-Dichloroethene	**330**	**69.0**	**145 J**	**8.60 J**	**21.0**	260,000	HH
cis-1,3-Dichloropropene	0.550 U	0.800 U	31.0 U	1.70 U	1.80 U	3,100	HH
Cyclohexane	**3.00 J**	0.760 U	30.0 U	**1.80 J**	**24.0**	26,000,000	HH
Dibromochloromethane	1.80 U	2.60 U	100 U	5.60 U	5.80 U	450	HH
Dichlorodifluoromethane	**3.20 J**	**3.00 J**	76.0 U	4.20 U	4.30 U	880,000	HH
Dichloromethane (Methylene Chloride)	**1.80 J**	1.50 U	60.0 U	3.30 U	3.40 U	26,000	HH
Ethanol	**13.0**	**13.0 J**	100 U	5.70 U	5.80 U	--	--
Ethylbenzene	**82.0**	**27.0**	**1,550**	**78.0**	**25.0**	4,900	HH
Freon 113	1.20 U	1.70 U	66.0 U	3.60 U	3.70 U	130,000,000	HH
Freon 114	1.50 U	2.20 U	84.0 U	4.60 U	4.70 U	130,000,000	HH
Heptane	**36.0**	9.00 U	**87.0 J**	**7.60 J**	**67.0**	3,100,000	HH
Hexachlorobutadiene	17.0 U	25.0 U	970 U	53.0 U	55.0 U	560	HH
Hexane	**12.0**	**1.30 J**	42.0 U	**8.60 J**	**110**	3,100,000	HH
Isopropylbenzene	**4.30 J**	**12.0**	**675**	**42.0**	**5.40 J**	1,800,000	HH
m,p-Xylenes	**350**	**100**	**5,850**	**310**	**61.0**	440,000	HH
Methyl tert-butyl ether	1.40 U	2.10 U	81.0 U	4.40 U	4.50 U	47,000	HH
n-Propylbenzene	**21.0**	**56.0**	**2,300**	**170**	**16.0 J**	4,400,000	HH
o-Xylene	**120**	**52.0**	**2,800**	**150**	**28.0**	3,100,000	HH
Styrene	1.30 U	1.90 U	73.0 U	4.00 U	4.10 U	4,400,000	HH
Tetrachloroethene (PCE)	**610**	**800**	**34,000**	**1,800**	**730**	2,100	HH
Tetrahydrofuran	1.10 U	1.60 U	61.0 U	3.30 U	3.40 U	--	--
Toluene	**300**	**1,200**	**47,500**	**2,400**	**2,000**	22,000,000	HH
trans-1,2-Dichloroethene	**4.00 J**	2.60 U	100 U	5.60 U	5.80 U	260,000	HH
trans-1,3-Dichloropropene	0.960 U	1.40 U	55.0 U	3.00 U	3.10 U	3,100	HH
Trichloroethene (TCE)	**360**	**33.0**	**610 J**	**27.0**	**41.0**	140	HH
Trichlorofluoromethane	**2.20 J**	1.70 U	68.0 U	3.70 U	3.80 U	3,100,000	HH
Vinyl Chloride	0.930 U	1.40 U	53.0 U	2.90 U	3.00 U	2,800	HH

Notes:

µg/m3 = microgram per cubic meter
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-4a
2009 Pistol Range AOPC Soil and Lagoon Sediment Analytical Results
Metals, General Chemistry Parameters, and Grain Size

Sample Description	Pistol Range Soil Composite Samples		Lagoon Sediment Grab Samples					**Selected SLV (0-3 ft bgs)**	**SLV Source (0-3 ft bgs)**
Site ID	PR-EUA	PR-EUB	PR-04	PR-05	PR-06*	PR-07	PR-08		
Sample ID	090319-PR-EUA-So	090319-PR-EUB-So	090111-PR4-0-1SD	090111-PR5-0-1SD	090111-PR6-0-1SD	090111-PR7-0-1SD	090111-PR8-0-1SD		
Sample Date	3/19/2009	3/19/2009	1/11/2009	1/11/2009	1/11/2009	1/11/2009	1/11/2009		
Sample Depth (Feet bgs or brb)	0.0-0.17	0.0-0.17	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0		
Metals (mg/kg dry)									
Copper	-	-	**24.4**	**23.9**	**25.4**	**21.7**	**20.2**	55.6	UPL
Lead	-	-	**27.5**	**30.2**	**33.0**	**24.9**	**20.0**	35.0	Eco
Nickel	-	-	**14.5**	**15.0**	**15.4**	**13.2**	**12.9**	21.2	UPL
Zinc	-	-	**160 J**	**171 J**	**174 J**	**146 J**	**128 J**	123	Eco
General Chemistry Parameters and Grain Size (%)									
Carbon, Total Organic	-	-	**9,500**	**10,700**	**19,600 J**	**14,500**	**12,200**	--	--
Solids, Total	**800,000**	**756,000**	**688,000**	**690,000**	**678,000**	**637,000**	**609,000**	--	--
Gravel (>2.00 mm)	**32.7**	**20.3**	**2.22**	**0.320**	**0.0750**	**1.76**	**0.270**	--	--
Sand, Very Coarse (1.00 - 2.00 mm)	**10.2**	**4.62**	**0.940**	**0.390**	**0.125**	**0.490**	**0.300**	--	--
Sand, Coarse (0.50 - 1.00 mm)	**7.66**	**6.67**	**2.01**	**3.73**	**3.26**	**2.65**	**0.760**	--	--
Sand, Medium (0.25 - 0.50 mm)	**7.51**	**9.14**	**3.57**	**4.37**	**3.18**	**3.91**	**1.70**	--	--
Sand, Fine (0.125 - 0.25 mm)	**7.80**	**10.6**	**5.54**	**5.49**	**4.52**	**5.93**	**5.27**	--	--
Sand, Very Fine (0.0625 - 0.125 mm)	**6.08**	**8.73**	**18.1**	**10.9**	**12.5**	**16.4**	**24.9**	--	--
Silt (0.039 - 0.0625 mm)	**18.7**	**25.3**	**60.3**	**62.0**	**63.2**	**58.1**	**60.2**	--	--
Clay (<0.039 mm)	**6.40**	**10.1**	**7.96**	**9.83**	**10.1**	**4.35**	**2.73**	--	--

Notes:

mg/kg = milligram per kilogram
bgs = below ground surface
brb = below river bottom
Eco = Ecological
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed

-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-4b
2009 Pistol Range AOPC Groundwater Analytical Results
Metals and General Chemistry Parameters

Site ID	PR-01	PR-02D*	Selected Discharge to Surface Water / Bioaccumulation SLV	SLV Source	Selected Direct Contact SLV	SLV Source
Sample ID	090202-PR-PR1-16-20GW	090202-PR-PR2D-9-19GW				
Sample Date	2/2/2009	2/2/2009				
Sample Depth (Feet bgs)	16.0-20.0	9.0-19.0				
Total Metals (mg/L)						
Copper	**0.0548 J**	**0.0400 J**	1.30	HH	1.50	HH
Lead	**0.0105**	**0.0125 J**	--	--	0.0150	HH
Nickel	**0.0501**	**0.0215 J**	0.610	HH	0.730	HH
Zinc	**0.149**	**0.0781 J**	7.40	HH	11.0	HH
Dissolved Metals (mg/L)						
Copper	**0.000800 J**	**0.000665 J**	0.00900	Eco	0.00900	Eco
Lead	0.0000200 U	0.0000200 U	0.00250	Eco	0.00250	Eco
Nickel	**0.003900 J**	0.00200 U	0.0520	Eco	0.0520	Eco
Zinc	**0.004100 J**	**0.00210 J**	0.120	Eco	0.120	Eco
General Chemistry Parameters (mg/L)						
Solids, Total Dissolved	**307**	**219**	--	--	--	--
Total Suspended Solids	5.00 U	**3,170 J**	--	--	--	--

Notes:

mg/L = milligram per liter
bgs = below ground surface
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-5a
2009 Reference Area Soil Analytical Results
Metals, Polycyclic Aromatic Hydrodarbons, Total Solids, and Grain Size

Site ID	R-01	R-02	R-03	R-04	R-05	R-06	R-07*	R-08	R-09	R-10	R-11	R-12	R-13	R-14
Sample ID	090128-R-R1-0-0.5So	090128-R-R2-0-0.5So	090128-R-R3-0-0.5So	090128-R-R4-0-0.5So	090128-R-R5-0-0.5So	090128-R-R6-0-0.5So	090128-R-R7-0-0.5So	090128-R-R8-0-0.5So	090128-R-R9-0-0.5So	090128-R-R10-0-0.5So	090128-R-R11-0-0.5So	090128-R-R12-0-0.5So	090128-R-R13-0-0.5So	090128-R-R14-0-0.5So
Sample Date	1/28/2009	1/28/2009	1/28/2009	1/28/2009	1/28/2009	1/28/2009	1/28/2009	1/28/2009	1/28/2009	1/28/2009	1/28/2009	1/28/2009	1/28/2009	1/28/2009
Sample Depth (Feet bgs)	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Metals (mg/kg)														
Aluminum	**21,300**	**20,300**	**19,000**	**21,800**	**26,200**	**15,900**	**22,200**	**23,700**	**16,500**	**19,900**	**26,300**	**23,200**	**28,900**	**33,200**
Antimony	**0.120 J**	**0.130 J**	**0.130 J**	**0.170 J**	**0.130 J**	**0.130 J**	**0.140 J**	**0.110 J**	**0.180 J**	**0.120 J**	**0.130 J**	**0.0700 J**	**0.110 J**	**0.120 J**
Arsenic	**3.55**	**3.27**	**2.04**	**4.70**	**2.64**	**5.18**	**1.78**	**4.55**	**4.20**	**3.38**	**3.16**	**1.09**	**2.03**	**1.80**
Barium	**81.5**	**118**	**95.2**	**131**	**182**	**91.6**	**75.0**	**137**	**88.7**	**98.8**	**122**	**57.4**	**145**	**112**
Beryllium	**0.433**	**0.513**	**0.579**	**0.504**	**0.625**	**0.393**	**0.564**	**0.459**	**0.387**	**0.448**	**0.492**	**0.319**	**0.531**	**0.629**
Cadmium	**0.164**	**0.156**	**0.162**	**0.150**	**0.175**	**0.0990**	**0.340**	**0.194**	**0.105**	**0.143**	**0.155**	**0.102**	**0.132**	**0.191**
Calcium	**7,160**	**9,120**	**8,720**	**6,110**	**9,060**	**4,310**	**8,500**	**7,700**	**4,760**	**6,810**	**6,970**	**3,510**	**7,590**	**8,880**
Chromium	**21.8**	**21.4**	**23.4**	**21.7**	**27.3**	**19.2**	**18.8**	**23.1**	**17.8**	**18.8**	**23.5**	**15.5**	**26.4**	**25.9**
Cobalt	**19.1**	**18.3**	**19.2**	**15.8**	**17.9**	**12.8**	**19.9**	**17.5**	**11.4**	**17.0**	**17.2**	**9.66**	**16.6**	**18.5**
Copper	**37.6**	**45.1**	**35.3**	**33.0**	**49.4**	**22.8**	**43.7**	**30.3**	**29.4**	**35.5**	**44.4**	**32.0**	**49.2**	**58.2**
Iron	**29,900**	**26,400**	**29,100**	**28,500**	**32,000**	**24,500**	**33,500**	**30,300**	**27,300**	**29,200**	**33,000**	**22,900**	**34,000**	**37,000**
Lead	**14.9**	**17.4**	**26.5**	**19.5**	**19.2**	**15.4**	**24.0**	**22.3**	**15.4**	**13.1**	**14.6**	**12.5**	**19.0**	**14.6**
Magnesium	**10,500**	**6,770**	**5,160**	**6,700**	**8,300**	**4,770**	**3,710**	**8,740**	**5,100**	**8,450**	**10,100**	**9,080**	**10,100**	**12,000**
Manganese	**589**	**685**	**526**	**733**	**716**	**498**	**920**	**622**	**423**	**627**	**650**	**415**	**580**	**799**
Mercury	**0.0430**	**0.0550**	**0.0680**	**0.0590**	**0.0510**	**0.0430**	**0.0620**	**0.0490**	**0.0440**	**0.0480**	**0.0340 J**	**0.0470**	**0.0480**	**0.0400**
Nickel	**18.2**	**19.0**	**20.8**	**15.7**	**23.8**	**11.5**	**17.6**	**19.6**	**12.9**	**20.9**	**19.5**	**12.8**	**22.9**	**26.1**
Potassium	**923**	**1,490**	**1,920**	**1,200**	**1,930**	**1,020**	**1,240**	**1,740**	**1,070**	**1,290**	**1,370**	**572 J**	**1,200**	**1,710**
Selenium	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.500 U	0.400 U	0.400 U	0.500 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U
Silver	**0.0870**	**0.0950**	**0.0530 J**	**0.0660**	**0.0450 J**	**0.187**	**0.0515 J**	**0.0270 J**	0.0230 U	**0.0440 J**	**0.0370 J**	0.0220 U	**0.0330 J**	**0.0370 J**
Sodium	**324**	**131**	**123**	**139**	**131**	**136**	**69.6 J**	**279**	**222**	**142**	**186**	**124**	**276**	**115**
Thallium	**0.153**	**0.203**	0.100 U	**0.143**	0.103 U	**0.147**	**0.154**	**0.190**	**0.142**	0.0980 U	**0.128**	0.0420 U	0.0930 U	0.0810 U
Vanadium	**79.4**	**69.6**	**83.7**	**82.0**	**91.8**	**69.4**	**75.1**	**81.0**	**75.2**	**73.7**	**90.2**	**43.0**	**89.1**	**99.3**
Zinc	**54.7 J**	**68.5 J**	**66.7 J**	**58.8 J**	**65.9 J**	**45.6 J**	**59.9 J**	**66.7 J**	**50.6 J**	**52.9 J**	**56.0 J**	**55.1 J**	**56.5 J**	**65.8 J**
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)														
Acenaphthene	**1.90 J**	**1.20 J**	**3.40 J**	1.00 U	**1.60 J**	**1.20 J**	**1.75 J**	**1.80 J**	1.00 U	**1.50 J**	1.00 U	**1.40 J**	1.00 U	1.00 U
Acenaphthylene	1.40 U	1.40 U	**1.60 J**	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Anthracene	**2.70 J**	**2.00 J**	**4.90 J**	**1.50 J**	**1.90 J**	**2.00 J**	**3.30 J**	**2.20 J**	**3.50 J**	**2.10 J**	1.40 U	**1.70 J**	**1.80 J**	1.40 U
Fluorene	1.70 U	1.70 U	**3.20 J**	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
Naphthalene	1.30 U	**1.60 J**	**2.20 J**	1.30 U	1.30 U	**1.30 J**	**1.80 J**	**1.60 J**	1.30 U	**1.70 J**	1.30 U	1.30 U	1.30 U	1.30 U
Phenanthrene	**16.0**	**16.0**	**34.0**	**9.10 J**	**13.0**	**9.60 J**	**16.0**	**18.0**	**13.0**	**11.0**	**5.50 J**	**9.60 J**	**8.30 J**	**5.80 J**
Total LPAHs (KM, capped; NDs at MDL)	**24.5 J**	**23.3 J**	**49.3 J**	**14.7 J**	**20.5 J**	**16.6 J**	**25.7 J**	**26.5 J**	**20.5 J**	**19.2 J**	**12.3 J**	**16.6 J**	**14.1 J**	**12.6 J**
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)														
Benzo(a)anthracene	**16.0**	**17.0**	**34.0**	**9.90 J**	**17.0**	**11.0**	**20.5**	**16.0**	**13.0**	**10.0**	**7.40 J**	**12.0**	**8.00 J**	**4.60 J**
Benzo(a)pyrene	**20.0**	**22.0**	**45.0**	**11.0**	**20.0**	**16.0**	**26.5**	**22.0**	**15.0**	**15.0**	**8.30 J**	**16.0**	**10.0**	**7.70 J**
Benzo(b)fluoranthene	**27.0**	**29.0**	**55.0**	**16.0**	**27.0**	**19.0**	**33.0**	**27.0**	**22.0**	**18.0**	**13.0**	**20.0**	**12.0**	**9.10 J**
Benzo(g,h,i)perylene	**14.0**	**16.0**	**32.0**	**11.0**	**16.0**	**13.0**	**20.5**	**15.0**	**11.0**	**12.0**	**8.20 J**	**9.70 J**	**7.30 J**	**5.80 J**
Benzo(k)fluoranthene	**8.30 J**	**9.70 J**	**19.0**	**6.70 J**	**9.50 J**	**7.70 J**	**10.8 J**	**8.70 J**	**7.10 J**	**6.90 J**	**3.40 J**	**7.20 J**	**4.30 J**	**2.70 J**
Chrysene	**20.0**	**23.0**	**45.0**	**13.0**	**22.0**	**17.0**	**25.5**	**21.0**	**15.0**	**15.0**	**8.90 J**	**15.0**	**10.0**	**6.40 J**
Dibenz(a,h)anthracene	**4.30 J**	2.20 U	**6.90 J**	2.20 U	**3.60 J**	**3.70 J**	**4.90 J**	**4.40 J**	2.20 U	2.20 U	**2.70 J**	2.20 U	2.20 U	2.20 U
Fluoranthene	**31.0**	**33.0**	**66.0**	**19.0**	**31.0**	**22.0**	**39.5**	**31.0**	**26.0**	**21.0**	**13.0**	**21.0**	**15.0**	**10.0**
Indeno(1,2,3-cd)pyrene	**17.0**	**16.0**	**34.0**	**12.0**	**16.0**	**12.0**	**22.0**	**17.0**	**12.0**	**5.20 J**	**8.20 J**	**12.0**	**7.60 J**	**6.00 J**
Pyrene	**29.0**	**31.0**	**64.0**	**18.0**	**30.0**	**23.0**	**39.0**	**31.0**	**26.0**	**21.0**	**15.0**	**24.0**	**14.0**	**10.0**
Total HPAHs (KM, capped; NDs at MDL)	**187 J**	**199 J**	**401 J**	**119 J**	**192 J**	**144 J**	**242 J**	**193 J**	**149 J**	**126 J**	**88.1 J**	**139 J**	**90.4 J**	**64.5 J**
General Chemistry Parameters (mg/kg) and Grain Size (%)														
Carbon, Total Organic	**37,200**	**39,800**	**53,100**	**50,800**	**55,300**	**37,300**	**38,800**	**44,600**	**29,900**	**42,700**	**33,100**	**77,800**	**39,200**	**46,100**
Solids, Total	**671,000**	**653,000**	**661,000**	**661,000**	**633,000**	**720,000**	**834,000**	**679,000**	**717,000**	**698,000**	**676,000**	**664,000**	**653,000**	**655,000**
Gravel (>2.00 mm)	**22.8**	**31.6**	**27.4**	**32.9**	**22.6**	**29.4**	**33.4**	**32.7**	**13.1**	**32.3**	**13.5**	**15.4**	**26.2**	**25.9**
Sand, Very Coarse (1.00 - 2.00 mm)	**14.2**	**14.9**	**20.5**	**15.3**	**14.2**	**7.50**	**20.9**	**15.2**	**9.29**	**15.3**	**9.05**	**16.2**	**14.2**	**12.8**
Sand, Coarse (0.50 - 1.00 mm)	**11.1**	**7.95**	**14.2**	**9.55**	**9.50**	**8.30**	**11.7**	**10.7**	**8.28**	**11.1**	**7.22**	**14.5**	**8.83**	**10.8**
Sand, Medium (0.25 - 0.50 mm)	**8.07**	**5.26**	**7.95**	**7.39**	**7.07**	**12.2**	**5.94**	**6.92**	**11.3**	**8.48**	**8.98**	**10.4**	**5.67**	**6.62**
Sand, Fine (0.125 - 0.25 mm)	**7.05**	**5.49**	**5.37**	**6.25**	**5.81**	**8.51**	**4.08**	**5.55**	**13.6**	**6.98**	**9.89**	**8.86**	**5.64**	**5.26**
Sand, Very Fine (0.0625 - 0.125 mm)	**5.38**	**4.79**	**3.31**	**4.31**	**4.26**	**5.81**	**3.26**	**4.19**	**11.3**	**4.48**	**7.26**	**8.76**	**5.18**	**4.00**
Silt (0.039 - 0.0625 mm)	**22.4**	**21.9**	**14.9**	**18.1**	**25.8**	**21.4**	**9.76**	**18.4**	**24.9**	**17.0**	**29.0**	**23.2**	**22.5**	**23.7**
Clay (<0.039 mm)	**10.9**	**11.0**	**6.37**	**8.03**	**11.9**	**12.1**	**10.2**	**8.09**	**8.98**	**7.08**	**17.7**	**5.84**	**14.1**	**13.2**

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
bgs = below ground surface
MDL = method detection limit
ND = non detect
- = Not Analyzed
-- = SLV for analyte not available

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table 6-5b
2008-2009 Reference Area Quarterly Groundwater Analytical Results
Metals, Petroleum Hydrocarbons, Butyltins, Volatile Organic Compounds, Semivolatile Organic Compounds, and General Chemistry Parameters

Site ID	MW-10*	MW-10*	MW-10*	MW-10*
Sample ID	080415MW10GW	080716MW10GW	081022MW10GW	090113MW10GW
Sample Date	4/15/2008	7/16/2008	10/22/2008	1/13/2009
Sample Depth (Feet btc)	40	52	50	52
Total Metals (µg/L)				
Aluminum	**211**	**48.4**	**174**	**6.45**
Antimony	**0.0800**	**0.0300 J**	**0.0250 J**	**0.0710 J**
Arsenic	1.32 U	**1.23**	**1.68**	**1.60**
Barium	**26.5**	**20.8**	**18.5**	**17.3**
Beryllium	**0.0100 J**	0.0200 U	0.0200 U	0.0200 U
Cadmium	0.0570 U	0.0200 U	**0.0490**	0.00500 U
Calcium	**29,350**	**30,950**	**29,150**	**30,550 J**
Chromium	0.570 U	**0.210**	**3.98 J**	**0.145 J**
Cobalt	**0.295**	**0.170**	**0.323**	**0.0710**
Copper	0.670 U	**0.260**	**1.12**	**0.125**
Iron	434 U	**116**	**451 J**	37.0 U
Lead	0.363 U	**0.130**	**0.248**	**0.102**
Magnesium	**8,315**	**8,140**	**7,620**	**7,710**
Manganese	**245**	**259**	**208**	**204**
Mercury	0.0300 U	0.0500 U	0.0500 U	0.0500 U
Nickel	0.500 U	**1.07**	**6.62**	**0.570**
Potassium	**4,800**	**4,955**	**4,705**	**4,945**
Selenium	0.400 U	0.500 U	0.400 U	0.400 U
Silver	0.0660 U	0.00900 U	0.00900 U	**0.00900 J**
Sodium	**5,625**	**5,255**	**4,940**	**5,015**
Thallium	0.00800 U	0.00500 U	0.00500 U	0.00500 U
Vanadium	**1.55 J**	**0.175 J**	**0.320**	0.0700 U
Zinc	**6.15 J**	**1.75**	**8.28 J**	**2.25 J**
Dissolved Metals (µg/L)				
Aluminum	**2.25**	**2.35**	**2.60**	**2.00 J**
Antimony	**0.0500 J**	0.0100 U	**0.0140 J**	0.0100 U
Arsenic	**1.32**	**1.13**	**1.47**	**1.55**
Barium	**22.9**	**19.5**	**17.4**	**15.3**
Beryllium	0.00800 U	0.0200 U	0.0200 U	0.0200 U
Cadmium	**0.0310**	0.0200 U	**0.0425**	0.00500 U
Calcium	**29,800**	**30,100**	**28,950**	**29,800 J**
Chromium	**0.180 J**	**0.120 J**	**0.290**	**0.0600 J**
Cobalt	0.0790 U	**0.109**	**0.139**	**0.0630**
Copper	0.300 U	**0.0950 J**	**0.315**	**0.0800 J**
Iron	**10.7 J**	**9.80 J**	**24.9**	20.0 U
Lead	**0.0220 J**	0.0300 U	0.0680 U	**0.00600 J**
Magnesium	**8,085**	**7,840**	**7,360**	**7,475**
Manganese	**218**	**228**	**197**	**187**
Mercury	0.0300 U	0.0500 U	0.0500 U	0.0500 U
Nickel	0.500 U	**1.07**	**1.41**	**0.660**
Potassium	**4,880**	**4,710**	**4,710**	**4,840**
Selenium	0.400 U	0.500 U	0.400 U	0.400 U
Silver	**0.117**	0.00900 U	0.00900 U	0.00900 U
Sodium	5,440 U	**4,975**	**4,825**	**4,875**
Thallium	0.00800 U	0.00500 U	0.00500 U	0.00500 U
Vanadium	0.800 U	0.0700 U	0.0700 U	0.0700 U
Zinc	10.0 U	**1.30**	**3.15**	**1.15 J**
Total Petroleum Hydrocarbons (µg/L)				
Diesel Range Organics	14.0 U	-	-	-
Residual Range Organics	24.0 U	-	-	-
Gasoline Range Organics	13.0 U	-	-	-
Total Butyltins (µg/L)				
Dibutyltin	0.00810 U	-	-	-
Monobutyltin	**0.0345 J**	-	-	-
Total Volatile Organic Compounds (µg/L)				
Chloroform	0.0820 U	-	-	-
Tetrachloroethene (PCE)	0.0970 U	-	-	-
Vinyl Chloride	0.0440 U	-	-	-
Total Semivolatile Organic Compounds (µg/L)				
1,4-Dichlorobenzene	0.0330 U	-	-	-
4-Nitrophenol	0.320 U	-	-	-
Phenol	0.0700 U	-	-	-
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/L)				
Phenanthrene	0.0250 U	-	-	-
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/L)				
Benzo(b)fluoranthene	**0.0250 J**	-	-	-
Benzo(k)fluoranthene	0.0270 U	-	-	-
General Chemistry Parameters (mg/L)				
Dissolved Bromide	0.0100 U	-	-	-
Dissolved Chloride	**1.80**	-	-	-
Dissolved Fluoride	**0.0270 J**	-	-	-
Dissolved Sulfate	**6.80**	-	-	-
Dissolved Ammonia	**0.0200 J**	-	-	-
Dissolved Nitrate+Nitrite	**0.0240 J**	-	-	-
Total Organic Carbon	**0.600**	-	-	-
Dissolved Organic Carbon	**0.500**	-	-	-
Dissolved Bicarbonate as CaCO3	**118**	-	-	-
Dissolved Carbonate as CaCO3	1.00 U	-	-	-

Notes:
µg/L = microgram per liter
mg/L = milligram per liter
btc = below top of well casing
MDL = method detection limit
- = Not Analyzed
-- = SLV for analyte not available
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-6a
Forebay Area Smallmouth Bass and Largescale Sucker Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 1 of 3)

Area	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay		
Site ID	1	2	3	4	5	6	7		
Sample ID	060605100SB	060605101SB	060605200SB	060605201SB	060605202SB	060605203SB	060605204SB		
Sample Date	6/5/2006	6/5/2006	6/5/2006	6/5/2006	6/5/2006	6/5/2006	6/5/2006		
Percent Lipids	2	3.2	1.7	1.7	1.4	2.8	3.6		
Tissue Type	Smallmouth Bass	Smallmouth Bass	Smallmouth Bass	Smallmouth Bass	Smallmouth Bass	Smallmouth Bass	Smallmouth Bass	**Selected SLV**	**SLV Source**
PCB Aroclors (µg/kg wet)									
Aroclor 1016	2.40 UJ	24.0 UJ	2.40 UJ	2.40 UJ	2.40 UJ	2.50 UJ	2.40 UJ	0.570	HH
Aroclor 1221	2.60 UJ	26.0 UJ	2.60 UJ	2.60 UJ	2.60 UJ	2.70 UJ	2.60 UJ	0.570	HH
Aroclor 1232	2.30 UJ	23.0 UJ	2.30 UJ	2.30 UJ	2.30 UJ	2.40 UJ	2.30 UJ	0.570	HH
Aroclor 1242	2.20 UJ	22.0 UJ	2.20 UJ	2.20 UJ	2.20 UJ	2.30 UJ	2.20 UJ	0.570	HH
Aroclor 1248	0.510 UJ	5.10 UJ	68.0 UJ	0.510 UJ	5.00 UJ	12.0 UJ	11.0 UJ	0.570	HH
Aroclor 1254	28.0 UJ	**1,300 J**	240 UJ	67.0 UJ	**51.0 J**	95.0 UJ	38.0 UJ	0.570	HH
Aroclor 1260	24.0 UJ	19.0 UJ	150 UJ	48.0 UJ	25.0 UJ	73.0 UJ	37.0 UJ	0.570	HH
Aroclor 1262	2.50 UJ	25.0 UJ	98.0 UJ	21.0 UJ	8.40 UJ	21.0 UJ	12.0 UJ	0.570	HH
Aroclor 1268	2.00 UJ	20.0 UJ	2.00 UJ	2.00 UJ	2.00 UJ	2.10 UJ	2.00 UJ	0.570	HH
Total PCBs as Aroclors (NDs at MDL) [1]	30.2 UJ	**1,322 J**	242 UJ	69.2 UJ	**53.2 J**	97.3 UJ	40.2 UJ	0.570	HH
PCB Congeners (µg/kg wet)									
PCB 77	**0.0241 J**	**0.165 J**	**0.205 J**	**0.0448 J**	**0.0315 J**	**0.0703 J**	**0.0624 J**	0.0760	HH
PCB 81	**0.00143 J**	**0.0195 J**	**0.0238 J**	**0.00384 J**	**0.00205 J**	**0.00422 J**	**0.00324 J**	0.0250	HH
PCB 105	**0.966 J**	**50.4 J**	**45.5 J**	**2.98 J**	**1.23 J**	**3.54 J**	**1.54 J**	0.250	HH
PCB 114	**0.0926 J**	**3.20 J**	**4.04 J**	**0.281 J**	**0.106 J**	**0.337 J**	**0.120 J**	0.250	HH
PCB 118	**3.31 J**	**138 J**	**132 J**	**8.31 J**	**3.61 J**	**10.8 J**	**3.75 J**	0.250	HH
PCB 123	**0.0557 J**	**1.60 J**	**2.45 J**	**0.118 J**	**0.0633 J**	**0.217 J**	**0.0695 J**	0.250	HH
PCB 126	**0.00505 J**	**0.0553 J**	**0.0755 J**	**0.00974 J**	**0.00807 J**	**0.0159 J**	**0.0111 J**	0.0000760	HH
PCB 156	**0.654 C J**	**26.6 C J**	**31.4 C J**	**2.22 C J**	**0.735 C J**	**2.89 C J**	**0.846 C J**	0.250	HH
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**							0.250	HH
PCB 167	**0.226 J**	**6.50 J**	**9.65 J**	**0.428 J**	**0.239 J**	**0.961 J**	**0.250 J**	0.250	HH
PCB 169	0.00152 UJ	0.00728 UJ	0.00449 UJ	0.00275 UJ	0.00129 UJ	0.00503 UJ	0.00260 UJ	0.000250	HH
PCB 189	**0.0216 J**	**0.482 J**	**0.531 J**	**0.0759 J**	**0.0250 J**	**0.113 J**	**0.0390 J**	0.250	HH
Total PCBs as Congeners (KM, capped)	**33.7 J**	**1440 J**	**879 J**	**96.7 J**	**42.0 J**	**137 J**	**59.3 J**	0.570	HH
Metals (mg/kg wet)									
Aluminum	**9.89**	**6.66**	**11.3**	**4.00**	**4.75**	**1.26 J**	**1.37**	-	-
Antimony	0.00500 U	0.00500 U	0.00500 U	0.00500 U	0.00500 U	0.00500 U	0.00500 U	-	-
Arsenic	**0.170**	**0.700**	**0.170**	**0.390**	**0.330**	**0.350**	**0.560**	0.000760	HH
Barium	**2.32**	**1.30**	**1.95**	**2.43**	**1.73**	**0.870**	**0.960**	-	-
Beryllium	**0.000600**	**0.000500**	0.000500 U	0.000500 U	0.000500 U	**0.000700**	**0.000600**	-	-
Cadmium	**0.0110**	**0.00700**	**0.0230**	**0.00600**	**0.00600**	**0.0110**	**0.00700**	0.150	Eco
Chromium	**0.190**	0.130 U	**0.270**	0.120 U	**0.290**	0.140 U	0.130 U	-	-
Cobalt	**0.0553**	**0.0516**	**0.0582**	**0.0452**	**0.0537**	**0.0594**	**0.0447**	-	-
Copper	**1.06**	**0.583**	**1.42**	**0.721**	**0.767**	**0.482**	**0.439**	-	-
Lead	**0.0200**	**0.0180**	**0.00800**	**0.0170**	**0.00900**	**0.00500 J**	**0.00500**	0.120	Eco
Mercury	**0.0710 J**	**0.342 J**	**0.131 J**	**0.187 J**	**0.0760 J**	**0.283 J**	**0.315 J**	0.0490	HH
Methyl Mercury	-	-	-	-	-	-	-	-	-
Nickel	**0.309**	**0.271**	**0.399**	**0.225**	**0.357**	**0.304 J**	**0.213**	-	-
Thallium	**0.0148**	**0.0198**	**0.0112**	**0.0146**	**0.0154**	**0.00930**	**0.0177**	-	-
Vanadium	**0.0700**	**0.0400**	**0.0600**	**0.0400**	**0.0400**	**0.0300**	**0.0300**	-	-
Zinc	**13.9**	**12.9**	**15.1**	**15.1**	**14.8**	**18.0**	**12.2**	-	-
Semivolatile Organic Compounds (µg/kg wet)									
Bis(2-ethylhexyl) Phthalate	66.0 UJ	**140 J**	**100 J**	66.0 UJ	66.0 UJ	**130 J**	**89.0 J**	81.9	HH
Butyl Benzyl Phthalate	7.30 UJ	7.30 UJ	7.30 UJ	7.30 UJ	7.30 UJ	7.30 UJ	7.30 UJ	310	Eco
Carbazole	9.10 UJ	9.10 UJ	9.10 UJ	9.10 UJ	9.10 UJ	9.10 UJ	9.10 UJ	-	-
Di-n-butyl Phthalate	16.0 UJ	48.0 UJ	16.0 UJ	16.0 UJ	36.0 UJ	16.0 UJ	16.0 UJ	626	Eco
Di-n-octyl Phthalate	11.0 UJ	11.0 UJ	11.0 UJ	11.0 UJ	11.0 UJ	11.0 UJ	11.0 UJ	626	Eco
p-cresol (4-Methylphenol)	7.70 UJ	7.70 UJ	7.70 UJ	7.70 UJ	7.70 UJ	7.70 UJ	7.70 UJ	-	-
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)									
Acenaphthene	**0.200 J**	0.110 UJ	**0.300 J**	**0.160 J**	**0.200 J**	**0.790 J**	0.110 UJ	15,000	HH
Anthracene	**0.110 J**	**0.230 J**	**0.320 J**	**0.0780 J**	**0.180 J**	**2.20 J**	**0.320 J**	15,000	HH
Fluorene	**0.410 J**	0.150 UJ	**0.670 J**	**0.300 J**	**0.370 J**	**1.30 J**	**0.970**	15,000	HH
Phenanthrene	**0.610**	**1.30**	**0.870 J**	**0.540**	**0.790**	**2.20 J**	**1.60**	15,000	HH
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)									
Benzo(a)anthracene	0.0660 UJ	0.0660 UJ	**1.20 J**	0.0660 UJ	0.0660 UJ	**5.00 J**	0.0660 UJ	1.57	HH
Benzo(a)pyrene	0.0810 UJ	0.0810 UJ	**0.770 J**	0.0810 UJ	0.0810 UJ	**3.50 J**	0.0810 UJ	0.157	HH
Benzo(b)fluoranthene	**0.110 J**	0.0700 UJ	0.140 UJ	0.0700 UJ	0.0700 UJ	**2.20 J**	0.0700 UJ	1.57	HH
Benzo(g,h,i)perylene	0.0730 UJ	0.0730 UJ	**0.420 J**	0.0730 UJ	0.0730 UJ	**1.50 J**	0.0730 UJ	15.7	HH
Benzo(k)fluoranthene	**0.110 J**	0.0560 UJ	**1.40 J**	0.0560 UJ	0.0560 UJ	**3.80 J**	0.0560 UJ	15.7	HH
Chrysene	0.0760 UJ	0.0760 UJ	**0.530 J**	0.0760 UJ	0.0760 UJ	**2.30 J**	0.0760 UJ	157	HH
Dibenz(a,h)anthracene	0.0590 UJ	0.0590 UJ	**0.410 J**	0.0590 UJ	0.0590 UJ	**1.90 J**	0.0590 UJ	0.157	HH
Fluoranthene	0.0900 UJ	0.0900 UJ	**0.840 J**	0.0900 UJ	0.0900 UJ	**3.30 J**	0.0900 UJ	19,000	Eco
Indeno(1,2,3-cd)pyrene	0.0640 UJ	0.0640 UJ	**0.700 J**	0.0640 UJ	0.0640 UJ	**2.80 J**	0.0640 UJ	1.57	HH
Pyrene	**0.140 J**	0.0980 UJ	**0.590 J**	0.0980 UJ	**0.110 J**	0.490 UJ	0.0980 UJ	1,000	Eco

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
RDL = reported detection limit
- = Not Analyzed
-- = SLV for analyte not available
ND = Non Detect

[1] Only Aroclors 1242 and 1254 were included in summing bass Total PCBs as Aroclors because all other aroclors were undected in Forebay smallmouth bass samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-6a
Forebay Area Smallmouth Bass and Largescale Sucker Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 2 of 3)

Area	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay		
Site ID	12	13	14	8	9	10	11		
Sample ID	060606102SB	060606103SB	060606104SB	060605205SB	060605207SB	060605208SB	060605209SB		
Sample Date	6/6/2006	6/6/2006	6/6/2006	6/5/2006	6/5/2006	6/5/2006	6/5/2006		
Percent Lipids	2.1	2.4	2.4	2.8	2.5	2.4	4.1		
Tissue Type	Smallmouth Bass	Smallmouth Bass	Smallmouth Bass	Smallmouth Bass	Smallmouth Bass	Smallmouth Bass	Smallmouth Bass	**Selected SLV**	**SLV Source**
PCB Aroclors (µg/kg wet)									
Aroclor 1016	2.40 UJ	120 UJ	6.00 UJ	24.0 UJ	4.70 UJ	2.40 UJ	240 UJ	0.570	HH
Aroclor 1221	2.60 UJ	20.0 UJ	32.0 UJ	26.0 UJ	25.0 UJ	2.60 UJ	260 UJ	0.570	HH
Aroclor 1232	2.30 UJ	8.90 UJ	12.0 UJ	23.0 UJ	14.0 UJ	2.30 UJ	230 UJ	0.570	HH
Aroclor 1242	2.20 UJ	3.80 UJ	10.0 UJ	22.0 UJ	4.40 UJ	2.20 UJ	220 UJ	0.570	HH
Aroclor 1248	33.0 UJ	61.0 UJ	4.20 UJ	5.10 UJ	9.10 UJ	12.0 UJ	51.0 UJ	0.570	HH
Aroclor 1254	85.0 UJ	420 UJ	11.0 UJ	**1,300 J**	25.0 UJ	96.0 UJ	**14,000 J**	0.570	HH
Aroclor 1260	300 UJ	200 UJ	26.0 UJ	19.0 UJ	67.0 UJ	78.0 UJ	190 UJ	0.570	HH
Aroclor 1262	110 UJ	160 UJ	16.0 UJ	25.0 UJ	24.0 UJ	50.0 UJ	250 UJ	0.570	HH
Aroclor 1268	5.90 UJ	9.90 UJ	5.00 UJ	20.0 UJ	6.40 UJ	16.0 UJ	200 UJ	0.570	HH
Total PCBs as Aroclors (NDs at MDL) [1]	87.2 UJ	424 UJ	21.0 UJ	**1,322 J**	29.4 UJ	98.2 UJ	**14,220 J**	0.570	HH
PCB Congeners (µg/kg wet)									
PCB 77	**0.102 J**	**0.186 J**	**0.0217 J**	**0.214 J**	**0.0367 J**	**0.0772 J**	**3.53 J**	0.0760	HH
PCB 81	**0.00807 J**	**0.0117 J**	**0.00121 J**	**0.0191 J**	**0.00233 J**	**0.00576 J**	0.0231 UJ	0.0250	HH
PCB 105	**11.2 J**	**57.7 J**	**0.717 J**	**66.3 J**	**2.09 J**	**3.91 J**	**766 J**	0.250	HH
PCB 114	**1.68 J**	**4.47 J**	**0.0594 J**	**4.87 J**	**0.173 J**	**0.332 J**	**65.7 J**	0.250	HH
PCB 118	**52.4 J**	**164 J**	**2.42 J**	**199 J**	**6.43 J**	**10.3 J**	**2,180 J**	0.250	HH
PCB 123	**0.948 J**	**2.07 J**	**0.0323 J**	**1.94 J**	**0.0810 J**	**0.136 J**	**35.6 J**	0.250	HH
PCB 126	**0.0262 J**	**0.0453 J**	**0.00642 J**	**0.0857 J**	**0.00890 J**	**0.0143 J**	**1.26 J**	0.0000760	HH
PCB 156	**12.8 C J**	**38.6 C J**	**0.541 C J**	**44.6 C J**	**1.36 C J**	**2.39 C J**	**403 C J**	0.250	HH
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**							0.250	HH
PCB 167	**3.65 J**	**7.99 J**	**0.161 J**	**9.35 J**	**0.311 J**	**0.574 J**	**116 J**	0.250	HH
PCB 169	0.00824 UJ	0.0145 UJ	0.00347 UJ	0.0112 UJ	0.00327 UJ	0.00508 UJ	0.127 UJ	0.000250	HH
PCB 189	**0.324 J**	**0.661 J**	**0.0311 J**	**0.841 J**	**0.0491 J**	**0.0910 J**	**9.30 J**	0.250	HH
Total PCBs as Congeners (KM, capped)	**325 J**	**1306 J**	**32.1 J**	**1733 J**	**69.6 J**	**149 J**	**19303 J**	0.570	HH
Metals (mg/kg wet)									
Aluminum	**15.5**	**2.49**	**1.06**	**4.72**	**2.25**	**1.33**	**3.90**	-	-
Antimony	0.00500 U	0.00600 U	0.00500 U	0.00500 U	0.00500 U	0.00500 U	0.00600 U	-	-
Arsenic	**0.310**	**0.350**	**0.560**	**0.520**	**0.450**	**0.490**	**0.600**	0.000760	HH
Barium	**1.34**	**1.28**	**0.720**	**1.13**	**0.860**	**1.57**	**1.96**	-	-
Beryllium	0.000500 U	0.000600 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000600 U	-	-
Cadmium	**0.00700**	**0.00400**	**0.0190**	**0.0130**	**0.00900**	**0.00400**	**0.00600**	0.150	Eco
Chromium	**0.200**	0.150 U	0.120 U	0.130 U	0.120 U	0.140 U	0.140 U	-	-
Cobalt	**0.0567**	**0.0758**	**0.0469**	**0.0588**	**0.0441**	**0.0575**	**0.0650**	-	-
Copper	**0.688**	**0.540**	**0.560**	**0.769**	**0.586**	**0.434**	**0.588**	-	-
Lead	**0.00900**	**0.00500**	**0.0100**	**0.00500**	**0.0100**	**0.00400**	**0.00500**	0.120	Eco
Mercury	**0.131 J**	**0.512 J**	**0.383 J**	**0.367 J**	**0.305 J**	**0.372 J**	**0.251 J**	0.0490	HH
Methyl Mercury	-	-	-	-	-	-	-	-	-
Nickel	**0.282**	**0.392**	**0.273**	**0.324**	**0.213**	**0.292**	**0.338**	-	-
Thallium	**0.0188**	**0.0128**	**0.0153**	**0.0157**	**0.0162**	**0.0133**	**0.0153**	-	-
Vanadium	**0.130**	**0.0700**	**0.0600**	**0.0500**	**0.0400**	**0.0500**	**0.0500**	-	-
Zinc	**12.3**	**15.5**	**16.1**	**14.8**	**13.3**	**13.3**	**14.4**	-	-
Semivolatile Organic Compounds (µg/kg wet)									
Bis(2-ethylhexyl) Phthalate	66.0 UJ	66.0 UJ	**120 J**	**190**	66.0 UJ	66.0 UJ	66.0 UJ	81.9	HH
Butyl Benzyl Phthalate	7.30 UJ	7.30 UJ	**33.0 J**	7.30 UJ	7.30 UJ	7.30 UJ	7.30 UJ	310	Eco
Carbazole	9.10 UJ	9.10 UJ	9.10 UJ	9.10 UJ	9.10 UJ	9.10 UJ	9.10 UJ	-	-
Di-n-butyl Phthalate	16.0 UJ	71.0 UJ	**150 J**	16.0 UJ	16.0 UJ	37.0 UJ	16.0 UJ	626	Eco
Di-n-octyl Phthalate	11.0 UJ	11.0 UJ	11.0 UJ	11.0 UJ	11.0 UJ	11.0 UJ	11.0 UJ	626	Eco
p-cresol (4-Methylphenol)	7.70 UJ	7.70 UJ	7.70 UJ	7.70 UJ	7.70 UJ	7.70 UJ	7.70 UJ	-	-
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)									
Acenaphthene	**0.260 J**	**0.280 J**	**0.230 J**	**0.260 J**	0.110 UJ	**0.390 J**	**0.350 J**	15,000	HH
Anthracene	**0.220 J**	**0.320 J**	0.0650 UJ	**0.160 J**	**0.170 J**	**0.450 J**	**0.450 J**	15,000	HH
Fluorene	**0.460 J**	**0.670**	**0.550**	**0.650**	**0.400 J**	**0.850 J**	0.150 UJ	15,000	HH
Phenanthrene	**1.00**	**1.90**	**0.760**	**1.10**	**0.980**	**2.00 J**	**2.10**	15,000	HH
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)									
Benzo(a)anthracene	0.0660 UJ	0.0660 UJ	0.0660 UJ	0.0660 UJ	0.0660 UJ	**1.00 J**	0.0660 UJ	1.57	HH
Benzo(a)pyrene	0.0810 UJ	0.0810 UJ	0.0810 UJ	0.0810 UJ	0.0810 UJ	**0.720 J**	0.0810 UJ	0.157	HH
Benzo(b)fluoranthene	0.0700 UJ	0.0700 UJ	0.0700 UJ	0.0700 UJ	0.0700 UJ	0.140 UJ	0.0700 UJ	1.57	HH
Benzo(g,h,i)perylene	0.0730 UJ	0.0730 UJ	0.0730 UJ	0.0730 UJ	0.0730 UJ	0.150 UJ	0.0730 UJ	15.7	HH
Benzo(k)fluoranthene	0.0560 UJ	0.0560 UJ	0.0560 UJ	0.0560 UJ	0.0560 UJ	**1.40 J**	0.0560 UJ	15.7	HH
Chrysene	0.0760 UJ	0.0760 UJ	0.0760 UJ	0.0760 UJ	0.0760 UJ	**0.500 J**	0.0760 UJ	157	HH
Dibenz(a,h)anthracene	0.0590 UJ	0.0590 UJ	0.0590 UJ	0.0590 UJ	0.0590 UJ	0.120 UJ	0.0590 UJ	0.157	HH
Fluoranthene	0.0900 UJ	**0.730**	0.0900 UJ	0.0900 UJ	0.0900 UJ	**1.30 J**	**0.490**	19,000	Eco
Indeno(1,2,3-cd)pyrene	0.0640 UJ	0.0640 UJ	0.0640 UJ	0.0640 UJ	0.0640 UJ	**0.720 J**	0.0640 UJ	1.57	HH
Pyrene	0.0980 UJ	0.0980 UJ	0.0980 UJ	0.0980 UJ	0.0980 UJ	**0.720 J**	0.0980 UJ	1,000	Eco

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
RDL = reported detection limit
- = Not Analyzed
-- = SLV for analyte not available
ND = Non Detect

[1] Only Aroclors 1242 and 1254 were included in summing bass Total PCBs as Aroclors because all other aroclors were undected in Forebay smallmouth bass samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-6a
Forebay Area Smallmouth Bass and Largescale Sucker Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 3 of 3)

Area	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay		
Site ID	15	16	17	18	19	SUCKER		
Sample ID	060606210SB	060815402SB	060815403SB	060815405SB	060815406SB	070505LS		
Sample Date	6/6/2006	8/15/2006	8/15/2006	8/15/2006	8/15/2006	5/5/2007		
Percent Lipids	1.7	5.3	5.5	4.7	6.6	10.4		
Tissue Type	Smallmouth Bass	Smallmouth Bass	Smallmouth Bass	Smallmouth Bass	Smallmouth Bass	Largescale Sucker	**Selected SLV**	**SLV Source**
PCB Aroclors (µg/kg wet)								
Aroclor 1016	10.0 UJ	2.40 UJ	120 UJ	24.0 UJ	9.90 UJ	2.40 U	0.570	HH
Aroclor 1221	20.0 UJ	2.60 UJ	130 UJ	26.0 UJ	2.60 UJ	2.60 U	0.570	HH
Aroclor 1232	10.0 UJ	2.30 UJ	120 UJ	23.0 UJ	9.90 UJ	2.30 U	0.570	HH
Aroclor 1242	8.50 UJ	**260 J**	110 UJ	22.0 UJ	4.70 UJ	2.20 U	0.570	HH
Aroclor 1248	10.0 UJ	0.510 UJ	26.0 UJ	5.10 UJ	5.70 UJ	0.510 U	0.570	HH
Aroclor 1254	16.0 UJ	**330 J**	**18,000 J**	**1,400 J**	13.0 UJ	**160**	0.570	HH
Aroclor 1260	31.0 UJ	1.90 UJ	95.0 UJ	19.0 UJ	37.0 UJ	1.90 U	0.570	HH
Aroclor 1262	10.0 UJ	2.50 UJ	130 UJ	25.0 UJ	12.0 UJ	-	0.570	HH
Aroclor 1268	2.50 UJ	2.00 UJ	100 UJ	20.0 UJ	3.50 UJ	2.00 U	0.570	HH
Total PCBs as Aroclors (NDs at MDL) [1]	24.5 UJ	**590 J**	**18,110 J**	**1,422 J**	17.7 UJ	**160**	0.570	HH
PCB Congeners (µg/kg wet)								
PCB 77	**0.0236 J**	**0.334 J**	**8.95 J**	**0.577 J**	**0.0568 J**	**0.110**	0.0760	HH
PCB 81	**0.00130 J**	**0.0198 J**	**1.19 J**	0.00615 UJ	**0.00358 J**	**0.00902**	0.0250	HH
PCB 105	**1.60 J**	**30.1 J**	**1,300 J**	**109 J**	**0.738 J**	**4.35**	0.250	HH
PCB 114	**0.122 J**	**2.33 J**	**89.8 J**	**11.2 J**	**0.115 J**	**0.289**	0.250	HH
PCB 118	**4.97 J**	**92.1 J**	**3,270 J**	**312 J**	**3.82 J**	**10.3**	0.250	HH
PCB 123	**0.0574 J**	**1.20 J**	**55.3 J**	**6.10 J**	**0.0750 J**	**0.179**	0.250	HH
PCB 126	**0.00755 J**	0.0480 UJ	**3.03 J**	**0.125 J**	**0.0123 J**	**0.0191**	0.0000760	HH
PCB 156	**1.20 C J**	**16.9 C J**	**486 C J**	**83.0 C J**	**0.791 C J**	**1.77 C**	0.250	HH
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**						0.250	HH
PCB 167	**0.270 J**	**4.71 J**	**140 J**	**21.0 J**	**0.356 J**	**0.565**	0.250	HH
PCB 169	0.00318 UJ	0.0151 UJ	0.607 UJ	0.0280 UJ	0.00439 UJ	**0.0111**	0.000250	HH
PCB 189	**0.0407 J**	**0.402 J**	**10.1 J**	**1.88 J**	**0.0419 J**	**0.0780**	0.250	HH
Total PCBs as Congeners (KM, capped)	**54.8 J**	**1193 J**	**26505 J**	**2482 J**	**40.7 J**	**201 J**	0.570	HH
Metals (mg/kg wet)								
Aluminum	**10.3**	**4.24**	**1.33**	**1.97**	**7.54**	**19.7 J**	-	-
Antimony	0.00500 U	0.00600 U	0.00600 U	0.00600 U	0.00500 U	0.00600 U	-	-
Arsenic	**0.540**	**0.190**	**0.290**	**0.450**	**0.410**	**0.350**	0.000760	HH
Barium	**0.980**	**2.64**	**1.74**	**1.24**	**1.66**	**1.92**	-	-
Beryllium	0.000500 U	0.000600 U	0.000600 U	0.000600 U	0.000500 U	0.000600 U	-	-
Cadmium	**0.0280**	**0.00500**	**0.00700**	**0.00500**	**0.00700**	**0.0420**	0.150	Eco
Chromium	**0.860**	0.150 U	0.150 U	0.150 U	0.130 U	**0.480**	-	-
Cobalt	**0.0519**	**0.0625**	**0.0566**	**0.0508**	**0.0457**	**0.0775**	-	-
Copper	**0.619**	**0.905**	**0.591**	**0.364**	**0.505**	**0.728**	-	-
Lead	**0.0360**	**0.0120**	**0.00800**	**0.0160**	**0.00500**	**0.0440**	0.120	Eco
Mercury	**0.203 J**	**0.301 J**	**0.165 J**	**0.498 J**	**0.147 J**	**0.139 J**	0.0490	HH
Methyl Mercury	-	-	-	-	-	-	-	-
Nickel	**0.333**	**0.327**	**0.295**	**0.281**	**0.228**	**0.343**	-	-
Thallium	**0.0215**	**0.00790**	**0.0136**	**0.0145**	**0.0142**	**0.00560**	-	-
Vanadium	**0.0500**	**0.0800**	**0.0700**	**0.0800**	**0.0900**	**0.170**	-	-
Zinc	**13.4**	**15.8**	**14.9**	**13.2**	**11.4**	**17.5**	-	-
Semivolatile Organic Compounds (µg/kg wet)								
Bis(2-ethylhexyl) Phthalate	**1,600**	5,000 U	66.0 UJ	66.0 UJ	66.0 UJ	66.0 U	81.9	HH
Butyl Benzyl Phthalate	7.30 UJ	**440**	7.30 UJ	7.30 UJ	7.30 UJ	7.30 U	310	Eco
Carbazole	9.10 UJ	9.10 UJ	9.10 UJ	9.10 UJ	9.10 UJ	9.10 U	-	-
Di-n-butyl Phthalate	16.0 UJ	16.0 UJ	16.0 UJ	16.0 UJ	16.0 UJ	16.0 U	626	Eco
Di-n-octyl Phthalate	11.0 UJ	11.0 UJ	11.0 UJ	11.0 UJ	11.0 UJ	11.0 U	626	Eco
p-cresol (4-Methylphenol)	7.70 UJ	7.70 UJ	7.70 UJ	7.70 UJ	7.70 UJ	7.70 U	-	-
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)								
Acenaphthene	**0.300 J**	**1.40 J**	**1.50 J**	**1.50 J**	**1.60 J**	1.10 U	15,000	HH
Anthracene	**0.400 J**	**17.0 J**	**5.70 J**	**6.00 J**	**6.60 J**	**4.50 J**	15,000	HH
Fluorene	**0.520 J**	**4.70 J**	**2.40 J**	**3.70 J**	**3.30 J**	1.50 U	15,000	HH
Phenanthrene	**1.00 J**	**5.70 J**	**4.60 J**	**5.20 J**	**5.40 J**	**3.80 J**	15,000	HH
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)								
Benzo(a)anthracene	**1.20 J**	**17.0 J**	0.660 UJ	0.660 UJ	0.660 UJ	0.660 U	1.57	HH
Benzo(a)pyrene	**0.740 J**	**6.80 J**	**7.10 J**	**6.40 J**	**7.40 J**	**6.30**	0.157	HH
Benzo(b)fluoranthene	0.140 UJ	**4.20 J**	**3.90 J**	**4.40 J**	**4.40 J**	0.700 U	1.57	HH
Benzo(g,h,i)perylene	0.150 UJ	**2.60 J**	**2.80 J**	**3.10 J**	**3.30 J**	**2.00 J**	15.7	HH
Benzo(k)fluoranthene	**1.60 J**	**7.70 J**	**7.20 J**	**7.20 J**	**7.60 J**	**11.0**	15.7	HH
Chrysene	**0.620 J**	**10.0 J**	**4.50 J**	**4.60 J**	**4.90 J**	0.760 U	157	HH
Dibenz(a,h)anthracene	0.120 UJ	**3.40 J**	**3.40 J**	**3.40 J**	**4.10 J**	**3.70 J**	0.157	HH
Fluoranthene	**0.960 J**	**5.90 J**	**5.90 J**	**6.30 J**	**6.50 J**	**5.90**	19,000	Eco
Indeno(1,2,3-cd)pyrene	0.130 UJ	**5.60 J**	**5.30 J**	**6.00 J**	**6.10 J**	**6.50**	1.57	HH
Pyrene	**0.670 J**	**7.20 J**	**4.90 J**	**5.00 J**	**5.30 J**	**7.40**	1,000	Eco

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
RDL = reported detection limit
- = Not Analyzed
-- = SLV for analyte not available
ND = Non Detect

[1] Only Aroclors 1242 and 1254 were included in summing bass Total PCBs as Aroclors because all other aroclors were undected in Forebay smallmouth bass
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-6b
Reference Area Smallmouth Bass Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 1 of 3)

Area	Reference	Reference	Reference	Reference	Reference	Reference
Site ID	20	21	22	23	24	25
Sample ID	071027R01SB	071027R02SB	071027R03SB	071027R04SB	071027R05SB	071027R06SB
Sample Date	10/27/2007	10/27/2007	10/27/2007	10/27/2007	10/27/2007	10/27/2007
Percent Lipids	6.2	7	7.2	8.5	7.9	5.9
PCB Aroclors (µg/kg wet)						
Aroclor 1016	3.50 U	4.70 U	3.40 U	2.40 U	9.90 U	2.40 U
Aroclor 1221	4.70 U	2.60 U	2.60 U	2.60 U	20.0 U	2.60 U
Aroclor 1232	6.10 U	5.90 U	3.90 U	2.30 U	9.90 U	2.30 U
Aroclor 1242	4.50 UJ	6.30 UJ	2.20 UJ	2.20 UJ	**14.0 J**	**9.50 J**
Aroclor 1248	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U
Aroclor 1254	**59.0 J**	**32.0 J**	**51.0 J**	9.60 UJ	**110 J**	**58.0 J**
Aroclor 1260	1.90 U	1.90 U	1.90 U	14.0 U	1.90 U	1.90 U
Aroclor 1262	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U
Aroclor 1268	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U
Total PCBs as Aroclors (NDs at MDL) [1]	**63.5 J**	**38.3 J**	**53.2 J**	11.8 UJ	**124 J**	**67.5 J**
PCB Congeners (µg/kg wet)						
PCB 77	**0.0470**	**0.0358**	**0.0435**	**0.0254**	**0.195**	**0.0381**
PCB 81	0.00681 U	0.00574 U	0.00504 U	0.00547 U	0.0205 U	0.00944 U
PCB 105	**1.15**	**1.07**	**1.11**	**0.498**	**4.06**	**1.16**
PCB 114	**0.0770**	**0.0723**	**0.0652**	**0.0292**	**0.300**	0.0856 EMPC
PCB 118	**3.30**	**3.05**	**3.01**	**1.33**	**10.2**	**3.14**
PCB 123	**0.0554**	**0.0477**	0.0435 EMPC	**0.0248**	**0.184**	0.0470 EMPC
PCB 126	0.0112 U	0.0116 EMPC	0.0122 U	**0.00561**	0.0301 U	0.0157 U
PCB 156	**0.468 C**	**0.402 C**	**0.378 C**	**0.194 C**	**1.39 C**	**0.490 C**
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**					
PCB 167	**0.193**	**0.169**	**0.157**	**0.0843**	**0.536**	**0.181**
PCB 169	0.00551 U	0.00890 U	0.00536 U	0.00227 U	0.0109 U	0.00489 U
PCB 189	0.0165 EMPC	**0.0174**	0.0168 EMPC	**0.0133**	**0.0677**	0.0195 EMPC
Total PCBs as Congeners (KM, capped)	**47.9 J**	**41.8 J**	**44.7 J**	**22.1 J**	**164 J**	**44.4 J**
Metals (mg/kg wet)						
Aluminum	**0.802**	**1.55**	**1.13**	**0.330 J**	**0.663**	**2.11**
Antimony	0.00500 U	0.00500 U	0.00600 U	0.00600 U	0.00500 U	0.00500 U
Arsenic	**0.311**	**0.406**	**0.434**	**0.159**	**0.761**	**0.277 J**
Barium	**1.06**	**0.837**	**1.20**	**0.430**	**0.456**	**0.748**
Beryllium	0.000500 U	0.000500 U	0.000600 U	0.000600 U	0.000500 U	0.000500 U
Cadmium	**0.00800 J**	**0.00500 J**	**0.00600 J**	**0.00500 J**	**0.00400 J**	**0.00600 J**
Chromium	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Cobalt	0.0255 U	0.0309 U	0.0278 U	0.0248 U	0.0255 U	0.0267 U
Copper	**0.571**	**0.344**	**0.457**	**0.336**	**0.327**	**0.419**
Lead	0.0130 U	0.0140 U	0.0140 U	0.0150 U	0.0140 U	0.0130 U
Mercury	**0.106 J**	**0.217 J**	**0.0904 J**	**0.130 J**	**0.144 J**	**0.0548 J**
Methyl Mercury	-	-	-	-	-	-
Nickel	**0.324**	**0.399**	**0.328**	0.298 U	0.306 U	0.277 U
Thallium	**0.0159**	**0.0201**	**0.0205**	**0.0120**	**0.0189**	**0.0165**
Vanadium	**0.0400 J**	**0.0400 J**	**0.0400 J**	**0.0500 J**	**0.0300 J**	**0.0300 J**
Zinc	**13.4**	**13.9**	**12.9**	**13.4**	**11.2**	**14.6 J**
Semivolatile Organic Compounds (µg/kg wet)						
Bis(2-ethylhexyl) Phthalate	66.0 U	2,500 U	2,400 U	1,800 U	1,800 U	1,500 U
Butyl Benzyl Phthalate	7.30 U	7.30 U	7.30 U	7.30 U	7.30 U	7.30 U
Carbazole	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U
Di-n-butyl Phthalate	220 U	16.0 U	150 U	280 U	150 U	230 U
Di-n-octyl Phthalate	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
p-cresol (4-Methylphenol)	7.70 U	7.70 U	7.70 U	7.70 U	7.70 U	7.70 UJ
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)						
Acenaphthene	**0.700 J**	**0.770**	**1.00 J**	**0.560 J**	**0.820**	**0.570 J**
Anthracene	**0.0900 J**	0.650 U	**0.380 J**	0.0650 UJ	0.650 U	0.310 U
Fluorene	**1.00 J**	1.80 U	**1.40 J**	**1.50 J**	2.00 U	**0.890 J**
Phenanthrene	**2.50 J**	**3.70 J**	**3.00**	**3.10 J**	**4.60 J**	**2.20**
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)						
Benzo(a)anthracene	0.0660 UJ	0.660 U	0.260 U	0.0660 UJ	0.660 U	0.140 U
Benzo(a)pyrene	0.0810 UJ	0.810 U	0.320 U	0.0810 UJ	0.810 U	0.170 U
Benzo(b)fluoranthene	0.0700 UJ	0.700 U	0.280 U	0.0700 UJ	0.700 U	0.140 U
Benzo(g,h,i)perylene	0.0730 UJ	0.730 U	0.290 U	0.0730 UJ	0.730 U	0.150 U
Benzo(k)fluoranthene	0.0560 UJ	0.560 U	0.220 U	0.0560 UJ	0.560 U	0.120 U
Chrysene	0.0760 UJ	0.760 U	0.300 U	0.0760 UJ	0.760 U	0.160 U
Dibenz(a,h)anthracene	0.0590 UJ	0.590 U	0.230 U	0.0590 UJ	0.590 U	0.120 U
Fluoranthene	0.0900 UJ	**1.90 J**	**1.40 J**	0.0900 UJ	**2.50 J**	1.20 U
Indeno(1,2,3-cd)pyrene	0.0640 UJ	0.640 U	0.250 U	0.0640 UJ	0.640 U	0.130 U
Pyrene	0.0980 UJ	0.980 U	**0.420 J**	0.0980 UJ	0.980 U	0.200 U

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
RDL = reported detection limit
- = Not Analyzed
ND = Non Detect
bold = analyte detected above MDL/RDL.
J = The reported value is an estimate.

[1] Only Aroclor 1242 and 1254 were included in summing bass Total PCBs as Aroclors because all other aroclors were undected in Reference Area smallmouth bass samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

Table 6-6b
Reference Area Smallmouth Bass Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 2 of 3)

Area	Reference	Reference	Reference	Reference	Reference	Reference	Reference
Site ID	26	27	28	29	30	31	32
Sample ID	071115R07SB	080517R10SB	080517R11SB	080517R12SB	080517R13SB	080517R14SB	080521R15SB
Sample Date	11/15/2007	5/17/2008	5/17/2008	5/17/2008	5/17/2008	5/17/2008	5/21/2008
Percent Lipids	5.4	6.1	4.7	2.5	5.1	3.7	4.2
PCB Aroclors (µg/kg wet)							
Aroclor 1016	3.80 U	2.40 U	7.90 U	4.80 U	2.40 U	6.00 U	3.10 U
Aroclor 1221	3.80 U	2.60 U	18.0 U	2.60 U	2.60 U	20.0 U	2.60 U
Aroclor 1232	3.10 U	2.30 U	10.0 U	5.10 U	2.30 U	9.90 U	10.0 U
Aroclor 1242	2.20 UJ	**5.60 J**	10.0 UJ	2.20 UJ	**2.40 J**	2.20 UJ	2.20 UJ
Aroclor 1248	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U	6.90 U	0.510 U
Aroclor 1254	**27.0 J**	**34.0 J**	**37.0 J**	**29.0 J**	**80.0 J**	17.0 UJ	**47.0 J**
Aroclor 1260	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U	46.0 U	1.90 U
Aroclor 1262	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	21.0 U	2.50 U
Aroclor 1268	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	3.40 U	2.00 U
Total PCBs as Aroclors (NDs at MDL) [1]	**29.2 J**	**39.6 J**	**47.0 J**	**31.2 J**	**82.4 J**	19.2 UJ	**49.2 J**
PCB Congeners (µg/kg wet)							
PCB 77	**0.0301**	**0.0754**	**0.0362**	**0.0436**	**0.0701**	**0.0548**	**0.0493**
PCB 81	0.00253 U	**0.00552**	**0.00256**	**0.00263**	**0.00326**	**0.00263**	**0.00235**
PCB 105	**1.01**	**3.50**	**0.940**	**1.00**	**1.91**	**1.37**	**1.31**
PCB 114	0.0684 EMPC	**0.272**	**0.0599**	**0.0802**	**0.123**	**0.145**	**0.0872**
PCB 118	**3.11**	**11.8**	**2.58**	**3.63**	**4.85**	**6.21**	**3.74**
PCB 123	**0.0531**	**0.148**	**0.0430**	**0.0553**	**0.0811**	**0.104**	**0.0606**
PCB 126	0.0107 U	**0.0259**	**0.00603**	**0.00955**	**0.0126**	**0.0143**	**0.00945**
PCB 156	**0.448 C**	**1.89 C**	**0.290 C**	**0.430 C**	**0.638 C**	**0.882 C**	**0.447 C**
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**						
PCB 167	**0.168**	**0.571**	**0.117**	**0.211**	**0.242**	**0.380**	**0.180**
PCB 169	0.00857 U	0.00812 U	0.00130 U	0.00186 U	0.00279 U	0.00307 U	0.00154 U
PCB 189	0.0232 EMPC	**0.102**	**0.0147**	**0.0217**	**0.0313**	**0.0444**	**0.0197**
Total PCBs as Congeners (KM, capped)	**41.7 J**	**117 J**	**35.8 J**	**39.8 J**	**69.0 J**	**50.2 J**	**43.1 J**
Metals (mg/kg wet)							
Aluminum	**1.55**	**1.52**	**3.86**	**10.1**	**2.44**	**0.970**	**5.41**
Antimony	0.00600 U	**0.0250**	**0.00300 J**	**0.00300 J**	0.00200 U	**0.00300 J**	0.00200 U
Arsenic	**0.270**	**0.640**	**0.240**	**0.420**	**0.290**	**0.430**	**0.230**
Barium	**1.50**	**0.915**	**0.875**	**1.72**	**0.871**	**1.65**	**1.11**
Beryllium	0.000600 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Cadmium	**0.00400 J**	**0.143**	**0.130**	**0.111**	**0.140**	**0.125**	**0.111**
Chromium	0.100 U	**7.15**	**0.210 J**	**0.160 J**	**0.0900 J**	**0.0900 J**	**0.0700 J**
Cobalt	0.0361 U	**0.0838**	**0.0576**	**0.0602**	**0.0487**	**0.0551**	**0.0748**
Copper	**0.575**	**0.680**	**0.490**	**0.500**	**0.700**	**0.440**	**0.690**
Lead	0.0140 U	**1.81**	**1.70**	**1.43**	**1.69**	**1.47**	**1.47**
Mercury	**0.0932 J**	**0.333 J**	**0.0630 J**	**0.102 J**	**0.141 J**	**0.233 J**	**0.0600 J**
Methyl Mercury	-	-	-	-	-	-	-
Nickel	**0.408**	**1.48**	**1.38**	**1.34**	**1.18**	**1.31**	**1.29**
Thallium	**0.0149**	**0.0261**	**0.0152**	**0.0149**	**0.0123**	**0.0152**	**0.0118**
Vanadium	**0.0600**	0.00600 U	**0.0510 J**	**0.102**	**0.0480 J**	**0.0710**	**0.0730**
Zinc	**12.9**	**15.1**	**14.8**	**13.1**	**12.8**	**13.0**	**11.5**
Semivolatile Organic Compounds (µg/kg wet)							
Bis(2-ethylhexyl) Phthalate	1,700 U	66.0 U	**150 J**	66.0 U	66.0 U	66.0 U	66.0 U
Butyl Benzyl Phthalate	7.30 U	7.30 U	7.30 U	7.30 U	7.30 U	7.30 U	7.30 U
Carbazole	9.10 U	7.70 U	7.70 U	7.70 U	7.70 U	7.70 U	7.70 U
Di-n-butyl Phthalate	87.0 U	100 U	100 U	100 U	100 U	100 U	100 U
Di-n-octyl Phthalate	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
p-cresol (4-Methylphenol)	7.70 U	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)							
Acenaphthene	**1.00 J**	**0.970**	**0.810**	0.110 U	**0.980**	**0.510**	**0.900**
Anthracene	**0.220 J**	0.0650 U	0.0650 U	0.0650 U	0.0650 U	0.0650 U	0.0650 U
Fluorene	**1.30 J**	**1.50**	**1.20**	0.150 U	**1.60**	**0.920**	**1.60**
Phenanthrene	**2.40**	**2.10**	**2.40**	**1.40**	**2.40**	**2.00**	**4.70**
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)							
Benzo(a)anthracene	0.190 U	**0.940**	**0.560**	0.0660 U	0.0660 U	0.0660 U	0.0660 U
Benzo(a)pyrene	0.230 U	0.0810 U	0.0810 U	0.0810 U	0.0810 U	0.0810 U	0.0810 U
Benzo(b)fluoranthene	0.200 U	0.0700 U	0.0700 U	0.0700 U	0.0700 U	0.0700 U	0.0700 U
Benzo(g,h,i)perylene	0.200 U	0.0730 U	0.0730 U	0.0730 U	0.0730 U	0.0730 U	0.0730 U
Benzo(k)fluoranthene	0.160 U	0.0560 U	0.0560 U	0.0560 U	0.0560 U	0.0560 U	0.0560 U
Chrysene	0.210 U	**0.550**	0.0760 U	0.0760 U	0.0760 U	0.0760 U	0.0760 U
Dibenz(a,h)anthracene	0.170 U	0.0590 U	0.0590 U	0.0590 U	0.0590 U	0.0590 U	0.0590 U
Fluoranthene	**0.690 J**	0.0900 U	0.0900 U	0.0900 U	0.0900 U	0.0900 U	**1.40**
Indeno(1,2,3-cd)pyrene	0.180 U	0.0640 U	0.0640 U	0.0640 U	0.0640 U	0.0640 U	0.0640 U
Pyrene	**0.380 J**	0.0980 U	0.0980 U	0.0980 U	0.0980 U	0.0980 U	0.0980 U

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
RDL = reported detection limit
- = Not Analyzed
ND = Non Detect
bold = analyte detected above MDL/RDL.
J = The reported value is an estimate.

[1] Only Aroclor 1242 and 1254 were included in summing bass Total PCBs as Aroclors because all other aroclors were undected in Reference Area smallmouth bass samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

Table 6-6b
Reference Area Smallmouth Bass Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 3 of 3)

Area	Reference	Reference	Reference	Reference	Reference	Reference
Site ID	33	34	35	36	37	38
Sample ID	080521R16SB	080521R17SB	080521R18SB	080521R19SB	080521R20SB	080521R21SB
Sample Date	5/21/2008	5/21/2008	5/21/2008	5/21/2008	5/21/2008	5/21/2008
Percent Lipids	2.6	4.1	4.2	5.3	4.1	2.8
PCB Aroclors (µg/kg wet)						
Aroclor 1016	5.90 U	5.20 U	4.50 U	5.40 U	7.30 U	4.50 U
Aroclor 1221	6.90 U	5.90 U	7.40 U	20.0 U	12.0 U	3.70 U
Aroclor 1232	5.70 U	3.90 U	4.40 U	5.40 U	10.0 U	11.0 U
Aroclor 1242	2.20 UJ	2.90 UJ	10.0 UJ	2.20 UJ	10.0 UJ	3.80 UJ
Aroclor 1248	33.0 U	0.510 U	0.510 U	0.510 U	0.510 U	0.510 U
Aroclor 1254	130 UJ	**47.0 J**	**46.0 J**	**85.0 J**	**37.0 J**	**58.0 J**
Aroclor 1260	140 U	1.90 U	1.90 U	1.90 U	1.90 U	1.90 U
Aroclor 1262	110 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U
Aroclor 1268	10.0 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U
Total PCBs as Aroclors (NDs at MDL) [1]	132 UJ	**49.9 J**	**56.0 J**	**87.2 J**	**47.0 J**	**58.0 J**
PCB Congeners (µg/kg wet)						
PCB 77	**0.172**	**0.0537**	**0.0597**	**0.0701**	**0.0528**	**0.0497**
PCB 81	**0.0159**	**0.00340**	**0.00406**	**0.00376**	**0.00202**	**0.00311**
PCB 105	**23.4**	**1.32**	**2.00**	**2.09**	**1.44**	**1.68**
PCB 114	**2.91**	**0.0826**	**0.132**	**0.137**	**0.0971**	**0.106**
PCB 118	**98.6**	**3.65**	**5.97**	**5.35**	**4.78**	**4.46**
PCB 123	**1.83**	**0.0648**	**0.0840**	**0.0802**	**0.0761**	**0.0691**
PCB 126	**0.0746**	**0.00901**	**0.0134**	**0.0129**	**0.0107**	**0.00865**
PCB 156	**20.0 C**	**0.420 C**	**0.786 C**	**0.714 C**	**0.557 C**	**0.544 C**
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**					
PCB 167	**6.54**	**0.175**	**0.286**	**0.242**	**0.276**	**0.198**
PCB 169	0.00662 U	0.00216 U	0.00482 U	0.00596 U	0.00356 U	0.00210 U
PCB 189	**0.532**	**0.0209**	**0.0386**	**0.0375**	**0.0295**	**0.0205**
Total PCBs as Congeners (KM, capped)	**499 J**	**44.2 J**	**60.6 J**	**77.9 J**	**52.9 J**	**52.8 J**
Metals (mg/kg wet)						
Aluminum	**1.13**	**3.02**	**0.680**	**4.01**	**3.95**	**2.28**
Antimony	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Arsenic	**0.180**	**0.240**	**0.290**	**0.320**	**0.440**	**0.390**
Barium	**1.42**	**1.22**	**0.843**	**0.957**	**1.36**	**1.70**
Beryllium	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Cadmium	**0.138**	**0.126**	**0.117**	**0.124**	**0.129**	**0.112**
Chromium	**0.130 J**	**0.0600 J**	**0.0600 J**	**0.0400 J**	**0.0700 J**	**0.0800 J**
Cobalt	**0.0704**	**0.0601**	**0.0552**	**0.0523**	**0.0536**	**0.0574**
Copper	**0.630**	**0.590**	**0.410**	**0.370**	**0.730**	**0.430**
Lead	**1.66**	**1.65**	**1.53**	**1.62**	**1.59**	**1.42**
Mercury	**0.123 J**	**0.0650 J**	**0.178 J**	**0.105 J**	**0.176 J**	**0.0730 J**
Methyl Mercury	-	-	-	-	-	-
Nickel	**1.79**	**1.38**	**1.29**	**1.23**	**1.18**	**1.33**
Thallium	**0.0113**	**0.0139**	**0.0109**	**0.0133**	**0.0218**	**0.0180**
Vanadium	**0.104**	**0.0510 J**	**0.0600**	**0.0800**	**0.0660**	**0.0570**
Zinc	**12.8**	**12.7**	**12.3**	**14.3**	**14.8**	**15.5**
Semivolatile Organic Compounds (µg/kg wet)						
Bis(2-ethylhexyl) Phthalate	66.0 U	66.0 U	66.0 U	66.0 U	**81.0 J**	66.0 U
Butyl Benzyl Phthalate	7.30 U	7.30 U	7.30 U	7.30 U	7.30 U	7.30 U
Carbazole	7.70 U	7.70 U	7.70 U	7.70 U	7.70 U	7.70 U
Di-n-butyl Phthalate	100 U	100 U	100 U	100 U	100 U	100 U
Di-n-octyl Phthalate	**15.0 J**	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
p-cresol (4-Methylphenol)	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)						
Acenaphthene	**0.540**	**0.870**	**0.990**	**1.30**	**0.800**	**0.540**
Anthracene	0.0650 U	0.0650 U	0.0650 U	0.0650 U	0.0650 U	0.0650 U
Fluorene	**0.940**	**1.40**	**1.70**	**2.10**	**1.50**	**0.990**
Phenanthrene	**3.70**	**3.80**	**4.10**	**5.10**	**2.30**	**3.60**
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)						
Benzo(a)anthracene	0.0660 U	0.0660 U	0.0660 U	0.0660 U	**0.610**	0.0660 U
Benzo(a)pyrene	0.0810 U	0.0810 U	0.0810 U	0.0810 U	0.0810 U	0.0810 U
Benzo(b)fluoranthene	0.0700 U	0.0700 U	0.0700 U	0.0700 U	0.0700 U	0.0700 U
Benzo(g,h,i)perylene	0.0730 U	0.0730 U	0.0730 U	0.0730 U	0.0730 U	0.0730 U
Benzo(k)fluoranthene	0.0560 U	0.0560 U	0.0560 U	0.0560 U	0.0560 U	0.0560 U
Chrysene	0.0760 U	0.0760 U	0.0760 U	0.0760 U	0.0760 U	0.0760 U
Dibenz(a,h)anthracene	0.0590 U	0.0590 U	0.0590 U	0.0590 U	0.0590 U	0.0590 U
Fluoranthene	**1.20**	**1.00**	**1.10**	**1.60**	**0.750**	**0.780**
Indeno(1,2,3-cd)pyrene	0.0640 U	0.0640 U	0.0640 U	0.0640 U	0.0640 U	0.0640 U
Pyrene	0.0980 U	0.0980 U	0.0980 U	0.0980 U	0.0980 U	0.0980 U

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
RDL = reported detection limit
- = Not Analyzed
ND = Non Detect
bold = analyte detected above MDL/RDL.
J = The reported value is an estimate.

[1] Only Aroclor 1242 and 1254 were included in summing bass Total PCBs as Aroclors because all other aroclors were undected in Reference Area smallmouth bass samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

Table 6-7a
Pre-Removal Sediment Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Semivolatile Organic Compounds, General Chemistry Parameters, and Grain Size

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Selected SLV	SLV Source
Site ID	A1	A2*	A3	A4	A5		
Sample ID	070926A1 SD	070926A2 SD	070927A3 SD	070925A4 SD	070925A5 SD		
Sample Date	9/26/2007	9/26/2007	9/27/2007	9/25/2007	9/25/2007		
PCB Aroclors (µg/kg dry)							
Aroclor 1016	2.60 U	2.80 U	5.80 U	3.00 U	2.80 U	0.0480	HH
Aroclor 1221	2.60 U	2.80 U	5.80 U	3.00 U	2.80 U	0.0480	HH
Aroclor 1232	2.60 U	2.80 U	5.80 U	3.00 U	2.80 U	0.0480	HH
Aroclor 1242	2.60 U	2.80 U	5.80 U	3.00 U	2.80 U	0.0480	HH
Aroclor 1248	2.60 U	2.80 U	5.80 U	3.00 U	2.80 U	0.0480	HH
Aroclor 1254	**130**	**44.0**	5.80 U	**100**	**13.0**	0.0480	HH
Aroclor 1260	2.60 U	2.80 U	5.80 U	3.00 U	2.80 U	0.0480	HH
Aroclor 1262	2.60 U	2.80 U	5.80 U	3.00 U	2.80 U	0.0480	HH
Aroclor 1268	2.60 U	2.80 U	5.80 U	3.00 U	2.80 U	0.0480	HH
Total PCBs as Aroclors (NDs at MDL) [1]	**133 J**	**46.8 J**	11.6 U	**103 J**	**15.8 J**	0.0480	HH
Metals (mg/kg dry)							
Aluminum	**8,830**	**14,000 J**	**13,400**	**13,100**	**11,900**	38,000	UPL
Antimony	**0.0500**	**0.115**	**0.130 J**	**0.170**	**0.170**	3.00	Eco
Arsenic	**5.68**	**4.24**	**2.00**	**2.33**	**2.36**	6.00	Eco
Barium	**89.8**	**116**	**93.3**	**108**	**149**	315	UPL
Beryllium	**0.353**	**0.358**	**0.314**	**0.331**	**0.280**	0.847	UPL
Cadmium	**0.265**	**0.608 J**	**0.498**	**0.540**	**0.490**	0.674	UPL
Chromium	**14.8**	**22.0**	**15.2**	**16.3**	**16.1**	37.0	Eco
Cobalt	**10.4**	**10.1**	**5.87**	**7.48**	**7.03**	15.2	UPL
Copper	**38.9**	**28.2 J**	**15.3**	**17.8**	**15.9**	55.6	UPL
Lead	**7.27**	**18.4 J**	**9.39**	**9.78**	**9.11**	35.0	Eco
Mercury	**0.0620**	**0.0915 J**	**0.224**	**0.269**	**0.366**	0.214	UPL
Nickel	**15.9**	**15.8**	**9.92**	**12.5**	**11.4**	21.2	UPL
Thallium	**0.112**	**0.171 J**	**0.132**	**0.165**	**0.139**	0.354	UPL
Vanadium	**34.6**	**58.2**	**45.9**	**58.6**	**56.8**	70.6	UPL
Zinc	**46.0**	**93.6**	**87.4**	**102**	**108**	123	Eco
Petroleum Hydrocarbons (mg/kg dry)							
Diesel Range Organics	**35.0**	**11.7 J**	**16.0 J**	**12.0 J**	**8.80 J**	--	--
Residual Range Organics	**77.0 J**	**63.5 J**	**120 J**	**98.0 J**	**70.0 J**	--	--
Semivolatile Organic Compounds (µg/kg dry)							
Bis(2-ethylhexyl) Phthalate	7.00 UJ	**15.5 J**	**16.0 J**	**180 J**	**51.0 J**	750	Eco
Butyl Benzyl Phthalate	3.20 U	3.20 U	**10.0 J**	3.20 U	3.20 U	110	Eco
Carbazole	1.30 U	1.30 U	**2.60 J**	1.30 U	1.30 U	140	Eco
Di-n-butyl Phthalate	**9.10 J**	**11.4 J**	**24.0 J**	**14.0 J**	**12.0 J**	110	Eco
Di-n-octyl Phthalate	1.70 U	1.70 U	2.90 U	1.70 U	1.70 U	110	Eco
p-cresol (4-Methylphenol)	2.90 U	**4,100**	4.70 U	**4.40 J**	2.90 U	--	--
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)							
Acenaphthene	1.40 U	1.40 U	2.40 U	1.40 U	1.40 U	290	Eco
Anthracene	**4.30 J**	14.0 U	2.30 U	1.40 U	1.40 U	57.0	Eco
Fluorene	1.10 U	1.10 U	1.90 U	1.10 U	1.10 U	77.0	Eco
Phenanthrene	**9.10**	**3.25 J**	**2.90 J**	**4.50 J**	**5.00 J**	42.0	Eco
Total LPAHs (KM, capped; NDs at MDL)	**15.9 J**	**19.8 J**	**9.50 J**	**8.40 J**	**8.90 J**	76.0	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)							
Benzo(a)anthracene	**5.70 J**	**3.05 J**	**3.70 J**	**3.30 J**	**3.50 J**	32.0	Eco
Benzo(a)pyrene	**32.0**	16.0 U	2.60 U	**6.10 J**	**7.40 J**	32.0	Eco
Benzo(b)fluoranthene	**11.0**	**7.05 J**	**4.20 J**	**6.40 J**	**7.40 J**	27.0	Eco
Benzo(g,h,i)perylene	**5.40 J**	**3.70 J**	**5.20 J**	**4.40 J**	**4.70 J**	300	Eco
Benzo(k)fluoranthene	**3.20 J**	**3.40 J**	**3.30 J**	**2.30 J**	**2.50 J**	27.0	Eco
Chrysene	**7.90**	**5.35 J**	**4.10 J**	**4.70 J**	**5.20 J**	57.0	Eco
Dibenz(a,h)anthracene	1.50 U	**2.50 J**	**3.10 J**	1.50 U	1.50 U	33.0	Eco
Fluoranthene	**13.0**	**7.10 J**	**4.40 J**	**7.10 J**	**8.30**	111	Eco
Indeno(1,2,3-cd)pyrene	**6.30 J**	**4.60 J**	**13.0 J**	**4.00 J**	**3.90 J**	17.0	Eco
Pyrene	**13.0**	**6.85 J**	**4.50 J**	**6.60 J**	**7.80 J**	53.0	Eco
Total HPAHs (KM, capped; NDs at MDL)	**99.0 J**	**48.4 J**	**48.1 J**	**46.4 J**	**52.2 J**	193	Eco
Total Polycyclic Aromatic Hydrodarbons (PAHs) (µg/kg dry)							
Total PAHs (KM, capped; NDs at MDL)	**114 J**	**57.2 J**	**56.0 J**	**53.8 J**	**60.1 J**	1600	Eco
General Chemistry Parameters (mg/kg) and Grain Size (%)							
Carbon, Total Organic	**10,200**	**5,500**	**10,900**	**9,200**	**7,300**	--	--
Gravel (>2.00 mm)	**40.0**	**49.4**	**29.3**	**0.350**	**0.0600**	--	--
Sand, Very Coarse (1.00 - 2.00 mm)	**15.8**	**11.9**	**1.46**	**0.590**	**0.610**	--	--
Sand, Coarse (0.50 - 1.00 mm)	**13.5**	**14.4**	**1.19**	**0.940**	**0.830**	--	--
Sand, Medium (0.25 - 0.50 mm)	**7.59**	**9.57**	**1.26**	**2.93**	**2.92**	--	--
Sand, Fine (0.125 - 0.25 mm)	**5.68**	**6.83**	**2.75**	**19.8**	**34.1**	--	--
Sand, Very Fine (0.0625 - 0.125 mm)	**4.24**	**4.12**	**6.11**	**30.6**	**29.4**	--	--
Silt (0.039 - 0.0625 mm)	**12.0**	**10.0**	**34.2**	**33.9**	**26.7**	--	--
Clay (<0.039 mm)	**1.37**	**2.38**	**6.36**	**6.65**	**6.76**	--	--

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed
-- = SLV for analyte not available
J = The reported value is an estimate.

[1] Only Aroclor 1248 and 1254 were included in summing sediment Total PCBs as Aroclors because all other aroclors were undected in Forebay sediment samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-7b
Pre-Removal Clam Tissue Analytical Results
PCB Aroclors, Metals, and Semivolatile Organic Compounds

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Selected SLV	SLV Source
Site ID	A1*	A2	A3	A5		
Sample ID	070926A1TC	070926A2TC	070927A3TC	070925A5TC		
Sample Date	9/26/2007	9/26/2007	9/27/2007	9/25/2007		
Percent Lipids	3.4	3.6	3.3	3.5		
PCB Aroclors (µg/kg wet)						
Aroclor 1016	2.40 U	2.40 U	2.40 U	4.70 U	35.0	Eco
Aroclor 1221	2.60 U	2.60 U	2.60 U	5.10 U	35.0	Eco
Aroclor 1232	2.30 U	2.30 U	2.30 U	4.50 U	35.0	Eco
Aroclor 1242	2.20 U	2.20 U	2.20 U	4.40 U	35.0	Eco
Aroclor 1248	0.510 U	0.510 U	0.510 U	1.00 U	35.0	Eco
Aroclor 1254	**355**	**250**	**180**	**120**	35.0	Eco
Aroclor 1260	1.90 U	1.90 U	1.90 U	3.80 U	35.0	Eco
Aroclor 1262	-	-	-	-	35.0	Eco
Aroclor 1268	2.00 U	2.00 U	2.00 U	4.00 U	35.0	Eco
Total PCBs as Aroclors (NDs at MDL) [1]	**355 J**	**250 J**	**180 J**	**120 J**	35.0	Eco
Metals (mg/kg wet)						
Aluminum	**196**	**166**	**184**	**151**	--	--
Antimony	0.00500 U	0.00500 UJ	0.00500 U	0.00500 U	--	--
Arsenic	**2.56**	**3.03**	**3.13**	**2.56**	6.60	Eco
Barium	**2.51**	**2.68**	**2.25**	**2.07**	--	--
Beryllium	**0.00565**	**0.00420**	**0.00550**	**0.00360**	--	--
Cadmium	**0.438**	**0.454**	**0.426**	**0.340**	0.150	Eco
Chromium	**0.700**	**1.20**	**1.20**	**0.600**	--	--
Cobalt	**0.143**	**0.135**	**0.172**	**0.121**	--	--
Copper	**10.8**	**12.3**	**13.5**	**10.1**	--	--
Lead	**0.133**	**0.101**	**0.184**	**0.104**	0.120	Eco
Mercury	**0.0101**	**0.0114 J**	**0.0132**	**0.0114**	0.0740	Eco
Methyl Mercury	-	-	-	-	--	--
Nickel	**0.304**	**0.394**	**0.343**	**0.275**	--	--
Thallium	**0.0192**	**0.0159**	**0.0155**	**0.0162**	--	--
Vanadium	**0.493**	**0.416**	**0.540**	**0.391**	--	--
Zinc	**28.2**	**23.7**	**25.0**	**25.1**	--	--
Semivolatile Organic Compounds (µg/kg wet)						
Bis(2-ethylhexyl) Phthalate	66.0 U	66.0 U	66.0 U	-	1,760	Eco
Butyl Benzyl Phthalate	7.30 U	7.30 U	7.30 U	-	310	Eco
Carbazole	9.10 U	9.10 U	9.10 U	-	--	--
Di-n-butyl Phthalate	**71.0 J**	16.0 U	**59.0 J**	-	626	Eco
Di-n-octyl Phthalate	11.0 U	11.0 U	11.0 U	-	626	Eco
p-cresol (4-Methylphenol)	7.70 U	7.70 U	7.70 U	-	--	--
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)						
Acenaphthene	**0.225 J**	**0.240 J**	**0.250 J**	-	19,000	Eco
Anthracene	**0.945**	**1.10 J**	**1.00**	-	19,000	Eco
Fluorene	**1.30**	**1.30**	**1.30**	-	19,000	Eco
Phenanthrene	**6.60**	**7.00**	**6.70**	-	19,000	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)						
Benzo(a)anthracene	**1.02**	**0.670**	**0.600**	-	1,000	Eco
Benzo(a)pyrene	0.0810 U	0.0810 U	0.0810 U	-	1,000	Eco
Benzo(b)fluoranthene	0.0700 U	0.0700 U	0.0700 U	-	1,000	Eco
Benzo(g,h,i)perylene	0.0730 U	0.0730 U	0.0730 U	-	1,000	Eco
Benzo(k)fluoranthene	0.0560 U	0.0560 U	0.0560 U	-	1,000	Eco
Chrysene	**2.55**	**2.50**	**2.10**	-	1,000	Eco
Dibenz(a,h)anthracene	0.0590 U	0.0590 U	0.0590 U	-	1,000	Eco
Fluoranthene	**12.5**	**12.0**	**12.0**	-	19,000	Eco
Indeno(1,2,3-cd)pyrene	0.0640 U	0.0640 U	0.0640 U	-	1,000	Eco
Pyrene	**2.80**	**2.80**	**2.70**	-	1,000	Eco

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
- = Not Analyzed
-- = SLV for analyte not available
J = The reported value is an estimate.

[1] Only Aroclor 1254 was included in summing clam Total PCBs as Aroclors because all other aroclors were undected in Forebay clam samples.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
= The reported concentration exceeds the selected SLV
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table 6-8a
Post-Removal Forebay Area Sediment Analytical Results
PCB Aroclors, PCB Congeners, Metals, Petroleum Hydrocarbons, Semivolatile Organic Compounds, General Chemistry Parameters, and Grain Size
(Page 1 of 3)

Area	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	**Selected SLV**	**SLV Source**
Site ID	P04	P05	P06	P07	P08	P09		
Sample ID	08022604SD	08031905SD	08031806SD	08021507SD	08021508SD	08021409SD		
Sample Date	2/26/2008	3/19/2008	3/18/2008	2/15/2008	2/15/2008	2/14/2008		
PCB Aroclors (µg/kg dry)								
Aroclor 1016	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1221	1.70 U	1.70 U	1.70 U	2.20 U	12.0 U	1.70 U	0.0480	HH
Aroclor 1232	1.70 U	1.70 U	1.70 U	7.90 U	7.40 U	1.70 U	0.0480	HH
Aroclor 1242	1.70 U	1.70 U	1.70 U	4.30 U	5.70 U	1.70 U	0.0480	HH
Aroclor 1248	1.70 U	1.70 U	1.70 U	3.50 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1254	**27.0**	1.70 U	**4.60 J**	2.50 U	1.90 U	2.60 U	0.0480	HH
Aroclor 1260	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1262	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1268	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Total PCBs as Aroclors (NDs at MDL) [1]	**28.7 J**	3.40 U	**6.30 J**	6.00 U	3.60 U	4.30 U	0.0480	HH
PCB Dioxin-Like Congeners (µg/kg dry)								
PCB 77	**0.00709**	**0.000209**	**0.000596**	**0.00110**	**0.00121**	**0.00199**	0.00640	HH
PCB 81	0.00340 EMPC	0.0000773 U	0.000106 U	0.000192 EMPC	0.000103 EMPC	0.000140 U	0.00210	HH
PCB 105	**1.08**	**0.00954**	**0.0246**	**0.0475**	**0.0335**	**0.0572**	0.0210	HH
PCB 114	**0.0603**	**0.000631**	**0.00160**	**0.00280**	**0.00185**	**0.00327**	0.0210	HH
PCB 118	**2.65**	**0.0294**	**0.0687**	**0.131**	**0.0926**	**0.145**	0.0260	HH
PCB 123	**0.0363**	0.000610 EMPC	0.00111 EMPC	0.00190 EMPC	**0.00144**	**0.00204**	0.0260	HH
PCB 126	0.00269 U	0.0000725 U	0.000318 U	0.000203 U	0.000177 EMPC	0.000219 EMPC	0.00000620	HH
PCB 156	**0.380 C**	**0.00350 C**	**0.00765 C**	**0.0120 C**	**0.0104 C**	**0.0195 C**	0.0260	HH
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**						0.0260	HH
PCB 167	**0.113**	**0.00152**	**0.00255**	**0.00452**	**0.00430**	**0.00633**	0.0260	HH
PCB 169	0.000879 U	0.0000479 U	0.0000626 U	0.0000923 U	0.0000881 U	0.000126 U	0.0000210	HH
PCB 189	**0.00901**	0.000127 EMPC	0.000241 EMPC	0.000331 EMPC	0.000347 EMPC	**0.000787**	0.140	HH
Total PCBs as Congeners (KM, capped)	**29.7 J**	**0.301 J**	**0.778 J**	**1.69 J**	**1.08 J**	**2.10 J**	0.0480	HH
Metals (mg/kg dry)								
Aluminum	**11,200**	**11,300**	**10,800**	**22,900**	**13,500**	**13,300**	38,000	UPL
Antimony	**0.180 J**	0.0400 UJ	**0.0400 J**	**0.140 J**	**0.150 J**	**0.210 J**	3.00	Eco
Arsenic	**3.24**	**1.40**	**2.22**	**5.39**	**4.24**	**2.73**	6.00	Eco
Barium	**121**	**53.1**	**71.2**	**202**	**147**	**123**	315	UPL
Beryllium	**0.367**	**0.215**	**0.295**	**0.597**	**0.398**	**0.369**	0.847	UPL
Cadmium	**0.509**	0.121 U	**0.175**	**0.429**	**0.430**	**0.694**	0.674	UPL
Chromium	**16.0**	**24.1**	**16.9**	**33.5**	**18.4**	**18.5**	37.0	Eco
Cobalt	**7.60**	**8.83**	**10.8**	**10.3**	**7.86**	**7.36**	15.2	UPL
Copper	**20.3**	**19.9**	**24.4**	**33.1**	**19.9**	**19.1**	55.6	UPL
Lead	**10.5**	**3.30**	**5.03**	**9.03**	**8.53**	**10.1**	35.0	Eco
Mercury	**0.264**	**0.0160**	**0.0230**	**0.102**	**0.117**	**0.174**	0.214	UPL
Nickel	**11.8**	**12.8**	**13.8**	**16.4**	**12.6**	**11.5**	21.2	UPL
Thallium	**0.172**	0.108 U	0.132 U	**0.218**	**0.203**	**0.207**	0.354	UPL
Vanadium	**35.1**	**40.3**	**45.0**	**59.3**	**37.9**	**37.4**	70.6	UPL
Zinc	**86.1**	**57.4**	**58.2**	**83.4**	**81.9**	**88.9**	123	Eco
Petroleum Hydrocarbons (mg/kg dry)								
Diesel Range Organics	**21.0**	**2.60 J**	**4.70 J**	**16.0 J**	**13.0 J**	**22.0**	-	-
Residual Range Organics	**98.0 J**	140 U	150 U	**71.0 J**	**55.0 J**	**120 J**	-	-
Semivolatile Organic Compounds (µg/kg dry)								
Bis(2-ethylhexyl) Phthalate	**340**	200 U	200 U	200 U	200 U	200 U	750	Eco
Butyl Benzyl Phthalate	1.50 U	10.0 U	9.80 U	1.50 U	1.50 U	1.50 U	110	Eco
Carbazole	1.30 U	1.30 U	1.30 U	1.30 U	1.30 U	1.30 U	140	Eco
Di-n-butyl Phthalate	10.0 U	15.0 U	9.80 U	9.90 U	9.80 U	9.90 U	110	Eco
Di-n-octyl Phthalate	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U	110	Eco
p-cresol (4-Methylphenol)	2.90 U	2.90 U	2.90 U	**4.80 J**	2.90 U	2.90 U	-	-
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)								
Acenaphthene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	290	Eco
Anthracene	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	57.0	Eco
Fluorene	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	77.0	Eco
Phenanthrene	**3.30 J**	**1.40 J**	1.30 U	**3.40 J**	1.30 U	**1.80 J**	42.0	Eco
Total LPAHs (KM, capped; NDs at MDL)	**7.40 J**	**5.50 J**	5.40 U	**7.50 J**	5.40 U	**5.90 J**	76.0	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)								
Benzo(a)anthracene	**3.90 J**	**1.60 J**	1.40 U	1.40 U	1.40 U	**2.70 J**	32.0	Eco
Benzo(a)pyrene	**4.40 J**	**1.70 J**	1.60 U	1.60 U	1.60 U	**4.50 J**	32.0	Eco
Benzo(b)fluoranthene	**6.10 J**	2.50 U	2.50 U	2.50 U	2.50 U	**5.80 J**	27.0	Eco
Benzo(g,h,i)perylene	**3.90 J**	2.30 U	2.30 U	2.30 U	2.30 U	**3.30 J**	300	Eco
Benzo(k)fluoranthene	**2.50 J**	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	27.0	Eco
Chrysene	**7.80 J**	**1.80 J**	**1.50 J**	**1.40 J**	1.40 U	**4.20 J**	57.0	Eco
Dibenz(a,h)anthracene	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	33.0	Eco
Fluoranthene	**5.50 J**	**3.00 J**	2.20 U	**2.50 J**	2.20 U	**3.70 J**	111	Eco
Indeno(1,2,3-cd)pyrene	**3.30 J**	1.90 U	1.90 U	1.90 U	1.90 U	**3.20 J**	17.0	Eco
Pyrene	**5.60 J**	**2.40 J**	**1.80 J**	**2.00 J**	1.30 U	**3.50 J**	53.0	Eco
Total HPAHs (KM, capped; NDs at MDL)	**45.2 J**	**19.2 J**	**15.4 J**	**16.2 J**	19.3 U	**35.3 J**	193	Eco
Total Polycyclic Aromatic Hydrodarbons (PAHs) (µg/kg dry)								
Total PAHs (KM, capped; NDs at MDL)	**50.3 J**	**22.3 J**	**16.6 J**	**20.5 J**	24.7 U	**38.1 J**	1600	Eco
General Chemistry Parameters (mg/kg dry) and Grain Size (%)								
Carbon, Total Organic	**10,100**	**15,400**	**2,400**	**5,100**	**5,600**	**12,500**	-	-
Gravel (>2.00 mm)	**0.290**	**31.0**	**32.5**	**26.7**	**18.2**	**0.640**	-	-
Sand, Very Coarse (1.00 - 2.00 mm)	**0.380**	**17.6**	**8.42**	**8.50**	**4.82**	**0.280**	-	-
Sand, Coarse (0.50 - 1.00 mm)	**0.830**	**23.9**	**16.3**	**9.36**	**4.96**	**0.710**	-	-
Sand, Medium (0.25 - 0.50 mm)	**5.87**	**16.4**	**17.4**	**17.8**	**10.0**	**1.78**	-	-
Sand, Fine (0.125 - 0.25 mm)	**33.3**	**6.58**	**11.6**	**18.9**	**30.8**	**14.1**	-	-
Sand, Very Fine (0.0625 - 0.125 mm)	**23.1**	**2.74**	**5.08**	**6.12**	**11.3**	**30.3**	-	-
Silt (0.039 - 0.0625 mm)	**40.4**	**6.47**	**7.40**	**16.0**	**17.5**	**44.8**	-	-
Clay (<0.039 mm)	**7.59**	**1.66**	**1.22**	**3.67**	**5.60**	**6.99**	-	-

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
ND = Non Detect
SLV = screening level value
RDL = reported detection limit
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed
-- = SLV for analyte not available

[1] Only Aroclors 1248 and 1254 were included in summing sediment Total PCBs as Aroclors because all other aroclors were undected in Forebay sediment samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-8a
Post-Removal Forebay Area Sediment Analytical Results
PCB Aroclors, PCB Congeners, Metals, Petroleum Hydrocarbons, Semivolatile Organic Compounds, General Chemistry Parameters, and Grain Size
(Page 2 of 3)

Area	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay		
Site ID	P10	P11	P13	P14	P15	P16		
Sample ID	08021410SD	08021411SD	08031713SD	08031814SD	08022115SD	08022116SD	**Selected SLV**	**SLV Source**
Sample Date	2/14/2008	2/14/2008	3/17/2008	3/18/2008	2/21/2008	2/21/2008		
PCB Aroclors (µg/kg dry)								
Aroclor 1016	10.0 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1221	21.0 U	20.0 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1232	8.20 U	6.30 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1242	2.20 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1248	1.90 U	4.00 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1254	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1260	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1262	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1268	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Total PCBs as Aroclors (NDs at MDL) [1]	3.60 U	5.70 U	3.40 U	3.40 U	3.40 U	3.40 U	0.0480	HH
PCB Dioxin-Like Congeners (µg/kg dry)								
PCB 77	**0.00198**	**0.00231**	**0.00163**	**0.000417**	**0.00240**	**0.00217**	0.00640	HH
PCB 81	0.000147 EMPC	0.000129 U	0.0000910 U	0.0000694 U	0.000138 U	0.0000754 U	0.00210	HH
PCB 105	**0.0311**	**0.0211**	**0.0124**	**0.00287**	**0.0188**	**0.0168**	0.0210	HH
PCB 114	0.00171 EMPC	**0.00117**	**0.000661**	0.000136 EMPC	0.000965 EMPC	**0.000813**	0.0210	HH
PCB 118	**0.0794**	**0.0528**	**0.0384**	**0.00690**	**0.0516**	**0.0408**	0.0260	HH
PCB 123	**0.00119**	**0.000859**	**0.000661**	0.000107 EMPC	**0.000796**	**0.000833**	0.0260	HH
PCB 126	0.000252 EMPC	0.000212 EMPC	0.000199 EMPC	0.0000662 U	0.000296 EMPC	**0.000238**	0.00000620	HH
PCB 156	**0.0106 C**	**0.00874 C**	**0.00473 C**	**0.00113 C**	**0.00653 C**	**0.00661 C**	0.0260	HH
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**						0.0260	HH
PCB 167	**0.00391**	**0.00349**	**0.00246**	**0.000461**	**0.00337**	**0.00287**	0.0260	HH
PCB 169	0.000123 U	0.000111 U	0.000104 U	0.0000484 U	0.000161 EMPC	0.000132 U	0.0000210	HH
PCB 189	**0.000617**	**0.000589**	**0.000620 EMPC**	0.000814 U	0.000534 EMPC	**0.000452**	0.140	HH
Total PCBs as Congeners (KM, capped)	**1.24 J**	**1.12 J**	**0.684 J**	**0.143 J**	**0.973 J**	**0.836 J**	0.0480	HH
Metals (mg/kg dry)								
Aluminum	**14,200**	**16,500**	**13,500**	**15,600**	**14,600**	**13,100**	38,000	UPL
Antimony	**0.240 J**	**0.210 J**	**0.280 J**	**0.120 J**	**0.200 J**	**0.200 J**	3.00	Eco
Arsenic	**2.87**	**3.08**	**3.06**	**3.49**	**2.93**	**2.74**	6.00	Eco
Barium	**126**	**134**	**118**	**188**	**141**	**120**	315	UPL
Beryllium	**0.437**	**0.468**	**0.385**	**0.251**	**0.425**	**0.417**	0.847	UPL
Cadmium	**0.691**	**0.719**	**0.531**	**0.307**	**0.652**	**0.690**	0.674	UPL
Chromium	**17.6**	**20.9**	**20.0**	**26.8**	**21.6**	**19.2**	37.0	Eco
Cobalt	**7.55**	**8.52**	**9.33**	**15.1**	**10.0**	**8.04**	15.2	UPL
Copper	**24.0**	**23.6**	**19.4**	**18.4**	**21.0**	**20.9**	55.6	UPL
Lead	**10.1**	**11.3**	**10.0**	**7.04**	**10.3**	**11.0**	35.0	Eco
Mercury	**0.306**	**0.244**	**0.00800**	**0.0410**	**0.109**	**0.373**	0.214	UPL
Nickel	**12.2**	**15.1**	**19.0**	**51.5**	**17.8**	**14.2**	21.2	UPL
Thallium	**0.182**	**0.194**	**0.193**	**0.179**	**0.197**	**0.196**	0.354	UPL
Vanadium	**37.1**	**45.2**	**49.5**	**30.9**	**54.7**	**45.2**	70.6	UPL
Zinc	**87.9**	**97.2**	**113**	**59.3**	**104**	**97.9**	123	Eco
Petroleum Hydrocarbons (mg/kg dry)								
Diesel Range Organics	**27.0**	**28.0**	**11.0 J**	**4.60 J**	**24.0**	**26.0**	-	-
Residual Range Organics	**150 J**	**160 J**	180 U	140 U	**170 J**	**150 J**	-	-
Semivolatile Organic Compounds (µg/kg dry)								
Bis(2-ethylhexyl) Phthalate	200 U	200 U	200 U	200 U	**140 J**	**38.0 J**	750	Eco
Butyl Benzyl Phthalate	1.50 U	1.50 U	1.50 U	9.90 U	1.50 U	1.50 U	110	Eco
Carbazole	1.30 U	1.30 U	**1.40 J**	1.30 U	1.30 U	1.30 U	140	Eco
Di-n-butyl Phthalate	9.90 U	10.0 U	19.0 U	14.0 U	10.0 U	9.90 U	110	Eco
Di-n-octyl Phthalate	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U	110	Eco
p-cresol (4-Methylphenol)	2.90 U	2.90 U	**6.50 J**	**7.30 J**	2.90 U	**21.0**	-	-
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)								
Acenaphthene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	290	Eco
Anthracene	1.40 U	**2.00 J**	**2.70 J**	1.40 U	1.40 U	**1.90 J**	57.0	Eco
Fluorene	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	77.0	Eco
Phenanthrene	**1.90 J**	**7.10 J**	**5.40 J**	**2.10 J**	**4.60 J**	**5.00 J**	42.0	Eco
Total LPAHs (KM, capped; NDs at MDL)	**6.00 J**	**11.8 J**	**10.8 J**	**6.20 J**	**8.70 J**	**9.60 J**	76.0	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)								
Benzo(a)anthracene	**2.30 J**	**7.40 J**	**12.0**	**2.20 J**	**2.10 J**	**5.90 J**	32.0	Eco
Benzo(a)pyrene	**3.00 J**	**7.50 J**	**6.10 J**	**2.00 J**	1.60 U	**6.50 J**	32.0	Eco
Benzo(b)fluoranthene	**4.10 J**	**9.10 J**	**6.00 J**	2.50 U	2.50 U	**8.00 J**	27.0	Eco
Benzo(g,h,i)perylene	**2.90 J**	**4.40 J**	**3.50 J**	2.30 U	2.30 U	**5.00 J**	300	Eco
Benzo(k)fluoranthene	2.50 U	**3.30 J**	**4.90 J**	2.50 U	2.50 U	**3.10 J**	27.0	Eco
Chrysene	**4.10 J**	**9.30 J**	**20.0**	**2.40 J**	**3.40 J**	**7.60 J**	57.0	Eco
Dibenz(a,h)anthracene	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	33.0	Eco
Fluoranthene	**3.80 J**	**10.0**	**5.30 J**	**3.20 J**	**4.00 J**	**9.70 J**	111	Eco
Indeno(1,2,3-cd)pyrene	**2.20 J**	**4.70 J**	**3.60 J**	1.90 U	1.90 U	**5.40 J**	17.0	Eco
Pyrene	**3.70 J**	**12.0**	**8.90 J**	**3.20 J**	**5.30 J**	**11.0**	53.0	Eco
Total HPAHs (KM, capped; NDs at MDL)	**30.5 J**	**69.9 J**	**72.5 J**	**23.0 J**	**25.1 J**	**64.4 J**	193	Eco
Total Polycyclic Aromatic Hydrodarbons (PAHs) (µg/kg dry)								
Total PAHs (KM, capped; NDs at MDL)	**33.7 J**	**80.1 J**	**81.4 J**	**25.0 J**	**29.1 J**	**72.4 J**	1600	Eco
General Chemistry Parameters (mg/kg dry) and Grain Size (%)								
Carbon, Total Organic	**15,000**	**14,200**	**11,900**	**15,400**	**10,600**	**12,500**	-	-
Gravel (>2.00 mm)	**1.91**	**0.400**	**2.02**	**40.0**	**4.61**	**0.500**	-	-
Sand, Very Coarse (1.00 - 2.00 mm)	**0.660**	**0.230**	**3.36**	**13.7**	**0.890**	**0.260**	-	-
Sand, Coarse (0.50 - 1.00 mm)	**0.660**	**0.550**	**4.42**	**16.4**	**1.36**	**0.580**	-	-
Sand, Medium (0.25 - 0.50 mm)	**2.06**	**1.53**	**7.39**	**8.63**	**8.82**	**2.73**	-	-
Sand, Fine (0.125 - 0.25 mm)	**9.54**	**10.1**	**25.6**	**8.36**	**36.7**	**15.2**	-	-
Sand, Very Fine (0.0625 - 0.125 mm)	**18.9**	**24.3**	**27.2**	**4.77**	**24.6**	**28.1**	-	-
Silt (0.039 - 0.0625 mm)	**62.3**	**52.4**	**30.0**	**8.95**	**28.3**	**40.4**	-	-
Clay (<0.039 mm)	**12.9**	**11.3**	**4.12**	**1.04**	**5.57**	**9.88**	-	-

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
ND = Non Detect
SLV = screening level value
RDL = reported detection limit
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed
-- = SLV for analyte not available

[1] Only Aroclors 1248 and 1254 were included in summing sediment Total PCBs as Aroclors because all other aroclors were undected in Forebay sediment samples.
-- = SLV for analyte not available
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-8a
Post-Removal Forebay Area Sediment Analytical Results
PCB Aroclors, PCB Congeners, Metals, Petroleum Hydrocarbons, Semivolatile Organic Compounds, General Chemistry Parameters, and Grain Size
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Area	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	**Selected SLV**	**SLV Source**
Site ID	P17	P18	P21	P65	P67	P88	P89		
Sample ID	08022117SD	08021118SD	08021221SD	08022965SD	08030367SD	08031788SD	08031789SD		
Sample Date	2/21/2008	2/11/2008	2/12/2008	2/29/2008	3/3/2008	3/17/2008	3/17/2008		
PCB Aroclors (µg/kg dry)									
Aroclor 1016	9.90 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1221	29.0 U	13.0 U	16.0 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1232	18.0 U	7.50 U	14.0 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1242	1.70 U	2.90 U	5.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1248	1.90 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1254	2.20 U	1.70 U	2.40 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1260	1.70 U	1.70 U	4.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1262	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Aroclor 1268	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	0.0480	HH
Total PCBs as Aroclors (NDs at MDL) [1]	4.10 U	3.40 U	4.10 U	3.40 U	3.40 U	3.40 U	3.40 U	0.0480	HH
PCB Dioxin-Like Congeners (µg/kg dry)									
PCB 77	**0.00151**	**0.00132**	**0.00147**	**0.00104**	**0.000289**	**0.000409**	**0.000341**	0.00640	HH
PCB 81	0.0000802 U	0.000115 U	0.0000934 U	0.000102 U	0.0000693 U	0.0000662 U	0.0000486 U	0.00210	HH
PCB 105	**0.0120**	**0.0113**	**0.0125**	**0.00849**	**0.00130**	**0.00402**	**0.00306**	0.0210	HH
PCB 114	**0.000665**	**0.000621**	**0.000666**	**0.000429**	0.0000580 EMPC	**0.000267**	**0.000174**	0.0210	HH
PCB 118	**0.0274**	**0.0290**	**0.0299**	**0.0209**	**0.00271**	**0.0127**	**0.0100**	0.0260	HH
PCB 123	**0.000459**	**0.000582**	**0.000569**	0.000327 EMPC	0.0000640 EMPC	0.000201 U	0.000158 U	0.0260	HH
PCB 126	**0.000173**	0.000123 EMPC	**0.000189**	0.000135 EMPC	0.0000479 U	0.0000635 U	0.0000693 U	0.00000620	HH
PCB 156	**0.00448 C**	**0.00381 C**	**0.00470 C**	**0.00308 C**	**0.000399 C**	**0.00135 C**	0.000935 C U	0.0260	HH
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**							0.0260	HH
PCB 167	**0.00184**	**0.00190**	**0.00190**	**0.00137**	0.000173 EMPC	0.000710 U	0.000640 U	0.0260	HH
PCB 169	0.000109 U	0.0000841 U	0.000103 U	0.0000931 U	0.0000479 U	0.0000485 U	0.0000454 U	0.0000210	HH
PCB 189	**0.000428 EMPC**	0.000217 EMPC	**0.000332**	**0.000242**	0.0000479 U	**0.000100**	**0.0000980**	0.140	HH
Total PCBs as Congeners (KM, capped)	**0.588 J**	**0.523 J**	**0.571 J**	**0.399 J**	**0.0611 J**	**0.204 J**	**0.151 J**	0.0480	HH
Metals (mg/kg dry)									
Aluminum	**11,000**	**12,400**	**12,100**	**12,500**	**14,400**	**10,400**	**9,000**	38,000	UPL
Antimony	**0.150 J**	**0.150 J**	**0.200 J**	**0.160 J**	**0.0400 J**	**0.140 J**	**0.0900 J**	3.00	Eco
Arsenic	**2.33**	**5.39**	**3.29**	**2.86**	**3.24**	**2.81**	**2.02**	6.00	Eco
Barium	**98.8**	**128**	**129**	**112**	**79.6**	**125**	**85.7**	315	UPL
Beryllium	**0.334**	**0.398**	**0.390**	**0.307**	**0.331**	**0.270**	**0.228**	0.847	UPL
Cadmium	**0.460**	**0.396**	**0.579**	**0.423**	0.115 U	**0.312**	**0.256**	0.674	UPL
Chromium	**15.3**	**20.7**	**17.8**	**18.4**	**27.1**	**15.9**	**10.1**	37.0	Eco
Cobalt	**7.24**	**8.78**	**8.31**	**6.71**	**8.95**	**7.12**	**4.82**	15.2	UPL
Copper	**16.5**	**20.1**	**19.5**	**14.9**	**27.0**	**15.6**	**11.3**	55.6	UPL
Lead	**8.13**	**16.8**	**10.6**	**10.7**	**4.31**	**7.58**	**5.28**	35.0	Eco
Mercury	**0.263**	**0.0910 J**	**0.167**	**0.118 J**	**0.0220**	**0.0430**	**0.0360**	0.214	UPL
Nickel	**13.0**	**13.4**	**14.2**	**11.4**	**16.1**	**11.6**	**6.39**	21.2	UPL
Thallium	**0.135**	**0.158**	**0.187**	**0.178**	0.122 U	**0.143**	0.113 U	0.354	UPL
Vanadium	**36.5**	**39.1**	**36.9**	**36.5**	**29.5**	**35.5**	**27.5**	70.6	UPL
Zinc	**69.0**	**78.2**	**94.1**	**101**	**50.3**	**86.3**	**59.1**	123	Eco
Petroleum Hydrocarbons (mg/kg dry)									
Diesel Range Organics	**54.0**	**10.0 J**	**10.0 J**	**9.30 J**	**3.10 J**	**7.90 J**	**4.00 J**	-	-
Residual Range Organics	**180 J**	**62.0 J**	**67.0 J**	150 U	**17.0 J**	130 U	150 U	-	-
Semivolatile Organic Compounds (µg/kg dry)									
Bis(2-ethylhexyl) Phthalate	200 U	200 U	200 U	200 U	200 U	200 U	200 U	750	Eco
Butyl Benzyl Phthalate	1.50 U	1.50 U	1.50 U	1.50 U	9.90 U	9.80 U	9.80 U	110	Eco
Carbazole	1.30 U	1.30 U	1.30 U	1.30 U	1.30 U	1.30 U	1.30 U	140	Eco
Di-n-butyl Phthalate	10.0 U	10.0 U	10.0 U	9.90 U	11.0 U	14.0 U	14.0 U	110	Eco
Di-n-octyl Phthalate	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U	110	Eco
p-cresol (4-Methylphenol)	2.90 U	2.90 U	2.90 U	**11.0**	2.90 U	2.90 U	**18.0**	-	-
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)									
Acenaphthene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	290	Eco
Anthracene	**1.90 J**	1.40 U	1.40 U	**1.50 J**	1.40 U	1.40 U	1.40 U	57.0	Eco
Fluorene	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	77.0	Eco
Phenanthrene	**7.40 J**	**2.90 J**	1.30 U	**2.20 J**	1.30 U	**1.70 J**	1.30 U	42.0	Eco
Total LPAHs (KM, capped; NDs at MDL)	**12.0 J**	**7.00 J**	5.40 U	**6.40 J**	5.40 U	**5.80 J**	5.40 U	76.0	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)									
Benzo(a)anthracene	**6.00 J**	**2.00 J**	1.40 U	**7.00 J**	1.40 U	1.40 U	1.40 U	32.0	Eco
Benzo(a)pyrene	**7.20 J**	**2.60 J**	1.60 U	**6.10 J**	1.60 U	1.60 U	1.60 U	32.0	Eco
Benzo(b)fluoranthene	**7.50 J**	**4.00 J**	2.50 U	**5.60 J**	2.50 U	2.50 U	2.50 U	27.0	Eco
Benzo(g,h,i)perylene	**6.20 J**	**2.60 J**	2.30 U	**4.20 J**	2.30 U	2.30 U	2.30 U	300	Eco
Benzo(k)fluoranthene	2.50 U	2.50 U	2.50 U	**3.20 J**	2.50 U	2.50 U	2.50 U	27.0	Eco
Chrysene	**7.90 J**	**3.20 J**	**1.80 J**	**12.0**	1.40 U	**1.70 J**	1.40 U	57.0	Eco
Dibenz(a,h)anthracene	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	33.0	Eco
Fluoranthene	**12.0**	**4.80 J**	**2.70 J**	**4.60 J**	2.20 U	**2.60 J**	2.20 U	111	Eco
Indeno(1,2,3-cd)pyrene	**5.70 J**	**2.50 J**	1.90 U	**4.10 J**	1.90 U	1.90 U	1.90 U	17.0	Eco
Pyrene	**17.0**	**4.80 J**	**2.20 J**	**4.40 J**	1.30 U	**2.20 J**	1.30 U	53.0	Eco
Total HPAHs (KM, capped; NDs at MDL)	**73.9 J**	**30.5 J**	**17.5 J**	**53.4 J**	19.3 U	**17.2 J**	19.3 U	193	Eco
Total Polycyclic Aromatic Hydrodarbons (PAHs) (µg/kg dry)									
Total PAHs (KM, capped; NDs at MDL)	**83.4 J**	**34.9 J**	**18.6 J**	**58.4 J**	24.7 U	**19.5 J**	24.7 U	1600	Eco
General Chemistry Parameters (mg/kg dry) and Grain Size (%)									
Carbon, Total Organic	**16,200**	**8,600**	**11,600**	**6,100**	**1,100**	**3,000**	**2,100**	-	-
Gravel (>2.00 mm)	**1.19**	**3.69**	**19.3**	**0.180**	**20.7**	**47.9**	**66.2**	-	-
Sand, Very Coarse (1.00 - 2.00 mm)	**0.950**	**1.96**	**1.00**	**0.210**	**10.6**	**6.39**	**4.70**	-	-
Sand, Coarse (0.50 - 1.00 mm)	**2.32**	**3.67**	**1.40**	**0.540**	**20.2**	**7.02**	**9.54**	-	-
Sand, Medium (0.25 - 0.50 mm)	**9.88**	**18.1**	**4.86**	**5.14**	**19.6**	**15.6**	**12.2**	-	-
Sand, Fine (0.125 - 0.25 mm)	**19.8**	**31.9**	**22.0**	**43.6**	**8.95**	**12.1**	**8.80**	-	-
Sand, Very Fine (0.0625 - 0.125 mm)	**25.3**	**18.6**	**17.9**	**18.3**	**4.72**	**3.53**	**1.92**	-	-
Silt (0.039 - 0.0625 mm)	**34.8**	**22.1**	**34.8**	**22.3**	**10.7**	**6.35**	**2.86**	-	-
Clay (<0.039 mm)	**7.13**	**4.75**	**8.06**	**4.60**	**4.21**	**0.860**	**0.460**	-	-

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
ND = Non Detect
SLV = screening level value
RDL = reported detection limit
UPL = Reference Area Upper Prediction Limit
- = Not Analyzed
-- = SLV for analyte not available

[1] Only Aroclors 1248 and 1254 were included in summing sediment Total PCBs as Aroclors because all other aroclors were undected in Forebay sediment samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-8b
Post-Removal Reference Area Sediment Analytical Results
PCB Aroclors, PCB Congeners, Metals, Petroleum Hydrocarbons, Semivolatile Organic Compounds, General Chemistry Parameters, and Grain Size
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Area	Reference	Reference	Reference	Reference	Reference	Reference
Site ID	P22	P24	P26	P27	P28	P29
Sample ID	08030522SD	08030524SD	08030426SD	08030427SD	08030428SD	08022229SD
Sample Date	3/5/2008	3/5/2008	3/4/2008	3/4/2008	3/4/2008	2/22/2008
PCB Aroclors (µg/kg dry)						
Aroclor 1016	1.70 U	1.70 U	1.70 U	1.70 U	1.80 U	1.70 U
Aroclor 1221	1.70 U	1.70 U	1.70 U	1.70 U	1.80 U	1.70 U
Aroclor 1232	1.70 U	1.70 U	1.70 U	1.70 U	1.80 U	1.70 U
Aroclor 1242	1.70 U	1.70 U	1.70 U	1.70 U	1.80 U	1.70 U
Aroclor 1248	1.70 U	1.70 U	1.70 U	1.70 U	1.80 U	1.70 U
Aroclor 1254	1.70 U	1.70 U	1.70 U	1.70 U	1.80 U	1.70 U
Aroclor 1260	1.70 U	1.70 U	1.70 U	1.70 U	1.80 U	1.70 U
Aroclor 1262	1.70 U	1.70 U	1.70 U	1.70 U	1.80 U	1.70 U
Aroclor 1268	1.70 U	1.70 U	1.70 U	1.70 U	1.80 U	1.70 U
Total PCBs as Aroclors (NDs at MDL) [1]	1.70 U	1.70 U	1.70 U	1.70 U	1.80 U	1.70 U
PCB Dioxin-Like Congeners (µg/kg dry)						
PCB 77	**0.000989**	**0.000983**	**0.000699**	**0.00139**	**0.00111**	**0.00140**
PCB 81	0.0000630 EMPC	0.0000786 U	0.0000490 EMPC	0.000100 EMPC	0.0000832 U	0.0000730 EMPC
PCB 105	**0.00892**	**0.00801**	**0.00717**	**0.0132**	**0.00906**	**0.0109**
PCB 114	**0.000410**	**0.000485**	**0.000378**	**0.000798**	**0.000479**	**0.000602**
PCB 118	**0.0222**	**0.0224**	**0.0209**	**0.0642**	**0.0221**	**0.0283**
PCB 123	0.000380 U	0.000429 U	0.000442 U	**0.00122**	0.000408 U	0.000446 U
PCB 126	0.000175 EMPC	0.000147 EMPC	**0.000117**	**0.000234**	0.000185 EMPC	**0.000205**
PCB 156	**0.00254 C**	**0.00258 C**	**0.00242 C**	**0.00517 C**	**0.00282 C**	**0.00319 C**
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**					
PCB 167	**0.00118**	**0.00130**	**0.00125**	**0.00384**	**0.00118**	**0.00146**
PCB 169	0.0000685 U	0.000102 U	0.0000571 U	0.0000971 U	0.000110 U	0.0000811 U
PCB 189	**0.000225**	**0.000260**	0.000264 EMPC	**0.000351**	**0.000416**	0.000357 EMPC
Total PCBs as Congeners (KM, capped)	**0.413 J**	**0.448 J**	**0.361 J**	**0.932 J**	**0.458 J**	**0.585 J**
Metals (mg/kg dry)						
Aluminum	**21,300**	**18,200**	**33,000**	**20,700**	**29,800**	**11,500**
Antimony	**0.200 J**	**0.210 J**	**0.320 J**	**0.520 J**	**0.220 J**	**0.340 J**
Arsenic	**3.72**	**4.00**	**5.67**	**4.12**	**4.98**	**3.63**
Barium	**207**	**205**	**247**	**225**	**242**	**109**
Beryllium	**0.540**	**0.552**	**0.633**	**0.621**	**0.694**	**0.319**
Cadmium	**0.467**	**0.411**	**0.368**	**0.444**	**0.592**	**0.593**
Chromium	**19.5**	**17.9**	**23.3**	**23.2**	**23.3**	**19.0**
Cobalt	**10.7**	**11.4**	**14.7**	**12.6**	**13.3**	**7.73**
Copper	**33.9**	**37.5**	**40.0**	**45.7**	**43.1**	**17.2**
Lead	**10.5**	**10.0**	**15.1**	**11.1**	**14.1**	**10.3**
Mercury	**0.130**	**0.108**	**0.0630**	**0.196**	**0.130**	**0.225 J**
Nickel	**14.0**	**14.1**	**17.1**	**17.0**	**17.2**	**14.9**
Thallium	**0.240**	**0.234**	**0.360**	**0.280**	**0.318**	**0.236**
Vanadium	**46.1 J**	**50.9 J**	**55.4 J**	**50.9 J**	**66.5 J**	**42.6 J**
Zinc	**75.9**	**70.2**	**82.3**	**74.7**	**88.9**	**82.7**
Petroleum Hydrocarbons (mg/kg dry)						
Diesel Range Organics	**12.0 J**	**9.80 J**	**18.0**	**25.0**	**15.0 J**	**15.0 J**
Residual Range Organics	**34.0 J**	180 U	**52.0 J**	**73.0 J**	**47.0 J**	**41.0 J**
Semivolatile Organic Compounds (µg/kg dry)						
Bis(2-ethylhexyl) Phthalate	**6.60 J**	**4.90 J**	**29.0 J**	**6.70 J**	**11.0 J**	**15.0 J**
Butyl Benzyl Phthalate	1.50 U	1.50 U	1.50 U	**2.50 J**	1.60 U	1.50 U
Carbazole	1.30 U	1.30 U	1.30 U	1.30 U	1.40 U	1.30 U
Di-n-butyl Phthalate	**5.20 J**	**4.10 J**	2.60 UJ	**6.30 J**	**7.40 J**	2.60 UJ
Di-n-octyl Phthalate	1.20 U	1.20 U	1.20 U	1.20 U	1.30 U	1.20 U
p-cresol (4-Methylphenol)	**210**	**170**	**7.10 J**	**130**	**120**	**9.10 J**
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)						
Acenaphthene	1.00 U	1.00 U	1.00 U	1.00 U	1.10 U	1.00 U
Anthracene	1.40 U	1.40 U	1.40 U	1.40 U	1.50 U	1.40 U
Fluorene	1.70 UJ	1.70 UJ	1.70 UJ	1.70 UJ	1.80 UJ	1.70 UJ
Phenanthrene	**2.30 J**	**2.20 J**	**3.60 J**	**3.30 J**	**2.10 J**	**3.70 J**
Total LPAHs (KM, capped; NDs at MDL)	**6.40 J**	**6.30 J**	**7.70 J**	**7.40 J**	**6.50 J**	**7.80 J**
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)						
Benzo(a)anthracene	**1.80 J**	**1.60 J**	**2.30 J**	**3.60 J**	**3.60 J**	**3.30 J**
Benzo(a)pyrene	**1.60 J**	1.60 U	**3.20 J**	1.60 U	**4.80 J**	**3.80 J**
Benzo(b)fluoranthene	2.50 U	2.50 U	**4.40 J**	**4.80 J**	**5.80 J**	**5.00 J**
Benzo(g,h,i)perylene	2.30 U	2.30 U	**4.70 J**	**3.20 J**	**3.60 J**	**3.50 J**
Benzo(k)fluoranthene	2.50 U	2.50 U	2.50 U	2.50 U	2.60 U	2.50 U
Chrysene	**9.70 J**	**2.10 J**	**3.70 J**	**3.50 J**	**4.90 J**	**4.00 J**
Dibenz(a,h)anthracene	2.20 U	2.20 U	2.20 U	2.20 U	2.30 U	2.20 U
Fluoranthene	**3.60 J**	**2.60 J**	**6.40 J**	**6.20 J**	**6.10 J**	2.20 UJ
Indeno(1,2,3-cd)pyrene	1.90 UJ	1.90 UJ	**3.30 J**	**2.70 J**	**3.20 J**	1.90 UJ
Pyrene	**2.60 J**	**1.70 J**	**7.00 J**	**4.50 J**	**4.90 J**	**4.90 J**
Total HPAHs (KM, capped; NDs at MDL)	**27.8 J**	**18.1 J**	**39.5 J**	**33.3 J**	**41.5 J**	**32.1 J**
Total Polycyclic Aromatic Hydrodarbons (PAHs) (µg/kg dry)						
Total PAHs (KM, capped; NDs at MDL)	**31.6 J**	**21.2 J**	**43.9 J**	**37.8 J**	**45.0 J**	**35.2 J**
General Chemistry Parameters (mg/kg dry) and Grain Size (%)						
Carbon, Total Organic	**11,900**	**10,200**	**10,700**	**12,400**	**16,700**	**9,100**
Clay (<0.039 mm)	**4.16**	**7.22**	**3.82**	**4.97**	**6.56**	**4.26**
Gravel (>2.00 mm)	**0.290**	**3.17**	**8.84**	**36.4**	**0.250**	**0.660**
Sand, Coarse (0.50 - 1.00 mm)	**3.21**	**3.77**	**8.71**	**2.26**	**0.560**	**1.44**
Sand, Fine (0.125 - 0.25 mm)	**12.0**	**10.9**	**6.01**	**4.80**	**4.66**	**6.71**
Sand, Medium (0.25 - 0.50 mm)	**8.44**	**3.34**	**5.06**	**1.78**	**1.11**	**5.90**
Sand, Very Coarse (1.00 - 2.00 mm)	**0.770**	**2.99**	**8.44**	**4.84**	**0.230**	**0.380**
Sand, Very Fine (0.0625 - 0.125 mm)	**24.6**	**28.5**	**20.7**	**19.5**	**25.4**	**29.0**
Silt (0.039 - 0.0625 mm)	**50.1**	**51.0**	**38.5**	**51.7**	**64.9**	**54.8**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
ND = Non Detect
RDL = reported detection limit
- = Not Analyzed
J = The reported value is an estimate.
bold = analyte detected above MDL/RDL.

[1] The sediment Total PCBs as Aroclors is shown as the maximum MDL because all aroclors were undected in Reference Area sediment samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

Table 6-8b
Post-Removal Reference Area Sediment Analytical Results
PCB Aroclors, PCB Congeners, Metals, Petroleum Hydrocarbons, Semivolatile Organic Compounds, General Chemistry Parameters, and Grain Size
(Page 2 of 3)

Area	Reference	Reference	Reference	Reference	Reference	Reference
Site ID	P34	P35	P36	P37	P38	P39
Sample ID	08022534SD	08022535SD	08022536SD	08022637SD	08022738SD	08022739SD
Sample Date	2/25/2008	2/25/2008	2/25/2008	2/26/2008	2/27/2008	2/27/2008
PCB Aroclors (µg/kg dry)						
Aroclor 1016	1.70 U	10.0 U	1.70 U	1.70 U	13.0 U	1.70 U
Aroclor 1221	1.70 U	6.00 U	1.70 U	9.80 U	11.0 U	1.70 U
Aroclor 1232	1.70 U	10.0 U	1.70 U	11.0 U	12.0 U	1.70 U
Aroclor 1242	1.70 U	16.0 U	1.70 U	14.0 U	1.70 U	1.70 U
Aroclor 1248	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
Aroclor 1254	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
Aroclor 1260	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
Aroclor 1262	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
Aroclor 1268	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
Total PCBs as Aroclors (NDs at MDL) [1]	1.70 U	16.00 U	1.70 U	14.00 U	13.00 U	1.70 U
PCB Dioxin-Like Congeners (µg/kg dry)						
PCB 77	**0.00201**	**0.00104**	**0.000965**	**0.00102**	**0.00113**	**0.000637**
PCB 81	**0.000143**	0.0000750 U	0.0000896 U	0.0000639 U	0.0000767 U	0.0000556 U
PCB 105	**0.0275**	**0.00818**	**0.00803**	**0.00653**	**0.00985**	**0.00534**
PCB 114	**0.00163**	**0.000382**	**0.000372**	0.000352 EMPC	**0.000422**	0.000337 EMPC
PCB 118	**0.0705**	**0.0199**	**0.0207**	**0.0157**	**0.0356**	**0.0131**
PCB 123	**0.000980**	0.000309 U	0.000401 U	**0.000374**	**0.000656**	0.000235 EMPC
PCB 126	**0.000337**	**0.000126**	0.000139 U	**0.000175**	**0.000184**	0.000115 EMPC
PCB 156	**0.00850 C**	**0.00242 C**	**0.00240 C**	**0.00225 C**	**0.00312 C**	**0.00180 C**
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**					
PCB 167	**0.00320**	0.00110 U	0.00101 U	**0.000918**	**0.00186**	**0.000761**
PCB 169	0.000179 U	0.0000711 U	0.0000891 U	0.0000860 EMPC	0.0000951 U	0.000200 U
PCB 189	**0.000573**	0.000248 EMPC	**0.000237**	**0.000197**	**0.000188**	0.000159 EMPC
Total PCBs as Congeners (KM, capped)	**1.20 J**	**0.405 J**	**0.402 J**	**0.378 J**	**0.591 J**	**0.272 J**
Metals (mg/kg dry)						
Aluminum	**15,100**	**9,890**	**10,100**	**11,200**	**10,100**	**9,380**
Antimony	**0.350 J**	**0.370 J**	**0.260 J**	**0.260 J**	**0.250 J**	**0.220 J**
Arsenic	**3.37**	**3.64**	**3.74**	**4.49**	**3.76**	**3.71**
Barium	**146**	**124**	**120**	**123**	**101**	**98.5**
Beryllium	**0.379**	**0.310**	**0.283**	**0.328**	**0.298**	**0.274**
Cadmium	**0.748**	**0.536**	**0.508**	**0.523**	**0.478**	**0.398**
Chromium	**27.2**	**16.5**	**16.6**	**16.9**	**15.6**	**15.8**
Cobalt	**10.8**	**7.18**	**7.13**	**7.94**	**6.86**	**6.58**
Copper	**20.1**	**14.6**	**14.4**	**15.7**	**14.2**	**13.7**
Lead	**11.5**	**11.0**	**11.3**	**13.2**	**11.2**	**11.4**
Mercury	**0.154 J**	**0.193 J**	**0.120 J**	**0.101 J**	**0.114 J**	**0.119 J**
Nickel	**25.6**	**12.9**	**11.9**	**13.7**	**11.8**	**11.6**
Thallium	**0.245**	**0.205**	**0.208**	**0.234**	**0.197**	**0.185**
Vanadium	**40.5 J**	**30.3 J**	**33.5 J**	**41.9 J**	**37.2 J**	**31.8 J**
Zinc	**93.6**	**92.1**	**98.5**	**109**	**93.3**	**94.6**
Petroleum Hydrocarbons (mg/kg dry)						
Diesel Range Organics	**31.0**	**7.00 J**	**16.0 J**	**9.70 J**	**11.0 J**	**11.0 J**
Residual Range Organics	**100 J**	160 U	**34.0 J**	**41.0 J**	**29.0 J**	**29.0 J**
Semivolatile Organic Compounds (µg/kg dry)						
Bis(2-ethylhexyl) Phthalate	**7.50 J**	**11.0 J**	**11.0 J**	**5.50 J**	**5.90 J**	**6.80 J**
Butyl Benzyl Phthalate	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	**3.80 J**
Carbazole	1.30 U	1.30 U	1.30 U	1.30 U	1.30 U	1.30 U
Di-n-butyl Phthalate	**7.80 J**	**6.40 J**	**5.80 J**	**4.70 J**	**8.60 J**	**4.60 J**
Di-n-octyl Phthalate	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U
p-cresol (4-Methylphenol)	**4.50 J**	2.90 U	**6.30 J**	2.90 U	2.90 U	2.90 U
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)						
Acenaphthene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
Anthracene	1.40 U	**2.30 J**	1.40 U	1.40 U	1.40 U	1.40 U
Fluorene	1.70 UJ	1.70 UJ	1.70 UJ	1.70 UJ	1.70 UJ	1.70 UJ
Phenanthrene	**3.00 J**	**2.30 J**	**3.20 J**	**4.40 J**	**2.60 J**	1.30 U
Total LPAHs (KM, capped; NDs at MDL)	**7.10 J**	**7.30 J**	**7.30 J**	**8.50 J**	**6.70 J**	5.40 UJ
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)						
Benzo(a)anthracene	**2.90 J**	**2.20 J**	**3.30 J**	**3.90 J**	**2.50 J**	1.40 U
Benzo(a)pyrene	1.60 U	1.60 U	**6.20 J**	**4.60 J**	1.60 U	1.60 U
Benzo(b)fluoranthene	**5.50 J**	**3.70 J**	**8.30 J**	**6.90 J**	**4.20 J**	2.50 U
Benzo(g,h,i)perylene	**3.60 J**	**2.70 J**	**7.90 J**	**4.60 J**	2.30 U	2.30 U
Benzo(k)fluoranthene	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U
Chrysene	**4.40 J**	**3.10 J**	**4.80 J**	**4.80 J**	**3.20 J**	1.40 U
Dibenz(a,h)anthracene	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U
Fluoranthene	**5.10 J**	**5.60 J**	**5.50 J**	**9.70 J**	**4.10 J**	**2.30 J**
Indeno(1,2,3-cd)pyrene	1.90 UJ	**2.20 J**	**8.80 J**	**4.90 J**	**2.30 J**	1.90 UJ
Pyrene	**4.80 J**	**3.30 J**	**7.10 J**	**7.80 J**	**3.60 J**	**2.10 J**
Total HPAHs (KM, capped; NDs at MDL)	**32.7 J**	**27.9 J**	**56.3 J**	**51.6 J**	**26.5 J**	**16.4 J**
Total Polycyclic Aromatic Hydrodarbons (PAHs) (µg/kg dry)						
Total PAHs (KM, capped; NDs at MDL)	**36.3 J**	**33.0 J**	**60.1 J**	**56.6 J**	**29.7 J**	**17.1 J**
General Chemistry Parameters (mg/kg dry) and Grain Size (%)						
Carbon, Total Organic	**14,800**	**7,300**	**7,000**	**6,600**	**6,400**	**5,500**
Clay (<0.039 mm)	**7.39**	**4.18**	**3.78**	**3.41**	**3.50**	**4.38**
Gravel (>2.00 mm)	**1.39**	**1.37**	**0.180**	**0.000**	**0.220**	**0.0600**
Sand, Coarse (0.50 - 1.00 mm)	**2.83**	**1.16**	**0.470**	**0.710**	**0.670**	**0.450**
Sand, Fine (0.125 - 0.25 mm)	**13.9**	**37.6**	**43.6**	**49.0**	**45.9**	**47.7**
Sand, Medium (0.25 - 0.50 mm)	**7.30**	**5.68**	**2.77**	**5.09**	**5.56**	**11.1**
Sand, Very Coarse (1.00 - 2.00 mm)	**1.74**	**0.0100**	**0.280**	**0.0500**	**0.350**	**0.130**
Sand, Very Fine (0.0625 - 0.125 mm)	**26.2**	**18.2**	**18.4**	**17.8**	**18.9**	**12.0**
Silt (0.039 - 0.0625 mm)	**43.9**	**31.6**	**29.1**	**30.6**	**30.1**	**25.7**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
ND = Non Detect
RDL = reported detection limit
- = Not Analyzed
J = The reported value is an estimate.
bold = analyte detected above MDL/RDL.

[1] The sediment Total PCBs as Aroclors is shown as the maximum MDL because all aroclors were undected in Reference Area sediment samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

Table 6-8b
Post-Removal Reference Area Sediment Analytical Results
PCB Aroclors, PCB Congeners, Metals, Petroleum Hydrocarbons, Semivolatile Organic Compounds, General Chemistry Parameters, and Grain Size
(Page 3 of 3)

Area	Reference	Reference	Reference	Reference	Reference	Reference
Site ID	P40	P41	P42	P85	P86	P87
Sample ID	08022740SD	08022741SD	08022742SD	08030685SD	08030686SD	08030687SD
Sample Date	2/27/2008	2/27/2008	2/27/2008	3/6/2008	3/6/2008	3/6/2008
PCB Aroclors (µg/kg dry)						
Aroclor 1016	3.40 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
Aroclor 1221	6.20 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
Aroclor 1232	10.0 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
Aroclor 1242	13.0 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
Aroclor 1248	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
Aroclor 1254	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
Aroclor 1260	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
Aroclor 1262	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
Aroclor 1268	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
Total PCBs as Aroclors (NDs at MDL) [1]	13.00 U	1.70 U	1.70 U	1.70 U	1.70 U	1.70 U
PCB Dioxin-Like Congeners (µg/kg dry)						
PCB 77	**0.000883**	**0.000709**	**0.000434**	**0.00127**	**0.000734**	**0.000890**
PCB 81	**0.0000580**	0.0000927 U	0.0000700 U	0.0000748 U	0.0000680 U	0.0000988 U
PCB 105	**0.00746**	**0.00489**	**0.00296**	**0.0103**	**0.00582**	**0.00691**
PCB 114	**0.000345**	**0.000284**	**0.000154**	**0.000542**	**0.000328**	**0.000336**
PCB 118	**0.0244**	**0.0139**	**0.00831**	**0.0298**	**0.0141**	**0.0168**
PCB 123	**0.000406**	**0.000272**	0.000172 EMPC	**0.000679**	**0.000309**	**0.000342**
PCB 126	0.000147 EMPC	0.0000930 EMPC	0.0000583 U	0.000184 EMPC	**0.0000840**	**0.000123**
PCB 156	**0.00246 C**	**0.00165 C**	**0.000930 C**	**0.00374 C**	**0.00204 C**	**0.00266 C**
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**					
PCB 167	**0.00140**	**0.000870**	0.000482 EMPC	**0.00197**	**0.000915**	**0.00120**
PCB 169	0.000100 U	0.000100 U	0.0000542 U	0.000200 U	0.000100 U	0.000100 U
PCB 189	**0.000181**	**0.000132**	**0.0000720**	**0.000250**	**0.000158**	**0.000243**
Total PCBs as Congeners (KM, capped)	**0.442 J**	**0.273 J**	**0.161 J**	**0.634 J**	**0.326 J**	**0.409 J**
Metals (mg/kg dry)						
Aluminum	**10,700**	**8,550**	**7,380**	**33,500**	**22,100**	**29,400**
Antimony	**0.190 J**	**0.160 J**	**0.150 J**	**0.180 J**	**0.270 J**	**0.290 J**
Arsenic	**3.75**	**3.36**	**3.03**	**5.10**	**6.04**	**5.36**
Barium	**117**	**104**	**86.3**	**312**	**201**	**231**
Beryllium	**0.303**	**0.244**	**0.194**	**0.748**	**0.522**	**0.628**
Cadmium	**0.413**	**0.332**	**0.262**	**0.449**	**0.484**	**0.558**
Chromium	**18.2**	**13.5**	**12.8**	**27.3**	**23.0**	**26.5**
Cobalt	**7.11**	**6.08**	**5.68**	**15.2**	**10.0**	**12.9**
Copper	**13.6**	**10.5**	**8.22**	**47.8**	**30.7**	**39.2**
Lead	**11.6**	**9.59**	**8.65**	**13.1**	**11.7**	**13.4**
Mercury	**0.167 J**	**0.0870 J**	**0.0410**	**0.0870**	**0.166**	**0.128**
Nickel	**12.3**	**11.2**	**9.87**	**18.2**	**13.3**	**16.1**
Thallium	**0.208**	**0.172**	**0.145**	**0.337**	**0.233**	**0.346**
Vanadium	**33.4 J**	**30.4 J**	**25.7 J**	**76.9 J**	**50.4 J**	**66.3 J**
Zinc	**101**	**88.0**	**85.1**	**76.1**	**81.2**	**89.3**
Petroleum Hydrocarbons (mg/kg dry)						
Diesel Range Organics	**31.0**	**8.10 J**	**7.40 J**	**31.0**	**11.0 J**	**13.0 J**
Residual Range Organics	**50.0 J**	150 U	150 U	**73.0 J**	180 U	**32.0 J**
Semivolatile Organic Compounds (µg/kg dry)						
Bis(2-ethylhexyl) Phthalate	**7.50 J**	**6.80 J**	**5.70 J**	**110 J**	**5.80 J**	**15.0 J**
Butyl Benzyl Phthalate	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	1.50 UJ
Carbazole	1.30 U	1.30 U	1.30 U	1.30 U	1.30 U	1.30 UJ
Di-n-butyl Phthalate	**11.0 J**	**3.80 J**	**3.50 J**	2.60 UJ	**4.10 J**	**4.30 J**
Di-n-octyl Phthalate	1.20 U	1.20 U	1.20 U	1.20 U	1.20 U	1.20 UJ
p-cresol (4-Methylphenol)	2.90 U	2.90 U	2.90 U	**5.50 J**	**6.60 J**	**7.90 J**
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)						
Acenaphthene	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 UJ
Anthracene	1.40 U	**1.40 J**	1.40 U	1.40 U	1.40 U	1.40 UJ
Fluorene	1.70 UJ	1.70 UJ	1.70 UJ	1.70 UJ	1.70 UJ	1.70 UJ
Phenanthrene	**1.30 J**	**5.90 J**	1.30 U	**1.90 J**	**2.00 J**	**3.60 J**
Total LPAHs (KM, capped; NDs at MDL)	**5.40 J**	**10.0 J**	5.40 UJ	**6.00 J**	**6.10 J**	**7.70 J**
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)						
Benzo(a)anthracene	1.40 U	**10.0**	1.40 U	1.40 U	**1.80 J**	**3.00 J**
Benzo(a)pyrene	1.60 U	**11.0**	1.60 U	**2.80 J**	1.60 U	**2.60 J**
Benzo(b)fluoranthene	2.50 U	**17.0**	2.50 U	**3.60 J**	**2.70 J**	**3.50 J**
Benzo(g,h,i)perylene	2.30 U	**7.30 J**	2.30 U	2.30 U	2.30 U	**2.30 J**
Benzo(k)fluoranthene	2.50 U	**5.00 J**	2.50 U	2.50 U	2.50 U	2.50 UJ
Chrysene	**1.90 J**	**9.80**	1.40 U	1.40 U	**2.40 J**	**3.10 J**
Dibenz(a,h)anthracene	2.20 U	2.20 U	2.20 U	2.20 U	2.20 U	2.20 UJ
Fluoranthene	**2.30 J**	**31.0 J**	2.20 UJ	2.20 UJ	**3.60 J**	**5.00 J**
Indeno(1,2,3-cd)pyrene	1.90 UJ	**8.40 J**	1.90 UJ	1.90 UJ	1.90 UJ	**2.00 J**
Pyrene	**1.80 J**	**23.0 J**	**1.50 J**	**2.70 J**	**2.10 J**	**4.90 J**
Total HPAHs (KM, capped; NDs at MDL)	**16.9 J**	**125 J**	**19.5 J**	**18.9 J**	**21.4 J**	**30.5 J**
Total Polycyclic Aromatic Hydrodarbons (PAHs) (µg/kg dry)						
Total PAHs (KM, capped; NDs at MDL)	**19.6 J**	**133 J**	**24.9 J**	**21.5 J**	**24.0 J**	**35.7 J**
General Chemistry Parameters (mg/kg dry) and Grain Size (%)						
Carbon, Total Organic	**5,900**	**5,100**	**2,900**	**12,800**	**8,100**	**10,300**
Clay (<0.039 mm)	**2.89**	**2.94**	**1.65**	**6.16**	**4.49**	**4.80**
Gravel (>2.00 mm)	**1.23**	**0.000**	**0.0200**	**10.8**	**18.8**	**1.47**
Sand, Coarse (0.50 - 1.00 mm)	**0.520**	**0.420**	**0.470**	**1.61**	**3.24**	**1.46**
Sand, Fine (0.125 - 0.25 mm)	**46.6**	**38.3**	**40.5**	**10.0**	**5.43**	**5.77**
Sand, Medium (0.25 - 0.50 mm)	**14.0**	**36.3**	**47.9**	**1.45**	**2.02**	**1.36**
Sand, Very Coarse (1.00 - 2.00 mm)	**0.210**	**0.110**	**0.0700**	**2.59**	**8.47**	**1.98**
Sand, Very Fine (0.0625 - 0.125 mm)	**9.20**	**7.21**	**3.87**	**33.4**	**18.3**	**25.2**
Silt (0.039 - 0.0625 mm)	**22.3**	**16.3**	**7.31**	**36.2**	**43.1**	**60.6**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
ND = Non Detect
RDL = reported detection limit
- = Not Analyzed
J = The reported value is an estimate.
bold = analyte detected above MDL/RDL.

[1] The sediment Total PCBs as Aroclors is shown as the maximum MDL because all aroclors were undected in Reference Area sediment samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

Table 6-9a
Post-Removal Forebay Area Clam Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 1 of 3)

Area	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	**Selected SLV**	**SLV Source**
Site ID	P04	P05	P06	P07	P08	P09		
Sample ID	08022604TC	08031905TC	08031806TC	08021507TC	08021508TC	08021409TC		
Sample Date	2/26/2008	3/19/2008	3/18/2008	2/15/2008	2/15/2008	2/14/2008		
Percent Lipds	3.0	3.0	2.9	2.6	2.6	2.3		
PCB Aroclors (µg/kg wet)								
Aroclor 1016	18.0 U	2.40 U	2.40 U	19.0 U	23.0 U	23.0 U	35.0	Eco
Aroclor 1221	20.0 U	2.60 U	2.60 U	20.0 U	20.0 U	20.0 U	35.0	Eco
Aroclor 1232	40.0 U	2.30 U	2.30 U	27.0 U	25.0 U	30.0 U	35.0	Eco
Aroclor 1242	48.0 U	2.20 U	2.20 U	35.0 U	29.0 U	30.0 U	35.0	Eco
Aroclor 1248	0.510 U	0.510 U	0.510 U	26.0 U	13.0 U	6.00 U	35.0	Eco
Aroclor 1254	**120 J**	**23.0 J**	**32.0 J**	74.0 U	55.0 U	49.0 U	35.0	Eco
Aroclor 1260	1.90 U	1.90 U	1.90 U	11.0 U	9.40 U	8.50 U	35.0	Eco
Aroclor 1262	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	35.0	Eco
Aroclor 1268	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	35.0	Eco
Total PCBs as Aroclors (NDs at MDL) [1]	**120 J**	**23.0 J**	**32.0 J**	74.0 U	55.0 U	49.0 U	35.0	Eco
PCB Dioxin-Like Congeners (µg/kg wet)								
PCB 77	**0.0690**	**0.0410**	**0.0523**	**0.0359**	**0.0348**	-	0.160	Eco
PCB 81	0.00330 EMPC	0.00270 EMPC	0.00197 EMPC	0.00156 EMPC	0.00142 EMPC	-	0.0800	Eco
PCB 105	**6.20**	**1.02**	**1.73**	**0.924**	**0.741**	-	20.0	Eco
PCB 114	**0.445**	**0.0774**	**0.126**	**0.0655**	**0.0525**	-	20.0	Eco
PCB 118	**64.7**	**10.3**	**15.9**	**12.1**	**7.97**	-	20.0	Eco
PCB 123	**1.15**	**0.239**	**0.293**	**0.229**	**0.152**	-	20.0	Eco
PCB 126	**0.0110**	**0.00527**	**0.00574**	**0.00457**	**0.00417**	-	0.00580	Eco
PCB 156	**3.61 C**	**0.614 C**	**0.828 C**	**0.584 C**	**0.405 C**	-	20.0	Eco
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**						20.0	Eco
PCB 167	**3.80**	**0.956**	**1.18**	**0.944**	**0.566**	-	20.0	Eco
PCB 169	0.0165 U	0.00173 U	0.00660 U	0.00560 U	0.00473 U	-	0.0200	Eco
PCB 189	**0.0101**	**0.00277**	**0.00403**	**0.00222**	**0.00212**	-	20.0	Eco
Total PCBs as Congeners (KM, capped)	**312 J**	**65.8 J**	**95.1 J**	**65.7 J**	**51.5 J**	-	35.0	Eco
Metals (mg/kg wet)								
Aluminum	**61.1**	**13.2**	**10.9**	**21.9**	**21.7**	**76.8**	--	--
Antimony	0.00200 U	0.00400 U	0.00400 U	0.00200 U	**0.00700 J**	**0.00200 J**	--	--
Arsenic	**2.48**	**2.44**	**2.26**	**2.38**	**2.24**	**2.12**	6.60	Eco
Barium	**2.14**	**1.23**	**1.35**	**2.23**	**1.62**	**2.45**	--	--
Beryllium	**0.00240 J**	**0.00100 J**	**0.00100 J**	**0.00170 J**	**0.00230 J**	**0.00280 J**	--	--
Cadmium	**0.369**	**0.383**	**0.406**	**0.377**	**0.351**	**0.305**	0.150	Eco
Chromium	**0.700**	**0.380**	**0.340**	**0.900**	**0.800**	**0.700**	--	--
Cobalt	**0.133**	**0.0790**	**0.0700**	**0.117**	**0.0970**	**0.148**	--	--
Copper	**10.4**	**9.63**	**9.45**	**9.80**	**9.36**	**8.36**	--	--
Lead	**0.0570**	**0.0260**	**0.0280**	**0.0330**	**0.0310**	**0.0890**	0.120	Eco
Mercury	**0.0160**	**0.00780**	**0.00660**	**0.00850**	**0.00710**	**0.0341**	0.0740	Eco
Methyl Mercury	**0.00460**	**0.00480**	**0.00490**	**0.00410**	**0.00350**	**0.00480**	--	--
Nickel	**0.281**	**0.114**	**0.117**	**0.306**	**0.263**	**0.336**	--	--
Thallium	**0.00660**	**0.00720**	**0.00970**	**0.00570**	**0.0119**	**0.00630**	--	--
Vanadium	**0.301**	**0.0810**	**0.0850**	**0.117**	**0.141**	**0.314**	--	--
Zinc	**26.5**	**19.8**	**19.9**	**20.6**	**18.0**	**22.3**	--	--
Semivolatile Organic Compounds (µg/kg wet)								
Bis(2-ethylhexyl) Phthalate	**150 J**	**670**	**740**	**130 J**	**130 J**	**150 J**	1,760	Eco
Butyl Benzyl Phthalate	7.30 U	**14.0 J**	7.30 U	7.30 U	7.30 U	11.0 U	310	Eco
Carbazole	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	13.0 U	--	--
Di-n-butyl Phthalate	16.0 U	16.0 U	16.0 U	16.0 U	16.0 U	56.0 U	626	Eco
Di-n-octyl Phthalate	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	16.0 U	626	Eco
p-cresol (4-Methylphenol)	**25.0 J**	**18.0 J**	**14.0 J**	**20.0 J**	**10.0 J**	11.0 U	--	--
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)								
Acenaphthene	**0.990**	**1.10**	**1.10 J**	**1.10**	**0.910**	**0.940**	19,000	Eco
Anthracene	0.0650 U	**0.960 J**	**1.00 J**	0.0650 U	**0.990**	**0.280 J**	19,000	Eco
Fluorene	**2.30**	**3.00**	**2.80 J**	**2.50**	**2.40**	**2.00**	19,000	Eco
Phenanthrene	**9.10**	**8.90**	**9.60 J**	**12.0**	**11.0**	**9.80**	19,000	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)								
Benzo(a)anthracene	0.0660 U	12.0 U	15.0 U	0.0660 U	**0.800**	**1.20**	1,000	Eco
Benzo(a)pyrene	0.0810 U	0.410 U	0.410 U	0.0810 U	**0.440 J**	0.610 U	1,000	Eco
Benzo(b)fluoranthene	0.0700 U	0.350 U	0.350 U	0.800 U	**0.530**	**0.950**	1,000	Eco
Benzo(g,h,i)perylene	**0.300 J**	0.370 U	0.370 U	0.0730 U	**0.0900 J**	**0.360 J**	1,000	Eco
Benzo(k)fluoranthene	0.0560 U	0.280 U	0.280 U	0.0560 U	0.0560 U	0.0560 U	1,000	Eco
Chrysene	0.0760 U	5.60 U	6.60 U	0.0760 U	**3.00**	**4.00**	1,000	Eco
Dibenz(a,h)anthracene	0.0590 U	0.300 U	0.300 U	0.0590 U	0.0590 U	0.0590 U	1,000	Eco
Fluoranthene	**11.0**	**11.0**	**12.0 J**	16.0 U	**12.0**	11.0 U	19,000	Eco
Indeno(1,2,3-cd)pyrene	**2.50**	0.320 U	0.320 U	0.0640 U	**0.0900 J**	**0.320 J**	1,000	Eco
Pyrene	0.0980 U	4.90 U	5.30 U	0.0980 U	**1.70**	2.30 U	1,000	Eco

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
RDL = reported detection limit
- = Not Analyzed
-- = SLV for analyte not available
ND = Non Detect

[1] Only Aroclor 1254 was included in summing Total PCBs as Aroclors because all other aroclors were undected in Forebay clam samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-9a
Post-Removal Forebay Area Clam Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 2 of 3)

Area	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	**Selected SLV**	**SLV Source**
Site ID	P10	P11	P13	P14	P15	P16		
Sample ID	08021410TC	08021411TC	08031713TC	08031814TC	08022115TC	08022116TC		
Sample Date	2/14/2008	2/14/2008	3/17/2008	3/18/2008	2/21/2008	2/21/2008		
Percent Lipds	2.0	2.6	2.7	2.8	2.6	2.3		
PCB Aroclors (µg/kg wet)								
Aroclor 1016	23.0 U	21.0 U	2.40 U	2.40 U	19.0 U	17.0 U	35.0	Eco
Aroclor 1221	20.0 U	20.0 U	2.60 U	2.60 U	20.0 U	20.0 U	35.0	Eco
Aroclor 1232	34.0 U	36.0 U	2.30 U	2.30 U	35.0 U	30.0 U	35.0	Eco
Aroclor 1242	19.0 U	19.0 U	2.20 U	2.20 U	17.0 U	15.0 U	35.0	Eco
Aroclor 1248	12.0 U	9.90 U	0.510 U	0.510 U	4.60 U	4.50 U	35.0	Eco
Aroclor 1254	36.0 U	32.0 U	**22.0**	**22.0**	32.0 U	30.0 U	35.0	Eco
Aroclor 1260	6.90 U	6.40 U	1.90 U	1.90 U	6.70 U	6.80 U	35.0	Eco
Aroclor 1262	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	35.0	Eco
Aroclor 1268	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	35.0	Eco
Total PCBs as Aroclors (NDs at MDL) [1]	36.0 U	32.0 U	**22.0**	**22.0**	32.0 U	30.0 U	35.0	Eco
PCB Dioxin-Like Congeners (µg/kg wet)								
PCB 77	**0.0269**	**0.0336**	**0.0375**	**0.0388**	**0.0333**	**0.0301**	0.160	Eco
PCB 81	0.000693 EMPC	0.00142 EMPC	**0.00194**	0.00208 EMPC	0.00131 EMPC	0.00154 EMPC	0.0800	Eco
PCB 105	**0.455**	**0.407**	**0.437**	**0.464**	**0.397**	**0.361**	20.0	Eco
PCB 114	**0.0281**	**0.0238**	**0.0260**	**0.0274**	**0.0231**	**0.0209**	20.0	Eco
PCB 118	**4.09**	**2.26**	**2.73**	**2.87**	**2.30**	**2.17**	20.0	Eco
PCB 123	**0.0837**	**0.0462**	**0.0512**	**0.0595**	**0.0471**	**0.0420**	20.0	Eco
PCB 126	**0.00337**	**0.00413**	**0.00506**	**0.00531**	**0.00386**	**0.00402**	0.00580	Eco
PCB 156	**0.228 C**	**0.136 C**	**0.157 C**	**0.171 C**	**0.133 C**	**0.128 C**	20.0	Eco
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**						20.0	Eco
PCB 167	**0.302**	**0.146**	**0.209**	**0.213**	**0.157**	**0.149**	20.0	Eco
PCB 169	0.00337 U	0.00327 U	0.00135 U	0.00109 U	0.00356 U	0.00353 U	0.0200	Eco
PCB 189	**0.00152**	**0.00171**	**0.00166**	**0.00203**	**0.00156**	**0.00156**	20.0	Eco
Total PCBs as Congeners (KM, capped)	**30.6 J**	**26.7 J**	**33.1 J**	**34.0 J**	**26.9 J**	**25.5 J**	35.0	Eco
Metals (mg/kg wet)								
Aluminum	**81.4**	**33.7**	**9.53**	**9.42**	**18.7**	**15.9**	--	--
Antimony	**0.00200 J**	0.00200 U	0.00400 U	0.00400 U	0.00200 U	0.00200 U	--	--
Arsenic	**1.79**	**2.04**	**2.49**	**2.47**	**2.43**	**2.11**	6.60	Eco
Barium	**2.22**	**2.04**	**1.74**	**1.18**	**1.77**	**1.63**	--	--
Beryllium	**0.00270 J**	**0.00190 J**	**0.00150 J**	**0.00170 J**	**0.00160 J**	**0.00140 J**	--	--
Cadmium	**0.286**	**0.321**	**0.461**	**0.442**	**0.366**	**0.321**	0.150	Eco
Chromium	**0.600**	**0.700**	**0.560**	**0.390**	**0.900**	**0.600**	--	--
Cobalt	**0.140**	**0.135**	**0.0980**	**0.0720**	**0.120**	**0.104**	--	--
Copper	**7.00**	**7.95**	**11.4**	**9.72**	**10.4**	**8.67**	--	--
Lead	**0.0610**	**0.0510**	**0.0290**	**0.0290**	**0.0370**	**0.0350**	0.120	Eco
Mercury	**0.00870**	**0.0108**	**0.00720**	**0.0169**	**0.0132**	**0.0103**	0.0740	Eco
Methyl Mercury	**0.00500**	**0.00500**	**0.00530**	**0.00650**	**0.00530**	**0.00480**	--	--
Nickel	**0.348**	**0.320**	**0.136**	**0.0950**	**0.242**	**0.222**	--	--
Thallium	**0.00500**	**0.00570**	**0.00710**	**0.00720**	**0.00580**	**0.00470**	--	--
Vanadium	**0.311**	**0.196**	**0.0850**	**0.0930**	**0.136**	**0.175**	--	--
Zinc	**22.9**	**23.5**	**17.8**	**16.3**	**20.8**	**17.7**	--	--
Semivolatile Organic Compounds (µg/kg wet)								
Bis(2-ethylhexyl) Phthalate	**97.0 J**	**120 J**	**890**	**720**	**180 J**	**130 J**	1,760	Eco
Butyl Benzyl Phthalate	7.30 U	7.30 U	7.30 U	**13.0 J**	7.30 U	7.30 U	310	Eco
Carbazole	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	--	--
Di-n-butyl Phthalate	16.0 U	16.0 U	16.0 U	16.0 U	16.0 U	16.0 U	626	Eco
Di-n-octyl Phthalate	11.0 U	11.0 U	11.0 U	**38.0 J**	11.0 U	11.0 U	626	Eco
p-cresol (4-Methylphenol)	7.70 U	**14.0 J**	**8.60 J**	7.70 U	7.70 U	7.70 U	--	--
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)								
Acenaphthene	**0.800**	**0.970**	**4.10**	**0.840**	**1.00 J**	**0.820**	19,000	Eco
Anthracene	**0.440 J**	**0.850**	**2.30 J**	**1.10 J**	**0.940 J**	**0.980**	19,000	Eco
Fluorene	**1.60**	**2.30**	**3.80**	**2.70**	**2.50 J**	**2.00**	19,000	Eco
Phenanthrene	**6.70**	**12.0**	**15.0**	**9.60**	**13.0 J**	**8.00**	19,000	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)								
Benzo(a)anthracene	**0.480 J**	**2.10**	22.0 U	15.0 U	0.0660 UJ	**0.990**	1,000	Eco
Benzo(a)pyrene	0.0810 U	**0.580**	0.410 U	0.410 U	0.0810 UJ	0.0810 U	1,000	Eco
Benzo(b)fluoranthene	**0.400 J**	**0.810**	0.350 U	0.350 U	**0.780 J**	**0.600**	1,000	Eco
Benzo(g,h,i)perylene	0.0730 U	**0.120 J**	2.50 U	0.370 U	**0.240 J**	**0.270 J**	1,000	Eco
Benzo(k)fluoranthene	**0.160 J**	0.0560 U	0.280 U	0.280 U	0.0560 UJ	0.0560 U	1,000	Eco
Chrysene	**2.90**	**3.00**	6.70 U	7.80 U	0.0760 UJ	**3.20**	1,000	Eco
Dibenz(a,h)anthracene	0.0590 U	0.0590 U	0.300 U	0.300 U	0.0590 UJ	0.0590 U	1,000	Eco
Fluoranthene	**8.90**	**13.0**	**14.0**	**12.0**	**6.30 J**	**11.0**	19,000	Eco
Indeno(1,2,3-cd)pyrene	0.0640 U	**0.0800 J**	0.320 U	0.320 U	0.0640 UJ	**0.400 J**	1,000	Eco
Pyrene	**2.40**	**2.20**	7.20 U	4.60 U	**3.60 J**	**1.60**	1,000	Eco

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
RDL = reported detection limit
- = Not Analyzed
-- = SLV for analyte not available
ND = Non Detect

[1] Only Aroclor 1254 was included in summing Total PCBs as Aroclors because all other aroclors were undected in Forebay clam samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-9a
Post-Removal Forebay Area Clam Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 3 of 3)

Area	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	Forebay	**Selected SLV**	**SLV Source**
Site ID	P17	P18	P21	P65	P67	P88	P89		
Sample ID	08022117TC	08021118TC	08021221TC	08022965TC	08030367TC	08031788TC	08031789TC		
Sample Date	2/21/2008	2/12/2008	2/12/2008	2/29/2008	3/3/2008	3/17/2008	3/17/2008		
Percent Lipds	2.2	2.4	2.4	3.3	3.7	2.8	2.6		
PCB Aroclors (µg/kg wet)									
Aroclor 1016	17.0 U	17.0 U	15.0 U	2.40 U	2.40 U	2.40 U	2.40 U	35.0	Eco
Aroclor 1221	20.0 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	2.60 U	35.0	Eco
Aroclor 1232	31.0 U	23.0 U	19.0 U	2.30 U	2.30 U	2.30 U	2.30 U	35.0	Eco
Aroclor 1242	15.0 U	22.0 U	10.0 U	2.20 U	2.20 U	2.20 U	2.20 U	35.0	Eco
Aroclor 1248	9.20 U	9.90 U	4.60 U	0.510 U	0.510 U	0.510 U	0.510 U	35.0	Eco
Aroclor 1254	28.0 U	28.0 U	30.0 U	**21.0**	**21.0**	**23.0**	**21.0**	35.0	Eco
Aroclor 1260	5.90 U	5.90 U	6.20 U	1.90 U	1.90 U	1.90 U	1.90 U	35.0	Eco
Aroclor 1262	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U	35.0	Eco
Aroclor 1268	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	35.0	Eco
Total PCBs as Aroclors (NDs at MDL) [1]	28.0 U	28.0 U	30.0 U	**21.0**	**21.0**	**23.0**	**21.0**	35.0	Eco
PCB Dioxin-Like Congeners (µg/kg wet)									
PCB 77	**0.0307**	**0.0339**	**0.0320**	**0.0420**	-	**0.0398**	**0.0359**	0.160	Eco
PCB 81	0.00155 EMPC	0.00142 EMPC	0.00138 EMPC	**0.00246**	-	**0.00201**	**0.00238**	0.0800	Eco
PCB 105	**0.365**	**0.377**	**0.371**	**0.478**	-	**0.476**	**0.444**	20.0	Eco
PCB 114	**0.0202**	**0.0228**	**0.0216**	**0.0291**	-	**0.0287**	**0.0273**	20.0	Eco
PCB 118	**2.08**	**2.13**	**2.05**	**2.54**	-	**2.76**	**2.67**	20.0	Eco
PCB 123	**0.0384**	**0.0413**	**0.0392**	**0.0438**	-	**0.0520**	**0.0544**	20.0	Eco
PCB 126	**0.00339**	**0.00363**	**0.00400**	**0.00530**	-	**0.00510**	**0.00472**	0.00580	Eco
PCB 156	**0.120 C**	**0.124 C**	**0.121 C**	**0.156 C**	-	**0.168 C**	**0.158 C**	20.0	Eco
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**							20.0	Eco
PCB 167	**0.134**	**0.131**	**0.125**	**0.154**	-	**0.185**	**0.201**	20.0	Eco
PCB 169	0.00340 U	0.00366 U	0.00362 U	0.000940 U	-	0.000901 U	0.00110 U	0.0200	Eco
PCB 189	**0.00167**	**0.00160**	**0.00166**	**0.00221**	-	**0.00218**	**0.00181**	20.0	Eco
Total PCBs as Congeners (KM, capped)	**24.5 J**	**25.9 J**	**24.6 J**	**33.1 J**	-	**33.2 J**	**31.6 J**	35.0	Eco
Metals (mg/kg wet)									
Aluminum	**35.2**	**34.5**	**49.2**	**83.2**	**15.2**	**9.37**	**18.9**	--	--
Antimony	**0.00300 J**	0.00200 U	**0.00400 J**	0.00400 U	0.00500 U	0.00400 U	0.00400 U	--	--
Arsenic	**1.88**	**1.88**	**2.07**	**2.31**	**2.15**	**2.34**	**2.38**	6.60	Eco
Barium	**1.76**	**2.05**	**2.29**	**3.05**	**1.64**	**1.49**	**1.62**	--	--
Beryllium	**0.00210 J**	**0.00180 J**	**0.00250 J**	**0.00380 J**	**0.00120 J**	**0.000700 J**	**0.00170 J**	--	--
Cadmium	**0.287**	**0.342**	**0.313**	**0.355**	**0.396**	**0.396**	**0.412**	0.150	Eco
Chromium	**0.600**	**0.700**	**0.800**	**0.480**	**0.300**	**0.330**	**0.530**	--	--
Cobalt	**0.115**	**0.110**	**0.124**	**0.138**	**0.0720**	**0.0670**	**0.0840**	--	--
Copper	**8.00**	**8.31**	**8.29**	**9.56**	**9.00**	**8.86**	**9.61**	--	--
Lead	**0.0370**	**0.0580**	**0.0580**	**0.0800**	**0.0330**	**0.0210**	**0.0260**	0.120	Eco
Mercury	**0.0116**	**0.0102**	**0.00770**	**0.00880**	**0.00860**	**0.0101**	**0.00580**	0.0740	Eco
Methyl Mercury	**0.00400**	**0.00510**	**0.00360**	**0.00480**	**0.00630**	**0.00430**	**0.00360**	--	--
Nickel	**0.238**	**0.303**	**0.324**	**0.227**	**0.144**	**0.126**	**0.178**	--	--
Thallium	**0.00450**	**0.00600**	**0.00590**	**0.00850**	**0.00950**	**0.00710**	**0.00700**	--	--
Vanadium	**0.205**	**0.207**	**0.204**	**0.426**	**0.104**	**0.0780**	**0.107**	--	--
Zinc	**20.2**	**25.1**	**23.5**	**25.0**	**24.3**	**20.4**	**21.6**	--	--
Semivolatile Organic Compounds (µg/kg wet)									
Bis(2-ethylhexyl) Phthalate	**67.0 J**	**130 J**	**110 J**	**760**	**830**	**710**	**750 J**	1,760	Eco
Butyl Benzyl Phthalate	7.30 U	7.30 U	7.30 U	7.30 U	7.30 U	**15.0 J**	7.30 U	310	Eco
Carbazole	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	--	--
Di-n-butyl Phthalate	16.0 U	16.0 U	40.0 U	16.0 U	16.0 U	16.0 U	16.0 UJ	626	Eco
Di-n-octyl Phthalate	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	11.0 UJ	626	Eco
p-cresol (4-Methylphenol)	7.70 U	7.70 U	7.70 U	**31.0 J**	**8.60 J**	**9.30 J**	7.70 U	--	--
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)									
Acenaphthene	**0.670**	**0.910**	**0.980**	**0.420 J**	0.110 U	**0.460 J**	**1.10**	19,000	Eco
Anthracene	**0.460 J**	**1.20**	**0.790**	0.330 U	0.330 U	**0.800 J**	**1.50**	19,000	Eco
Fluorene	**1.60**	**2.20**	**2.10**	**1.70**	**0.920**	**1.50 J**	**2.90**	19,000	Eco
Phenanthrene	**6.90**	**9.70**	**8.50**	**7.90**	**4.50**	**5.30 J**	**12.0**	19,000	Eco
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)									
Benzo(a)anthracene	**0.680**	**1.30**	**0.970**	0.330 U	0.330 U	17.0 UJ	1.30 U	1,000	Eco
Benzo(a)pyrene	0.0810 U	0.620 U	**0.380 J**	0.410 U	0.410 U	0.410 UJ	0.860 U	1,000	Eco
Benzo(b)fluoranthene	**0.710**	**0.640**	**0.550**	0.350 U	0.350 U	0.350 UJ	0.740 U	1,000	Eco
Benzo(g,h,i)perylene	0.0730 U	**0.130 J**	**0.130 J**	0.370 U	0.370 U	0.370 UJ	0.500 U	1,000	Eco
Benzo(k)fluoranthene	0.0560 U	**0.250 J**	0.0560 U	0.280 U	0.280 U	0.280 UJ	0.580 U	1,000	Eco
Chrysene	**2.60**	**1.90**	**3.70**	0.380 U	0.380 U	6.50 UJ	2.50 U	1,000	Eco
Dibenz(a,h)anthracene	0.0590 U	0.0590 U	0.0590 U	0.300 U	0.300 U	0.300 UJ	0.500 U	1,000	Eco
Fluoranthene	**9.40**	14.0 U	**11.0**	14.0 U	8.60 U	**7.60 J**	**16.0**	19,000	Eco
Indeno(1,2,3-cd)pyrene	0.0640 U	**0.0850 J**	0.0640 U	0.320 U	0.320 U	0.320 UJ	0.500 U	1,000	Eco
Pyrene	**2.90**	2.90 U	1.50 U	0.490 U	0.490 U	4.00 UJ	**6.30**	1,000	Eco

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
Eco = Ecological
HH = Human Health
MDL = method detection limit
SLV = screening level value
RDL = reported detection limit
- = Not Analyzed
-- = SLV for analyte not available
ND = Non Detect

[1] Only Aroclor 1254 was included in summing Total PCBs as Aroclors because all other aroclors were undected in Forebay clam samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
bold = analyte detected above MDL/RDL.
= The reported concentration exceeds the selected SLV

Table 6-9b
Post-Removal Reference Area Clam Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 1 of 3)

Area	Reference	Reference	Reference	Reference	Reference	Reference
Site ID	P22	P24	P26	P27	P28	P29
Sample ID	08030522TC	08030524TC	08030426TC	08030427TC	08030428TC	08022229TC
Sample Date	3/5/2008	3/5/2008	3/4/2008	3/4/2008	3/4/2008	2/22/2008
Percent Lipds	2.9	2.6	3.0	3.1	2.7	3.0
PCB Aroclors (µg/kg wet)						
Aroclor 1016	13.0 U	11.0 U	11.0 U	12.0 U	8.90 U	13.0 U
Aroclor 1221	14.0 U	14.0 U	14.0 U	8.20 U	9.60 U	16.0 U
Aroclor 1232	19.0 U	18.0 U	22.0 U	27.0 U	18.0 U	26.0 U
Aroclor 1242	13.0 U	7.90 U	11.0 U	12.0 U	12.0 U	13.0 U
Aroclor 1248	5.70 U	5.70 U	7.60 U	8.30 U	5.70 U	7.70 U
Aroclor 1254	**36.0**	**30.0**	**35.0**	**37.0**	**33.0**	**32.0**
Aroclor 1260	6.40 U	6.20 U	6.50 U	6.80 U	6.60 U	5.70 U
Aroclor 1262	9.30 U	7.20 U	7.70 U	7.80 U	7.50 U	8.00 U
Aroclor 1268	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U
Total PCBs as Aroclors (NDs at MDL) [1]	**36.0**	**30.0**	**35.0**	**37.0**	**33.0**	**32.0**
PCB Dioxin-Like Congeners (µg/kg wet)						
PCB 77	**0.0378**	**0.0338**	**0.0332**	**0.0343**	**0.0373**	**0.0364**
PCB 81	**0.00189**	**0.00204**	0.00143 EMPC	0.000961 EMPC	**0.00211**	**0.00207**
PCB 105	**0.438**	**0.399**	**0.350**	**0.370**	**0.434**	**0.406**
PCB 114	**0.0267**	**0.0228**	**0.0213**	**0.0242**	**0.0258**	**0.0236**
PCB 118	**2.42**	**2.22**	**1.91**	**2.13**	**2.66**	**2.14**
PCB 123	**0.0484**	**0.0423**	**0.0390**	**0.0421**	**0.0540**	**0.0403**
PCB 126	**0.00501**	**0.00444**	**0.00407**	**0.00451**	**0.00504**	**0.00405**
PCB 156	**0.138 C**	**0.126 C**	**0.137 C**	**0.149 C**	**0.152 C**	**0.125 C**
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**					
PCB 167	**0.149**	**0.127**	**0.151**	**0.167**	**0.170**	**0.130**
PCB 169	0.000809 U	0.000933 U	0.00153 U	0.00170 U	0.000872 U	0.000900 U
PCB 189	**0.00183**	**0.00175**	**0.00144**	0.00151 EMPC	**0.00185**	**0.00168**
Total PCBs as Congeners (KM, capped)	**30.8 J**	**28.3 J**	**31.6 J**	**32.9 J**	**31.3 J**	**29.7 J**
Metals (mg/kg wet)						
Aluminum	**34.3**	**50.4**	**46.5**	**52.2**	**39.8**	**16.8**
Antimony	**0.00500**	0.00400 U	0.00400 U	0.00400 U	0.00400 U	0.00400 U
Arsenic	**2.53**	**2.03**	**2.51**	**2.46**	**2.32**	**2.22**
Barium	**1.79**	**2.11**	**1.77**	**1.80**	**2.17**	**1.89**
Beryllium	0.000400 U	**0.000900**	**0.00110**	0.000400 U	**0.000900**	0.000400 U
Cadmium	**0.307**	**0.275**	**0.377**	**0.370**	**0.340**	**0.254**
Chromium	**0.510**	**0.600**	**0.730**	**0.690**	**0.660**	**0.480**
Cobalt	**0.132**	**0.132**	**0.124**	**0.141**	**0.150**	**0.116**
Copper	**9.67**	**8.91**	**10.7**	**10.7**	**10.4**	**8.46**
Lead	**0.0660**	**0.0570**	**0.0570**	**0.0590**	**0.0570**	**0.0690**
Mercury	**0.0179**	**0.00600**	**0.0128**	**0.00890**	**0.0130**	**0.00760**
Methyl Mercury	**0.00990**	**0.00470**	**0.00490**	**0.00470**	**0.00520**	**0.00780**
Nickel	**0.311**	**0.405**	**0.338**	**0.347**	**0.347**	**0.408**
Thallium	**0.00590**	**0.00530**	**0.00650**	**0.00630**	**0.00560**	**0.00560**
Vanadium	**0.169**	**0.170**	**0.172**	**0.182**	**0.150**	**0.135**
Zinc	**18.7**	**19.9**	**21.0**	**20.2**	**19.4**	**19.8**
Semivolatile Organic Compounds (µg/kg wet)						
Bis(2-ethylhexyl) Phthalate	**310**	**320**	**430**	**680**	**340**	**680**
Butyl Benzyl Phthalate	7.30 U	7.30 U	7.30 U	**57.0 J**	7.30 U	7.30 U
Carbazole	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U
Di-n-butyl Phthalate	16.0 U	16.0 U	16.0 U	16.0 U	16.0 U	16.0 U
Di-n-octyl Phthalate	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
p-cresol (4-Methylphenol)	**44.0**	**52.0**	**18.0 J**	**42.0**	**55.0**	**63.0**
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)						
Acenaphthene	**0.710**	**0.480 J**	**0.730**	**0.450 J**	**0.510**	**1.20 J**
Anthracene	1.40 U	3.20 U	1.40 U	1.30 UJ	3.20 U	**1.80 J**
Fluorene	**2.00**	**1.50**	**2.00**	**1.60 J**	**1.50**	**3.10 J**
Phenanthrene	**9.10**	**6.70**	**9.00**	**8.10 J**	**7.50**	**14.0 J**
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)						
Benzo(a)anthracene	18.0 U	3.70 U	26.0 U	15.0 UJ	7.30 U	12.0 UJ
Benzo(a)pyrene	0.410 U	0.410 U	0.410 U	0.410 UJ	0.410 U	0.410 UJ
Benzo(b)fluoranthene	0.350 U	0.350 U	0.350 U	0.350 UJ	0.350 U	0.350 UJ
Benzo(g,h,i)perylene	0.370 U	0.370 U	0.370 U	0.370 UJ	0.370 U	0.370 UJ
Benzo(k)fluoranthene	0.280 U	0.280 U	0.280 U	0.280 UJ	0.280 U	0.280 UJ
Chrysene	5.50 U	5.30 U	5.30 U	13.0 UJ	6.30 U	1.30 UJ
Dibenz(a,h)anthracene	0.300 U	0.300 U	0.300 U	0.300 UJ	0.300 U	0.300 UJ
Fluoranthene	**11.0**	**8.50**	**11.0**	**10.0 J**	**9.30**	**17.0 J**
Indeno(1,2,3-cd)pyrene	0.320 U	**1.70 J**	0.320 U	0.320 UJ	0.320 U	0.320 UJ
Pyrene	3.70 U	2.00 U	4.10 U	2.80 UJ	2.40 U	5.60 UJ

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
RDL = reported detection limit
ND = Non Detect
- = Not Analyzed
bold = analyte detected above MDL/RDL.
J = The reported value is an estimate.

[1] Only Aroclors 1254 was included in summing clam Total PCBs as Aroclors because all other aroclors were undected in Reference Area clam samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

Table 6-9b
Post-Removal Reference Area Clam Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 2 of 3)

Area	Reference	Reference	Reference	Reference	Reference	Reference
Site ID	P34	P35	P36	P37	P38	P39
Sample ID	08022534TC	08022535TC	08022536TC	08022637TC	08022738TC	08022739TC
Sample Date	2/25/2008	2/25/2008	2/25/2008	2/26/2008	2/27/2008	2/27/2008
Percent Lipds	2.8	3.6	3.5	3.1	3.2	3.2
PCB Aroclors (µg/kg wet)						
Aroclor 1016	12.0 U	9.50 U	8.40 U	9.70 U	15.0 U	15.0 U
Aroclor 1221	15.0 U	8.80 U	12.0 U	16.0 U	6.30 U	7.40 U
Aroclor 1232	23.0 U	28.0 U	19.0 U	29.0 U	35.0 U	33.0 U
Aroclor 1242	13.0 U	14.0 U	13.0 U	9.30 U	12.0 U	11.0 U
Aroclor 1248	6.40 U	9.10 U	9.90 U	9.90 U	9.40 U	9.60 U
Aroclor 1254	**32.0**	**37.0**	**38.0**	**35.0**	**37.0**	**38.0**
Aroclor 1260	5.90 U	7.70 U	7.60 U	7.30 U	8.10 U	7.50 U
Aroclor 1262	8.10 U	8.10 U	7.70 U	3.70 U	7.60 U	9.10 U
Aroclor 1268	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U
Total PCBs as Aroclors (NDs at MDL) [1]	**32.0**	**37.0**	**38.0**	**35.0**	**37.0**	**38.0**
PCB Dioxin-Like Congeners (µg/kg wet)						
PCB 77	**0.0361**	**0.0428**	**0.0443**	**0.0384**	**0.0371**	**0.0432**
PCB 81	0.00223 EMPC	**0.00260**	**0.00251**	0.00167 EMPC	0.00199 EMPC	0.00213 EMPC
PCB 105	**0.424**	**0.484**	**0.484**	**0.419**	**0.416**	**0.484**
PCB 114	**0.0246**	**0.0299**	**0.0272**	**0.0240**	**0.0233**	**0.0287**
PCB 118	**2.20**	**2.47**	**2.42**	**2.18**	**2.14**	**2.52**
PCB 123	**0.0384**	**0.0461**	**0.0439**	**0.0418**	**0.0368**	**0.0469**
PCB 126	**0.00403**	**0.00535**	**0.00519**	**0.00464**	**0.00474**	**0.00533**
PCB 156	**0.129 C**	**0.148 C**	**0.154 C**	**0.138 C**	**0.135 C**	**0.166 C**
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**					
PCB 167	**0.127**	**0.139**	**0.139**	**0.146**	**0.123**	**0.154**
PCB 169	0.000939 U	0.000901 U	0.00132 U	0.000698 U	0.000987 U	0.00101 U
PCB 189	**0.00198**	**0.00223**	**0.00240**	**0.00209**	**0.00195**	**0.00234**
Total PCBs as Congeners (KM, capped)	**30.4 J**	**34.5 J**	**33.7 J**	**30.2 J**	**28.6 J**	**34.3 J**
Metals (mg/kg wet)						
Aluminum	**29.2**	**12.0**	**17.1**	**14.5**	**20.6**	**19.9**
Antimony	**0.00400**	0.00500 U	0.00400 U	0.00400 U	0.00400 U	0.00400 U
Arsenic	**2.00**	**2.28**	**2.38**	**2.22**	**2.24**	**2.46**
Barium	**1.78**	**1.79**	**1.72**	**1.83**	**1.71**	**1.97**
Beryllium	**0.000400**	**0.000700**	0.000400 U	**0.000500**	0.000400 U	**0.000900**
Cadmium	**0.247**	**0.308**	**0.356**	**0.320**	**0.335**	**0.385**
Chromium	**0.490**	**0.450**	**0.470**	**0.540**	**0.460**	**0.570**
Cobalt	**0.121**	**0.100**	**0.0969**	**0.106**	**0.0974**	**0.104**
Copper	**8.18**	**9.57**	**9.61**	**10.1**	**9.50**	**10.4**
Lead	**0.0670**	**0.0660**	**0.0650**	**0.0650**	**0.0670**	**0.0670**
Mercury	**0.00850**	**0.0121**	**0.00610**	**0.00460**	**0.0113**	**0.00630**
Methyl Mercury	**0.00750**	**0.00610**	**0.00590**	**0.00610**	**0.00590**	**0.00610**
Nickel	**0.324**	**0.392**	**0.389**	**0.359**	**0.289**	**0.341**
Thallium	**0.00630**	**0.00820**	**0.00740**	**0.00640**	**0.00810**	**0.00660**
Vanadium	**0.188**	**0.0860**	**0.104**	**0.124**	**0.171**	**0.138**
Zinc	**20.5**	**22.9**	**23.2**	**20.3**	**21.7**	**23.0**
Semivolatile Organic Compounds (µg/kg wet)						
Bis(2-ethylhexyl) Phthalate	**440**	**510**	**510**	**400**	**480**	**350**
Butyl Benzyl Phthalate	7.30 U	7.30 U	7.30 U	**74.0 J**	7.30 U	7.30 U
Carbazole	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U
Di-n-butyl Phthalate	16.0 U	16.0 U	16.0 U	16.0 U	16.0 U	16.0 U
Di-n-octyl Phthalate	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
p-cresol (4-Methylphenol)	**20.0 J**	**45.0**	**72.0**	**110**	**36.0 J**	**52.0**
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)						
Acenaphthene	**0.610**	**0.650**	**1.00**	**0.910**	**0.530 J**	**0.590**
Anthracene	1.50 U	1.90 U	1.90 U	2.00 U	1.40 UJ	1.60 U
Fluorene	**1.90**	**2.40**	**2.70**	**2.70**	**1.90 J**	**2.10**
Phenanthrene	**9.40**	**12.0**	**12.0**	**13.0**	**9.30 J**	**10.0**
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)						
Benzo(a)anthracene	16.0 U	22.0 U	26.0 U	27.0 U	20.0 UJ	27.0 U
Benzo(a)pyrene	0.410 U	0.410 U	0.410 U	0.410 U	0.410 UJ	0.410 U
Benzo(b)fluoranthene	0.350 U	0.350 U	0.350 U	0.350 U	0.350 UJ	0.350 U
Benzo(g,h,i)perylene	0.370 U	**0.500 J**	0.370 U	0.370 U	**0.850 J**	**1.40 J**
Benzo(k)fluoranthene	0.280 U	0.280 U	0.280 U	0.280 U	0.280 UJ	0.280 U
Chrysene	4.60 U	3.70 U	4.00 U	4.10 U	6.20 UJ	4.80 U
Dibenz(a,h)anthracene	0.300 U	0.300 U	0.300 U	0.300 U	0.300 UJ	0.300 U
Fluoranthene	**11.0**	**14.0**	**14.0**	**14.0**	**11.0 J**	**12.0**
Indeno(1,2,3-cd)pyrene	0.320 U	**1.40 J**	**0.830 J**	**0.800 J**	0.320 UJ	**1.50 J**
Pyrene	3.70 U	4.30 U	4.80 U	4.60 U	3.70 UJ	3.80 U

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
RDL = reported detection limit
ND = Non Detect
- = Not Analyzed
bold = analyte detected above MDL/RDL.
J = The reported value is an estimate.

[1] Only Aroclors 1254 was included in summing clam Total PCBs as Aroclors because all other aroclors were undected in Reference Area clam samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

Table 6-9b
Post-Removal Reference Area Clam Tissue Analytical Results
PCB Aroclors, PCB Dioxin-Like Congeners, Metals, and Semivolatile Organic Compounds
(Page 3 of 3)

Area	Reference	Reference	Reference	Reference	Reference	Reference
Site ID	P40	P41	P42	P85	P86	P87
Sample ID	08022740TC	08022741TC	08022742TC	08030685TC	08030686TC	08030687TC
Sample Date	2/27/2008	2/27/2008	2/27/2008	3/6/2008	3/6/2008	3/6/2008
Percent Lipds	3.3	3.3	3.1	2.8	2.7	3.1
PCB Aroclors (µg/kg wet)						
Aroclor 1016	12.0 U	14.0 U	12.0 U	14.0 U	12.0 U	9.50 U
Aroclor 1221	12.0 U	7.50 U	16.0 U	12.0 U	9.10 U	9.20 U
Aroclor 1232	22.0 U	31.0 U	20.0 U	28.0 U	24.0 U	26.0 U
Aroclor 1242	9.70 U	14.0 U	9.40 U	9.90 U	9.20 U	9.50 U
Aroclor 1248	8.70 U	8.90 U	8.20 U	9.90 U	7.10 U	5.50 U
Aroclor 1254	**37.0**	**39.0**	**35.0**	**34.0**	**31.0**	**33.0**
Aroclor 1260	6.90 U	7.70 U	7.50 U	6.70 U	6.20 U	6.60 U
Aroclor 1262	9.90 U	7.80 U	9.10 U	8.20 U	7.90 U	8.40 U
Aroclor 1268	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U
Total PCBs as Aroclors (NDs at MDL) [1]	**37.0**	**39.0**	**35.0**	**34.0**	**31.0**	**33.0**
PCB Dioxin-Like Congeners (µg/kg wet)						
PCB 77	**0.0463**	**0.0468**	**0.0414**	**0.0408**	**0.0384**	**0.0357**
PCB 81	**0.00275**	**0.00221**	**0.00203**	0.00188 EMPC	**0.00180**	0.00151 EMPC
PCB 105	**0.535**	**0.556**	**0.488**	**0.478**	**0.440**	**0.414**
PCB 114	**0.0308**	**0.0330**	**0.0281**	**0.0271**	**0.0249**	**0.0247**
PCB 118	**2.77**	**2.82**	**2.53**	**2.64**	**2.29**	**2.27**
PCB 123	**0.0532**	**0.0506**	**0.0438**	**0.0500**	**0.0412**	**0.0409**
PCB 126	**0.00564**	**0.00536**	**0.00512**	0.00588 U	**0.00446**	**0.00451**
PCB 156	**0.158 C**	**0.161 C**	**0.145 C**	**0.137 C**	**0.123 C**	**0.125 C**
PCB 157	**PCB 156 and 157 are coeluting congeners and are represented with one concentration.**					
PCB 167	**0.146**	**0.146**	**0.137**	**0.165**	**0.123**	**0.131**
PCB 169	0.00125 U	0.00103 U	0.00101 U	0.00173 U	0.00117 U	0.00157 U
PCB 189	**0.00241**	**0.00237**	**0.00217**	**0.00201**	**0.00171**	**0.00172**
Total PCBs as Congeners (KM, capped)	**32.9 J**	**32.8 J**	**29.7 J**	**30.7 J**	**27.0 J**	**26.9 J**
Metals (mg/kg wet)						
Aluminum	**11.5**	**16.9**	**8.00**	**36.3**	**26.7**	**83.4**
Antimony	0.00400 U	**0.00800**	0.00400 U	0.00400 U	0.00400 U	0.00400 U
Arsenic	**2.41**	**2.44**	**2.26**	**2.62**	**2.09**	**2.01**
Barium	**1.82**	**1.71**	**1.87**	**1.81**	**2.02**	**2.38**
Beryllium	0.000400 U	**0.000800**	0.000400 U	0.000400 U	0.000400 U	**0.00140**
Cadmium	**0.363**	**0.347**	**0.353**	**0.405**	**0.298**	**0.328**
Chromium	**0.470**	**0.490**	**0.470**	**0.760**	**0.570**	**0.460**
Cobalt	**0.0929**	**0.0965**	**0.0902**	**0.129**	**0.138**	**0.147**
Copper	**9.94**	**9.65**	**9.10**	**11.6**	**9.24**	**9.67**
Lead	**0.0570**	**0.0600**	**0.0490**	**0.0530**	**0.0550**	**0.0720**
Mercury	**0.00620**	**0.00720**	**0.00510**	**0.00710**	**0.00640**	**0.0135**
Methyl Mercury	**0.00160**	**0.00550**	**0.00140**	**0.00320**	**0.00460**	**0.00500**
Nickel	**0.273**	**0.289**	**0.402**	**0.346**	**0.333**	**0.482**
Thallium	**0.00660**	**0.0105**	**0.00570**	**0.00610**	**0.00650**	**0.00800**
Vanadium	**0.0840**	**0.104**	**0.0740**	**0.150**	**0.127**	**0.286**
Zinc	**22.4**	**21.3**	**22.1**	**18.5**	**21.0**	**22.2**
Semivolatile Organic Compounds (µg/kg wet)						
Bis(2-ethylhexyl) Phthalate	**460**	**390**	**600**	**330**	**370**	**390**
Butyl Benzyl Phthalate	7.30 U	7.30 U	**57.0 J**	7.30 U	7.30 U	7.30 U
Carbazole	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U	9.10 U
Di-n-butyl Phthalate	16.0 U	16.0 UJ	16.0 U	35.0 U	48.0 U	16.0 U
Di-n-octyl Phthalate	11.0 U	11.0 UJ	11.0 U	11.0 U	11.0 U	11.0 U
p-cresol (4-Methylphenol)	**52.0**	**60.0**	**30.0 J**	**38.0**	**13.0 J**	**35.0 J**
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)						
Acenaphthene	**0.270 J**	**0.330 J**	**0.810 J**	**0.670**	**0.470**	**0.720**
Anthracene	1.60 U	1.30 UiJ	**0.850 J**	1.50 U	2.90 U	1.40 U
Fluorene	**2.00**	**1.80**	**2.30 J**	**1.90**	**1.80**	**2.20**
Phenanthrene	**8.30**	**8.80**	**8.80 J**	**8.60**	**8.20**	**10.0**
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)						
Benzo(a)anthracene	21.0 U	26.0 UiJ	20.0 UJ	20.0 U	8.50 U	22.0 U
Benzo(a)pyrene	0.410 U	0.410 U	0.410 UJ	0.410 U	0.410 U	0.410 U
Benzo(b)fluoranthene	0.350 U	0.350 U	0.350 UJ	0.350 U	0.350 U	0.350 U
Benzo(g,h,i)perylene	**1.40 J**	**0.600 J**	0.370 UJ	0.370 U	0.370 U	0.370 U
Benzo(k)fluoranthene	0.280 U	0.280 U	0.280 UJ	0.280 U	0.280 U	0.280 U
Chrysene	5.80 U	5.10 UiJ	6.50 UJ	5.80 U	5.10 U	5.20 U
Dibenz(a,h)anthracene	0.300 U	0.300 U	0.300 UJ	0.300 U	0.300 U	0.300 U
Fluoranthene	**13.0**	**12.0**	**13.0 J**	**11.0**	**12.0**	**13.0**
Indeno(1,2,3-cd)pyrene	**2.00 J**	**1.80 J**	0.320 UJ	0.320 U	0.320 U	0.320 U
Pyrene	3.30 U	3.50 UiJ	4.00 UJ	2.90 U	3.20 U	4.10 U

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
RDL = reported detection limit
ND = Non Detect
- = Not Analyzed
bold = analyte detected above MDL/RDL.
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[1] Only Aroclors 1254 was included in summing clam Total PCBs as Aroclors because all other aroclors were undected in Reference Area clam samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

Table 7-1
Upland OU Limited and Estimated Data Sets
Bradford Island Remedial Investigation

	Limited Data Set (Sample Size less than 8)	High Proportion of Estimated Data		
		Majority of Detected Data is Estimated (J-flagged)[1]	Majority of Detected Data is Estimated (J-flagged)[1] *AND* MRL is > HH SLV	Majority of Detected Data is Estimated (J-flagged)[1] *AND* MRL is > Eco SLV
Landfill AOPC				
Soil (0-1 ft bgs)	Dibutyltin, monobutyltin, tetrabutyltin, tributyltin, 4-nitrophenol, pentachlorophenol, chlordane (technical), and total benzofluoranthenes	1 metal, 3 SVOCs, 3 VOCs	NA	Butyl benzyl phthalate and ethylbenzene
Soil (0-3 ft bgs)	4-Nitrophenol, pentachlorophenol, chlordane (technical), and total benzofluoranthenes	2 metals, 4 SVOCs, 4 VOCs	Thallium and dibenz(a,h)anthracene	Selenium, butyl benzyl phthalate, and ethylbenzene
Soil (0-10 ft bgs)	-	3 metals, GRO, 6 SVOCs, 7 VOCs	Thallium and dibenz(a,h)anthracene	NA
Mass Wasting Soil Subset	All herbicides, TPHs, and VOCs; & aniline	4 SVOCs, 1 VOC	-	Dibenzofuran
Groundwater	Dissolved antimony, barium, beryllium, cadmium, chromium, copper, nickel, selenium, silver, thallium, and zinc	4 metals (total), 1 metal (dissolved), 1 pesticide, GRO, 3 SVOCs, 3 VOCs	Total antimony and thallium; dieldrin; GRO 1,4-dichlorobenzene; and vinyl chloride	Lead (dissolved) and dieldrin
Seep Water	All analytes	1 metal (total), 3 metals (dissolved), DRO	DRO	-
Surface Water	All analytes	3 metals (dissolved), DRO	DRO	-
Sandblast AOPC				
Soil (0-1 ft bgs)	-	5 metals, 12 pesticides, GRO, 14 SVOCs, 26 VOCs	NA	Antimony, selenium, aldrin, dieldrin, endrin aldehyde, endrin ketone, dibenzofuran, di-n butyl phthalate, and pentachlorophenol
Soil (0-3 ft bgs)	-	5 metals, 12 pesticides, GRO, 13 SVOCs, 26 VOCs	Thallium, 1,1-dichloroethane, benzene, chloroform, and trichloroethene (TCE)	Antimony, selenium, aldrin, dieldrin, endrin aldehyde, endrin ketone, dibenzofuran, di-n butyl phthalate, pentachlorophenol, and ethylbenzene
Soil (0-10 ft bgs)	-	5 metals, 12 pesticides, GRO, 14 SVOCs, 25 VOCs	Thallium, 1,1-dichloroethane, benzene, chloroform, and trichloroethene (TCE)	NA
Soil (>10 ft bgs)	All analytes	4 metals, 1 butyltin, 4 SVOCs, 8 VOCS	Thallium	NA

Table 7-1
Upland OU Limited and Estimated Data Sets
Bradford Island Remedial Investigation

	Limited Data Set (Sample Size less than 8)	High Proportion of Estimated Data		
		Majority of Detected Data is Estimated (J-flagged)[1]	Majority of Detected Data is Estimated (J-flagged)[1] *AND* MRL is > HH SLV	Majority of Detected Data is Estimated (J-flagged)[1] *AND* MRL is > Eco SLV
Erodible Soil Subset	All metals, butyltins, pesticides, PCBs, SVOCs, & DRO and RRO	2 metals, 4 pesticides, DRO, GRO, 4 SVOCs, 15 VOCs	Dibenz(a,h)anthracene	Selenium
Groundwater	Dissolved calcium, magnesium, potassium, and sodium; & the majority of VOCs	1 butyltin, DRO, GRO, 2 SVOCs, 7 VOCs, 1 metal (dissolved)	Potassium (dissolved), DRO, GRO, benzo(b)fluoranthene, chloroform, and vinyl chloride	Monobutyltin
DP Groundwater	All butyltins, pesticides, PCBs, and TPHs; & the following total and dissolved SVOCs: 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, 2,4-dichlorophenol, 2,4-dimethylphenol, 2,4-dinitrophenol, 2-chlorophenol, 2-methylphenol, 2-nitrophenol, 4,6-dinitro-2-methylphenol, 4-chloro-3-methylphenol, 4-nitrophenol, benzoic acid, benzyl alcohol, p-cresol (4-methylphenol), pentachlorophenol, and phenol (dissolved only)	8 metals (total), 10 metals (dissolved), 1 pesticide, RRO, GRO, 18 SVOCs (total), 15 SVOCs (dissolved), 19 VOCs	Total & dissolved thallium and vanadium; RRO; total SVOCs benzo(a)pyrene, benzofluoranthenes (total), bis(2-ethylhexyl) phthalate, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene; dissolved SVOCs benzo(a)pyrene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene; and total VOCs 2,2-dichloropropane, benzene, chloroform, naphthalene, trichloroethene (TCE), and vinyl chloride	Dissolved aluminum and cadmium; total SVOCs benzo(a)pyrene and benzofluoranthenes (total); dissolved SVOC benzo(a)pyrene; and total VOC carbon disulfide
Soil Gas	All VOCs	15 VOCs	-	NA
Pistol Range AOPC				
Soil (0-1 ft bgs)	Antimony and arsenic	-	-	-
DP Groundwater	All analytes	1 metal (total), 2 metals (dissolved	-	-
Lagoon Sediment	All analytes	-	-	-
Bulb Slope AOPC				
Soil (0-1 ft bgs)	-	-	-	-
All Four AOPC Combined				
Soil (0-1 ft bgs)	-	5 metals, 12 pesticides, GRO, 12 SVOCs, 26 VOCs	NA	Antimony, selenium, aldrin, dieldrin, endrin aldehyde, endrin ketone, butyl benzyl phthalate, dibenzofuran, di-n-butyl phthalate, pentachlorophenol, and ethylbenzene
Soil (0-3 ft bgs)	-	5 metals, 12 pesticides, GRO, 11 SVOCs, 26 VOCs	Thallium, 1,1-dichloroethane, benzene, chloroform,and trichloroethene (TCE)	Antimony, selenium, aldrin, dieldrin, endrin ketone, butyl benzyl phthalate, dibenzofuran, pentachlorophenol, and ethylbenzene

Table 7-1
Upland OU Limited and Estimated Data Sets
Bradford Island Remedial Investigation

	Limited Data Set (Sample Size less than 8)	High Proportion of Estimated Data		
		Majority of Detected Data is Estimated (J-flagged)[1]	Majority of Detected Data is Estimated (J-flagged)[1] *AND* MRL is > HH SLV	Majority of Detected Data is Estimated (J-flagged)[1] *AND* MRL is > Eco SLV
Soil (0-10 ft bgs)	-	5 metals, 12 pesticides, GRO, 11 SVOCs, 27 VOCs	Thallium, 1,1-dichloroethane, benzene, chloroform, and trichloroethene (TCE)	NA
Groundwater	Dissolved antimony, barium, beryllium, cadmium, chromium, copper, nickel, selenium, silver, thallium, and zinc	5 metals (total), 1 pesticide, GRO, 7 SVOCs, 9 VOCs	Total antimony and thallium; dieldrin; GRO 1,4-dichlorobenzene; chloroform; and vinyl chloride	Dieldrin
DP Groundwater	All butyltins, PCBs, TPHs, pesticides; & the following total and dissovled SVOCs: 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, 2,4-dichlorophenol, 2,4-dimethylphenol, 2,4-dinitrophenol, 2-chlorophenol, 2-methylphenol, 2-nitrophenol, 4,6-dinitro-2-methylphenol, 4-chloro-3-methylphenol, 4-nitrophenol, benzoic acid, benzyl alcohol, p-cresol, pentachlorophenol, and phenol (dissolved only)	8 metals (total), 10 metals (dissolved), RRO, GRO, 1 pesticide, 18 SVOCs (total), 15 SVOCs (dissolved), 19 VOCs	Total & dissolved thallium and vanadium; RRO; total SVOCs benzo(a)pyrene, benzofluoranthenes (total), bis(2-ethylhexyl) phthalate, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene; dissolved SVOCs benzo(a)pyrene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene; and total VOCs benzene, chloroform, naphthalene, trichloroethene (TCE), and vinyl chloride	Dissolved aluminum and cadmium; total SVOCs benzo(a)pyrene and benzofluoranthenes (total); dissolved SVOC benzo(a)pyrene; and total VOC carbon disulfide
Reerence Area				
Soil (0-1 ft bgs)	-	1 metal, 7 SVOCs	NA	NA
Groundwater	All analytes	5 metals (total), 5 metals (dissolved), 1 butyltin, 1 SVOC,	NA	NA

Notes:
1) Detected analytes are listed if they were estimated (J-flagged) in 50% or more of the total number of detected samples
* Analytes were listed, but there is no SLV available

DRO = diesel range organic
Eco = Ecological
GRO = gasoline range organic
HH = Human health
NA = not applicable
RRO = residual range organic
SLV = screening level value

Table 7-2
River OU Limited and Estimated Data Sets
Bradford Island Remedial Investigation

	Limited Data Set (Sample Size less than 8)	High Proportion of Estimated Data		
		Majority of Detected Data is Estimated (J-flagged)[1]	Majority of Detected Data is Estimated (J-flagged)[1] *AND* MRL is > HH SLV	Majority of Detected Data is Estimated (J-flagged)[1] *AND* MRL is > Eco SLV
Pre-Removal Sediment Forebay				
Sediment	All analytes	DRO, RRO, 17 SVOCs	-	Anthracene and benzo(a)pyrene
Clam	All analytes	1 metal, 1 SVOC	NA	-
Random Forebay				
Surface Water	All analytes	2 metals (total) 3 metals (dissolved), DRO	Dissolved cadmium; and total & dissolved DRO	Dissolved cadmium
Sediment	-	DRO, RRO, Aroclor 1254, 14 SVOCs	Aroclor 1254	Aroclor 1254
Clam	-	2 metals, 9 SVOCs	NA	-
Crayfish	-	1 metal, 13 SVOCs	Benzo(a)pyrene and bis(2-ethylhexyl) phthalate	-
Sculpin	-	-	NA	-
Smallmouth Bass	-	1 metal, 10 SVOCs	Benzo(b)fluoranthene, bis(2-ethylhexyl) phthalate, and dibenz(a,h)anthracene	Bis(2-ethylhexyl) phthalate
Largescale Sucker	All analytes	1 metal, 4 SVOCs	Dibenz(a,h)anthracene	-
Targeted Forebay - Eagle Creek				
Sediment	All analytes	2 metals, DRO, 10 SVOCs	-	-
Targeted Forebay - Goose Island				
Sediment	All analytes	DRO, Aroclor 1254, 13 SVOCs	Aroclor 1254	Aroclor 1254
Clam	All analytes	1 metal, 2 SVOCs	NA	-
Crayfish	All analytes	2 metals, 5 SVOCs	-	-
Downstream				
Sediment	All analytes	DRO, RRO, 14 SVOCs,	-	-
Reference Area				
Surface Water	All analytes	4 metals (dissolved), 5 metals (total), DRO and RRO (total & dissolved)	NA	NA
Sediment	-	DRO, RRO, 15 SVOCs	NA	NA
Clam	-	2 metals, 4 SVOCs	NA	NA
Crayfish	-	1 metal, 13 SVOCs	NA	NA
Sculpin	-	-	NA	NA
Smallmouth Bass	-	3 metals, Aroclor 1242, 4 SVOCs	NA	NA

Table 7-2
River OU Limited and Estimated Data Sets
Bradford Island Remedial Investigation

Notes:
1) Detected analytes are listed if they were estimated (J-flagged) in 50% or more of the total number of detected samples
* Analytes were listed, but there is no SLV available

DRO = diesel range organic
Eco = Ecological
GRO = gasoline range organic
HH = Human health
NA = not applicable
RRO = residual range organic
SLV = screening level value

Table 7-3
Upland OU Non-detects Above SLVs
Bradford Island Remedial Investigation

	100% NDs with MDLs > HH SLV	< 100% NDs with MDLs > HH SLV	100% NDs with MDLs > Eco SLV	< 100% NDs with MDLs > Eco SLV
Landfill AOPC				
Soil (0-1 ft bgs)	NA	NA	Herbicides 2,4,5-TP (silvex), 2,4-D, 2,4-DB, and MCPA; pesticides 4,4'-DDD, endrin aldehyde, endrin ketone, and endrin; SVOC di-n-octyl phthalate; and VOCs 1,2-dichlorobenzene, 1,3-dichlorobenzene, isopropylbenzene, n-propylbenzene, sec-butylbenzene, and tert-butylbenzene	Antimony, mercury, and selenium; herbicides 2,4,5-T, dichloroprop, and MCPP; pesticide dieldrin; and SVOCs dibenzofuran, di-n-butyl phthalate, and dibenz(a,h)anthracene
Soil (0-3 ft bgs)	N-Nitrosodimethylamine, N-nitrosodi-n-propylamine, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 1,2-dichloroethane (EDC), benzene, bromochloromethane, bromodichloromethane, carbon tetrachloride, chloroform, trichloroethene (TCE), and vinyl chloride	Thallium and dibenz(a,h)anthracene	Herbicides 2,4,5-TP (silvex), 2,4-D, 2,4-DB, and MCPA; pesticides 4,4'-DDD, endrin aldehyde, endrin ketone, and endrin; SVOC di-n-octyl phthalate; and VOCs 1,2-dichlorobenzene, 1,3-dichlorobenzene, isopropylbenzene, n-propylbenzene, sec-butylbenzene, and tert-butylbenzene	Antimony, mercury, and selenium; herbicides 2,4,5-T, dichloroprop, and MCPP; pesticide dieldrin; and SVOCs dibenzofuran, di-n-butyl phthalate, and dibenz(a,h)anthracene
Soil (0-10 ft bgs)	N-nitrosodimethylamine, N-nitrosodi-n-propylamine, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 1,2-dichloroethane (EDC), benzene, bromochloromethane, bromodichloromethane, carbon tetrachloride, chloroform, trichloroethene (TCE), and vinyl chloride	Thallium and dibenz(a,h)anthracene	NA	NA
Mass Wasting Soil Subset	N-Nitrosodimethylamine, N-nitrosodi-n-propylamine, 1,2,3-trichloropropane, and 1,2-dibromo-3-chloropropane	Thallium	Antimony; herbicides 2,4,5-T, 2,4,5-TP (Silvex), 2,4-D, 2,4-DB, dichloroprop, MCPA, and MCPP; and pesticides endrin aldehyde, endrin ketone, and endrin	Dieldrin and dibenzofuran

Table 7-3
Upland OU Non-detects Above SLVs
Bradford Island Remedial Investigation

	100% NDs with MDLs > HH SLV	< 100% NDs with MDLs > HH SLV	100% NDs with MDLs > Eco SLV	< 100% NDs with MDLs > Eco SLV
Groundwater	Dissolved antimony and thallium; herbicides MCPA and MCPP; pesticides 4,4'-DDD, 4,4'-DDT, aldrin, BHC (alpha), BHC (beta), BHC (delta), chlordane (alpha), chlordane (gamma), chlordane (technical), dieldrin, endrin ketone, endrin, heptachlor epoxide, heptachlor, and toxaphene; all PCBs as Aroclors; SVOCs 1,2,4-trichlorobenzene, 1,3-dichlorobenzene, 2,4,6-trichlorophenol, 2,4-dinitrotoluene, 3,3'-dichlorobenzidine, 3-nitroaniline, 4,6-dinitro-2-methylphenol, 4-chloroaniline, 4-nitroaniline, acenaphthylene, benzidine, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzofluoranthenes (total), bis(2-chloroethyl) ether, chrysene, dibenz(a,h)anthracene, hexachlorobenzene, hexachlorobutadiene, hexachloroethane, Indeno(1,2,3-cd)pyrene, nitrobenzene, N-nitrosodimethylamine, N-nitrosodi-n-propylamine, N-nitrosodiphenylamine, and pentachlorophenol; and VOCs 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,1-dichloropropene, 1,2,3-trichloropropane, 1,2,4-trichlorobenzene, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 1,2-dichloroethane (EDC), 1,2-dichloropropane, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 2,2-dichloropropane, benzene, bromochloromethane, bromodichloromethane, cis-1,3-dichloropropene, dibromochloromethane, dichloromethane, hexachlorobutadiene, naphthalene, trans-1,3-dichloropropene, and trichloroethene (TCE)	Total antimony, arsenic, and thallium and dissolved arsenic; pesticide 4,4'-DDE; DRO and RRO; SVOCs 1,4-dichlorobenzene, bis(2-ethylhexyl) phthalate, di-n-octyl phthalate, naphthalene; and VOCs carbon tetrachloride, chloroform, tetrachloroethene (PCE), and vinyl chloride	Dissolved cadmium, copper, and silver; herbicides dinoseb and MCPA; all PCBs as Aroclors; pesticides 4,4'-DDD, 4,4'-DDT, chlordane (alpha), chlordane (gamma), chlordane (technical), endosulfan II, endosulfan sulfate, endrin, heptachlor epoxide, heptachlor, methoxychlor, and toxaphene; SVOCs 2,4,5-trichlorophenol, 2,4-dinitrophenol, 3,3'-dichlorobenzidine, 4-bromophenyl phenyl ether, aniline, benzidine, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzofluoranthenes (total), benzyl alcohol, chrysene, dibenz(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, hexachlorobenzene, hexachlorobutadiene, hexachlorocyclopentadiene, indeno(1,2,3-cd)pyrene, and pentachlorophenol; VOCs cis-1,3-dichloropropene and trans-1,3-dichloropropene	Dissolved lead; pesticides 4,4'-DDEand dieldrin; SVOCs benzoic acid, bis(2-ethylhexyl) phthalate, dimethyl phthalate, and phenanthrene; and VOC carbon disulfide

Table 7-3
Upland OU Non-detects Above SLVs
Bradford Island Remedial Investigation

	100% NDs with MDLs > HH SLV	< 100% NDs with MDLs > HH SLV	100% NDs with MDLs > Eco SLV	< 100% NDs with MDLs > Eco SLV
Seep Water	Total & dissolved thallium; herbicides MCPA and MCPP; pesticides 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, aldrin, BHC (alpha), BHC (beta), BHC (delta), chlordane (alpha), chlordane (gamma), dieldrin, endrin, heptachlor epoxide, heptachlor, and toxaphene; all PCBs as Aroclors; GRO; SVOCs 1,2,4-trichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 2,4,6-trichlorophenol, 2,4-dinitrotoluene, 3,3'-dichlorobenzidine, 3-nitroaniline, 4,6-dinitro-2-methylphenol, 4-chloroaniline, 4-nitroaniline, acenaphthylene, benzidine, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-chloroethyl) ether, bis(2-ethylhexyl) phthalate, chrysene, dibenz(a,h)anthracene, di-n-octyl phthalate, hexachlorobenzene, hexachlorobutadiene, hexachloroethane, indeno(1,2,3-cd)pyrene, naphthalene, nitrobenzene, N-nitrosodimethylamine, N-nitrosodi-n-propylamine, N-nitrosodiphenylamine, and pentachlorophenol; and VOCs 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,1-dichloropropene, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 1,2-dichloroethane (EDC), 1,2-dichloropropane, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 2,2-dichloropropane, benzene, bromochloromethane, bromodichloromethane, carbon tetrachloride, cis-1,3-dichloropropene, dibromochloromethane, dichloromethane, hexachlorobutadiene, naphthalene, tetrachloroethene (PCE), trans-1,3-dichloropropene, and vinyl chloride	Total & dissolved arsenic; DRO and RRO; and VOCs chloroform and tetrachloroethene (PCE)	Dissolved cadmium, mercury, and silver; herbicides dinoseb and MCPA; all PCBs as Aroclors; pesticides 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, chlordane (alpha), chlordane (gamma), dieldrin, endosulfan sulfate, endrin, heptachlor epoxide, heptachlor, methoxychlor, and toxaphene; SVOCs 3,3'-dichlorobenzidine, 4-bromophenyl phenyl ether, aniline, benzidine, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl) phthalate, chrysene, dibenz(a,h)anthracene, dibenzofuran, dimethyl phthalate, fluorene, hexachlorobenzene, and indeno(1,2,3-cd)pyrene; and VOCs 1,1-dichloropropene, carbon disulfide, cis-1,3-dichloropropene, and trans-1,3-dichloropropene	-
Surface Water	Tetrachloroethene (PCE) and vinyl chloride	Arsenic and DRO	-	-

Table 7-3
Upland OU Non-detects Above SLVs
Bradford Island Remedial Investigation

	100% NDs with MDLs > HH SLV	< 100% NDs with MDLs > HH SLV	100% NDs with MDLs > Eco SLV	< 100% NDs with MDLs > Eco SLV
Sandblast AOPC				
Soil (0-1 ft bgs)	NA	NA	-	Antimony, 4,4'-DDT, aldrin, dieldrin, endrin aldehyde, endrin ketone, endrin, dibenzofuran, and di-n-butyl phthalate
Soil (0-3 ft bgs)	Toxaphene, N-nitrosodimethylamine, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 1,2-dichloroethane (EDC), bromodichloromethane, carbon tetrachloride, and vinyl chloride	Benzene and chloroform	1,2-Dichlorobenzene	Antimony, 4,4'-DDT, aldrin, dieldrin, endrin aldehyde, endrin ketone, endrin, dibenzofuran, di-n-butyl phthalate, isopropylbenzene, and n-propylbenzene
Soil (0-10 ft bgs)	Toxaphene, N-nitrosodimethylamine, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 1,2-dichloroethane (EDC), bromodichloromethane, carbon tetrachloride, and vinyl chloride	Benzene and chloroform	NA	NA
Soil (>10 ft bgs)	-	-	NA	NA
Erodible Soil Subset	N-Nitrosodimethylamine and 1,2-dibromo-3-chloropropane	-	Dibenzofuran	-
Groundwater	SVOC benzo(k)fluoranthene; and VOCs 1,1,2,2-tetrachloroethane, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), and 2,2-dichloropropane	DRO; SVOC benzo(b)fluoranthene; and VOCs chloroform, tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride	trans-1,3-Dichloropropene	-
DP Groundwater	Pesticides 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, aldrin, dieldrin, heptachlor epoxide, heptachlor, and toxaphene; all PCBs as Aroclors; total and dissolved SVOCs 3,3'-dichlorobenzidine, benzidine, benzo(a)anthracene, total benzofluoranthenes (dissolved only), benzo(g,h,i)perylene, bis(2-chloroethyl) ether, chrysene, hexachlorobenzene, N-nitrosodimethylamine, and N-nitrosodi-n-propylamine; and VOCs 1,1,2,2-tetrachloroethane, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, and 1,2-dibromoethane (EDB)	Total arsenic and dissolved vanadium; total and dissolved SVOCs benzo(a)pyrene, total benzofluoranthenes (total only), dibenz(a,h)anthracene; and VOCs naphthalene, trichloroethene (TCE), and vinyl chloride	Toxaphene and total & dissolved hexachlorobenzene	Carbon disulfide

Table 7-3
Upland OU Non-detects Above SLVs
Bradford Island Remedial Investigation

	100% NDs with MDLs > HH SLV	< 100% NDs with MDLs > HH SLV	100% NDs with MDLs > Eco SLV	< 100% NDs with MDLs > Eco SLV
Soil Gas	1,2-Dibromoethane (EDB) and hexachlorobutadiene	-	NA	NA
Pistol Range AOPC				
Soil (0-1 ft bgs)	Arsenic	-	Antimony	-
DP Groundwater	-	-	-	-
Lagoon Sediment	-	-	-	-
Bulb Slope AOPC				
Soil (0-1 ft bgs)	-	-	-	-

Notes:

DRO = diesel range organic
Eco = Ecological
GRO = gasoline range organic
HH = Human health
NA = not applicable
RRO = residual range organic
SLV = screening level value

Table 7-4
Upland OU Non-detects Without SLVs
Bradford Island Remedial Investigation

	100% NDs without HH SLVs	< 100% NDs without HH SLVs	100% NDs without Eco SLVs	< 100% NDs without Eco SLVs
Landfill AOPC				
Soil (0-1 ft bgs)	NA	NA	Herbicides dalapon, dicamba, and dinoseb; SVOCs 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-chloronaphthalene, 2-nitroaniline, 2-nitrophenol, 3,3'-dichlorobenzidine, 4,6-dinitro-2-methylphenol, 4-bromophenyl phenyl ether, 4-chloro-3-methylphenol, 4-chlorophenyl phenyl ether, benzidine, bis(2-chloroethyl) ether, bis(2-chloroisopropyl) ether, hexachlorobutadiene, hexachloroethane, isophorone, N-nitrosodimethylamine, and N-nitrosodi-n-propylamine; and VOCs 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,1-dichloropropene, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 1,3-dichloropropane, 2,2-dichloropropane, 2-chlorotoluene, 4-chlorotoluene, bromobenzene, bromoform, chloroethane, cis-1,3 dichloropropene, hexachlorobutadiene, n-butylbenzene, trans-1,3-dichloropropene, and vinyl acetate	DRO, RRO and GRO
Soil (0-3 ft bgs)	4-Bromophenyl phenyl ether, 4-chlorophenyl phenyl ether, n-butylbenzene, sec-butylbenzene, and tert-butylbenzene	-	Herbicides dalapon, dicamba, and dinoseb; SVOCs 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-chloronaphthalene, 2-nitroaniline, 2-nitrophenol, 3,3'-dichlorobenzidine, 4,6-dinitro-2-methylphenol, 4-bromophenyl phenyl ether, 4-chloro-3-methylphenol, 4-chlorophenyl phenyl ether, benzidine, bis(2-chloroethyl) ether, bis(2-chloroisopropyl) ether, hexachlorobutadiene, hexachloroethane, isophorone, N-nitrosodimethylamine, and N-nitrosodi-n-propylamine; and VOCs 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,1-dichloropropene, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 1,3-dichloropropane, 2,2-dichloropropane, 2-chlorotoluene, 4-chlorotoluene, bromobenzene, bromoform, chloroethane, cis-1,3 dichloropropene, hexachlorobutadiene, n-butylbenzene, trans-1,3-dichloropropene, and vinyl acetate	DRO, RRO and GRO
Soil (0-10 ft bgs)	4-Bromophenyl phenyl ether, 4-chlorophenyl phenyl ether, n-butylbenzene, sec-butylbenzene, and tert-butylbenzene	-	NA	NA

Table 7-4
Upland OU Non-detects Without SLVs
Bradford Island Remedial Investigation

	100% NDs without HH SLVs	< 100% NDs without HH SLVs	100% NDs without Eco SLVs	< 100% NDs without Eco SLVs
Mass Wasting Soil Subset	4-Bromophenyl phenyl ether, 4-chlorophenyl phenyl ether, n-butylbenzene, sec-butylbenzene, and tert-butylbenzene	-	Herbicides dalapon, dicamba, and dinoseb; DRO, RRO and GRO; SVOCs 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-chloronaphthalene, 2-nitroaniline, 2-nitrophenol, 3,3'-dichlorobenzidine, 4,6-dinitro-2-methylphenol, 4-bromophenyl phenyl ether, 4-chloro-3-methylphenol, 4-chlorophenyl phenyl ether, bis(2-chloroethyl) ether, bis(2-chloroisopropyl) ether, hexachlorobutadiene, hexachloroethane, isophorone, N-nitrosodimethylamine, and N-nitrosodi-n-propylamine; and VOCs 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,1-dichloropropene, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 1,3-dichloropropane, 2,2-dichloropropane, 2-chlorotoluene, 4-chlorotoluene, bromobenzene, bromoform, chloroethane, cis-1,3-dichloropropene, hexachlorobutadiene, n-butylbenzene, and trans-1,3-dichloropropene	-
Groundwater	4-Bromophenyl phenyl ether, 4-chlorophenyl phenyl ether, bis(2-chloroisopropyl) ether, carbazole, 2-chloroethylvinylether, 4-isopropyltoluene, n-butylbenzene, sec-butylbenzene, and tert-butylbenzene	-	Herbicides 2,4,5-TP, 2,4-DB, dalapon, and MCPP; pesticide endrin ketone; SVOCs 2-nitroaniline, 2-nitrophenol, 3-nitroaniline, 4,6-dinitro-2-methylphenol, 4-chloro-3-methylphenol, 4-chlorophenyl phenyl ether, 4-nitroaniline, bis(2-chloroethoxy)methane, bis(2-chloroisopropyl) ether, and carbazole; and VOCs 1,1-dichloropropene, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 2-chlorotoluene, 4-chlorotoluene, 4-isopropyltoluene, bromobenzene, bromochloromethane, bromodichloromethane, chloroethane, chloromethane, dibromochloromethane, dibromomethane, dichlorodifluoromethane, n-butylbenzene, sec-butylbenzene, tert-butylbenzene, and trichlorofluoromethane	DRO, RRO, and GRO
Seep Water	4-Bromophenyl phenyl ether, 4-chlorophenyl phenyl ether, bis(2-chloroisopropyl) ether, carbazole, 4-isopropyltoluene, n-butylbenzene, sec-butylbenzene, and tert-butylbenzene	-	Herbicides 2,4,5-TP (silvex), 2,4-DB, dalapon, and MCPP; GRO; SVOCs 2-nitroaniline, 2-nitrophenol, 3-nitroaniline, 4,6-dinitro-2-methylphenol, 4-chloro-3-methylphenol, 4-chlorophenyl phenyl ether, 4-nitroaniline, bis(2-chloroethoxy)methane, bis(2-chloroisopropyl) ether, and carbazole; and VOCs 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 2-chlorotoluene, 4-chlorotoluene, 4-isopropyltoluene, bromobenzene, bromochloromethane, bromodichloromethane, chloroethane, chloromethane, dibromochloromethane, dibromomethane, dichlorodifluoromethane, n-butylbenzene, sec-butylbenzene, tert-butylbenzene, and trichlorofluoromethane	DRO and RRO
Surface Water	-	-	-	DRO, RRO, and GRO

Table 7-4
Upland OU Non-detects Without SLVs
Bradford Island Remedial Investigation

	100% NDs without HH SLVs	< 100% NDs without HH SLVs	100% NDs without Eco SLVs	< 100% NDs without Eco SLVs
Sandblast AOPC				
Soil (0-1 ft bgs)	NA	NA	Herbicides dalapon, dicamba, and dinoseb; SVOCs 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-chloronaphthalene, 2-nitroaniline, 2-nitrophenol, 3,3'-dichlorobenzidine, 4,6-dinitro-2-methylphenol, 4-bromophenyl phenyl ether, 4-chloro-3-methylphenol, 4-chlorophenyl phenyl ether, benzidine, bis(2-chloroethyl) ether, bis(2-chloroisopropyl) ether, hexachlorobutadiene, hexachloroethane, isophorone, N-nitrosodimethylamine, and N-nitrosodi-n-propylamine; and VOCs 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,1-dichloropropene, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 1,3-dichloropropane, 2,2-dichloropropane, 2-chlorotoluene, 4-chlorotoluene, bromobenzene, bromoform, chloroethane, cis-1,3 dichloropropene, hexachlorobutadiene, trans-1,3-dichloropropene, and vinyl acetate	DRO, RRO and GRO; and n-butylbenzene
Soil (0-3 ft bgs)	4-Bromophenyl phenyl ether, 4-chlorophenyl phenyl ether, and tert-butylbenzene	n-Butylbenzene and sec-butylbenzene	Herbicides dalapon, dicamba, and dinoseb; SVOCs 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-chloronaphthalene, 2-nitroaniline, 2-nitrophenol, 3,3'-dichlorobenzidine, 4,6-dinitro-2-methylphenol, 4-bromophenyl phenyl ether, 4-chloro-3-methylphenol, 4-chlorophenyl phenyl ether, benzidine, bis(2-chloroethyl) ether, bis(2-chloroisopropyl) ether, hexachlorobutadiene, hexachloroethane, isophorone, N-nitrosodimethylamine, and N-nitrosodi-n-propylamine; and VOCs 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,1-dichloropropene, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 1,3-dichloropropane, 2,2-dichloropropane, 2-chlorotoluene, 4-chlorotoluene, bromobenzene, bromoform, chloroethane, cis-1,3 dichloropropene, hexachlorobutadiene, trans-1,3-dichloropropene, and vinyl acetate	DRO, RRO and GRO; and n-butylbenzene
Soil (0-10 ft bgs)	4-Bromophenyl phenyl ether, 4-chlorophenyl phenyl ether, and tert-butylbenzene	n-Butylbenzene and sec-butylbenzene	NA	NA
Soil (>10 ft bgs)	4-Bromophenyl phenyl ether, 4-chlorophenyl phenyl ether, n-butylbenzene, sec-butylbenzene, and tert-butylbenzene	-	NA	NA

Table 7-4
Upland OU Non-detects Without SLVs
Bradford Island Remedial Investigation

	100% NDs without HH SLVs	< 100% NDs without HH SLVs	100% NDs without Eco SLVs	< 100% NDs without Eco SLVs
Erodible Soil Subset	4-Bromophenyl phenyl ether, 4-chlorophenyl phenyl ether, n-butylbenzene, sec-butylbenzene, and tert-butylbenzene	-	SVOCs 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-chloronaphthalene, 2-nitroaniline, 2-nitrophenol, 3,3'-dichlorobenzidine, 4,6-dinitro-2-methylphenol, 4-bromophenyl phenyl ether, 4-chloro-3-methylphenol, 4-chlorophenyl phenyl ether, bis(2-chloroethyl) ether, bis(2-chloroisopropyl) ether, hexachlorobutadiene, hexachloroethane, isophorone, N-nitrosodimethylamine, and N-nitrosodi-n-propylamine; and VOCs 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,1-dichloropropene, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 1,3-dichloropropane, 2,2-dichloropropane, 2-chlorotoluene, 4-chlorotoluene, bromobenzene, bromoform, chloroethane, cis-1,3-dichloropropene, hexachlorobutadiene, n-butylbenzene, trans-1,3-dichloropropene, and vinyl acetate	GRO
Groundwater	4-Isopropyltoluene, n-butylbenzene, sec-butylbenzene, and tert-butylbenzene	-	RRO; and VOCs 1,1-dichloropropene, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 2-chlorotoluene, 4-chlorotoluene, 4-isopropyltoluene, bromobenzene, bromochloromethane, bromodichloromethane, chloroethane, chloromethane, dibromochloromethane, dibromomethane, dichlorodifluoromethane, n-butylbenzene, sec-butylbenzene, tert-butylbenzene, and trichlorofluoromethane	DRO and GRO
DP Groundwater	Total and dissolved SVOCs 4-bromophenyl phenyl ether, 4-chlorophenyl phenyl ether bis(2-chloroisopropyl) ether, and carbazole; and VOCs 4-isopropyltoluene, n-butylbenzene, sec-butylbenzene, and tert-butylbenzene	-	Endrin ketone; DRO; total and dissolved SVOCs 2-nitroaniline, 2-nitrophenol, 3-nitroaniline, 4,6-dinitro-2-methylphenol, 4-chloro-3-methylphenol, 4-chlorophenyl phenyl ether, 4-nitroaniline, bis(2-chloroethoxy)methane, bis(2-chloroisopropyl) ether, and carbazole; and VOCs 1,1-dichloropropene, 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane (EDB), 2-chlorotoluene, 4-chlorotoluene, 4-isopropyltoluene, bromobenzene, bromochloromethane, bromodichloromethane, chloroethane, chloromethane, dibromochloromethane, dibromomethane, dichlorodifluoromethane, n-butylbenzene, sec-butylbenzene, tert-butylbenzene, and trichlorofluoromethane	RRO and GRO
Soil Gas	Tetrahydrofuran	Ethanol	NA	NA
Pistol Range AOPC				
Soil (0-1 ft bgs)	-	-	-	-
DP Groundwater	-	-	-	-
Lagoon Sediment	-	-	-	-
Bulb Slope AOPC				
Soil (0-1 ft bgs)	-	-	-	-

Table 7-4
Upland OU Non-detects Without SLVs
Bradford Island Remedial Investigation

	100% NDs without HH SLVs	< 100% NDs without HH SLVs	100% NDs without Eco SLVs	< 100% NDs without Eco SLVs

Notes:

DRO = diesel range organic
Eco = Ecological
GRO = gasoline range organic
HH = Human health
NA = not applicable
RRO = residual range organic
SLV = screening level value

Table 7-5
River OU Non-detects Above SLVs
Bradford Island Remedial Investigation

	100% NDs with MDLs > HH SLV	< 100% NDs with MDLs > HH SLV	100% NDs with MDLs > Eco SLV	< 100% NDs with MDLs > Eco SLV
Pre-Removal Sediment Forebay				
Sediment	Aroclors 1016, 1221, 1232, 1242, 1248, 1260, 1262, and 1268	Aroclor 1254 and Total PCBs as Aroclors	Aroclors 1016, 1221, 1232, 1242, 1248, 1260, 1262, and 1268	Aroclor 1254 and Total PCBs as Aroclors
Clam	NA	NA	-	-
Random Forebay				
Surface Water	Total & dissolved antimony and vanadium	-	-	Dissolved cadmium; and total aluminum
Sediment	Aroclors 1016, 1221, 1232, 1242, 1248, 1260, 1262, and 1268	Aroclor 1254 and Total PCBs as Aroclors	Aroclors 1016, 1221, 1232, 1242, 1248, and 1260	Aroclor 1254 and Total PCBs as Aroclors
Clam	NA	NA	Aroclors 1232 and 1242	Aroclor 1254 and Total PCBs as Aroclors
Crayfish	Aroclors 1016, 1221, 1232, 1242, 1254, 1260, 1262, 1268, and Total PCBs as Aroclors	-	-	-
Sculpin	NA	NA	Aroclors 1221, 1232, 1260	Aroclor 1254 and Total PCBs as Aroclors
Smallmouth Bass	Aroclors 1016, 1221, 1232, 1248, 1260, 1262, and 1268	Aroclors 1242 and 1254, Total PCBs as Aroclors, and bis(2-ethylhexyl) phthalate	Aroclors 1016, 1221, 1232, 1248, 1260, 1262, and 1268	Aroclors 1242 and 1254, Total PCBs as Aroclors, and bis(2-ethylhexyl) phthalate
Largescale Sucker	Aroclors 1016, 1221, 1232, 1242, 1260, and 1268	-	-	-
Targeted Forebay - Eagle Creek				
Sediment	Aroclors 1016, 1221, 1232, 1242, 1254, 1260, 1262, and 1268	Aroclor 1248 and Total PCBs as Aroclors	-	Total PCBs as Aroclors
Targeted Forebay - Goose Island				
Sediment	Aroclors 1016, 1221, 1232, 1242, 1248, and 1260	Aroclor 1254 and Total PCBs as Aroclors	Aroclors 1016, 1221, 1232, 1242, 1248, and 1260	Aroclor 1254 and Total PCBs as Aroclors
Clam	NA	NA	-	-
Crayfish	Aroclors 1016, 1221, 1232, 1242, 1254, 1260, 1262, 1268, and Total PCBs as Aroclors	-	-	-
Downstream				
Sediment	All PCBs as Aroclors	-	-	-

Notes:
* Non-detect analytes were listed, but there is no SLV available

DRO = diesel range organic
Eco = Ecological
GRO = gasoline range organic
HH = Human health
NA = not applicable
RRO = residual range organic
SLV = screening level value

Table 7-6
River OU Non-detects Without SLVs
Bradford Island Remedial Investigation

	100% NDs without HH SLV	< 100% NDs without HH SLV	100% NDs without Eco SLV	< 100% NDs without Eco SLV
Pre-Removal Sediment Forebay				
Sediment	di-n-octyl phthalate	bis(2-ethylhexyl) phthalate, butyl benzyl phthalate, carbazole, and p-cresol	-	-
Clam	NA	NA	Antimony, carbazole, and p-cresol	-
Random Forebay				
Surface Water	-	-	Total and dissolved RRO	Total DRO
Sediment	butyl benzyl phthalate, di-n-butyl phthalate, and di-n-octyl phthalate	RRO, bis(2-ethylhexyl) phthalate, carbazole, and p-cresol	-	RRO
Clam	NA	NA	Carbazole	Antimony and p-cresol
Crayfish	Carbazole and p-cresol	-	Carbazole and p-cresol	-
Sculpin	NA	NA	-	-
Smallmouth Bass	Antimony, carbazole, and p-cresol	Beryllium and chromium	Antimony, carbazole, and p-cresol	Beryllium and chromium
Largescale Sucker	Antimony, beryllium, carbazole, and p-cresol	-	Antimony, beryllium, carbazole, and p-cresol	-
Targeted Forebay - Eagle Creek				
Sediment	RRO, bis(2-ethylhexyl) phthalate, butyl benzyl phthalate, di-n-butyl phthalate, di-n-octyl phthalate, and p-cresol	Carbazole	RRO	-
Targeted Forebay - Goose Island				
Sediment	Butyl benzyl phthalate, carbazole, di-n-octyl phthalate	p-Cresol	-	-
Clam	NA	NA	Antimony and carbazole	-
Crayfish	Carbazole and p-cresol	-	Carbazole and p-cresol	-
Downstream				
Sediment	bis(2-ethylhexyl) phthalate, butyl benzyl phthalate, di-n-butyl phthalate, and di-n-octyl phthalate	RRO, carbazole, and p-cresol	-	RRO

Notes:
* Non-detect analytes were listed, but there is no SLV available

DRO = diesel range organic
Eco = Ecological
GRO = gasoline range organic
HH = Human health
NA = not applicable
RRO = residual range organic
SLV = screening level value

Table 8-1
COIs for which Upland OU Soil Concentrations are Statistically Higher than Reference Area

Media	Analyte Group	Area of Potential concern (AOPC)				
		Landfill	Sandblast Area	Pistol Range[1]	Bulb Slope	All Four AOPCs Combined
Soils 0-1 ft bgs	Metals	Antimony Cadmium Lead Mercury Silver [2] Sodium Zinc	Antimony [2] Arsenic Cadmium Chromium Lead Nickel Selenium Silver Zinc	Lead Nickel Zinc	Lead Mercury	Antimony [2] Arsenic Cadmium Chromium Lead Mercury [2] Nickel Selenium Silver [2] Zinc
	Organics	all PAHs (no other organic COIs were evaluated)	all PAHs (no other organic COIs were evaluated)	all PAHs (no other organic COIs were evaluated)	all PAHs (no other organic COIs were evaluated)	all PAHs (no other organic COIs were evaluated)
Soils 0-3 ft bgs	Metals	Antimony Arsenic Cadmium Lead Mercury Silver [2] Sodium Zinc	Antimony [2] Arsenic Cadmium Chromium Lead Nickel Selenium Silver Zinc	(No subsurface samples)	(No subsurface samples)	Antimony [2] Arsenic Cadmium Chromium Lead Mercury [2] Nickel Selenium Silver [2] Zinc
	Organics	all PAHs (no other organic COIs were evaluated)	all PAHs (no other organic COIs were evaluated)			all PAHs (no other organic COIs were evaluated)
Soils 0-10 ft bgs	Metals	Antimony Cadmium Lead Mercury Nickel Selenium Silver Sodium Zinc	Antimony [2] Arsenic Cadmium Chromium Lead Nickel Selenium Silver Zinc	(No subsurface samples)	(No subsurface samples)	Antimony [2] Arsenic Cadmium Chromium Lead Mercury [2] Nickel Selenium Silver [2] Zinc
	Organics	all PAHs (no other organics were evaluated)	all PAHs (no other organics were evaluated)			all PAHs (no other organics were evaluated)

Notes
ft bgs - feet below ground surface
PAHs - polycyclic aromatic hydrocarbons
[1] Results from all Pistol Range AOPC samples (0-1.5 ft bgs) were included in the statistical comparison for the Depth Group 0-1 ft bgs for the Pistol Range AOPC and All Four AOPCs Combined.
[2] A portion of Upland AOPC data contained elevated MDLs/MRLs. Hence, the results were concluded to be not significant due to data censoring at median MDL/MRL for non-detects. Examination of the box-and-whisker plots in Appendix L indicated that these analytes should be considered as having higher concentrations than the Reference concentrations.

Table 8-2
COIs for which Upland OU Groundwater and Seep Water Concentrations are Higher than Reference Area

Media	Analyte Group	Area of Potential Concern (AOPC)	
		Landfill	**Sandblast Area**
Groundwater (total)	**Metals**	All metals analyzed	Arsenic Iron Vanadium (No other metals were analyzed in samples from montoring wells. Direct push results were not compared to MW-10.)
	Organics	GRO, DRO, RRO Butyltins Chloroform Tetrachloroethene (PCE) Vinyl Chloride 1,4-Dichlorobenzene Phenol Phenanthrene (Other organics may be elevated, but reference area data is not available for comparison)	GRO, DRO Chloroform Tetrachloroethene (PCE) Vinyl Chloride Phenanthrene (A few other VOCs may be elevated, but reference area data is not available for comparison) (Other organics were only analyzed in direct push samples. These results were not compared to MW-10.)
Groundwater (dissolved)	**Metals**	Arsenic Barium Calcium Iron Lead Magnesium Manganese Nickel Potassium Sodium Zinc	Arsenic Calcium Iron Magnesium Sodium Vanadium (No other metals were analyzed in samples from montoring wells. Direct push results were not compared to MW-10.)
	Organics	(not analyzed)	(not analyzed)
Seep Water	**Metals**	Arsenic Barium Copper Iron Lead Mercury Selenium	(no seep samples collected)
	Organics	DRO, RRO Chloroform Tetrachloroethene (PCE)	

Notes:
Only compounds that were analyzed in samples from MW-10 (Reference Area Well) were evaluated.
See Appendix L, Table L-3.

Table 8-3
COIs for which Forebay Sediment or Tissue Concentrations are Statistically Higher than Reference Area Concentrations

Chemical Class	Media				
	Sediment[1]	**Clams**	**Crayfish**	**Sculpin[2]**	**Smallmouth Bass**
Metals		Beryllium Cadmium	Antimony Arsenic Chromium Mercury Methyl Mercury Nickel	Cadmium Lead Mercury	Aluminum Barium Copper Mercury Zinc
PAHs and TPH	RRO	Acenaphthene Benzo(a)anthracene Benzo(b)fluoranthene Chrysene Pyrene	Acenaphthene Benzo(a)anthracene Benzo(g,h,i)perylene Fluoranthene Phenanthrene Pyrene		Anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(k)fluoranthene Chrysene Dibenz(a,h)anthracene Indeno(1,2,3-cd)pyrene pyrene
Phthalates					Bis(2-ethylhexyl) Phthalate
PCBs	Selected Dioxin-like Congeners	Selected Dioxin-like Congeners	Selected Dioxin-like Congeners Total PCBs (as Congeners)	Selected Dioxin-like Congeners Total PCBs (as Congeners)	All Dioxin-like Congeners Total PCBs (as Congeners)

Notes
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
TPH = total petroleum hydrocarbons
RRO = residual range organics
[1] Sediment was the only media analyzed for TPH
[2] Due to insufficient sample volume, Scuplin were only analyzed for four metals (arsenic, cadmium, lead, and mercury), and they were not analyzed for PAHs or Phthalates.

Table 8-4
COIs for which Maximum Forebay Surface Water Total Concentrations Exceed Maximum Reference Area Concentrations

Chemical Class	Media Surface Water (total concentrations)
Metals	Aluminum Barium
PAHs	Benzo(a)anthracene Benzo(b)fluoranthene Chrysene Phenanthrene Indeno(1,2,3-cd)pyrene
Phthalates	none
PCBs	Selected Dioxin-like Congeners Total PCBs (as Congeners)

Notes
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls

Table 9-1
Preliminary-COPC Identification for Landfill AOPC Data
Bradford Island - Upland Operable Unit
(1 of 10)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	Metals	Total	Aluminum	0-1 ft	mg/kg	--	No	--	--	--	--	No
Soil	Metals	Total	Antimony	0-1 ft	mg/kg	**Yes**	**Yes**	4.20	0.27	**Yes**	4	**Yes**
Soil	Metals	Total	Arsenic	0-1 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Barium	0-1 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Beryllium	0-1 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Cadmium	0-1 ft	mg/kg	**Yes**	**Yes**	2.09	0.360	**Yes**	14	**Yes**
Soil	Metals	Total	Chromium	0-1 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Cobalt	0-1 ft	mg/kg	--	No	--	--	--	--	No
Soil	Metals	Total	Copper	0-1 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Lead	0-1 ft	mg/kg	**Yes**	**Yes**	741	25.5	**Yes**	18	**Yes**
Soil	Metals	Total	Manganese	0-1 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Mercury	0-1 ft	mg/kg	**Yes**	**Yes**	4.15	0.0660	**Yes**	18	**Yes**
Soil	Metals	Total	Nickel	0-1 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Selenium	0-1 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Silver	0-1 ft	mg/kg	**Yes**	**Yes**	1.50	4.20	No	0	No
Soil	Metals	Total	Thallium	0-1 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Vanadium	0-1 ft	mg/kg	--	No	--	--	--	--	No
Soil	Metals	Total	Zinc	0-1 ft	mg/kg	**Yes**	**Yes**	635	71.7	**Yes**	18	**Yes**
Soil	Metals	Total	Aluminum	0-3 ft	mg/kg	--	No	--	--	--	--	No
Soil	Metals	Total	Antimony	0-3 ft	mg/kg	**Yes**	**Yes**	4.20	0.27	**Yes**	6	**Yes**
Soil	Metals	Total	Arsenic	0-3 ft	mg/kg	**Yes**	**Yes**	30.1	5.40	**Yes**	5	**Yes**
Soil	Metals	Total	Barium	0-3 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Beryllium	0-3 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Cadmium	0-3 ft	mg/kg	**Yes**	**Yes**	3.54	0.360	**Yes**	16	**Yes**
Soil	Metals	Total	Chromium	0-3 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Cobalt	0-3 ft	mg/kg	--	No	--	--	--	--	No
Soil	Metals	Total	Copper	0-3 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Lead	0-3 ft	mg/kg	**Yes**	**Yes**	1,660	25.5	**Yes**	26	**Yes**
Soil	Metals	Total	Manganese	0-3 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Mercury	0-3 ft	mg/kg	**Yes**	**Yes**	4.15	0.0660	**Yes**	19	**Yes**
Soil	Metals	Total	Nickel	0-3 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Selenium	0-3 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Silver	0-3 ft	mg/kg	**Yes**	**Yes**	1.50	4.20	No	0	No
Soil	Metals	Total	Thallium	0-3 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Vanadium	0-3 ft	mg/kg	--	No	--	--	--	--	No
Soil	Metals	Total	Zinc	0-3 ft	mg/kg	**Yes**	**Yes**	1,140	71.7	**Yes**	20	**Yes**
Soil	Metals	Total	Aluminum	0-10 ft	mg/kg	**Yes**	No	23,100	990,000	No	0	No
Soil	Metals	Total	Antimony	0-10 ft	mg/kg	**Yes**	**Yes**	8.19	410	No	0	No
Soil	Metals	Total	Arsenic	0-10 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Barium	0-10 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Beryllium	0-10 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Cadmium	0-10 ft	mg/kg	**Yes**	**Yes**	3.54	150	No	0	No
Soil	Metals	Total	Chromium	0-10 ft	mg/kg	**Yes**	No	--	--	--	--	No

Table 9-1
Preliminary-COPC Identification for Landfill AOPC Data
Bradford Island - Upland Operable Unit
(2 of 10)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	Metals	Total	Cobalt	0-10 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Copper	0-10 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Lead	0-10 ft	mg/kg	**Yes**	**Yes**	1,660	800	**Yes**	6	**Yes**
Soil	Metals	Total	Manganese	0-10 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Mercury	0-10 ft	mg/kg	**Yes**	**Yes**	4.15	93.0	No	0	No
Soil	Metals	Total	Nickel	0-10 ft	mg/kg	**Yes**	**Yes**	1,760	6,100	No	0	No
Soil	Metals	Total	Selenium	0-10 ft	mg/kg	**Yes**	**Yes**	0.879	5,100	No	0	No
Soil	Metals	Total	Silver	0-10 ft	mg/kg	**Yes**	**Yes**	1.52	1,500	No	0	No
Soil	Metals	Total	Thallium	0-10 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Vanadium	0-10 ft	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Zinc	0-10 ft	mg/kg	**Yes**	**Yes**	1,140	310,000	No	0	No
Soil	Butyltins	Total	Dibutyltin	0-1 ft	ug/kg	--	--	20.2	28,000	No	0	No
Soil	Butyltins	Total	Monobutyltin	0-1 ft	ug/kg	--	--	38.0	28,000	No	0	No
Soil	Butyltins	Total	Tributyltin	0-1 ft	ug/kg	--	--	165	28,000	No	0	No
Soil	Butyltins	Total	Dibutyltin	0-3 ft	ug/kg	--	--	20.2	28,000	No	0	No
Soil	Butyltins	Total	Monobutyltin	0-3 ft	ug/kg	--	--	38.0	28,000	No	0	No
Soil	Butyltins	Total	Tributyltin	0-3 ft	ug/kg	--	--	165	28,000	No	0	No
Soil	Butyltins	Total	Dibutyltin	0-10 ft	ug/kg	**Yes**	**--**	20.2	180,000	No	0	No
Soil	Butyltins	Total	Monobutyltin	0-10 ft	ug/kg	**Yes**	**--**	38.0	180,000	No	0	No
Soil	Butyltins	Total	Tributyltin	0-10 ft	ug/kg	**Yes**	**--**	165	180,000	No	0	No
Soil	Herbicides	Total	2,4,5-T	0-1 ft	ug/kg	--	--	93.0	21.0	**Yes**	2	**Yes**
Soil	Herbicides	Total	Dichloroprop	0-1 ft	ug/kg	--	--	180	21.0	**Yes**	2	**Yes**
Soil	Herbicides	Total	MCPP	0-1 ft	ug/kg	--	--	14,000	21.0	**Yes**	2	**Yes**
Soil	Herbicides	Total	2,4,5-T	0-3 ft	ug/kg	--	--	93.0	21.0	**Yes**	2	**Yes**
Soil	Herbicides	Total	Dichloroprop	0-3 ft	ug/kg	--	--	180	21.0	**Yes**	2	**Yes**
Soil	Herbicides	Total	MCPP	0-3 ft	ug/kg	--	--	14,000	21.0	**Yes**	2	**Yes**
Soil	Herbicides	Total	2,4,5-T	0-10 ft	ug/kg	**Yes**	**--**	93.0	6,200,000	No	0	No
Soil	Herbicides	Total	Dichloroprop	0-10 ft	ug/kg	**Yes**	**--**	180	NV	***Yes***	--	***Yes***
Soil	Herbicides	Total	MCPP	0-10 ft	ug/kg	**Yes**	**--**	14,000	620,000	No	0	No
Soil	Pesticides	Total	4,4'-DDE	0-1 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	4,4'-DDT	0-1 ft	ug/kg	**Yes**	**--**	28.0	21.0	**Yes**	2	**Yes**
Soil	Pesticides	Total	BHC (alpha)	0-1 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	BHC (beta)	0-1 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Chlordane (alpha)	0-1 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Chlordane (technical)	0-1 ft	ug/kg	--	--	1,560	7,200	No	0	No
Soil	Pesticides	Total	Dieldrin	0-1 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Endosulfan II	0-1 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Endosulfan Sulfate	0-1 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Heptachlor	0-1 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-1 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	4,4'-DDE	0-3 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	4,4'-DDT	0-3 ft	ug/kg	**Yes**	**--**	28.0	21.0	**Yes**	2	**Yes**
Soil	Pesticides	Total	BHC (alpha)	0-3 ft	ug/kg	No	--	--	--	--	--	No

Table 9-1
Preliminary-COPC Identification for Landfill AOPC Data
Bradford Island - Upland Operable Unit
(3 of 10)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	Pesticides	Total	BHC (beta)	0-3 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Chlordane (alpha)	0-3 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Chlordane (technical)	0-3 ft	ug/kg	--	--	1,560	7,200	No	0	No
Soil	Pesticides	Total	Dieldrin	0-3 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Endosulfan II	0-3 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Endosulfan Sulfate	0-3 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Heptachlor	0-3 ft	ug/kg	**Yes**	**--**	3.07	480	No	0	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-3 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	4,4'-DDE	0-10 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	4,4'-DDT	0-10 ft	ug/kg	**Yes**	**--**	28.0	7,700	No	0	No
Soil	Pesticides	Total	BHC (alpha)	0-10 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	BHC (beta)	0-10 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Chlordane (alpha)	0-10 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Chlordane (technical)	0-10 ft	ug/kg	--	--	1,560	7,200	No	0	No
Soil	Pesticides	Total	Dieldrin	0-10 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Endosulfan II	0-10 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Endosulfan Sulfate	0-10 ft	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Heptachlor	0-10 ft	ug/kg	**Yes**	**--**	3.07	480	No	0	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-10 ft	ug/kg	No	--	--	--	--	--	No
Soil	PCB Aroclors	Total	Aroclor 1248	0-1 ft	ug/kg	**Yes**	--	968	371	**Yes**	1	**Yes**
Soil	PCB Aroclors	Total	Aroclor 1254	0-1 ft	ug/kg	**Yes**	**--**	78.6	371	No	0	No
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	ug/kg	**Yes**	**--**	660	371	**Yes**	2	**Yes**
Soil	PCB Aroclors	Total	Total PCBs as Aroclors	0-1 ft	ug/kg	**Yes**	**--**	996	371	**Yes**	3	**Yes**
Soil	PCB Aroclors	Total	Aroclor 1248	0-3 ft	ug/kg	**Yes**	--	968	371	**Yes**	1	**Yes**
Soil	PCB Aroclors	Total	Aroclor 1254	0-3 ft	ug/kg	**Yes**	**--**	86.1	371	No	0	No
Soil	PCB Aroclors	Total	Aroclor 1260	0-3 ft	ug/kg	**Yes**	**--**	660	371	**Yes**	2	**Yes**
Soil	PCB Aroclors	Total	Total PCBs as Aroclors	0-3 ft	ug/kg	**Yes**	**--**	996	371	**Yes**	3	**Yes**
Soil	PCB Aroclors	Total	Aroclor 1248	0-10 ft	ug/kg	No	--	--	--	--	--	No
Soil	PCB Aroclors	Total	Aroclor 1254	0-10 ft	ug/kg	**Yes**	**--**	499	740	No	0	No
Soil	PCB Aroclors	Total	Aroclor 1260	0-10 ft	ug/kg	**Yes**	**--**	660	740	No	0	No
Soil	PCB Aroclors	Total	Total PCBs as Aroclors	0-10 ft	ug/kg	**Yes**	**--**	996	740	**Yes**	1	**Yes**
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	mg/kg	--	--	1,000	23,000	No	0	No
Soil	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	mg/kg	--	--	9,450	40,000	No	0	No
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-3 ft	mg/kg	**Yes**	--	1,000	23,000	No	0	No
Soil	NWTPH-Dx	Total	Residual Range Organics	0-3 ft	mg/kg	**Yes**	--	9,450	40,000	No	0	No
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-10 ft	mg/kg	**Yes**	**--**	9,740	23,000	No	0	No
Soil	NWTPH-Dx	Total	Residual Range Organics	0-10 ft	mg/kg	**Yes**	**--**	41,900	40,000	**Yes**	1	**Yes**
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	mg/kg	--	--	23,900	13,000	**Yes**	1	**Yes**
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-3 ft	mg/kg	--	--	23,900	13,000	**Yes**	1	**Yes**
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-10 ft	mg/kg	**Yes**	**--**	23,900	13,000	**Yes**	1	**Yes**
Soil	SVOCs	Total	2-Methylnaphthalene	0-1 ft	ug/kg	**Yes**	**--**	1,530	4,100,000	No	0	No
Soil	SVOCs	Total	Acenaphthene	0-1 ft	ug/kg	**Yes**	**--**	2,600	19,000,000	No	0	No
Soil	SVOCs	Total	Acenaphthylene	0-1 ft	ug/kg	**Yes**	**--**	78.1	23,000	No	0	No

Table 9-1
Preliminary-COPC Identification for Landfill AOPC Data
Bradford Island - Upland Operable Unit
(4 of 10)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	SVOCs	Total	Anthracene	0-1 ft	ug/kg	**Yes**	--	2,700	93,000,000	No	0	No
Soil	SVOCs	Total	Benzo(a)anthracene	0-1 ft	ug/kg	**Yes**	--	32,000	2,700	**Yes**	7	**Yes**
Soil	SVOCs	Total	Benzo(a)pyrene	0-1 ft	ug/kg	**Yes**	--	33,000	270	**Yes**	17	**Yes**
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	ug/kg	**Yes**	--	65,000	2,700	**Yes**	5	**Yes**
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	ug/kg	**Yes**	--	18,000	27,000	No	0	No
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	ug/kg	**Yes**	--	65,000	27,000	**Yes**	1	**Yes**
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-1 ft	ug/kg	--	--	14,700	2,700	**Yes**	2	**Yes**
Soil	SVOCs	Total	Benzoic Acid	0-1 ft	ug/kg	**Yes**	--	553	200,000	No	0	No
Soil	SVOCs	Total	Benzyl Alcohol	0-1 ft	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	ug/kg	**Yes**	--	21,000	4,500	**Yes**	2	**Yes**
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	ug/kg	**Yes**	--	68.7	450	No	0	No
Soil	SVOCs	Total	Carbazole	0-1 ft	ug/kg	**Yes**	--	2,650	2,260	**Yes**	1	**Yes**
Soil	SVOCs	Total	Chrysene	0-1 ft	ug/kg	**Yes**	--	32,000	270,000	No	0	No
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	ug/kg	**Yes**	--	9,900	270	**Yes**	8	**Yes**
Soil	SVOCs	Total	Dibenzofuran	0-1 ft	ug/kg	**Yes**	--	810	2.00	**Yes**	11	**Yes**
Soil	SVOCs	Total	Diethyl Phthalate	0-1 ft	ug/kg	**Yes**	--	73.4	100,000	No	0	No
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	ug/kg	**Yes**	--	1,800	450	**Yes**	1	**Yes**
Soil	SVOCs	Total	Fluoranthene	0-1 ft	ug/kg	**Yes**	--	54,000	8,900,000	No	0	No
Soil	SVOCs	Total	Fluorene	0-1 ft	ug/kg	**Yes**	--	1,200	12,000,000	No	0	No
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	ug/kg	**Yes**	--	19,000	2,700	**Yes**	5	**Yes**
Soil	SVOCs	Total	Naphthalene	0-1 ft	ug/kg	**Yes**	--	823	23,000	No	0	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	Pentachlorophenol	0-1 ft	ug/kg	**Yes**	--	201	2,100	No	0	No
Soil	SVOCs	Total	Phenanthrene	0-1 ft	ug/kg	**Yes**	--	12,000	23,000	No	0	No
Soil	SVOCs	Total	Pyrene	0-1 ft	ug/kg	**Yes**	--	40,000	6,700,000	No	0	No
Soil	SVOCs	Total	Total HPAHs (KM, capped)	0-1 ft	ug/kg	**Yes**	--	367,900	1,100	**Yes**	21	**Yes**
Soil	SVOCs	Total	Total LPAHs (KM, capped)	0-1 ft	ug/kg	**Yes**	--	18,674	29,000	No	0	No
Soil	SVOCs	Total	2-Methylnaphthalene	0-3 ft	ug/kg	**Yes**	--	1,530	4,100,000	No	0	No
Soil	SVOCs	Total	Acenaphthene	0-3 ft	ug/kg	**Yes**	--	2,600	19,000,000	No	0	No
Soil	SVOCs	Total	Acenaphthylene	0-3 ft	ug/kg	**Yes**	--	111	23,000	No	0	No
Soil	SVOCs	Total	Anthracene	0-3 ft	ug/kg	**Yes**	--	8,440	93,000,000	No	0	No
Soil	SVOCs	Total	Benzo(a)anthracene	0-3 ft	ug/kg	**Yes**	--	32,000	2,700	**Yes**	13	**Yes**
Soil	SVOCs	Total	Benzo(a)pyrene	0-3 ft	ug/kg	**Yes**	--	34,000	270	**Yes**	23	**Yes**
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-3 ft	ug/kg	**Yes**	--	65,000	2,700	**Yes**	9	**Yes**
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-3 ft	ug/kg	**Yes**	--	18,000	27,000	No	0	No
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-3 ft	ug/kg	**Yes**	--	65,000	27,000	**Yes**	1	**Yes**
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-3 ft	ug/kg	--	--	31,300	2,700	**Yes**	4	**Yes**
Soil	SVOCs	Total	Benzoic Acid	0-3 ft	ug/kg	**Yes**	--	553	200,000	No	0	No
Soil	SVOCs	Total	Benzyl Alcohol	0-3 ft	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-3 ft	ug/kg	**Yes**	--	21,000	4,500	**Yes**	2	**Yes**
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-3 ft	ug/kg	**Yes**	--	68.7	450	No	0	No
Soil	SVOCs	Total	Carbazole	0-3 ft	ug/kg	**Yes**	--	2,840	2,260	**Yes**	2	**Yes**
Soil	SVOCs	Total	Chrysene	0-3 ft	ug/kg	**Yes**	--	35,300	270,000	No	0	No

Table 9-1
Preliminary-COPC Identification for Landfill AOPC Data
Bradford Island - Upland Operable Unit
(5 of 10)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-3 ft	ug/kg	**Yes**	--	9,900	270	**Yes**	14	**Yes**
Soil	SVOCs	Total	Dibenzofuran	0-3 ft	ug/kg	**Yes**	--	810	2.00	**Yes**	13	**Yes**
Soil	SVOCs	Total	Diethyl Phthalate	0-3 ft	ug/kg	**Yes**	--	73.4	100,000	No	0	No
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-3 ft	ug/kg	**Yes**	--	1,800	450	**Yes**	1	**Yes**
Soil	SVOCs	Total	Fluoranthene	0-3 ft	ug/kg	**Yes**	--	54,000	8,900,000	No	0	No
Soil	SVOCs	Total	Fluorene	0-3 ft	ug/kg	**Yes**	--	1,610	12,000,000	No	0	No
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-3 ft	ug/kg	**Yes**	--	20,000	2,700	**Yes**	10	**Yes**
Soil	SVOCs	Total	Naphthalene	0-3 ft	ug/kg	**Yes**	--	823	23,000	No	0	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-3 ft	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	Pentachlorophenol	0-3 ft	ug/kg	**Yes**	--	201	2,100	No	0	No
Soil	SVOCs	Total	Phenanthrene	0-3 ft	ug/kg	**Yes**	--	21,900	23,000	No	0	No
Soil	SVOCs	Total	Pyrene	0-3 ft	ug/kg	**Yes**	--	67,100	6,700,000	No	0	No
Soil	SVOCs	Total	Total HPAHs (KM, capped)	0-3 ft	ug/kg	**Yes**	--	367,900	1,100	**Yes**	27	**Yes**
Soil	SVOCs	Total	Total LPAHs (KM, capped)	0-3 ft	ug/kg	**Yes**	--	34,767	29,000	**Yes**	1	**Yes**
Soil	SVOCs	Total	2-Methylnaphthalene	0-10 ft	ug/kg	**Yes**	--	1,530	4,100,000	No	0	No
Soil	SVOCs	Total	Acenaphthene	0-10 ft	ug/kg	**Yes**	--	3,040	19,000,000	No	0	No
Soil	SVOCs	Total	Acenaphthylene	0-10 ft	ug/kg	**Yes**	--	111	23,000	No	0	No
Soil	SVOCs	Total	Anthracene	0-10 ft	ug/kg	**Yes**	--	8,440	93,000,000	No	0	No
Soil	SVOCs	Total	Benzo(a)anthracene	0-10 ft	ug/kg	**Yes**	--	32,000	2,700	**Yes**	22	**Yes**
Soil	SVOCs	Total	Benzo(a)pyrene	0-10 ft	ug/kg	**Yes**	--	34,000	270	**Yes**	33	**Yes**
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-10 ft	ug/kg	**Yes**	--	65,000	2,700	**Yes**	9	**Yes**
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-10 ft	ug/kg	**Yes**	--	18,000	27,000	No	0	No
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-10 ft	ug/kg	**Yes**	--	65,000	27,000	**Yes**	1	**Yes**
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-10 ft	ug/kg	--	--	31,300	2,700	**Yes**	13	**Yes**
Soil	SVOCs	Total	Benzoic Acid	0-10 ft	ug/kg	**Yes**	--	553	2,500,000,000	No	0	No
Soil	SVOCs	Total	Benzyl Alcohol	0-10 ft	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-10 ft	ug/kg	**Yes**	--	21,000	150,000	No	0	No
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-10 ft	ug/kg	**Yes**	--	152	910,000	No	0	No
Soil	SVOCs	Total	Carbazole	0-10 ft	ug/kg	**Yes**	--	2,840	NV	***Yes***	--	***Yes***
Soil	SVOCs	Total	Chrysene	0-10 ft	ug/kg	**Yes**	--	35,300	270,000	No	0	No
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-10 ft	ug/kg	**Yes**	--	9,900	270	**Yes**	21	**Yes**
Soil	SVOCs	Total	Dibenzofuran	0-10 ft	ug/kg	**Yes**	--	810	1,000,000	No	0	No
Soil	SVOCs	Total	Diethyl Phthalate	0-10 ft	ug/kg	**Yes**	--	73.4	490,000,000	No	0	No
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-10 ft	ug/kg	**Yes**	--	1,800	62,000,000	No	0	No
Soil	SVOCs	Total	Fluoranthene	0-10 ft	ug/kg	**Yes**	--	54,000	8,900,000	No	0	No
Soil	SVOCs	Total	Fluorene	0-10 ft	ug/kg	**Yes**	--	1,610	12,000,000	No	0	No
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-10 ft	ug/kg	**Yes**	--	20,000	2,700	**Yes**	17	**Yes**
Soil	SVOCs	Total	Naphthalene	0-10 ft	ug/kg	**Yes**	--	1,710	23,000	No	0	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-10 ft	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	Pentachlorophenol	0-10 ft	ug/kg	**Yes**	--	201	13,000	No	0	No
Soil	SVOCs	Total	Phenanthrene	0-10 ft	ug/kg	**Yes**	--	21,900	23,000	No	0	No
Soil	SVOCs	Total	Pyrene	0-10 ft	ug/kg	**Yes**	--	67,100	6,700,000	No	0	No
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	ug/kg	--	--	14,300	200,000	No	0	No

Table 9-1
Preliminary-COPC Identification for Landfill AOPC Data
Bradford Island - Upland Operable Unit
(6 of 10)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	ug/kg	--	--	5,410	150,000	No	0	No
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	ug/kg	--	--	12.0	20,000	No	0	No
Soil	VOCs	Total	Ethylbenzene	0-1 ft	ug/kg	--	--	2,700	2,260	**Yes**	1	**Yes**
Soil	VOCs	Total	m,p-Xylenes	0-1 ft	ug/kg	--	--	9,800	120,000	No	0	No
Soil	VOCs	Total	Naphthalene	0-1 ft	ug/kg	--	--	8,360	23,000	No	0	No
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	ug/kg	**Yes**	--	65.0	1,600	No	0	No
Soil	VOCs	Total	Toluene	0-1 ft	ug/kg	**Yes**	--	5.30	200,000	No	0	No
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-3 ft	ug/kg	**Yes**	--	14,300	200,000	No	0	No
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-3 ft	ug/kg	**Yes**	--	5,410	150,000	No	0	No
Soil	VOCs	Total	4-Isopropyltoluene	0-3 ft	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Dichlorodifluoromethane	0-3 ft	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-3 ft	ug/kg	**Yes**	--	12.0	20,000	No	0	No
Soil	VOCs	Total	Ethylbenzene	0-3 ft	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	m,p-Xylenes	0-3 ft	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Naphthalene	0-3 ft	ug/kg	**Yes**	--	8,360	23,000	No	0	No
Soil	VOCs	Total	Styrene	0-3 ft	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-3 ft	ug/kg	**Yes**	--	65.0	1,600	No	0	No
Soil	VOCs	Total	Toluene	0-3 ft	ug/kg	**Yes**	--	5.30	200,000	No	0	No
Soil	VOCs	Total	Trichlorofluoromethane	0-3 ft	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-10 ft	ug/kg	**Yes**	--	14,300	980,000	No	0	No
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-10 ft	ug/kg	**Yes**	--	5,410	150,000	No	0	No
Soil	VOCs	Total	4-Isopropyltoluene	0-10 ft	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Dichlorodifluoromethane	0-10 ft	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-10 ft	ug/kg	**Yes**	--	12.0	20,000	No	0	No
Soil	VOCs	Total	Ethylbenzene	0-10 ft	ug/kg	**Yes**	--	2,700	12,000	No	0	No
Soil	VOCs	Total	m,p-Xylenes	0-10 ft	ug/kg	**Yes**	--	9,800	2,700,000	No	0	No
Soil	VOCs	Total	Naphthalene	0-10 ft	ug/kg	**Yes**	--	8,360	23,000	No	0	No
Soil	VOCs	Total	o-Xylene	0-10 ft	ug/kg	**Yes**	--	4,260	19,000,000	No	0	No
Soil	VOCs	Total	Styrene	0-10 ft	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-10 ft	ug/kg	**Yes**	--	403,000	1,600	**Yes**	1	**Yes**
Soil	VOCs	Total	Toluene	0-10 ft	ug/kg	**Yes**	--	133,000	24,000,000	No	0	No
Soil	VOCs	Total	Trichlorofluoromethane	0-10 ft	ug/kg	No	--	--	--	--	--	No
Groundwater[3]	Metals	Dissolved	Arsenic	N/A	mg/L	**Yes**	**Yes**	0.0193	0.0000180	**Yes**	29	**Yes**
Groundwater[3]	Metals	Dissolved	Barium	N/A	mg/L	--	**Yes**	0.134	0.00400	**Yes**	3	**Yes**
Groundwater[3]	Metals	Dissolved	Calcium	N/A	mg/L	--	**Yes**	172	116	**Yes**	1	**Yes**
Groundwater[3]	Metals	Dissolved	Iron	N/A	mg/L	**Yes**	**Yes**	35.4	0.300	**Yes**	16	**Yes**
Groundwater[3]	Metals	Dissolved	Lead	N/A	mg/L	**Yes**	**Yes**	0.00350	0.00144	**Yes**	3	**Yes**
Groundwater[3]	Metals	Dissolved	Magnesium	N/A	mg/L	--	**Yes**	25.8	82.0	No	0	No
Groundwater[3]	Metals	Dissolved	Manganese	N/A	mg/L	**Yes**	**Yes**	5.54	0.0500	**Yes**	20	**Yes**
Groundwater[3]	Metals	Dissolved	Nickel	N/A	mg/L	--	**Yes**	0.0187	0.0340	No	0	No
Groundwater[3]	Metals	Dissolved	Potassium	N/A	mg/L	--	**Yes**	12.9	53.0	No	0	No
Groundwater[3]	Metals	Dissolved	Sodium	N/A	mg/L	--	**Yes**	740	680	**Yes**	1	**Yes**

Table 9-1
Preliminary-COPC Identification for Landfill AOPC Data
Bradford Island - Upland Operable Unit
(7 of 10)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Groundwater[3]	Metals	Dissolved	Zinc	N/A	mg/L	--	**Yes**	0.197	0.077	**Yes**	1	**Yes**
Groundwater[3]	Metals	Total	Antimony	N/A	mg/L	--	**Yes**	0.00389	0.00560	No	0	No
Groundwater[3]	Metals	Total	Arsenic	N/A	mg/L	**Yes**	**Yes**	0.0213	0.0000180	**Yes**	43	**Yes**
Groundwater[3]	Metals	Total	Barium	N/A	mg/L	--	**Yes**	0.304	1.00	No	0	No
Groundwater[3]	Metals	Total	Beryllium	N/A	mg/L	--	**Yes**	0.000435	0.0730	No	0	No
Groundwater[3]	Metals	Total	Cadmium	N/A	mg/L	--	**Yes**	0.00560	0.0180	No	0	No
Groundwater[3]	Metals	Total	Chromium	N/A	mg/L	--	**Yes**	0.0185	55.0	No	0	No
Groundwater[3]	Metals	Total	Copper	N/A	mg/L	--	**Yes**	0.201	1.30	No	0	No
Groundwater[3]	Metals	Total	Iron	N/A	mg/L	**Yes**	**Yes**	42.9	0.300	**Yes**	34	**Yes**
Groundwater[3]	Metals	Total	Lead	N/A	mg/L	**Yes**	**Yes**	0.0782	0.0150	**Yes**	2	**Yes**
Groundwater[3]	Metals	Total	Manganese	N/A	mg/L	**Yes**	**Yes**	5.38	0.0500	**Yes**	35	**Yes**
Groundwater[3]	Metals	Total	Mercury	N/A	mg/L	**Yes**	**Yes**	0.000330	0.0110	No	0	No
Groundwater[3]	Metals	Total	Nickel	N/A	mg/L	--	**Yes**	0.117	0.610	No	0	No
Groundwater[3]	Metals	Total	Selenium	N/A	mg/L	--	**Yes**	0.0329	0.170	No	0	No
Groundwater[3]	Metals	Total	Silver	N/A	mg/L	--	**Yes**	0.000658	0.180	No	0	No
Groundwater[3]	Metals	Total	Thallium	N/A	mg/L	--	**Yes**	0.000323	0.000240	**Yes**	2	**Yes**
Groundwater[3]	Metals	Total	Zinc	N/A	mg/L	--	**Yes**	2.66	7.40	No	0	No
Groundwater[3]	Butyltins	Total	Dibutyltin	N/A	ug/L	**Yes**	**--**	0.447	0.0630	**Yes**	6	**Yes**
Groundwater[3]	Butyltins	Total	Monobutyltin	N/A	ug/L	**Yes**	**--**	0.240	0.0630	**Yes**	1	**Yes**
Groundwater[3]	Butyltins	Total	Tributyltin	N/A	ug/L	--	--	0.0601	0.0630	No	0	No
Groundwater[3]	Herbicides	Total	4-Nitrophenol	N/A	ug/L	--	--	0.840	150	No	0	No
Groundwater[3]	Herbicides	Total	Dichloroprop	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	Herbicides	Total	Pentachlorophenol	N/A	ug/L	--	--	0.112	0.270	No	0	No
Groundwater[3]	Pesticides	Total	4,4'-DDE	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	Pesticides	Total	Dieldrin	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	NWTPH-Dx	Total	Diesel Range Organics	N/A	mg/L	**Yes**	**--**	1.80	0.0900	**Yes**	30	**Yes**
Groundwater[3]	NWTPH-Dx	Total	Residual Range Organics	N/A	mg/L	**Yes**	**--**	1.90	0.290	**Yes**	12	**Yes**
Groundwater[3]	NWTPH-Gx	Total	Gasoline Range Organics	N/A	mg/L	**Yes**	**--**	0.430	0.100	**Yes**	5	**Yes**
Groundwater[3]	SVOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	SVOCs	Total	2-Methylnaphthalene	N/A	ug/L	**Yes**	**--**	0.360	72.2	No	0	No
Groundwater[3]	SVOCs	Total	2-Methylphenol	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	SVOCs	Total	Acenaphthene	N/A	ug/L	**Yes**	**--**	0.239	520	No	0	No
Groundwater[3]	SVOCs	Total	Anthracene	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	SVOCs	Total	Benzoic Acid	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	ug/L	**Yes**	**--**	48.0	1.20	**Yes**	6	**Yes**
Groundwater[3]	SVOCs	Total	Diethyl Phthalate	N/A	ug/L	**Yes**	**--**	1.90	210	No	0	No
Groundwater[3]	SVOCs	Total	Dimethyl Phthalate	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	SVOCs	Total	Di-n-octyl Phthalate	N/A	ug/L	**Yes**	**--**	7.08	1.20	**Yes**	3	**Yes**
Groundwater[3]	SVOCs	Total	Isophorone	N/A	ug/L	**Yes**	**--**	0.282	35.0	No	0	No

Table 9-1
Preliminary-COPC Identification for Landfill AOPC Data
Bradford Island - Upland Operable Unit
(8 of 10)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Groundwater[3]	SVOCs	Total	Naphthalene	N/A	ug/L	**Yes**	**--**	0.157	0.140	**Yes**	1	**Yes**
Groundwater[3]	SVOCs	Total	p-cresol (4-Methylphenol)	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	SVOCs	Total	Phenanthrene	N/A	ug/L	**Yes**	**--**	3.90	0.140	**Yes**	4	**Yes**
Groundwater[3]	SVOCs	Total	Phenol	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	SVOCs	Total	Pyrene	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	VOCs	Total	1,2,4-Trimethylbenzene	N/A	ug/L	**Yes**	**--**	5.20	7.30	No	0	No
Groundwater[3]	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	VOCs	Total	Acetone	N/A	ug/L	**Yes**	**--**	15.4	1,500	No	0	No
Groundwater[3]	VOCs	Total	Carbon Disulfide	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	VOCs	Total	Carbon Tetrachloride	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	VOCs	Total	Chloroform	N/A	ug/L	**Yes**	**--**	3.70	0.190	**Yes**	7	**Yes**
Groundwater[3]	VOCs	Total	cis-1,2-Dichloroethene	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	VOCs	Total	Ethylbenzene	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	VOCs	Total	Isopropylbenzene	N/A	ug/L	**Yes**	**--**	4.60	7.30	No	0	No
Groundwater[3]	VOCs	Total	n-Propylbenzene	N/A	ug/L	**Yes**	**--**	2.00	7.30	No	0	No
Groundwater[3]	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	**Yes**	**--**	8.78	0.0930	**Yes**	13	**Yes**
Groundwater[3]	VOCs	Total	Vinyl Chloride	N/A	ug/L	**Yes**	**--**	0.955	0.0250	**Yes**	16	**Yes**
Seep Water[3]	Metals	Dissolved	Antimony	N/A	mg/L	--	**Yes**	0.00228	0.00560	No	0	No
Seep Water[3]	Metals	Dissolved	Arsenic	N/A	mg/L	--	No	--	--	--	--	No
Seep Water[3]	Metals	Dissolved	Barium	N/A	mg/L	--	**Yes**	0.277	0.00400	**Yes**	1	**Yes**
Seep Water[3]	Metals	Dissolved	Calcium	N/A	mg/L	--	**Yes**	76.4	116	No	0	No
Seep Water[3]	Metals	Dissolved	Copper	N/A	mg/L	--	**Yes**	0.00109	0.00580	No	0	No
Seep Water[3]	Metals	Dissolved	Iron	N/A	mg/L	--	**Yes**	3.21	0.300	**Yes**	1	**Yes**
Seep Water[3]	Metals	Dissolved	Lead	N/A	mg/L	--	**Yes**	0.0000650	0.00144	No	0	No
Seep Water[3]	Metals	Dissolved	Magnesium	N/A	mg/L	--	**Yes**	16.6	82.0	No	0	No
Seep Water[3]	Metals	Dissolved	Manganese	N/A	mg/L	--	**Yes**	1.48	0.0500	**Yes**	1	**Yes**
Seep Water[3]	Metals	Dissolved	Nickel	N/A	mg/L	--	**Yes**	0.00222	0.0340	No	0	No
Seep Water[3]	Metals	Dissolved	Potassium	N/A	mg/L	--	No	--	--	--	--	No
Seep Water[3]	Metals	Dissolved	Sodium	N/A	mg/L	--	**Yes**	19.7	680	No	0	No
Seep Water[3]	Metals	Dissolved	Zinc	N/A	mg/L	--	**Yes**	0.0856	0.077	**Yes**	1	**Yes**
Seep Water[3]	Metals	Total	Arsenic	N/A	mg/L	--	**Yes**	0.0128	0.0000180	**Yes**	4	**Yes**
Seep Water[3]	Metals	Total	Barium	N/A	mg/L	--	**Yes**	0.0742	1.00	No	0	No
Seep Water[3]	Metals	Total	Chromium	N/A	mg/L	--	No	--	--	--	--	No
Seep Water[3]	Metals	Total	Copper	N/A	mg/L	--	**Yes**	0.00272	1.30	No	0	No
Seep Water[3]	Metals	Total	Iron	N/A	mg/L	--	**Yes**	121	0.300	**Yes**	4	**Yes**
Seep Water[3]	Metals	Total	Lead	N/A	mg/L	--	**Yes**	0.0257	0.0150	**Yes**	1	**Yes**
Seep Water[3]	Metals	Total	Manganese	N/A	mg/L	--	**Yes**	3.24	0.0500	**Yes**	3	**Yes**
Seep Water[3]	Metals	Total	Mercury	N/A	mg/L	--	No	--	--	--	--	No
Seep Water[3]	Metals	Total	Nickel	N/A	mg/L	--	No	--	--	--	--	No

Table 9-1
Preliminary-COPC Identification for Landfill AOPC Data
Bradford Island - Upland Operable Unit
(9 of 10)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Seep Water[3]	Metals	Total	Selenium	N/A	mg/L	--	**Yes**	0.00111	0.170	No	0	No
Seep Water[3]	NWTPH-Dx	Total	Diesel Range Organics	N/A	mg/L	--	--	0.130	0.0900	**Yes**	1	**Yes**
Seep Water[3]	NWTPH-Dx	Total	Residual Range Organics	N/A	mg/L	--	--	0.130	0.290	No	0	No
Seep Water[3]	SVOCs	Total	Benzoic Acid	N/A	ug/L	--	--	5.90	42.0	No	0	No
Seep Water[3]	VOCs	Total	Chloroform	N/A	ug/L	--	--	2.80	0.190	**Yes**	2	**Yes**
Seep Water[3]	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	--	--	4.40	0.0930	**Yes**	3	**Yes**
Surface Water[3]	Metals	Dissolved	Arsenic	N/A	mg/L	--	--	0.00101	0.0000180	**Yes**	4	**Yes**
Surface Water[3]	Metals	Dissolved	Calcium	N/A	mg/L	--	--	20.5	116	No	0	No
Surface Water[3]	Metals	Dissolved	Iron	N/A	mg/L	--	--	0.00920	0.300	No	0	No
Surface Water[3]	Metals	Dissolved	Lead	N/A	mg/L	--	--	0.0000160	0.00144	No	0	No
Surface Water[3]	Metals	Dissolved	Magnesium	N/A	mg/L	--	--	6.33	82.0	No	0	No
Surface Water[3]	Metals	Dissolved	Manganese	N/A	mg/L	--	--	0.00101	0.0500	No	0	No
Surface Water[3]	Metals	Dissolved	Potassium	N/A	mg/L	--	--	1.51	53.0	No	0	No
Surface Water[3]	Metals	Dissolved	Sodium	N/A	mg/L	--	--	7.90	680	No	0	No
Surface Water[3]	Metals	Total	Arsenic	N/A	mg/L	--	--	0.00117	0.0000180	**Yes**	3	**Yes**
Surface Water[3]	Metals	Total	Iron	N/A	mg/L	--	--	0.446	0.300	**Yes**	1	**Yes**
Surface Water[3]	Metals	Total	Lead	N/A	mg/L	--	--	0.000407	0.0150	No	0	No
Surface Water[3]	Metals	Total	Manganese	N/A	mg/L	--	--	0.0136	0.0500	No	0	No
Surface Water[3]	NWTPH-Dx	Total	Diesel Range Organics	N/A	mg/L	--	--	0.0300	0.0900	No	0	No

Notes

(1) Only evaluated for analytes with a sample size of 20 or more. See the Data Summary for the Landfill AOPC - Appendix I, Table I-1.

(2) Only applicable to inorganics. For soils, see the statistical comparison of Site soil concentrations to Reference Area concentrations; Appendix L, Tables L-1 and L-2.
For groundwater and seep water, see Table 8-3 and Appendix L, Table L-3.

(3) The groundwater, seep water, and surface water SLVs are the lower of the Direct Contact Water SLV and the Discharge to Surface Water-Bioaccumulative SLV; see Appendix J.

Table 9-1
Preliminary-COPC Identification for Landfill AOPC Data
Bradford Island - Upland Operable Unit
(10 of 10)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?

'--' = Not evaluated
% = percent
BHC = hexachlorocyclohexane
ft = feet
Max = maximum
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
N/A = not applicable
NV = No Value
No. = number
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
VOC = volatile organic carbon

Table 9-10
Preliminary COPC Identification for Targeted Eagle Creek Data
Bradford Island - Upland Operable Unit
(1 of 2)

Medium	Analyte Group	Analyte	Unit	Detection Rate > 5%?[1]	Higher Conc than Reference Area?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Sediment	Metals	Aluminum	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	Antimony	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	Arsenic	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	Barium	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	Beryllium	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	Chromium	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	Cobalt	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	Copper	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	Lead	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	Mercury	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	Nickel	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	Vanadium	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	Zinc	mg/kg	--	No	--	--	--	--	No
Sediment	NWTPH-Dx	Diesel Range Organics	mg/kg	--	--	13.0	NV	***Yes***	--	***Yes***
Sediment	PCB Aroclors	Aroclor 1248	ug/kg	--	--	76.0	0.048	**Yes**	1	**Yes**
Sediment	PCB Aroclors	Total PCBs As Aroclors	ug/kg	--	--	77.7	0.048	**Yes**	1	**Yes**
Sediment	SVOCs	Anthracene	ug/kg	--	--	2.60	57.0	No	0	No
Sediment	SVOCs	Benzo(a)anthracene	ug/kg	--	--	6.60	32.0	No	0	No
Sediment	SVOCs	Benzo(a)pyrene	ug/kg	--	--	7.10	32.0	No	0	No
Sediment	SVOCs	Benzo(b)fluoranthene	ug/kg	--	--	11.0	27.0	No	0	No
Sediment	SVOCs	Benzo(g,h,i)perylene	ug/kg	--	--	5.00	300	No	0	No
Sediment	SVOCs	Benzo(k)fluoranthene	ug/kg	--	--	3.40	27.0	No	0	No
Sediment	SVOCs	Carbazole	ug/kg	--	--	2.20	140	No	0	No
Sediment	SVOCs	Chrysene	ug/kg	--	--	13.0	57.0	No	0	No
Sediment	SVOCs	Fluoranthene	ug/kg	--	--	11.0	111	No	0	No
Sediment	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	--	--	4.60	17.0	No	0	No
Sediment	SVOCs	Phenanthrene	ug/kg	--	--	6.50	42.0	No	0	No
Sediment	SVOCs	Pyrene	ug/kg	--	--	17.0	53.0	No	0	No
Sediment	SVOCs	Total LPAH (KM, capped)	ug/kg	--	--	11.8	76.0	No	0	No
Sediment	SVOCs	Total HPAH (KM, capped)	ug/kg	--	--	80.9	193	No	0	No
Sediment	SVOCs	Total PAHs (KM, capped)	ug/kg	--	--	90.8	1610	No	0	No

Table 9-10
Preliminary COPC Identification for Targeted Eagle Creek Data
Bradford Island - Upland Operable Unit
(2 of 2)

Notes
(1) Only evaluated for analytes with a sample size of 20 or more.
(2) Only evaluated for inorganics, see Appendix L, Table L-7
All concentrations are totals and in dry weight.

'--' = Not evaluated
% = percent
Max = maximum
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
Min = minimum
No. = number
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
W = Wet Weight

Table 9-11
River OU Preliminary COPC Summary
Bradford Island - River Operable Unit
(1 of 3)

Medium	Analyte Group	Random Forebay Preliminary COPCs	Targeted Goose Island Preliminary COPCs	Targeted Eagle Creek Preliminary COPCs
Detection Frequency > 5%, Detected > Reference (Inorganics), and Detected > SLV				
Sediment	Metals	None	Cadmium, Thallium, and Zinc	None
	TPH	None*	None*	None*
	PCB Aroclors	Aroclor 1254 and Total PCBs as Aroclors	Aroclor 1254 and Total PCBs as Aroclors	Aroclor 1248 and Total PCBs as Aroclors
	PCB Congeners	PCBs 77, 105, 114, 118, 123, 126, 156+157, and 167; and Total PCBs as Congeners	PCBs 105 and 118; and Total PCBs as Congeners	-
	PAHs	None	None	None
	SVOCs	None	None	None
Tissue-Clam	Metals	Cadmium	None*	(No clam samples)
	TPH	-	-	
	PCB Aroclors	Aroclor 1254 and Total PCBs as Aroclors	ND	
	PCB Congeners	PCBs 118 and 126; and Total PCBs as Congeners	None	
	PAHs	None	None	
	SVOCs	None*	None*	
Tissue- Crayfish	Metals	Arsenic	None	(No crayfish samples)
	TPH	-	-	
	PCB Aroclors	ND	ND	
	PCB Congeners	PCBs 114, 118, 123, 126, 156+157, and 167; and Total PCBs as Congeners	Total PCBs as Congeners	
	PAHs	Benzo(a)pyrene	None	
	SVOCs	Bis(2-ethylhexyl) Phthalate	ND	
Tissue - Sculpin	Metals	Lead and Mercury	-	(No sculpin samples)
	TPH	-	-	
	PCB Aroclors	Aroclor 1254 and Total PCBs as Aroclors	-	
	PCB Congeners	PCBs 77, 105, 118, 126, 156+157, and 167; and Total PCBs as Congeners	None	
	PAHs	-	-	

Table 9-11
River OU Preliminary COPC Summary
Bradford Island - River Operable Unit
(2 of 3)

	SVOCs	-	-	

Table 9-11
River OU Preliminary COPC Summary
Bradford Island - River Operable Unit
(3 of 3)

Detection Frequency > 5%, Detected > Reference (Inorganics), and Detected > SLV				
Tissue-Smallmouth Bass	Metals	Mercury	(No bass samples)	(No bass samples)
	TPH	-		
	PCB Aroclors	Aroclor 1242, Aroclor 1254, and Total PCBs as Aroclors		
	PCB Congeners	PCBs 77, 81, 105, 114, 118, 123, 126, 156+157, 167, and 189; and Total PCBs as Congeners		
	PAHs	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, and Indeno(1,2,3-cd)pyrene		
	SVOCs	Bis(2-ethylhexyl) Phthalate and Butyl Benzyl Phthalate		
Surface Water	Metals (Total)	None	(No surface water samples)	(No surface water samples)
	Metals (Dissolved)	Arsenic and Barium		
	TPH	None		
	PCB Congeners	Total PCBs as Congeners		
	PAHs	None		
	SVOCs	-		
Detection Frequency > 5%, Detected > Reference (Inorganics), and No SLV				
Sediment	TPH	DRO and RRO	DRO and RRO	DRO
Tissue-Clam	Metals	Beryllium	Beryllium	(No clam samples)
	SVOCs	p-cresol (4-Methylphenol)	p-cresol (4-Methylphenol)	
Tissue- Crayfish	Metals	Antimony, Chromium, and Nickel	None	(No crayfish samples)
Tissue-Smallmouth Bass	Metals	Aluminum, Barium, Copper, and Zinc	(No bass samples)	(No bass samples)

* See the section of the table for COFIs retained due to lack of SLVs
"-" = Not Analyzed
ND = Not Detected

Table 9-12
Comparison of Downstream Sediment Data to SLVs and River Reference Area
Bradford Island - River Operable Unit
(1 of 2)

Analyte Group	IUPAC #	Analyte	Unit	Max Detected Value	Lower of HH and Eco Sediment SLV	Reference Area Sediment 95% UPL	No. of Detections > SLV and Ref UPL
Metals		Aluminum	mg/kg	21,600	NV	38,000	0
Metals		Antimony	mg/kg	0.400	3.00	0.427	0
Metals		Arsenic	mg/kg	5.84	6.00	5.86	0
Metals		Barium	mg/kg	172	NV	315	0
Metals		Beryllium	mg/kg	0.513	0.600	0.847	0
Metals		Cadmium	mg/kg	0.791	37.0	0.674	1
Metals		Chromium	mg/kg	29.9	37.0	28.0	0
Metals		Cobalt	mg/kg	11.5	NV	15.2	0
Metals		Copper	mg/kg	24.1	36.0	55.6	0
Metals		Lead	mg/kg	12.7	35.0	14.5	0
Metals		Mercury	mg/kg	0.136	0.200	0.214	0
Metals		Nickel	mg/kg	15.2	18.0	21.2	0
Metals		Thallium	mg/kg	0.234	NV	0.354	0
Metals		Vanadium	mg/kg	73.5	NV	70.6	1
Metals		Zinc	mg/kg	117	123	106	0
NWTPH-Dx		Diesel Range Organics	mg/kg	25.0	NV	31.7	0
NWTPH-Dx		Residual Range Organics	mg/kg	41.0	NV	100	0
PCB Congeners	-	Total PCBs As Congeners (KM, capped)	ug/kg	0.917	0.0480	0.941	0
PCB Congeners	77	3,3',4,4'-Tetrachlorobiphenyl	ug/kg	0.00201	0.00640	0.00165	0
PCB Congeners	81	3,4,4',5-Tetrachlorobiphenyl	ug/kg	0.000260	0.00210	0.000143	0
PCB Congeners	105	2,3,3',4,4'-Pentachlorobiphenyl	ug/kg	0.0197	0.0210	0.0177	0
PCB Congeners	114	2,3,4,4',5-Pentachlorobiphenyl	ug/kg	0.000957	0.0210	0.00163	0
PCB Congeners	118	2,3',4,4',5-Pentachlorobiphenyl	ug/kg	0.0456	0.0260	0.0552	0
PCB Congeners	123	2,3',4,4',5'-Pentachlorobiphenyl	ug/kg	0.000874	0.0260	0.00122	0
PCB Congeners	126	3,3',4,4',5-Pentachlorobiphenyl	ug/kg	0.000211	0.0000062	0.000337	0
PCB Congeners	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	ug/kg	0.00625	0.0260	0.00579	0
PCB Congeners	167	2,3',4,4',5,5'-Hexachlorobiphenyl	ug/kg	0.00261	0.0260	0.00384	0
PCB Congeners	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	ug/kg	0.000596	0.140	0.000573	0
SVOCs		Anthracene	ug/kg	3.10	57.0	2.30	0
SVOCs		Benzo(a)anthracene	ug/kg	12.0	32.0	10.0	0
SVOCs		Benzo(a)pyrene	ug/kg	14.0	32.0	11.0	0

Table 9-12
Comparison of Downstream Sediment Data to SLVs and River Reference Area
Bradford Island - River Operable Unit
(2 of 2)

Analyte Group	IUPAC #	Analyte	Unit	Max Detected Value	Lower of HH and Eco Sediment SLV	Reference Area Sediment 95% UPL	No. of Detections > SLV and Ref UPL
SVOCs		Benzo(b)fluoranthene	ug/kg	16.0	27.0	17.0	0
SVOCs		Benzo(g,h,i)perylene	ug/kg	6.80	300	7.90	0
SVOCs		Benzo(k)fluoranthene	ug/kg	6.50	27.0	5.00	0
SVOCs		Carbazole	ug/kg	1.60	140	1.40	0
SVOCs		Chrysene	ug/kg	18.0	57.0	9.80	0
SVOCs		Dibenz(a,h)anthracene	ug/kg	2.30	33.0	2.30	0
SVOCs		Fluoranthene	ug/kg	22.0	111	31.0	0
SVOCs		Indeno(1,2,3-cd)pyrene	ug/kg	8.20	17.0	8.80	0
SVOCs		p-cresol (4-Methylphenol)	ug/kg	130	48.0	210	0
SVOCs		Phenanthrene	ug/kg	4.90	42.0	5.90	0
SVOCs		Pyrene	ug/kg	21.0	53.0	12.7	0
SVOCs		Total LPAH (KM, capped)	ug/kg	10.7	76.0	7.30	0
SVOCs		Total HPAH (KM, capped)	ug/kg	127	193	76.0	0
SVOCs		Total PAHs (KM, capped)	ug/kg	137	1610	76.0	0

Notes
All concentrations are in dry weight and total.

% = percent
COPC = C
Max = maximum
mg/kg = milligrams per kilogram
NV = no value
No. = number
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
UPL = upper prediction limit

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(1 of 26)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV
Soil	Metals	Total	Aluminum	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Antimony	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	13.7	0.270	**Yes**	36
Soil	Metals	Total	Arsenic	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	80.9	5.40	**Yes**	25
Soil	Metals	Total	Barium	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Beryllium	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Cadmium	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	17.3	0.360	**Yes**	48
Soil	Metals	Total	Chromium	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	2,650	28.1	**Yes**	42
Soil	Metals	Total	Cobalt	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Copper	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Lead	0-1 ft	<250um	mg/kg	--	**Yes**	921	25.5	**Yes**	8
Soil	Metals	Total	Lead	0-1 ft	<2mm	mg/kg	--	**Yes**	768	25.5	**Yes**	8
Soil	Metals	Total	Lead	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	3,260	25.5	**Yes**	56
Soil	Metals	Total	Manganese	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Mercury	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Nickel	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	1,060	38	**Yes**	32
Soil	Metals	Total	Selenium	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	0.900	0.520	**Yes**	17
Soil	Metals	Total	Silver	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	0.431	4.20	No	0
Soil	Metals	Total	Thallium	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Vanadium	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Zinc	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	1,160	71.7	**Yes**	42
Soil	Metals	Total	Aluminum	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Antimony	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	13.7	0.270	**Yes**	44
Soil	Metals	Total	Arsenic	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	80.9	5.40	**Yes**	34
Soil	Metals	Total	Barium	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Beryllium	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Cadmium	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	17.3	0.360	**Yes**	58
Soil	Metals	Total	Chromium	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	2,650	28.1	**Yes**	49
Soil	Metals	Total	Cobalt	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Copper	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Lead	0-3 ft	<250um	mg/kg	--	**Yes**	921	25.5	**Yes**	10
Soil	Metals	Total	Lead	0-3 ft	<2mm	mg/kg	--	**Yes**	768	25.5	**Yes**	9
Soil	Metals	Total	Lead	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	3,260	25.5	**Yes**	65
Soil	Metals	Total	Manganese	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Mercury	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Nickel	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	1,060	38	**Yes**	34
Soil	Metals	Total	Selenium	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	0.900	0.520	**Yes**	26
Soil	Metals	Total	Silver	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	0.431	4.20	No	0
Soil	Metals	Total	Thallium	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Vanadium	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Zinc	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	1,160	71.7	**Yes**	47
Soil	Metals	Total	Aluminum	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Antimony	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	13.7	410	No	0
Soil	Metals	Total	Arsenic	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	80.9	5.40	**Yes**	35
Soil	Metals	Total	Barium	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Beryllium	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(2 of 26)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV
Soil	Metals	Total	Cadmium	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	17.3	150	No	0
Soil	Metals	Total	Chromium	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	2,650	28.1	**Yes**	50
Soil	Metals	Total	Cobalt	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Copper	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Lead	0-10 ft	<250um	mg/kg	--	**Yes**	921	800	**Yes**	1
Soil	Metals	Total	Lead	0-10 ft	<2mm	mg/kg	--	**Yes**	768	800	No	0
Soil	Metals	Total	Lead	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	3,260	800	**Yes**	6
Soil	Metals	Total	Manganese	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Mercury	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Nickel	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	1,060	6,100	No	0
Soil	Metals	Total	Selenium	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	0.900	5,100	No	0
Soil	Metals	Total	Silver	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	0.431	1,500	No	0
Soil	Metals	Total	Thallium	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Vanadium	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--
Soil	Metals	Total	Zinc	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	1,160	310,000	No	0
Soil	Butyltins	Total	Dibutyltin	0-1 ft	N/A	ug/kg	**Yes**	--	210	28,000	No	0
Soil	Butyltins	Total	Monobutyltin	0-1 ft	N/A	ug/kg	**Yes**	--	108	28,000	No	0
Soil	Butyltins	Total	Tetrabutyltin	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	Butyltins	Total	Tributyltin	0-1 ft	N/A	ug/kg	**Yes**	--	1,860	28,000	No	0
Soil	Butyltins	Total	Dibutyltin	0-3 ft	N/A	ug/kg	**Yes**	--	210	28,000	No	0
Soil	Butyltins	Total	Monobutyltin	0-3 ft	N/A	ug/kg	**Yes**	--	108	28,000	No	0
Soil	Butyltins	Total	Tetrabutyltin	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	Butyltins	Total	Tributyltin	0-3 ft	N/A	ug/kg	**Yes**	--	1,860	28,000	No	0
Soil	Butyltins	Total	Dibutyltin	0-10 ft	N/A	ug/kg	**Yes**	--	210	180,000	No	0
Soil	Butyltins	Total	Monobutyltin	0-10 ft	N/A	ug/kg	**Yes**	--	108	180,000	No	0
Soil	Butyltins	Total	Tetrabutyltin	0-10 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	Butyltins	Total	Tributyltin	0-10 ft	N/A	ug/kg	**Yes**	--	1,860	180,000	No	0
Soil	Pesticides	Total	4,4'-DDD	0-1 ft	N/A	ug/kg	**Yes**	--	0.990	21.0	No	0
Soil	Pesticides	Total	4,4'-DDE	0-1 ft	N/A	ug/kg	**Yes**	--	2.44	21.0	No	0
Soil	Pesticides	Total	4,4'-DDT	0-1 ft	N/A	ug/kg	**Yes**	--	140	21.0	**Yes**	7
Soil	Pesticides	Total	Aldrin	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	Pesticides	Total	BHC (beta)	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	Pesticides	Total	BHC (delta)	0-1 ft	N/A	ug/kg	**Yes**	--	3.03	340	No	0
Soil	Pesticides	Total	BHC (gamma) Lindane	0-1 ft	N/A	ug/kg	**Yes**	--	9.68	2,000	No	0
Soil	Pesticides	Total	Chlordane (alpha)	0-1 ft	N/A	ug/kg	--	--	1.50	7,200	No	0
Soil	Pesticides	Total	Chlordane (gamma)	0-1 ft	N/A	ug/kg	--	--	97.0	7,200	No	0
Soil	Pesticides	Total	Dieldrin	0-1 ft	N/A	ug/kg	**Yes**	--	0.823	4.90	No	0
Soil	Pesticides	Total	Endosulfan I	0-1 ft	N/A	ug/kg	**Yes**	--	6.45	20,000	No	0
Soil	Pesticides	Total	Endosulfan II	0-1 ft	N/A	ug/kg	**Yes**	--	1.99	20,000	No	0
Soil	Pesticides	Total	Endosulfan Sulfate	0-1 ft	N/A	ug/kg	**Yes**	--	3.30	20,000	No	0
Soil	Pesticides	Total	Endrin	0-1 ft	N/A	ug/kg	**Yes**	--	17.0	4.90	**Yes**	2
Soil	Pesticides	Total	Endrin Aldehyde	0-1 ft	N/A	ug/kg	**Yes**	--	16.0	4.90	**Yes**	2
Soil	Pesticides	Total	Endrin Ketone	0-1 ft	N/A	ug/kg	**Yes**	--	13.0	4.90	**Yes**	1
Soil	Pesticides	Total	Heptachlor	0-1 ft	N/A	ug/kg	**Yes**	--	2.90	480	No	0

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(3 of 26)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV
Soil	Pesticides	Total	Heptachlor Epoxide	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	Pesticides	Total	Methoxychlor	0-1 ft	N/A	ug/kg	**Yes**	--	1.20	500,000	No	0
Soil	Pesticides	Total	4,4'-DDD	0-3 ft	N/A	ug/kg	**Yes**	--	0.990	21.0	No	0
Soil	Pesticides	Total	4,4'-DDE	0-3 ft	N/A	ug/kg	**Yes**	--	2.44	21.0	No	0
Soil	Pesticides	Total	4,4'-DDT	0-3 ft	N/A	ug/kg	**Yes**	--	140	21.0	**Yes**	8
Soil	Pesticides	Total	Aldrin	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	Pesticides	Total	BHC (beta)	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	Pesticides	Total	BHC (delta)	0-3 ft	N/A	ug/kg	**Yes**	--	3.03	340	No	0
Soil	Pesticides	Total	BHC (gamma) Lindane	0-3 ft	N/A	ug/kg	**Yes**	--	9.68	2,000	No	0
Soil	Pesticides	Total	Chlordane (alpha)	0-3 ft	N/A	ug/kg	**Yes**	--	1.50	7,200	No	0
Soil	Pesticides	Total	Chlordane (gamma)	0-3 ft	N/A	ug/kg	**Yes**	--	97.0	7,200	No	0
Soil	Pesticides	Total	Dieldrin	0-3 ft	N/A	ug/kg	**Yes**	--	0.823	4.90	No	0
Soil	Pesticides	Total	Endosulfan I	0-3 ft	N/A	ug/kg	**Yes**	--	6.45	20,000	No	0
Soil	Pesticides	Total	Endosulfan II	0-3 ft	N/A	ug/kg	**Yes**	--	1.99	20,000	No	0
Soil	Pesticides	Total	Endosulfan Sulfate	0-3 ft	N/A	ug/kg	**Yes**	--	3.30	20,000	No	0
Soil	Pesticides	Total	Endrin	0-3 ft	N/A	ug/kg	**Yes**	--	17.0	4.90	**Yes**	2
Soil	Pesticides	Total	Endrin Aldehyde	0-3 ft	N/A	ug/kg	**Yes**	--	16.0	4.90	**Yes**	2
Soil	Pesticides	Total	Endrin Ketone	0-3 ft	N/A	ug/kg	**Yes**	--	13.0	4.90	**Yes**	1
Soil	Pesticides	Total	Heptachlor	0-3 ft	N/A	ug/kg	**Yes**	--	2.90	480	No	0
Soil	Pesticides	Total	Heptachlor Epoxide	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	Pesticides	Total	Methoxychlor	0-3 ft	N/A	ug/kg	**Yes**	--	1.20	500,000	No	0
Soil	Pesticides	Total	4,4'-DDD	0-10 ft	N/A	ug/kg	**Yes**	--	0.990	11,000	No	0
Soil	Pesticides	Total	4,4'-DDE	0-10 ft	N/A	ug/kg	**Yes**	--	2.44	7,700	No	0
Soil	Pesticides	Total	4,4'-DDT	0-10 ft	N/A	ug/kg	**Yes**	--	140	7,700	No	0
Soil	Pesticides	Total	Aldrin	0-10 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	Pesticides	Total	BHC (beta)	0-10 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	Pesticides	Total	BHC (delta)	0-10 ft	N/A	ug/kg	**Yes**	--	3.03	340	No	0
Soil	Pesticides	Total	BHC (gamma) Lindane	0-10 ft	N/A	ug/kg	**Yes**	--	9.68	2,000	No	0
Soil	Pesticides	Total	Chlordane (alpha)	0-10 ft	N/A	ug/kg	**Yes**	--	1.50	7,200	No	0
Soil	Pesticides	Total	Chlordane (gamma)	0-10 ft	N/A	ug/kg	**Yes**	--	97.0	7,200	No	0
Soil	Pesticides	Total	Dieldrin	0-10 ft	N/A	ug/kg	**Yes**	--	0.823	130	No	0
Soil	Pesticides	Total	Endosulfan I	0-10 ft	N/A	ug/kg	**Yes**	--	6.45	1,400,000	No	0
Soil	Pesticides	Total	Endosulfan II	0-10 ft	N/A	ug/kg	**Yes**	--	1.99	1,400,000	No	0
Soil	Pesticides	Total	Endosulfan Sulfate	0-10 ft	N/A	ug/kg	**Yes**	--	3.30	1,400,000	No	0
Soil	Pesticides	Total	Endrin	0-10 ft	N/A	ug/kg	**Yes**	--	17.0	71,000	No	0
Soil	Pesticides	Total	Endrin Aldehyde	0-10 ft	N/A	ug/kg	**Yes**	--	16.0	71,000	No	0
Soil	Pesticides	Total	Endrin Ketone	0-10 ft	N/A	ug/kg	**Yes**	--	13.0	71,000	No	0
Soil	Pesticides	Total	Heptachlor	0-10 ft	N/A	ug/kg	**Yes**	--	2.90	480	No	0
Soil	Pesticides	Total	Heptachlor Epoxide	0-10 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	Pesticides	Total	Methoxychlor	0-10 ft	N/A	ug/kg	**Yes**	--	1.20	3,100,000	No	0
Soil	PCB Aroclors	Total	Aroclor 1254	0-1 ft	N/A	ug/kg	**Yes**	--	1,700	371	**Yes**	4
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	N/A	ug/kg	**Yes**	--	690	371	**Yes**	4
Soil	PCB Aroclors	Total	Total PCBs as Aroclors	0-1 ft	N/A	ug/kg	**Yes**	--	2,140	371	**Yes**	6
Soil	PCB Aroclors	Total	Aroclor 1254	0-3 ft	N/A	ug/kg	**Yes**	--	1,700	371	**Yes**	4

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(4 of 26)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV
Soil	PCB Aroclors	Total	Aroclor 1260	0-3 ft	N/A	ug/kg	**Yes**	--	690	371	**Yes**	4
Soil	PCB Aroclors	Total	Total PCBs as Aroclors	0-3 ft	N/A	ug/kg	**Yes**	--	2,140	371	**Yes**	6
Soil	PCB Aroclors	Total	Aroclor 1254	0-10 ft	N/A	ug/kg	**Yes**	--	1,700	740	**Yes**	2
Soil	PCB Aroclors	Total	Aroclor 1260	0-10 ft	N/A	ug/kg	**Yes**	--	690	740	No	0
Soil	PCB Aroclors	Total	Total PCBs as Aroclors	0-10 ft	N/A	ug/kg	**Yes**	--	2,140	740	**Yes**	3
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	N/A	mg/kg	**Yes**	--	1,090	23,000	No	0
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	N/A	mg/kg	**Yes**	--	3.49	13,000	No	0
Soil	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	N/A	mg/kg	**Yes**	--	2,300	40,000	No	0
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-3 ft	N/A	mg/kg	**Yes**	--	1,440	23,000	No	0
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-3 ft	N/A	mg/kg	**Yes**	--	3,960	13,000	No	0
Soil	NWTPH-Dx	Total	Residual Range Organics	0-3 ft	N/A	mg/kg	**Yes**	--	2,300	40,000	No	0
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-10 ft	N/A	mg/kg	**Yes**	--	1,440	23,000	No	0
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-10 ft	N/A	mg/kg	**Yes**	--	3,960	13,000	No	0
Soil	NWTPH-Dx	Total	Residual Range Organics	0-10 ft	N/A	mg/kg	**Yes**	--	2,300	40,000	No	0
Soil	SVOCs	Total	2-Methylnaphthalene	0-1 ft	N/A	ug/kg	**Yes**	--	150	4,100,000	No	0
Soil	SVOCs	Total	Acenaphthene	0-1 ft	N/A	ug/kg	**Yes**	--	470	19,000,000	No	0
Soil	SVOCs	Total	Acenaphthylene	0-1 ft	N/A	ug/kg	**Yes**	--	87.7	23,000	No	0
Soil	SVOCs	Total	Anthracene	0-1 ft	N/A	ug/kg	**Yes**	--	832	93,000,000	No	0
Soil	SVOCs	Total	Benzo(a)anthracene	0-1 ft	N/A	ug/kg	**Yes**	--	6,440	2,700	**Yes**	1
Soil	SVOCs	Total	Benzo(a)pyrene	0-1 ft	N/A	ug/kg	**Yes**	--	6,470	270	**Yes**	13
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	N/A	ug/kg	--	--	4,100	2,700	**Yes**	1
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	N/A	ug/kg	**Yes**	--	3,830	27,000	No	0
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	N/A	ug/kg	--	--	1,400	27,000	No	0
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-1 ft	N/A	ug/kg	--	--	12,100	2,700	**Yes**	2
Soil	SVOCs	Total	Benzoic Acid	0-1 ft	N/A	ug/kg	**Yes**	--	980	200,000	No	0
Soil	SVOCs	Total	Benzyl Alcohol	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	N/A	ug/kg	**Yes**	--	260,000	4,500	**Yes**	8
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	N/A	ug/kg	**Yes**	--	124	450	No	0
Soil	SVOCs	Total	Carbazole	0-1 ft	N/A	ug/kg	**Yes**	--	530	2,260	No	0
Soil	SVOCs	Total	Chrysene	0-1 ft	N/A	ug/kg	**Yes**	--	7,590	270,000	No	0
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	N/A	ug/kg	**Yes**	--	1,430	270	**Yes**	5
Soil	SVOCs	Total	Dibenzofuran	0-1 ft	N/A	ug/kg	**Yes**	--	220	2.00	**Yes**	16
Soil	SVOCs	Total	Diethyl Phthalate	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	SVOCs	Total	Dimethyl Phthalate	0-1 ft	N/A	ug/kg	**Yes**	--	41.0	150,000	No	0
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	N/A	ug/kg	**Yes**	--	280	450	No	0
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-1 ft	N/A	ug/kg	**Yes**	--	127	450	No	0
Soil	SVOCs	Total	Fluoranthene	0-1 ft	N/A	ug/kg	**Yes**	--	20,700	8,900,000	No	0
Soil	SVOCs	Total	Fluorene	0-1 ft	N/A	ug/kg	**Yes**	--	462	12,000,000	No	0
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	N/A	ug/kg	**Yes**	--	3,910	2,700	**Yes**	1
Soil	SVOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	**Yes**	--	227	23,000	No	0
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	SVOCs	Total	Pentachlorophenol	0-1 ft	N/A	ug/kg	**Yes**	--	32.0	2,100	No	0
Soil	SVOCs	Total	Phenanthrene	0-1 ft	N/A	ug/kg	**Yes**	--	4,000	23,000	No	0

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV
Soil	SVOCs	Total	Phenol	0-1 ft	N/A	ug/kg	**Yes**	--	3.70	30,000	No	0
Soil	SVOCs	Total	Pyrene	0-1 ft	N/A	ug/kg	**Yes**	--	21,900	6,700,000	No	0
Soil	SVOCs	Total	Total HPAHs (KM, capped)	0-1 ft	N/A	ug/kg	**Yes**	--	72,270	1,100	**Yes**	15
Soil	SVOCs	Total	Total LPAHs (KM, capped)	0-1 ft	N/A	ug/kg	**Yes**	--	5,687	29,000	No	0
Soil	SVOCs	Total	2-Methylnaphthalene	0-3 ft	N/A	ug/kg	**Yes**	--	150	4,100,000	No	0
Soil	SVOCs	Total	Acenaphthene	0-3 ft	N/A	ug/kg	**Yes**	--	3,200	19,000,000	No	0
Soil	SVOCs	Total	Acenaphthylene	0-3 ft	N/A	ug/kg	**Yes**	--	295	23,000	No	0
Soil	SVOCs	Total	Anthracene	0-3 ft	N/A	ug/kg	**Yes**	--	2,040	93,000,000	No	0
Soil	SVOCs	Total	Benzo(a)anthracene	0-3 ft	N/A	ug/kg	**Yes**	--	12,300	2,700	**Yes**	2
Soil	SVOCs	Total	Benzo(a)pyrene	0-3 ft	N/A	ug/kg	**Yes**	--	11,700	270	**Yes**	15
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-3 ft	N/A	ug/kg	--	--	4,100	2,700	**Yes**	1
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-3 ft	N/A	ug/kg	**Yes**	--	3,830	27,000	No	0
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-3 ft	N/A	ug/kg	--	--	1,400	27,000	No	0
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-3 ft	N/A	ug/kg	**Yes**	--	16,300	2,700	**Yes**	4
Soil	SVOCs	Total	Benzoic Acid	0-3 ft	N/A	ug/kg	**Yes**	--	980	200,000	No	0
Soil	SVOCs	Total	Benzyl Alcohol	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-3 ft	N/A	ug/kg	**Yes**	--	260,000	4,500	**Yes**	10
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-3 ft	N/A	ug/kg	**Yes**	--	124	450	No	0
Soil	SVOCs	Total	Carbazole	0-3 ft	N/A	ug/kg	**Yes**	--	530	2,260	No	0
Soil	SVOCs	Total	Chrysene	0-3 ft	N/A	ug/kg	**Yes**	--	12,000	270,000	No	0
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-3 ft	N/A	ug/kg	**Yes**	--	1,430	270	**Yes**	7
Soil	SVOCs	Total	Dibenzofuran	0-3 ft	N/A	ug/kg	**Yes**	--	485	2.00	**Yes**	19
Soil	SVOCs	Total	Diethyl Phthalate	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	SVOCs	Total	Dimethyl Phthalate	0-3 ft	N/A	ug/kg	**Yes**	--	41.0	150,000	No	0
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-3 ft	N/A	ug/kg	**Yes**	--	280	450	No	0
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-3 ft	N/A	ug/kg	**Yes**	--	127	450	No	0
Soil	SVOCs	Total	Fluoranthene	0-3 ft	N/A	ug/kg	**Yes**	--	28,600	8,900,000	No	0
Soil	SVOCs	Total	Fluorene	0-3 ft	N/A	ug/kg	**Yes**	--	779	12,000,000	No	0
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-3 ft	N/A	ug/kg	**Yes**	--	4,170	2,700	**Yes**	2
Soil	SVOCs	Total	Naphthalene	0-3 ft	N/A	ug/kg	**Yes**	--	256	23,000	No	0
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	SVOCs	Total	Pentachlorophenol	0-3 ft	N/A	ug/kg	**Yes**	--	32.0	2,100	No	0
Soil	SVOCs	Total	Phenanthrene	0-3 ft	N/A	ug/kg	**Yes**	--	6,550	23,000	No	0
Soil	SVOCs	Total	Phenol	0-3 ft	N/A	ug/kg	**Yes**	--	35.0	30,000	No	0
Soil	SVOCs	Total	Pyrene	0-3 ft	N/A	ug/kg	**Yes**	--	32,000	6,700,000	No	0
Soil	SVOCs	Total	Total HPAHs (KM, capped)	0-3 ft	N/A	ug/kg	**Yes**	--	105,200	1,100	**Yes**	19
Soil	SVOCs	Total	Total LPAHs (KM, capped)	0-3 ft	N/A	ug/kg	**Yes**	--	13,120	29,000	No	0
Soil	SVOCs	Total	2-Methylnaphthalene	0-10 ft	N/A	ug/kg	**Yes**	--	150	4,100,000	No	0
Soil	SVOCs	Total	Acenaphthene	0-10 ft	N/A	ug/kg	**Yes**	--	3,200	19,000,000	No	0
Soil	SVOCs	Total	Acenaphthylene	0-10 ft	N/A	ug/kg	**Yes**	--	295	23,000	No	0
Soil	SVOCs	Total	Anthracene	0-10 ft	N/A	ug/kg	**Yes**	--	2,040	93,000,000	No	0
Soil	SVOCs	Total	Benzo(a)anthracene	0-10 ft	N/A	ug/kg	**Yes**	--	12,300	2,700	**Yes**	2
Soil	SVOCs	Total	Benzo(a)pyrene	0-10 ft	N/A	ug/kg	**Yes**	--	11,700	270	**Yes**	15

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-10 ft	N/A	ug/kg	--	--	4,100	2,700	**Yes**	1
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-10 ft	N/A	ug/kg	**Yes**	--	3,830	27,000	No	0
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-10 ft	N/A	ug/kg	--	--	1,400	27,000	No	0
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-10 ft	N/A	ug/kg	**Yes**	--	16,300	2,700	**Yes**	4
Soil	SVOCs	Total	Benzoic Acid	0-10 ft	N/A	ug/kg	**Yes**	--	980	2,500,000,000	No	0
Soil	SVOCs	Total	Benzyl Alcohol	0-10 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-10 ft	N/A	ug/kg	**Yes**	--	260,000	150,000	**Yes**	1
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-10 ft	N/A	ug/kg	**Yes**	--	124	910,000	No	0
Soil	SVOCs	Total	Carbazole	0-10 ft	N/A	ug/kg	**Yes**	--	530	NV	***Yes***	--
Soil	SVOCs	Total	Chrysene	0-10 ft	N/A	ug/kg	**Yes**	--	12,000	270,000	No	0
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-10 ft	N/A	ug/kg	**Yes**	--	1,430	270	**Yes**	7
Soil	SVOCs	Total	Dibenzofuran	0-10 ft	N/A	ug/kg	**Yes**	--	485	1,000,000	No	0
Soil	SVOCs	Total	Diethyl Phthalate	0-10 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	SVOCs	Total	Dimethyl Phthalate	0-10 ft	N/A	ug/kg	**Yes**	--	41.0	150,000	No	0
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-10 ft	N/A	ug/kg	**Yes**	--	280	62,000,000	No	0
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-10 ft	N/A	ug/kg	**Yes**	--	127	150,000	No	0
Soil	SVOCs	Total	Fluoranthene	0-10 ft	N/A	ug/kg	**Yes**	--	28,600	8,900,000	No	0
Soil	SVOCs	Total	Fluorene	0-10 ft	N/A	ug/kg	**Yes**	--	779	12,000,000	No	0
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-10 ft	N/A	ug/kg	**Yes**	--	4,170	2,700	**Yes**	2
Soil	SVOCs	Total	Naphthalene	0-10 ft	N/A	ug/kg	**Yes**	--	256	23,000	No	0
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-10 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-10 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	SVOCs	Total	Pentachlorophenol	0-10 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	SVOCs	Total	Phenanthrene	0-10 ft	N/A	ug/kg	**Yes**	--	6,550	23,000	No	0
Soil	SVOCs	Total	Phenol	0-10 ft	N/A	ug/kg	**Yes**	--	35.0	180,000,000	No	0
Soil	SVOCs	Total	Pyrene	0-10 ft	N/A	ug/kg	**Yes**	--	32,000	6,700,000	No	0
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-1 ft	N/A	ug/kg	**Yes**	--	0.580	38,000,000	No	0
Soil	VOCs	Total	1,1-Dichloroethane	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	N/A	ug/kg	**Yes**	--	0.523	200,000	No	0
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	N/A	ug/kg	**Yes**	--	0.125	150,000	No	0
Soil	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	2-Butanone (MEK)	0-1 ft	N/A	ug/kg	**Yes**	--	50.0	200,000,000	No	0
Soil	VOCs	Total	2-Hexanone	0-1 ft	N/A	ug/kg	**Yes**	--	8.80	1,250,000	No	0
Soil	VOCs	Total	4-Isopropyltoluene	0-1 ft	N/A	ug/kg	**Yes**	--	12.0	200,000	No	0
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	N/A	ug/kg	**Yes**	--	1.20	1,250,000	No	0
Soil	VOCs	Total	Acetone	0-1 ft	N/A	ug/kg	**Yes**	--	540	1,250,000	No	0
Soil	VOCs	Total	Benzene	0-1 ft	N/A	ug/kg	**Yes**	--	1.20	1,200	No	0
Soil	VOCs	Total	Bromomethane	0-1 ft	N/A	ug/kg	**Yes**	--	5.00	17,000	No	0
Soil	VOCs	Total	Carbon Disulfide	0-1 ft	N/A	ug/kg	**Yes**	--	6.90	1,000,000	No	0
Soil	VOCs	Total	Chloroform	0-1 ft	N/A	ug/kg	**Yes**	--	19.0	410	No	0
Soil	VOCs	Total	Chloromethane	0-1 ft	N/A	ug/kg	**Yes**	--	0.250	300,000	No	0
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	Dichlorodifluoromethane	0-1 ft	N/A	ug/kg	**Yes**	--	94.0	730,000	No	0
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	N/A	ug/kg	**Yes**	--	460	20,000	No	0

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV
Soil	VOCs	Total	Ethylbenzene	0-1 ft	N/A	ug/kg	**Yes**	--	0.320	2,260	No	0
Soil	VOCs	Total	Isopropylbenzene	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	m,p-Xylenes	0-1 ft	N/A	ug/kg	**Yes**	--	0.440	120,000	No	0
Soil	VOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	**Yes**	--	1.50	23,000	No	0
Soil	VOCs	Total	n-Butylbenzene	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	n-Propylbenzene	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	o-Xylene	0-1 ft	N/A	ug/kg	**Yes**	--	0.180	1,000	No	0
Soil	VOCs	Total	sec-Butylbenzene	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	N/A	ug/kg	**Yes**	--	3.10	1,600	No	0
Soil	VOCs	Total	Toluene	0-1 ft	N/A	ug/kg	**Yes**	--	5.80	200,000	No	0
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	Trichloroethene (TCE)	0-1 ft	N/A	ug/kg	**Yes**	--	0.171	130	No	0
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	1,1-Dichloroethane	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-3 ft	N/A	ug/kg	**Yes**	--	14,300	200,000	No	0
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-3 ft	N/A	ug/kg	**Yes**	--	6,500	150,000	No	0
Soil	VOCs	Total	1,4-Dichlorobenzene	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	2-Butanone (MEK)	0-3 ft	N/A	ug/kg	**Yes**	--	50.0	200,000,000	No	0
Soil	VOCs	Total	2-Hexanone	0-3 ft	N/A	ug/kg	**Yes**	--	8.80	1,250,000	No	0
Soil	VOCs	Total	4-Isopropyltoluene	0-3 ft	N/A	ug/kg	**Yes**	--	161	200,000	No	0
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-3 ft	N/A	ug/kg	**Yes**	--	1.20	1,250,000	No	0
Soil	VOCs	Total	Acetone	0-3 ft	N/A	ug/kg	**Yes**	--	540	1,250,000	No	0
Soil	VOCs	Total	Benzene	0-3 ft	N/A	ug/kg	**Yes**	--	1.20	1,200	No	0
Soil	VOCs	Total	Bromomethane	0-3 ft	N/A	ug/kg	**Yes**	--	5.00	17,000	No	0
Soil	VOCs	Total	Carbon Disulfide	0-3 ft	N/A	ug/kg	**Yes**	--	6.90	1,000,000	No	0
Soil	VOCs	Total	Chloroform	0-3 ft	N/A	ug/kg	**Yes**	--	19.0	410	No	0
Soil	VOCs	Total	Chloromethane	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	Dichlorodifluoromethane	0-3 ft	N/A	ug/kg	**Yes**	--	94.0	730,000	No	0
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-3 ft	N/A	ug/kg	**Yes**	--	460	20,000	No	0
Soil	VOCs	Total	Ethylbenzene	0-3 ft	N/A	ug/kg	**Yes**	--	37.4	2,260	No	0
Soil	VOCs	Total	Isopropylbenzene	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	m,p-Xylenes	0-3 ft	N/A	ug/kg	**Yes**	--	7,400	120,000	No	0
Soil	VOCs	Total	Naphthalene	0-3 ft	N/A	ug/kg	**Yes**	--	19.5	23,000	No	0
Soil	VOCs	Total	n-Butylbenzene	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	n-Propylbenzene	0-3 ft	N/A	ug/kg	**Yes**	--	122	2,260	No	0
Soil	VOCs	Total	o-Xylene	0-3 ft	N/A	ug/kg	**Yes**	--	3,200	1,000	**Yes**	1
Soil	VOCs	Total	sec-Butylbenzene	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-3 ft	N/A	ug/kg	**Yes**	--	420,000	1,600	**Yes**	2
Soil	VOCs	Total	Toluene	0-3 ft	N/A	ug/kg	**Yes**	--	39,000	200,000	No	0
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-3 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	Trichloroethene (TCE)	0-3 ft	N/A	ug/kg	**Yes**	--	6,080	130	**Yes**	2
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-10 ft	N/A	ug/kg	**Yes**	--	0.580	38,000,000	No	0
Soil	VOCs	Total	1,1-Dichloroethane	0-10 ft	N/A	ug/kg	No	--	--	--	--	--

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(8 of 26)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-10 ft	N/A	ug/kg	**Yes**	--	14,300	980,000	No	0
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-10 ft	N/A	ug/kg	**Yes**	--	6,500	150,000	No	0
Soil	VOCs	Total	1,4-Dichlorobenzene	0-10 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	2-Butanone (MEK)	0-10 ft	N/A	ug/kg	**Yes**	--	50.0	200,000,000	No	0
Soil	VOCs	Total	2-Hexanone	0-10 ft	N/A	ug/kg	**Yes**	--	8.80	1,400,000	No	0
Soil	VOCs	Total	4-Isopropyltoluene	0-10 ft	N/A	ug/kg	**Yes**	--	161	NV	***Yes***	--
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-10 ft	N/A	ug/kg	**Yes**	--	1.20	53,000,000	No	0
Soil	VOCs	Total	Acetone	0-10 ft	N/A	ug/kg	**Yes**	--	540	630,000,000	No	0
Soil	VOCs	Total	Benzene	0-10 ft	N/A	ug/kg	**Yes**	--	1.20	1,200	No	0
Soil	VOCs	Total	Bromomethane	0-10 ft	N/A	ug/kg	**Yes**	--	5.00	17,000	No	0
Soil	VOCs	Total	Carbon Disulfide	0-10 ft	N/A	ug/kg	**Yes**	--	6.90	3,700,000	No	0
Soil	VOCs	Total	Chloroform	0-10 ft	N/A	ug/kg	**Yes**	--	19.0	410	No	0
Soil	VOCs	Total	Chloromethane	0-10 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-10 ft	N/A	ug/kg	**Yes**	--	120	3,100,000	No	0
Soil	VOCs	Total	Dichlorodifluoromethane	0-10 ft	N/A	ug/kg	**Yes**	--	94.0	780,000	No	0
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-10 ft	N/A	ug/kg	**Yes**	--	460	20,000	No	0
Soil	VOCs	Total	Ethylbenzene	0-10 ft	N/A	ug/kg	**Yes**	--	37.4	12,000	No	0
Soil	VOCs	Total	Isopropylbenzene	0-10 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	m,p-Xylenes	0-10 ft	N/A	ug/kg	**Yes**	--	7,400	2,700,000	No	0
Soil	VOCs	Total	Naphthalene	0-10 ft	N/A	ug/kg	**Yes**	--	19.5	23,000	No	0
Soil	VOCs	Total	n-Butylbenzene	0-10 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	n-Propylbenzene	0-10 ft	N/A	ug/kg	**Yes**	--	122	21,000,000	No	0
Soil	VOCs	Total	o-Xylene	0-10 ft	N/A	ug/kg	**Yes**	--	3,200	19,000,000	No	0
Soil	VOCs	Total	sec-Butylbenzene	0-10 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-10 ft	N/A	ug/kg	**Yes**	--	420,000	1,600	**Yes**	2
Soil	VOCs	Total	Toluene	0-10 ft	N/A	ug/kg	**Yes**	--	39,000	24,000,000	No	0
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-10 ft	N/A	ug/kg	No	--	--	--	--	--
Soil	VOCs	Total	Trichloroethene (TCE)	0-10 ft	N/A	ug/kg	**Yes**	--	6,080	130	**Yes**	2
Groundwater[3]	Metals	Dissolved	Arsenic	N/A	N/A	mg/L	**Yes**	**Yes**	0.00899	0.000018	**Yes**	20
Groundwater[3]	Metals	Dissolved	Calcium	N/A	N/A	mg/L	--	**Yes**	44.3	116	No	0
Groundwater[3]	Metals	Dissolved	Iron	N/A	N/A	mg/L	**Yes**	**Yes**	0.270	0.300	No	0
Groundwater[3]	Metals	Dissolved	Magnesium	N/A	N/A	mg/L	--	**Yes**	14.0	82.0	No	0
Groundwater[3]	Metals	Dissolved	Potassium	N/A	N/A	mg/L	--	No	--	--	--	--
Groundwater[3]	Metals	Dissolved	Sodium	N/A	N/A	mg/L	--	**Yes**	89.4	680	No	0
Groundwater[3]	Metals	Dissolved	Vanadium	N/A	N/A	mg/L	**Yes**	**Yes**	0.00310	0.00260	**Yes**	1
Groundwater[3]	Metals	Total	Arsenic	N/A	N/A	mg/L	**Yes**	**Yes**	0.0116	0.000018	**Yes**	20
Groundwater[3]	Metals	Total	Iron	N/A	N/A	mg/L	**Yes**	**Yes**	1.50	0.300	**Yes**	2
Groundwater[3]	Metals	Total	Vanadium	N/A	N/A	mg/L	**Yes**	**Yes**	0.00590	0.00260	**Yes**	1
Groundwater[3]	Butyltins	Total	Monobutyltin	N/A	N/A	ug/L	**Yes**	--	0.0260	0.0630	No	0
Groundwater[3]	NWTPH-Dx	Total	Diesel Range Organics	N/A	N/A	mg/L	**Yes**	--	0.0180	0.0900	No	0
Groundwater[3]	NWTPH-Gx	Total	Gasoline Range Organics	N/A	N/A	mg/L	**Yes**	--	0.0235	0.100	No	0
Groundwater[3]	SVOCs	Total	Benzo(b)fluoranthene	N/A	N/A	ug/L	No	--	--	--	--	--
Groundwater[3]	SVOCs	Total	Phenanthrene	N/A	N/A	ug/L	No	--	--	--	--	--

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV
Groundwater[3]	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/L	**Yes**	--	1.90	11.0	No	0
Groundwater[3]	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/L	**Yes**	--	5.00	2.30	**Yes**	1
Groundwater[3]	VOCs	Total	1,1-Dichloroethene	N/A	N/A	ug/L	**Yes**	--	2.10	25.0	No	0
Groundwater[3]	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/L	--	--	0.255	0.920	No	0
Groundwater[3]	VOCs	Total	Chloroform	N/A	N/A	ug/L	No	--	--	--	--	--
Groundwater[3]	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/L	**Yes**	--	660	360	**Yes**	4
Groundwater[3]	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	N/A	ug/L	--	--	0.175	4.40	No	0
Groundwater[3]	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/L	**Yes**	--	6.20	0.0930	**Yes**	16
Groundwater[3]	VOCs	Total	Toluene	N/A	N/A	ug/L	--	--	0.640	9.8	No	0
Groundwater[3]	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/L	--	--	1.70	110	No	0
Groundwater[3]	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/L	**Yes**	--	3.40	0.039	**Yes**	15
Groundwater[3]	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/L	**Yes**	--	4.10	0.025	**Yes**	4
Groundwater - DP[3]	Metals	Dissolved	Aluminum	N/A	N/A	mg/L	**--**	--	1.37	0.0870	**Yes**	2
Groundwater - DP[3]	Metals	Dissolved	Antimony	N/A	N/A	mg/L	--	--	0.00167	0.00560	No	0
Groundwater - DP[3]	Metals	Dissolved	Arsenic	N/A	N/A	mg/L	--	--	0.00136	0.0000180	**Yes**	10
Groundwater - DP[3]	Metals	Dissolved	Barium	N/A	N/A	mg/L	--	--	0.0207	0.00400	**Yes**	8
Groundwater - DP[3]	Metals	Dissolved	Cadmium	N/A	N/A	mg/L	--	--	0.0000300	0.000170	No	0
Groundwater - DP[3]	Metals	Dissolved	Calcium	N/A	N/A	mg/L	--	--	34.1	116	No	0
Groundwater - DP[3]	Metals	Dissolved	Chromium	N/A	N/A	mg/L	--	--	0.00429	0.0540	No	0
Groundwater - DP[3]	Metals	Dissolved	Cobalt	N/A	N/A	mg/L	--	--	0.00508	0.0110	No	0
Groundwater - DP[3]	Metals	Dissolved	Copper	N/A	N/A	mg/L	--	--	0.00438	0.00580	No	0
Groundwater - DP[3]	Metals	Dissolved	Iron	N/A	N/A	mg/L	--	--	0.476	0.300	**Yes**	1
Groundwater - DP[3]	Metals	Dissolved	Lead	N/A	N/A	mg/L	--	--	0.000378	0.00144	No	0
Groundwater - DP[3]	Metals	Dissolved	Magnesium	N/A	N/A	mg/L	--	--	12.0	82.0	No	0
Groundwater - DP[3]	Metals	Dissolved	Manganese	N/A	N/A	mg/L	--	--	0.587	0.0500	**Yes**	4
Groundwater - DP[3]	Metals	Dissolved	Mercury	N/A	N/A	mg/L	--	--	0.0000600	0.000770	No	0
Groundwater - DP[3]	Metals	Dissolved	Nickel	N/A	N/A	mg/L	--	--	0.00210	0.0340	No	0
Groundwater - DP[3]	Metals	Dissolved	Potassium	N/A	N/A	mg/L	--	--	2.21	53.0	No	0
Groundwater - DP[3]	Metals	Dissolved	Selenium	N/A	N/A	mg/L	--	--	0.00130	0.00500	No	0
Groundwater - DP[3]	Metals	Dissolved	Silver	N/A	N/A	mg/L	--	--	0.0000790	0.000120	No	0
Groundwater - DP[3]	Metals	Dissolved	Sodium	N/A	N/A	mg/L	--	--	47.7	680	No	0
Groundwater - DP[3]	Metals	Dissolved	Thallium	N/A	N/A	mg/L	--	--	0.0000855	0.000240	No	0
Groundwater - DP[3]	Metals	Dissolved	Vanadium	N/A	N/A	mg/L	--	--	0.00261	0.00260	**Yes**	1
Groundwater - DP[3]	Metals	Dissolved	Zinc	N/A	N/A	mg/L	--	--	0.00348	0.077	No	0
Groundwater - DP[3]	Metals	Total	Aluminum	N/A	N/A	mg/L	**--**	--	17.9	37.0	No	0
Groundwater - DP[3]	Metals	Total	Antimony	N/A	N/A	mg/L	**--**	--	0.00157	0.00560	No	0
Groundwater - DP[3]	Metals	Total	Arsenic	N/A	N/A	mg/L	**--**	--	0.00770	0.0000180	**Yes**	8
Groundwater - DP[3]	Metals	Total	Barium	N/A	N/A	mg/L	**--**	--	0.0978	1.00	No	0
Groundwater - DP[3]	Metals	Total	Beryllium	N/A	N/A	mg/L	**--**	--	0.000785	0.0730	No	0
Groundwater - DP[3]	Metals	Total	Calcium	N/A	N/A	mg/L	**--**	--	33.7	NV	***Yes***	--

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV
Groundwater - DP[3]	Metals	Total	Chromium	N/A	N/A	mg/L	--	--	0.0318	55.0	No	0
Groundwater - DP[3]	Metals	Total	Cobalt	N/A	N/A	mg/L	--	--	0.0131	0.0110	**Yes**	1
Groundwater - DP[3]	Metals	Total	Copper	N/A	N/A	mg/L	--	--	0.204	1.30	No	0
Groundwater - DP[3]	Metals	Total	Iron	N/A	N/A	mg/L	--	--	25.9	0.300	**Yes**	8
Groundwater - DP[3]	Metals	Total	Lead	N/A	N/A	mg/L	--	--	0.0137	0.0150	No	0
Groundwater - DP[3]	Metals	Total	Magnesium	N/A	N/A	mg/L	--	--	15.4	NV	***Yes***	--
Groundwater - DP[3]	Metals	Total	Manganese	N/A	N/A	mg/L	--	--	0.709	0.0500	**Yes**	7
Groundwater - DP[3]	Metals	Total	Mercury	N/A	N/A	mg/L	--	--	0.000100	0.0110	No	0
Groundwater - DP[3]	Metals	Total	Nickel	N/A	N/A	mg/L	--	--	0.0214	0.610	No	0
Groundwater - DP[3]	Metals	Total	Potassium	N/A	N/A	mg/L	--	--	3.21	NV	***Yes***	--
Groundwater - DP[3]	Metals	Total	Selenium	N/A	N/A	mg/L	--	--	0.00206	0.170	No	0
Groundwater - DP[3]	Metals	Total	Silver	N/A	N/A	mg/L	--	--	0.000376	0.180	No	0
Groundwater - DP[3]	Metals	Total	Sodium	N/A	N/A	mg/L	--	--	42.9	NV	***Yes***	--
Groundwater - DP[3]	Metals	Total	Thallium	N/A	N/A	mg/L	--	--	0.000146	0.000240	No	0
Groundwater - DP[3]	Metals	Total	Vanadium	N/A	N/A	mg/L	--	--	0.0776	0.00260	**Yes**	7
Groundwater - DP[3]	Metals	Total	Zinc	N/A	N/A	mg/L	--	--	0.0444	7.40	No	0
Groundwater - DP[3]	Butyltins	Total	Monobutyltin	N/A	N/A	ug/L	--	--	0.00671	0.0630	No	0
Groundwater - DP[3]	Butyltins	Total	Tributyltin	N/A	N/A	ug/L	--	--	0.00435	0.0630	No	0
Groundwater - DP[3]	Pesticides	Total	BHC (gamma) Lindane	N/A	N/A	ug/L	--	--	0.00249	0.0520	No	0
Groundwater - DP[3]	Pesticides	Total	Methoxychlor	N/A	N/A	ug/L	--	--	0.00521	0.0300	No	0
Groundwater - DP[3]	NWTPH-Dx	Total	Residual Range Organics	N/A	N/A	mg/L	--	--	0.113	0.290	No	0
Groundwater - DP[3]	NWTPH-Gx	Total	Gasoline Range Organics	N/A	N/A	mg/L	--	--	0.0209	0.100	No	0
Groundwater - DP[3]	SVOCs	Dissolved	2-Methylnaphthalene	N/A	N/A	ug/L	--	--	0.280	72.2	No	0
Groundwater - DP[3]	SVOCs	Dissolved	Acenaphthene	N/A	N/A	ug/L	--	--	0.0348	520	No	0
Groundwater - DP[3]	SVOCs	Dissolved	Acenaphthylene	N/A	N/A	ug/L	--	--	0.00361	0.140	No	0
Groundwater - DP[3]	SVOCs	Dissolved	Benzo(a)pyrene	N/A	N/A	ug/L	--	--	0.00714	0.00290	**Yes**	1
Groundwater - DP[3]	SVOCs	Dissolved	Benzoic Acid	N/A	N/A	ug/L	--	--	0.317	42.0	No	0
Groundwater - DP[3]	SVOCs	Dissolved	Butyl Benzyl Phthalate	N/A	N/A	ug/L	--	--	0.155	19.0	No	0
Groundwater - DP[3]	SVOCs	Dissolved	Dibenz(a,h)anthracene	N/A	N/A	ug/L	--	--	0.00381	0.00290	**Yes**	1
Groundwater - DP[3]	SVOCs	Dissolved	Diethyl Phthalate	N/A	N/A	ug/L	--	--	0.101	210	No	0
Groundwater - DP[3]	SVOCs	Dissolved	Di-n-butyl Phthalate	N/A	N/A	ug/L	--	--	0.207	35.0	No	0
Groundwater - DP[3]	SVOCs	Dissolved	Fluorene	N/A	N/A	ug/L	--	--	0.0116	3.90	No	0
Groundwater - DP[3]	SVOCs	Dissolved	Indeno(1,2,3-cd)pyrene	N/A	N/A	ug/L	--	--	0.00630	0.00380	**Yes**	1
Groundwater - DP[3]	SVOCs	Dissolved	Isophorone	N/A	N/A	ug/L	--	--	0.0782	35.0	No	0
Groundwater - DP[3]	SVOCs	Dissolved	Naphthalene	N/A	N/A	ug/L	--	--	0.200	0.140	**Yes**	3
Groundwater - DP[3]	SVOCs	Dissolved	Phenanthrene	N/A	N/A	ug/L	--	--	0.0190	0.140	No	0
Groundwater - DP[3]	SVOCs	Dissolved	Phenol	N/A	N/A	ug/L	--	--	0.0248	110	No	0
Groundwater - DP[3]	SVOCs	Total	2-Methylnaphthalene	N/A	N/A	ug/L	--	--	0.153	72.2	No	0
Groundwater - DP[3]	SVOCs	Total	Acenaphthene	N/A	N/A	ug/L	--	--	0.0230	520	No	0
Groundwater - DP[3]	SVOCs	Total	Anthracene	N/A	N/A	ug/L	--	--	0.0126	13.0	No	0

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV
Groundwater - DP[3]	SVOCs	Total	Benzo(a)pyrene	N/A	N/A	ug/L	--	--	0.00895	0.00290	**Yes**	1
Groundwater - DP[3]	SVOCs	Total	Benzofluoranthenes, Total	N/A	N/A	ug/L	--	--	0.0173	0.00380	**Yes**	1
Groundwater - DP[3]	SVOCs	Total	Benzyl Alcohol	N/A	N/A	ug/L	--	--	0.0523	8.60	No	0
Groundwater - DP[3]	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	N/A	ug/L	--	--	0.408	1.20	No	0
Groundwater - DP[3]	SVOCs	Total	Butyl Benzyl Phthalate	N/A	N/A	ug/L	--	--	0.228	19.0	No	0
Groundwater - DP[3]	SVOCs	Total	Dibenz(a,h)anthracene	N/A	N/A	ug/L	--	--	0.00671	0.00290	**Yes**	1
Groundwater - DP[3]	SVOCs	Total	Dibenzofuran	N/A	N/A	ug/L	--	--	0.0421	3.70	No	0
Groundwater - DP[3]	SVOCs	Total	Di-n-butyl Phthalate	N/A	N/A	ug/L	--	--	0.239	35.0	No	0
Groundwater - DP[3]	SVOCs	Total	Fluoranthene	N/A	N/A	ug/L	--	--	0.0311	6.16	No	0
Groundwater - DP[3]	SVOCs	Total	Fluorene	N/A	N/A	ug/L	--	--	0.0351	3.90	No	0
Groundwater - DP[3]	SVOCs	Total	Indeno(1,2,3-cd)pyrene	N/A	N/A	ug/L	--	--	0.00797	0.00380	**Yes**	1
Groundwater - DP[3]	SVOCs	Total	Isophorone	N/A	N/A	ug/L	--	--	0.0842	35.0	No	0
Groundwater - DP[3]	SVOCs	Total	Naphthalene	N/A	N/A	ug/L	--	--	0.0452	0.140	No	0
Groundwater - DP[3]	SVOCs	Total	Phenanthrene	N/A	N/A	ug/L	--	--	0.144	0.140	**Yes**	1
Groundwater - DP[3]	SVOCs	Total	Phenol	N/A	N/A	ug/L	--	--	0.0291	110	No	0
Groundwater - DP[3]	SVOCs	Total	Pyrene	N/A	N/A	ug/L	--	--	0.0261	10.1	No	0
Groundwater - DP[3]	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/L	--	--	2.22	11.0	No	0
Groundwater - DP[3]	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/L	--	--	2.52	2.30	**Yes**	1
Groundwater - DP[3]	VOCs	Total	1,1-Dichloroethene	N/A	N/A	ug/L	--	--	1.16	25.0	No	0
Groundwater - DP[3]	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/L	--	--	0.0485	7.30	No	0
Groundwater - DP[3]	VOCs	Total	1,3,5-Trimethylbenzene	N/A	N/A	ug/L	--	--	0.0297	7.30	No	0
Groundwater - DP[3]	VOCs	Total	2,2-Dichloropropane	N/A	N/A	ug/L	--	--	0.179	0.390	No	0
Groundwater - DP[3]	VOCs	Total	Acetone	N/A	N/A	ug/L	--	--	3.88	1500	No	0
Groundwater - DP[3]	VOCs	Total	Benzene	N/A	N/A	ug/L	--	--	0.137	0.390	No	0
Groundwater - DP[3]	VOCs	Total	Bromoform	N/A	N/A	ug/L	--	--	0.151	4.30	No	0
Groundwater - DP[3]	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/L	--	--	0.0619	0.920	No	0
Groundwater - DP[3]	VOCs	Total	Chloroform	N/A	N/A	ug/L	--	--	0.174	0.190	No	0
Groundwater - DP[3]	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/L	--	--	341	360	No	0
Groundwater - DP[3]	VOCs	Total	Ethylbenzene	N/A	N/A	ug/L	--	--	0.0447	1.40	No	0
Groundwater - DP[3]	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/L	--	--	0.0197	7.30	No	0
Groundwater - DP[3]	VOCs	Total	m,p-Xylenes	N/A	N/A	ug/L	--	--	0.132	13.0	No	0
Groundwater - DP[3]	VOCs	Total	Naphthalene	N/A	N/A	ug/L	--	--	0.0452	0.140	No	0
Groundwater - DP[3]	VOCs	Total	o-Xylene	N/A	N/A	ug/L	--	--	0.0735	350	No	0
Groundwater - DP[3]	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/L	--	--	54.5	0.0930	**Yes**	10
Groundwater - DP[3]	VOCs	Total	Toluene	N/A	N/A	ug/L	--	--	0.299	9.80	No	0
Groundwater - DP[3]	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/L	--	--	1.80	110	No	0
Groundwater - DP[3]	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/L	--	--	43.7	0.0390	**Yes**	9
Groundwater - DP[3]	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/L	--	--	0.611	0.0250	**Yes**	2
Soil Gas	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/m^3	--	--	98.0	22,000,000	No	0
Soil Gas	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/m^3	--	--	18,500	31,000	No	0

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(12 of 26)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV
Soil Gas	VOCs	Total	1,3,5-Trimethylbenzene	N/A	N/A	ug/m^3	--	--	6,250	26,000	No	0
Soil Gas	VOCs	Total	1,3-Butadiene	N/A	N/A	ug/m^3	--	--	210	410	No	0
Soil Gas	VOCs	Total	1,4-Dioxane	N/A	N/A	ug/m^3	--	--	1.10	1,600	No	0
Soil Gas	VOCs	Total	2,2,4-Trimethylpentane	N/A	N/A	ug/m^3	--	--	1.80	NV	***Yes***	--
Soil Gas	VOCs	Total	2-Butanone (MEK)	N/A	N/A	ug/m^3	--	--	31.0	22,000,000	No	0
Soil Gas	VOCs	Total	4-Ethyltoluene	N/A	N/A	ug/m^3	--	--	9,150	NV	***Yes***	--
Soil Gas	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	N/A	ug/m^3	--	--	2.10	13,000,000	No	0
Soil Gas	VOCs	Total	Acetone	N/A	N/A	ug/m^3	--	--	97.0	140,000,000	No	0
Soil Gas	VOCs	Total	Benzene	N/A	N/A	ug/m^3	--	--	85.0	1,600	No	0
Soil Gas	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/m^3	--	--	42.0	3,100,000	No	0
Soil Gas	VOCs	Total	Chloroform	N/A	N/A	ug/m^3	--	--	0.750	530	No	0
Soil Gas	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/m^3	--	--	330	260,000	No	0
Soil Gas	VOCs	Total	Cyclohexane	N/A	N/A	ug/m^3	--	--	24.0	26,000,000	No	0
Soil Gas	VOCs	Total	Dichlorodifluoromethane	N/A	N/A	ug/m^3	--	--	3.20	880,000	No	0
Soil Gas	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	N/A	ug/m^3	--	--	1.80	26,000	No	0
Soil Gas	VOCs	Total	Ethanol	N/A	N/A	ug/m^3	--	--	13.0	NV	***Yes***	--
Soil Gas	VOCs	Total	Ethylbenzene	N/A	N/A	ug/m^3	--	--	1,550	4,900	No	0
Soil Gas	VOCs	Total	Heptane	N/A	N/A	ug/m^3	--	--	87.0	NV	***Yes***	--
Soil Gas	VOCs	Total	Hexane	N/A	N/A	ug/m^3	--	--	110	3,100,000	No	0
Soil Gas	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/m^3	--	--	675	1,800,000	No	0
Soil Gas	VOCs	Total	m,p-Xylenes	N/A	N/A	ug/m^3	--	--	5,850	440,000	No	0
Soil Gas	VOCs	Total	n-Propylbenzene	N/A	N/A	ug/m^3	--	--	2,300	4,400,000	No	0
Soil Gas	VOCs	Total	o-Xylene	N/A	N/A	ug/m^3	--	--	2,800	3,100,000	No	0
Soil Gas	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/m^3	--	--	34,000	2,100	**Yes**	1
Soil Gas	VOCs	Total	Toluene	N/A	N/A	ug/m^3	--	--	47,500	22,000,000	No	0
Soil Gas	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/m^3	--	--	4.00	260,000	No	0
Soil Gas	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/m^3	--	--	610	140	**Yes**	2
Soil Gas	VOCs	Total	Trichlorofluoromethane	N/A	N/A	ug/m^3	--	--	2.20	3,100,000	No	0

Notes

(1) Only evaluated for analytes with a sample size of 20 or more. See the Data Summary for the Sandblast Area AOPC - Appendix I, Table I-2.

(2) Only applicable to inorganics. For soils, see the statistical comparison of Site soil concentrations to Reference Area concentrations; Appendix L, Tables L-1 and L-2.
For groundwater, see Table 8-3 and Appendix L, Table L-3. Direct push groundwater samples are not compared to Reference Area monitoring well data.

(3) The groundwater SLVs are the lower of the Direct Contact Water SLV and the Discharge to Surface Water-Bioaccumulative SLV; see Appendix J.

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(13 of 26)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV

(4) Total DDT is evaluated in the ERA for the Upland OU; see Section 12 and Appendix N.

'--' = Not evaluated
% = percent
BHC = hexachlorocyclohexane
DP = Direct Push
ft = feet
Max = maximum
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
mm = millimeter
N/A = not applicable
NV = No Value
No. = number
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
ug/m3 = micrograms per cubic meter
um = micrometer
VOC = volatile organic carbon

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(14 of 26)

Retain as Preliminary COPC?
No
Yes
Yes
No
No
Yes
Yes
No
No
Yes
Yes
Yes
No
No
Yes
Yes
No
No
No
Yes
No
Yes
Yes
No
No
Yes
Yes
No
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Yes
Yes
Yes
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Yes
Yes
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Yes
No
No
Yes
No
No

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(15 of 26)

Retain as Preliminary COPC?
No
Yes
No
No
Yes
No
Yes
No
No
No
No
No
No
No
No
No
No
No
No
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No
No
Yes
Yes
Yes
No

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(16 of 26)

Retain as Preliminary COPC?
No
No
No
No
Yes
No
No
No
No
No
No
No
No
No
No
Yes
Yes
Yes
No
No
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No
Yes
Yes
Yes
Yes

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(17 of 26)

Retain as Preliminary COPC?
Yes
Yes
Yes
No
Yes
No
No
No
No
No
No
No
No
No
No
No
No
No
Yes
Yes
Yes
No
No
Yes
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Yes
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Yes
Yes
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Yes
No
No
No
No
No

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(18 of 26)

Retain as Preliminary COPC?
No
No
Yes
No
No
No
No
No
Yes
Yes
Yes
No
No
Yes
No
No
Yes
No
No
No
Yes
Yes
No
No
No
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No
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Yes
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Yes
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No
No
No
No
Yes
Yes

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(19 of 26)

Retain as Preliminary COPC?
Yes
No
No
Yes
No
No
Yes
No
Yes
No
Yes
No
No
No
No
No
No
No
Yes
No
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No
No
No

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(20 of 26)

Retain as Preliminary COPC?
No
No
No
No
No
No
No
No
No
No
No
No
No
No
No
No
No
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Yes
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Yes
No
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Yes
No
No

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(21 of 26)

Retain as Preliminary COPC?
No
No
No
No
No
Yes
No
No
No
No
No
No
No
No
No
No
No
No
No
No
No
No
No
No
Yes
No
No
Yes
Yes
No
No
No
No
No
Yes
Yes
Yes
Yes
No
No
No
No
No

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(22 of 26)

Retain as Preliminary COPC?
No
Yes
No
No
No
Yes
No
Yes
No
No
Yes
Yes
Yes
No
Yes
Yes
No
No
No
No
No
Yes
No
No
Yes
No
No
No
No
No
No
No
Yes
No
No
No
Yes
No
No
Yes

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(23 of 26)

Retain as Preliminary COPC?
No
Yes
No
Yes
No
Yes
Yes
No
No
Yes
No
No
Yes
No
Yes
No
No
No
No
No
No
No
No
No
Yes
No
No
Yes
No
No
No
Yes
No
Yes
No
No
No
No
No

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(24 of 26)

Retain as Preliminary COPC?
Yes
Yes
No
No
No
Yes
No
No
No
No
Yes
No
No
Yes
No
No
No
Yes
No
No
No
No
No
No
No
No
No
No
No
No
No
No
No
Yes
No
No
Yes
Yes
No
No

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(25 of 26)

Retain as Preliminary COPC?
No
No
No
Yes
No
Yes
No
No
No
No
No
No
No
No
No
Yes
No
Yes
No
No
No
No
No
Yes
No
No
Yes
No

Table 9-2
Preliminary-COPC Identification for Sandblast AOPC Data
Bradford Island - Upland Operable Unit
(26 of 26)

Retain as Preliminary COPC?

Table 9-3
Preliminary-COPC Identification for Pistol Range AOPC Data
Bradford Island - Upland Operable Unit
(1 of 1)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	Metals	Total	Lead	0-1.5 ft	mg/kg	**Yes**	**Yes**	1,110	25.5	**Yes**	52	**Yes**
Soil	Metals	Total	Nickel	0-1.5 ft	mg/kg	--	**Yes**	32.0	38	No	0	No
Soil	Metals	Total	Zinc	0-1.5 ft	mg/kg	--	**Yes**	199	71.7	**Yes**	10	**Yes**
Lagoon Sediment	Metals	Total	Copper	N/A	mg/kg	--	No	25.4	55.6	No	0	No
Lagoon Sediment	Metals	Total	Lead	N/A	mg/kg	--	**Yes**	33.0	35	No	0	No
Lagoon Sediment	Metals	Total	Nickel	N/A	mg/kg	--	No	15.4	21.2	No	0	No
Lagoon Sediment	Metals	Total	Zinc	N/A	mg/kg	--	**Yes**	174	123	**Yes**	5	**Yes**
Groundwater - DP[3]	Metals	Dissolved	Copper	N/A	mg/L	--	--	0.000800	0.00900	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Nickel	N/A	mg/L	--	--	0.00390	0.0520	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Zinc	N/A	mg/L	--	--	0.00410	0.077	No	0	No
Groundwater - DP[3]	Metals	Total	Copper	N/A	mg/L	--	--	0.0548	1.30	No	0	No
Groundwater - DP[3]	Metals	Total	Lead	N/A	mg/L	--	--	0.0125	0.0150	No	0	No
Groundwater - DP[3]	Metals	Total	Nickel	N/A	mg/L	--	--	0.0501	0.610	No	0	No
Groundwater - DP[3]	Metals	Total	Zinc	N/A	mg/L	--	--	0.149	7.40	No	0	No

Notes
(1) Only evaluated for analytes with a sample size of 20 or more. See the Data Summary for the Pistol Range AOPC - Appendix I, Table I-3.
(2) Only applicable to inorganics. For soils, see the statistical comparison of Site soil concentrations to Reference Area concentrations; Appendix L, Tables L-1 and L-2.
For sediments, the maximum concentrations were compared to the maximum Reference Area sediment concentrations.
Direct push groundwater samples are not compared to Reference Area monitoring well data.
(3) The groundwater SLVs are the lower of the Direct Contact Water SLV and the Discharge to Surface Water-Bioaccumulative SLV; see Appendix J.

'--' = Not evaluated
% = percent
DP = Direct Push
ft = feet
Max = maximum
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
N/A = not applicable
No. = number
SLV = screening level value

Table 9-4
Preliminary-COPC Identification for Bulb Slope AOPC Data
Bradford Island - Upland Operable Unit
(1 of 1)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	Metals	Total	Lead	0-1 ft	mg/kg	--	**Yes**	597	25.5	**Yes**	11	**Yes**
Soil	Metals	Total	Mercury	0-1 ft	mg/kg	--	**Yes**	1.54	0.066	**Yes**	10	**Yes**
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	ug/kg	--	--	251	371	No	0	No
Soil	PCB Aroclors	Total	Total PCBs as Aroclors	0-1 ft	ug/kg	--	--	251	371	No	0	No
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	mg/kg	--	--	170	23,000	No	0	No
Soil	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	mg/kg	--	--	410	40,000	No	0	No

Notes
(1) Only evaluated for analytes with a sample size of 20 or more. See the Data Summary for the Bulb Slope AOPC - Appendix I, Table I-4.
(2) Only applicable to inorganics in soil. See the statistical comparison of Site soil concentrations to Reference Area concentrations; Appendix L, Tables L-1 and L-2.

'--' = Not evaluated
% = percent
ft = feet
Max = maximum
mg/kg = milligrams per kilogram
No. = number
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
PCB = polychlorinated biphenyl
SLV = screening level value
ug/kg = micrograms per kilogram

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
(1 of 16)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	Metals	Total	Aluminum	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Antimony	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	13.7	0.270	**Yes**	40	**Yes**
Soil	Metals	Total	Arsenic	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	80.9	5.40	**Yes**	29	**Yes**
Soil	Metals	Total	Barium	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Beryllium	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Cadmium	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	17.3	0.360	**Yes**	62	**Yes**
Soil	Metals	Total	Chromium	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	2,650	28.1	**Yes**	50	**Yes**
Soil	Metals	Total	Cobalt	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Copper	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Lead	0-1 ft	<250um	mg/kg	--	**Yes**	921	25.5	**Yes**	8	**Yes**
Soil	Metals	Total	Lead	0-1 ft	<2mm	mg/kg	--	**Yes**	768	25.5	**Yes**	8	**Yes**
Soil	Metals	Total	Lead	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	3,260	25.5	**Yes**	137	**Yes**
Soil	Metals	Total	Manganese	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Mercury	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	4.15	0.0660	**Yes**	43	**Yes**
Soil	Metals	Total	Nickel	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	1,060	38.0	**Yes**	38	**Yes**
Soil	Metals	Total	Selenium	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	0.900	0.520	**Yes**	18	**Yes**
Soil	Metals	Total	Silver	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	1.50	4.20	No	0	No
Soil	Metals	Total	Thallium	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Vanadium	0-1 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Zinc	0-1 ft	N/A	mg/kg	**Yes**	**Yes**	1,160	71.7	**Yes**	70	**Yes**
Soil	Metals	Total	Aluminum	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Antimony	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	13.7	0.270	**Yes**	50	**Yes**
Soil	Metals	Total	Arsenic	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	80.9	5.40	**Yes**	39	**Yes**
Soil	Metals	Total	Barium	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Beryllium	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Cadmium	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	17.3	0.360	**Yes**	74	**Yes**
Soil	Metals	Total	Chromium	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	2,650	28.1	**Yes**	59	**Yes**
Soil	Metals	Total	Cobalt	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Copper	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Lead	0-3 ft	<250um	mg/kg	--	**Yes**	921	25.5	**Yes**	10	**Yes**
Soil	Metals	Total	Lead	0-3 ft	<2mm	mg/kg	--	**Yes**	768	25.5	**Yes**	9	**Yes**
Soil	Metals	Total	Lead	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	3,260	25.5	**Yes**	154	**Yes**
Soil	Metals	Total	Manganese	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Mercury	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	4.15	0.0660	**Yes**	47	**Yes**
Soil	Metals	Total	Nickel	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	1,610	38.0	**Yes**	42	**Yes**
Soil	Metals	Total	Selenium	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	0.900	0.520	**Yes**	28	**Yes**
Soil	Metals	Total	Silver	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	1.50	4.20	No	0	No
Soil	Metals	Total	Thallium	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Vanadium	0-3 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Zinc	0-3 ft	N/A	mg/kg	**Yes**	**Yes**	1,160	71.7	**Yes**	77	**Yes**
Soil	Metals	Total	Aluminum	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Antimony	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	13.7	410	No	0	No
Soil	Metals	Total	Arsenic	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	80.9	5.40	**Yes**	42	**Yes**
Soil	Metals	Total	Barium	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Beryllium	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Cadmium	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	17.3	150	No	0	No

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
(2 of 16)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	Metals	Total	Chromium	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	2,650	28.1	**Yes**	67	**Yes**
Soil	Metals	Total	Cobalt	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Copper	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Lead	0-10 ft	<250um	mg/kg	--	**Yes**	921	800	**Yes**	1	**Yes**
Soil	Metals	Total	Lead	0-10 ft	<2mm	mg/kg	--	**Yes**	768	800	No	0	No
Soil	Metals	Total	Lead	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	3,260	800	**Yes**	16	**Yes**
Soil	Metals	Total	Manganese	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Mercury	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	4.15	93.0	No	0	No
Soil	Metals	Total	Nickel	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	1,760	6,100	No	0	No
Soil	Metals	Total	Selenium	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	0.900	5,100	No	0	No
Soil	Metals	Total	Silver	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	1.52	1,500	No	0	No
Soil	Metals	Total	Thallium	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Vanadium	0-10 ft	N/A	mg/kg	**Yes**	No	--	--	--	--	No
Soil	Metals	Total	Zinc	0-10 ft	N/A	mg/kg	**Yes**	**Yes**	1,160	310,000	No	0	No
Soil	Butyltins	Total	Dibutyltin	0-1 ft	N/A	ug/kg	**Yes**	--	210	28,000	No	0	No
Soil	Butyltins	Total	Monobutyltin	0-1 ft	N/A	ug/kg	**Yes**	--	108	28,000	No	0	No
Soil	Butyltins	Total	Tetrabutyltin	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Butyltins	Total	Tributyltin	0-1 ft	N/A	ug/kg	**Yes**	--	1,860	28,000	No	0	No
Soil	Butyltins	Total	Dibutyltin	0-3 ft	N/A	ug/kg	**Yes**	--	210	28,000	No	0	No
Soil	Butyltins	Total	Monobutyltin	0-3 ft	N/A	ug/kg	**Yes**	--	108	28,000	No	0	No
Soil	Butyltins	Total	Tetrabutyltin	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Butyltins	Total	Tributyltin	0-3 ft	N/A	ug/kg	**Yes**	--	1,860	28,000	No	0	No
Soil	Butyltins	Total	Dibutyltin	0-10 ft	N/A	ug/kg	**Yes**	--	210	180,000	No	0	No
Soil	Butyltins	Total	Monobutyltin	0-10 ft	N/A	ug/kg	**Yes**	--	108	180,000	No	0	No
Soil	Butyltins	Total	Tetrabutyltin	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Butyltins	Total	Tributyltin	0-10 ft	N/A	ug/kg	**Yes**	--	1,860	180,000	No	0	No
Soil	Herbicides	Total	2,4,5-T	0-1 ft	N/A	ug/kg	**Yes**	--	93.0	21.0	**Yes**	2	**Yes**
Soil	Herbicides	Total	Dichloroprop	0-1 ft	N/A	ug/kg	**Yes**	--	180	21.0	**Yes**	2	**Yes**
Soil	Herbicides	Total	MCPP	0-1 ft	N/A	ug/kg	**Yes**	--	14,000	21.0	**Yes**	2	**Yes**
Soil	Herbicides	Total	2,4,5-T	0-3 ft	N/A	ug/kg	**Yes**	--	93.0	21.0	**Yes**	2	**Yes**
Soil	Herbicides	Total	Dichloroprop	0-3 ft	N/A	ug/kg	**Yes**	--	180	21.0	**Yes**	2	**Yes**
Soil	Herbicides	Total	MCPP	0-3 ft	N/A	ug/kg	**Yes**	--	14,000	21.0	**Yes**	2	**Yes**
Soil	Herbicides	Total	2,4,5-T	0-10 ft	N/A	ug/kg	**Yes**	--	93.0	6,200,000	No	0	No
Soil	Herbicides	Total	Dichloroprop	0-10 ft	N/A	ug/kg	**Yes**	--	180	NV	***Yes***	--	***Yes***
Soil	Herbicides	Total	MCPP	0-10 ft	N/A	ug/kg	**Yes**	--	14,000	620,000	No	0	No
Soil	Pesticides	Total	4,4'-DDD	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	4,4'-DDE	0-1 ft	N/A	ug/kg	**Yes**	--	17.0	21.0	No	0	No
Soil	Pesticides	Total	4,4'-DDT	0-1 ft	N/A	ug/kg	**Yes**	--	140	21.0	**Yes**	9	**Yes**
Soil	Pesticides	Total	Aldrin	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	BHC (alpha)	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	BHC (beta)	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	BHC (delta)	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	BHC (gamma) Lindane	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Chlordane (alpha)	0-1 ft	N/A	ug/kg	**Yes**	--	4.00	7,200	No	0	No
Soil	Pesticides	Total	Chlordane (gamma)	0-1 ft	N/A	ug/kg	**Yes**	--	97.0	7,200	No	0	No
Soil	Pesticides	Total	Chlordane (technical)	0-1 ft	N/A	ug/kg	--	--	1,560	7,200	No	0	No

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
(3 of 16)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	Pesticides	Total	Dieldrin	0-1 ft	N/A	ug/kg	**Yes**	--	2.10	4.90	No	0	No
Soil	Pesticides	Total	Endosulfan I	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Endosulfan II	0-1 ft	N/A	ug/kg	**Yes**	--	8.84	20,000	No	0	No
Soil	Pesticides	Total	Endosulfan Sulfate	0-1 ft	N/A	ug/kg	**Yes**	--	5.97	20,000	No	0	No
Soil	Pesticides	Total	Endrin	0-1 ft	N/A	ug/kg	**Yes**	--	17.0	4.90	**Yes**	2	**Yes**
Soil	Pesticides	Total	Endrin Aldehyde	0-1 ft	N/A	ug/kg	**Yes**	--	16.0	4.90	**Yes**	2	**Yes**
Soil	Pesticides	Total	Endrin Ketone	0-1 ft	N/A	ug/kg	**Yes**	--	13.0	4.90	**Yes**	1	**Yes**
Soil	Pesticides	Total	Heptachlor	0-1 ft	N/A	ug/kg	**Yes**	--	2.90	480	No	0	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Methoxychlor	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	4,4'-DDD	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	4,4'-DDE	0-3 ft	N/A	ug/kg	**Yes**	--	17.0	21.0	No	0	No
Soil	Pesticides	Total	4,4'-DDT	0-3 ft	N/A	ug/kg	**Yes**	--	140	21.0	**Yes**	10	**Yes**
Soil	Pesticides	Total	Aldrin	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	BHC (alpha)	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	BHC (beta)	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	BHC (delta)	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	BHC (gamma) Lindane	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Chlordane (alpha)	0-3 ft	N/A	ug/kg	**Yes**	--	4.00	7,200	No	0	No
Soil	Pesticides	Total	Chlordane (gamma)	0-3 ft	N/A	ug/kg	**Yes**	--	97.0	7,200	No	0	No
Soil	Pesticides	Total	Chlordane (technical)	0-3 ft	N/A	ug/kg	--	--	1,560	7,200	No	0	No
Soil	Pesticides	Total	Dieldrin	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Endosulfan I	0-3 ft	N/A	ug/kg	**Yes**	--	6.45	20,000	No	0	No
Soil	Pesticides	Total	Endosulfan II	0-3 ft	N/A	ug/kg	**Yes**	--	8.84	20,000	No	0	No
Soil	Pesticides	Total	Endosulfan Sulfate	0-3 ft	N/A	ug/kg	**Yes**	--	5.97	20,000	No	0	No
Soil	Pesticides	Total	Endrin	0-3 ft	N/A	ug/kg	**Yes**	--	17.0	4.90	**Yes**	2	**Yes**
Soil	Pesticides	Total	Endrin Aldehyde	0-3 ft	N/A	ug/kg	**Yes**	--	16.0	4.90	**Yes**	2	**Yes**
Soil	Pesticides	Total	Endrin Ketone	0-3 ft	N/A	ug/kg	**Yes**	--	13.0	4.90	**Yes**	1	**Yes**
Soil	Pesticides	Total	Heptachlor	0-3 ft	N/A	ug/kg	**Yes**	--	3.07	480	No	0	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Methoxychlor	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	4,4'-DDD	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	4,4'-DDE	0-10 ft	N/A	ug/kg	**Yes**	--	17.0	7,700	No	0	No
Soil	Pesticides	Total	4,4'-DDT	0-10 ft	N/A	ug/kg	**Yes**	--	140	7,700	No	0	No
Soil	Pesticides	Total	Aldrin	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	BHC (alpha)	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	BHC (beta)	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	BHC (delta)	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	BHC (gamma) Lindane	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Chlordane (alpha)	0-10 ft	N/A	ug/kg	**Yes**	--	4.00	7,200	No	0	No
Soil	Pesticides	Total	Chlordane (gamma)	0-10 ft	N/A	ug/kg	**Yes**	--	97.0	7,200	No	0	No
Soil	Pesticides	Total	Chlordane (technical)	0-10 ft	N/A	ug/kg	**Yes**	--	1,560	7,200	No	0	No
Soil	Pesticides	Total	Dieldrin	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Endosulfan I	0-10 ft	N/A	ug/kg	**Yes**	--	6.45	1,400,000	No	0	No
Soil	Pesticides	Total	Endosulfan II	0-10 ft	N/A	ug/kg	**Yes**	--	8.84	1,400,000	No	0	No
Soil	Pesticides	Total	Endosulfan Sulfate	0-10 ft	N/A	ug/kg	**Yes**	--	5.97	1,400,000	No	0	No

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
(4 of 16)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	Pesticides	Total	Endrin	0-10 ft	N/A	ug/kg	**Yes**	--	17.0	71,000	No	0	No
Soil	Pesticides	Total	Endrin Aldehyde	0-10 ft	N/A	ug/kg	**Yes**	--	16.0	71,000	No	0	No
Soil	Pesticides	Total	Endrin Ketone	0-10 ft	N/A	ug/kg	**Yes**	--	13.0	71,000	No	0	No
Soil	Pesticides	Total	Heptachlor	0-10 ft	N/A	ug/kg	**Yes**	--	3.07	480	No	0	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	Pesticides	Total	Methoxychlor	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	PCB Aroclors	Total	Aroclor 1248	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	PCB Aroclors	Total	Aroclor 1254	0-1 ft	N/A	ug/kg	**Yes**	--	1,700	371	**Yes**	4	**Yes**
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	N/A	ug/kg	**Yes**	--	690	371	**Yes**	6	**Yes**
Soil	PCB Aroclors	Total	Total PCBs as Aroclors	0-1 ft	N/A	ug/kg	**Yes**	--	2,140	371	**Yes**	9	**Yes**
Soil	PCB Aroclors	Total	Aroclor 1248	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	PCB Aroclors	Total	Aroclor 1254	0-3 ft	N/A	ug/kg	**Yes**	--	1,700	371	**Yes**	4	**Yes**
Soil	PCB Aroclors	Total	Aroclor 1260	0-3 ft	N/A	ug/kg	**Yes**	--	690	371	**Yes**	6	**Yes**
Soil	PCB Aroclors	Total	Total PCBs as Aroclors	0-3 ft	N/A	ug/kg	**Yes**	--	2,140	371	**Yes**	9	**Yes**
Soil	PCB Aroclors	Total	Aroclor 1248	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	PCB Aroclors	Total	Aroclor 1254	0-10 ft	N/A	ug/kg	**Yes**	--	1,700	740	**Yes**	2	**Yes**
Soil	PCB Aroclors	Total	Aroclor 1260	0-10 ft	N/A	ug/kg	**Yes**	--	690	740	No	0	No
Soil	PCB Aroclors	Total	Total PCBs as Aroclors	0-10 ft	N/A	ug/kg	**Yes**	--	2,140	740	**Yes**	4	**Yes**
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	N/A	mg/kg	**Yes**	--	1,090	23,000	No	0	No
Soil	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	N/A	mg/kg	**Yes**	--	9,450	40,000	No	0	No
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-3 ft	N/A	mg/kg	**Yes**	--	1,440	23,000	No	0	No
Soil	NWTPH-Dx	Total	Residual Range Organics	0-3 ft	N/A	mg/kg	**Yes**	--	9,450	40,000	No	0	No
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-10 ft	N/A	mg/kg	**Yes**	--	9,740	23,000	No	0	No
Soil	NWTPH-Dx	Total	Residual Range Organics	0-10 ft	N/A	mg/kg	**Yes**	--	41,900	40,000	**Yes**	1	**Yes**
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	N/A	mg/kg	**Yes**	--	23,900	13,000	**Yes**	1	**Yes**
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-3 ft	N/A	mg/kg	**Yes**	--	23,900	13,000	**Yes**	1	**Yes**
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-10 ft	N/A	mg/kg	**Yes**	--	23,900	13,000	**Yes**	1	**Yes**
Soil	SVOCs	Total	2-Methylnaphthalene	0-1 ft	N/A	ug/kg	**Yes**	--	1,530	4,100,000	No	0	No
Soil	SVOCs	Total	Acenaphthene	0-1 ft	N/A	ug/kg	**Yes**	--	2,600	19,000,000	No	0	No
Soil	SVOCs	Total	Acenaphthylene	0-1 ft	N/A	ug/kg	**Yes**	--	87.7	23,000	No	0	No
Soil	SVOCs	Total	Anthracene	0-1 ft	N/A	ug/kg	**Yes**	--	2,700	93,000,000	No	0	No
Soil	SVOCs	Total	Benzo(a)anthracene	0-1 ft	N/A	ug/kg	**Yes**	--	32,000	2,700	**Yes**	8	**Yes**
Soil	SVOCs	Total	Benzo(a)pyrene	0-1 ft	N/A	ug/kg	**Yes**	--	33,000	270	**Yes**	30	**Yes**
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	N/A	ug/kg	**Yes**	--	65,000	2,700	**Yes**	6	**Yes**
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	N/A	ug/kg	**Yes**	--	18,000	27,000	No	0	No
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	N/A	ug/kg	**Yes**	--	65,000	27,000	**Yes**	1	**Yes**
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-1 ft	N/A	ug/kg	**Yes**	--	14,700	2,700	**Yes**	4	**Yes**
Soil	SVOCs	Total	Benzoic Acid	0-1 ft	N/A	ug/kg	**Yes**	--	980	200,000	No	0	No
Soil	SVOCs	Total	Benzyl Alcohol	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	N/A	ug/kg	**Yes**	--	260,000	4,500	**Yes**	10	**Yes**
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	N/A	ug/kg	**Yes**	--	124	450	No	0	No
Soil	SVOCs	Total	Carbazole	0-1 ft	N/A	ug/kg	**Yes**	--	2,650	2,260	**Yes**	1	**Yes**
Soil	SVOCs	Total	Chrysene	0-1 ft	N/A	ug/kg	**Yes**	--	32,000	270,000	No	0	No
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	N/A	ug/kg	**Yes**	--	9,900	270	**Yes**	13	**Yes**
Soil	SVOCs	Total	Dibenzofuran	0-1 ft	N/A	ug/kg	**Yes**	--	810	2.00	**Yes**	27	**Yes**
Soil	SVOCs	Total	Diethyl Phthalate	0-1 ft	N/A	ug/kg	**Yes**	--	73.4	100,000	No	0	No

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
(5 of 16)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	SVOCs	Total	Dimethyl Phthalate	0-1 ft	N/A	ug/kg	**Yes**	--	41.0	150,000	No	0	No
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	N/A	ug/kg	**Yes**	--	1,800	450	**Yes**	1	**Yes**
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-1 ft	N/A	ug/kg	**Yes**	--	127	450	No	0	No
Soil	SVOCs	Total	Fluoranthene	0-1 ft	N/A	ug/kg	**Yes**	--	54,000	8,900,000	No	0	No
Soil	SVOCs	Total	Fluorene	0-1 ft	N/A	ug/kg	**Yes**	--	1,200	12,000,000	No	0	No
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	N/A	ug/kg	**Yes**	--	19,000	2,700	**Yes**	6	**Yes**
Soil	SVOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	**Yes**	--	823	23,000	No	0	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	Pentachlorophenol	0-1 ft	N/A	ug/kg	**Yes**	--	201	2,100	No	0	No
Soil	SVOCs	Total	Phenanthrene	0-1 ft	N/A	ug/kg	**Yes**	--	12,000	23,000	No	0	No
Soil	SVOCs	Total	Phenol	0-1 ft	N/A	ug/kg	No	--	3.70	30,000	No	0	No
Soil	SVOCs	Total	Pyrene	0-1 ft	N/A	ug/kg	**Yes**	--	40,000	6,700,000	No	0	No
Soil	SVOCs	Total	Total HPAHs (KM, capped)	0-1 ft	N/A	ug/kg	**Yes**	**--**	367,900	1,100	**Yes**	36	**Yes**
Soil	SVOCs	Total	Total LPAHs (KM, capped)	0-1 ft	N/A	ug/kg	**Yes**	**--**	18,674	29,000	No	0	No
Soil	SVOCs	Total	2-Methylnaphthalene	0-3 ft	N/A	ug/kg	**Yes**	--	1,530	4,100,000	No	0	No
Soil	SVOCs	Total	Acenaphthene	0-3 ft	N/A	ug/kg	**Yes**	--	3,200	19,000,000	No	0	No
Soil	SVOCs	Total	Acenaphthylene	0-3 ft	N/A	ug/kg	**Yes**	--	295	23,000	No	0	No
Soil	SVOCs	Total	Anthracene	0-3 ft	N/A	ug/kg	**Yes**	--	8,440	93,000,000	No	0	No
Soil	SVOCs	Total	Benzo(a)anthracene	0-3 ft	N/A	ug/kg	**Yes**	--	32,000	2,700	**Yes**	15	**Yes**
Soil	SVOCs	Total	Benzo(a)pyrene	0-3 ft	N/A	ug/kg	**Yes**	--	34,000	270	**Yes**	38	**Yes**
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-3 ft	N/A	ug/kg	**Yes**	--	65,000	2,700	**Yes**	10	**Yes**
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-3 ft	N/A	ug/kg	**Yes**	--	18,000	27,000	No	0	No
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-3 ft	N/A	ug/kg	**Yes**	--	65,000	27,000	**Yes**	1	**Yes**
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-3 ft	N/A	ug/kg	**Yes**	--	31,300	2,700	**Yes**	8	**Yes**
Soil	SVOCs	Total	Benzoic Acid	0-3 ft	N/A	ug/kg	**Yes**	--	980	200,000	No	0	No
Soil	SVOCs	Total	Benzyl Alcohol	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-3 ft	N/A	ug/kg	**Yes**	--	260,000	4,500	**Yes**	12	**Yes**
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-3 ft	N/A	ug/kg	**Yes**	--	124	450	No	0	No
Soil	SVOCs	Total	Carbazole	0-3 ft	N/A	ug/kg	**Yes**	--	2,840	2,260	**Yes**	2	**Yes**
Soil	SVOCs	Total	Chrysene	0-3 ft	N/A	ug/kg	**Yes**	--	35,300	270,000	No	0	No
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-3 ft	N/A	ug/kg	**Yes**	--	9,900	270	**Yes**	21	**Yes**
Soil	SVOCs	Total	Dibenzofuran	0-3 ft	N/A	ug/kg	**Yes**	--	810	2.00	**Yes**	32	**Yes**
Soil	SVOCs	Total	Diethyl Phthalate	0-3 ft	N/A	ug/kg	**Yes**	--	73.4	100,000	No	0	No
Soil	SVOCs	Total	Dimethyl Phthalate	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-3 ft	N/A	ug/kg	**Yes**	--	1,800	450	**Yes**	1	**Yes**
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-3 ft	N/A	ug/kg	**Yes**	--	127	450	No	0	No
Soil	SVOCs	Total	Fluoranthene	0-3 ft	N/A	ug/kg	**Yes**	--	54,000	8,900,000	No	0	No
Soil	SVOCs	Total	Fluorene	0-3 ft	N/A	ug/kg	**Yes**	--	1,610	12,000,000	No	0	No
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-3 ft	N/A	ug/kg	**Yes**	--	20,000	2,700	**Yes**	12	**Yes**
Soil	SVOCs	Total	Naphthalene	0-3 ft	N/A	ug/kg	**Yes**	--	823	23,000	No	0	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	Pentachlorophenol	0-3 ft	N/A	ug/kg	**Yes**	--	201	2,100	No	0	No
Soil	SVOCs	Total	Phenanthrene	0-3 ft	N/A	ug/kg	**Yes**	--	21,900	23,000	No	0	No
Soil	SVOCs	Total	Phenol	0-3 ft	N/A	ug/kg	**Yes**	--	35.0	30,000	No	0	No

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	SVOCs	Total	Pyrene	0-3 ft	N/A	ug/kg	**Yes**	--	67,100	6,700,000	No	0	No
Soil	SVOCs	Total	Total HPAHs (KM, capped)	0-3 ft	N/A	ug/kg	**Yes**	**--**	367,900	1,100	**Yes**	46	**Yes**
Soil	SVOCs	Total	Total LPAHs (KM, capped)	0-3 ft	N/A	ug/kg	**Yes**	**--**	34,767	29,000	No	1	No
Soil	SVOCs	Total	2-Methylnaphthalene	0-10 ft	N/A	ug/kg	**Yes**	--	1,530	4,100,000	No	0	No
Soil	SVOCs	Total	Acenaphthene	0-10 ft	N/A	ug/kg	**Yes**	--	3,200	19,000,000	No	0	No
Soil	SVOCs	Total	Acenaphthylene	0-10 ft	N/A	ug/kg	**Yes**	--	295	23,000	No	0	No
Soil	SVOCs	Total	Anthracene	0-10 ft	N/A	ug/kg	**Yes**	--	8,440	93,000,000	No	0	No
Soil	SVOCs	Total	Benzo(a)anthracene	0-10 ft	N/A	ug/kg	**Yes**	--	32,000	2,700	**Yes**	24	**Yes**
Soil	SVOCs	Total	Benzo(a)pyrene	0-10 ft	N/A	ug/kg	**Yes**	--	34,000	270	**Yes**	48	**Yes**
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-10 ft	N/A	ug/kg	**Yes**	--	65,000	2,700	**Yes**	10	**Yes**
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-10 ft	N/A	ug/kg	**Yes**	--	18,000	27,000	No	0	No
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-10 ft	N/A	ug/kg	**Yes**	--	65,000	27,000	**Yes**	1	**Yes**
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-10 ft	N/A	ug/kg	**Yes**	--	31,300	2,700	**Yes**	17	**Yes**
Soil	SVOCs	Total	Benzoic Acid	0-10 ft	N/A	ug/kg	**Yes**	--	980	2,500,000,000	No	0	No
Soil	SVOCs	Total	Benzyl Alcohol	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-10 ft	N/A	ug/kg	**Yes**	--	260,000	150,000	**Yes**	1	**Yes**
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-10 ft	N/A	ug/kg	**Yes**	--	152	910,000	No	0	No
Soil	SVOCs	Total	Carbazole	0-10 ft	N/A	ug/kg	**Yes**	--	2,840	NV	***Yes***	--	***Yes***
Soil	SVOCs	Total	Chrysene	0-10 ft	N/A	ug/kg	**Yes**	--	35,300	270,000	No	0	No
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-10 ft	N/A	ug/kg	**Yes**	--	9,900	270	**Yes**	28	**Yes**
Soil	SVOCs	Total	Dibenzofuran	0-10 ft	N/A	ug/kg	**Yes**	--	810	1,000,000	No	0	No
Soil	SVOCs	Total	Diethyl Phthalate	0-10 ft	N/A	ug/kg	**Yes**	--	73.4	490,000,000	No	0	No
Soil	SVOCs	Total	Dimethyl Phthalate	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-10 ft	N/A	ug/kg	**Yes**	--	1,800	62,000,000	No	0	No
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-10 ft	N/A	ug/kg	**Yes**	--	127	150,000	No	0	No
Soil	SVOCs	Total	Fluoranthene	0-10 ft	N/A	ug/kg	**Yes**	--	54,000	8,900,000	No	0	No
Soil	SVOCs	Total	Fluorene	0-10 ft	N/A	ug/kg	**Yes**	--	1,610	12,000,000	No	0	No
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-10 ft	N/A	ug/kg	**Yes**	--	20,000	2,700	**Yes**	19	**Yes**
Soil	SVOCs	Total	Naphthalene	0-10 ft	N/A	ug/kg	**Yes**	--	1,710	23,000	No	0	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	SVOCs	Total	Pentachlorophenol	0-10 ft	N/A	ug/kg	**Yes**	--	201	13,000	No	0	No
Soil	SVOCs	Total	Phenanthrene	0-10 ft	N/A	ug/kg	**Yes**	--	21,900	23,000	No	0	No
Soil	SVOCs	Total	Phenol	0-10 ft	N/A	ug/kg	**Yes**	--	35.0	180,000,000	No	0	No
Soil	SVOCs	Total	Pyrene	0-10 ft	N/A	ug/kg	**Yes**	--	67,100	6,700,000	No	0	No
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	1,1-Dichloroethane	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	N/A	ug/kg	**Yes**	--	14,300	200,000	No	0	No
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	N/A	ug/kg	**Yes**	--	5,410	150,000	No	0	No
Soil	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	2-Butanone (MEK)	0-1 ft	N/A	ug/kg	**Yes**	--	50.0	200,000,000	No	0	No
Soil	VOCs	Total	2-Hexanone	0-1 ft	N/A	ug/kg	**Yes**	--	8.80	1,250,000	No	0	No
Soil	VOCs	Total	4-Isopropyltoluene	0-1 ft	N/A	ug/kg	**Yes**	--	12.0	200,000	No	0	No
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	N/A	ug/kg	**Yes**	--	1.20	1,250,000	No	0	No
Soil	VOCs	Total	Acetone	0-1 ft	N/A	ug/kg	**Yes**	--	540	1,250,000	No	0	No
Soil	VOCs	Total	Benzene	0-1 ft	N/A	ug/kg	**Yes**	--	1.20	1,200	No	0	No

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
(7 of 16)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	VOCs	Total	Bromomethane	0-1 ft	N/A	ug/kg	**Yes**	--	5.00	17,000	No	0	No
Soil	VOCs	Total	Carbon Disulfide	0-1 ft	N/A	ug/kg	**Yes**	--	6.90	1,000,000	No	0	No
Soil	VOCs	Total	Chloroform	0-1 ft	N/A	ug/kg	**Yes**	--	19.0	410	No	0	No
Soil	VOCs	Total	Chloromethane	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Dichlorodifluoromethane	0-1 ft	N/A	ug/kg	**Yes**	--	94.0	730,000	No	0	No
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	N/A	ug/kg	**Yes**	--	460	20,000	No	0	No
Soil	VOCs	Total	Ethylbenzene	0-1 ft	N/A	ug/kg	**Yes**	--	2,700	2,260	**Yes**	1	**Yes**
Soil	VOCs	Total	Isopropylbenzene	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	m,p-Xylenes	0-1 ft	N/A	ug/kg	**Yes**	--	9,800	120,000	No	0	No
Soil	VOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	**Yes**	--	8,360	23,000	No	0	No
Soil	VOCs	Total	n-Butylbenzene	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	n-Propylbenzene	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	o-Xylene	0-1 ft	N/A	ug/kg	**Yes**	--	0.180	1,000	No	0	No
Soil	VOCs	Total	sec-Butylbenzene	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Styrene	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	N/A	ug/kg	**Yes**	--	65.0	1,600	No	0	No
Soil	VOCs	Total	Toluene	0-1 ft	N/A	ug/kg	**Yes**	--	5.80	200,000	No	0	No
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Trichloroethene (TCE)	0-1 ft	N/A	ug/kg	**Yes**	--	0.171	130	No	0	No
Soil	VOCs	Total	Trichlorofluoromethane	0-1 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	1,1-Dichloroethane	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-3 ft	N/A	ug/kg	**Yes**	--	14,300	200,000	No	0	No
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-3 ft	N/A	ug/kg	**Yes**	--	6,500	150,000	No	0	No
Soil	VOCs	Total	1,4-Dichlorobenzene	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	2-Butanone (MEK)	0-3 ft	N/A	ug/kg	**Yes**	--	50.0	200,000,000	No	0	No
Soil	VOCs	Total	2-Hexanone	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	4-Isopropyltoluene	0-3 ft	N/A	ug/kg	**Yes**	--	161	200,000	No	0	No
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-3 ft	N/A	ug/kg	**Yes**	--	1.20	1,250,000	No	0	No
Soil	VOCs	Total	Acetone	0-3 ft	N/A	ug/kg	**Yes**	--	540	1,250,000	No	0	No
Soil	VOCs	Total	Benzene	0-3 ft	N/A	ug/kg	**Yes**	--	1.20	1,200	No	0	No
Soil	VOCs	Total	Bromomethane	0-3 ft	N/A	ug/kg	**Yes**	--	5.00	17,000	No	0	No
Soil	VOCs	Total	Carbon Disulfide	0-3 ft	N/A	ug/kg	**Yes**	--	6.90	1,000,000	No	0	No
Soil	VOCs	Total	Chloroform	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Chloromethane	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Dichlorodifluoromethane	0-3 ft	N/A	ug/kg	**Yes**	--	94.0	730,000	No	0	No
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-3 ft	N/A	ug/kg	**Yes**	--	460	20,000	No	0	No
Soil	VOCs	Total	Ethylbenzene	0-3 ft	N/A	ug/kg	**Yes**	--	2,700	2,260	**Yes**	1	**Yes**
Soil	VOCs	Total	Isopropylbenzene	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	m,p-Xylenes	0-3 ft	N/A	ug/kg	**Yes**	--	9,800	120,000	No	0	No
Soil	VOCs	Total	Naphthalene	0-3 ft	N/A	ug/kg	**Yes**	--	8,360	23,000	No	0	No
Soil	VOCs	Total	n-Butylbenzene	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	n-Propylbenzene	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	o-Xylene	0-3 ft	N/A	ug/kg	**Yes**	--	3,200	1,000	**Yes**	1	**Yes**

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
(8 of 16)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil	VOCs	Total	sec-Butylbenzene	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Styrene	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-3 ft	N/A	ug/kg	**Yes**	--	420,000	1,600	**Yes**	2	**Yes**
Soil	VOCs	Total	Toluene	0-3 ft	N/A	ug/kg	**Yes**	--	39,000	200,000	No	0	No
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Trichloroethene (TCE)	0-3 ft	N/A	ug/kg	**Yes**	--	6,080	130	**Yes**	2	**Yes**
Soil	VOCs	Total	Trichlorofluoromethane	0-3 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	1,1-Dichloroethane	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-10 ft	N/A	ug/kg	**Yes**	--	14,300	980,000	No	0	No
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-10 ft	N/A	ug/kg	**Yes**	--	6,500	150,000	No	0	No
Soil	VOCs	Total	1,4-Dichlorobenzene	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	2-Butanone (MEK)	0-10 ft	N/A	ug/kg	**Yes**	--	50.0	200,000,000	No	0	No
Soil	VOCs	Total	2-Hexanone	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	4-Isopropyltoluene	0-10 ft	N/A	ug/kg	**Yes**	--	161	NV	***Yes***	--	***Yes***
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-10 ft	N/A	ug/kg	**Yes**	--	1.20	53,000,000	No	0	No
Soil	VOCs	Total	Acetone	0-10 ft	N/A	ug/kg	**Yes**	--	540	630,000,000	No	0	No
Soil	VOCs	Total	Benzene	0-10 ft	N/A	ug/kg	**Yes**	--	1.20	1,200	No	0	No
Soil	VOCs	Total	Bromomethane	0-10 ft	N/A	ug/kg	**Yes**	--	5.00	17,000	No	0	No
Soil	VOCs	Total	Carbon Disulfide	0-10 ft	N/A	ug/kg	**Yes**	--	6.90	3,700,000	No	0	No
Soil	VOCs	Total	Chloroform	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Chloromethane	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-10 ft	N/A	ug/kg	**Yes**	--	120	3,100,000	No	0	No
Soil	VOCs	Total	Dichlorodifluoromethane	0-10 ft	N/A	ug/kg	**Yes**	--	94.0	780,000	No	0	No
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-10 ft	N/A	ug/kg	**Yes**	--	460	20,000	No	0	No
Soil	VOCs	Total	Ethylbenzene	0-10 ft	N/A	ug/kg	**Yes**	--	2,700	12,000	No	0	No
Soil	VOCs	Total	Isopropylbenzene	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	m,p-Xylenes	0-10 ft	N/A	ug/kg	**Yes**	--	9,800	2,700,000	No	0	No
Soil	VOCs	Total	Naphthalene	0-10 ft	N/A	ug/kg	**Yes**	--	8,360	23,000	No	0	No
Soil	VOCs	Total	n-Butylbenzene	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	n-Propylbenzene	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	o-Xylene	0-10 ft	N/A	ug/kg	**Yes**	--	4,260	19,000,000	No	0	No
Soil	VOCs	Total	sec-Butylbenzene	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Styrene	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-10 ft	N/A	ug/kg	**Yes**	--	420,000	1,600	**Yes**	3	**Yes**
Soil	VOCs	Total	Toluene	0-10 ft	N/A	ug/kg	**Yes**	--	133,000	24,000,000	No	0	No
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Soil	VOCs	Total	Trichloroethene (TCE)	0-10 ft	N/A	ug/kg	**Yes**	--	6,080	130	**Yes**	2	**Yes**
Soil	VOCs	Total	Trichlorofluoromethane	0-10 ft	N/A	ug/kg	No	--	--	--	--	--	No
Lagoon Sediment	Metals	Total	Copper	N/A	N/A	mg/kg	--	--	25.4	55.6	No	0	No
Lagoon Sediment	Metals	Total	Lead	N/A	N/A	mg/kg	--	--	33.0	35	No	0	No
Lagoon Sediment	Metals	Total	Nickel	N/A	N/A	mg/kg	--	--	15.4	21.2	No	0	No
Lagoon Sediment	Metals	Total	Zinc	N/A	N/A	mg/kg	--	--	174	123	**Yes**	5	**Yes**
Groundwater[3]	Metals	Dissolved	Arsenic	N/A	N/A	mg/L	**Yes**	**Yes**	0.0193	0.0000180	**Yes**	49	**Yes**
Groundwater[3]	Metals	Dissolved	Barium	N/A	N/A	mg/L	--	**Yes**	0.134	0.00400	**Yes**	3	**Yes**

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
(9 of 16)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Groundwater[3]	Metals	Dissolved	Calcium	N/A	N/A	mg/L	--	**Yes**	172	116	**Yes**	1	**Yes**
Groundwater[3]	Metals	Dissolved	Iron	N/A	N/A	mg/L	**Yes**	**Yes**	35.4	0.300	**Yes**	16	**Yes**
Groundwater[3]	Metals	Dissolved	Lead	N/A	N/A	mg/L	**Yes**	**Yes**	0.00350	0.00144	**Yes**	3	**Yes**
Groundwater[3]	Metals	Dissolved	Magnesium	N/A	N/A	mg/L	--	**Yes**	25.8	82.0	No	0	No
Groundwater[3]	Metals	Dissolved	Manganese	N/A	N/A	mg/L	**Yes**	**Yes**	5.55	0.0500	**Yes**	20	**Yes**
Groundwater[3]	Metals	Dissolved	Nickel	N/A	N/A	mg/L	--	**Yes**	0.0187	0.0340	No	0	No
Groundwater[3]	Metals	Dissolved	Potassium	N/A	N/A	mg/L	--	**Yes**	12.9	53.0	No	0	No
Groundwater[3]	Metals	Dissolved	Sodium	N/A	N/A	mg/L	--	**Yes**	740	680	**Yes**	1	**Yes**
Groundwater[3]	Metals	Dissolved	Vanadium	N/A	N/A	mg/L	**Yes**	**Yes**	0.00310	0.00260	**Yes**	1	**Yes**
Groundwater[3]	Metals	Dissolved	Zinc	N/A	N/A	mg/L	--	**Yes**	0.197	0.077	**Yes**	1	**Yes**
Groundwater[3]	Metals	Total	Antimony	N/A	N/A	mg/L	--	**Yes**	0.00389	0.00560	No	0	No
Groundwater[3]	Metals	Total	Arsenic	N/A	N/A	mg/L	**Yes**	**Yes**	0.0213	0.0000180	**Yes**	63	**Yes**
Groundwater[3]	Metals	Total	Barium	N/A	N/A	mg/L	--	**Yes**	0.304	1.00	No	0	No
Groundwater[3]	Metals	Total	Beryllium	N/A	N/A	mg/L	--	**Yes**	0.000435	0.0730	No	0	No
Groundwater[3]	Metals	Total	Cadmium	N/A	N/A	mg/L	--	**Yes**	0.00560	0.0180	No	0	No
Groundwater[3]	Metals	Total	Chromium	N/A	N/A	mg/L	--	**Yes**	0.0185	55.0	No	0	No
Groundwater[3]	Metals	Total	Copper	N/A	N/A	mg/L	--	**Yes**	0.201	1.30	No	0	No
Groundwater[3]	Metals	Total	Iron	N/A	N/A	mg/L	**Yes**	**Yes**	42.9	0.300	**Yes**	36	**Yes**
Groundwater[3]	Metals	Total	Lead	N/A	N/A	mg/L	**Yes**	**Yes**	0.0782	0.0150	**Yes**	2	**Yes**
Groundwater[3]	Metals	Total	Manganese	N/A	N/A	mg/L	**Yes**	**Yes**	5.39	0.0500	**Yes**	35	**Yes**
Groundwater[3]	Metals	Total	Mercury	N/A	N/A	mg/L	**Yes**	**Yes**	0.000330	0.0110	No	0	No
Groundwater[3]	Metals	Total	Nickel	N/A	N/A	mg/L	--	**Yes**	0.117	0.610	No	0	No
Groundwater[3]	Metals	Total	Selenium	N/A	N/A	mg/L	--	**Yes**	0.0329	0.170	No	0	No
Groundwater[3]	Metals	Total	Silver	N/A	N/A	mg/L	--	**Yes**	0.000658	0.180	No	0	No
Groundwater[3]	Metals	Total	Thallium	N/A	N/A	mg/L	--	**Yes**	0.000323	0.000240	**Yes**	2	**Yes**
Groundwater[3]	Metals	Total	Vanadium	N/A	N/A	mg/L	**Yes**	**Yes**	0.00590	0.00260	**Yes**	1	**Yes**
Groundwater[3]	Metals	Total	Zinc	N/A	N/A	mg/L	--	**Yes**	2.66	7.40	No	0	No
Groundwater[3]	Butyltins	Total	Dibutyltin	N/A	N/A	ug/L	**Yes**	--	0.447	0.0630	**Yes**	6	**Yes**
Groundwater[3]	Butyltins	Total	Monobutyltin	N/A	N/A	ug/L	**Yes**	--	0.240	0.0630	**Yes**	1	**Yes**
Groundwater[3]	Butyltins	Total	Tributyltin	N/A	N/A	ug/L	**--**	--	0.0601	0.0630	No	0	No
Groundwater[3]	Herbicides	Total	4-Nitrophenol	N/A	N/A	ug/L	--	--	0.840	150	No	0	No
Groundwater[3]	Herbicides	Total	Dichloroprop	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	Herbicides	Total	Pentachlorophenol	N/A	N/A	ug/L	--	--	0.112	0.270	No	0	No
Groundwater[3]	Pesticides	Total	4,4'-DDE	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	Pesticides	Total	Dieldrin	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	NWTPH-Dx	Total	Diesel Range Organics	N/A	N/A	mg/L	**Yes**	--	1.80	0.0900	**Yes**	30	**Yes**
Groundwater[3]	NWTPH-Dx	Total	Residual Range Organics	N/A	N/A	mg/L	**Yes**	--	1.90	0.290	**Yes**	12	**Yes**
Groundwater[3]	NWTPH-Gx	Total	Gasoline Range Organics	N/A	N/A	mg/L	**Yes**	--	0.430	0.100	**Yes**	5	**Yes**
Groundwater[3]	SVOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	SVOCs	Total	2-Methylnaphthalene	N/A	N/A	ug/L	**Yes**	--	0.360	72.2	No	0	No
Groundwater[3]	SVOCs	Total	2-Methylphenol	N/A	N/A	ug/L	No	--	--	--	--	--	No

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Groundwater[3]	SVOCs	Total	Acenaphthene	N/A	N/A	ug/L	**Yes**	--	0.239	520	No	0	No
Groundwater[3]	SVOCs	Total	Anthracene	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	SVOCs	Total	Benzo(b)fluoranthene	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	SVOCs	Total	Benzoic Acid	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	N/A	ug/L	**Yes**	--	48.0	1.20	**Yes**	6	**Yes**
Groundwater[3]	SVOCs	Total	Diethyl Phthalate	N/A	N/A	ug/L	**Yes**	--	1.90	210	No	0	No
Groundwater[3]	SVOCs	Total	Dimethyl Phthalate	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	SVOCs	Total	Di-n-octyl Phthalate	N/A	N/A	ug/L	**Yes**	--	7.08	1.20	**Yes**	3	**Yes**
Groundwater[3]	SVOCs	Total	Isophorone	N/A	N/A	ug/L	**Yes**	--	0.282	35.0	No	0	No
Groundwater[3]	SVOCs	Total	Naphthalene	N/A	N/A	ug/L	**Yes**	--	0.157	0.140	**Yes**	1	**Yes**
Groundwater[3]	SVOCs	Total	p-cresol (4-Methylphenol)	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	SVOCs	Total	Phenanthrene	N/A	N/A	ug/L	**Yes**	--	3.90	0.140	**Yes**	4	**Yes**
Groundwater[3]	SVOCs	Total	Phenol	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	SVOCs	Total	Pyrene	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/L	**Yes**	--	1.90	11.0	No	0	No
Groundwater[3]	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/L	**Yes**	--	5.00	2.30	**Yes**	1	**Yes**
Groundwater[3]	VOCs	Total	1,1-Dichloroethene	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/L	**Yes**	--	5.20	7.30	No	0	No
Groundwater[3]	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	VOCs	Total	Acetone	N/A	N/A	ug/L	**Yes**	--	15.4	1500	No	0	No
Groundwater[3]	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/L	**Yes**	--	3.95	0.920	**Yes**	1	**Yes**
Groundwater[3]	VOCs	Total	Carbon Tetrachloride	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	VOCs	Total	Chloroform	N/A	N/A	ug/L	**Yes**	--	3.70	0.190	**Yes**	7	**Yes**
Groundwater[3]	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/L	**Yes**	--	660	360	**Yes**	4	**Yes**
Groundwater[3]	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	VOCs	Total	Ethylbenzene	N/A	N/A	ug/L	No	--	--	--	--	--	No
Groundwater[3]	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/L	**Yes**	--	4.60	7.30	No	0	No
Groundwater[3]	VOCs	Total	n-Propylbenzene	N/A	N/A	ug/L	**Yes**	--	2.00	7.30	No	0	No
Groundwater[3]	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/L	**Yes**	--	8.78	0.0930	**Yes**	29	**Yes**
Groundwater[3]	VOCs	Total	Toluene	N/A	N/A	ug/L	**Yes**	--	0.640	9.80	No	0	No
Groundwater[3]	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/L	**Yes**	--	1.70	110	No	0	No
Groundwater[3]	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/L	**Yes**	--	3.40	0.0390	**Yes**	15	**Yes**
Groundwater[3]	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/L	**Yes**	--	4.10	0.0250	**Yes**	20	**Yes**
Groundwater - DP[3]	Metals	Dissolved	Aluminum	N/A	N/A	mg/L	--	--	1.37	0.0870	**Yes**	2	**Yes**
Groundwater - DP[3]	Metals	Dissolved	Antimony	N/A	N/A	mg/L	--	--	0.00167	0.00560	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Arsenic	N/A	N/A	mg/L	--	--	0.00136	0.0000180	**Yes**	10	**Yes**
Groundwater - DP[3]	Metals	Dissolved	Barium	N/A	N/A	mg/L	--	--	0.0207	0.00400	**Yes**	8	**Yes**
Groundwater - DP[3]	Metals	Dissolved	Cadmium	N/A	N/A	mg/L	--	--	0.0000300	0.000170	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Calcium	N/A	N/A	mg/L	--	--	34.1	116	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Chromium	N/A	N/A	mg/L	--	--	0.00429	0.0540	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Cobalt	N/A	N/A	mg/L	--	--	0.00508	0.0110	No	0	No

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Groundwater - DP[3]	Metals	Dissolved	Copper	N/A	N/A	mg/L	--	--	0.00438	0.00580	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Iron	N/A	N/A	mg/L	--	--	0.476	0.300	**Yes**	1	**Yes**
Groundwater - DP[3]	Metals	Dissolved	Lead	N/A	N/A	mg/L	--	--	0.000378	0.00144	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Magnesium	N/A	N/A	mg/L	--	--	12.0	82.0	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Manganese	N/A	N/A	mg/L	--	--	0.587	0.0500	**Yes**	4	**Yes**
Groundwater - DP[3]	Metals	Dissolved	Mercury	N/A	N/A	mg/L	--	--	0.0000600	0.000770	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Nickel	N/A	N/A	mg/L	--	--	0.00390	0.0340	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Potassium	N/A	N/A	mg/L	--	--	2.21	53.0	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Selenium	N/A	N/A	mg/L	--	--	0.00130	0.00500	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Silver	N/A	N/A	mg/L	--	--	0.0000790	0.000120	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Sodium	N/A	N/A	mg/L	--	--	47.7	680	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Thallium	N/A	N/A	mg/L	--	--	0.0000855	0.000240	No	0	No
Groundwater - DP[3]	Metals	Dissolved	Vanadium	N/A	N/A	mg/L	--	--	0.00261	0.00260	**Yes**	1	**Yes**
Groundwater - DP[3]	Metals	Dissolved	Zinc	N/A	N/A	mg/L	--	--	0.00410	0.077	No	0	No
Groundwater - DP[3]	Metals	Total	Aluminum	N/A	N/A	mg/L	--	--	17.9	37.0	No	0	No
Groundwater - DP[3]	Metals	Total	Antimony	N/A	N/A	mg/L	--	--	0.00157	0.00560	No	0	No
Groundwater - DP[3]	Metals	Total	Arsenic	N/A	N/A	mg/L	--	--	0.00770	0.0000180	**Yes**	8	**Yes**
Groundwater - DP[3]	Metals	Total	Barium	N/A	N/A	mg/L	--	--	0.0978	1.00	No	0	No
Groundwater - DP[3]	Metals	Total	Beryllium	N/A	N/A	mg/L	--	--	0.000785	0.0730	No	0	No
Groundwater - DP[3]	Metals	Total	Calcium	N/A	N/A	mg/L	--	--	33.7	NV	***Yes***	--	***Yes***
Groundwater - DP[3]	Metals	Total	Chromium	N/A	N/A	mg/L	--	--	0.0318	55.0	No	0	No
Groundwater - DP[3]	Metals	Total	Cobalt	N/A	N/A	mg/L	--	--	0.0131	0.0110	**Yes**	1	**Yes**
Groundwater - DP[3]	Metals	Total	Copper	N/A	N/A	mg/L	--	--	0.204	1.30	No	0	No
Groundwater - DP[3]	Metals	Total	Iron	N/A	N/A	mg/L	--	--	25.9	0.300	**Yes**	8	**Yes**
Groundwater - DP[3]	Metals	Total	Lead	N/A	N/A	mg/L	--	--	0.0137	0.0150	No	0	No
Groundwater - DP[3]	Metals	Total	Magnesium	N/A	N/A	mg/L	--	--	15.4	NV	***Yes***	--	***Yes***
Groundwater - DP[3]	Metals	Total	Manganese	N/A	N/A	mg/L	--	--	0.709	0.0500	**Yes**	7	**Yes**
Groundwater - DP[3]	Metals	Total	Mercury	N/A	N/A	mg/L	--	--	0.000100	0.0110	No	0	No
Groundwater - DP[3]	Metals	Total	Nickel	N/A	N/A	mg/L	--	--	0.0501	0.610	No	0	No
Groundwater - DP[3]	Metals	Total	Potassium	N/A	N/A	mg/L	--	--	3.21	NV	***Yes***	--	***Yes***
Groundwater - DP[3]	Metals	Total	Selenium	N/A	N/A	mg/L	--	--	0.00206	0.170	No	0	No
Groundwater - DP[3]	Metals	Total	Silver	N/A	N/A	mg/L	--	--	0.000376	0.180	No	0	No
Groundwater - DP[3]	Metals	Total	Sodium	N/A	N/A	mg/L	--	--	42.9	NV	***Yes***	--	***Yes***
Groundwater - DP[3]	Metals	Total	Thallium	N/A	N/A	mg/L	--	--	0.000146	0.000240	No	0	No
Groundwater - DP[3]	Metals	Total	Vanadium	N/A	N/A	mg/L	--	--	0.0776	0.00260	**Yes**	7	**Yes**
Groundwater - DP[3]	Metals	Total	Zinc	N/A	N/A	mg/L	--	--	0.149	7.40	No	0	No
Groundwater - DP[3]	Butyltins	Total	Monobutyltin	N/A	N/A	ug/L	--	--	0.00671	0.0630	No	0	No
Groundwater - DP[3]	Butyltins	Total	Tributyltin	N/A	N/A	ug/L	--	--	0.00435	0.0630	No	0	No
Groundwater - DP[3]	Pesticides	Total	BHC (gamma) Lindane	N/A	N/A	ug/L	--	--	0.00249	0.0520	No	0	No
Groundwater - DP[3]	Pesticides	Total	Methoxychlor	N/A	N/A	ug/L	--	--	0.00521	0.0300	No	0	No
Groundwater - DP[3]	NWTPH-Dx	Total	Residual Range Organics	N/A	N/A	mg/L	--	--	0.113	0.290	No	0	No

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
(12 of 16)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Groundwater - DP[3]	NWTPH-Gx	Total	Gasoline Range Organics	N/A	N/A	mg/L	--	--	0.0209	0.100	No	0	No
Groundwater - DP[3]	SVOCs	Dissolved	2-Methylnaphthalene	N/A	N/A	ug/L	--	--	0.280	72.2	No	0	No
Groundwater - DP[3]	SVOCs	Dissolved	Acenaphthene	N/A	N/A	ug/L	--	--	0.0348	520	No	0	No
Groundwater - DP[3]	SVOCs	Dissolved	Acenaphthylene	N/A	N/A	ug/L	--	--	0.00361	0.140	No	0	No
Groundwater - DP[3]	SVOCs	Dissolved	Benzo(a)pyrene	N/A	N/A	ug/L	--	--	0.00714	0.00290	**Yes**	1	**Yes**
Groundwater - DP[3]	SVOCs	Dissolved	Benzoic Acid	N/A	N/A	ug/L	--	--	0.317	42.0	No	0	No
Groundwater - DP[3]	SVOCs	Dissolved	Butyl Benzyl Phthalate	N/A	N/A	ug/L	--	--	0.155	19.0	No	0	No
Groundwater - DP[3]	SVOCs	Dissolved	Dibenz(a,h)anthracene	N/A	N/A	ug/L	--	--	0.00381	0.00290	**Yes**	1	**Yes**
Groundwater - DP[3]	SVOCs	Dissolved	Diethyl Phthalate	N/A	N/A	ug/L	--	--	0.101	210	No	0	No
Groundwater - DP[3]	SVOCs	Dissolved	Di-n-butyl Phthalate	N/A	N/A	ug/L	--	--	0.207	35.0	No	0	No
Groundwater - DP[3]	SVOCs	Dissolved	Fluorene	N/A	N/A	ug/L	--	--	0.0116	3.90	No	0	No
Groundwater - DP[3]	SVOCs	Dissolved	Indeno(1,2,3-cd)pyrene	N/A	N/A	ug/L	--	--	0.00630	0.00380	**Yes**	1	**Yes**
Groundwater - DP[3]	SVOCs	Dissolved	Isophorone	N/A	N/A	ug/L	--	--	0.0782	35.0	No	0	No
Groundwater - DP[3]	SVOCs	Dissolved	Naphthalene	N/A	N/A	ug/L	--	--	0.200	0.140	**Yes**	3	**Yes**
Groundwater - DP[3]	SVOCs	Dissolved	Phenanthrene	N/A	N/A	ug/L	--	--	0.0190	0.140	No	0	No
Groundwater - DP[3]	SVOCs	Dissolved	Phenol	N/A	N/A	ug/L	--	--	0.0248	110	No	0	No
Groundwater - DP[3]	SVOCs	Total	2-Methylnaphthalene	N/A	N/A	ug/L	--	--	0.153	72.2	No	0	No
Groundwater - DP[3]	SVOCs	Total	Acenaphthene	N/A	N/A	ug/L	--	--	0.0230	520	No	0	No
Groundwater - DP[3]	SVOCs	Total	Anthracene	N/A	N/A	ug/L	--	--	0.0126	0.140	No	0	No
Groundwater - DP[3]	SVOCs	Total	Benzo(a)pyrene	N/A	N/A	ug/L	--	--	0.00895	0.00290	**Yes**	1	**Yes**
Groundwater - DP[3]	SVOCs	Total	Benzofluoranthenes, Total	N/A	N/A	ug/L	--	--	0.0173	0.00380	**Yes**	1	**Yes**
Groundwater - DP[3]	SVOCs	Total	Benzyl Alcohol	N/A	N/A	ug/L	--	--	0.0523	8.60	No	0	No
Groundwater - DP[3]	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	N/A	ug/L	--	--	0.408	1.20	**Yes**	0	No
Groundwater - DP[3]	SVOCs	Total	Butyl Benzyl Phthalate	N/A	N/A	ug/L	--	--	0.228	19.0	No	0	No
Groundwater - DP[3]	SVOCs	Total	Dibenz(a,h)anthracene	N/A	N/A	ug/L	--	--	0.00671	0.00290	**Yes**	1	**Yes**
Groundwater - DP[3]	SVOCs	Total	Dibenzofuran	N/A	N/A	ug/L	--	--	0.0421	3.70	No	0	No
Groundwater - DP[3]	SVOCs	Total	Di-n-butyl Phthalate	N/A	N/A	ug/L	--	--	0.239	35.0	No	0	No
Groundwater - DP[3]	SVOCs	Total	Fluoranthene	N/A	N/A	ug/L	--	--	0.0311	35.0	No	0	No
Groundwater - DP[3]	SVOCs	Total	Fluorene	N/A	N/A	ug/L	--	--	0.0351	3.90	No	0	No
Groundwater - DP[3]	SVOCs	Total	Indeno(1,2,3-cd)pyrene	N/A	N/A	ug/L	--	--	0.00797	0.00380	**Yes**	1	**Yes**
Groundwater - DP[3]	SVOCs	Total	Isophorone	N/A	N/A	ug/L	--	--	0.0842	35.0	No	0	No
Groundwater - DP[3]	SVOCs	Total	Naphthalene	N/A	N/A	ug/L	--	--	0.0452	0.140	No	0	No
Groundwater - DP[3]	SVOCs	Total	Phenanthrene	N/A	N/A	ug/L	--	--	0.144	0.140	**Yes**	1	**Yes**
Groundwater - DP[3]	SVOCs	Total	Phenol	N/A	N/A	ug/L	--	--	0.0291	110	No	0	No
Groundwater - DP[3]	SVOCs	Total	Pyrene	N/A	N/A	ug/L	--	--	0.0261	10.1	No	0	No
Groundwater - DP[3]	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/L	--	--	2.23	11.0	No	0	No
Groundwater - DP[3]	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/L	--	--	2.52	2.30	**Yes**	1	**Yes**
Groundwater - DP[3]	VOCs	Total	1,1-Dichloroethene	N/A	N/A	ug/L	--	--	1.17	25.0	No	0	No
Groundwater - DP[3]	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/L	--	--	0.0485	7.30	No	0	No
Groundwater - DP[3]	VOCs	Total	1,3,5-Trimethylbenzene	N/A	N/A	ug/L	--	--	0.0297	7.30	No	0	No
Groundwater - DP[3]	VOCs	Total	2,2-Dichloropropane	N/A	N/A	ug/L	--	--	0.179	0.390	No	0	No

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
(13 of 16)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Groundwater - DP[3]	VOCs	Total	Acetone	N/A	N/A	ug/L	--	--	3.88	1500	No	0	No
Groundwater - DP[3]	VOCs	Total	Benzene	N/A	N/A	ug/L	--	--	0.137	0.390	No	0	No
Groundwater - DP[3]	VOCs	Total	Bromoform	N/A	N/A	ug/L	--	--	0.151	4.30	No	0	No
Groundwater - DP[3]	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/L	--	--	0.0619	0.920	No	0	No
Groundwater - DP[3]	VOCs	Total	Chloroform	N/A	N/A	ug/L	--	--	0.174	0.190	No	0	No
Groundwater - DP[3]	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/L	--	--	341	360	No	0	No
Groundwater - DP[3]	VOCs	Total	Ethylbenzene	N/A	N/A	ug/L	--	--	0.045	1.40	No	0	No
Groundwater - DP[3]	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/L	--	--	0.0197	7.30	No	0	No
Groundwater - DP[3]	VOCs	Total	m,p-Xylenes	N/A	N/A	ug/L	--	--	0.132	13.0	No	0	No
Groundwater - DP[3]	VOCs	Total	Naphthalene	N/A	N/A	ug/L	--	--	0.0452	0.140	No	0	No
Groundwater - DP[3]	VOCs	Total	o-Xylene	N/A	N/A	ug/L	--	--	0.0735	350	No	0	No
Groundwater - DP[3]	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/L	--	--	54.5	0.0930	**Yes**	10	**Yes**
Groundwater - DP[3]	VOCs	Total	Toluene	N/A	N/A	ug/L	--	--	0.299	9.80	No	0	No
Groundwater - DP[3]	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/L	--	--	1.80	110	No	0	No
Groundwater - DP[3]	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/L	--	--	43.7	0.0390	**Yes**	9	**Yes**
Groundwater - DP[3]	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/L	--	--	0.611	0.0250	**Yes**	2	**Yes**
Seep Water[3]	Metals	Dissolved	Antimony	N/A	N/A	mg/L	--	--	0.00228	0.00560	No	0	No
Seep Water[3]	Metals	Dissolved	Arsenic	N/A	N/A	mg/L	--	--	0.00100	0.0000180	**Yes**	3	**Yes**
Seep Water[3]	Metals	Dissolved	Barium	N/A	N/A	mg/L	--	--	0.277	0.00400	**Yes**	1	**Yes**
Seep Water[3]	Metals	Dissolved	Calcium	N/A	N/A	mg/L	--	--	76.4	116	No	0	No
Seep Water[3]	Metals	Dissolved	Copper	N/A	N/A	mg/L	--	--	0.00109	0.00580	No	0	No
Seep Water[3]	Metals	Dissolved	Iron	N/A	N/A	mg/L	--	--	3.21	0.300	**Yes**	1	**Yes**
Seep Water[3]	Metals	Dissolved	Lead	N/A	N/A	mg/L	--	--	0.0000650	0.00144	No	0	No
Seep Water[3]	Metals	Dissolved	Magnesium	N/A	N/A	mg/L	--	--	16.6	82.0	No	0	No
Seep Water[3]	Metals	Dissolved	Manganese	N/A	N/A	mg/L	--	--	1.48	0.0500	**Yes**	1	**Yes**
Seep Water[3]	Metals	Dissolved	Nickel	N/A	N/A	mg/L	--	--	0.00222	0.0340	No	0	No
Seep Water[3]	Metals	Dissolved	Potassium	N/A	N/A	mg/L	--	--	4.16	53.0	No	0	No
Seep Water[3]	Metals	Dissolved	Sodium	N/A	N/A	mg/L	--	--	19.7	680	No	0	No
Seep Water[3]	Metals	Dissolved	Zinc	N/A	N/A	mg/L	--	--	0.0856	0.077	**Yes**	1	**Yes**
Seep Water[3]	Metals	Total	Arsenic	N/A	N/A	mg/L	--	--	0.0128	0.0000180	**Yes**	4	**Yes**
Seep Water[3]	Metals	Total	Barium	N/A	N/A	mg/L	--	--	0.0742	1.00	No	0	No
Seep Water[3]	Metals	Total	Chromium	N/A	N/A	mg/L	--	--	0.00105	55.0	No	0	No
Seep Water[3]	Metals	Total	Copper	N/A	N/A	mg/L	--	--	0.00272	1.30	No	0	No
Seep Water[3]	Metals	Total	Iron	N/A	N/A	mg/L	--	--	121	0.300	**Yes**	4	**Yes**
Seep Water[3]	Metals	Total	Lead	N/A	N/A	mg/L	--	--	0.0257	0.0150	**Yes**	1	**Yes**
Seep Water[3]	Metals	Total	Manganese	N/A	N/A	mg/L	--	--	3.24	0.0500	**Yes**	3	**Yes**
Seep Water[3]	Metals	Total	Mercury	N/A	N/A	mg/L	--	--	0.0000300	0.0110	No	0	No
Seep Water[3]	Metals	Total	Nickel	N/A	N/A	mg/L	--	--	0.00232	0.610	No	0	No
Seep Water[3]	Metals	Total	Selenium	N/A	N/A	mg/L	--	--	0.00111	0.170	No	0	No
Seep Water[3]	NWTPH-Dx	Total	Diesel Range Organics	N/A	N/A	mg/L	--	--	0.130	0.0900	**Yes**	1	**Yes**
Seep Water[3]	NWTPH-Dx	Total	Residual Range Organics	N/A	N/A	mg/L	--	--	0.130	0.290	No	0	No

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
(14 of 16)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Seep Water[3]	SVOCs	Total	Benzoic Acid	N/A	N/A	ug/L	--	--	5.90	42.0	No	0	No
Seep Water[3]	VOCs	Total	Chloroform	N/A	N/A	ug/L	--	--	2.80	0.190	**Yes**	2	**Yes**
Seep Water[3]	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/L	--	--	4.40	0.0930	**Yes**	3	**Yes**
Surface Water[3]	Metals	Dissolved	Arsenic	N/A	N/A	mg/L	--	--	0.00101	0.0000180	**Yes**	4	**Yes**
Surface Water[3]	Metals	Dissolved	Calcium	N/A	N/A	mg/L	--	--	20.5	116	No	0	No
Surface Water[3]	Metals	Dissolved	Iron	N/A	N/A	mg/L	--	--	0.00920	0.300	No	0	No
Surface Water[3]	Metals	Dissolved	Lead	N/A	N/A	mg/L	--	--	0.0000160	0.00144	No	0	No
Surface Water[3]	Metals	Dissolved	Magnesium	N/A	N/A	mg/L	--	--	6.33	82.0	No	0	No
Surface Water[3]	Metals	Dissolved	Manganese	N/A	N/A	mg/L	--	--	0.00101	0.0500	No	0	No
Surface Water[3]	Metals	Dissolved	Potassium	N/A	N/A	mg/L	--	--	1.51	53.0	No	0	No
Surface Water[3]	Metals	Dissolved	Sodium	N/A	N/A	mg/L	--	--	7.90	680	No	0	No
Surface Water[3]	Metals	Total	Arsenic	N/A	N/A	mg/L	--	--	0.00117	0.0000180	**Yes**	3	**Yes**
Surface Water[3]	Metals	Total	Iron	N/A	N/A	mg/L	--	--	0.446	0.300	**Yes**	1	**Yes**
Surface Water[3]	Metals	Total	Lead	N/A	N/A	mg/L	--	--	0.000407	0.0150	No	0	No
Surface Water[3]	Metals	Total	Manganese	N/A	N/A	mg/L	--	--	0.0136	0.0500	No	0	No
Surface Water[3]	NWTPH-Dx	Total	Diesel Range Organics	N/A	N/A	mg/L	--	--	0.0300	0.0900	No	0	No
Soil Gas	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/m3	--	--	98.0	22,000,000	No	0	No
Soil Gas	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/m3	--	--	18,500	31,000	No	0	No
Soil Gas	VOCs	Total	1,3,5-Trimethylbenzene	N/A	N/A	ug/m3	--	--	6,250	26,000	No	0	No
Soil Gas	VOCs	Total	1,3-Butadiene	N/A	N/A	ug/m3	--	--	210	410	No	0	No
Soil Gas	VOCs	Total	1,4-Dioxane	N/A	N/A	ug/m3	--	--	1.10	1,600	No	0	No
Soil Gas	VOCs	Total	2,2,4-Trimethylpentane	N/A	N/A	ug/m3	--	--	1.80	NV	**Yes**	--	**Yes**
Soil Gas	VOCs	Total	2-Butanone (MEK)	N/A	N/A	ug/m3	--	--	31.0	22,000,000	No	0	No
Soil Gas	VOCs	Total	4-Ethyltoluene	N/A	N/A	ug/m3	--	--	9,150	NV	***Yes***	--	***Yes***
Soil Gas	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	N/A	ug/m3	--	--	2.10	13,000,000	No	0	No
Soil Gas	VOCs	Total	Acetone	N/A	N/A	ug/m3	--	--	97.0	140,000,000	No	0	No
Soil Gas	VOCs	Total	Benzene	N/A	N/A	ug/m3	--	--	85.0	1,600	No	0	No
Soil Gas	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/m3	--	--	42.0	3,100,000	No	0	No
Soil Gas	VOCs	Total	Chloroform	N/A	N/A	ug/m3	--	--	0.750	530	No	0	No
Soil Gas	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/m3	--	--	330	260,000	No	0	No
Soil Gas	VOCs	Total	Cyclohexane	N/A	N/A	ug/m3	--	--	24.0	26,000,000	No	0	No
Soil Gas	VOCs	Total	Dichlorodifluoromethane	N/A	N/A	ug/m3	--	--	3.20	880,000	No	0	No
Soil Gas	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	N/A	ug/m3	--	--	1.80	26,000	No	0	No
Soil Gas	VOCs	Total	Ethanol	N/A	N/A	ug/m3	--	--	13.0	NV	***Yes***	--	***Yes***
Soil Gas	VOCs	Total	Ethylbenzene	N/A	N/A	ug/m3	--	--	1,550	4,900	No	0	No
Soil Gas	VOCs	Total	Heptane	N/A	N/A	ug/m3	--	--	87.0	NV	***Yes***	--	***Yes***
Soil Gas	VOCs	Total	Hexane	N/A	N/A	ug/m3	--	--	110	3,100,000	No	0	No
Soil Gas	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/m3	--	--	675	1,800,000	No	0	No
Soil Gas	VOCs	Total	m,p-Xylenes	N/A	N/A	ug/m3	--	--	5,850	440,000	No	0	No
Soil Gas	VOCs	Total	n-Propylbenzene	N/A	N/A	ug/m3	--	--	2,300	4,400,000	No	0	No
Soil Gas	VOCs	Total	o-Xylene	N/A	N/A	ug/m3	--	--	2,800	3,100,000	No	0	No
Soil Gas	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/m3	--	--	34,000	2,100	**Yes**	1	**Yes**
Soil Gas	VOCs	Total	Toluene	N/A	N/A	ug/m3	--	--	47,500	22,000,000	No	0	No
Soil Gas	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/m3	--	--	4.00	260,000	No	0	No

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
(15 of 16)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Soil Gas	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/m3	--	--	610	140	**Yes**	2	**Yes**
Soil Gas	VOCs	Total	Trichlorofluoromethane	N/A	N/A	ug/m3	--	--	2.20	3,100,000	No	0	No

Table 9-5
Preliminary-COPC Identification for Combined Data from all Four AOPCs
Bradford Island - Upland Operable Unit
(16 of 16)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in AOPC than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?

Notes
(1) Only evaluated for analytes with a sample size of 20 or more. See the Data Summary for All Four AOPCs Combined - Appendix I, Table I-5.
(2) Only applicable to inorganics. For soils, see the statistical comparison of Site soil concentrations to Reference Area concentrations; Appendix L, Tables L-1 and L-2.
For groundwater and seep water, see Table 8-3 and Appendix L, Table L-3. Direct push groundwater samples are not compared to Reference Area monitoring well data.
(3) The groundwater, seep water, and surface water SLVs are the lower of the Direct Contact Water SLV and the Discharge to Surface Water-Bioaccumulative SLV; see Appendix J.
(4) Total DDT is evaluated in the ERA for the Upland OU; see Section 12 and Appendix N.

'--' = Not evaluated
% = percent
BHC = hexachlorocyclohexane
DP = Direct Push
ft = feet
Max = maximum
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
N/A = not applicable
NV = No Value
No. = number
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
ug/m3 = micrograms per cubic meter

Table 9-6
Preliminary-COPC Identification for Potentially Erodible or Mass Wasting Soil
Bradford Island - Upland Operable Unit
(1 of 4)

AOPC	Medium	Analyte Group	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate	Detection Rate > 5%?[1]	Higher Conc than Reference Sediments?[2]	Max Detected Value	Selected Sediment SLV[3]	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Landfill	Soil	Metals	Aluminum	0-1 ft	N/A	mg/kg	100%	--	No	--	--	--	--	No
Landfill	Soil	Metals	Arsenic	0-1 ft	N/A	mg/kg	100%	--	**Yes**	6.20	6.00	**Yes**	2	**Yes**
Landfill	Soil	Metals	Barium	0-1 ft	N/A	mg/kg	100%	--	No	--	--	--	--	No
Landfill	Soil	Metals	Beryllium	0-1 ft	N/A	mg/kg	100%	--	No	--	--	--	--	No
Landfill	Soil	Metals	Cadmium	0-1 ft	N/A	mg/kg	100%	--	**Yes**	1.70	0.674	**Yes**	4	**Yes**
Landfill	Soil	Metals	Chromium	0-1 ft	N/A	mg/kg	100%	--	**Yes**	801	37.0	**Yes**	2	**Yes**
Landfill	Soil	Metals	Cobalt	0-1 ft	N/A	mg/kg	100%	--	**Yes**	22.7	15.2	**Yes**	2	**Yes**
Landfill	Soil	Metals	Copper	0-1 ft	N/A	mg/kg	100%	--	**Yes**	60.5	55.6	**Yes**	2	**Yes**
Landfill	Soil	Metals	Lead	0-1 ft	N/A	mg/kg	100%	--	**Yes**	680	35.0	**Yes**	9	**Yes**
Landfill	Soil	Metals	Manganese	0-1 ft	N/A	mg/kg	100%	--	--	614	1100	No	0	No
Landfill	Soil	Metals	Mercury	0-1 ft	N/A	mg/kg	100%	--	**Yes**	0.320	0.214	**Yes**	3	**Yes**
Landfill	Soil	Metals	Nickel	0-1 ft	N/A	mg/kg	100%	--	**Yes**	570	21.2	**Yes**	3	**Yes**
Landfill	Soil	Metals	Selenium	0-1 ft	N/A	mg/kg	20%	--	--	0.848	NV	***Yes***	--	***Yes***
Landfill	Soil	Metals	Silver	0-1 ft	N/A	mg/kg	50%	--	--	0.500	4.50	No	0	No
Landfill	Soil	Metals	Thallium	0-1 ft	N/A	mg/kg	10%	--	**Yes**	0.378	0.354	**Yes**	1	**Yes**
Landfill	Soil	Metals	Vanadium	0-1 ft	N/A	mg/kg	100%	--	No	--	--	--	--	No
Landfill	Soil	Metals	Zinc	0-1 ft	N/A	mg/kg	100%	--	**Yes**	221	123	**Yes**	9	**Yes**
Landfill	Soil	Pesticides	4,4'-DDT	0-1 ft	N/A	ug/kg	70%	--	--	28.0	0.040	**Yes**	7	**Yes**
Landfill	Soil	Pesticides	Dieldrin	0-1 ft	N/A	ug/kg	10%	--	--	2.10	0.0010	**Yes**	1	**Yes**
Landfill	Soil	PCB Aroclors	Aroclor 1254	0-1 ft	N/A	ug/kg	70%	--	--	49.0	0.0480	**Yes**	7	**Yes**
Landfill	Soil	PCB Aroclors	Aroclor 1260	0-1 ft	N/A	ug/kg	90%	--	--	92.0	0.0480	**Yes**	9	**Yes**
Landfill	Soil	PCB Aroclors	Total PCBs as Aroclors	0-1 ft	N/A	ug/kg	90%	--	--	127	0.0480	**Yes**	9	**Yes**
Landfill	Soil	SVOCs	2-Methylnaphthalene	0-1 ft	N/A	ug/kg	10%	--	--	11.0	NV	***Yes***	--	***Yes***
Landfill	Soil	SVOCs	Acenaphthene	0-1 ft	N/A	ug/Kg	79%	--	--	1,160	290	**Yes**	2	**Yes**
Landfill	Soil	SVOCs	Acenaphthylene	0-1 ft	N/A	ug/kg	29%	--	--	19.0	160	No	0	No
Landfill	Soil	SVOCs	Anthracene	0-1 ft	N/A	ug/kg	93%	--	--	1,070	57	**Yes**	8	**Yes**
Landfill	Soil	SVOCs	Benzo(a)anthracene	0-1 ft	N/A	ug/kg	93%	--	--	4,500	32	**Yes**	13	**Yes**
Landfill	Soil	SVOCs	Benzo(a)pyrene	0-1 ft	N/A	ug/kg	93%	--	--	6,200	32	**Yes**	13	**Yes**
Landfill	Soil	SVOCs	Benzo(b)fluoranthene	0-1 ft	N/A	ug/kg	93%	--	--	8,200	27	**Yes**	13	**Yes**
Landfill	Soil	SVOCs	Benzo(g,h,i)perylene	0-1 ft	N/A	ug/kg	93%	--	--	3,300	300	**Yes**	8	**Yes**
Landfill	Soil	SVOCs	Benzo(k)fluoranthene	0-1 ft	N/A	ug/kg	93%	--	--	2,500	27	**Yes**	13	**Yes**
Landfill	Soil	SVOCs	Benzoic Acid	0-1 ft	N/A	ug/kg	30%	--	--	300	NV	***Yes***	--	***Yes***
Landfill	Soil	SVOCs	Benzyl Alcohol	0-1 ft	N/A	ug/kg	10%	--	--	14.0	NV	***Yes***	--	***Yes***
Landfill	Soil	SVOCs	Bis(2-ethylhexyl) Phthalate	0-1 ft	N/A	ug/kg	90%	--	--	420	750	No	0	No
Landfill	Soil	SVOCs	Carbazole	0-1 ft	N/A	ug/kg	80%	--	--	210	140	**Yes**	1	**Yes**
Landfill	Soil	SVOCs	Chrysene	0-1 ft	N/A	ug/kg	93%	--	--	5,900	57	**Yes**	13	**Yes**
Landfill	Soil	SVOCs	Dibenz(a,h)anthracene	0-1 ft	N/A	ug/kg	93%	--	--	1,000	33	**Yes**	11	**Yes**
Landfill	Soil	SVOCs	Dibenzofuran	0-1 ft	N/A	ug/kg	20%	--	--	36.0	5100	No	0	No
Landfill	Soil	SVOCs	Di-n-butyl Phthalate	0-1 ft	N/A	ug/kg	40%	--	--	1,800	110	**Yes**	1	**Yes**
Landfill	Soil	SVOCs	Fluoranthene	0-1 ft	N/A	ug/kg	93%	--	--	14,000	111	**Yes**	13	**Yes**
Landfill	Soil	SVOCs	Fluorene	0-1 ft	N/A	ug/kg	71%	--	--	510	77	**Yes**	4	**Yes**
Landfill	Soil	SVOCs	Indeno(1,2,3-cd)pyrene	0-1 ft	N/A	ug/kg	93%	--	--	4,600	17	**Yes**	13	**Yes**
Landfill	Soil	SVOCs	Naphthalene	0-1 ft	N/A	ug/kg	36%	--	--	79.0	176	No	0	No
Landfill	Soil	SVOCs	Phenanthrene	0-1 ft	N/A	ug/Kg	93%	--	--	4,200	42	**Yes**	13	**Yes**
Landfill	Soil	SVOCs	Pyrene	0-1 ft	N/A	ug/kg	93%	--	--	9,100	53	**Yes**	13	**Yes**

Table 9-6
Preliminary-COPC Identification for Potentially Erodible or Mass Wasting Soil
Bradford Island - Upland Operable Unit
(2 of 4)

AOPC	Medium	Analyte Group	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate	Detection Rate > 5%?[1]	Higher Conc than Reference Sediments?[2]	Max Detected Value	Selected Sediment SLV[3]	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Landfill	Soil	SVOCs	Total LPAHs (KM, capped)	0-1 ft	N/A	ug/kg	93%	--	**--**	7,043	76	**Yes**	13	**Yes**
Landfill	Soil	SVOCs	Total HPAHs (KM, capped)	0-1 ft	N/A	ug/kg	93%	--	**--**	55,030	193	**Yes**	13	**Yes**
Landfill	Soil	VOCs	Tetrachloroethene (PCE)	0-1 ft	N/A	ug/kg	80%	--	--	9.70	NV	***Yes***	--	***Yes***
Landfill	Soil	VOCs	Toluene	0-1 ft	N/A	ug/kg	80%	--	--	1.46	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	Metals	Aluminum	0-1 ft	N/A	mg/kg	100%	--	No	--	--	--	--	No
Sandblast Area	Soil	Metals	Antimony	0-1 ft	N/A	mg/kg	100%	--	No	--	--	--	--	No
Sandblast Area	Soil	Metals	Arsenic	0-1 ft	N/A	mg/kg	100%	--	No	--	--	--	--	No
Sandblast Area	Soil	Metals	Barium	0-1 ft	N/A	mg/kg	100%	--	No	--	--	--	--	No
Sandblast Area	Soil	Metals	Beryllium	0-1 ft	N/A	mg/kg	100%	--	No	--	--	--	--	No
Sandblast Area	Soil	Metals	Cadmium	0-1 ft	N/A	mg/kg	100%	--	**Yes**	1.06	0.674	**Yes**	1	**Yes**
Sandblast Area	Soil	Metals	Chromium	0-1 ft	N/A	mg/kg	100%	--	**Yes**	162	37.0	**Yes**	2	**Yes**
Sandblast Area	Soil	Metals	Cobalt	0-1 ft	N/A	mg/kg	100%	--	No	--	--	--	--	No
Sandblast Area	Soil	Metals	Copper	0-1 ft	N/A	mg/kg	100%	--	**Yes**	71.6	55.6	**Yes**	1	**Yes**
Sandblast Area	Soil	Metals	Lead	0-1 ft	<250um	mg/kg	100%	--	**Yes**	90.8	35	**Yes**	1	**Yes**
Sandblast Area	Soil	Metals	Lead	0-1 ft	<2mm	mg/kg	100%	--	**Yes**	52.7	35	**Yes**	1	**Yes**
Sandblast Area	Soil	Metals	Lead	0-1 ft	N/A	mg/kg	100%	--	**Yes**	319	35	**Yes**	2	**Yes**
Sandblast Area	Soil	Metals	Manganese	0-1 ft	N/A	mg/kg	100%	--	--	479	1100	No	0	No
Sandblast Area	Soil	Metals	Mercury	0-1 ft	N/A	mg/kg	100%	--	No	--	--	--	--	No
Sandblast Area	Soil	Metals	Nickel	0-1 ft	N/A	mg/kg	100%	--	**Yes**	74.9	21.2	**Yes**	2	**Yes**
Sandblast Area	Soil	Metals	Selenium	0-1 ft	N/A	mg/kg	100%	--	--	0.650	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	Metals	Silver	0-1 ft	N/A	mg/kg	100%	--	--	0.175	4.50	No	0	No
Sandblast Area	Soil	Metals	Thallium	0-1 ft	N/A	mg/kg	100%	--	No	--	--	--	--	No
Sandblast Area	Soil	Metals	Vanadium	0-1 ft	N/A	mg/kg	100%	--	No	--	--	--	--	No
Sandblast Area	Soil	Metals	Zinc	0-1 ft	N/A	mg/kg	100%	--	**Yes**	203	123	**Yes**	1	**Yes**
Sandblast Area	Soil	Butyltins	Dibutyltin	0-1 ft	N/A	ug/kg	100%	--	--	9.10	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	Butyltins	Monobutyltin	0-1 ft	N/A	ug/kg	100%	--	--	8.25	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	Butyltins	Tributyltin	0-1 ft	N/A	ug/kg	100%	--	--	12.8	2.3	**Yes**	2	**Yes**
Sandblast Area	Soil	Pesticides	4,4'-DDE	0-1 ft	N/A	ug/kg	100%	--	--	0.440	0.0400	**Yes**	2	**Yes**
Sandblast Area	Soil	Pesticides	4,4'-DDT	0-1 ft	N/A	ug/kg	100%	--	--	10.0	0.0400	**Yes**	2	**Yes**
Sandblast Area	Soil	Pesticides	BHC (delta)	0-1 ft	N/A	ug/kg	50%	--	--	0.0780	0.900	No	0	No
Sandblast Area	Soil	Pesticides	Endosulfan II	0-1 ft	N/A	ug/kg	50%	--	--	0.240	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	Pesticides	Endosulfan Sulfate	0-1 ft	N/A	ug/kg	50%	--	--	0.770	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	Pesticides	Heptachlor	0-1 ft	N/A	ug/kg	100%	--	--	0.380	10.0	No	0	No
Sandblast Area	Soil	PCB Aroclors	Aroclor 1260	0-1 ft	N/A	ug/kg	100%	--	--	67.0	0.0480	**Yes**	2	**Yes**
Sandblast Area	Soil	PCB Aroclors	Total PCBs as Aroclors	0-1 ft	N/A	ug/kg	100%	--	--	69.1	0.0480	**Yes**	2	**Yes**
Sandblast Area	Soil	NWTPH-Dx	Diesel Range Organics	0-1 ft	N/A	mg/kg	100%	--	--	69.0	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	NWTPH-Dx	Residual Range Organics	0-1 ft	N/A	mg/kg	100%	--	--	1,000	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	NWTPH-Gx	Gasoline Range Organics	0-1 ft	N/A	mg/kg	50%	--	--	3.20	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	SVOCs	Acenaphthene	0-1 ft	N/A	ug/kg	100%	--	--	68.0	290	No	0	No
Sandblast Area	Soil	SVOCs	Anthracene	0-1 ft	N/A	ug/kg	100%	--	--	150	57	**Yes**	1	**Yes**
Sandblast Area	Soil	SVOCs	Benzo(a)anthracene	0-1 ft	N/A	ug/kg	100%	--	--	1,200	32	**Yes**	2	**Yes**
Sandblast Area	Soil	SVOCs	Benzo(a)pyrene	0-1 ft	N/A	ug/kg	100%	--	--	1,000	32	**Yes**	2	**Yes**
Sandblast Area	Soil	SVOCs	Benzo(b)fluoranthene	0-1 ft	N/A	ug/kg	100%	--	--	1,600	27	**Yes**	2	**Yes**
Sandblast Area	Soil	SVOCs	Benzo(g,h,i)perylene	0-1 ft	N/A	ug/kg	100%	--	--	590	300	**Yes**	1	**Yes**

Table 9-6
Preliminary-COPC Identification for Potentially Erodible or Mass Wasting Soil
Bradford Island - Upland Operable Unit
(3 of 4)

AOPC	Medium	Analyte Group	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate	Detection Rate > 5%?[1]	Higher Conc than Reference Sediments?[2]	Max Detected Value	Selected Sediment SLV[3]	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Sandblast Area	Soil	SVOCs	Benzo(k)fluoranthene	0-1 ft	N/A	ug/kg	100%	--	--	570	27	**Yes**	2	**Yes**
Sandblast Area	Soil	SVOCs	Bis(2-ethylhexyl) Phthalate	0-1 ft	N/A	ug/kg	100%	--	--	260,000	750	**Yes**	2	**Yes**
Sandblast Area	Soil	SVOCs	Carbazole	0-1 ft	N/A	ug/kg	100%	--	--	91.0	140	No	0	No
Sandblast Area	Soil	SVOCs	Chrysene	0-1 ft	N/A	ug/kg	100%	--	--	1,500	57	**Yes**	2	**Yes**
Sandblast Area	Soil	SVOCs	Dibenz(a,h)anthracene	0-1 ft	N/A	ug/kg	100%	--	--	220	33	**Yes**	2	**Yes**
Sandblast Area	Soil	SVOCs	Fluoranthene	0-1 ft	N/A	ug/kg	100%	--	--	2,100	111	**Yes**	2	**Yes**
Sandblast Area	Soil	SVOCs	Indeno(1,2,3-cd)pyrene	0-1 ft	N/A	ug/kg	100%	--	--	690	17	**Yes**	2	**Yes**
Sandblast Area	Soil	SVOCs	Phenanthrene	0-1 ft	N/A	ug/kg	100%	--	--	940	42	**Yes**	2	**Yes**
Sandblast Area	Soil	SVOCs	Pyrene	0-1 ft	N/A	ug/kg	100%	--	--	1,900	53	**Yes**	2	**Yes**
Sandblast Area	Soil	SVOCs	Total LPAHs (KM, capped)	0-1 ft	N/A	ug/kg	100%	--	**--**	1,356	76	**Yes**	2	**Yes**
Sandblast Area	Soil	SVOCs	Total HPAHs (KM, capped)	0-1 ft	N/A	ug/kg	100%	--	**--**	11,370	193	**Yes**	2	**Yes**
Sandblast Area	Soil	VOCs	1,2,4-Trimethylbenzene	0-1 ft	N/A	ug/kg	75%	--	--	0.280	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	2-Butanone (MEK)	0-1 ft	N/A	ug/kg	88%	--	--	50.0	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	2-Hexanone	0-1 ft	N/A	ug/kg	38%	--	--	8.80	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	4-Isopropyltoluene	0-1 ft	N/A	ug/kg	38%	--	--	2.50	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	4-Methyl-2-pentanone (MIBK)	0-1 ft	N/A	ug/kg	38%	--	--	1.20	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	Acetone	0-1 ft	N/A	ug/kg	88%	--	--	540	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	Benzene	0-1 ft	N/A	ug/kg	50%	--	--	1.00	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	Bromomethane	0-1 ft	N/A	ug/kg	25%	--	--	5.00	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	Carbon Disulfide	0-1 ft	N/A	ug/kg	88%	--	--	1.00	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	Chloroform	0-1 ft	N/A	ug/kg	38%	--	--	19.0	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	Chloromethane	0-1 ft	N/A	ug/kg	25%	--	--	0.250	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	cis-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	13%	--	--	12.0	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	Dichlorodifluoromethane	0-1 ft	N/A	ug/kg	13%	--	--	94.0	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	Dichloromethane (Methylene Chloride)	0-1 ft	N/A	ug/kg	50%	--	--	460	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	Ethylbenzene	0-1 ft	N/A	ug/kg	38%	--	--	0.200	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	m,p-Xylenes	0-1 ft	N/A	ug/kg	38%	--	--	0.360	NV	***Yes***	--	***Yes***
Sandblast Area	Soil	VOCs	Naphthalene	0-1 ft	N/A	ug/kg	25%	--	--	0.540	176	No	0	No
Sandblast Area	Soil	VOCs	Toluene	0-1 ft	N/A	ug/kg	88%	--	--	1.30	NV	***Yes***	--	***Yes***
Bulb Slope	Soil	Metals	Lead	0-1 ft	N/A	mg/kg	100%	**--**	**Yes**	597	35	**Yes**	11	**Yes**
Bulb Slope	Soil	Metals	Mercury	0-1 ft	N/A	mg/kg	100%	**--**	**Yes**	1.54	0.214	**Yes**	6	**Yes**
Bulb Slope	Soil	PCB Aroclors	Aroclor 1260	0-1 ft	N/A	ug/kg	67%	**--**	--	251	0.0480	**Yes**	8	**Yes**
Bulb Slope	Soil	PCB Aroclors	Total PCBs as Aroclors	0-1 ft	N/A	ug/kg	67%	**--**	--	251	0.0480	**Yes**	8	**Yes**
Bulb Slope	Soil	NWTPH-Dx	Diesel Range Organics	0-1 ft	N/A	mg/kg	100%	**--**	--	170	NV	***Yes***	--	***Yes***
Bulb Slope	Soil	NWTPH-Dx	Residual Range Organics	0-1 ft	N/A	mg/kg	100%	**--**	--	410	NV	***Yes***	--	***Yes***

Notes

(1) Only evaluated for analytes with a sample size of 20 or more.

(2) Only applicable to inorganics. See the comparison of potentially erodible and mass wasting soil concentrations to Reference Area sediment concentrations; Appendix L, Table L-8.

(3) Total DDT is evaluated in the ERA and HHRA for the Upland OU; see Sections 11 and 12 and Appendix O.

The subset of Landfill AOPC soil potentially suseptible to mass wasting is comprised of the following samples: BIL01USE through BIL09USE, BIL13SSI, and L-01 through L-04.

The Sandblast Area AOPC potentially erodible soil subset is comprised of the following samples: SB-EUA, SB-EUB, SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, SB-EUB-15, and SB-04.

The entire Bulb Slope AOPC is potentially suseptible to mass wasting.

Table 9-6
Preliminary-COPC Identification for Potentially Erodible or Mass Wasting Soil
Bradford Island - Upland Operable Unit
(4 of 4)

AOPC	Medium	Analyte Group	Analyte	Depth Category (Soil)	Sieve Size (Sieved Soil)	Unit	Detection Rate	Detection Rate > 5%?[1]	Higher Conc than Reference Sediments?[2]	Max Detected Value	Selected Sediment SLV[3]	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?

'--' = Not evaluated
% = percent
BHC = hexachlorocyclohexane
ft = feet
Max = maximum
mg/kg = milligrams per kilogram
N/A = not applicable
NV = No Value
No. = number
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
VOC = volatile organic carbon

Table 9-7
Upland OU Preliminary COPC Summary
Bradford Island - Upland Operable Unit
(1 of 6)

Medium	Depth Category (Soil)	Analyte Group	Landfill AOPC Preliminary COPCs	Sandblast Area AOPC Preliminary COPCs	Pistol Range AOPC Preliminary COPCs	Bulb Slope AOPC Preliminary COPCs	All Four AOPCs Combined Preliminary COPCs
Detection Frequency > 5%, Detected > Reference (Inorganics), and Detected > SLV							
Soil	0-1 ft bgs	Metals	Antimony, Cadmium, Lead, Mercury, and Zinc	Antimony, Arsenic, Cadmium, Chromium, Lead, Nickel, Selenium, and Zinc	Lead and Zinc	Lead and Mercury	Antimony, Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, and Zinc
		Organotins	None	None	-	-	None
		Herbicides	2,4,5-T, Dichloroprop, and MCPP	ND	-	-	2,4,5-T, Dichloroprop, and MCPP
		Pesticides	4,4'-DDT	4,4'-DDT, Endrin, Endrin Aldehyde, and Endrin Ketone	-	-	4,4'-DDT, Endrin, Endrin Aldehyde, and Endrin Ketone
		PCBs	Aroclor 1248, Aroclor 1260, and Total PCBs as Aroclors	Arochlor 1254, Aroclor 1260, and Total PCBs as Aroclors	-	None	Aroclor 1248, Arochlor 1254, Aroclor 1260, and Total PCBs as Aroclors
		TPH	GRO	None	-	None	GRO
		PAHs	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzofluoranthenes (Total), Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Total HPAHs	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzofluoranthenes (Total), Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Total HPAHs	-	-	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzofluoranthenes (Total), Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Total HPAHs
		SVOCs	Bis(2-ethylhexyl)phthalate, Carbazole, Dibenzofuran, and Di-n-butyl phthalate	Bis(2-ethylhexyl) phthalate and Dibenzofuran	-	-	Bis(2-ethylhexyl)phthalate, Carbazole, Dibenzofuran, and Di-n-butyl phthalate
		VOCs	Ethylbenzene	None	-	-	Ethylbenzene
	0-3 ft bgs	Metals	Antimony, Arsenic, Cadmium, Lead, Mercury, and Zinc	Antimony, Arsenic, Cadmium, Chromium, Lead, Nickel, Selenium, and Zinc	(No subsurface samples)	(No subsurface samples)	Antimony, Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, and Zinc
		Organotins	None	None			None
		Herbicides	2,4,5-T, Dichloroprop, and MCPP	ND			2,4,5-T, Dichloroprop, and MCPP
		Pesticides	4,4'-DDT	4,4'-DDT, Endrin, Endrin Aldehyde, and Endrin Ketone			4,4'-DDT, Endrin, Endrin Aldehyde, and Endrin Ketone
		PCBs	Aroclor 1248, Aroclor 1260, and Total PCBs as Aroclors	Arochlor-1254, Aroclor 1260, and Total PCBs as Aroclors			Aroclor 1248, Arochlor 1254, Aroclor 1260, and Total PCBs as Aroclors
		TPH	GRO	None			GRO

Table 9-7
Upland OU Preliminary COPC Summary
Bradford Island - Upland Operable Unit
(2 of 6)

Medium	Depth Category (Soil)	Analyte Group	Landfill AOPC Preliminary COPCs	Sandblast Area AOPC Preliminary COPCs	Pistol Range AOPC Preliminary COPCs	Bulb Slope AOPC Preliminary COPCs	All Four AOPCs Combined Preliminary COPCs
Detection Frequency > 5%, Detected > Reference (Inorganics), and Detected > SLV							
Soil (Continued)	0-3 ft bgs (Continued)	PAHs	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzofluoranthenes (Total), Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, Total HPAHs, and Total LPAHs	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzofluoranthenes (Total), Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Total HPAHs	(No subsurface samples)	(No subsurface samples)	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzofluoranthenes (Total), Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Total HPAHs
		SVOCs	Bis(2-ethylhexyl)phthalate Carbazole, Dibenzofuran, and Di-n-butyl phthalate	Bis(2-ethylhexyl) phthalate and Dibenzofuran			Bis(2-ethylhexyl)phthalate Carbazole, Dibenzofuran, and Di-n-butyl phthalate
		VOCs	None	o-Xylene, PCE, and TCE			Ethylbenzene, o-Xylene, PCE, and TCE
	0-10 ft bgs	Metals	Lead	Arsenic, Chromium, and Lead	(No deeper samples)	(No deeper samples)	Arsenic, Chromium, and Lead
		Organotins	None	None			None
		Herbicides	None*	ND			None*
		Pesticides	None	None			None
		PCBs	Total PCBs as Aroclors	Arochlor-1254 and Total PCBs as Aroclors			Arochlor 1254 and Total PCBs as Aroclors
		TPH	GRO and RRO	None			GRO and RRO
		PAHs	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzofluoranthenes (Total), Dibenz(a,h)anthracene, and Indeno(1,2,3-cd)pyrene	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzofluoranthenes (Total), Dibenz(a,h)anthracene, and Indeno(1,2,3-cd)pyrene			Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzofluoranthenes (Total), Dibenz(a,h)anthracene, and Indeno(1,2,3-cd)pyrene
		SVOCs	None*	Bis(2-ethylhexyl) phthalate			Bis(2-ethylhexyl) phthalate
		VOCs	PCE	PCE and TCE			PCE and TCE

Table 9-7
Upland OU Preliminary COPC Summary
Bradford Island - Upland Operable Unit
(3 of 6)

Medium	Depth Category (Soil)	Analyte Group	Landfill AOPC Preliminary COPCs	Sandblast Area AOPC Preliminary COPCs	Pistol Range AOPC Preliminary COPCs	Bulb Slope AOPC Preliminary COPCs	All Four AOPCs Combined Preliminary COPCs
Detection Frequency > 5%, Detected > Reference (Inorganics), and Detected > SLV							
Erodible Soil	0-1 ft bgs	Metals	Arsenic, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Nickel, Thallium, and Zinc	Cadmium, Chromium, Copper, Lead, Nickel, and Zinc	(Not evaluated)	Lead and Mercury	(Not evaluated)
		Organotins	-	Tributyltin		-	
		Herbicides	ND	-		-	
		Pesticides	4,4'-DDT and Dieldrin	4,4'-DDT and 4,4'-DDE		-	
		PCBs	Aroclor 1254, Aroclor 1260, and Total PCBs as Aroclors	Aroclor 1260 and Total PCBs as Aroclors		Aroclor 1260 and Total PCBs as Aroclors	
		TPH	ND	None*		None*	
		PAHs	Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Phenanthrene, Pyrene, Total LPAHs, and Total HPAHs	Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, Pyrene, Total LPAHs, and Total HPAHs		-	
		SVOCs	Carbazole and Di-n-butyl Phthalate	Bis(2-ethylhexyl) phthalate		-	
		VOCs	None*	None*		-	

Table 9-7
Upland OU Preliminary COPC Summary
Bradford Island - Upland Operable Unit
(4 of 6)

Medium	Depth Category (Soil)	Analyte Group	Landfill AOPC Preliminary COPCs	Sandblast Area AOPC Preliminary COPCs	Pistol Range AOPC Preliminary COPCs	Bulb Slope AOPC Preliminary COPCs	All Four AOPCs Combined Preliminary COPCs
Detection Frequency > 5%, Detected > Reference (Inorganics), and Detected > SLV							
Groundwater		Metals (Total)	**MW:** Arsenic, Iron, Lead, Manganese, and Thallium	**MW:** Arsenic, Iron, and Vanadium **DP:** Arsenic, Cobalt, Iron, Manganese, and Vanadium	None	(No goundwater samples)	**MW:** Arsenic, Iron, Lead, Manganese, Thallium, and Vanadium **DP:** Arsenic, Cobalt, Iron, Manganese, and Vanadium
		Metals (Dissolved)	**MW:** Arsenic, Barium, Cacium, Iron, Lead, Manganese, Sodium, and Zinc	**MW:** Arsenic and Vanadium **DP:** Aluminum, Arsenic, Barium, Iron, Manganese, and Vanadium	None		**MW:** Arsenic, Barium, Cacium, Iron, Lead, Manganese, Sodium, Vanadium, and Zinc **DP:** Aluminum, Arsenic, Barium, Iron, Manganese, and Vanadium
		Organotins	**MW:** Dibutyltin and Monobutyltin	None	-		**MW:** Dibutyltin and Monobutyltin
		Herbicides	None	-	-		None
		Pesticides	None	None	-		None
		PCBs	ND	ND	-		ND
		TPH	**MW:** DRO, GRO, and RRO	None	-		**MW:** DRO, GRO, and RRO
		PAHs (Total)	**MW:** Naphthalene and Phenanthrene	**DP:** Benzo(a)pyrene, Benzofluoranthenes (Total), Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Phenanthrene	-		**MW:** Naphthalene and Phenanthrene **DP:** Benzo(a)pyrene, Benzofluoranthenes (Total), Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Phenanthrene
		PAHs (Dissolved)	-	**DP:** Benzo(a)pyrene, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Naphthalene	-		**DP:** Benzo(a)pyrene, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Naphthalene
		SVOCs	**MW:** Bis(2-ethylhexyl)phthalate and Di-n-octyl phthalate	None	-		**MW:** Bis(2-ethylhexyl)phthalate and Di-n-octyl phthalate
		VOCs	**MW:** Chloroform, PCE, and Vinyl Chloride	**MW:** 1,1-Dichloroethane, cis-1,2-Dichloroethene, PCE, TCE, and Vinyl Chloride **DP:** 1,1-Dichloroethane, PCE, TCE, and Vinyl Chloride	-		**MW:** 1,1-Dichloroethane, Carbon Disulfide, Chloroform, cis-1,2-Dichloroethene, PCE, TCE, and Vinyl Chloride **DP:** 1,1-Dichloroethane, PCE, TCE, and Vinyl Chloride

Table 9-7
Upland OU Preliminary COPC Summary
Bradford Island - Upland Operable Unit
(5 of 6)

Medium	Depth Category (Soil)	Analyte Group	Landfill AOPC Preliminary COPCs	Sandblast Area AOPC Preliminary COPCs	Pistol Range AOPC Preliminary COPCs	Bulb Slope AOPC Preliminary COPCs	All Four AOPCs Combined Preliminary COPCs
Detection Frequency > 5%, Detected > Reference (Inorganics), and Detected > SLV							
Seep Water		Metals (Total)	Arsenic, Iron, Lead, and Manganese	(No seep water samples)	(No seep water samples)	(No seep water samples)	Arsenic, Iron, Lead, and Manganese
		Metals (Dissolved)	Barium, Iron, Manganese, and Zinc				Barium, Iron, Manganese, and Zinc
		Organotins	ND				ND
		Herbicides	ND				ND
		Pesticides	ND				ND
		PCBs	ND				ND
		TPH	DRO				DRO
		PAHs	ND				ND
		SVOCs	None				None
		VOCs	Chloroform and PCE				Chloroform and PCE
Surface Water		Metals (Total)	Arsenic and Iron	(No surface water samples)	(No surface water samples)	(No surface water samples)	Arsenic and Iron
		Metals (Dissolved)	Arsenic				Arsenic
		Organotins	ND				ND
		Herbicides	-				-
		Pesticides	-				-
		PCBs	-				-
		TPH	None				None
		PAHs	ND				ND
		SVOCs	ND				ND
		VOCs	ND				ND
Lagoon Sediment		Metals	(No lagoon sediment)	(No lagoon sediment)	Zinc	(No lagoon sediment)	Zinc
Soil Gas		VOCs	(No soil gas samples)	PCE and TCE	(No soil gas samples)	(No soil gas samples)	PCE and TCE
Detection Frequency > 5%, Detected > Reference (Inorganics), and No SLV							
Soil	0-10 ft bgs	Herbicides	Dichloroprop	None	(No deeper samples)	(No deeper samples)	Dichloroprop
		SVOCs	Carbazole	Carbazole			Carbazole
		VOCs	None	4-Isopropyltoluene			4-Isopropyltoluene
Erodible Soil	0-1 ft bgs	Metals	Selenium	Selenium	(Not evaluated)	None	(Not evaluated)
		Organotins	-	Dibutyltin and Monobutyltin		-	
		Pesticides	None	Endosulfan II and Endosulfan Sulfate		-	
		TPH	ND	DRO, RRO, and GRO		DRO and RRO	
		PAHs	2-Methylnaphthalene	None		None	
		SVOCs	Benzoic Acid and Benzyl Alcohol	None		-	
		VOCs	PCE and Toluene	All detected VOCs except Napthalene		-	
Groundwater		Metals (Total)	None	**DP:** Calcium, Magnesium, Potassium, and Sodium	None	(No goundwater samples)	**DP:**Calcium, Magnesium, Potassium, and Sodium
Soil Gas		VOCs	(No soil gas samples)	2,2,4-Trimethylpentane, 4-Ethyltoluene, Ethanol, and Heptane	(No soil gas samples)	(No soil gas samples)	2,2,4-Trimethylpentane, 4-Ethyltoluene, Ethanol, and Heptane

Notes

Table 9-7
Upland OU Preliminary COPC Summary
Bradford Island - Upland Operable Unit
(6 of 6)

Medium	Depth Category (Soil)	Analyte Group	Landfill AOPC Preliminary COPCs	Sandblast Area AOPC Preliminary COPCs	Pistol Range AOPC Preliminary COPCs	Bulb Slope AOPC Preliminary COPCs	All Four AOPCs Combined Preliminary COPCs

* See the section of the table for COFIs retained due to lack of SLVs
"-" = Not Analyzed
COPC = contaminant of potential concern
ND = no detected

Table 9-8
Preliminary COPC Identification for Forebay Random Data
Bradford Island - River Operable Unit
(1 of 6)

Medium	Analyte Group	Basis	Total/ Dissolved	IUPAC #	Analyte	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in Forebay than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Dections > SLV	Retain as Preliminary COPC?
Surface Water - Grab	Metals	W	Dissolved		Arsenic	ug/L	--	--	0.940	0.018	**Yes**	5	**Yes**
Surface Water - Grab	Metals	W	Dissolved		Barium	ug/L	--	--	24.0	4	**Yes**	5	**Yes**
Surface Water - Grab	Metals	W	Dissolved		Beryllium	ug/L	--	--	0.00400	5.3	No	0	No
Surface Water - Grab	Metals	W	Dissolved		Cadmium	ug/L	--	--	0.0100	0.17	No	0	No
Surface Water - Grab	Metals	W	Dissolved		Copper	ug/L	--	--	0.520	5.8	No	0	No
Surface Water - Grab	Metals	W	Dissolved		Lead	ug/L	--	--	0.0360	1.44	No	0	No
Surface Water - Grab	Metals	W	Dissolved		Thallium	ug/L	--	--	0.0310	0.24	No	0	No
Surface Water - Grab	Metals	W	Dissolved		Zinc	ug/L	--	--	7.50	77	No	0	No
Surface Water - Grab	Metals	W	Total		Aluminum	ug/L	--	**Yes**	141	37000	No	0	No
Surface Water - Grab	Metals	W	Total		Arsenic	ug/L	--	No	--	--	--	--	No
Surface Water - Grab	Metals	W	Total		Barium	ug/L	--	**Yes**	27.0	1000	No	0	No
Surface Water - Grab	Metals	W	Total		Beryllium	ug/L	--	No	--	--	--	--	No
Surface Water - Grab	Metals	W	Total		Cadmium	ug/L	--	No	--	--	--	--	No
Surface Water - Grab	Metals	W	Total		Copper	ug/L	--	No	--	--	--	--	No
Surface Water - Grab	Metals	W	Total		Lead	ug/L	--	No	--	--	--	--	No
Surface Water - Grab	Metals	W	Total		Thallium	ug/L	--	No	--	--	--	--	No
Surface Water - Grab	NWTPH-Dx	W	Dissolved		Diesel Range Organics	ug/L	--	--	46.0	90	No	0	No
Surface Water - Grab	NWTPH-Dx	W	Total		Diesel Range Organics	ug/L	--	--	15.0	90	No	0	No
Surface Water - XAD	PCB Congeners	W	C+F	-	Total PCBs As Congeners (KM, capped)	pg/L	--	--	209	64.0	**Yes**	5	**Yes**
Surface Water - XAD	PCB Congeners	W	C+F	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	--	--	0.133	5200	No	0	No
Surface Water - XAD	PCB Congeners	W	C+F	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/L	--	--	0.540	5200	No	0	No
Surface Water - XAD	PCB Congeners	W	C+F	118	2,3',4,4',5-Pentachlorobiphenyl	pg/L	--	--	1.57	5200	No	0	No
Surface Water - XAD	PCB Congeners	W	C+F	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	--	--	0.382	1000	No	0	No
Surface Water - XAD	PCB Congeners	W	C+F	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	--	--	0.158	52000	No	0	No
Surface Water - XAD	PCB Congeners	W	C+F	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/L	--	--	0.0662	5200	No	0	No
Surface Water - XAD	SVOCs	W	C+F		Acenaphthene	ng/L	--	--	1.28	520000	No	0	No
Surface Water - XAD	SVOCs	W	C+F		Anthracene	ng/L	--	--	0.121	13000	No	0	No
Surface Water - XAD	SVOCs	W	C+F		Benzo(a)anthracene	ng/L	--	--	0.0600	3.80	No	0	No
Surface Water - XAD	SVOCs	W	C+F		Benzo(b)fluoranthene	ng/L	--	--	0.0917	3.80	No	0	No
Surface Water - XAD	SVOCs	W	C+F		Chrysene	ng/L	--	--	0.171	3.80	No	0	No
Surface Water - XAD	SVOCs	W	C+F		Fluoranthene	ng/L	--	--	0.784	6160	No	0	No
Surface Water - XAD	SVOCs	W	C+F		Phenanthrene	ng/L	--	--	1.61	140	No	0	No
Sediment	Metals	D	Total		Aluminum	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D	Total		Antimony	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D	Total		Arsenic	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D	Total		Barium	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D	Total		Beryllium	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D	Total		Cadmium	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D	Total		Chromium	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D	Total		Cobalt	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D	Total		Copper	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D	Total		Lead	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D	Total		Mercury	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D	Total		Nickel	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D	Total		Thallium	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D	Total		Vanadium	mg/kg	--	No	--	--	--	--	No

Table 9-8
Preliminary COPC Identification for Forebay Random Data
Bradford Island - River Operable Unit
(2 of 6)

Medium	Analyte Group	Basis	Total/ Dissolved	IUPAC #	Analyte	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in Forebay than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Dections > SLV	Retain as Preliminary COPC?
Sediment	Metals	D	Total		Zinc	mg/kg	--	No	--	--	--	--	No
Sediment	NWTPH-Dx	D	Total		Diesel Range Organics	mg/kg	--	--	54.0	NV	***Yes***	--	***Yes***
Sediment	NWTPH-Dx	D	Total		Residual Range Organics	mg/kg	--	--	180	NV	***Yes***	--	***Yes***
Sediment	PCB Aroclors	D	Total		Aroclor 1254	ug/kg	--	--	27.0	0.048	**Yes**	2	**Yes**
Sediment	PCB Aroclors	D	Total		Total PCBs As Aroclors	ug/kg	--	--	28.7	0.048	**Yes**	2	**Yes**
Sediment	PCB Congeners	D	Total	-	Total PCBs As Congeners (KM, capped)	ug/kg	--	--	29.7	0.048	**Yes**	19	**Yes**
Sediment	PCB Congeners	D	Total	77	3,3',4,4'-Tetrachlorobiphenyl	ug/kg	--	--	0.00709	0.0064	**Yes**	1	**Yes**
Sediment	PCB Congeners	D	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	ug/kg	--	--	1.08	0.021	**Yes**	7	**Yes**
Sediment	PCB Congeners	D	Total	114	2,3,4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.0603	0.021	**Yes**	1	**Yes**
Sediment	PCB Congeners	D	Total	118	2,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	2.65	0.026	**Yes**	14	**Yes**
Sediment	PCB Congeners	D	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	ug/kg	--	--	0.0363	0.026	**Yes**	1	**Yes**
Sediment	PCB Congeners	D	Total	126	3,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.000238	6.2E-06	**Yes**	3	**Yes**
Sediment	PCB Congeners	D	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	ug/kg	--	--	0.380	0.026	**Yes**	1	**Yes**
Sediment	PCB Congeners	D	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	ug/kg	--	--	0.113	0.026	**Yes**	1	**Yes**
Sediment	PCB Congeners	D	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	ug/kg	--	--	0.00901	0.14	No	0	No
Sediment	SVOCs	D	Total		Anthracene	ug/kg	--	--	2.70	57.0	No	0	No
Sediment	SVOCs	D	Total		Benzo(a)anthracene	ug/kg	--	--	12.0	32.0	No	0	No
Sediment	SVOCs	D	Total		Benzo(a)pyrene	ug/kg	--	--	7.50	32.0	No	0	No
Sediment	SVOCs	D	Total		Benzo(b)fluoranthene	ug/kg	--	--	9.10	27.0	No	0	No
Sediment	SVOCs	D	Total		Benzo(g,h,i)perylene	ug/kg	--	--	6.20	300	No	0	No
Sediment	SVOCs	D	Total		Benzo(k)fluoranthene	ug/kg	--	--	4.90	27.0	No	0	No
Sediment	SVOCs	D	Total		Bis(2-ethylhexyl) Phthalate	ug/kg	--	--	340	750	No	0	No
Sediment	SVOCs	D	Total		Carbazole	ug/kg	--	--	1.40	140	No	0	No
Sediment	SVOCs	D	Total		Chrysene	ug/kg	--	--	20.0	57.0	No	0	No
Sediment	SVOCs	D	Total		Fluoranthene	ug/kg	--	--	12.0	111	No	0	No
Sediment	SVOCs	D	Total		Indeno(1,2,3-cd)pyrene	ug/kg	--	--	5.70	17.0	No	0	No
Sediment	SVOCs	D	Total		p-cresol (4-Methylphenol)	ug/kg	--	--	21.0	48.0	No	0	No
Sediment	SVOCs	D	Total		Phenanthrene	ug/kg	--	--	7.40	42.0	No	0	No
Sediment	SVOCs	D	Total		Pyrene	ug/kg	--	--	17.0	53.0	No	0	No
Sediment	SVOCs	D	Total		Total LPAH (KM, capped)	ug/kg	--	--	12.0	76.0	No	0	No
Sediment	SVOCs	D	Total		Total HPAH (KM, capped)	ug/kg	--	--	73.9	193	No	0	No
Sediment	SVOCs	D	Total		Total PAHs (KM, capped)	ug/kg	--	--	83.4	1610	No	0	No
Tissue - Crayfish	Metals	W	Total		Aluminum	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W	Total		Antimony	mg/kg	--	**Yes**	0.133	NV	***Yes***	--	***Yes***
Tissue - Crayfish	Metals	W	Total		Arsenic	mg/kg	--	**Yes**	0.680	0.00076	**Yes**	17	**Yes**
Tissue - Crayfish	Metals	W	Total		Barium	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W	Total		Beryllium	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W	Total		Cadmium	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W	Total		Chromium	mg/kg	--	**Yes**	1.20	NV	***Yes***	--	***Yes***
Tissue - Crayfish	Metals	W	Total		Cobalt	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W	Total		Copper	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W	Total		Lead	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W	Total		Mercury	mg/kg	--	**Yes**	0.0315	0.049	No	0	No
Tissue - Crayfish	Metals	W	Total		Methyl Mercury	mg/kg	--	**Yes**	0.0400	0.049	No	0	No
Tissue - Crayfish	Metals	W	Total		Nickel	mg/kg	--	**Yes**	5.35	NV	***Yes***	--	***Yes***
Tissue - Crayfish	Metals	W	Total		Thallium	mg/kg	--	No	--	--	--	--	No

Table 9-8
Preliminary COPC Identification for Forebay Random Data
Bradford Island - River Operable Unit
(3 of 6)

Medium	Analyte Group	Basis	Total/ Dissolved	IUPAC #	Analyte	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in Forebay than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Dections > SLV	Retain as Preliminary COPC?
Tissue - Crayfish	Metals	W	Total		Vanadium	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W	Total		Zinc	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	PCB Congeners	W	Total	-	Total PCBs As Congeners (KM, capped)	ug/kg	--	--	42.6	0.57	**Yes**	14	**Yes**
Tissue - Crayfish	PCB Congeners	W	Total	77	3,3',4,4'-Tetrachlorobiphenyl	ug/kg	--	--	0.0207	0.076	No	0	No
Tissue - Crayfish	PCB Congeners	W	Total	81	3,4,4',5-Tetrachlorobiphenyl	ug/kg	--	--	0.00132	0.025	No	0	No
Tissue - Crayfish	PCB Congeners	W	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	ug/kg	--	--	0.134	0.25	No	0	No
Tissue - Crayfish	PCB Congeners	W	Total	114	2,3,4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.804	0.25	**Yes**	3	**Yes**
Tissue - Crayfish	PCB Congeners	W	Total	118	2,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	14.0	0.25	**Yes**	5	**Yes**
Tissue - Crayfish	PCB Congeners	W	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	ug/kg	--	--	0.460	0.25	**Yes**	1	**Yes**
Tissue - Crayfish	PCB Congeners	W	Total	126	3,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.00783	0.000076	**Yes**	7	**Yes**
Tissue - Crayfish	PCB Congeners	W	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	ug/kg	--	--	3.91	0.25	**Yes**	4	**Yes**
Tissue - Crayfish	PCB Congeners	W	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	ug/kg	--	--	1.53	0.25	**Yes**	3	**Yes**
Tissue - Crayfish	PCB Congeners	W	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	ug/kg	--	--	0.0821	0.25	No	0	No
Tissue - Crayfish	SVOCs	W	Total		Acenaphthene	ug/kg	--	--	0.260	15,000	No	0	No
Tissue - Crayfish	SVOCs	W	Total		Anthracene	ug/kg	--	--	0.160	15,000	No	0	No
Tissue - Crayfish	SVOCs	W	Total		Benzo(a)anthracene	ug/kg	--	--	0.350	1.57	No	0	No
Tissue - Crayfish	SVOCs	W	Total		Benzo(a)pyrene	ug/kg	--	--	0.170	0.157	Yes	2	**Yes**
Tissue - Crayfish	SVOCs	W	Total		Benzo(b)fluoranthene	ug/kg	--	--	0.240	1.57	No	0	No
Tissue - Crayfish	SVOCs	W	Total		Benzo(g,h,i)perylene	ug/kg	--	--	0.390	15.7	No	0	No
Tissue - Crayfish	SVOCs	W	Total		Benzo(k)fluoranthene	ug/kg	--	--	0.160	15.7	No	0	No
Tissue - Crayfish	SVOCs	W	Total		Bis(2-ethylhexyl) Phthalate	ug/kg	--	--	110	81.9	Yes	2	**Yes**
Tissue - Crayfish	SVOCs	W	Total		Chrysene	ug/kg	--	--	0.310	157	No	0	No
Tissue - Crayfish	SVOCs	W	Total		Fluoranthene	ug/kg	--	--	0.750	19,000	No	0	No
Tissue - Crayfish	SVOCs	W	Total		Fluorene	ug/kg	--	--	0.210	15,000	No	0	No
Tissue - Crayfish	SVOCs	W	Total		Indeno(1,2,3-cd)pyrene	ug/kg	--	--	0.180	1.57	No	0	No
Tissue - Crayfish	SVOCs	W	Total		Phenanthrene	ug/kg	--	--	0.860	15,000	No	0	No
Tissue - Crayfish	SVOCs	W	Total		Pyrene	ug/kg	--	--	1.20	1,000	No	0	No
Tissue - Smallmouth Bass	Metals	W	Total		Aluminum	mg/kg	--	**Yes**	15.5	NV	***Yes***	--	***Yes***
Tissue - Smallmouth Bass	Metals	W	Total		Arsenic	mg/kg	--	No	--	--	--	--	No
Tissue - Smallmouth Bass	Metals	W	Total		Barium	mg/kg	--	**Yes**	2.64	NV	***Yes***	--	***Yes***
Tissue - Smallmouth Bass	Metals	W	Total		Beryllium	mg/kg	--	No	--	--	--	--	No
Tissue - Smallmouth Bass	Metals	W	Total		Cadmium	mg/kg	--	No	--	--	--	--	No
Tissue - Smallmouth Bass	Metals	W	Total		Chromium	mg/kg	--	No	--	--	--	--	No
Tissue - Smallmouth Bass	Metals	W	Total		Cobalt	mg/kg	--	No	--	--	--	--	No
Tissue - Smallmouth Bass	Metals	W	Total		Copper	mg/kg	--	**Yes**	1.42	NV	***Yes***	--	***Yes***
Tissue - Smallmouth Bass	Metals	W	Total		Lead	mg/kg	--	No	--	--	--	--	No
Tissue - Smallmouth Bass	Metals	W	Total		Mercury	mg/kg	--	**Yes**	0.512	0.049	**Yes**	19	**Yes**
Tissue - Smallmouth Bass	Metals	W	Total		Nickel	mg/kg	--	No	--	--	--	--	No
Tissue - Smallmouth Bass	Metals	W	Total		Thallium	mg/kg	--	No	--	--	--	--	No
Tissue - Smallmouth Bass	Metals	W	Total		Vanadium	mg/kg	--	No	--	--	--	--	No
Tissue - Smallmouth Bass	Metals	W	Total		Zinc	mg/kg	--	**Yes**	18.0	NV	***Yes***	--	***Yes***
Tissue - Smallmouth Bass	PCB Aroclors	W	Total		Aroclor 1242	ug/kg	--	--	260	0.57	**Yes**	1	**Yes**
Tissue - Smallmouth Bass	PCB Aroclors	W	Total		Aroclor 1254	ug/kg	--	--	18,000	0.57	**Yes**	7	**Yes**
Tissue - Smallmouth Bass	PCB Aroclors	W	Total		Total PCBs As Aroclors	ug/kg	--	--	18,110	0.57	**Yes**	7	**Yes**
Tissue - Smallmouth Bass	PCB Congeners	W	Total	-	Total PCBs As Congeners (KM, capped)	ug/kg	--	--	26,505	0.57	**Yes**	19	**Yes**
Tissue - Smallmouth Bass	PCB Congeners	W	Total	77	3,3',4,4'-Tetrachlorobiphenyl	ug/kg	--	--	8.95	0.076	**Yes**	10	**Yes**

Table 9-8
Preliminary COPC Identification for Forebay Random Data
Bradford Island - River Operable Unit
(4 of 6)

Medium	Analyte Group	Basis	Total/ Dissolved	IUPAC #	Analyte	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in Forebay than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Dections > SLV	Retain as Preliminary COPC?
Tissue - Smallmouth Bass	PCB Congeners	W	Total	81	3,4,4',5-Tetrachlorobiphenyl	ug/kg	--	--	1.19	0.025	**Yes**	1	**Yes**
Tissue - Smallmouth Bass	PCB Congeners	W	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	ug/kg	--	--	1,300	0.25	**Yes**	19	**Yes**
Tissue - Smallmouth Bass	PCB Congeners	W	Total	114	2,3,4,4',5-Pentachlorobiphenyl	ug/kg	--	--	89.8	0.25	**Yes**	12	**Yes**
Tissue - Smallmouth Bass	PCB Congeners	W	Total	118	2,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	3,270	0.25	**Yes**	19	**Yes**
Tissue - Smallmouth Bass	PCB Congeners	W	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	ug/kg	--	--	55.3	0.25	**Yes**	9	**Yes**
Tissue - Smallmouth Bass	PCB Congeners	W	Total	126	3,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	3.03	0.000076	**Yes**	18	**Yes**
Tissue - Smallmouth Bass	PCB Congeners	W	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	ug/kg	--	--	486	0.25	**Yes**	19	**Yes**
Tissue - Smallmouth Bass	PCB Congeners	W	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	ug/kg	--	--	140	0.25	**Yes**	15	**Yes**
Tissue - Smallmouth Bass	PCB Congeners	W	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	ug/kg	--	--	10.1	0.25	**Yes**	9	**Yes**
Tissue - Smallmouth Bass	SVOCs	W	Total		Acenaphthene	ug/kg	--	--	1.60	15,000	No	0	No
Tissue - Smallmouth Bass	SVOCs	W	Total		Anthracene	ug/kg	--	--	17.0	15,000	No	0	No
Tissue - Smallmouth Bass	SVOCs	W	Total		Benzo(a)anthracene	ug/kg	--	--	17.0	1.57	Yes	2	**Yes**
Tissue - Smallmouth Bass	SVOCs	W	Total		Benzo(a)pyrene	ug/kg	--	--	7.40	0.157	Yes	8	**Yes**
Tissue - Smallmouth Bass	SVOCs	W	Total		Benzo(b)fluoranthene	ug/kg	--	--	4.40	1.57	Yes	5	**Yes**
Tissue - Smallmouth Bass	SVOCs	W	Total		Benzo(g,h,i)perylene	ug/kg	--	--	3.30	15.7	No	0	No
Tissue - Smallmouth Bass	SVOCs	W	Total		Benzo(k)fluoranthene	ug/kg	--	--	7.70	15.7	No	0	No
Tissue - Smallmouth Bass	SVOCs	W	Total		Bis(2-ethylhexyl) Phthalate	ug/kg	--	--	1,600	81.9	Yes	7	**Yes**
Tissue - Smallmouth Bass	SVOCs	W	Total		Butyl Benzyl Phthalate	ug/kg	--	--	440	310	Yes	1	**Yes**
Tissue - Smallmouth Bass	SVOCs	W	Total		Chrysene	ug/kg	--	--	10.0	157	No	0	No
Tissue - Smallmouth Bass	SVOCs	W	Total		Dibenz(a,h)anthracene	ug/kg	--	--	4.10	0.157	Yes	6	**Yes**
Tissue - Smallmouth Bass	SVOCs	W	Total		Di-n-butyl Phthalate	ug/kg	--	--	150	626	No	0	No
Tissue - Smallmouth Bass	SVOCs	W	Total		Fluoranthene	ug/kg	--	--	6.50	19,000	No	0	No
Tissue - Smallmouth Bass	SVOCs	W	Total		Fluorene	ug/kg	--	--	4.70	15,000	No	0	No
Tissue - Smallmouth Bass	SVOCs	W	Total		Indeno(1,2,3-cd)pyrene	ug/kg	--	--	6.10	1.57	Yes	5	**Yes**
Tissue - Smallmouth Bass	SVOCs	W	Total		Phenanthrene	ug/kg	--	--	5.70	15,000	No	0	No
Tissue - Smallmouth Bass	SVOCs	W	Total		Pyrene	ug/kg	--	--	7.20	1,000	No	0	No
Tissue - Clam	Metals	W	Total		Aluminum	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W	Total		Antimony	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W	Total		Arsenic	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W	Total		Barium	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W	Total		Beryllium	mg/kg	--	**Yes**	0.00380	NV	***Yes***	--	***Yes***
Tissue - Clam	Metals	W	Total		Cadmium	mg/kg	--	**Yes**	0.461	0.15	**Yes**	19	**Yes**
Tissue - Clam	Metals	W	Total		Chromium	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W	Total		Cobalt	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W	Total		Copper	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W	Total		Lead	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W	Total		Mercury	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W	Total		Methyl Mercury	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W	Total		Nickel	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W	Total		Thallium	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W	Total		Vanadium	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W	Total		Zinc	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	PCB Aroclors	W	Total		Aroclor 1254	ug/kg	--	--	120	35	**Yes**	1	**Yes**
Tissue - Clam	PCB Aroclors	W	Total		Total PCBs As Aroclors	ug/kg	--	--	120	35	**Yes**	1	**Yes**
Tissue - Clam	PCB Congeners	W	Total	-	Total PCBs As Congeners (KM, capped)	ug/kg	--	--	312	35	**Yes**	5	**Yes**
Tissue - Clam	PCB Congeners	W	Total	77	3,3',4,4'-Tetrachlorobiphenyl	ug/kg	--	--	0.0690	0.16	No	0	No

Table 9-8
Preliminary COPC Identification for Forebay Random Data
Bradford Island - River Operable Unit
(5 of 6)

Medium	Analyte Group	Basis	Total/ Dissolved	IUPAC #	Analyte	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in Forebay than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Dections > SLV	Retain as Preliminary COPC?
Tissue - Clam	PCB Congeners	W	Total	81	3,4,4',5-Tetrachlorobiphenyl	ug/kg	--	--	0.00246	0.08	No	0	No
Tissue - Clam	PCB Congeners	W	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	ug/kg	--	--	6.20	20	No	0	No
Tissue - Clam	PCB Congeners	W	Total	114	2,3,4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.445	20	No	0	No
Tissue - Clam	PCB Congeners	W	Total	118	2,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	64.7	20	**Yes**	1	**Yes**
Tissue - Clam	PCB Congeners	W	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	ug/kg	--	--	1.15	20	No	0	No
Tissue - Clam	PCB Congeners	W	Total	126	3,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.0110	0.0058	**Yes**	1	**Yes**
Tissue - Clam	PCB Congeners	W	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	ug/kg	--	--	3.61	20	No	0	No
Tissue - Clam	PCB Congeners	W	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	ug/kg	--	--	3.80	20	No	0	No
Tissue - Clam	PCB Congeners	W	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	ug/kg	--	--	0.0101	20	No	0	No
Tissue - Clam	SVOCs	W	Total		Acenaphthene	ug/kg	--	--	4.10	19,000	No	0	No
Tissue - Clam	SVOCs	W	Total		Anthracene	ug/kg	--	--	2.30	19,000	No	0	No
Tissue - Clam	SVOCs	W	Total		Benzo(a)anthracene	ug/kg	--	--	2.10	1,000	No	0	No
Tissue - Clam	SVOCs	W	Total		Benzo(a)pyrene	ug/kg	--	--	0.580	1,000	No	0	No
Tissue - Clam	SVOCs	W	Total		Benzo(b)fluoranthene	ug/kg	--	--	0.950	1,000	No	0	No
Tissue - Clam	SVOCs	W	Total		Benzo(g,h,i)perylene	ug/kg	--	--	0.360	1,000	No	0	No
Tissue - Clam	SVOCs	W	Total		Benzo(k)fluoranthene	ug/kg	--	--	0.250	1,000	No	0	No
Tissue - Clam	SVOCs	W	Total		Bis(2-ethylhexyl) Phthalate	ug/kg	--	--	890	1,760	No	0	No
Tissue - Clam	SVOCs	W	Total		Butyl Benzyl Phthalate	ug/kg	--	--	15.0	310	No	0	No
Tissue - Clam	SVOCs	W	Total		Chrysene	ug/kg	--	--	4.00	1,000	No	0	No
Tissue - Clam	SVOCs	W	Total		Di-n-octyl Phthalate	ug/kg	--	--	38.0	626	No	0	No
Tissue - Clam	SVOCs	W	Total		Fluoranthene	ug/kg	--	--	16.0	19,000	No	0	No
Tissue - Clam	SVOCs	W	Total		Fluorene	ug/kg	--	--	3.80	19,000	No	0	No
Tissue - Clam	SVOCs	W	Total		Indeno(1,2,3-cd)pyrene	ug/kg	--	--	2.50	1,000	No	0	No
Tissue - Clam	SVOCs	W	Total		p-cresol (4-Methylphenol)	ug/kg	--	--	31.0	NV	***Yes***	--	***Yes***
Tissue - Clam	SVOCs	W	Total		Phenanthrene	ug/kg	--	--	15.0	19,000	No	0	No
Tissue - Clam	SVOCs	W	Total		Pyrene	ug/kg	--	--	6.30	1,000	No	0	No
Tissue - Sculpin	Metals	W	Total		Arsenic	mg/kg	--	No	--	--	--	--	No
Tissue - Sculpin	Metals	W	Total		Cadmium	mg/kg	--	**Yes**	0.0453	0.15	No	0	No
Tissue - Sculpin	Metals	W	Total		Lead	mg/kg	--	**Yes**	0.306	0.12	**Yes**	2	**Yes**
Tissue - Sculpin	Metals	W	Total		Mercury	mg/kg	--	**Yes**	0.308	0.074	**Yes**	13	**Yes**
Tissue - Sculpin	PCB Aroclors	W	Total		Aroclor 1254	ug/kg	--	--	1,700	35	**Yes**	3	**Yes**
Tissue - Sculpin	PCB Aroclors	W	Total		Total PCBs As Aroclors	ug/kg	--	--	1,700	35	**Yes**	3	**Yes**
Tissue - Sculpin	PCB Congeners	W	Total	-	Total PCBs As Congeners (KM, capped)	ug/kg	--	--	4,773	35	**Yes**	9	**Yes**
Tissue - Sculpin	PCB Congeners	W	Total	77	3,3',4,4'-Tetrachlorobiphenyl	ug/kg	--	--	0.443	0.16	**Yes**	1	**Yes**
Tissue - Sculpin	PCB Congeners	W	Total	81	3,4,4',5-Tetrachlorobiphenyl	ug/kg	--	--	0.00145	0.08	No	0	No
Tissue - Sculpin	PCB Congeners	W	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	ug/kg	--	--	269	20	**Yes**	3	**Yes**
Tissue - Sculpin	PCB Congeners	W	Total	114	2,3,4,4',5-Pentachlorobiphenyl	ug/kg	--	--	19.9	20	No	0	No
Tissue - Sculpin	PCB Congeners	W	Total	118	2,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	757	20	**Yes**	3	**Yes**
Tissue - Sculpin	PCB Congeners	W	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	ug/kg	--	--	11.8	20	No	0	No
Tissue - Sculpin	PCB Congeners	W	Total	126	3,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.0540	0.0058	**Yes**	9	**Yes**
Tissue - Sculpin	PCB Congeners	W	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	ug/kg	--	--	118	20	**Yes**	3	**Yes**
Tissue - Sculpin	PCB Congeners	W	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	ug/kg	--	--	30.8	20	**Yes**	1	**Yes**
Tissue - Sculpin	PCB Congeners	W	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	ug/kg	--	--	0.00365	0.020	No	0	No
Tissue - Sculpin	PCB Congeners	W	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	ug/kg	--	--	2.48	20	No	0	No

Table 9-8
Preliminary COPC Identification for Forebay Random Data
Bradford Island - River Operable Unit
(6 of 6)

Medium	Analyte Group	Basis	Total/ Dissolved	IUPAC #	Analyte	Unit	Detection Rate > 5%?[1]	Significantly Higher Conc in Forebay than Reference?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Dections > SLV	Retain as Preliminary COPC?

Notes
(1) Only evaluated for analytes with a sample size of 20 or more.
(2) Only applicable to inorganics. For sediment and tissue the statistical comparison of Forebay concentrations to Reference Area concentrations; Table 8-3 and Appendix L, Tables L-4, L-5, and L-6.
For surface water, see Table 8-4.
(3) Total PCB TEQs are evaluated in the HHRA and ERA for the River OU; see Sections 11 and 12 and Appendices M and N.

'--' = Not evaluated
% = percent
D = Dry weight
Max = maximum
MDL = method detection limit
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
Min = minimum
ND = non-detect
No. = number
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
C + F = Column and filter
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
W = Wet Weight

Table 9-9
Preliminary COPC Identification for Targeted Goose Island Data
Bradford Island - River Operable Unit
(1 of 4)

Medium	Analyte Group	Basis	IUPAC #	Analyte	Unit	Detection Rate > 5%?[1]	Higher Conc than Reference Area?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Sediment	Metals	D		Aluminum	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D		Antimony	mg/kg	--	**Yes**	0.580	3.00	No	0	No
Sediment	Metals	D		Arsenic	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D		Barium	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D		Beryllium	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D		Cadmium	mg/kg	--	**Yes**	1.17	0.674	**Yes**	2	**Yes**
Sediment	Metals	D		Chromium	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D		Cobalt	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D		Copper	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D		Lead	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D		Mercury	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D		Nickel	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D		Thallium	mg/kg	--	**Yes**	0.435	0.354	**Yes**	1	**Yes**
Sediment	Metals	D		Vanadium	mg/kg	--	No	--	--	--	--	No
Sediment	Metals	D		Zinc	mg/kg	--	**Yes**	148	123	**Yes**	1	**Yes**
Sediment	NWTPH-Dx	D		Diesel Range Organics	mg/kg	--	--	53.0	NV	***Yes***	--	***Yes***
Sediment	NWTPH-Dx	D		Residual Range Organics	mg/kg	--	--	480	NV	***Yes***	--	***Yes***
Sediment	PCB Aroclors	D		Aroclor 1254	ug/kg	--	--	9.90	0.048	**Yes**	1	**Yes**
Sediment	PCB Aroclors	D		Total PCBs As Aroclors	ug/kg	--	--	12.6	0.048	**Yes**	1	**Yes**
Sediment	PCB Congeners	D	-	Total PCBs As Congeners (KM, capped)	ug/kg	--	--	1.34	0.048	**Yes**	2	**Yes**
Sediment	PCB Congeners	D	77	3,3',4,4'-Tetrachlorobiphenyl	ug/kg	--	--	0.00353	0.0064	No	0	No
Sediment	PCB Congeners	D	81	3,4,4',5-Tetrachlorobiphenyl	ug/kg	--	--	0.000135	0.0021	No	0	No
Sediment	PCB Congeners	D	105	2,3,3',4,4'-Pentachlorobiphenyl	ug/kg	--	--	0.0277	0.021	**Yes**	2	**Yes**
Sediment	PCB Congeners	D	114	2,3,4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.00137	0.021	No	0	No
Sediment	PCB Congeners	D	118	2,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.0695	0.026	**Yes**	2	**Yes**
Sediment	PCB Congeners	D	123	2,3',4,4',5'-Pentachlorobiphenyl	ug/kg	--	--	0.000963	0.026	No	0	No
Sediment	PCB Congeners	D	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	ug/kg	--	--	0.0104	0.026	No	0	No
Sediment	PCB Congeners	D	167	2,3',4,4',5,5'-Hexachlorobiphenyl	ug/kg	--	--	0.00402	0.026	No	0	No
Sediment	PCB Congeners	D	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	ug/kg	--	--	0.000869	0.14	No	0	No
Sediment	SVOCs	D		Benzo(a)anthracene	ug/kg	--	--	7.80	32.0	No	0	No
Sediment	SVOCs	D		Benzo(a)pyrene	ug/kg	--	--	13.0	32.0	No	0	No
Sediment	SVOCs	D		Benzo(b)fluoranthene	ug/kg	--	--	15.0	27.0	No	0	No
Sediment	SVOCs	D		Benzo(g,h,i)perylene	ug/kg	--	--	9.90	300	No	0	No
Sediment	SVOCs	D		Benzo(k)fluoranthene	ug/kg	--	--	4.10	27.0	No	0	No
Sediment	SVOCs	D		Bis(2-ethylhexyl) Phthalate	ug/kg	--	--	13.0	750	No	0	No
Sediment	SVOCs	D		Chrysene	ug/kg	--	--	11.0	57.0	No	0	No
Sediment	SVOCs	D		Di-n-butyl Phthalate	ug/kg	--	--	10.0	110	No	0	No
Sediment	SVOCs	D		Fluoranthene	ug/kg	--	--	9.60	111	No	0	No

Table 9-9
Preliminary COPC Identification for Targeted Goose Island Data
Bradford Island - River Operable Unit
(2 of 4)

Medium	Analyte Group	Basis	IUPAC #	Analyte	Unit	Detection Rate > 5%?[1]	Higher Conc than Reference Area?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Sediment	SVOCs	D		Indeno(1,2,3-cd)pyrene	ug/kg	--	--	7.10	17.0	No	0	No
Sediment	SVOCs	D		p-cresol (4-Methylphenol)	ug/kg	--	--	8.50	48.0	No	0	No
Sediment	SVOCs	D		Phenanthrene	ug/kg	--	--	4.60	42.0	No	0	No
Sediment	SVOCs	D		Pyrene	ug/kg	--	--	8.80	53.0	No	0	No
Sediment	SVOCs	D		Total LPAH (KM, capped)	ug/kg	--	--	9.90	76.0	No	0	No
Sediment	SVOCs	D		Total HPAH (KM, capped)	ug/kg	--	--	89.1	193	No	0	No
Sediment	SVOCs	D		Total PAHs (KM, capped)	ug/kg	--	--	96.1	1610	No	0	No
Tissue - Crayfish	Metals	W		Aluminum	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W		Antimony	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W		Arsenic	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W		Barium	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W		Beryllium	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W		Cadmium	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W		Chromium	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W		Cobalt	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W		Copper	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W		Lead	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W		Mercury	mg/kg	--	**Yes**	0.0359	0.049	No	0	No
Tissue - Crayfish	Metals	W		Nickel	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W		Thallium	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W		Vanadium	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	Metals	W		Zinc	mg/kg	--	No	--	--	--	--	No
Tissue - Crayfish	PCB Congeners	W	-	Total PCBs As Congeners (KM, capped)	ug/kg	--	--	0.587	0.57	**Yes**	1	**Yes**
Tissue - Crayfish	PCB Congeners	W	77	3,3',4,4'-Tetrachlorobiphenyl	ug/kg	--	--	0.00226	0.076	No	0	No
Tissue - Crayfish	PCB Congeners	W	105	2,3,3',4,4'-Pentachlorobiphenyl	ug/kg	--	--	0.00624	0.25	No	0	No
Tissue - Crayfish	PCB Congeners	W	114	2,3,4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.00235	0.25	No	0	No
Tissue - Crayfish	PCB Congeners	W	118	2,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.0870	0.25	No	0	No
Tissue - Crayfish	PCB Congeners	W	123	2,3',4,4',5'-Pentachlorobiphenyl	ug/kg	--	--	0.00256	0.25	No	0	No
Tissue - Crayfish	PCB Congeners	W	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	ug/kg	--	--	0.0133	0.25	No	0	No
Tissue - Crayfish	PCB Congeners	W	167	2,3',4,4',5,5'-Hexachlorobiphenyl	ug/kg	--	--	0.0112	0.25	No	0	No
Tissue - Crayfish	PCB Congeners	W	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	ug/kg	--	--	0.000662	0.25	No	0	No
Tissue - Crayfish	SVOCs	W		Anthracene	ug/kg	--	--	0.430	15,000	No	0	No
Tissue - Crayfish	SVOCs	W		Benzo(b)fluoranthene	ug/kg	--	--	0.150	1.57	No	0	No
Tissue - Crayfish	SVOCs	W		Benzo(g,h,i)perylene	ug/kg	--	--	0.110	15.7	No	0	No
Tissue - Crayfish	SVOCs	W		Benzo(k)fluoranthene	ug/kg	--	--	0.110	15.7	No	0	No
Tissue - Crayfish	SVOCs	W		Fluorene	ug/kg	--	--	0.510	15,000	No	0	No
Tissue - Crayfish	SVOCs	W		Indeno(1,2,3-cd)pyrene	ug/kg	--	--	0.150	1.57	No	0	No
Tissue - Crayfish	SVOCs	W		Phenanthrene	ug/kg	--	--	0.820	15,000	No	0	No

Table 9-9
Preliminary COPC Identification for Targeted Goose Island Data
Bradford Island - River Operable Unit
(3 of 4)

Medium	Analyte Group	Basis	IUPAC #	Analyte	Unit	Detection Rate > 5%?[1]	Higher Conc than Reference Area?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Tissue - Clam	Metals	W		Aluminum	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W		Arsenic	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W		Barium	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W		Beryllium	mg/kg	--	**Yes**	0.00200	NV	***Yes***	--	***Yes***
Tissue - Clam	Metals	W		Cadmium	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W		Chromium	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W		Cobalt	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W		Copper	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W		Lead	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W		Mercury	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W		Nickel	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W		Thallium	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W		Vanadium	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	Metals	W		Zinc	mg/kg	--	No	--	--	--	--	No
Tissue - Clam	PCB Congeners	W	-	Total PCBs As Congeners (KM, capped)	ug/kg	--	--	21.4	35	No	0	No
Tissue - Clam	PCB Congeners	W	77	3,3',4,4'-Tetrachlorobiphenyl	ug/kg	--	--	0.0337	0.16	No	0	No
Tissue - Clam	PCB Congeners	W	105	2,3,3',4,4'-Pentachlorobiphenyl	ug/kg	--	--	0.352	20	No	0	No
Tissue - Clam	PCB Congeners	W	114	2,3,4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.0228	20	No	0	No
Tissue - Clam	PCB Congeners	W	118	2,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	1.59	20	No	0	No
Tissue - Clam	PCB Congeners	W	123	2,3',4,4',5'-Pentachlorobiphenyl	ug/kg	--	--	0.0280	20	No	0	No
Tissue - Clam	PCB Congeners	W	126	3,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.00307	0.0058	No	0	No
Tissue - Clam	PCB Congeners	W	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	ug/kg	--	--	0.0969	20	No	0	No
Tissue - Clam	PCB Congeners	W	167	2,3',4,4',5,5'-Hexachlorobiphenyl	ug/kg	--	--	0.0925	20	No	0	No
Tissue - Clam	PCB Congeners	W	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	ug/kg	--	--	0.00157	20	No	0	No
Tissue - Clam	SVOCs	W		Acenaphthene	ug/kg	--	--	0.680	19,000	No	0	No
Tissue - Clam	SVOCs	W		Anthracene	ug/kg	--	--	1.20	19,000	No	0	No
Tissue - Clam	SVOCs	W		Benzo(a)anthracene	ug/kg	--	--	3.40	1,000	No	0	No
Tissue - Clam	SVOCs	W		Benzo(a)pyrene	ug/kg	--	--	0.750	1,000	No	0	No
Tissue - Clam	SVOCs	W		Benzo(b)fluoranthene	ug/kg	--	--	2.20	1,000	No	0	No
Tissue - Clam	SVOCs	W		Benzo(g,h,i)perylene	ug/kg	--	--	0.740	1,000	No	0	No
Tissue - Clam	SVOCs	W		Benzo(k)fluoranthene	ug/kg	--	--	1.30	1,000	No	0	No
Tissue - Clam	SVOCs	W		Chrysene	ug/kg	--	--	2.50	1,000	No	0	No
Tissue - Clam	SVOCs	W		Dibenz(a,h)anthracene	ug/kg	--	--	0.480	1,000	No	0	No
Tissue - Clam	SVOCs	W		Fluoranthene	ug/kg	--	--	18.0	19,000	No	0	No
Tissue - Clam	SVOCs	W		Fluorene	ug/kg	--	--	1.80	19,000	No	0	No
Tissue - Clam	SVOCs	W		Indeno(1,2,3-cd)pyrene	ug/kg	--	--	0.890	1,000	No	0	No
Tissue - Clam	SVOCs	W		p-cresol (4-Methylphenol)	ug/kg	--	--	29.0	NV	***Yes***	--	***Yes***
Tissue - Clam	SVOCs	W		Phenanthrene	ug/kg	--	--	10.0	19,000	No	0	No

Table 9-9
Preliminary COPC Identification for Targeted Goose Island Data
Bradford Island - River Operable Unit
(4 of 4)

Medium	Analyte Group	Basis	IUPAC #	Analyte	Unit	Detection Rate > 5%?[1]	Higher Conc than Reference Area?[2]	Max Detected Value	Selected SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Tissue - Clam	SVOCs	W		Pyrene	ug/kg	--	--	5.40	1,000	No	0	No
Tissue - Sculpin	PCB Congeners	W	-	Total PCBs As Congeners (KM, capped)	ug/kg	--	--	8.14	35	No	0	No
Tissue - Sculpin	PCB Congeners	W	77	3,3',4,4'-Tetrachlorobiphenyl	ug/kg	--	--	0.00799	0.16	No	0	No
Tissue - Sculpin	PCB Congeners	W	105	2,3,3',4,4'-Pentachlorobiphenyl	ug/kg	--	--	0.362	20	No	0	No
Tissue - Sculpin	PCB Congeners	W	114	2,3,4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.0220	20	No	0	No
Tissue - Sculpin	PCB Congeners	W	118	2,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.872	20	No	0	No
Tissue - Sculpin	PCB Congeners	W	123	2,3',4,4',5'-Pentachlorobiphenyl	ug/kg	--	--	0.0163	20	No	0	No
Tissue - Sculpin	PCB Congeners	W	126	3,3',4,4',5-Pentachlorobiphenyl	ug/kg	--	--	0.00315	0.0058	No	0	No
Tissue - Sculpin	PCB Congeners	W	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	ug/kg	--	--	0.106	20	No	0	No
Tissue - Sculpin	PCB Congeners	W	167	2,3',4,4',5,5'-Hexachlorobiphenyl	ug/kg	--	--	0.0348	20	No	0	No
Tissue - Sculpin	PCB Congeners	W	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	ug/kg	--	--	0.00383	20	No	0	No

Notes
(1) Only evaluated for analytes with a sample size of 20 or more.
(2) Only evaluated for inorganics, see Appendix L, Table L-7
(3) Total PCB TEQs are evaluated in the HHRA and ERA for the River OU; see Sections 11 and 12 and Appendices M and N.
All concentrations are totals.

'--' = Not evaluated
% = percent
D = Dry weight
Max = maximum
mg/kg = milligrams per kilogram
Min = minimum
No. = number
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
W = Wet Weight

Table 11-1
Summary of COPCs Recommended for Risk Management - Landfill AOPC
Bradford Island - Upland Operable Unit
(1 of 1)

Media	Chemicals of Potential Concern (COPCs) (1) (2)
Soil	Arsenic cPAHs Tetrachloroethene (PCE)
	Chromium Lead PCE Degradation Products (3)
Groundwater	Arsenic Bis(2-ethylhexyl) Phthalate Chloroform Diesel Range Organics Di-n-octyl Phthalate Manganese Residual Range Organics Tetrachloroethene (PCE) Vinyl Chloride
	1,2,4-Trimethylbenzene Antimony Barium Gasoline Range Organics Zinc Lead Mercury Thallium n-Propylbenzene Isopropylbenzene Tributyltin PCE Degradation Products (3)
Seepwater	Arsenic Chloroform Diesel Range Organics Lead Manganese Tetrachloroethene (PCE)
	Antimony Mercury Residual Range Organics PCE Degradation Products (3)
Surface Water (at Shoreline)	Arsenic
	Lead

cPAHs = Carcinogenic polynuclear aromatic hydrocarbons

Shaded indicates COPC selection rationales were not based on C/SLV>1 (i.e., selection was due to: multi-media, C/SLV>0.1, degradation product, no SLV, etc.,)

(1) Not all COPCs apply to all receptors and exposure pathways within that medium.

(2) Additional COPCs were identified and discussed for the erodible soil/mass wasting scenarios (see Appendix O, Section 0.2.1.6)

(3) Degradation products are dichloroethenes, TCE, and vinyl chloride.

Table 11-2
Summary of COPCs Recommended for Risk Management - Sandblast Area AOPC
Bradford Island - Upland Operable Unit
(1 of 1)

Media	Chemicals of Potential Concern (COPCs) (1) (2)
Soil	Arsenic cPAHs Chromium Lead Tetrachloroethene (PCE)
	PCE Degradation Products (3)
Soil Gas	Tetrachloroethene (PCE) Trichloroethene (TCE)
	PCE Degradation Products (3)
Groundwater	1,1-Dichloroethane Arsenic cPAHs Tetrachloroethene (PCE) Trichloroethene (TCE) Vinyl Chloride
	Diesel Range Organics Gasoline Range Organics Vanadium PCE Degradation Products (3)

cPAHs = Carcinogenic polynuclear aromatic hydrocarbons

Shaded indicates COPC selection rationales were not based on C/SLV>1 (i.e., selection was due to: multi-media, C/SLV>0.1, degradation product, no SLV, etc.,)

(1) Not all COPCs apply to all receptors and exposure pathways within that medium.

(2) Additional COPCs were identified and discussed for the erodible soil/mass wasting scenarios (see Appendix O, Section 0.2.1.6)

(3) Degradation products are dichloroethenes, TCE, and vinyl chloride.

Table 11-3
Summary of COPCs Recommended for Risk Management - River OU
Bradford Island - River Operable Unit
(1 of 1)

Media	Chemicals of Potential Concern (COPCs) (1) (2)
Random Forebay Tissue - Crayfish	Arsenic Polychlorinated Biphenyls (PCBs)
Random Forebay Tissue - Small Mouth Bass	cPAHs Bis(2-ethylhexyl) Phthalate Mercury PCBs Barium
Random Forebay Sediment	PCBs Mercury Bis(2-ethylhexyl) Phthalate
Forebay Surface Water	Arsenic PCBs Aluminum Lead
Eagle Creek Sediment	Anthracene cPAHs Diesel Range Organics Fluoranthene Phenanthrene Pyrene PCBs
Goose Island Tissue - Crayfish	PCBs
Goose Island Sediment	PCBs Bis(2-ethylhexyl) Phthalate

cPAHs = Carcinogenic polynuclear aromatic hydrocarbons

Shaded indicates COPC selection rationales were not based on C/SLV>1 (i.e., selection was due to: multi-media, C/SLV>0.1, degradation product, no SLV, etc.,)

(1) Not all COPCs apply to all receptors and exposure pathways within that medium.

(2) Additional COPCs were identified and discussed for the erodible soil/mass wasting scenarios (see Appendix O, Section 0.2.1.6)

Table 12-1
Summary of CPECs Recommended for Risk Management - Upland OU
Bradford Island - Upland Operable Unit
(1 of 1)

AOPC	Medium	CPECs
Landfill	Soil	Antimony, Chromium*, Copper*, Lead, Mercury, Nickel*, and total HPAHs
Sandblast Area	Soil	Antimony, Cadmium, Chromium, Lead, Mercury*, Nickel, Bis(2-ethylhexyl) phthalate, and total HPAHs
Pistol Range	Soil	Lead
Bulb Slope	Soil	Lead, Mercury

Notes
AOPC - area of potential concern
CPEC - chemical of potential ecological concern
HPAHs - high molecular weight polycyclic aromatic hydrocarbons

* These metals were eliminated as CPECs based on the statistical background comparison, but were ultimately retained for risk management based on the additional evaluation performed in Section O.3.1.2 of Appendix O.

Note: In addition to the CPECs listed in this table, CPECs in soils identified based on the evaluation of potential transport to the River OU via mass wasting or erosion are also recommended for risk management (see Section O.3.1.5 of Appendix O).

Table 12-2
Summary of CPECs Recommended for Risk Management - River OU
Bradford Island - River Operable Unit
(1 of 1)

Data Set	Receptor Group	Medium	CPECs
Random Forebay	Benthic Community	Sediment	PCBs
	Fish and Shellfish	Clam Tissue	Cadmium
		Sculpin Tissue	Cadmium, Lead, Mercury and PCBs
		Bass Tissue	Mercury and PCBs
		Sediment	Cadmium, Lead, Mercury and PCBs
	Birds	Crayfish Tissue	PCBs
		Sculpin Tissue	Mercury and PCBs
		Bass Tissue	Mercury and PCBs
		Sediment	Mercury and PCBs
	Mammals	Sculpin Tissue	Mercury and PCBs
		Bass Tissue	Mercury and PCBs
		Sediment	Mercury and PCBs
Eagle Creek	All	Sediment	PCBs

Notes

CPECs - chemicals of potential ecological concern

PCBs - polychlorinated biphenyls (as Aroclors and 209 congeners)

Note: Although CPEC concentrations in media collected from the targeted Goose Island samples indicate acceptable risk levels, Goose Island will be maintained as part of the Forebay evaluation in the forthcoming FS in response to DEQ's request.

APPENDIX B

BORING LOGS

HTRW DRILLING LOG

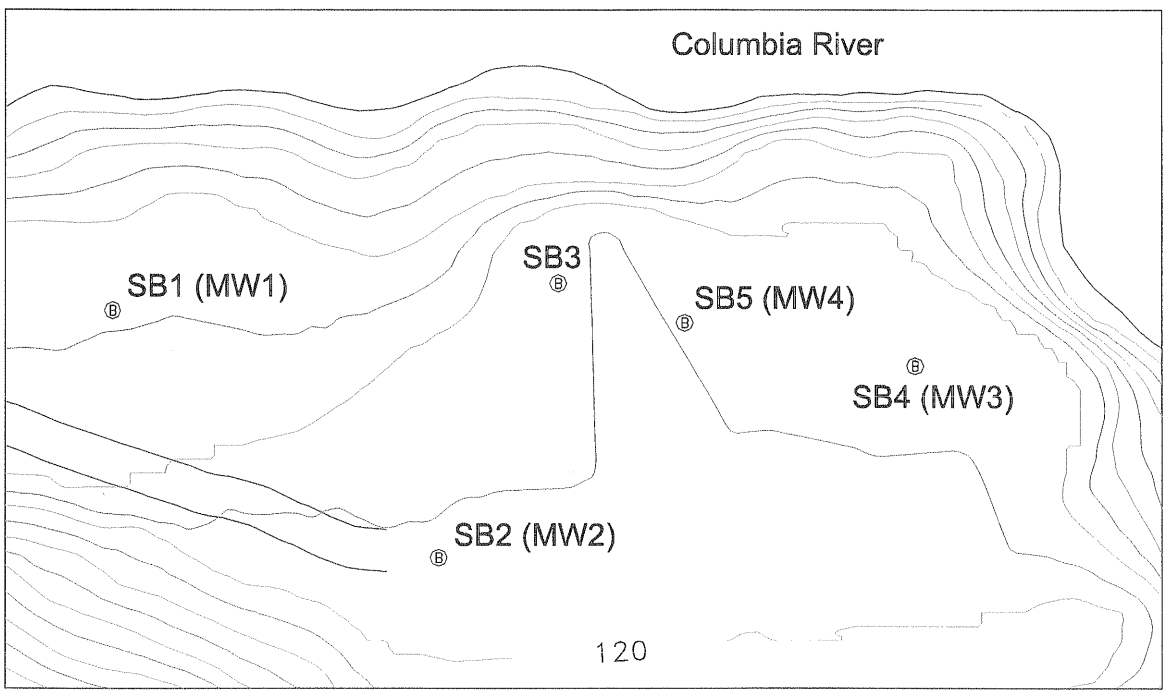
DISTRICT Portland		HOLE NUMBER SB3
1 COMPANY NAME Tetra Tech, Inc.	2 DRILL SUBCONTRACTOR Cascade Drilling	SHEET 1 OF SHEETS 2
3 PROJECT USCOE Bradford Island Landfill	4 LOCATION Bradford Island Landfill	
5 NAME OF DRILLER Steve Hughes	6 MANUFACTURERS DESIGNATION OF DRILL CME 75	
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4.25" ID (9.25 OD) HAS 18" long, 2" OD split spoon sampler 140 lbs with 30-inch drop	8 HOLE LOCATION Central landfill	
	9 SURFACE ELEVATION Not surveyed	
	10 DATE STARTED 8/17/98	11 DATE COMPLETED 8/17/98
12 OVERBURDEN THICKNESS N/A	15 DEPTH GROUNDWATER ENCOUNTERED N/A	
13 DEPTH DRILLED INTO ROCK N/A	16 DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED N/A	
14 TOTAL DEPTH OF HOLE 7'	17 OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A	

18 GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19 TOTAL NUMBER OF CORE BOXES
0	--	--	0

20 SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS/SVOCs	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21 TOTAL CORE RECOVERY

22 DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23 SIGNATURE OF INSPECTOR
	X			

LOCATION SKETCH/COMMENTS:



PROJECT	HOLE NO.
Bradford Island	SB3

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER	SHEET	SHEETS
SB3	2	2

PROJECT	INSPECTOR
Bradford Island	Carlotta Cellucci

ELEV (a)	DEPTH (FEET) (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
	0	Grassy cover					
	1						
	2						
	3						
	4						
Basalt	5	Fractured basalt to contact at approximately 5.5' with well graded fine to very fine grained, moist gray sand (SW) (100% sand) dense				12 6 4	
SW	6						
	7	Refusal at 7' BLS					
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						

PROJECT	HOLD NO.
Bradford Island	SB3

Project: Bradford Island Landfill
Project Location: Bonneville Dam, Oregon
Project Number: 53-F0072173.02

Key to Log of Boring

Elevation feet	Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Sampling Resistance, blows / 6 in.	SAMPLES: Recovery, inches	SAMPLES: Headspace PID [FID], ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
1	2	3	4	5	6	7	8	9	10	11	12

COLUMN DESCRIPTIONS

1. **Elevation:** Elevation in feet referenced to mean sea level (MSL) or site datum.
2. **Depth:** Depth in feet below the ground surface.
3. **Sample Type:** Type of soil sample collected at depth interval shown; sampler symbols are explained below.
4. **Sample Number:** Sample identification number.
5. **Sampling Resistance:** Number of blows to advance driven sampler each 6-inch drive interval, or distance noted, using a 140-lb hammer with a 30-inch drop; "NA" indicates data not recorded.
6. **Recovery:** Length in inches of sample actually recovered in driven or pushed sampler; "NA" indicates data not recorded.
7. **Headspace PID/FID:** Photo-ionization/flame ionization device sample headspace reading in parts per million (ppm).
8. **Graphic Log:** Graphic depiction of subsurface material encountered; typical symbols are explained below.
9. **USCS Code:** Unified Soil Classification System (USCS) group symbol code for associated soil strata.
10. **Material Description:** Description of material encountered; may include color, moisture, grain size, and density/consistency.
11. **Well Completion Schematic:** Schematic of piezometer or well installation; materials are listed in header block and alongside well schematic; graphic symbols are explained below.
12. **Field Notes and Well Details:** Comments and observations regarding drilling or sampling made by driller or field personnel. Well construction materials and installation details are also listed in this column.

TYPICAL SOIL GRAPHIC SYMBOLS

- SAND (SP)
- CLAY (CL)
- SILT (ML)
- SANDSTONE
- SAND with silt (SP-SM)
- Plastic CLAY (CH)
- Silty CLAY (CL/ML)
- Rock Fragments / Gravel
- Silty SAND (SM)
- Clayey SAND (SC)
- Silty GRAVEL (GM)
- Non-soil Fill

TYPICAL WELL GRAPHIC SYMBOLS

- Blank well casing in concrete
- Blank well casing in filter sand
- Blank well casing in bentonite-cement slurry
- Slotted well casing in filter sand
- Blank well casing in bentonite chips
- Native backfill or slough

TYPICAL SAMPLER GRAPHIC SYMBOLS

- 2-inch-OD split spoon sampler (SPT)
- 2.5-inch-OD split spoon with brass liners (modified California)
- Thin-walled tube sampler (Shelby tube)

OTHER GRAPHIC SYMBOLS

- First water encountered at time of drilling (ATD)
- Static water level measured in well on specified date
- Change in material properties within a stratum
- Inferred or gradational lithologic contact

GENERAL NOTES

1. Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive; actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

Report: ENV_12W_CLEVELAND_W/USCS_KEY; File: BRADFORD.GPJ; 1/12/2000 keyowwell

Project: Bradford Island Landfill
Project Location: Bonneville Dam, Oregon
Project Number: 53-F0072173.02

Log of Boring SB-6

Date(s) Drilled	**9/29/99**	Geologist	**G. Lukert**	Reviewer	
Drilling Method	**Hollow-Stem Auger**	Drilling Contractor	**Cascade Drilling, Inc.**	Total Depth of Borehole	**19.0 feet**
Drill Bit Size/Type	**8-7/8-inch-OD auger bit**	Sampling Method	**Split spoon**	Ground Surface Elevation	**110.82 feet MSL**
Groundwater Level(s)	**14.60 feet bgs on 9/29/99**	Hammer Data	**140 lb / 30-inch drop**	Coordinates	**N 723,668.16 E 1,633,059.45**
Borehole Backfill	**Bentonite-Portland cement grout**	Comments	**Refer to site plan for location**		

Elevation feet	Depth, feet	SAMPLES Type Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace PID [FID], ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							Surface conditions: brown, silty SAND with rounded cobbles [Fill]	
110	1								
	2								
108	3								
	4	01	1-1-2	0	0.0 [0.5]		GM	Silty GRAVEL; yellowish brown (10YR 5/4), ~60% gravel, ~40% fines, some cobbles to 4 inches diameter, slightly micaceous, dry, very loose, no odor [FILL]	No recovery in driven sampler; collected sample from cuttings.
106	5								
	6								
104	7								
	8								Metal debris observed at 7.5 ft.
102	9	02	5-3-3	4	64 [32]		SM	Silty SAND with gravel; very dark gray (10YR 3/1), ~50% sand, ~40% silt, ~10% gravel, some wood debris, damp, loose, no odor [FILL]	
	10								
100	11								
	12								
98	13								

Report: ENV_12S_CLEVELAND+/-USCS_2FT/IN; File: BRADFORD.GPJ; 1/12/2000 SB-06

Project: Bradford Island Landfill
Project Location: Bonneville Dam, Oregon
Project Number: 53-F0072173.02

Log of Boring SB-6

Elevation feet	Depth, feet	SAMPLES Type Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace PID [FID], ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	13								
		03	2-4-3	4	134 [105]		SM/ML	Silty SAND to sandy SILT; very dark grayish brown (10YR 3/2), some wood debris, trace gravel, wet, loose, no odor [FILL]	
	14								
96	15								
	16								
94	17								
	18								
92	19								
								Boring terminated at 19.0 feet bgs due to refusal	
	20								
90	21								
	22								
88	23								
	24								
86	25								
	26								
84	27								
	28								
82	29								

Report: ENV_12S_CLEVELAND+/-USCS_2FT/IN; File: BRADFORD.GPJ; 1/12/2000 SB-06

Project: Bradford Island Landfill
Project Location: Bonneville Dam, Oregon
Project Number: 53-F0072173.02

Log of Boring DH-2002Z

Date(s) Drilled	**Not recorded**	Geologist	**G. Lukert**	Reviewer	
Drilling Method	**Hollow-Stem Auger (0-6 ft); Mud Rotary (6-116 ft)**	Drilling Contractor	**Cascade Drilling, Inc.**	Total Depth of Borehole	**116.0 feet**
Drill Bit Size/Type	**4-7/8-inch and 3-inch tricone bits**	Sampling Method	**No samples collected**	Ground Surface Elevation	**Not available**
Groundwater Level(s)	**Not measured**	Hammer Data	**Not applicable**	Coordinates	**Not available**
Borehole Backfill	**Bentonite-Portland cement grout**	Comments	**Refer to site plan for location**		

Elevation feet	Depth, feet	SAMPLES Type Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	0						0-18 ft: debris, gravel, concrete fragments, wood pieces in cuttings	Started drilling with hollow-stem auger.
	5							Hit concrete with augers; switched to mud rotary drilling.
	10							
	15						18-60 ft: no cuttings generated	
	20							No cuttings generated.
	25							
	30							

Project: Bradford Island Landfill
Project Location: Bonneville Dam, Oregon
Project Number: 53-F0072173.02

Log of Boring DH-2002Z

Elevation feet	Depth, feet	SAMPLES: Type Number	SAMPLES: Sampling Resistance, blows / 6 in.	SAMPLES: Recovery, inches	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	30						18-60 ft: no cuttings generated	
	35							
	40							No cuttings generated.
	45							
	50							
	55							Borehole collapsed at 54 ft bgs. Began drilling with outer casing advanced to 60 ft. Switched to 3-inch-dia. tricone bit.
	60						60-70 ft: charred wood in cuttings	
	65							

Project: Bradford Island Landfill
Project Location: Bonneville Dam, Oregon
Project Number: 53-F0072173.02

Log of Boring DH-2002Z

Elevation feet	Depth, feet	SAMPLES: Type Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
	65						60-70 ft: charred wood in cuttings	
	70						70-80 ft: basalt, some black silt in cuttings	
	75							
	80						80-116 ft: weathered basalt and quartz fragments in cuttings	
	85							Advanced casing to 65 ft bgs, and continued drilling with 3-inch-dia. bit.
	90							
	95							
	100							

Project: Bradford Island Landfill
Project Location: Bonneville Dam, Oregon
Project Number: 53-F0072173.02

Log of Boring DH-2002Z

Elevation feet	Depth, feet	SAMPLES: Type Number	SAMPLES: Sampling Resistance, blows / 6 in.	SAMPLES: Recovery, inches	SAMPLES: Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	FIELD NOTES
							80-116 ft: weathered basalt and quartz fragments in cuttings	
	105							
	110							
	115							
							Boring terminated at 116.0 feet bgs	
	120							
	125							
	130							
	135							

Project: Bradford Island
Project Location: Cascade Locks, Oregon
Project Number: 25695767.00003

Log of Boring DP-01-05

Date(s) Drilled	11/16/04 - 11/16/2004	Logged By	BPM	Checked By	JOD
Drilling Method	GeoProbe	Drill Bit Size/Type	N/A	Total Depth of Borehole	17.5 feet
Drill Rig Type	GeoProbe	Drilling Contractor	Geotech Explorations, Inc.	Approximate Surface Elevation	N/A
Groundwater Level and Date Measured	11.5 feet bgs	Sampling Method(s)	1 1/4" dia. Macrocore	Hammer Data	N/A
Borehole Backfill	Bentonite Grout	Location	Riverfront - Landfill Access Road		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery, (ft.)	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	REMARKS
	0						GP	**3" ASPHALTIC CONCRETE** **POORLY-GRADED GRAVEL [GP]**, gray, fine grained, angular to subangular. [FILL]	
			MC1	2.5	BKGD				
							GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, tan to brown, dry, loose, gravel is fine grained, subrounded to rounded, sand is medium coarse.	
	5								
			MC2	3	BKGD			*Basalt cobble at 7.5'-8.5'* *Graded to moist, dark brown with fine grained sand from 8.5'-9.5'*	
	10							∇	
			MC3	3.5	BKGD			*Cobble encountered. Dry, may be pulverized by drive rod.*	
	15						GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, trace silt, dark greenish-gray, moist, gravel is fine grained, subangular to subrounded, sand is fine grained.	
			MC4	2.5	BKGD				
								Boring terminated at a depth of 17.5 feet bgs on 11/16/04 and backfilled with bentonite grout upon completion.	
	20								
	25								

URS

Project: Bradford Island
Project Location: Cascade Locks, Oregon
Project Number: 25695767.00003

Log of Boring DP-02-05

Date(s) Drilled	11/16/04 - 11/17/2004	Logged By	BPM	Checked By	JOD
Drilling Method	GeoProbe	Drill Bit Size/Type	N/A	Total Depth of Borehole	20.0 feet
Drill Rig Type	GeoProbe	Drilling Contractor	Geotech Explorations, Inc.	Approximate Surface Elevation	N/A
Groundwater Level and Date Measured	11.3 feet bgs	Sampling Method(s)	1 1/4" dia. Macrocore	Hammer Data	N/A
Borehole Backfill	Bentonite Grout	Location	Riverfront - Landfill Access Road		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery, (ft.)	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	REMARKS
	0						GP	**3" BROKEN ASPHALTIC CONCRETE** **POORLY-GRADED GRAVEL [GP]**, gray to tannish-brown, dry, loose, fine grained, angular to subangular, [FILL].	
			MC1	3			GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, gray to tannish-brown, moist, gravel is fine grained, angular, sand is fine to coarse grained. [FILL]	
	5								
			MC2	3					
	10								
			MC3	3	BKGD		GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, gravel is coarse grained	
							SP	**POORLY-GRADED SAND WITH GRAVEL [SP]**, brown, sand is medium to coarse grained, gravel is fine grained, subrounded. *Coarse basalt gravel encountered. Subrounded to subangular.*	
	15								
			MC4	2	BKGD		GP	**POORLY-GRADED GRAVEL WITH SAND [GP]** *Dark gray, medium grained sand matrix from 18'-19'. Brown to gray from 19'-20'.*	
	20							Boring terminated at a depth of 20 feet bgs on 11/17/04 and backfilled with bentonite grout upon completion.	
	25								

URS

Project: Bradford Island
Project Location: Cascade Locks, Oregon
Project Number: 25695767.00003

Log of Boring DP-03-05

Date(s) Drilled	11/16/04 - 11/17/2004	Logged By	BPM	Checked By	JOD
Drilling Method	GeoProbe	Drill Bit Size/Type	N/A	Total Depth of Borehole	20.0 feet
Drill Rig Type	GeoProbe	Drilling Contractor	Geotech Explorations, Inc.	Approximate Surface Elevation	N/A
Groundwater Level and Date Measured	11.2 feet bgs	Sampling Method(s)	1 1/4" dia. Macrocore	Hammer Data	N/A
Borehole Backfill	Bentonite Grout	Location	Riverfront - Landfill Access Road		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery, (ft.)	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	REMARKS
	0						GP	**3" ASPHALTIC CONCRETE** **POORLY-GRADED GRAVEL [GP]**, gray, dry, fine grained.	
			MC1	4	BKGD		GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, gray to brown, dry, gravel is fine grained, subangular to subrounded, sand is tan, medium to coarse grained. *Graded to moist.*	
	5								
			MC2	3	BKGD			*Graded to moist, dark brown with fine grained sand from 8.5'-9.5'* *Coarse basalt gravel at 9.5'.*	
	10							∇	
			MC3	5	BKGD				
							SP	**POORLY-GRADED SAND [SP]**, trace silt, tan to brown.	
							GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, brown to dark gray, wet, gravel is medium to coarse grained, sand is coarse grained.	
	15								
			MC4	4	BKGD		SP	**POORLY-GRADED SAND [SP]**, trace silt, tan to orangish-brown, moist, sand is coarse grained.	
							GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, moist to dry. *2" Dry gray gravel from 18.6'-18.8'.*	
	20							Boring terminated at a depth of 20 feet bgs on 11/17/04 and backfilled with bentonite grout upon completion.	
	25								

URS

Project: Bradford Island
Project Location: Cascade Locks, Oregon
Project Number: 25695767.00003

Log of Boring DP-04-05

Date(s) Drilled	11/16/04 - 11/17/2004	Logged By	BPM	Checked By	JOD
Drilling Method	GeoProbe	Drill Bit Size/Type	N/A	Total Depth of Borehole	20.0 feet
Drill Rig Type	GeoProbe	Drilling Contractor	Geotech Explorations, Inc.	Approximate Surface Elevation	N/A
Groundwater Level and Date Measured	10.2 feet bgs	Sampling Method(s)	1 1/4" dia. Macrocore	Hammer Data	N/A
Borehole Backfill	Bentonite Grout	Location	Riverfront - Landfill Access Road		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery, (ft.)	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	REMARKS
	0						GP	**3" ASPHALTIC CONCRETE** **POORLY-GRADED GRAVEL [GP]**, gray, fine grained.	
			MC1	4	BKGD		GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, gravel is gray to brown, fine grained with trace coarse, sand is tan to brown, medium to coarse grained. *Moist.*	
	5								
			MC2	3	BKGD		GP	**POORLY-GRADED GRAVEL [GP]**, dry, coarse grained.	
	10		MC3	5	BKGD		GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, gravel is gray to brown, fine grained with trace coarse gravel, sand is tan to brown, medium to coarse grained. *Sand grades to orange-brown-tan, medium to fine grained.*	
	15								
			MC4	4	BKGD		SP	**POORLY-GRADED SAND WITH SILT [SP]**, trace gravel, sand is fine to medium grained.	
	20							Boring terminated at a depth of 20 feet bgs on 11/17/04 and backfilled with bentonite grout upon completion.	
	25								

URS

Project: Bradford Island
Project Location: Cascade Locks, Oregon
Project Number: 25695767.00003

Log of Boring DP-05-05

Date(s) Drilled	11/16/04 - 11/19/2004	Logged By	BPM	Checked By	JOD
Drilling Method	GeoProbe	Drill Bit Size/Type	N/A	Total Depth of Borehole	28.5 feet
Drill Rig Type	GeoProbe	Drilling Contractor	Geotech Explorations, Inc.	Approximate Surface Elevation	N/A
Groundwater Level and Date Measured	22.0 feet bgs	Sampling Method(s)	1 1/4" dia. Macrocore	Hammer Data	N/A
Borehole Backfill	Bentonite Grout	Location	Grassy, rocky field North of sandblast building.		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery, (ft.)	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	REMARKS
	0						GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, gray to brownish-tan, dry, loose, gravel is coarse to fine grained, sand is medium grained.	
			MC1	4	BKGD				
	5							*Moist.* *Basalt cobble encountered.*	
			MC2	2	BKGD				
								Mottled red-orange.	
	10							*Refusal/bent rod. Pulled rod and set up adjacent to borehole. Moist to wet from 10'-11', moist from 11'-12'.*	
			MC3	4.5	BKGD			*Basalt cobble encountered.*	
	15							*Dry.*	
			MC4	4	BKGD		SP	**POORLY-GRADED SAND WITH GRAVEL [SP]**, trace silt, tan to brown, medium dense.	
							GM	**SILTY GRAVEL WITH SAND [GM]**, greenish-gray, moist, hard, gravel is coarse to fine grained.	
	20						SM	**SILTY SAND [SM]**, trace gravel, olive gray to brown, moist, soft, sand is medium grained.	
			MC5	5	BKGD		OL	**ORGANIC SANDY SILT [OL]**, trace gravel, black, wood debris, root matter. ▽	
							SM	**SILTY SAND [SM]**, greenish-gray, moist to dry, weak to moderate cementation, sand is crystalline, white, medium to fine grained.	
	25						SP	**POORLY-GRADED SAND [SP]**, orange-brown to red-brown,	

URS

Project: Bradford Island
Project Location: Cascade Locks, Oregon
Project Number: 25695767.00003

Log of Boring DP-05-05

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery, (ft.)	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	REMARKS
	25		MC6	1	BKGD			moderate to strong cementation.	
								Refusal. Sample tube stuck in drive rod. Boring terminated at a depth of 28.5 feet bgs on 11/19/04 and backfilled with bentonite grout upon completion.	
	30								
	35								
	40								
	45								
	50								

URS

Project: Bradford Island
Project Location: Cascade Locks, Oregon
Project Number: 25695767.00003

Log of Boring DP-06-05

Date(s) Drilled	11/17/04 - 11/17/2004	Logged By	BPM	Checked By	JOD
Drilling Method	GeoProbe	Drill Bit Size/Type	N/A	Total Depth of Borehole	20.0 feet
Drill Rig Type	GeoProbe	Drilling Contractor	Geotech Explorations, Inc.	Approximate Surface Elevation	N/A
Groundwater Level and Date Measured	15.0 feet bgs	Sampling Method(s)	1 1/4" dia. Macrocore	Hammer Data	N/A
Borehole Backfill	Bentonite Grout	Location	Grassy, rocky area North of sandblast building, adjacent to septic tank.		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery, (ft.)	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	REMARKS
	0							**6" SURFACE SANDY SOIL**	
							GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, trace cobbles, dark brown, gravel is fine grained, angular to subangular, sand is medium to coarse. No bedding structures.	
			MC1	4	BKGD				
								Sand grades to brown, medium to fine grained.	
	5							*Grades to gray, sand grades to medium to coarse.*	
			MC2	1.5	BKGD			*Refusal due to large cobbles. Moved drill rig 6 feet to southeast.*	
							GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, trace cobbles, brown, gravel is fine grained, sand is medium coarse. *Moist.*	
	10								
			MC3	5	BKGD				
	15						GP	**POORLY-GRADED GRAVEL [GP]**, brown, saturated, loose, gravel is fine grained, rounded, sand is coarse grained.	
			MC4	5	BKGD		GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, tannish-brown to gray, sand grades to fine grained.	
							SM	**SILTY SAND [SM]**, black, some organics.	
							SP	**POORLY-GRADED SAND [SP]**, green, <5% organics, white, crystalline sand.	
	20							Boring terminated at a depth of 20 feet bgs on 11/17/04 and backfilled with bentonite grout upon completion.	
	25								

URS

Project: Bradford Island
Project Location: Cascade Locks, Oregon
Project Number: 25695767.00003

Log of Boring DP-07-05

Date(s) Drilled	11/17/04 - 11/22/2004	Logged By	BPM	Checked By	JOD
Drilling Method	GeoProbe	Drill Bit Size/Type	N/A	Total Depth of Borehole	20.0 feet
Drill Rig Type	GeoProbe	Drilling Contractor	Geotech Explorations, Inc.	Approximate Surface Elevation	N/A
Groundwater Level and Date Measured	13.5 feet bgs	Sampling Method(s)	1 1/4" dia. Macrocore	Hammer Data	N/A
Borehole Backfill	Bentonite Grout	Location	Grassy, rocky area North of sandblast building.		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery, (ft.)	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	REMARKS
	0							**SILTY SAND [SM]** trace cobbles, brown, fine grained.	
							GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, trace cobbles, tan to brown, moist, gravel is fine to coarse grained, subangular.	
			MC1	4	BKGD				
							GP	**POORLY-GRADED GRAVEL [GP]**, gray, dry, coarse grained.	
	5								
			MC2	4	BKGD		GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, trace silt, gray with orange mottling, moist, gravel is fine grained, sand is medium to fine grained. *Tan to brown.*	
	10								
			MC3	3	BKGD			*Wood debris.* *Cobbles encountered.*	
							GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, wet, gravel is coarse grained, sand is medium to coarse grained.	
	15								
			MC4	5	BKGD		GM	**SILTY GRAVEL WITH SAND [GM]**, tan to brown, gravel is fine grained, rounded. *Woody debris from 18'-19'.*	
							SM	**SILTY SAND [SM]**, trace gravel, black to green, organics.	
	20							Boring terminated at a depth of 20 feet bgs on 11/22/04 and backfilled with bentonite grout upon completion.	
	25								

URS

Project: Bradford Island
Project Location: Cascade Locks, Oregon
Project Number: 25695767.00003

Log of Boring DP-08-05

Date(s) Drilled	11/17/04 - 11/17/2004	Logged By	BPM	Checked By	JOD
Drilling Method	GeoProbe	Drill Bit Size/Type	N/A	Total Depth of Borehole	20.0 feet
Drill Rig Type	GeoProbe	Drilling Contractor	Geotech Explorations, Inc.	Approximate Surface Elevation	N/A
Groundwater Level and Date Measured	13.5 feet bgs	Sampling Method(s)	1 1/4" dia. Macrocore	Hammer Data	N/A
Borehole Backfill	Bentonite Grout	Location	Grassy, cobbly area North of sandblast building.		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery, (ft.)	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	REMARKS
	0						SM	**SILTY SAND [SM]** trace cobbles, brown, moist to wet.	
							GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, trace cobbles, dry to moist, gravel is gray to brown, fine grained, angular to subrounded, sand is tan to brown, coarse grained.	
			MC1	4	BKGD				
								Cobbles encountered.	
	5								
								Cobbles encountered.	
			MC2	4	BKGD				
								Decreasing gravel, increasing medium grained sand, moist.	
	10								
			MC3		BKGD				
							GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, dark gray to brown, wet, loose, gravel is coarse grained, sand is coarse grained.	
	15						GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, dark greenish-gray, moist, gravel is fine grained, subangular to subrounded, sand is medium to fine grained.	
			MC4		BKGD		GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, reddish-gray, dry, gravel is rounded.	
							SM	**SILTY SAND [SM]**, trace organics, green, very hard, fine grained.	
	20							Boring terminated at a depth of 20 feet bgs on 11/17/04 and backfilled with bentonite grout upon completion.	
	25								

URS

Project: Bradford Island
Project Location: Cascade Locks, Oregon
Project Number: 25695767.00003

Log of Boring DP-09-05

Date(s) Drilled	11/17/04 - 11/22/2004	Logged By	BPM	Checked By	JOD
Drilling Method	GeoProbe	Drill Bit Size/Type	N/A	Total Depth of Borehole	20.0 feet
Drill Rig Type	GeoProbe	Drilling Contractor	Geotech Explorations, Inc.	Approximate Surface Elevation	N/A
Groundwater Level and Date Measured	16 feet bgs	Sampling Method(s)	1 1/4" dia. Macrocore	Hammer Data	N/A
Borehole Backfill	Bentonite Grout	Location	Grassy, cobbly area at toe slope of the North side of the sandblast building.		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery, (ft.)	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	REMARKS
	0						SM	**SILTY SAND [SM]** trace gravel, brown to orange, wet.	
			MC1	5	BKGD		GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, brown to gray, dry to moist, gravel is coarse to fine grained, sand is coarse to medium grained.	
	5							*Gravel and sand grade to fine grained.*	
			MC2	3	BKGD			*3" of sand, orange to brown mottling, dry.* *Cobbles encountered from 8'-10', dark brown.*	
	10							*Grades to gray, gravel coarsens.*	
			MC3	5	BKGD		GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, gray, dry, coarse grained.	
							SP	**POORLY-GRADED SAND WITH GRAVEL [SP]**, tan to brown, moist to wet, loose from 13.5'-15', hard at 15'.	
	15						GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, tan to gray, wet, loose. ▽	
			MC4	5	BKGD			*Cobbles encountered. Increased tan, coarse to medium sand from 18'-18.5'.*	
							GP	**POORLY-GRADED GRAVEL [GP]**, dark gray.	
	20							Boring terminated at a depth of 20 feet bgs on 11/22/04 and backfilled with bentonite grout upon completion.	
	25								

URS

Project: Bradford Island
Project Location: Cascade Locks, Oregon
Project Number: 25695767.00003

Log of Boring DP-10-05

Date(s) Drilled	11/18/04 - 11/18/2004	Logged By	BPM	Checked By	JOD
Drilling Method	GeoProbe	Drill Bit Size/Type	N/A	Total Depth of Borehole	14.0 feet
Drill Rig Type	GeoProbe	Drilling Contractor	Geotech Explorations, Inc.	Approximate Surface Elevation	N/A
Groundwater Level and Date Measured	8.5 feet bgs	Sampling Method(s)	1 1/4" dia. Macrocore	Hammer Data	N/A
Borehole Backfill	Bentonite Grout	Location	Grassy, gravelly area adjacent to hazardous material storage area.		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery, (ft.)	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	REMARKS
	0		MC1	5	BKGD		GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, dark brown, hard, gravel is fine to medium grained, subangular to subrounded, sand is coarse to medium grained.	
	5		MC2	5	BKGD		SM	**SILTY SAND [SM]**, light greenish-gray, moist to wet, medium grained.	
							SP	**POORLY-GRADED SAND [SP]**, trace gravel, tan to greenish-gray, medium grained. ∇ *Basalt cobbles encountered.*	
							GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, dark gray to brown, wet, loose, coarse grained.	
	10		MC3	4	BKGD		SP	**POORLY-GRADED SAND WITH SILT AND GRAVEL [SP]**, tan to brown with orange to red mottling, hard.	
	15							Boring terminated at a depth of 14 feet bgs on 11/18/04 and backfilled with bentonite grout upon completion.	
	20		MC4	4	BKGD				
	25								

URS

Project: Bradford Island
Project Location: Cascade Locks, Oregon
Project Number: 25695767.00003

Log of Boring DP-11-05

Date(s) Drilled	11/18/04 - 11/22/2004	Logged By	BPM	Checked By	JOD
Drilling Method	GeoProbe	Drill Bit Size/Type	N/A	Total Depth of Borehole	21.5 feet
Drill Rig Type	GeoProbe	Drilling Contractor	Geotech Explorations, Inc.	Approximate Surface Elevation	N/A
Groundwater Level and Date Measured	8.5 feet bgs	Sampling Method(s)	1 1/4" dia. Macrocore	Hammer Data	N/A
Borehole Backfill	Bentonite Grout	Location	Hazardous Material Storage Area		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery, (ft.)	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	REMARKS
	0						SP GP	*2" sandblast grit on ground surface.* **POORLY-GRADED GRAVEL WITH SAND [GP]**, black to gray, angular to subangular.	
			MC1	5	BKGD				
	5						SP-SM	**POORLY-GRADED SAND WITH SILT [SP-SM]**, trace gravel, tan to brown, dry to moist, loose.	
			MC2	2.5	BKGD		SP	**POORLY-GRADED SAND WITH GRAVEL [SP]**, brown to gray with orange to red mottling, moist to wet. *Soft from 7'-8', moist to wet.* *Soft from 8.5'-9', moist to wet.*	
	10		MC3	5	BKGD			*Increased gravel, rounded, weathered.* *Very hard, sand is medium to fine grained.* *Graded to gray.* *Wet, soft, loose, medium to coarse sand from 16'-17'.*	
	15		MC4	5	BKGD		SP	**POORLY-GRADED SAND [SP]**, trace gravel, dark gray, hard, sand is medium to fine grained, gravel is fine grained basalt.	
	20		MC5	0	BKGD				
								Refusal. Boring terminated at a depth of 21.5 feet bgs on 11/22/04 and backfilled with bentonite grout upon completion.	
	25								

URS

Project: Bradford Island
Project Location: Cascade Locks, Oregon
Project Number: 25695767.00003

Log of Boring DP-12-05

Date(s) Drilled	11/18/04 - 11/22/2004	Logged By	BPM	Checked By	JOD
Drilling Method	GeoProbe	Drill Bit Size/Type	N/A	Total Depth of Borehole	21.0 feet
Drill Rig Type	GeoProbe	Drilling Contractor	Geotech Explorations, Inc.	Approximate Surface Elevation	N/A
Groundwater Level and Date Measured	7.5 feet bgs	Sampling Method(s)	1 1/4" dia. Macrocore	Hammer Data	N/A
Borehole Backfill	Bentonite Grout	Location	Hazardous Material Storage Area		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery, (ft.)	Headspace OVA, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	REMARKS
	0		MC1	5	BKGD		GP	**POORLY-GRADED GRAVEL WITH SAND [GP]**, black to greenish brown. Sandblast grit present to 2.5', no red or green color, medium grained. [FILL] *Cobbles encountered.* *Metal debris. [FILL]*	
	5						SM	**SILTY SAND [SM]**, trace gravel, tan to brown, dry to moist, soft, loose, fine to medium grained, no bedding structures. *Grades to medium dense, mottling from 6'-7.75'.*	
			MC2	5	BKGD		SP	**POORLY-GRADED SAND WITH GRAVEL [SP]**, trace silt, grayish-brown, moist to wet, loose, sand is medium to coarse grained, gravel is fine grained, weathered, rounded. ∇ *Moist to wet from 7.5'-9'.* *Orange to red mottling.*	
	10						SM	**SILTY SAND [SM]**, light gray with orange mottling.	
			MC3	5	BKGD		SP	**POORLY-GRADED SAND [SP]**, trace basalt pebbles, very hard.	
	15		MC4	5	BKGD				
	20		MC5	0	BKGD				
								Refusal. Boring terminated at a depth of 21 feet bgs on 11/22/04 and backfilled with bentonite grout upon completion.	
	25								

URS

Project: Bradford Island - Upland OU Remedial Investigation **Project Location: Bonneville Dam, Oregon** **Project Number: 25696931**	**Log of Boring PR1** Sheet 1 of 1

Date(s) Drilled	**2/2/2009**	Logged By	**N. Moody**	Checked By	**JOD**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Percussion Hammer**	Total Depth of Borehole	**20.0 feet bgs**
Drill Rig Type	**AMS Power Probe**	Drilling Contractor	**PSW**	Approximate Surface Elevation	**N/A**
Groundwater Level and Date Measured	**10.0 feet bgs**	Sampling Method(s)	**2 Inch x 5 foot Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Hydrated Bentonite Chips**	Location	**Pistol Range**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery (ft)	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0		MC1	2.25			**GRAVELLY SILT [ML]**, brown to dark brown, dry to moist, stiff, medium to fine grained gravel.	
	5						*Cobble @ 4.5 feet bgs* **SILTY SAND WITH GRAVEL [SM]**, brown to brownish yellow, dry to moist, medium to fine grained sand, coarse gravel.	
			MC2	1.5				
	10						∇	
			MC3	2.5			**SILT WITH GRAVEL [ML]**, dark brown to olive gray, moist, fine to coarse gravels.	
	15						*Becomes wet @ 14.5 feet bgs* **POORLY GRADED GRAVEL WITH SILT AND SAND [GP-GM]**, dark brown, wet, fine to medium gravel.	
			MC4	3.5			**SILT [ML]**, yellowish brown, moist, hard.	
							POORLY GRADED SAND [SP], yellowish brown, moist, fine to medium grained.	
	20						Terminated boring at 20 feet bgs on 2/2/2009. Installed a stainless steel temporary well screen from 16 to 20 feet bgs. Collected groundwater sample: 090202-PR-PR1-16-20GW	
	25							
	30							

URS

Project: Bradford Island - Upland OU Remedial Investigation **Project Location: Bonneville Dam, Oregon** **Project Number: 25696931**	**Log of Boring PR2A** Sheet 1 of 1

Date(s) Drilled	**2/2/2009**	Logged By	**N. Moody**	Checked By	**JOD**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Percussion Hammer**	Total Depth of Borehole	**14.0 feet bgs**
Drill Rig Type	**AMS Power Probe**	Drilling Contractor	**PSW**	Approximate Surface Elevation	**N/A**
Groundwater Level and Date Measured	**Not Encountered**	Sampling Method(s)	**2 Inch x 5 foot Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Hydrated Bentonite Chips**	Location	**Pistol Range**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery (ft)	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0						*3" Woody debris on surface*	
							SILT [ML], brown to dark brown, moist, stiff with some fine grained angular gravels.	
			MC1	2.5				
	5						**GRAVELLY SILT WITH SAND [ML]**, brownish yellow, dry to moist, stiff, fine gravel, fine sand.	
			MC2	3.0				
							POORLY GRADED GRAVEL [GP], coarse subangular to angular gravel.	
	10						**GRAVELLY SILT WITH SAND [ML]**, brownish yellow, dry to moist, stiff, fine gravel, fine sand.	
			MC3	0.5			**POORLY GRADED SAND [SP]**, highly cemented sand, dry.	
							Terminated boring at 14 feet bgs due to refusal on 2/2/2009.	
	15							
	20							
	25							
	30							

URS

Project: Bradford Island - Upland OU Remedial Investigation **Project Location: Bonneville Dam, Oregon** **Project Number: 25696931**	**Log of Boring PR2B** Sheet 1 of 1

Date(s) Drilled	**2/2/2009**	Logged By	**N. Moody**	Checked By	**JOD**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Percussion Hammer**	Total Depth of Borehole	**17.0 feet bgs**
Drill Rig Type	**AMS Power Probe**	Drilling Contractor	**PSW**	Approximate Surface Elevation	**N/A**
Groundwater Level and Date Measured	**Not Encountered**	Sampling Method(s)	**2 Inch x 5 foot Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Hydrated Bentonite Chips**	Location	**Pistol Range**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery (ft)	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0						*No recovery 0.0-5.0 feet bgs*	
			MC1	0				
	5						**GRAVELLY SILT WITH SAND [ML]**, dark brown, moist to dry.	
			MC2	2.5			**POORLY GRADED GRAVEL [GP]**, coarse subangular to angular gravel.	
							GRAVELLY SILT WITH SAND [ML], dark brown, moist to dry.	
	10							
			MC3	2.5				
	15						**POORLY GRADED SAND [SP]**, highly cemented sand, dry.	
			MC4	0.4				
							Terminated boring at 17 feet bgs due to refusal on 2/2/2009.	
	20							
	25							
	30							

Report: PORT_ENV_PID; File: BRADFORD ISLAND.GPJ; 3/17/2009 PR2B

URS

Project: Bradford Island - Upland OU Remedial Investigation **Project Location: Bonneville Dam, Oregon** **Project Number: 25696931**	**Log of Boring PR2C** Sheet 1 of 1

Date(s) Drilled	**2/2/2009**	Logged By	**N. Moody**	Checked By	**JOD**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Percussion Hammer**	Total Depth of Borehole	**16.0 feet bgs**
Drill Rig Type	**AMS Power Probe**	Drilling Contractor	**PSW**	Approximate Surface Elevation	**N/A**
Groundwater Level and Date Measured	**Not Encountered**	Sampling Method(s)	**2 Inch x 5 foot Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Hydrated Bentonite Chips**	Location	**Pistol Range**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery (ft)	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0						**GRAVELLY SILT WITH SAND [ML]**, dark brown, dry to moist, medium to fine sand.	
			MC1	2.5				
	5							
							POORLY GRADED GRAVEL [GP], coarse subangular to angular gravel, dry to moist.	
			MC2	2.0			**GRAVELLY SILT WITH SAND [ML]**, dark brown, dry to moist, medium to fine sand.	
	10							
			MC3	2.5				
							POORLY GRADED SAND [SP], brown, medium grained, dry, cemented.	
	15		MC4	0				
							Terminated boring at 16 feet bgs due to refusal on 2/2/2009.	
	20							
	25							
	30							

URS

Project: Bradford Island - Upland OU Remedial Investigation **Project Location: Bonneville Dam, Oregon** **Project Number: 25696931**	**Log of Boring PR2D** Sheet 1 of 1

Date(s) Drilled	**2/2/2009**	Logged By	**N. Moody**	Checked By	**JOD**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Percussion Hammer**	Total Depth of Borehole	**20.0 feet bgs**
Drill Rig Type	**AMS Power Probe**	Drilling Contractor	**PSW**	Approximate Surface Elevation	**N/A**
Groundwater Level and Date Measured	**10.9 feet bgs**	Sampling Method(s)	**2 Inch x 5 foot Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Hydrated Bentonite Chips**	Location	**Pistol Range**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery (ft)	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0		MC1	2.5			**GRAVELLY SILT WITH SAND [ML]**, brown to dark brown, dry to moist, stiff, medium to fine sand.	
	5		MC2	2			**SILTY SAND WITH GRAVEL [SM]**, brown, medium to fine sand, coarse gravel.	
	10						∇	
			MC3	1.0			**SILT WITH GRAVEL [ML]**, dark brown to olive gray, fine to coarse gravel.	
	15		MC4	1.75			**POORLY GRADED GRAVEL WITH SILT AND SAND [GP-GM]**, dark brown, very soft, fine to medium gravel, wet.	
	20						**SILT [ML]**, dark brown. Terminate boring at 20 feet bgs on 2/2/2009. Installed a stainless steel temporary well screen from 16 to 20 feet bgs. After 10 minutes, water level probe dry. Pulled rods and inserted temporary 3/4" PVC temporary well with slotted screen (0.010 inch) from 9 to 19 feet bgs. Collected groundwater sample: 090202-PR-PR2D-9-196W.	
	25							
	30							

URS

Project: Bradford Island - Upland OU Remedial Investigation **Project Location: Bonneville Dam, Oregon** **Project Number: 25696931**	**Log of Boring PR2E** Sheet 1 of 1

Date(s) Drilled	**2/2/2009**	Logged By	**N. Moody**	Checked By	**JOD**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Percussion Hammer**	Total Depth of Borehole	**25.0 feet bgs**
Drill Rig Type	**AMS Power Probe**	Drilling Contractor	**PSW**	Approximate Surface Elevation	**N/A**
Groundwater Level and Date Measured	**Not Encountered**	Sampling Method(s)	**2 Inch x 5 foot Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Hydrated Bentonite Chips**	Location	**Pistol Range**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery (ft)	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0		MC1	2.5			**GRAVELLY SILT WITH SAND [ML]**, dark brown, dry to moist, stiff, medium to fine sand.	
	5						**SILTY SAND WITH GRAVEL [SM]**, brown, medium to fine sand, coarse gravel.	
			MC2	0			*No recovery 5.0-10.0 feet bgs*	
	10		MC3	2.5			**SILT WITH GRAVEL [ML]**, dark brown to olive gray, dry to moist, fine to coarse gravel.	
							POORLY GRADED GRAVEL [GP], dry, fine to coarse gravel.	
	15		MC4	2.5			**SILT [ML]**, yelowish brown, dry to moist, stiff.	
	20		MC5	2.5			**POORLY GRADED SAND [SP]**, yellowish brown, dry, fine to medium sand.	
	25						Terminate boring at 25 feet bgs on 2/2/2009 because no saturated soil encountered.	
	30							

Report: PORT_ENV_PID; File: BRADFORD ISLAND.GPJ; 3/17/2009 PR2E

URS

Project: Bradford Island - Upland OU Remedial Investigation
Project Location: Bonneville Dam, Oregon
Project Number: 25696931

Log of Boring PR3A

Date(s) Drilled	1/27/2009	Logged By	N. Moody	Checked By	JOD
Drilling Method	Direct Push	Drill Bit Size/Type	Percussion Hammer	Total Depth of Borehole	27.0 feet bgs
Drill Rig Type	AMS Power Probe	Drilling Contractor	PSW	Approximate Surface Elevation	N/A
Groundwater Level and Date Measured	Not Encountered	Sampling Method(s)	2 Inch x 5 foot Macrocore	Hammer Data	N/A
Borehole Backfill	Hydrated Bentonite Chips	Location	Pistol Range		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery (ft)	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0						**SANDY SILT [ML]**, dark brown, moist, stiff with some subangular coarse gravels.	
			MC1	1.5				
	5						**SILTY SAND [SM]**, dark brown, moist, fine to medium grained sand.	
			MC2	1.5			**POORLY GRADED GRAVEL [GP]**, coarse grained.	
							SILTY SAND [SM], dark brown, moist, fine to medium grained sand, some coarse gravels.	
	10							
			MC3	1.5				
	15							
			MC4	1.5				
							POORLY GRADED GRAVEL [GP], coarse grained.	
	20							
			MC5	1.5				
	25						*Grades with trace silt*	
							Boring terminated at 27 feet bgs due to refusal on 1/27/2009.	
	30							

URS

Project: Bradford Island - Upland OU Remedial Investigation **Project Location: Bonneville Dam, Oregon** **Project Number: 25696931**	**Log of Boring PR3B** Sheet 1 of 2

Date(s) Drilled	**1/27/2009**	Logged By	**N. Moody**	Checked By	**JOD**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Percussion Hammer**	Total Depth of Borehole	**40.0 feet bgs**
Drill Rig Type	**AMS Power Probe**	Drilling Contractor	**PSW**	Approximate Surface Elevation	**N/A**
Groundwater Level and Date Measured	**Not Encountered**	Sampling Method(s)	**2 Inch x 5 foot Macrocore**	Hammer Data	**N/A**
Borehole Backfill	**Hydrated Bentonite Chips**	Location	**Pistol Range**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery (ft)	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	0		MC1	3			**SANDY SILT [ML]**, dark brown, moist, stiff, fine sand, trace coarse gravels.	
	5						**POORLY GRADED GRAVEL [GP]**, coarse grained, subangular cobble pieces.	
			MC2	3			**SILTY SAND [SM]**, dark brown, moist, stiff, trace coarse gravels.	
	10		MC3	0.5			*Becomes dry to moist with some fine to coarse grained gravels*	
	15		MC4	.25			**POORLY GRADED GRAVEL [GP]**, dark to light gray, dry to moist with trace dark brown silty sand.	
	20		MC5	1.5				
	25						**SILT [ML]**, dark brown, wet, soft.	
			MC6	2.5			**SANDY SILT [ML]**, brown, moist to dry, stiff.	
							SILTY SAND [SM], brown, moist to dry, stiff, fine grained sand.	
	30							

Report: PORT_ENV_PID; File: BRADFORD ISLAND.GPJ; 3/17/2009 PR3B

URS

Project: Bradford Island - Upland OU Remedial Investigation
Project Location: Bonneville Dam, Oregon
Project Number: 25696931

Log of Boring PR3B

Elevation, feet	Depth, feet	SAMPLES Type	Number	Recovery (ft)	Headspace PID, ppm	Graphic Log	MATERIAL DESCRIPTION	REMARKS
	30							
			MC7				**POORLY GRADED SAND [SP]**, dark brown, moist, medium grained sand with fine gravels.	
							Becomes moist to wet @ 34-35 feet bgs	
	35						*Grades to fine to medium grained sand with trace fine subangular gravel*	
			MC8	37.5				
	40						Terminate boring at 40 feet bgs on 1/27/2009. Installed a stainless steel temporary screen from 31 to 35 feet bgs and dry. No groundwater sample collected.	
	45							
	50							
	55							
	60							
	65							

URS

HTRW DRILLING LOG

DISTRICT Portland		HOLE NUMBER SB1
1 COMPANY NAME Tetra Tech, Inc.	2 DRILL SUBCONTRACTOR Cascade Drilling	SHEET 1 OF SHEETS 3

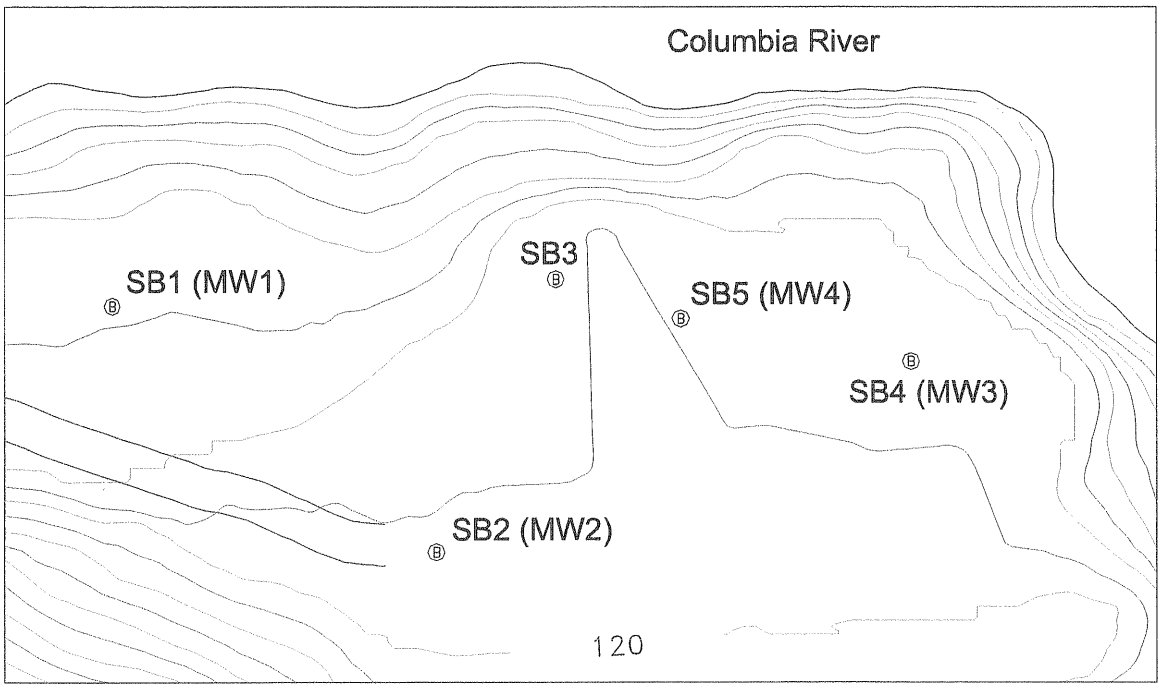
3 PROJECT USCOE Bradford Island Landfill	4 LOCATION Bradford Island Landfill
5 NAME OF DRILLER Steve Hughes	6 MANUFACTURERS DESIGNATION OF DRILL CME 75
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4.25" ID (9.25 OD) HSA 18" long, 2" OD split spoon sampler 140 lbs with 30-inch drop	8 HOLE LOCATION West end of landfill (723653.80 North) (1632933.91 East)
	9 SURFACE ELEVATION 102.84' (TOC = 105.50')
	10 DATE STARTED 8/17/98 — 11 DATE COMPLETED 8/17/98
12 OVERBURDEN THICKNESS 28'	15 DEPTH GROUNDWATER ENCOUNTERED No Groundwater
13 DEPTH DRILLED INTO ROCK 2' (fractured)	16 DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED No groundwater after >24 hours
14 TOTAL DEPTH OF HOLE 30'	17 OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18 GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19 TOTAL NUMBER OF CORE BOXES
0	0	0	0

20 SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS/SVOCs	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21 TOTAL CORE RECOVERY
	1	1	PCB – 1	Chlor herbs - 1	TPH - 1	

22 DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23 SIGNATURE OF INSPECTOR
Well installed		X		

LOCATION SKETCH/COMMENTS:



PROJECT Bradford Island	HOLE NO. SB1

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB1

PROJECT: Bradford Island

INSPECTOR: Carlotta Cellucci

SHEET 2 OF 3 SHEETS

ELEV (a)	DEPTH (FEET) (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
ML ? ? ?	0	Grassy cover underlain by brown sandy silt with gravel (ML) (sand 10%, gravel 30%, fines 60%) loose, dry					Background PID reading = 2.8
	1						
	2						
	3						
	4						
	5	No recovery				40 50	No recovery at 5' drilled to 6' BLS
	6	No recovery (1" slough)	2.7			31 64 72	About 1" of slough in sampler at 6' BLS
ML	7	Dark brown clayey silt (ML) with gravel, moist, firm (gravel 5%, fines 95%) grading, to silty clay (CL) at approximately 7.5' BLS, low plasticity (95% fines, 5% gravel)	2.7			13 13 17	2' of recovery in 2.5' sampler at 7' BLS
CL	8						
	9						
CL	10	Same as above with areas of orange oxidation in spots grading to gray silty clay (CL) with gravel at approximately 11' BLS (95% fines, 5% gravel)	3.1			7 7 7	1.25' of recovery Background PID = 3.1
	11						
	12						
	13						Very hard at 13' BLS
	14						
	15	No recovery				86 120	No recovery
	16						Very hard at 16' BLS
SM	17	Gray silty clayey sand (SM), dry/moist, well graded, (45% fines, 55% sand) possible ash flow	2.7			28 41 60	1.25' recovery

PROJECT: Bradford Island

HOLD NO. SB1

ENG FORM 5056A-4, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB1

PROJECT: Bradford Island

INSPECTOR: Carlotta Cellucci

SHEET 3 OF 3 SH

ELEV (a)	DEPTH (FEET) (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
	18						
	19						
ML	20	Gray gravelly, clayey silt (ML) (20% gravel, 80% fines) low plasticity, very stiff	2.3		8/17/98-BIL-SB1-SS01 (1200)	28 46 60	PID background = 2.3: 2' Recovery in 1st sampler
	21		2.7			19 46 70	3" of Recovery; 2nd sampler at 20'; PID background 2.0
CL	22	Same with increasing clay content (20% gravel, 80% fines) grading at 22.5' to gray silty gravelly clay (CL), low plasticity, moist, very stiff (5% gravel, 95% fines)	2.0			25 48 56	4th sampler hammered at 22' BLS
	23		1.6			28 45 60	Full recovery 5th sampler hammered at 22.5' BLS
	24						1.5' Recovery Background PID = 1.6
	25						
	26						
CL Ash tuff	27	Same as above to contact at approximately 28' with weathered rock/sand stone/ash tuff, well graded angular macrocrystalline (100% sand/crushed rock)	1.6			25 46	1.25' Recovery
	28						
	29	Drilled to 29.5' BLS					
	30						
	31						
	32						
	33						
	34						
	35						

PROJECT: Bradford Island

HOLD NO.: SB1

ENG FORM 5056A-4, AUG 94

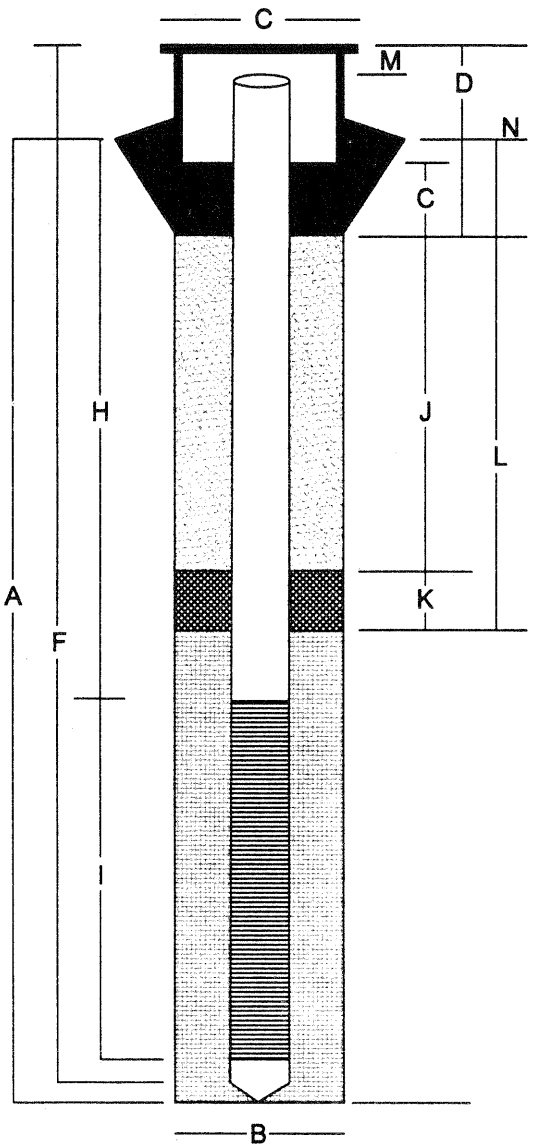
(Proponent: CECW-EG)

Above-ground Monitoring Well Construction Log

Project Name: USCOE BRADFORD ISLAND **Well No.:** MW01 (SB1) **Date:** 8/17/98

Project No: 10022-03 **Drilling Method:** HSA

Geologist: Carlotta Cellucci



A: Total Boring Depth:	30'
B: Boring Diameter:	9.25"
C: Diameter of Protective Casing:	5" ID
D: Length of Protective Casing:	5'
Type of Protective Casing:	Steel mountment
E: Interval of Surface Grout:	0-4'
F: Total Riser Casing Length:	31.4'
Length of Sediment Sump:	1"
Casing Type:	Sch. 80, Flush threaded PVC
G: Inner Diameter:	1.62" (2" OD)
H: Depth to Screen:	20'
I: Screen Length:	10'
Screen Intrval:	20'-30'
Screen / Slot Type:	0.010" Factory slot
J: Depth to Top of Seal:	4'
K: Thickness of Seal:	13'
Type of seal material:	Pure gold medium Bentonite chips
L: Depth to Top of Filter Pack:	17'
Type of Filter Pack:	20/40 Colorado silica sand
M: Top of Casing Elevation:	105.50' above msl
N: Surface Elevation:	102.84' above msl

NOTE: Well was not surged after placement of sand pack, because there was no water in the well.

HTRW DRILLING LOG

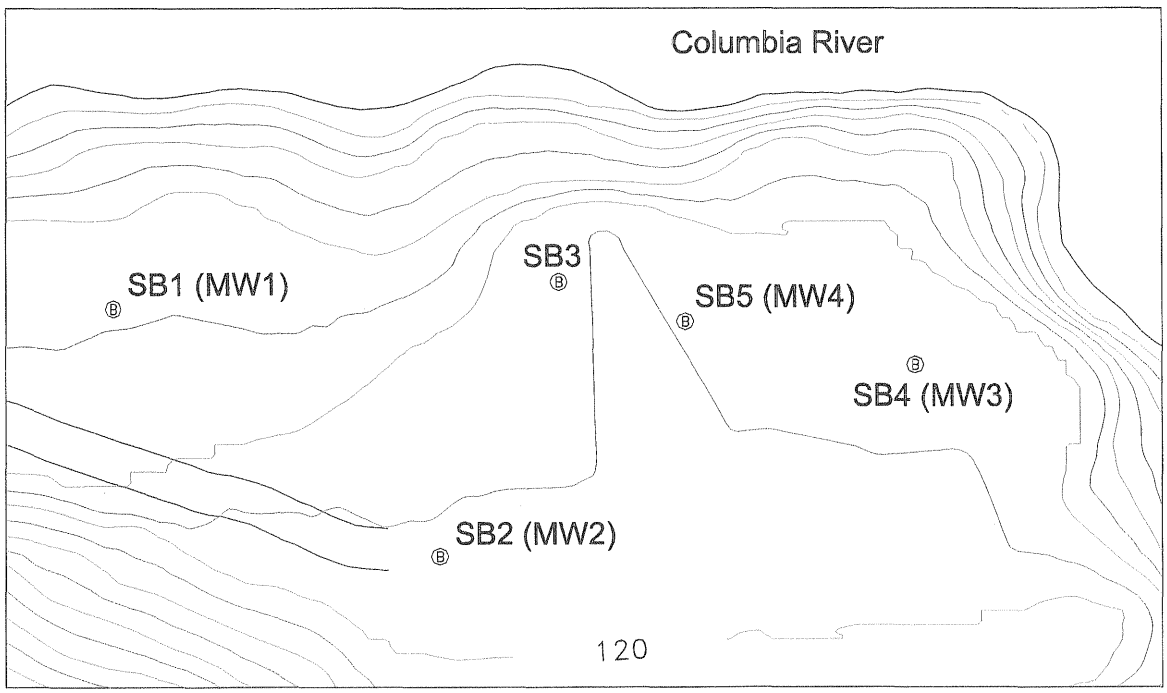
DISTRICT Portland		HOLE NUMBER SB2
1 COMPANY NAME Tetra Tech, Inc.	2 DRILL SUBCONTRACTOR Cascade Drilling	SHEET 1 OF SHEETS 3
3 PROJECT USCOE Bradford Island Landfill	4 LOCATION Bradford Island Landfill	
5 NAME OF DRILLER Steve Hughes	6 MANUFACTURERS DESIGNATION OF DRILL CME 75	
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4.25" ID (9.25 OD) HSA 18" long, 2" OD split spoon sampler 140 lbs with 30-inch drop	8 HOLE LOCATION Pesticide wash area (723564.81 North) (1633051.27 East)	
	9 SURFACE ELEVATION 114.21' (TOC = 116.56')	
	10 DATE STARTED 8/17/98	11 DATE COMPLETED 8/17/98
12 OVERBURDEN THICKNESS 30'	15 DEPTH GROUNDWATER ENCOUNTERED No Groundwater Encountered/Dry Hole	
13 DEPTH DRILLED INTO ROCK ~2' (weathered)	16 DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED 32.32 below TOC after 24 hours	
14 TOTAL DEPTH OF HOLE 32'	17 OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18 GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19 TOTAL NUMBER OF CORE BOXES
0	--	--	0

20 SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS/SVOCs	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21 TOTAL CORE RECOVERY

22 DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23 SIGNATURE OF INSPECTOR
		X		

LOCATION SKETCH/COMMENTS:



PROJECT	HOLE NO.
Bradford Island	SB2

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB2

PROJECT: Bradford Island

INSPECTOR:

SHEET 2 OF 3 SHEETS

ELEV (a)	DEPTH (FEET) (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
	0	Grassy cover	2.0				Background PID reading = 2.0
SM	5	Very dark gray clayey sand (SM) with gravel, well graded, moist (20% fines, 15% gravel, 65% sand), loose-firm.	0.2			28 48 56	Background PID dropped to 0.0 2' of recovery
CL	6	Contact at 6.5' BLS with brown sandy silty clay with gravel, (CL) (25% sand, 65% fines, 5% gravel) firm, moist, low plasticity					
Weathered Basalt	10	Brown sandy clay matrix with basalt fragments to cobble size, some moisture in fractures and between matrix and basalt cobbles. Cobbles are angular to subrounded (10-20% matrix, 80-90% fractured basalt)	0.0			18 26 50	1.5' recovery
Weathered Basalt	15	Same as above, gray-black fractured basalt in a brown sandy clay matrix. Sand and basalt fragments are angular to subrounded (10-20% matrix, 80-90% fractured basalt)	0.0			23 50	8" recovery

PROJECT: Bradford Island

HOLD NO. SB2

ENG FORM 5056A-4, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER	SHEET	SHEETS
SB2	3	3

PROJECT: Bradford Island

INSPECTOR:

ELEV (a)	DEPTH (FEET) (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
	18						
	19						
CL Weathered rock	20	Brown sandy clay with gravel (CL) (10% gravel, 20% sand, 70% fines) low plasticity, moist, firm to contact at approximately 20.5' with desiccated rock (sand with angular gravel) (5% gravel, 95% sand) moist, well graded, angular, dense (granite or macrocrystalline volcanic)	0.0 0.0			28 50	1.25' recovery
	21						
	22						
	23						
	24						
	25	Gray weathered/desiccated sand stone (ash tuff?), very dense, well graded, moist	0.0			26 50	1' + 3 " slough
	26						
	27						
	28						
	29						
Weathered rock	30	Red rhyolitic cobble underlain by gray sand/sandstone/ash tuff (weathered) well graded sandstone fragments are angular, very dense, moist	0.0			40 50	1' + 3 " slough recovery
	31						
Weathered rock	32	Gray weathered sandstone/ash tuff, fragmented Total Depth = 32'	0.0			50	6" recovery
	33						
	34						
	35						

PROJECT: Bradford Island

HOLD NO.: SB2

ENG FORM 5056A-4, AUG 94

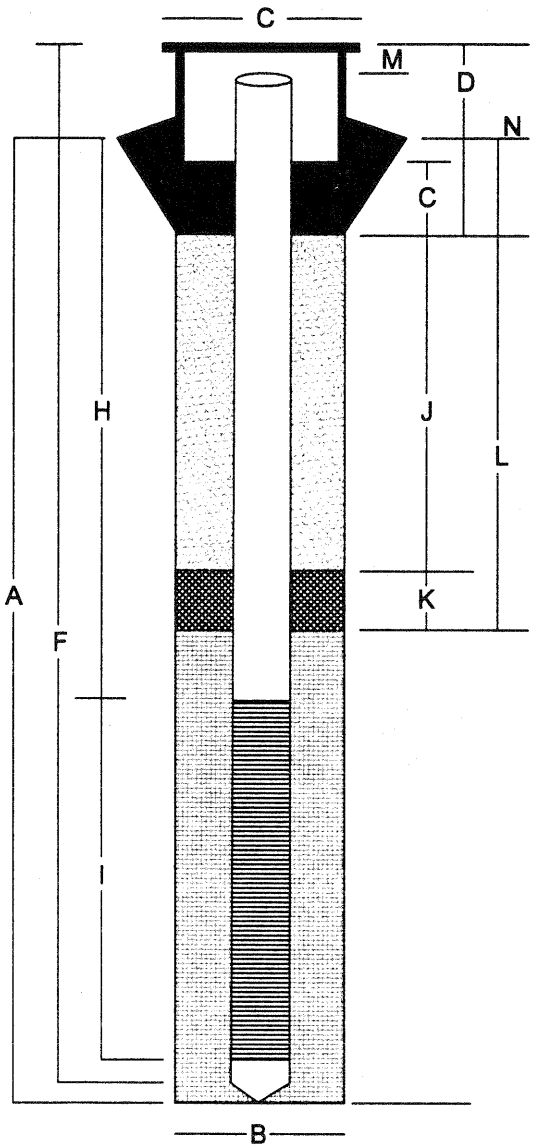
(Proponent: CECW-EG)

Above-ground Monitoring Well Construction Log

Project Name: USCOE BRADFORD ISLAND **Well No.:** MW02 (SB2) **Date:** 8/17/98

Project No: 10022-03 **Drilling Method:** HSA

Geologist: Carlotta Cellucci



A:	Total Boring Depth:	32'
B:	Boring Diameter:	9.25"
C:	Diameter of Protective Casing:	5" ID
D:	Length of Protective Casing:	5'
	Type of Protective Casing:	Steel mountment
E:	Interval of Surface Grout:	0-4'
F:	Total Riser Casing Length:	34.14'
	Length of Sediment Sump:	1"
	Casing Type:	Sch. 80, Flush threaded PVC
G:	Inner Diameter:	1.62" (2" OD)
H:	Depth to Screen:	22'
I:	Screen Length:	10'
	Screen Intrval:	22'-32'
	Screen / Slot Type:	0.010" Factory slot
J:	Depth to Top of Seal:	4'
K:	Thickness of Seal:	16'
	Type of seal material:	Pure gold medium Bentonite chips
L:	Depth to Top of Filter Pack:	20'
	Type of Filter Pack:	20/40 Colorado silica sand
M:	Top of Casing Elevation:	116.56' above msl
N:	Surface Elevation:	114.21' above msl

NOTE: Well was not surged after placement of sand pack, because there was no water in the well at that time. Well was surged by hand prior to well development.

HTRW DRILLING LOG

DISTRICT Portland		HOLE NUMBER SB4
1 COMPANY NAME Tetra Tech, Inc.	2 DRILL SUBCONTRACTOR Cascade Drilling	SHEET 1 OF SHEETS 3

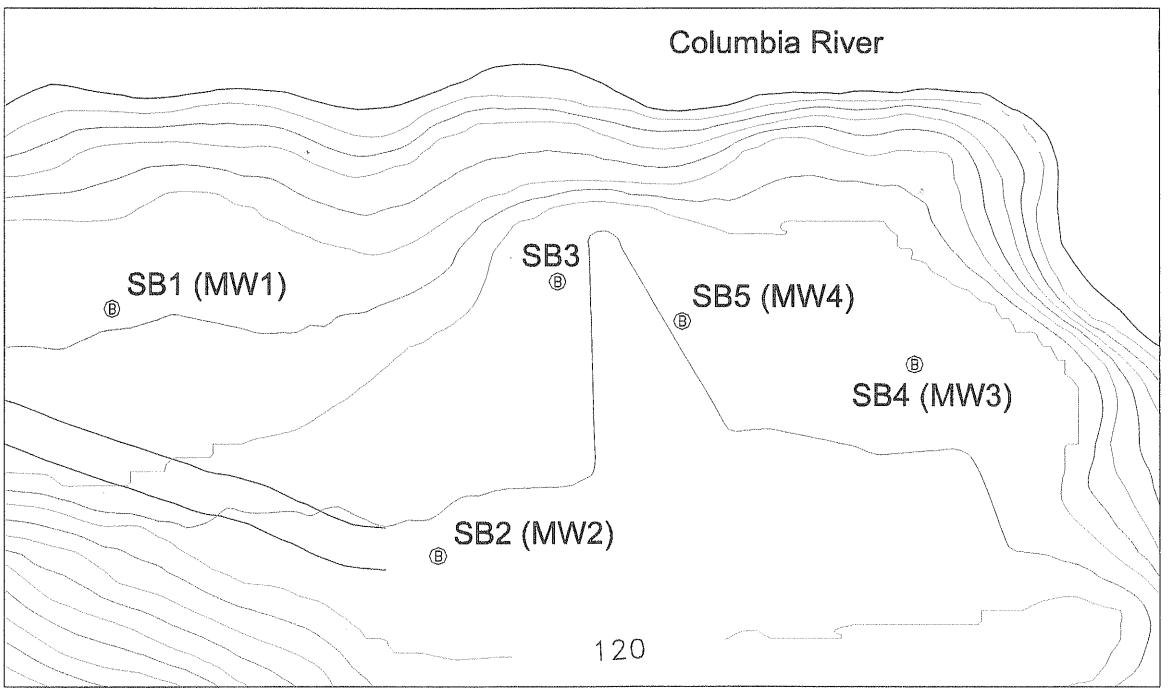
3 PROJECT USCOE Bradford Island Landfill	4 LOCATION Bradford Island Landfill
5 NAME OF DRILLER Steve Hughes	6 MANUFACTURERS DESIGNATION OF DRILL CME 75
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4.25" ID (9.25 OD) HSA 18" long, 2" OD split spoon sampler 140 lbs with 30-inch drop	8 HOLE LOCATION East end of Landfill (723633.77 north) (1633220.55 east)
	9 SURFACE ELEVATION 112.99' (TOC = 115.22')
	10 DATE STARTED 8/17/98 — 11 DATE COMPLETED 8/17/98
12 OVERBURDEN THICKNESS N/A	15 DEPTH GROUNDWATER ENCOUNTERED Approximately 18'
13 DEPTH DRILLED INTO ROCK Approximately 0.5' (Fractured)	16 DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED 17.65 after 20 hours
14 TOTAL DEPTH OF HOLE 21'	17 OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A

18 GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19 TOTAL NUMBER OF CORE BOXES
0	--	--	0

20 SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS/SVOCs	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21 TOTAL CORE RECOVERY
	1					

22 DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23 SIGNATURE OF INSPECTOR
		X		

LOCATION SKETCH/COMMENTS:



PROJECT	HOLE NO.
Bradford Island	SB4

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER: SB4

PROJECT: Bradford Island

INSPECTOR: Carlotta Cellucci

SHEET 2 OF 3 SHEETS

ELEV (a)	DEPTH (FEET) (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
	0	Grassy cover					
	1						
	2						
	3						
	4						
SM	5	Brown silty sand with gravel (SM) (fines 20%, gravel 5%, sand 75%) very dense, dry, well graded	0.0			50	1' of recovery
	6						
	7						
	8						
	9						
SM	10	Same as above with clay (SM) (fines 40%, gravel 5%, sand 55%) very dense, dry to moist, well graded, appears to be weathered basalt (i.e., clayey matrix with basalt/volcanic sand and gravel)	0.0			50	6" of recovery Material packing augers had to pull augers and clean out material.
	11						
	12						
	13						
	14						
	15	No recovery				86 120	No recovery. Material packed auger and bit again at 15' BLS had to pull augers and clean out again. Drilled with center rod and plug
	16						
	17						

PROJECT: Bradford Island

HOLD NO.: SB4

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB4

PROJECT Bradford Island

INSPECTOR Carlotta Cellucci

SHEET 3 OF 3 SH

ELEV (a)	DEPTH (FEET) (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
	18						Became wet at approximately 18' BLS
	19						
Weather-ed rock	20	Brown weathered rock in silty sand matrix (fines 5%, sand 25%, gravel/angular rock 70%) wet, very dense, well graded	0.0		8/17/98-BIL-SB4-SS-01 (1805) VOCs only (Not submitted to the laboratory for analysis)	8 50	1' of recovery in 1st sampler
	21	second sampler driven at 20' BLS = Fractured basalt in a sand matrix with large volume of free water				50	3" of recovery in 2nd sampler
	22	Refusal at 21' BLS (Hard rock)					
	23						
	24						
	25						
	26						
	27						
	28						
	29						
	30						
	31						
	32						
	33						
	34						
	35						

PROJECT Bradford Island

HOLD NO. SB4

ENG FORM 5056A-4, AUG 94

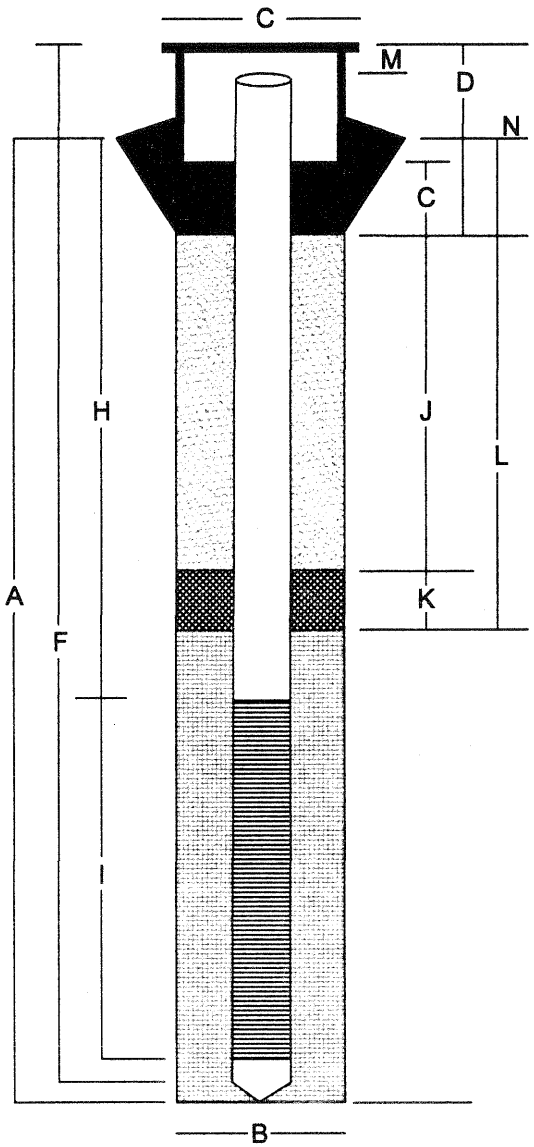
(Proponent: CECW-EG)

Above-ground Monitoring Well Construction Log

Project Name: USCOE BRADFORD ISLAND **Well No.:** MW03 (SB4) **Date:** 8/17/98

Project No: 10022-03 **Drilling Method:** HSA

Geologist: Carlotta Cellucci



A:	Total Boring Depth:	21'
B:	Boring Diameter:	9.25"
C:	Diameter of Protective Casing:	5" ID
D:	Length of Protective Casing:	5'
	Type of Protective Casing:	Steel mountment
E:	Interval of Surface Grout:	0-3'
F:	Total Riser Casing Length:	22.57'
	Length of Sediment Sump:	1"
	Casing Type:	Sch. 80, Flush threaded PVC
G:	Inner Diameter:	1.62" (2" OD)
H:	Depth to Screen:	11'
I:	Screen Length:	10'
	Screen Intrval:	11'-21'
	Screen / Slot Type:	0.010" Factory slot
J:	Depth to Top of Seal:	3'
K:	Thickness of Seal:	6'
	Type of seal material:	Pure gold medium Bentonite chips
L:	Depth to Top of Filter Pack:	9'
	Type of Filter Pack:	20/40 Colorado silica sand
M:	Top of Casing Elevation:	115.22' above msl
N:	Surface Elevation:	112.99' above msl

NOTE: After placement of sand pack, surged well for 5 minutes, Sand settled 4-inches. Replaced sand and surged again for 5 more minutes; sand did not settle.

HTRW DRILLING LOG

DISTRICT Portland		HOLE NUMBER SB5
1 COMPANY NAME Tetra Tech, Inc.	2 DRILL SUBCONTRACTOR Cascade Drilling	SHEET 1 OF SHEETS 3

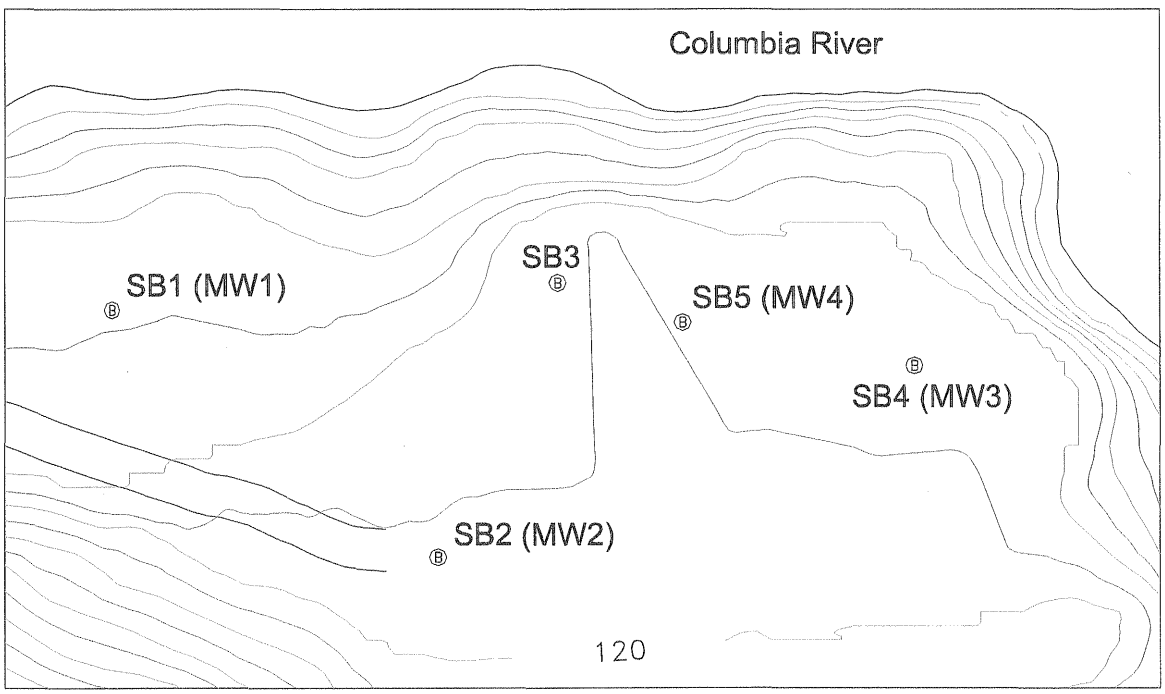
3 PROJECT USCOE Bradford Island Landfill	4 LOCATION Bradford Island Landfill
5 NAME OF DRILLER Steve Hughes	6 MANUFACTURERS DESIGNATION OF DRILL CME 75
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4.25" ID (9.25 OD) HSA 18" long, 2" OD split spoon sampler 140 lbs with 30-inch drop	8 HOLE LOCATION Northeast area of landfill (723649.42 north) (1633138.74 east)
	9 SURFACE ELEVATION 114.47' (TOC = 114.79')
	10 DATE STARTED 8/18/98 — 11 DATE COMPLETED 8/18/98
12 OVERBURDEN THICKNESS approximately 30'	15 DEPTH GROUNDWATER ENCOUNTERED Between 15-20' BGS
13 DEPTH DRILLED INTO ROCK Decompose <1'	16 DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED 17.25 after 4 hours
14 TOTAL DEPTH OF HOLE 30'	17 OTHER WATER LEVEL MEASUREMENTS (SPECIFY) N/A

18 GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19 TOTAL NUMBER OF CORE BOXES
0	--	--	0

20 SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS/SVOCs	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21 TOTAL CORE RECOVERY

22 DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23 SIGNATURE OF INSPECTOR
		X		

LOCATION SKETCH/COMMENTS:



PROJECT	HOLE NO.
Bradford Island	SB5

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER SB5

PROJECT: Bradford Island

INSPECTOR: Carlotta Cellucci

SHEET 2 OF 3 SHEETS

ELEV (a)	DEPTH (FEET) (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
	0	Grassy cover					
	1						
	2						
	3						
	4						
SM	5	Brown silty sand with gravel (SM) (fines 25%, gravel 5%, sand 70%) dry to moist, dense, well graded	1.1			11 11 20	6" recovery (2" of which are slough) Background PID <1.1
	6						
	7						
	8						
	9						
SM	10	Mottled black/orange/brown silty sand (SM) with gravel (fines 10%, sand 75%, gravel 15%) moist, dense, well graded	0.4			5 5 5	6" of recovery Background PID = 0.3
	11						
	12						
	13						
	14						
	15	No recovery Sampler wet				3 6 4	No recovery
	16						
	17						

PROJECT: Bradford Island

HOLD NO. SB5

ENG FORM 5056A-4, AUG 94

(Proponent: CECW-EG)

HTRW DRILLING LOG (CONTINUATION SHEET)

HOLE NUMBER	SHEET	SHEETS
SB5	3	3

PROJECT	INSPECTOR
Bradford Island	Carlotta Cellucci

ELEV (a)	DEPTH (FEET) (b)	DESCRIPTION OF MATERIALS (c)	FIELD SCREENING RESULTS (d)	GEOTECH SAMPLE OR CORE BOX NO (e)	ANALYTICAL SAMPLE NO. (f)	BLOW COUNT (g)	REMARKS (h)
	18						
	19						
	20	No recovery				50	No recovery Background PID = 0.1
CL	21	Gray gravelly (fractured volcanics) clay (CL) (fines 60%, fractured rock 40%) very stiff, moist-wet, low plasticity	0.1			10 33 50	2.75' recovery
	22						
	23						
	24						
SM	25	Gray gravelly, clayey sand (SM) (gravel 10%, fines 10%, sand 80%) gravel = angular volcanics, sand is volcanic/angular wet, dense, well graded	1.0			50	5" recovery Background PID = 0.8
	26						
	27						
	28						
	29						
Weather-ed Rock	30	Gray decomposed volcanics in a gravelly clay matrix, moist, very dense, well graded, all gravel and rock is angular	0.3			31 50	2' recovery Background PID = 0.3
	31	Total Depth = 30'					
	32						
	33						
	34	**NOTE: A large piece of metal was wrapped around the augers when they were removed from the boring.**					
	35						

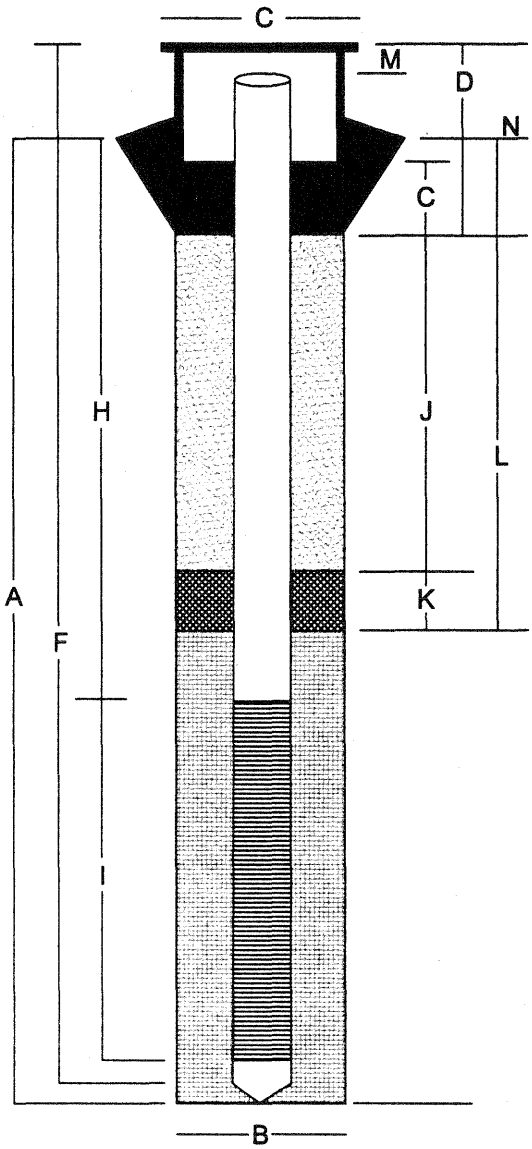
PROJECT	HOLD NO.
Bradford Island	SB5

Above-ground Monitoring Well Construction Log

Project Name: USCOE BRADFORD ISLAND **Well No.:** MW04 (SB5) **Date:** 8/18/98

Project No: 10022-03 **Drilling Method:** HSA

Geologist: Carlotta Cellucci



A: Total Boring Depth:	30'
B: Boring Diameter:	9.25"
C: Diameter of Protective Casing:	5"
D: Length of Protective Casing:	5'
Type of Protective Casing:	Steel mountment
E: Interval of Surface Grout:	0-4'
F: Total Riser Casing Length:	31.85'
Length of Sediment Sump:	1"
Casing Type:	Sch. 80, Flush threaded PVC
G: Inner Diameter:	1.62" (2" OD)
H: Depth to Screen:	10'
I: Screen Length:	20'
Screen Intrval:	10'-30'
Screen / Slot Type:	0.010" Factory slot
J: Depth to Top of Seal:	4'
K: Thickness of Seal:	4'
Type of seal material:	Pure gold medium Bentonite chips
L: Depth to Top of Filter Pack:	8'
Type of Filter Pack:	20/40 Colorado silica sand
M: Top of Casing Elevation:	114.79' above msl
N: Surface Elevation:	114.47' above msl

NOTE: After placement of sand pack, surged well for 5 minutes, Sand settled 1' inch. Replaced sand and surged again for 5 more minutes; sand did not settle.

Project: Bradford Island Landfill
Project Location: Bonneville Dam, Oregon
Project Number: 53-F0072173.02

Key to Log of Boring

Elevation feet	Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Sampling Resistance, blows / 6 in.	SAMPLES: Recovery, inches	SAMPLES: Headspace PID [FID], ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
1	2	3	4	5	6	7	8	9	10	11	12

COLUMN DESCRIPTIONS

1. **Elevation:** Elevation in feet referenced to mean sea level (MSL) or site datum.
2. **Depth:** Depth in feet below the ground surface.
3. **Sample Type:** Type of soil sample collected at depth interval shown; sampler symbols are explained below.
4. **Sample Number:** Sample identification number.
5. **Sampling Resistance:** Number of blows to advance driven sampler each 6-inch drive interval, or distance noted, using a 140-lb hammer with a 30-inch drop; "NA" indicates data not recorded.
6. **Recovery:** Length in inches of sample actually recovered in driven or pushed sampler; "NA" indicates data not recorded.
7. **Headspace PID/FID:** Photo-ionization/flame ionization device sample headspace reading in parts per million (ppm).
8. **Graphic Log:** Graphic depiction of subsurface material encountered; typical symbols are explained below.
9. **USCS Code:** Unified Soil Classification System (USCS) group symbol code for associated soil strata.
10. **Material Description:** Description of material encountered; may include color, moisture, grain size, and density/consistency.
11. **Well Completion Schematic:** Schematic of piezometer or well installation; materials are listed in header block and alongside well schematic; graphic symbols are explained below.
12. **Field Notes and Well Details:** Comments and observations regarding drilling or sampling made by driller or field personnel. Well construction materials and installation details are also listed in this column.

TYPICAL SOIL GRAPHIC SYMBOLS

- SAND (SP)
- CLAY (CL)
- SILT (ML)
- SANDSTONE
- SAND with silt (SP-SM)
- Plastic CLAY (CH)
- Silty CLAY (CL/ML)
- Rock Fragments / Gravel
- Silty SAND (SM)
- Clayey SAND (SC)
- Silty GRAVEL (GM)
- Non-soil Fill

TYPICAL WELL GRAPHIC SYMBOLS

- Blank well casing in concrete
- Blank well casing in filter sand
- Blank well casing in bentonite-cement slurry
- Slotted well casing in filter sand
- Blank well casing in bentonite chips
- Native backfill or slough

TYPICAL SAMPLER GRAPHIC SYMBOLS

- 2-inch-OD split spoon sampler (SPT)
- 2.5-inch-OD split spoon with brass liners (modified California)
- Thin-walled tube sampler (Shelby tube)

OTHER GRAPHIC SYMBOLS

- First water encountered at time of drilling (ATD)
- Static water level measured in well on specified date
- Change in material properties within a stratum
- Inferred or gradational lithologic contact

GENERAL NOTES

1. Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive; actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

Report: ENV_12W_CLEVELAND_W/USCS_KEY; File: BRADFORD.GPJ; 1/12/2000 keyowwell

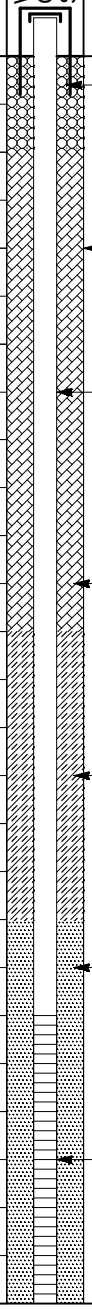
Project: Bradford Island Landfill
Project Location: Bonneville Dam, Oregon
Project Number: 53-F0072173.02

Log of Boring SB-7 (MW-5)

Date(s) Drilled and Installed	**9/29/99 and 9/30/99**	Geologist	**G. Lukert**	Reviewer	
Drilling Method	**Hollow-Stem Auger**	Drilling Contractor	**Cascade Drilling, Inc.**	Total Depth of Borehole	**36.5 feet**
Sampling Method	**Split spoon**	Drill Bit Size/Type	**8-7/8-inch-OD auger bit**	Top of Casing Elevation	**114.07 feet MSL**
Size and Type of Well Casing	**1-7/8-inch-I.D. Schedule 80 PVC**	Screen Perforation	**0.010-inch slot (10-34.5 feet)**	Ground Surface Elevation	**112.36 feet MSL**
Seal or Backfill	**Bentonite-cement slurry 1-6 feet, bentonite chips 6-9 feet**	Location	**North side of landfill**	Coordinates	**N 723,665.69 E 1,633,072.42**

Elevation feet	Depth, feet	SAMPLES Type Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace PID [FID], ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION
112	0							Surface conditions: brown, silty SAND with rounded cobbles [Fill]
	1							
110	2							
	3							
108	4	01	1-1-1	2	0.0 [0.0]		ML	SILT; dark yellowish brown (10YR 3/4), trace fine sand, slightly micaceous, dry, soft, no odor [FILL]
	5							
106	6							
	7							
104	8							
102	9	02	7-5-7	0				**No recovery in sampled interval 9-10.5 feet; apparent void space 7.5-10 feet**
	10							
	11							
100	12							
	13							

Well Completion Schematic



FIELD NOTES AND WELL DETAILS

- 6-3/16-in.-dia. steel casing set in concrete to 1 ft
- 8-7/8-in.-dia. borehole (0-35 ft)
- 1-7/8-in.-I.D. blank Schedule 80 PVC casing to 10 ft
- Bentonite-Portland cement slurry (1-6 ft)
- Bentonite chips (6-9 ft)
- 20/40 silica sand (9-35 ft)
- 1-7/8-in.-I.D. Schedule 80 PVC screen, 0.010-in. slot (10-35 ft)

Project: Bradford Island Landfill
Project Location: Bonneville Dam, Oregon
Project Number: 53-F0072173.02

Log of Boring SB-7 (MW-5)

Elevation feet	Depth, feet	SAMPLES Type Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace PID [FID], ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	13									8-7/8-in.-dia. borehole (0-35 ft)
98	14	03	8-3-4	2	0.0 [0.0]		SM	Silty SAND with gravel; very dark gray (2.5Y 3/1), ~60% sand, ~30% medium plasticity silt, ~10% rounded to subrounded gravel, wet, loose, no odor [FILL]		
	15									20/40 silica sand (9-35 ft)
96	16									
	17									1-7/8-in.-I.D. Schedule 80 PVC screen, 0.010-in. slot (10-35 ft)
94	18									
	19									
92	20	04	10-12-9	2	0.0 [0.0]		SM/ML	Silty SAND to sandy SILT; very dark gray (2.5Y 3/1), slightly micaceous, damp to wet, medium dense, no odor [FILL]		
	21									
90	22									
	23									
88	24	05	4-6-5	4	43 [0.0]		SM	Silty SAND; dark gray (2.5Y 4/1), trace angular volcanic gravel, wood fragments, damp to wet, medium dense		
	25									
86	26									
	27									
84	28									
	29									

Report: ENV_12W_CLEVELAND+/-USCS_2FT/IN; File: BRADFORD.GPJ; 1/12/2000 SB-07

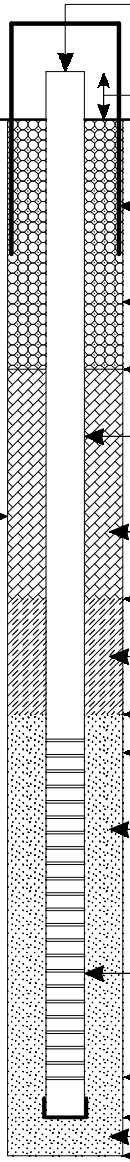
Project: Bradford Island Landfill
Project Location: Bonneville Dam, Oregon
Project Number: 53-F0072173.02

Log of Boring SB-7 (MW-5)

Elevation feet	Depth, feet	SAMPLES Type Number	Sampling Resistance, blows / 6 in.	Recovery, inches	Headspace PID [FID], ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	29									
82	30	06	1-2-4	18	375 [0.0]		SC	CLAYEY SAND with silt; dark gray (2.5Y 4/1), ~60% poorly graded sand, ~35% medium plasticity fines, ~5% angular gravel, wet, loose		8-7/8-in.-dia. borehole (0-35 ft)
	31									20/40 silica sand (9-35 ft)
80	32									
	33									1-7/8-in.-I.D. Schedule 80 PVC screen, 0.010-in. slot (10-35 ft)
78	34									
76	35	07	5-9-14	14	32 [0.0]		[Rock]	Weathered SANDSTONE; very dark gray (2.5Y 3/1), angular volcanic fragments (35.0-35.5 ft), trace clay, damp to wet, medium dense		Native soil (sampled interval)
	36									
	37							**Bottom of boring at 36.5 feet bgs**		
74	38									
	39									
72	40									
	41									
70	42									
	43									
68	44									
	45									

Project: Bradford Island Landfill **Project Location: Bonneville Dam, Oregon** **Project Number: 53-F0072173.02**	**MONITORING WELL CONSTRUCTION LOG FOR WELL MW-5**

Well Location	**Boring SB-7, north side of landfill**		Date(s) Installed **9/30/99**	Time	**0930**
Installed By	**Cascade Drilling, Inc.**	Observed By	**G. Lukert**	Total Depth	**36.5 feet**
Method of Installation	**Hollow-stem auger**				
Screened Interval	**10 - 35 feet**	Completion Zone	**Unconfined aquifer above slideblock**		
Remarks	**Well installed at coordinate location N 723,665.69 E 1,633,072.42**				



Elevation of Top of Riser Pipe: **114.07 ft MSL**

Height of Riser Above Ground: **1.71 ft**

Ground Elevation: **112.36 ft MSL**

ID/Type of Surface Casing:
6-3/16-inch-dia. steel

Type of Surface Seal:
Concrete

Depth of Surface Seal: **1.0 ft**

ID/Type of Riser Pipe:
1-7/8-inch-I.D. Schedule 80 PVC

Boring Diameter:
8-7/8 inches

Type of Backfill:
Bentonite/Portland cement slurry

Depth of Seal: **6.0 ft**

Type of Seal:
Bentonite chips

Depth of Top of Filter Pack: **9.0 ft**

Depth of Top of Screen: **10.0 ft**

Type of Filter Pack:
20/40 silica sand

ID/Type of Screen:
1-7/8-inch-I.D. Schedule 80 PVC
Screen Slot Size:
0.010-inch

Depth of Bottom of Screen: **34.5 ft**

Depth of Bottom of Plugged Blank Casing: **35.0 ft**

Type/Depth of Backfill/Seal Below Well:
Native soil (sampled interval)

Total Depth of Boring: **36.5 ft**

NOTE: DIAGRAM IS NOT TO SCALE

Report: ENV_WELL_CONSTR_ABOVE_GROUND; File: BRADFORD.GPJ; 1/8/00

Project: Bradford Island Landfill **Project Location:** Cascade Locks, Oregon **Project Number:** 52-00080001.00	**Log of Boring MW-6** Sheet 1 of 2

Date(s) Drilled	4/22/02	Logged By	CM	Checked By	BM
Drilling Method	Air Rotary	Drill Bit Size/Type		Total Depth of Borehole	35.0 feet
Drill Rig Type		Drilling Contractor	Enviromental West	Approximate Surface Elevation	110.00' MSL
Groundwater Level and Date Measured	16.36 feet [btoc] [4/22/02]	Sampling Method(s)	Split Spoon Sampler	Hammer Data	140 lb. Automatic
Borehole Backfill	Monitoring Well Installed	Location	Bradford Island Landfill		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, Blows/12 in.	Recovery, (feet)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS
110	0						GW	**COBBLES [GW]**, dark grey, [angular basalt, maximum size 1.0' to 2.0'], [Fill for drill rig pad].		
							ML	**CLAYEY SILT [ML]**, brown, [10YR-4/3], [trace sand], [fines medium plastic], soft, [moist], [Fill/Alluvium].		
105	5									
							SM	**SILTY SAND WITH GRAVEL [SM]**, dark yellowish brown [10YR-4/3], [well graded], [gravel maximum size 1/4", rounded to subrounded], medium dense, [wet to saturated], [Fill/Alluvium].		
100	10		1	20	1.5					
95	15		2	28-6"	0.0					
							CL	**SILTY CLAY [CL]**, black [10YR], [slightly plastic], [wood debris], [slight petroleum odor and sheen], soft, wet to saturated,[Fill/Alluvium].		
90	20		3	25	0.2					
							SM	**SILTY SAND [SM]**, dark greenish grey [Glex 1-3/1], [trace gravel, gravel angular with a maximum size 1" and consists of siltstone], [saturated], [Weathered Slide Block].		
85	25		4	9	0.2					
80	30									

URS

Project: Bradford Island Landfill
Project Location: Cascade Locks, Oregon
Project Number: 52-00080001.00

Log of Boring MW-6

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, Blows/12 in.	Recovery, (feet)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic		REMARKS
80	30		5	50-5"	.42			**SILTSTONE [SLST]**, dark olive grey [5Y-3/2], [weathered to clays and silts], [fractures], very dense, [moist to wet], [Slide Block].			
75	35							Boring terminated at a depth of 35.0' [bgs] on 4/22/2002 and a monitoring well was installed upon completion.			
70	40										
65	45										
60	50										
55	55										
50	60										
45	65										

URS

Project: Bradford Island Landfill **Project Location:** Cascade Locks, Oregon **Project Number:** 52-00080001.00	**Log of Boring MW-7** Sheet 1 of 2

Date(s) Drilled	4/22/02	Logged By	CM	Checked By	BM
Drilling Method	Air Rotary	Drill Bit Size/Type		Total Depth of Borehole	45.5 feet
Drill Rig Type		Drilling Contractor	Enviromental West	Approximate Surface Elevation	104.24' MSL
Groundwater Level and Date Measured	8.96 feet [btoc] [4/22/02]	Sampling Method(s)	Split Spoon Sampler	Hammer Data	140 lb. Automatic
Borehole Backfill	Monitoring Well Installed	Location	Bradford Island Landfill		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, Blows/12 in.	Recovery, (feet)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS
	0						SC	**CLAYEY SAND WITH GRAVEL [SC]**, very dark brown [7.5YR-2.5/2], [well graded sand with angular to rounded grains], loose, [damp to moist], [Fill/Alluvium].		
100	5		1	16	1.5		CL	**SANDY CLAY [CL]**, dark brown [10YR-3/3], [trace gravel], [plastic], [gravel had rounded to subrounded grains], soft, [moist], [Fill/Alluvium].		
95	10		2	80-11"	1.33			*Grades to dark greenish grey, wet to saturated.*		
								More gravel in cuttings, gravel consists of dark grey siltstone clasts, friable.		
90	15		3	50-1"	0.0					
							SC	**CLAYEY SAND [SC]**, dark greenish grey [Glex 1-3/1], [trace silt], [sand rounded to subrounded], [moist to wet], [Weathered Slide Block].		
85	20		4	50-3"	.17			**SILTSTONE [SLST]**, dark greenish grey, [weathered to silts and clays in fractures of rock], [moist to wet], [Slide Block].		
80	25		5	50-2"	.17			*Sand present in cuttings and sampler.*		
								Less sand in cuttings.		
75	30									

Report: PORT_GEO_WELL_NO_DD; File: BRADISL.GPJ; 12/4/2003 MW-7

URS

Project: Bradford Island Landfill
Project Location: Cascade Locks, Oregon
Project Number: 52-00080001.00

Log of Boring MW-7

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, Blows/12 in.	Recovery, (feet)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic		REMARKS
	30		6	90-10"	.5		GW	**GRAVELLY SAND [GW]**, dark greyish green [Glex 1-3/2], [trace clay], [gravel consists of siltstone clasts with hard angular basalt], [wet], [Slide Block].			
70								**SILTSTONE [SLST]**, dark greenish grey, [weathered to silts and clays in fractures], [moist to wet], [Slide Block].			
	35		7	50-2"	0.0						
65											
	40		8	50-2"	.083			*Basalt chips in cuttings.*			
60											
	45		9	50-2"	0.0						
								Boring terminated at a depth of 45.5' [bgs] on 04/22/2002 and a monitoing well was installed upon completion.			
55											
	50										
50											
	55										
45											
	60										
40											
	65										

URS

Project: Bradford Island Landfill **Project Location:** Cascade Locks, Oregon **Project Number:** 52-00080001.00	**Log of Boring MW-8** Sheet 1 of 2

Date(s) Drilled	4/23/02	Logged By	CM	Checked By	BM
Drilling Method	Air Rotary	Drill Bit Size/Type		Total Depth of Borehole	62.0 feet
Drill Rig Type		Drilling Contractor	Enviromental West	Approximate Surface Elevation	112.49' MSL
Groundwater Level and Date Measured	57.78 feet [btoc] [4/22/02]	Sampling Method(s)	Split Spoon Sampler	Hammer Data	140 lb. Automatic
Borehole Backfill	Monitoring Well Installed	Location	Bradford Island Landfill		

Elevation, feet	Depth, feet	SAMPLES: Type	Number	Sampling Resistance, Blows/12 in.	Recovery, (feet)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS
	0						ML	**CLAYEY SILT [ML]**, dark brownish yellow [10YR-3/4], [trace fine sand], soft, [dry to damp], [Landfill].		
110										
	5						SM	**SILTY SAND WITH GRAVEL [SM]**, dark brownish yellow [10YR-3/4], [gravel maximum size 1/4", rounded], [damp], [Landfill].		
105										
	10									
100										
							CL	**SILTY CLAY [CL]**, black [10YR-2/1], [wood fragments], [slight petroleum sheen and odor], soft, [wet to saturated], [Fill/Alluvium].		
	15									
95										
	20									
90										
							SM	**SILTY SAND [SM]**, dark greenish grey [Glex 1-3/1], [trace gravel, angular, maximum size 1"], [saturated], [Weathered Slide Block].		
	25									
85										
							SC	**CLAYEY SAND WITH SILT [SC]**, dark greenish grey [Glex 1-3/1], [fines medium plastic], [wet to saturated], [Weathered Slide Block].		
	30									

URS

Project: Bradford Island Landfill
Project Location: Cascade Locks, Oregon
Project Number: 52-00080001.00

Log of Boring MW-8

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, Blows/12 in.	Recovery, (feet)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS
	30									
80								**SILTSTONE [SLST]**, dark olive grey [5Y-3/2], [weathered to clays and silts], very dense, [moist to wet], [Slide Block].		
	35									Begin Coring
			1		1.5		GP	**GRAVEL**[GP], grey, [hard rounded to subrounded gravels of basalt maximum size 1/2"].		
75								**CONGLOMERATE**, grey, [clasts consists of hard angular to rounded basalt up to 1.0'], [matrix consists of a plastic sandy to silty clay], [Slide Block].		
	40									
			2		2.0					
70										
	45									End Coring due to poor recovery
65										
	50									
60										Resume Coring
	55							*Chloritic alteration in basalt vesicles.*		
55									▽	
	60									
50								Boring terminated at a depth of 62.0' [bgs] on 04/23/2002 and a monitoring well was installed upon completion.		
	65									

URS

Project: Bradford Island Landfill **Project Location:** Cascade Locks, Oregon **Project Number:** 52-00080001.00	**Log of Boring MW-9** Sheet 1 of 1

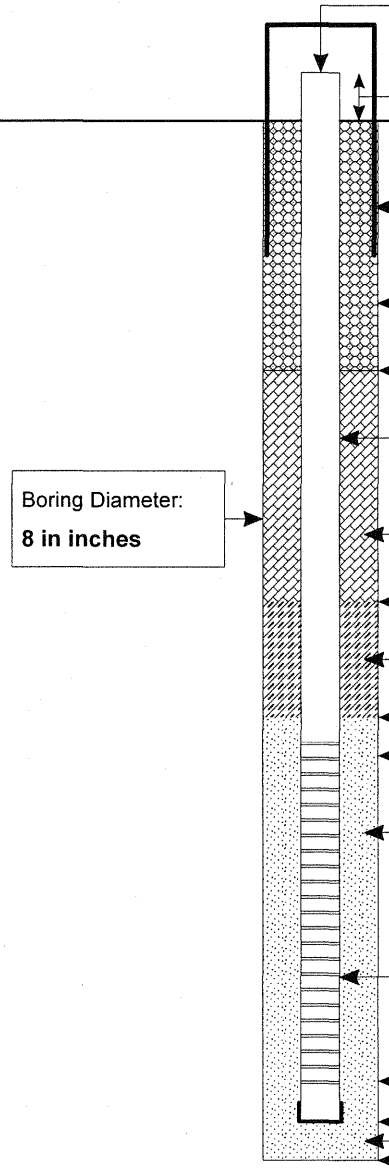
Date(s) Drilled	4/23/02	Logged By	CM	Checked By	BM
Drilling Method	Air Rotary	Drill Bit Size/Type		Total Depth of Borehole	18.0 feet
Drill Rig Type		Drilling Contractor	Enviromental West	Approximate Surface Elevation	112.18' MSL
Groundwater Level and Date Measured	14.97 feet [btoc] [05/01/02	Sampling Method(s)	Split Spoon Sampler	Hammer Data	140 lb. Automatic
Borehole Backfill	Monitoring Well Installed	Location	Bradford Island Landfill		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, Blows/12 in.	Recovery, (feet)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS
	0						GW	**WELL GRADED GRAVEL [GW]**, dark grey, some cobbles, 1-2' in diameter, angular basalt, [Fill for Drilling Pad].		
110										
	5						SC	**CLAYEY SAND WITH SILT [SC]**, dark yellowish-brown, [10YR-3/4], well graded, [rounded to sub-rounded], [wood debris], loose, [moist], [Fill/Alluvium].		
105										
	10	■	1	50/6"	.25		SM	**SILTY SAND [SM]**, yellowish-brown, [10YR-5/4], [medium coarse sand, rounded to sub-rounded], [saturated], [Fill/Alluvium].		
100										
	15		2	50/0"	0			**SILTSTONE [SLST]**, dark olive grey [5Y-3/2], [weathered to clays and silts in fractures], very dense, [wet to saturated], [Slide Block]. ▽		
95										
								Boring terminated at a depth of 18.0' [bgs] on 04/23/2002 and a monitoring well was installed upon completion.		
	20									
90										
	25									
85										
	30									

URS

Project: Bradford Island Landfill **Project Location: Cascade Locks, Oregon** **Project Number: 52-00080001.00**	**MONITORING WELL CONSTRUCTION LOG FOR WELL MW-6**

Well Location	**Bradford Island**		Date(s) Installed **4/22/2002**	Time	
Installed By	**CM**	Observed By	**CM**	Total Depth	**35.0 feet**
Method of Installation	**Air Rotary**				
Screened Interval	**25-30 ft bgs**	Completion Zone	**24-31 ft bgs**		
Remarks					



Elevation of Top of Riser Pipe: **113.02**

Height of Riser Above Ground: **3.02 ft**

Ground Elevation: **110.00 ft MSL**

ID/Type of Surface Casing: **6 in Steel**

Type of Surface Seal: **Concrete**

Depth of Surface Seal: **1.0 ft**

ID/Type of Riser Pipe: **2 in Sch. 40 PVC**

Boring Diameter: **8 in inches**

Type of Backfill: **Bentonite Grout**

Depth of Seal: **14.0 ft**

Type of Seal: **Bentonite Chips**

Depth of Top of Filter Pack: **24.0 ft**

Depth of Top of Screen: **25.0 ft**

Type of Filter Pack: **20/40 Silica Sand**

ID/Type of Screen: **2 in Sch. 40 PVC**
Screen Slot Size: **0.010 in**

Depth of Bottom of Screen: **30.0 ft**

Depth of Bottom of Plugged Blank Casing: **30.0 ft**

Type/Depth of Backfill/Seal Below Well: **Bentonite Chips/5 ft**

Total Depth of Boring: **35.0 ft**

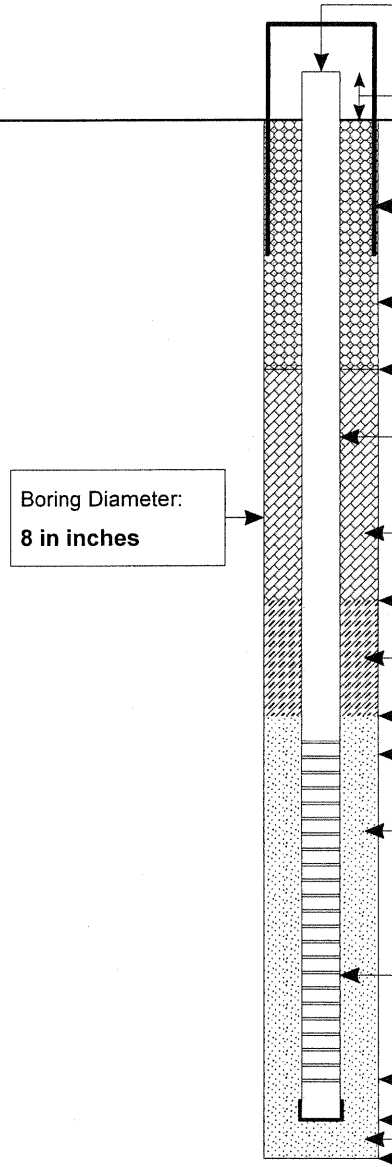
NOTE: DIAGRAM IS NOT TO SCALE

Report: ENV_WELL_CONSTR_ABOVE_GROUND; File: BRADISL.GPJ; 8/14/2002 MW-6

URS

Project: Bradford Island Landfill Project Location: Cascade Locks, Oregon Project Number: 52-00080001.00	MONITORING WELL CONSTRUCTION LOG FOR WELL MW-7

Well Location	**Bradford Island**		Date(s) Installed **4/22/2002**	Time	
Installed By	**CM**	Observed By	**CM**	Total Depth	**45.5 feet**
Method of Installation	**Air Rotary**				
Screened Interval	**5-30 ft bgs**	Completion Zone	**3-32 ft bgs**		
Remarks					



Elevation of Top of Riser Pipe: **106.92**

Height of Riser Above Ground: **2.68 ft**

Ground Elevation: **104.24 ft MSL**

ID/Type of Surface Casing:
6 in Steel

Type of Surface Seal:
Concrete

Depth of Surface Seal: **1.0 ft**

ID/Type of Riser Pipe:
2 in Sch. 40 PVC

Boring Diameter:
8 in inches

Type of Backfill:
Bentonite Grout

Depth of Seal: **3.0 ft**

Type of Seal:
Bentonite Chips

Depth of Top of Filter Pack: **3.0 ft**

Depth of Top of Screen: **5.0 ft**

Type of Filter Pack:
20/40 Silica Sand

ID/Type of Screen:
2 in Sch. 40 PVC
Screen Slot Size:
0.010 in

Depth of Bottom of Screen: **30.0 ft**

Depth of Bottom of Plugged Blank Casing: **30.0 ft**

Type/Depth of Backfill/Seal Below Well:
Bentonite Chips/15.5 ft

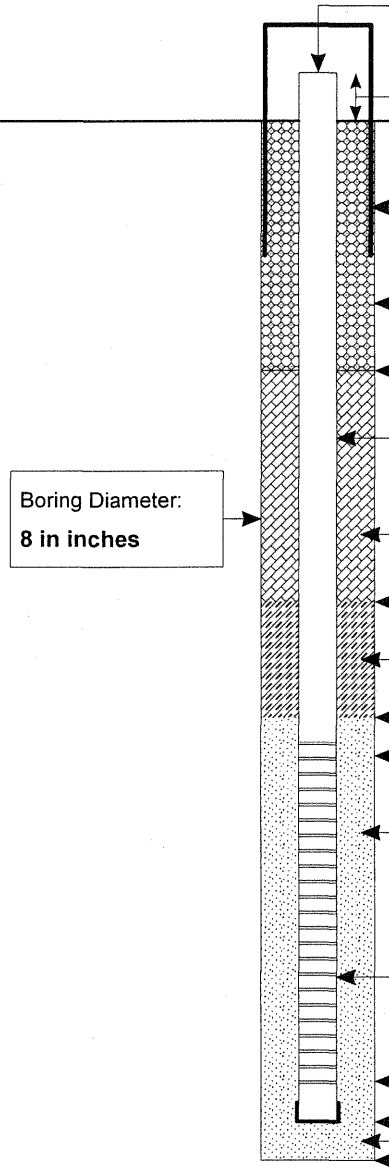
Total Depth of Boring: **45.5 ft**

NOTE: DIAGRAM IS NOT TO SCALE

URS

Project: Bradford Island Landfill **Project Location: Cascade Locks, Oregon** **Project Number: 52-00080001.00**	**MONITORING WELL CONSTRUCTION LOG FOR WELL MW-8**

Well Location	**Bradford Island**		Date(s) Installed **4/23/2002**	Time	
Installed By	**CM**	Observed By	**CM**	Total Depth	**62.0 feet**
Method of Installation	**Air Rotary**				
Screened Interval	**53-58 ft bgs**	Completion Zone	**50-58 ft bgs**		
Remarks					



Elevation of Top of Riser Pipe: **115.29**

Height of Riser Above Ground: **2.80 ft**

Ground Elevation: **112.49 ft MSL**

ID/Type of Surface Casing:
6 in Steel

Type of Surface Seal:
Concrete

Depth of Surface Seal: **1.0 ft**

ID/Type of Riser Pipe:
2 in Sch. 40 PVC

Boring Diameter:
8 in inches

Type of Backfill:
Bentonite Grout

Depth of Seal: **45.0 ft**

Type of Seal:
Bentonite Chips

Depth of Top of Filter Pack: **50.0 ft**

Depth of Top of Screen: **53.0 ft**

Type of Filter Pack:
20/40 Silica Sand

ID/Type of Screen:
2 in Sch. 40 PVC
Screen Slot Size:
0.010 in

Depth of Bottom of Screen: **58.0 ft**

Depth of Bottom of Plugged Blank Casing: **58.0 ft**

Type/Depth of Backfill/Seal Below Well:
Bentonite Chips/58-62 ft

Total Depth of Boring: **62.0 ft**

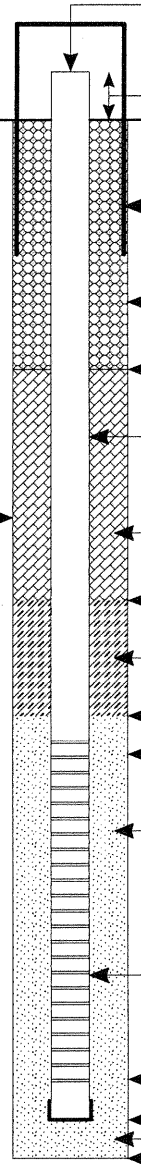
NOTE: DIAGRAM IS NOT TO SCALE

URS

Report: ENV_WELL_CONSTR_ABOVE_GROUND; File: BRADISL.GPJ; 8/14/2002 MW-8

Project: Bradford Island Landfill Project Location: Cascade Locks, Oregon Project Number: 52-00080001.00	MONITORING WELL CONSTRUCTION LOG FOR WELL MW-9

Well Location	**Bradford Island**		Date(s) Installed **4/23/2002**	Time	
Installed By	**CM**	Observed By	**CM**	Total Depth	**18.0 feet**
Method of Installation	**Air Rotary**				
Screened Interval	**10-15 ft bgs**	Completion Zone	**9-16 ft bgs**		
Remarks					



Elevation of Top of Riser Pipe: **115.16**

Height of Riser Above Ground: **2.98 ft**

Ground Elevation: **112.18 ft MSL**

ID/Type of Surface Casing:
6 in Steel

Type of Surface Seal:
Concrete

Depth of Surface Seal: **1.0 ft**

ID/Type of Riser Pipe:
2 in Sch. 40 PVC

Boring Diameter:
8 in inches

Type of Backfill:
Bentonite Grout

Depth of Seal: **7.0 ft**

Type of Seal:
Bentonite Chips

Depth of Top of Filter Pack: **9.0 ft**

Depth of Top of Screen: **10.0 ft**

Type of Filter Pack:
20/40 Silica Sand

ID/Type of Screen:
2 in Sch. 40 PVC
Screen Slot Size:
0.010 in

Depth of Bottom of Screen: **15.0 ft**

Depth of Bottom of Plugged Blank Casing: **15.0 ft**

Type/Depth of Backfill/Seal Below Well:
Bentonite Chips/15-18 ft bgs

Total Depth of Boring: **18.0 ft**

NOTE: DIAGRAM IS NOT TO SCALE

URS

Project: Bradford Island
Project Location: Bonneville Dam, Oregon
Project Number: 25696679

Log of Boring MW-10

Date(s) Drilled and Installed	**4/3 - 4/5/2008**	Geologist	**MC**	Reviewer	**NM**
Drilling Method	**Sonic**	Drilling Contractor	**Boart Longyear**	Total Depth of Borehole	**57.6 ft. [bgs]**
Sampling Method	**Continuous Core**	Drill Bit Size/Type	**4 in. core with 6 in. casing**	Approximate Surface Elevation	**129.28 ft. MSL**
Drill Rig Type	**Prosonic Spider**	Groundwater Level(s)	**16.53 ft. [bgs] [4/16/08]**	Hammer Data	**n/a**
Borehole Backfill	**Monitoring Well Installed**	Comments	**MSL: mean sea level, bgs: below ground surface**	Location	**Bradford Island Reference Area**

Elevation feet	Depth, feet	SAMPLES Type	Number		Recovery, (feet)	Headspace PID, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	0								**Basalt BOULDER**, dark grey, dry, hard, fresh.		Stickup Monument; Concrete; 2" Schedule PVC Riser
			1		4			SM	**Silty SAND with Gravel [SM]**, brown to orange-brown, moist, loose, well-graded sand with root fragments. Moderate plasticity fines. Subrounded gravel with some hard, angular clasts, few cobbles. [Colluvium]		
	5					0.0			*Light yellow-brown, no root fragments.*		
			2		6			ML	**Sandy SILT with Gravel [ML]**, brown, medium stiff, moist, low plasticity fines. Poorly-graded fine sand. Rounded gravel with few hard, angular clasts. [Colluvium]		
	10					0.0			*Dark olive-brown, stiff, moderately plastic fines with yellow-brown, loose coarse-grained sand.*		
	15		3		10	0.2			*Increasingly fine, angular gravel, moist to wet.*		Baroid Hole Plug 3/8" Bentonite Chips [hydrated]
									Basalt BOULDER, dark grey, moist, hard, fresh.		
	20					0.0			**SILTSTONE**, greenish-grey, dry, dense, friable, moderately weathered to soft silt and clay with irregularly-spaced 1/8-in [chloritic] laminae . Fine-grained matrix with rock texture. Trace fine, angular gravel-sized basalt clasts. [Weathered Slide Block]		
	25		4		10	0.3			*Dry to moist.*		
	30										

URS

Project: Bradford Island
Project Location: Bonneville Dam, Oregon
Project Number: 25696679

Log of Boring MW-10

Elevation feet	Depth, feet	SAMPLES Type	Number		Recovery, (feet)	Headspace PID, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	30					0.2			*Increased [chloritic] alteration throughout.*		
	35		5		10	0.3			*As above, with dark brown moderate plasticity clay laminae, up to 1/2", increasingly soft.*		
								CL	**Sandy CLAY with Gravel [CL]**, dark brown-black, wet, soft, low plasticity. Trace subangular gravel. [Weathered Slide Block]		
	40					0.6			**SILTSTONE**, dark greenish-grey, moist to wet, dense, slightly weathered to stiff silt and clay with irregularly-spaced 1/8-in [chloritic] laminae. Fine-grained matrix with rock texture. Trace fine, angular gravel-sized basalt clasts. [Slide Block]		
			6		6						Oglebay Norton 10-20 Silica Sand
	45					0.0			*Wet.*		
									Basalt BOULDER, dark grey, moist, hard, fresh.		0.010 in. - Slot Schedule 40 PVC screen
			7		4						
	50					0.1			**SILTSTONE**, dark greenish-grey, moist to wet, dense, fresh with irregularly-spaced 1/8-in [chloritic] laminae. Trace fine, angular basalt gravel clasts partially weathered to silty sand. [Slide Block]		
			8		7.6						
	55										Schedule 40 PVC Sump
									Boring terminated at a depth of 57.6' [bgs] on 4/5/2008 and a monitoring well was installed upon completion.		
	60										
	65										

URS

Project: Bradford Island
Project Location: Bonneville Dam, Oregon
Project Number: 25696679

Log of Boring MW-11

Date(s) Drilled and Installed	**4/3/2008**	Geologist	**MC**	Reviewer	**NM**
Drilling Method	**Sonic**	Drilling Contractor	**Boart Longyear**	Total Depth of Borehole	**37.0 ft. [bgs]**
Sampling Method	**Continuous Core**	Drill Bit Size/Type	**4 in. core with 6 in. casing**	Approximate Surface Elevation	**99.45 ft. MSL**
Drill Rig Type	**Prosonic Truck Mount**	Groundwater Level(s)	**7.74 ft. [bgs] [4/15/08]**	Hammer Data	**n/a**
Borehole Backfill	**Monitoring Well Installed**	Comments	**MSL: mean sea level, bgs: below ground surface**	Location	**Bradford Island Sandblast Area**

Elevation feet	Depth, feet	SAMPLES Type	Number		Recovery, (feet)	Headspace PID, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	0							GM	**Asphalt**		Flush to Grade Monument
									Silty GRAVEL [GM], dark brown, dry, rounded, well-graded gravel with few cobbles. Low plasticity, hard silt. [Colluvium]		Concrete
			1		7			SM	**Silty SAND with Gravel [SM]**, brown to yellow-brown, dry to moist, low plasticity medium stiff fines. Rounded to subangular, well-graded gravel with some cobbles. [Colluvium]		
									Trace gravel, no cobbles.		
	5					0.2					2" Schedule PVC Riser
								MH	**Clayey SILT with Gravel [MH]**, orange-brown, moist, high plasticity hard fines with thinly laminated 1/8" orange-brown and yellow-brown zones. Rounded well-graded gravel with some cobbles and oxidized zones surrounding some clasts. [Colluvium]		
	10		2		5	1.2			*Fewer cobbles.*		
			3		3			ML	**Clayey SILT with Gravel [ML]**, grey, moist, hard low plasticity fines. Rounded to subrounded gravel with some cobbles and trace well graded sand. [Weathered Slide Block]		
	15					0.3					Baroid Hole Plug 3/8" Bentonite Chips [hydrated]
			4		2				*Increasing sand, decreasing clay.*		
									Basalt BOULDER, dark grey, dry, hard and fresh.		
	20		5		6	0.1		ML	**Sandy SILT with Gravel [ML]**, grey, moist, stiff low plasticity fines. Poorly graded medium to fine-grained sand. Rounded gravel with few cobbles. [Weathered Slide Block]		
	25		6		4	0.2			*Wet.*		Oglebay Norton 10-20 Silica Sand; 0.010 in. - Slot Schedule 40 PVC screen
	30										

Report: PORT_ENV_WELL; File: BRADISL.GPJ; 6/6/2008 MW-11

URS

Project: Bradford Island
Project Location: Bonneville Dam, Oregon
Project Number: 25696679

Log of Boring MW-11

Elevation feet	Depth, feet	SAMPLES Type	Number		Recovery, (feet)	Headspace PID, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	30		7		7	0.4			*Increasing low plasticity clay, decreasing sand.*		
	35		8		3	0.0					Schedule 40 PVC Sump
									Boring terminated at a depth of 37' [bgs] on 4/3/2008 and a monitoring well was installed upon completion.		
	40										
	45										
	50										
	55										
	60										
	65										

URS

Project: Bradford Island
Project Location: Bonneville Dam, Oregon
Project Number: 25696679

Log of Boring MW-12

Sheet 1 of 1

Date(s) Drilled and Installed	**3/26/2008**	Geologist	**MC**	Reviewer	**NM**
Drilling Method	**Hollow Stem Auger [HSA]**	Drilling Contractor	**Boart Longyear**	Total Depth of Borehole	**26.5 ft. [bgs]**
Sampling Method	**Split Spoon Sampler**	Drill Bit Size/Type	**6 5/8 in. I.D. HSA with center bit**	Approximete Surface Elevation	**96.93 ft. MSL**
Drill Rig Type	**CME-75 HT**	Groundwater Level(s)	**24.08 ft. [bgs] [4/15/08]**	Hammer Data	**140 lb. , 30 in. drop automatic hammer**
Borehole Backfill	**Monitoring Well Installed**	Comments	**MSL: mean sea level, bgs: below ground surface**	Location	**Bradford Island Sandblast Area**

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, Blows/12 in.	Recovery, (feet)	Headspace PID, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	0							GW	**Sandy GRAVEL with Silt [GW]**, grey-brown, dry to moist, subrounded to rounded well-graded gravel. Loose fine sand. Low plasticity silt. [Colluvium]		Stickup Monument; Concrete; 2" Schedule PVC Riser
	5		1	61/3 in.	.5	0.2		ML	**Gravelly SILT with Sand [ML]**, brown to orange-brown, moist, low plasticity, stiff silt. Rounded to subrounded, well-graded gravel with some cobbles. Loose fine sand. [Colluvium] *Trace low plasticity clay.*		Steel cable in auger cuttings from 4' to 5' bgs.
	10		2	10	NR	NS					Baroid Hole Plug 3/8" Bentonite Chips [hydrated]
	15		3	39	0.3	0.4		CL	**Silty CLAY [CL]**, grey-brown, moist, low plasticity hard fines. Some rounded gravel and cobbles. [Colluvium]		Oglebay Norton 10-20 Silica Sand; 0.010 in. - Slot Schedule 40 PVC screen
	20		4	22	0.5	0.5		CL	**Silty CLAY [CL]**, dark grey, moist, low plasticity, stiff fines. Little subangular to subrounded gravel. [Weathered Slide Block]		
								ML	**Sandy SILT [ML]**, grey-green with yellow and grey mottling, moist, low plasticity, very stiff silt. Loose fine sand. Some angular gravel. [Weathered Slide Block] *Wet.*		
	25		5	61/8 in.	0.3	0.2			**SILTSTONE**, dark grey, wet, slightly weathered to low plasticity silt and clay in fractures. Fine grained matrix with some subrounded to subangular gravel clasts. [Slide Block]		Schedule 40 PVC Sump
	30								Boring terminated at a depth of 26.3' [bgs] due to auger refusal on 3/26/2008 and a monitoring well was installed upon completion.		

Report: PORT_ENV_WELL; File: BRADISL.GPJ; 6/6/2008 MW-12

URS

Project: Bradford Island
Project Location: Bonneville Dam, Oregon
Project Number: 25696679

Log of Boring MW-13

Date(s) Drilled and Installed	**4/2/2008**	Geologist	**MC**	Reviewer	**NM**
Drilling Method	**Sonic**	Drilling Contractor	**Boart Longyear**	Total Depth of Borehole	**37.0 ft. [bgs]**
Sampling Method	**Continuous Core**	Drill Bit Size/Type	**4 in. core with 6 in. casing**	Approximete Surface Elevation	**97.82 ft. MSL**
Drill Rig Type	**Prosonic Truck Mount**	Groundwater Level(s)	**16.62 ft. [bgs] [4/14/08]**	Hammer Data	**n/a**
Borehole Backfill	**Monitoring Well Installed**	Comments	**MSL: mean sea level, bgs: below ground surface**	Location	**Bradford Island Sandblast Area**

Elevation feet	Depth, feet	SAMPLES Type	Number		Recovery, (feet)	Headspace PID, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	0							GM	**Asphalt**		Flush to Grade Monument
									Silty GRAVEL [GM], brown, dry to moist, rounded, well-graded gravel with some cobbles. Matrix consists of low plasticity stiff, silt with trace loose fine sand. [Colluvium]		Concrete
											2" Schedule PVC Riser
			1		7						
									Decreasing sand, increasing low plasticity clay, increasingly angular gravel.		
	5					0.6		ML	**Clayey SILT with Gravel [ML]**, mottled grey, brown, and greenish-grey, moist, low plasticity, medium stiff fines. Subangular to subrounded gravel with some cobbles. Fractures in matrix are filled with yellow-brown, low plasticity clay. [Weathered Slide Block]		
	10					0.0			*Brown, subrounded to rounded gravel, green low plasticity clay on fracture surfaces.*		
			2		9						
								ML	**Gravelly SILT with Sand [ML]**, brown fines with yellow-orange sand, dry, low plasticity, hard fines. Subangular to subrounded gravel with some rounded cobbles. Loose, poorly graded, medium-fine sand. [Weathered Slide Block]		
	15					0.3					Baroid Hole Plug 3/8" Bentonite Chips [hydrated]
			3		5						
	20					0.6		ML	**Sandy SILT with Gravel [ML]**, grey to dark greenish grey, moist, low plasticity medium stiff silt. Loose, poorly graded fine sand. Subrounded to rounded gravel with some cobbles. [Weathered Slide Block]		
			4		5						
	25					0.5			*Wet.*		Oglebay Norton 10-20 Silica Sand
											0.010 in. - Slot Schedule 40 PVC screen
	30										

Report: PORT_ENV_WELL; File: BRADISL.GPJ; 6/6/2008 MW-13

URS

Project: Bradford Island
Project Location: Bonneville Dam, Oregon
Project Number: 25696679

Log of Boring MW-13

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES	SAMPLES Recovery, (feet)	SAMPLES Headspace PID, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	30		5		11	0.4			*As above.*		
	35					0.5					Schedule 40 PVC Sump
									Boring terminated at a depth of 37' [bgs] on 4/2/2008 and a monitoring well was installed upon completion.		
	40										
	45										
	50										
	55										
	60										
	65										

URS

Project: Bradford Island
Project Location: Bonneville Dam, Oregon
Project Number: 25696679

Log of Boring MW-14

Sheet 1 of 1

Date(s) Drilled and Installed	**3/25/2008**	Geologist	**MC**	Reviewer	**NM**
Drilling Method	**Hollow Stem Auger [HSA]**	Drilling Contractor	**Boart Longyear**	Total Depth of Borehole	**24.0 ft. [bgs]**
Sampling Method	**Split Spoon Sampler**	Drill Bit Size/Type	**6 5/8 in. I.D. HSA with center bit**	Approximete Surface Elevation	**86.84 ft. MSL**
Drill Rig Type	**CME-75 HT**	Groundwater Level(s)	**13.11 ft. [bgs] [4/14/08]**	Hammer Data	**140 lb. , 30 in. drop automatic hammer**
Borehole Backfill	**Monitoring Well Installed**	Comments	**MSL: mean sea level, bgs: below ground surface**	Location	**Bradford Island Sandblast Area**

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, Blows/12 in.	Recovery, (feet)	Headspace PID, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	0					33.2		GW	**Asphalt** **Sandy GRAVEL with Silt [GW]**, grey-brown, dry to moist, subrounded to rounded well-graded gravel with some cobbles. Matrix consists of loose fine sand and nonplastic silt. Slight solvent odor. [Colluvium]		Flush to Grade Monument Concrete Collected bag headspace sample from auger cuttings @ 2' due to odor.
	5		1	13	.8	17.6		GM	**Silty GRAVEL with Clay [GM]**, grey-brown, dry to moist, subrounded, well graded gravel with some cobbles. Low plasticity stiff fines. Slight solvent odor. [Colluvium] *No odor @ 6 ft.*		2" Schedule PVC Riser Baroid Hole Plug 3/8" Bentonite Chips [hydrated]
	10		2	5	.3	14.1		CL	**Silty CLAY with Gravel [CL]**, mottled yellow, grey, and brown, moist, low plasticity, medium stiff fines. Subrounded, well graded gravel. [Colluvium] *Wet.*		Oglebay Norton 10-20 Silica Sand 0.010 in. - Slot Schedule 40 PVC screen
	15		3	13	.5	1.0			**SILTSTONE**, greenish-grey, wet, slightly weathered to low plasticity silt and clay. Fine-grained matrix with rock texture and some subrounded to subangular gravel-sized clasts. [Slide Block]		
	20		4	7	.6	1.6		GW	**Sandy GRAVEL [GW]**, greenish-grey, wet, subrounded, well graded gravel with loose coarse sand. [Slide Block]		
									SILTSTONE, greenish-grey, wet, moderately weathered to low plasticity, stiff silt and clay. Fine-grained matrix with rock texture and some subrounded to subangular gravel-sized clasts. [Slide Block]		Schedule 40 PVC Sump
	25								Boring terminated at a depth of 24' [bgs] on 3/25/2008 and a monitoring well was installed upon completion.		
	30										

Report: PORT_ENV_WELL; File: BRADISL.GPJ; 6/6/2008 MW-14

URS

Project: Bradford Island
Project Location: Bonneville Dam, Oregon
Project Number: 25696679

Log of Boring MW-15

Sheet 1 of 1

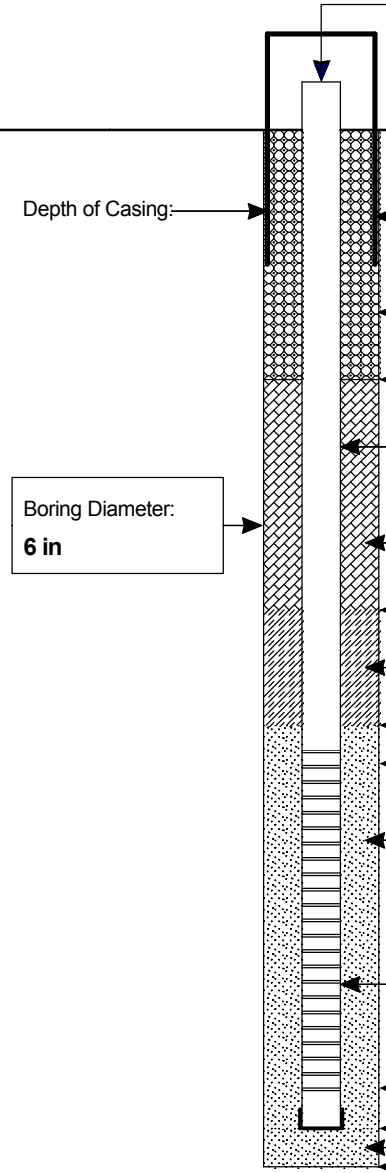
Date(s) Drilled and Installed	**3/24/2008**	Geologist	**MC**	Reviewer	**NM**
Drilling Method	**Hollow Stem Auger [HSA]**	Drilling Contractor	**Boart Longyear**	Total Depth of Borehole	**22.9 ft. [bgs]**
Sampling Method	**Split Spoon Sampler**	Drill Bit Size/Type	**6 5/8 in. I.D. HSA with center bit**	Approximate Surface Elevation	**87.09 ft. MSL**
Drill Rig Type	**CME-75 HT**	Groundwater Level(s)	**13.28 ft. [bgs] [4/14/08]**	Hammer Data	**140 lb. , 30 in. drop automatic hammer**
Borehole Backfill	**Monitoring Well Installed**	Comments	**MSL: mean sea level, bgs: below ground surface**	Location	**Bradford Island Sandblast Area**

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, Blows/12 in.	Recovery, (feet)	Headspace PID, ppm	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
	0							GW	**Asphalt.**		Flush to Grade Monument
									Sandy Gravel with Silt [GW], grey-brown, dry to moist, rounded well-graded gravel with cobbles. Loose poorly-graded fine sand. Nonplastic medium stiff silt. [Colluvium]		Concrete
											2" Schedule 40 PVC Riser
	5		1	14	.4	1.2			*Moist.*		
								GM	**Silty GRAVEL [GM]**, grey-brown, moist, rounded, well-graded gravel with few cobbles. Low plasticity stiff to very stiff silt with trace clay. [Colluvium]		Baroid Hole Plug 3/8" Bentonite Chips [hydrated]
	10		2	24	.5	1.0					Oglebay Norton 10-20 Silica Sand
									Wet.		0.010 in. - Slot Schedule 40 PVC screen
								CL	**Gravelly CLAY [CL]**, grey-brown, wet, low plasticity, hard clay with trace silt. Rounded, well graded gravel. [Weathered Slide Block]		
	15		3	31	.9	0.6					
								SM	**Basalt Boulder**, red-brown, wet, moderately weathered and highly fractured with low plasticity hard green clay infilling. [Weathered Slide Block]		
									Silty SAND [SM], yellow-brown, wet, well-graded loose sand. Low plasticity soft silt. [Weathered Slide Block]		
	20		4	3	.3	0.9					Schedule 40 PVC Sump
									Boring terminated at a depth of 22.9' [bgs] on 3/24/2008 and a monitoring well was installed upon completion.		
	25										
	30										

URS

Project: Bradford Island Project Location: Bonneville Dam, Oregon Project Number: 25696679	MONITORING WELL CONSTRUCTION LOG FOR WELL MW-10

Well Location	**Bradford Island Reference Area**			Date Completed	**4/8/2008**
Installed By	**Boart Longyear**	Observed By	**MC**	Total Depth	**57.6 ft. bgs**
Method of Installation	**Sonic**				
Screened Interval	**47-57 ft bgs**	Completion Zone	**45-57.6 ft bgs**		
Remarks					



Support Plate Elevation: **133.20 ft. MSL**

Ground Elevation: **129.28 ft. MSL**

Depth of Casing:

ID/Type of Surface Casing:
6 in Square Aluminum Stickup Monument

Type of Surface Seal:
Concrete

Depth of Surface Seal: **1.0 ft**

ID/Type of Riser Pipe:
2 in Sch. 40 PVC

Boring Diameter:
6 in

Type of Backfill:
Baroid Hole Plug 3/8 in Bentonite Chips

Depth of Seal: **1.0 ft**

Type of Seal:
Baroid Hole Plug 3/8 in Bentonite Chips

Depth of Top of Filter Pack: **43.0 ft**

Depth of Top of Screen: **47.0 ft**

Type of Filter Pack:
Oglebay Norton 10-20 Silica Sand

ID/Type of Screen:
2 in Sch. 40 PVC
Screen Slot Size:
0.010 in

Depth of Bottom of Screen: **57.0 ft**

Depth of Bottom of Plugged Blank Casing: **57.5 ft**

Type/Depth of Backfill/Seal Below Well:
none

Total Depth of Boring: **57.6 ft**

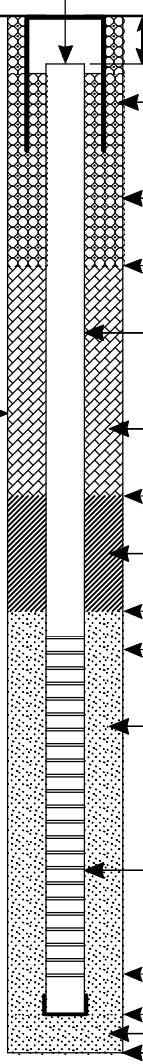
NOTE: DIAGRAM IS NOT TO SCALE

Report: PORT_ENV_WELL_ABOVE_GROUND; File: BRADISL.GPJ; 6/6/2008 MW-10

URS

Project: Bradford Island Project Location: Bonneville Dam, Oregon Project Number: 25696679	MONITORING WELL CONSTRUCTION LOG FOR WELL MW-11

Well Location	**Bradford Island Sandblast Area**		Date(s) Installed	**4/3/2008**	Time
Installed By	**Boart Longyear**	Observed By	**MC**	Total Depth (ft)	**37.0 ft. bgs**
Method of Installation	**Sonic**				
Screened Interval	**26-36 ft bgs**	Completion Zone	**26.5-37 ft bgs**		
Remarks					



Elevation of Top of Riser Pipe: **98.12 ft. MSL**

Depth of Riser Below Ground Surface: **-1.33 ft**

Ground Elevation: **99.45 ft MSL**

ID/Type of Surface Casing:
8 in Flush to Grade Monument

Type of Surface Seal:
Concrete

Depth of Surface Seal: **1.0 ft**

ID/Type of Riser Pipe:
2 in Sch. 40 PVC

Boring Diameter:
6 in

Type of Backfill:
Baroid Hole Plug 3/8 in Bentonite Chips

Depth of Seal: **1.0 ft**

Type of Seal:
Baroid Hole Plug 3/8 in Bentonite Chips

Depth of Top of Filter Pack: **24.5 ft**

Depth of Top of Screen: **26.0 ft**

Type of Filter Pack:
Oglebay Norton 10-20 Silica Sand

ID/Type of Screen:
2 in Sch. 40 PVC
Screen Slot Size:
0.010 in

Depth of Bottom of Screen: **36.0 ft**

Depth of Bottom of Plugged Blank Casing: **36.4 ft**

Type/Depth of Backfill/Seal Below Well:
none

Total Depth of Boring: **37.0 ft**

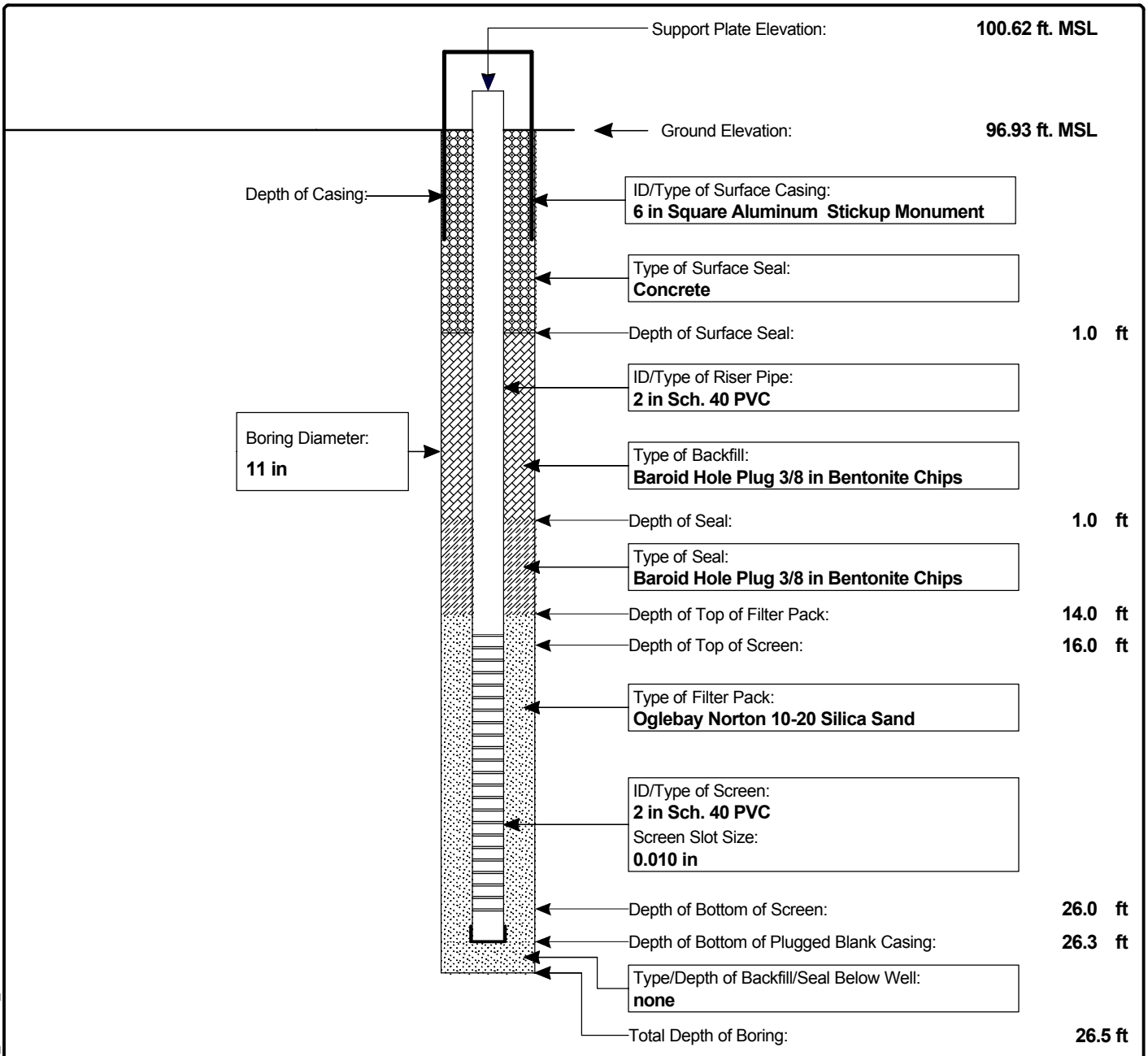
NOTE: DIAGRAM IS NOT TO SCALE

URS

Report: ENV_WELL_CONSTR_BELOW_GROUND; File: BRADISL.GPJ; 6/6/2008 MW-11

Project: Bradford Island **Project Location: Bonneville Dam, Oregon** **Project Number: 25696679**	**MONITORING WELL CONSTRUCTION LOG FOR WELL MW-12**

Well Location	**Bradford Island Sandblast Area**			Date Completed	**3/26/2008**
Installed By	**Boart Longyear**	Observed By	**MC**	Total Depth	**26.5 ft. bgs**
Method of Installation	**Hollow Stem Auger**				
Screened Interval	**16-26 ft bgs**	Completion Zone	**22-26.3 ft bgs**		
Remarks					



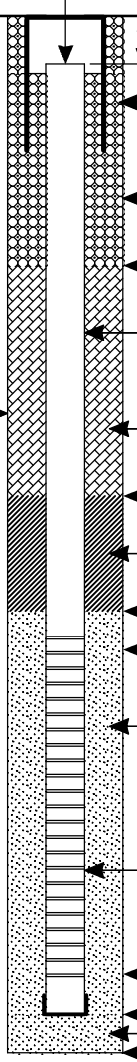
NOTE: DIAGRAM IS NOT TO SCALE

Report: PORT_ENV_WELL_ABOVE_GROUND; File: BRADISL.GPJ; 6/6/2008 MW-12

URS

Project: Bradford Island Project Location: Bonneville Dam, Oregon Project Number: 25696679	MONITORING WELL CONSTRUCTION LOG FOR WELL MW-13

Well Location	**Bradford Island Sandblast Area**		Date(s) Installed	**4/2/2008**	Time
Installed By	**Boart Longyear**	Observed By	**MC**	Total Depth (ft)	**37.0 ft. bgs**
Method of Installation	**Sonic**				
Screened Interval	**26-36 ft bgs**	Completion Zone	**26-37 ft bgs**		
Remarks					



Elevation of Top of Riser Pipe: **97.55 ft. MSL**

Depth of Riser Below Ground Surface: **-0.27 ft**

Ground Elevation: **97.82 ft MSL**

ID/Type of Surface Casing:
8 in Flush to Grade Monument

Type of Surface Seal:
Concrete

Depth of Surface Seal: **1.0 ft**

ID/Type of Riser Pipe:
2 in Sch. 40 PVC

Boring Diameter:
6 in

Type of Backfill:
Baroid Hole Plug 3/8 in Bentonite Chips

Depth of Seal: **1.0 ft**

Type of Seal:
Baroid Hole Plug 3/8 in Bentonite Chips

Depth of Top of Filter Pack: **24.0 ft**

Depth of Top of Screen: **26.0 ft**

Type of Filter Pack:
Oglebay Norton 10-20 Silica Sand

ID/Type of Screen:
2 in Sch. 40 PVC
Screen Slot Size:
0.010 in

Depth of Bottom of Screen: **36.0 ft**

Depth of Bottom of Plugged Blank Casing: **36.4 ft**

Type/Depth of Backfill/Seal Below Well:
none

Total Depth of Boring: **37.0 ft**

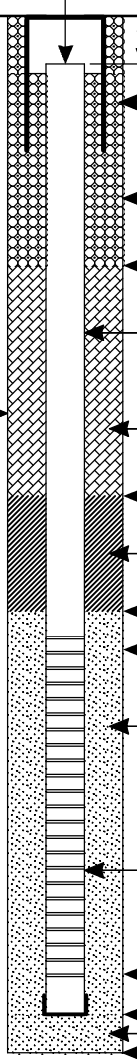
NOTE: DIAGRAM IS NOT TO SCALE

Report: ENV_WELL_CONSTR_BELOW_GROUND; File: BRADISL.GPJ; 6/6/2008 MW-13

URS

Project: Bradford Island **Project Location: Bonneville Dam, Oregon** **Project Number: 25696679**	**MONITORING WELL CONSTRUCTION LOG FOR WELL MW-14**

Well Location	**Bradford Island Sandblast Area**		Date(s) Installed	**3/25/2008**	Time
Installed By	**Boart Longyear**	Observed By	**MC**	Total Depth (ft)	**24.0 ft. bgs**
Method of Installation	**Hollow Stem Auger**				
Screened Interval	**13-23 ft bgs**	Completion Zone	**13-24 ft bgs**		
Remarks					



Elevation of Top of Riser Pipe: **86.67 ft. MSL**

Depth of Riser Below Ground Surface: **-0.17 ft**

Ground Elevation: **86.84 ft MSL**

ID/Type of Surface Casing:
8 in Flush to Grade Monument

Type of Surface Seal:
Concrete

Depth of Surface Seal: **0.7 ft**

ID/Type of Riser Pipe:
2 in Sch. 40 PVC

Boring Diameter:
11 in

Type of Backfill:
Baroid Hole Plug 3/8 in Bentonite Chips

Depth of Seal: **0.7 ft**

Type of Seal:
Baroid Hole Plug 3/8 in Bentonite Chips

Depth of Top of Filter Pack: **11.0 ft**

Depth of Top of Screen: **13.0 ft**

Type of Filter Pack:
Oglebay Norton 10-20 Silica Sand

ID/Type of Screen:
2 in Sch. 40 PVC
Screen Slot Size:
0.010 in

Depth of Bottom of Screen: **23.0 ft**

Depth of Bottom of Plugged Blank Casing: **23.5 ft**

Type/Depth of Backfill/Seal Below Well:
none

Total Depth of Boring: **24.0 ft**

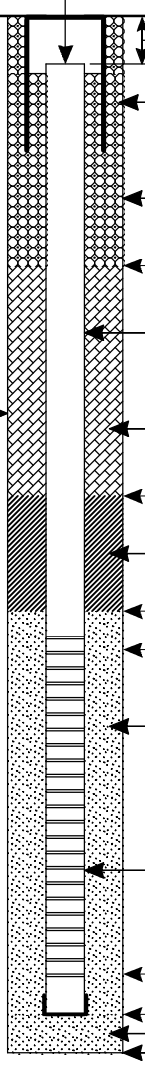
NOTE: DIAGRAM IS NOT TO SCALE

Report: ENV_WELL_CONSTR_BELOW_GROUND; File: BRADISL.GPJ; 6/6/2008 MW-14

URS

Project: Bradford Island Project Location: Bonneville Dam, Oregon Project Number: 25696679	MONITORING WELL CONSTRUCTION LOG FOR WELL MW-15

Well Location	**Bradford Island Sandblast Area**		Date(s) Installed	**3/24/2008**	Time
Installed By	**Boart Longyear**	Observed By	**MC**	Total Depth (ft)	**22.9 ft. bgs**
Method of Installation	**Hollow Stem Auger**				
Screened Interval	**12-22 ft bgs**	Completion Zone	**12-23 ft bgs**		
Remarks					



Elevation of Top of Riser Pipe: **86.86 ft. MSL**

Depth of Riser Below Ground Surface: **-0.23 ft**

Ground Elevation: **87.09 ft MSL**

ID/Type of Surface Casing:
8 in Flush to Grade Monument

Type of Surface Seal:
Concrete

Depth of Surface Seal: **0.9 ft**

ID/Type of Riser Pipe:
2 in Sch. 40 PVC

Boring Diameter:
11 in

Type of Backfill:
Baroid Hole Plug 3/8 in Bentonite Chips

Depth of Seal: **0.9 ft**

Type of Seal:
Baroid Hole Plug 3/8 in Bentonite Chips

Depth of Top of Filter Pack: **9.5 ft**

Depth of Top of Screen: **12.0 ft**

Type of Filter Pack:
Oglebay Norton 10-20 Silica Sand

ID/Type of Screen:
2 in Sch. 40 PVC
Screen Slot Size:
0.010 in

Depth of Bottom of Screen: **22.0 ft**

Depth of Bottom of Plugged Blank Casing: **22.5 ft**

Type/Depth of Backfill/Seal Below Well:
none

Total Depth of Boring: **22.9 ft**

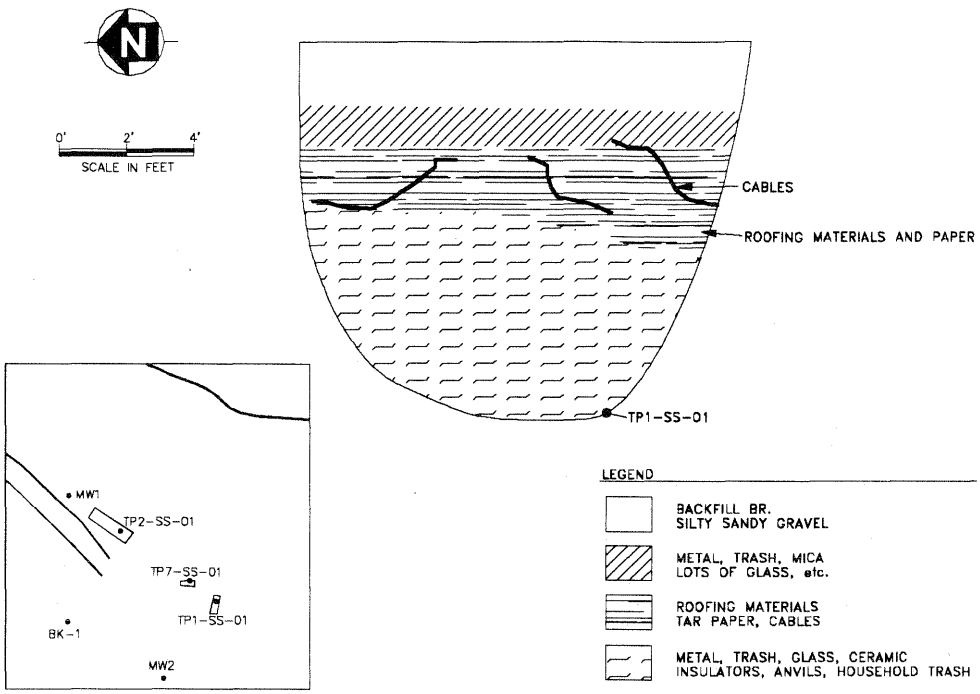
NOTE: DIAGRAM IS NOT TO SCALE

URS

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP1 Test Pit Location: North Central Landfill

EXCAVATION DIAGRAM



Final Test Pit Dimensions (Sq.Ft.): 13 X 5 X 11 deep

Associated Photographs: 1-17 through 1-25

Grab Sample No. 8-19-98-BIL-TP1-SS-01

Time/Date Collected: 0950 / 8/19/98 Depth Collected: 10' BLS Location: TP1 S/SW

PID Reading: 0.0 USCS Designation: GM Soil Color: Very Dark Brown/Black

Soil Description: Silty sandy gravel with trash (fines 10%, gravel/sand 90% - matrix of trash only) wet, loose-dense, well graded.

Grab Sample No.

Time/Date Collected: Depth Collected: Location:

PID Reading: USCS Designation: Soil Color:

Soil Description:

Comments: Also collected asbestos samples from material removed from TP1: 8-20-98-BIL-ASB-01 – roofing paper – black at 1415 and 8-20-98-BIL-ASB-02 – silver roofing coating/mastic at 1418

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP1 Test Pit Location: North Central Landfill Page 2 of 3

Temperature: 60's Wind Speed: <5 mph Wind Direction: Variable

General Weather Conditions: Partly cloudy Log Prepared By: Carlotta Cellucci

Soil Description

Depth Range: 0-11' BLS Soil Color: Brown USCS Designation: GW

PID Reading: 3.2 (background) Description: Brown silty, sandy, gravel (fines 10%, sand 20%, gravel 70%) dry-wet, well graded, loose-dense with trash from 2' BLS as described on page 3 attached.

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

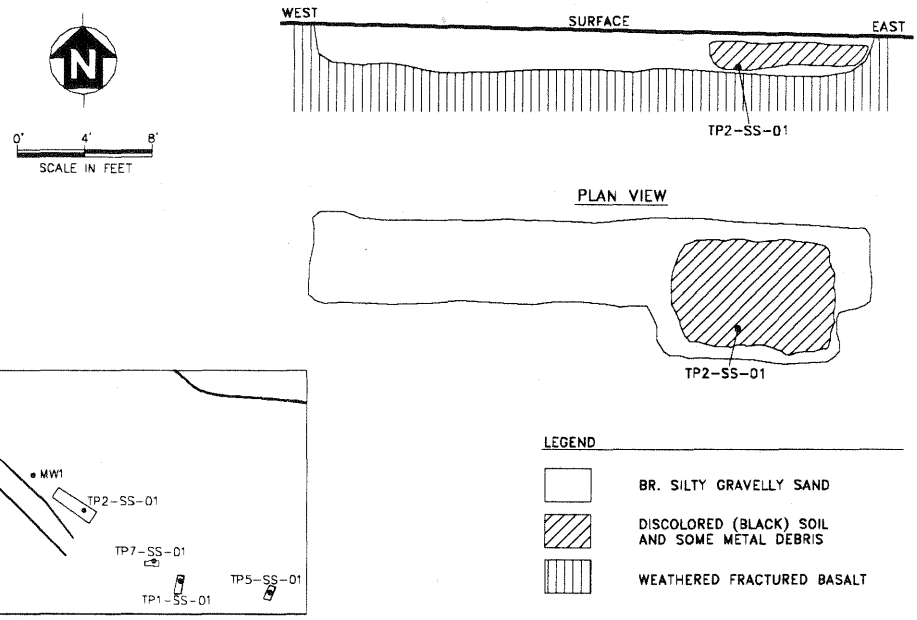
PID Reading: Description:

Feet BLS	Description	PID
2.5	Top of buried trash, mostly household with mica sheets and small books, and lots of glass fragments	(Background @ 3.2)
4	Buried cables and assorted metal	
6	Buried roofing paper and assorted metal	(Background @ 2.5)
8	Abundance of roofing paper	(Background @ 1.0)
10 to 11	Assorted metal, roofing paper, and cloth, SE corner of bucket wet Sample TP1-SS-01 bucket contained broken glass, broken pieces of ceramic insulators, rusted pieces of metal, and household trash (bottle of nail polish), metal nails	Background dropped to 0.0 0.3 0.0

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP2 Test Pit Location: West Edge of Landfill

EXCAVATION DIAGRAM



Final Test Pit Dimensions (Sq.Ft.): 31' X 8' X 2-2.5' deep

Associated Photographs: Camera damaged, photos lost

Grab Sample No. 8-19-98-BIL-TP2-SS-01

Time/Date Collected: 1225 / 8/19/98 Depth Collected: 2' BLS Location: TP2 East End (25' E of West end)

PID Reading: 0.0 USCS Designation: SM Soil Color: Dark Brown

Soil Description: Dark brown silty, gravelly sand (fines 25%, gravel 30%, sand 45%) dry to moist, dense, well graded with glass fragments and small pieces of metal/nails.

Grab Sample No.

Time/Date Collected: Depth Collected: Location:

PID Reading: USCS Designation: Soil Color:

Soil Description:

Comments:

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP2 Test Pit Location: West Edge of Landfill Page 2 of 3

Temperature: High 60's Wind Speed: <5 mph Wind Direction: Variable

General Weather Conditions: Partly cloudy to clear Log Prepared By: Carlotta Cellucci

Soil Description

Depth Range: 0-2.5' BLS Soil Color: Brown USCS Designation: SM

PID Reading: 0.0 Description: Brown silty, gravelly sand (fines 25%, gravel 30%, sand 45%) dry, dense, well graded.

Depth Range: >2.5' Soil Color: Dark Gray/Black USCS Designation:

PID Reading: 0.0 Description: Weathered, fractured basalt, microcrystalline, very hard

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

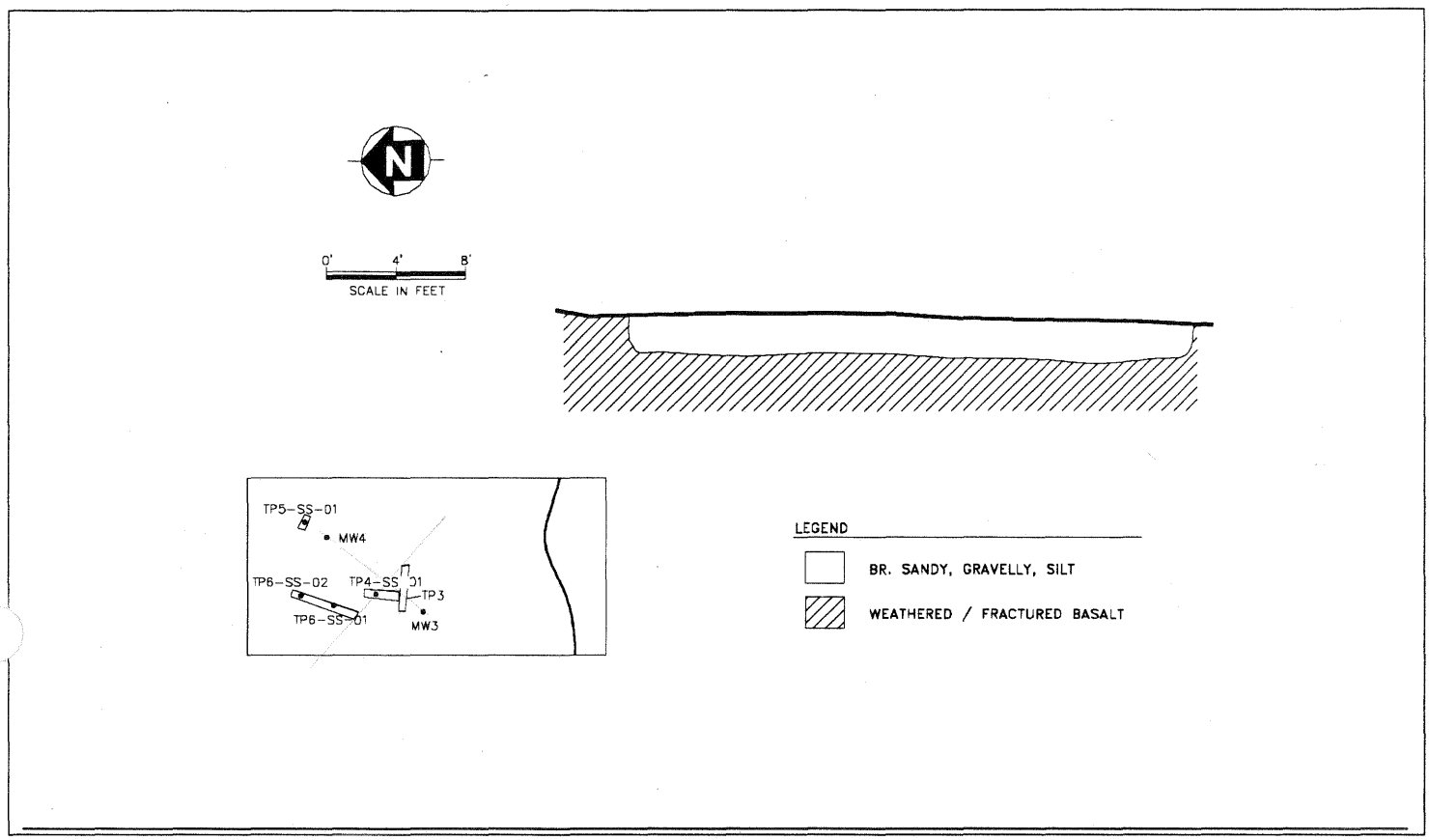
PID Reading: Description:

Feet BLS	Feet East of Western Edge	Contents	PID
2	Entire Length	Fractured basalt contact. Black, microcrystalline, very hard	0.0
1.5-2.5' contact with basalt	22' (37' from MW1) (West end of TP2 is 15' East of MW1)	Black discolored soil with some metal and cables to basalt contact at 2.5 feet BLS. (Western edge of landfill)	0.0

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP3 Test Pit Location: East end of Landfill

EXCAVATION DIAGRAM



Final Test Pit Dimensions (Sq.Ft.): 31' X 4' X 2' deep

Associated Photographs: 2-1

Grab Sample No.

Time/Date Collected: _____ Depth Collected: _____ Location: _____

PID Reading: _____ USCS Designation: _____ Soil Color: _____

Soil Description: _____

Grab Sample No.

Time/Date Collected: _____ Depth Collected: _____ Location: _____

PID Reading: _____ USCS Designation: _____ Soil Color: _____

Soil Description: _____

Comments: _____

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP3 Test Pit Location: East end of Landfill Page 2 of 2

Temperature: 70's Wind Speed: 5 mph Wind Direction: SE

General Weather Conditions: Clear, light wind Log Prepared By: Carlotta Cellucci

Soil Description

Depth Range: 0-2' BLS Soil Color: Brown USCS Designation: ML

PID Reading: 0.0 Description: Brown sandy gravelly silt (sand 15%, gravel 25%, fines 60%) dry, dense/firm, low plasticity.

Depth Range: >2' Soil Color: Brown/Black USCS Designation:

PID Reading: 0.0 Description: Weathered and fractured basalt

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

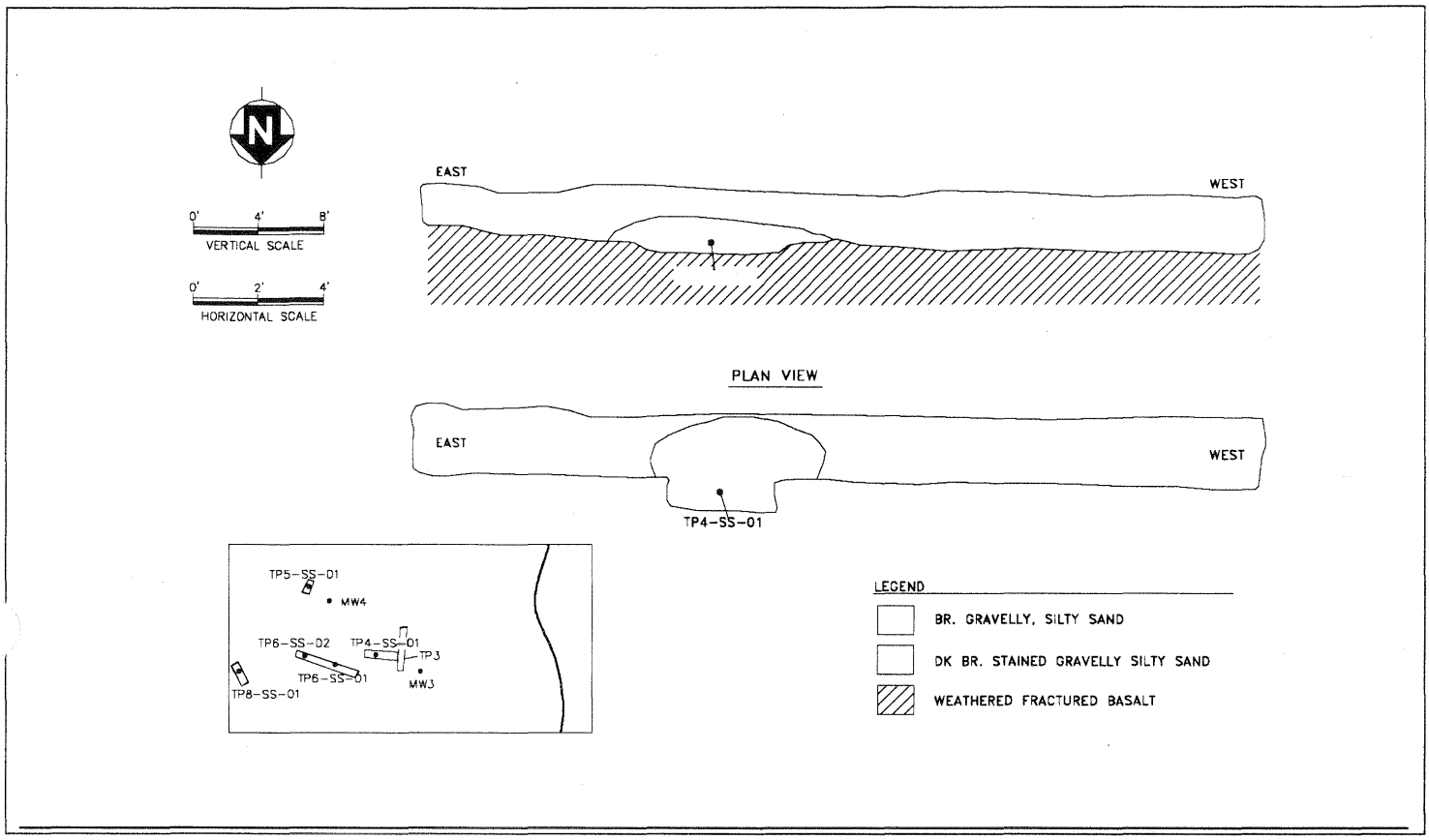
Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP4 Test Pit Location: East end of Landfill

EXCAVATION DIAGRAM



Final Test Pit Dimensions (Sq.Ft.): 24.5' X 4' X 3.7'

Associated Photographs: N/A

Grab Sample No. 8-19-98-BIL-TP4-SS-01

Time/Date Collected: 1525 / 8/19/98 Depth Collected: 3.7' Location: TP4

PID Reading: 0.0 USCS Designation: SM Soil Color: Dark Brown

Soil Description: Dark brown gravelly, silty sand (gravel 30%, fines 15%, sand 55%)
dry-moist, well graded, dense.

Grab Sample No.

Time/Date Collected: Depth Collected: Location:

PID Reading: USCS Designation: Soil Color:

Soil Description:

Comments:

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP4 Test Pit Location: East end of Landfill Page 2 of 2

Temperature: 70's Wind Speed: <5 mph Wind Direction: Variable

General Weather Conditions: Clear, sunny Log Prepared By: Carlotta Cellucci

Soil Description

Depth Range: 0-3' BLS Soil Color: Brown USCS Designation: SM

PID Reading: 0.0 Description: Brown gravelly, silty sand (gravel 30%, fines 15%, sand 55%) dry, well graded, dense.

Depth Range: >3' Soil Color: Dark Gray/Black USCS Designation:

PID Reading: 0.0 Description: Weathered, fractured basalt

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

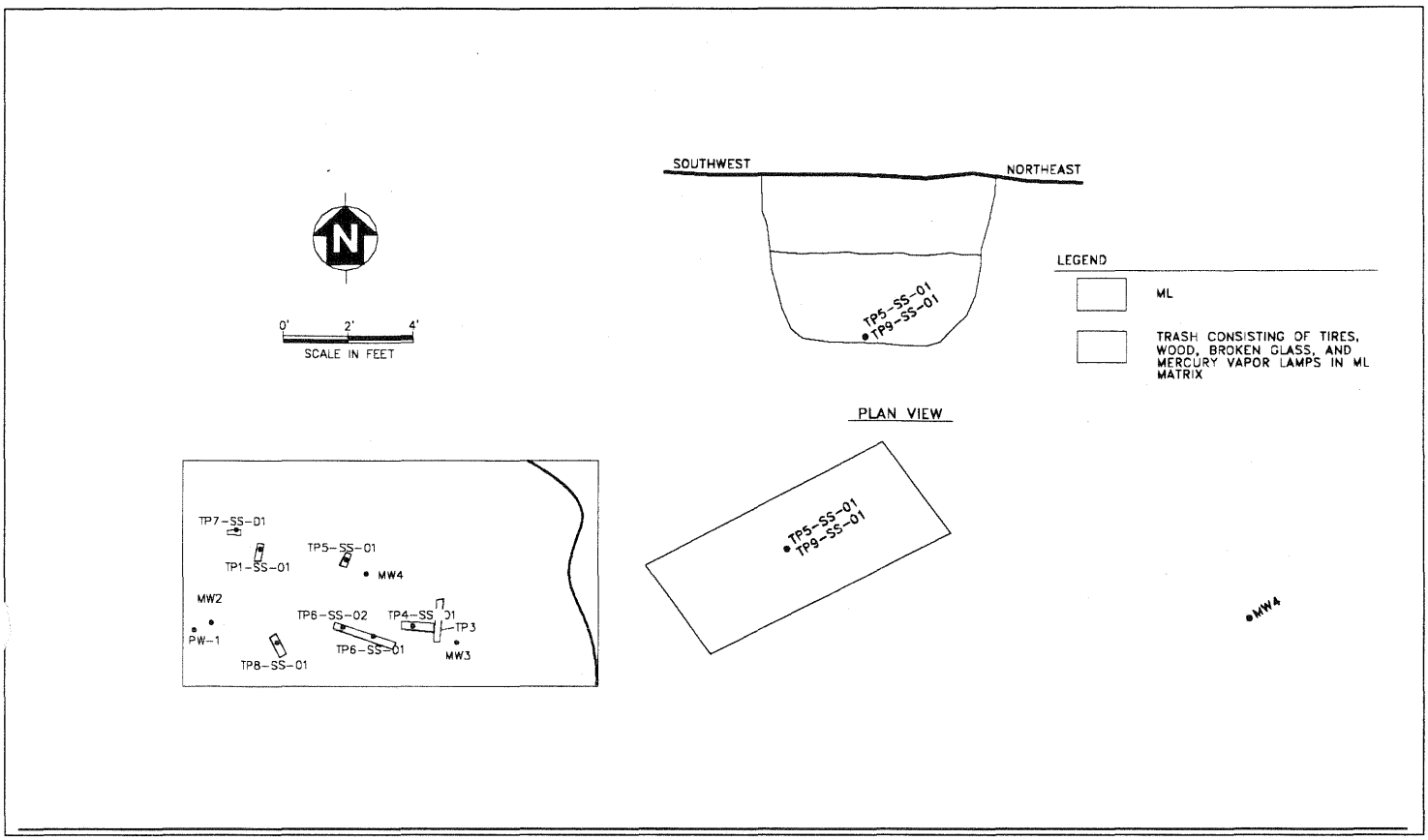
Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP5 Test Pit Location: North Central Landfill

EXCAVATION DIAGRAM



Final Test Pit Dimensions (Sq.Ft.): 7' X 4' X 5' deep

Associated Photographs: 2-2 through 2-9

Grab Sample No. 8-20-98-BIL-TP5-SS-01 / 8-20-98-BIL-TP9-SS-01

Time/Date Collected: 0855 / 8/20/98 Depth Collected: 5' BLS Location: TP5

PID Reading: 0.0 USCS Designation: ML Soil Color: Black

Soil Description: Black stained sandy, gravelly, silt (sand 10%, gravel/cobbles 25%, fines 65%), wet/saturated/oily, firm, low plasticity.

Grab Sample No.

Time/Date Collected: Depth Collected: Location:

PID Reading: USCS Designation: Soil Color:

Soil Description:

Comments: Collected TP5-SS-01 in duplicate; TP9-SS-01 as Blind duplicate from this test pit (0955)

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP5 Test Pit Location: North Central Landfill Page 2 of 3

Temperature: 70's Wind Speed: None / <5 mph Wind Direction: Variable

General Weather Conditions: Clear to partly cloudy Log Prepared By: Carlotta Cellucci

Soil Description

Depth Range: 0-2.5' BLS Soil Color: Brown USCS Designation: ML

PID Reading: 0.0 Description: Brown sandy, gravelly silt (sand 10%, gravel/cobble 25%, fines 65%) dry, firm, low plasticity.

Depth Range: 2.5'-5' (TD) Soil Color: Black USCS Designation:

PID Reading: 0.0 Description: Debris in above matrix (50% debris), matrix is black and oily. Types of debris are listed in the table on page 3 of 3 below.

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

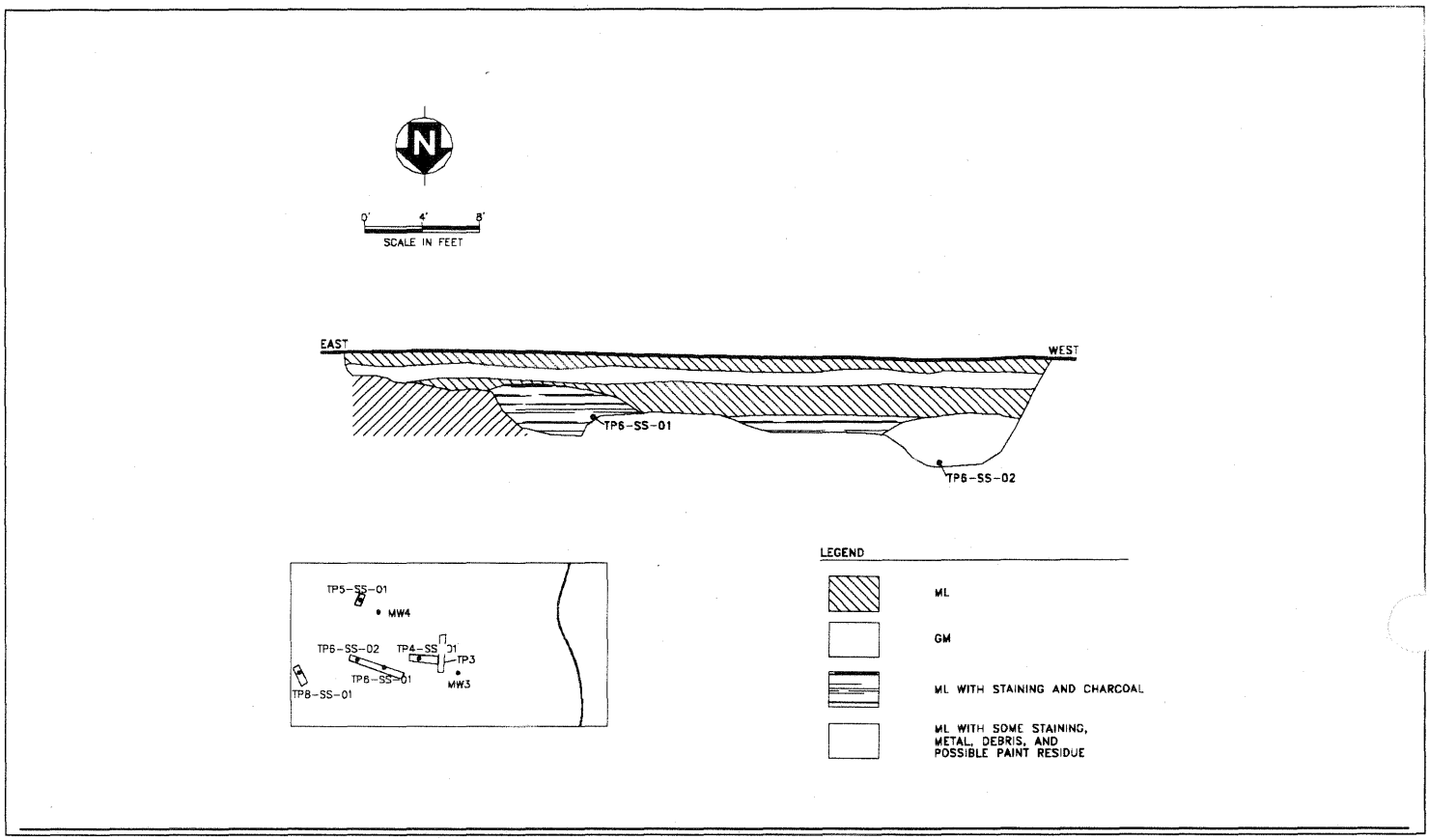
PID Reading: Description:

Feet BLS	Contents	PID
2.5	Beginning of trash – tire (discolored-black soil matrix)	0.0
3.0	Wood cover underlain by lots of broken glass then more tires	0.0
5	Broken glass, mercury vapor lamps	0.0

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP6 Test Pit Location: East end of Landfill

EXCAVATION DIAGRAM



Final Test Pit Dimensions (Sq.Ft.): 47' X 4' X 1.5'-6.5' deep

Associated Photographs: 2-10 through 2-12 and 3-1 through 3-3

Grab Sample No. 8-20-98-BIL-TP6-SS-01

Time/Date Collected: 1050 / 8/20/98 Depth Collected: 4' Location: 17' west of east end TP6

PID Reading: 0.0 USCS Designation: ML Soil Color: Black/Very Dark Brown

Soil Description: Black/Very dark brown stained sandy, gravelly, silt (sand 10%, gravel 35%, fines 55%) moist, firm, well graded, low plasticity.

Grab Sample No. 8-20-98-BIL-TP6-SS-02

Time/Date Collected: 1140 / 8/20/98 Depth Collected: 6.5' Location: 40' west of east end of TP6

PID Reading: 0.0 USCS Designation: ML Soil Color: Brown/Dark Brown

Soil Description: Brown-Dark Brown, sandy, gravelly, silt (sand 20%, gravel/cobbles 15%, fines 65%) moist, firm, low plasticity with metal and possibly paint waste.

Comments: East end of TP6 is 46 feet west of monitoring well MW3

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP6 Test Pit Location: East end of Landfill Page 2 of 2

Temperature: 70's Wind Speed: 5 mph Wind Direction: South

General Weather Conditions: Partly cloudy, sunny Log Prepared By: Carlotta Cellucci

Soil Description

Depth Range: 0-1' BLS Soil Color: Brown USCS Designation: ML

PID Reading: 0.0 Description: Brown sandy, gravelly, silt (sand 31%, gravel 25%, fines 65%), dry, firm, low plasticity.

Depth Range: 1-2' Soil Color: Brown USCS Designation: GM

PID Reading: 0.0 Description: Brown silty sandy gravel (fines 10%, sand 10%, gravel 80%) moist, firm, low plasticity.

Depth Range: 2-6.5' Soil Color: Dark Brown-Brown USCS Designation: ML

PID Reading: 0.0 Description: Dark Brown-Brown sandy gravelly silt (sand 20%, gravel/cobbles 15%, fines 65%) moist, firm, low plasticity with mica flakes, staining, with metal debris and possible paint residue 40' west of east end of TP6.

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

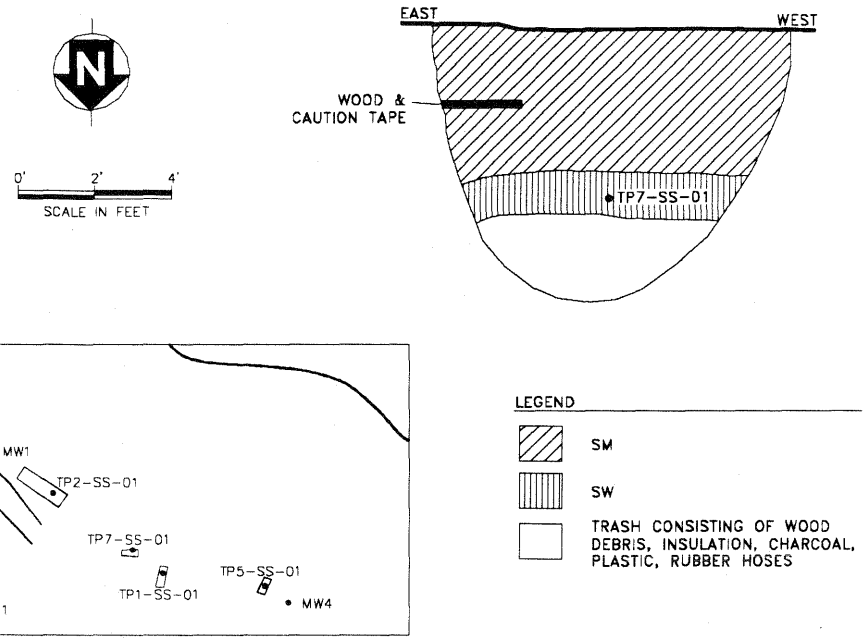
Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP7 Test Pit Location: Central Landfill

EXCAVATION DIAGRAM



Final Test Pit Dimensions (Sq.Ft.): 9' X 4' X 7' deep

Associated Photographs: 3-4 through 3-6

Grab Sample No. 8-20-98-BIL-TP7-SS-01

Time/Date Collected: 1350 / 8/20/98 Depth Collected: 4.5 Location: Central Landfill

PID Reading: 0.0 USCS Designation: SW Soil Color: Gray

Soil Description: Gray, fine grained, well graded sand (100%), moist, dense.

Grab Sample No.

Time/Date Collected: Depth Collected: Location:

PID Reading: USCS Designation: Soil Color:

Soil Description:

Comments:

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP7 Test Pit Location: Central Landfill Page 2 of 2

Temperature: 70's Wind Speed: <5 mph Wind Direction: SE

General Weather Conditions: Partly cloudy Log Prepared By: Carlotta Cellucci

Soil Description

Depth Range: 0-4' BLS Soil Color: Brown USCS Designation: SM

PID Reading: 0.0 Description: Brown silty, gravelly, sand (fines 15%, gravel 25%, sand 60%) dry, well graded, dense.

Depth Range: 4'- 7' (total depth) Soil Color: Gray USCS Designation: SW

PID Reading: 0.0 Description: Gray sand, well graded, moist, dense, mixed with debris from 5-7' BLS

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

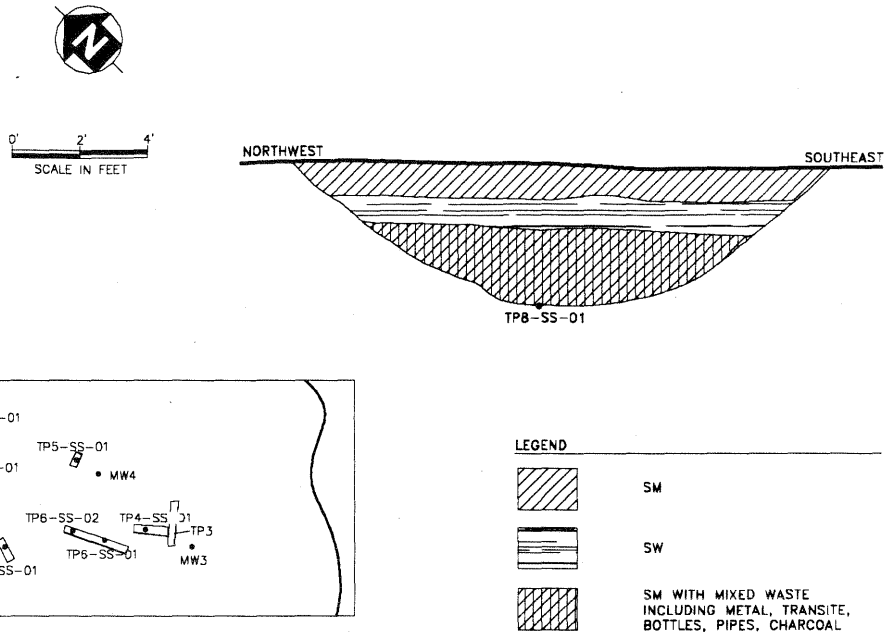
Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP8 Test Pit Location: South Central Landfill

EXCAVATION DIAGRAM



Final Test Pit Dimensions (Sq.Ft.): 15' X 4' X 4' deep

Associated Photographs: 3-7 through 3-9

Grab Sample No. 8-20-98-BIL-TP8-SS-01

Time/Date Collected: 1450 / 8/20/98 Depth Collected: 4' Location: South Central Landfill

PID Reading: 0.0 USCS Designation: SM Soil Color: Brown-Dark Brown

Soil Description: Brown-Dark Brown silty, gravelly, sand (fines 10%, gravel 30%, sand 60%) moist, dense, well graded.

Grab Sample No.

Time/Date Collected: Depth Collected: Location:

PID Reading: USCS Designation: Soil Color:

Soil Description:

Comments: Also collected asbestos sample: 8-20-98-ASB-03 – Dark gray transite collected at 1500.

Test Pit Log
Site Inspection
Former Bradford Island Landfill Site
Cascade Locks, Oregon
TC-10022-03

Test Pit No: TP8 Test Pit Location: South Central Landfill

Temperature: 70's Wind Speed: <5 mph Wind Direction: SE

General Weather Conditions: Partly cloudy Log Prepared By: Carlotta Cellucci

Soil Description

Depth Range: 0-1' BLS Soil Color: Brown USCS Designation: SM

PID Reading: 0.0 Description: Brown silty, gravelly, sand (fines 10%, gravel 25-30%, sand 60-65%) dry, well graded, dense.

Depth Range: 1-2' BLS Soil Color: Gray USCS Designation: SW

PID Reading: 0.0 Description: Gray sand (100%), well graded, dry-moist, dense.

Depth Range: 2-4' BLS Soil Color: Brown-Dark Brown USCS Designation: SM

PID Reading: 0.0 Description: Brown-Dark Brown stained silty, gravelly, sand (fines 10%, gravel/cobbles 25-30%, sand 60-65%), moist, well graded, dense with mixed waste including charcoal, metal debris and pipes, glass and bottles, and transite.

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Depth Range: Soil Color: USCS Designation:

PID Reading: Description:

Project: Bradford Island Landfill **Project Location:** Cascade Locks, Oregon **Project Number:** 52-0080001.00	**Log of Test Pit** **TP-1-2001**

Date(s) Excavated	10/15/2001	Logged By	BPM	Checked By	BPM
Length of Excavation	60.0 feet	Width of Excavation	20.0 feet	Depth of Excavation	10.0 feet
Excavation Equipment	Kamatsu PC200	Excavation Contractor	PNE	Approximate Surface Elevation	N/A
Water Observations	N/A			Weather	N/A
Location	Gully Area			Surface Condition	Mix of Vegetative Cover, Concrete Rubble and Fill

Elevation feet	Depth, feet	Sample Type	Sample Number	Graphic Log	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0				**Poorly sorted landfill debris consisting of asphalt, wire, wire cable, metal buckets, ceramic insulators (3), sandblast grit (red & green), burned debris, scrap metal, electric motor, plastic planters, concrete rubble, hose, steel-reinforced wood planks, (3) 55-gallon drums (empty).**	
	1		17			
	2		18			
	3		22 23			
	4		13 16		*Sandblast grit (red and green) found throughout eastern 3/4 of excavation. Waste visible in all sides of excavation except the west. Possilble petroleum stained sediments on eastern half of gully. Most of landfill debris concentrated in eastern half of excavation.*	
	5		19 21			
	6		14			
	7					
	8		15 20		**SILTY SAND [SM]**, yellowish-orange to orange brown, [with subangular to round cobbles up to 1" in size], [Fill/Alluvium].	
	9					
	10				Test Pit terminated at a depth of 10.0 feet [bgs], on 11/06/2001 and backfilled with soil cuttings upon completion.	
	11					
	12					
	13					
	14					
	15					

URS

Project: Bradford Island Landfill **Project Location:** Cascade Locks, Oregon **Project Number:** 52-0080001.00	**Log of Test Pit TP-2-2001**

Date(s) Excavated	10/16/2001	Logged By	BPM	Checked By	BPM
Length of Excavation	20.0 feet	Width of Excavation	20.0 feet	Depth of Excavation	10.0 feet
Excavation Equipment	Kamatsu PC200	Excavation Contractor	PNE	Approximate Surface Elevation	N/A
Water Observations	N/A			Weather	N/A
Location	MVL Area			Surface Condition	Vegetative Cover and Fill. [Planter Containers]

Elevation feet	Depth, feet	Sample Type	Sample Number	Graphic Log	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0				**BROWN SILT WITH SAND [ML].**	
	1					
	2					
	3				**BLACK SILTY SAND [SM]**, with landfill oily debris. Debris observed includes crushed glass (suspected hy-vapor lamps), and wood crates. Other lamps encountered include incandescent bulbs, vehicle headlights. Metal debris and wire found.	
	4					
	5		7 8 10		*Oil odor and sheen observed on silty sand. Base of excavation is still oily. No visible fill at the base of excavation to the northwest. Fill still present to the east and south.*	
	6		9			
	7				*Sandblast grit observed from ~1.0' [bgs] to the base of the excavation on the north and west sidewalls.*	
	8		5 6 11 12			
	9					
	10				Test Pit terminated at a depth of 10.0 feet [bgs], on 11/06/2001 and backfilled with soil cuttings upon completion.	
	11					
	12					
	13					
	14					
	15					

URS

Project: Bradford Island Landfill **Project Location:** Cascade Locks, Oregon **Project Number:** 52-0080001.00	**Log of Test Pit TP-3-2001**

Date(s) Excavated	10/17/2001	Logged By	BPM	Checked By	BPM
Length of Excavation	10.0 feet	Width of Excavation	10.0 feet	Depth of Excavation	3.0 feet
Excavation Equipment	Kamatsu PC200	Excavation Contractor	PNE	Approximate Surface Elevation	N/A
Water Observations	N/A			Weather	N/A
Location	04 Hot Spot			Surface Condition	Vegetative Cover and Fill

Elevation feet	Depth, feet	Sample Type	Sample Number	Graphic Log	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0				**Poorly sorted landfill debris consisting of treated wood (creosote odor), wire, and misc. plastic and metal debris. Sandblast grit observed in center of the excavation. Sandy gravel matrix present.**	
	1					
	2				Sandblast grit observed in test pit is interpreted as the "Hot Spot". Soil samples were collected around (not in) sandblast grit.	
	3		24 25 26 27		Test Pit terminated at a deoth of 3.0 feet [bgs], on 10/17/2001 and backfilled with soil cuttings uopn completion.	
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					

URS

Project: Bradford Island Landfill **Project Location:** Cascade Locks, Oregon **Project Number:** 52-0080001.00	**Log of Test Pit TP-4-2001**

Date(s) Excavated	10/17/2001	Logged By	BPM	Checked By	BPM
Length of Excavation	3.0 feet	Width of Excavation	3.0 feet	Depth of Excavation	3.0 feet
Excavation Equipment	Kamatsu PC200	Excavation Contractor	PNE	Approximate Surface Elevation	N/A
Water Observations	N/A			Weather	N/A
Location	MW4 Hot Spot			Surface Condition	Vegetative Cover

Elevation feet	Depth, feet	Sample Type	Sample Number	Graphic Log	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0				**POORLY GRADED GRAVEL WITH SAND [GP]**, gravel to pea size, gray and brown, no odor, hard-dense, [dry].	
	1				*No fill (debris) observed.*	
	2					
	3		30 31 32		Test Pit terminated at a depth of 3.0 feet [bgs], on 10/17/2001 and backfilled with soil cuttings upon completion.	
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					

URS

APPENDIX C

PHOTOGRAPHIC SUMMARY

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
1	1939

Direction Photo Taken:

N/A

Description:

July, 1939 aerial photograph of eastern portion of Bradford Island.

Photo No.	Date:
2	1948

Direction Photo Taken:

N/A

Description:

September, 1948 aerial photograph of eastern portion of Bradford Island.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
3	1954

Direction Photo Taken:

N/A

Description:

April, 1954 aerial photograph of eastern portion of Bradford Island.

Photo No.	Date:
4	1966

Direction Photo Taken:

N/A

Description:

June, 1966 aerial photograph of eastern portion of Bradford Island.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
7	1973

Direction Photo Taken:

N/A

Description:

May, 1973 aerial photograph of eastern portion of Bradford Island.

Photo No.	Date:
8	1981

Direction Photo Taken:

N/A

Description:

October, 1981 aerial photograph of eastern portion of Bradford Island.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
9	1988

Direction Photo Taken:

N/A

Description:

1988 aerial photograph of eastern portion of Bradford Island.

Photo No.	Date:
10	1995

Direction Photo Taken:

N/A

Description:

1995, aerial photograph of eastern portion of Bradford Island.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
11	May 2001

Direction Photo Taken:

Southeast

Description:

Landfill AOPC:
View of the Landfill AOPC at the Northeast tip of Bradford Island. Monitoring wells MW-1, MW-2, and MW-5 are visible. This photo was taken prior to the installation of monitoring wells MW-6 through MW-9.

Photo No.	Date:
12	12/11/01

Direction Photo Taken:

West

Description:

Landfill AOPC:
View of monitoring wells MW-1 through MW-5 located within the Landfill AOPC. This photo was taken prior to the installation of monitoring wells MW-6 through MW-9.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
13	Oct. 2001

Direction Photo Taken:

East

Description:

Landfill AOPC:
Mercury vapor lamp excavation done as part of the Landfill AOPC characterization in 2001.

Photo No.	Date:
14	4/30/00

Direction Photo Taken:

West

Description:

Landfill AOPC:
View of the sampling equipment used during the groundwater monitoring and sampling activities within the Landfill AOPC. The field geologist is set up at monitoring well MW-1.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
15	1/11/09

Direction Photo Taken:

N/A

Description:

Landfill AOPC:
View of one of the seep sample locations.

Photo No.	Date:
16	4/13/00

Direction Photo Taken:

N/A

Description:

Landfill AOPC:
View of one of the seep sample locations and the sampling equipment used to collect one of the seep samples.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
17	3/23/01

Direction Photo Taken:

East

Description:

Landfill AOPC:
View of the steep bank on the northeast end of Bradford Island.

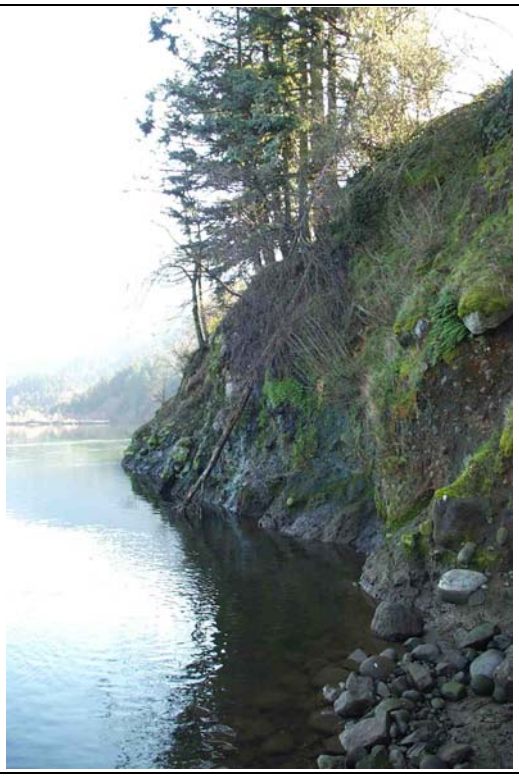


Photo No.	Date:
18	3/20/08

Direction Photo Taken:

South

Description:

Reference Area:
View of the Reference Area monitoring well location (MW-10). The field personnel are standing at the approximate location of the monitoring well.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
19	11/19/01

Direction Photo Taken:

East

Description:

Sandblast Area AOPC:
View of the Sandblast Building and adjacent Septic Tank Drain Field located in the grass covered area to the left of the building.

Photo No.	Date:
20	3/7/00

Direction Photo Taken:

West

Description:

Sandblast Area AOPC:
View of the Sandblast Building in the background and the Spend Sandblast Grit Area in the foreground.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
21	3/20/08

Direction Photo Taken:

East

Description:

Sandblast Area AOPC:
View of the Spent Sandblast Grit Area east of the Sandblast Building.

Photo No.	Date:
22	1/11/09

Direction Photo Taken:

West

Description:

Sandblast Area AOPC:
View of the Sandblast Building in the background and the Spend Sandblast Grit Area in the foreground.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
23	1/11/09

Direction Photo Taken:

East

Description:

Sandblast Area AOPC:
View of the Spent Sandblast Grit Area adjacent to the Sandblast Building on the hillside above the Equipment Laydown Area

Photo No.	Date:
24	11/19/01

Direction Photo Taken:

N/A

Description:

Sandblast Area AOPC:
View of sandblast grit observed on ground surface during site reconnaissance near the Current Hazardous Materials Storage Area.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
25	3/7/00

Direction Photo Taken:

South

Description:

Sandblast Area AOPC:
View of the north side of the Current Hazardous Materials Storage Area.

Photo No.	Date:
26	11/19/01

Direction Photo Taken:

West

Description:

Sandblast Area AOPC:
View of the east side of the Current Hazardous Materials Storage Area.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
27	3/15/00

Direction Photo Taken:

West

Description:

Sandblast Area AOPC:
View of the Equipment Laydown Area looking west along the Landfill access road.

Photo No.	Date:
28	1/11/09

Direction Photo Taken:

East

Description:

Sandblast Area AOPC:
View of the Equipment Laydown Area looking east along the Landfill access road.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
29	03/20/09

Direction Photo Taken:

East

Description:

Sandblast Area AOPC:
View of the eastern end of the Equipment Laydown Area. Locations of surface soil grab sample stations LD-09, LD-10 and LD-11 are shown with red circles. LD-10 and LD-11 were collected from stockpiled soils below plastic liner. Access road to Landfill AOPC visible in background.

Photo No.	Date:
30	3/18/09

Direction Photo Taken:

South

Description:

Sandblast Area AOPC:
View of the Erodable Soils Area in the foreground. This temporary feature was a result of contruction activities in late 2008. The following year, this slope was naturally revegetated (see Photo 31). Monitoring well MW-12 and the Sandblast Building are visible in the background.

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
31	6/30/10

Direction Photo Taken:

South

Description:

Sandblast Area AOPC:
View of the vegetated slope adjacent to the Sandblast Building, which is visible in the background. The previous year, this area was unvegetated (as shown in Photo 30) due to late 2008 construction activities and identified as the Erodable Soils Area.

Photo No.	Date:
32	6/30/10

Direction Photo Taken:

Southeast

Description:

Sandblast Area AOPC:
Closer view of the vegetated slope adjacent to the Sandblast Building. The previous year, this area was unvegetated (as shown in Photo 30) due to late 2008 construction activities.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
33	11/19/01

Direction Photo Taken:

Southeast

Description:

Sandblast Area AOPC:
View of the access road to the Former Hazardous Materials Storage Area, which is visible in the background.

Photo No.	Date:
34	6/30/10

Direction Photo Taken:

West

Description:

Sandblast Area AOPC:
View of the storage pad within the Former Hazardous Materials Storage Area

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
35	1958

Direction Photo Taken:

N/A

Description:

Pistol Range AOPC:
1958 aerial photo view of area of the Pistol Range AOPC. Vegetation along bank is well established. Photo indicates a small building and backstop in place. The Sandblast Building is visible to the north.

Photo No.	Date:
36	02/02/09

Direction Photo Taken:

East

Description:

Pistol Range AOPC:
View of the drilling subcontractor advancing drill rods at boring PR2C within the center of the Pistol Range AOPC.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
37	11/22/02

Direction Photo Taken:

Southwest

Description:

Pistol Range AOPC:
View to the southwest from the top of the backstop. The debris from the firing shed (which has collapsed) is visible in the center of the photo and an access road is visible on the left (southern portion of the Pistol Range AOPC).

38	Date:
	01/11/09

Direction Photo Taken:

West

Description:

Pistol Range AOPC:
View of the five sediment sample stations (circled in red) located in the lagoon adjacent to the Pistol Range AOPC.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
39	11/20/02

Direction Photo Taken:

West

Description:

Bulb Slope AOPC:
View of landfill access road and upper boundary of Bulb Slope.

Photo No.	Date:
40	11/20/02

Direction Photo Taken:

South

Description:

Bulb Slope AOPC:
View of Bulb Slope AOPC just above the waterline. Concrete debris and glass debris are visible near the center of the photograph.
.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
41	12/21/00

Direction Photo Taken:

West

Description:

River OU:
View facing downstream of Bradford Island in the center and the Bonneville Dam and Spillway visible in the background on the right side.

Photo No.	Date:
42	2/28/02

Direction Photo Taken:

East

Description:

River OU:
View facing upstream of the barge set up during the electrical equipment removal off the northeast portion of Bradford Island. Picture Rock and Boat Rock are visible in the background.

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
43	3/5/02

Direction Photo Taken:

West-Northwest

Description:

River OU:
View facing downstream of the Bonneville Dam and Spillway in the background.

Photo No.	Date:
44	3/20/08

Direction Photo Taken:

West

Description:

River OU:
View downstream inside the Forebay on the south side of Bradford Island, which is not visible in this photo. The Oregon shore of the river and Interstate 84 are visible in this photo.

Appendix C: Photographic Log

Client Name:	Site Location:	URS Project No.
United States Army Corps of Engineers	Bonneville Lock and Dam – Oregon/Washington	25697026

Photo No.	Date:
45	2/12/08

Direction Photo Taken:

East

Description:

River OU:
View upstream with the north side of Goose Island on the right side of the photo.

Photo No.	Date:
46	2/27/08

Direction Photo Taken:

N/A

Description:

River OU:
View of typical sediment sample collection from VanVeen sampler.

APPENDIX D

GROUNDWATER ELEVATIONS

Table D-1
Groundwater Elevations for the Landfill and Sandblast Area AOPCs and the Reference Area
Bradford Island - Upland Operable Unit
(1 of 2)

Area	Well	Measuring Date	Measuring Point Elevation (ft msl)	Depth to Water (ft btc)	Groundwater Elevation (ft msl)	Bonneville Forebay Elevation (ft msl)
Landfill AOPC	MW-1	7/12/1999	105.5	28.81	76.69	71.80
Landfill AOPC	MW-1	11/8/1999	105.5	26.5	79.00	75.00
Landfill AOPC	MW-1	1/10/2000	105.5	26.9	78.60	74.20
Landfill AOPC	MW-1	10/24/2001	105.5	7.67	97.83	74.90
Landfill AOPC	MW-1	12/6/2001	105.5	7.36	98.14	74.10
Landfill AOPC	MW-1	5/1/2002	105.5	7.93	97.57	76.00
Landfill AOPC	MW-1	4/16/2008	105.5	27.12	78.38	75.10*
Landfill AOPC	MW-1	7/14/2008	105.5	27.76	77.74	73.80
Landfill AOPC	MW-1	10/20/2008	105.5	-	78.28	76.10
Landfill AOPC	MW-1	1/12/2009	105.5	27.42	78.08	74.20
Landfill AOPC	MW-2	7/12/1999	116.56	9.05	107.51	71.80
Landfill AOPC	MW-2	11/8/1999	116.56	9.54	107.02	75.00
Landfill AOPC	MW-2	1/10/2000	116.56	8.18	108.38	74.20
Landfill AOPC	MW-2	10/24/2001	116.56	10.01	106.55	74.90
Landfill AOPC	MW-2	12/6/2001	116.56	9.21	107.35	74.10
Landfill AOPC	MW-2	5/1/2002	116.56	8.85	107.71	76.00
Landfill AOPC	MW-2	4/16/2008	116.56	10.25	106.31	75.10*
Landfill AOPC	MW-2	7/14/2008	116.56	10.1	106.46	73.80
Landfill AOPC	MW-2	10/20/2008	116.56	-	106.56	76.10
Landfill AOPC	MW-2	1/12/2009	116.56	9.44	107.12	74.20
Landfill AOPC	MW-3	7/12/1999	115.21	17.22	97.99	71.80
Landfill AOPC	MW-3	11/8/1999	115.21	15.6	99.61	75.00
Landfill AOPC	MW-3	1/10/2000	115.21	10.73	104.48	74.20
Landfill AOPC	MW-3	10/24/2001	115.21	17.43	97.78	74.90
Landfill AOPC	MW-3	12/6/2001	115.21	10.21	105.00	74.10
Landfill AOPC	MW-3	5/1/2002	115.21	14.8	100.41	76.00
Landfill AOPC	MW-3	4/17/2008	115.21	13.46	101.75	75.10*
Landfill AOPC	MW-3	7/14/2008	115.21	17.3	97.91	73.80
Landfill AOPC	MW-3	10/20/2008	115.21	-	97.16	76.10
Landfill AOPC	MW-3	1/12/2009	115.21	12.48	102.73	74.20
Landfill AOPC	MW-4	7/12/1999	114.79	16.84	97.95	71.80
Landfill AOPC	MW-4	11/8/1999	114.79	15.77	99.02	75.00
Landfill AOPC	MW-4	1/10/2000	114.79	11.75	103.04	74.20
Landfill AOPC	MW-4	10/24/2001	114.79	17.35	97.44	74.90
Landfill AOPC	MW-4	12/6/2001	114.79	11.47	103.32	74.10
Landfill AOPC	MW-4	5/1/2002	114.79	14.51	100.28	76.00
Landfill AOPC	MW-4	4/17/2008	114.79	13.36	101.43	75.10*
Landfill AOPC	MW-4	7/14/2008	114.79	16.81	97.98	73.80
Landfill AOPC	MW-4	10/20/2008	114.79	-	97.24	76.10
Landfill AOPC	MW-4	1/12/2009	114.79	12.47	102.32	74.20
Landfill AOPC	MW-5	11/8/1999	114.07	19.1	94.97	75.00
Landfill AOPC	MW-5	1/10/2000	114.07	16.47	97.6	74.20
Landfill AOPC	MW-5	10/24/2001	114.07	20.76	93.31	74.90
Landfill AOPC	MW-5	12/6/2001	114.07	16.54	97.53	74.10
Landfill AOPC	MW-5	5/1/2002	114.07	18.12	95.95	76.00
Landfill AOPC	MW-5	4/16/2008	113.9	17.24	96.83	75.10*
Landfill AOPC	MW-5	7/14/2008	113.9	19.33	94.57	73.80
Landfill AOPC	MW-5	10/20/2008	113.9	-	93.34	76.10
Landfill AOPC	MW-5	1/12/2009	113.9	16.81	97.09	74.20

Table D-1
Groundwater Elevations for the Landfill and Sandblast Area AOPCs and the Reference Area
Bradford Island - Upland Operable Unit
(2 of 2)

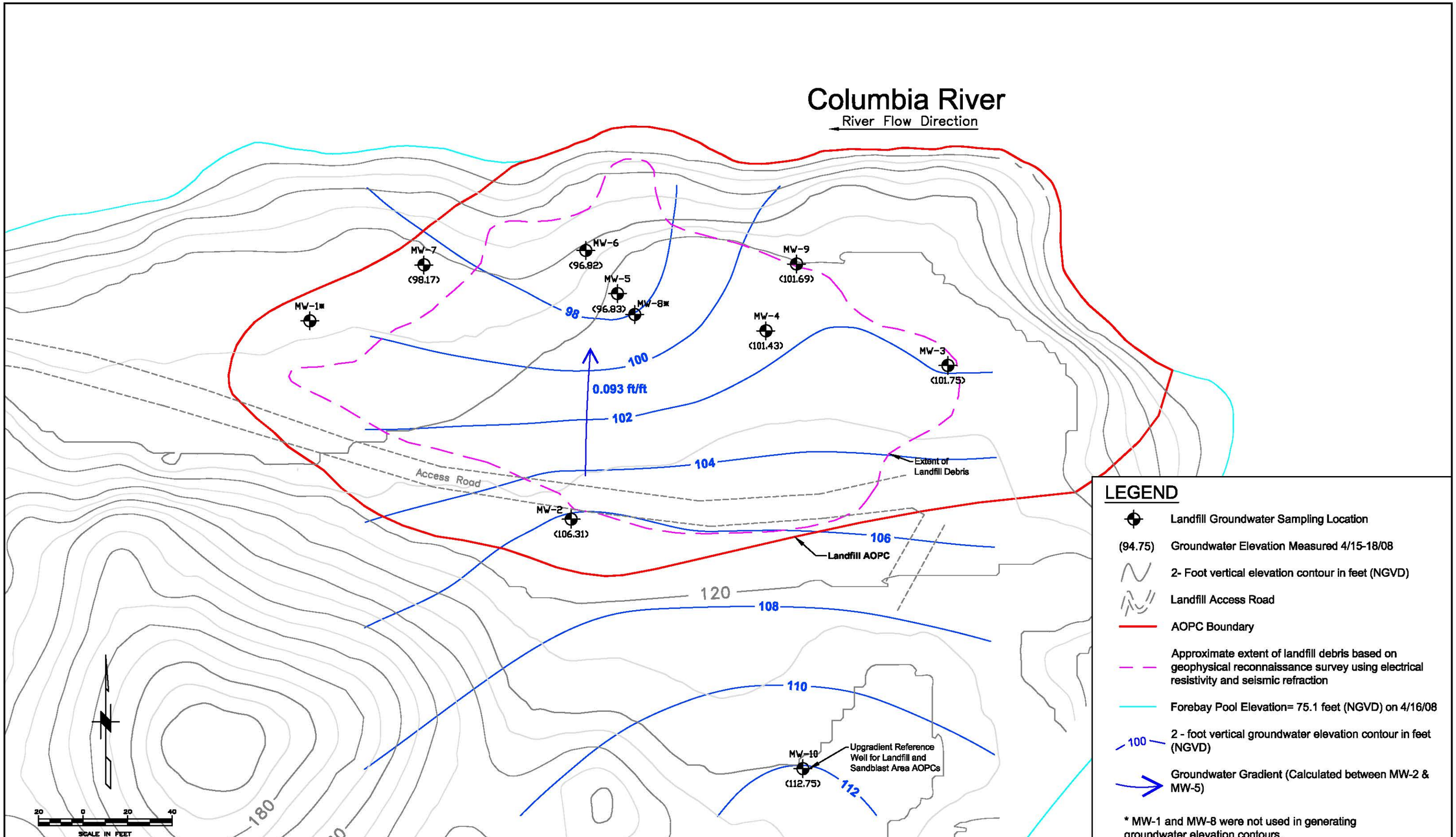
Area	Well	Measuring Date	Measuring Point Elevation (ft msl)	Depth to Water (ft btc)	Groundwater Elevation (ft msl)	Bonneville Forebay Elevation (ft msl)
Landfill AOPC	MW-6	5/1/2002	113.02	17.06	95.96	76.00
Landfill AOPC	MW-6	4/17/2008	112.8	16.2	96.82	75.10*
Landfill AOPC	MW-6	7/14/2008	112.8	18.24	94.56	73.80
Landfill AOPC	MW-6	10/20/2008	112.8	-	93.39	76.10
Landfill AOPC	MW-6	1/12/2009	112.8	15.72	97.08	74.20
Landfill AOPC	MW-7	5/1/2002	106.92	9.45	97.47	76.00
Landfill AOPC	MW-7	4/16/2008	106.73	8.75	98.17	75.10*
Landfill AOPC	MW-7	7/14/2008	106.73	9.67	97.06	73.80
Landfill AOPC	MW-7	10/20/2008	106.73	-	97.71	76.10
Landfill AOPC	MW-7	1/12/2009	106.73	8.33	98.40	74.20
Landfill AOPC	MW-8	5/1/2002	115.29	56.66	58.68	76.00
Landfill AOPC	MW-8	4/18/2008	115.13	41.63	73.66	75.10*
Landfill AOPC	MW-8	7/14/2008	115.13	26.66	88.47	73.80
Landfill AOPC	MW-8	10/20/2008	115.13	-	88.52	76.10
Landfill AOPC	MW-8	1/12/2009	115.13	25.16	89.97	74.20
Landfill AOPC	MW-9	5/1/2002	115.16	14.97	100.19	76.00
Landfill AOPC	MW-9	4/17/2008	114.98	13.47	101.69	75.10*
Landfill AOPC	MW-9	7/14/2008	114.98	15.99	98.99	73.80
Landfill AOPC	MW-9	10/20/2008	114.98	-	99.04	76.10
Landfill AOPC	MW-9	1/12/2009	114.98	12.6	102.38	74.20
Reference Area	MW-10	4/15/2008	133.2	20.45	112.75	75.10*
Reference Area	MW-10	7/14/2008	133.2	25.94	107.26	73.80
Reference Area	MW-10	10/20/2008	133.2	-	104.29	76.10
Reference Area	MW-10	1/12/2009	133.2	19.52	113.68	74.20
Sandblast Area AOPC	MW-11	4/15/2008	98.12	6.41	91.71	75.10*
Sandblast Area AOPC	MW-11	7/14/2008	98.12	8.05	90.07	73.80
Sandblast Area AOPC	MW-11	10/20/2008	98.12	-	90.72	76.10
Sandblast Area AOPC	MW-11	1/12/2009	98.12	7.06	91.06	74.20
Sandblast Area AOPC	MW-12	4/15/2008	100.62	24.08	76.54	75.10*
Sandblast Area AOPC	MW-12	7/14/2008	100.62	26.05	74.57	73.80
Sandblast Area AOPC	MW-12	10/20/2008	100.62	-	76.26	76.10
Sandblast Area AOPC	MW-12	1/12/2009	100.62	23.1	77.52	74.20
Sandblast Area AOPC	MW-13	4/14/2008	97.55	16.35	81.2	75.10*
Sandblast Area AOPC	MW-13	7/14/2008	97.55	17.08	80.47	73.80
Sandblast Area AOPC	MW-13	10/20/2008	97.55	-	80.5	76.10
Sandblast Area AOPC	MW-13	1/12/2009	97.55	15.62	81.93	74.20
Sandblast Area AOPC	MW-14	4/14/2008	86.67	12.94	73.73	75.10*
Sandblast Area AOPC	MW-14	7/14/2008	86.67	13.61	73.06	73.80
Sandblast Area AOPC	MW-14	10/20/2008	86.67	-	75.9	76.10
Sandblast Area AOPC	MW-14	1/12/2009	86.67	12.59	74.08	74.20
Sandblast Area AOPC	MW-15	4/14/2008	86.86	13.05	73.81	75.10*
Sandblast Area AOPC	MW-15	7/14/2008	86.86	13.81	73.05	73.80
Sandblast Area AOPC	MW-15	10/20/2008	86.86	-	75.96	76.10
Sandblast Area AOPC	MW-15	1/12/2009	86.86	12.76	74.1	74.20

Bonneville Forebay Elevation data from USACE (http://www.cbr.washington.edu/dart/river.html)
ft msl = feet above mean sea level
ft btc = feet below top of well casing
* = measured on April 16, 2008
"-" = Not evaluated

Table D-2
Groundwater Elevation Gradients for the Landfill andSandblast Area AOPCs
Bradford Island - Upland Operable Unit
(1 of 1)

Date	Landfill AOPC	Sandblast AOPC	
	Gradient Between MW-02 and MW-05 (north)	Gradient Between MW-11 and MW-14 (northwest)	Gradient Between MW-11 and MW-15 (north)
11/8/1999	0.118	-	-
1/10/2000	0.105	-	-
10/24/2001	0.129	-	-
12/6/2001	0.096	-	-
5/1/2002	0.115	-	-
April 2008	0.093	0.082	0.117
7/14/2008	0.116	0.078	0.111
10/20/2008	0.129	0.068	0.097
1/12/2009	0.098	0.078	0.111
Average	0.111	0.077	0.109
Avg Nov to April	0.102	0.080	0.114
Avg May to Oct	0.122	0.073	0.104

Gradient units in feet/feet (vertical/horizontal)



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CASCADE LOCKS, OREGON

LANDFILL AOPC

GROUNDWATER ELEVATION CONTOURS
APRIL 2008 (WET SEASON)

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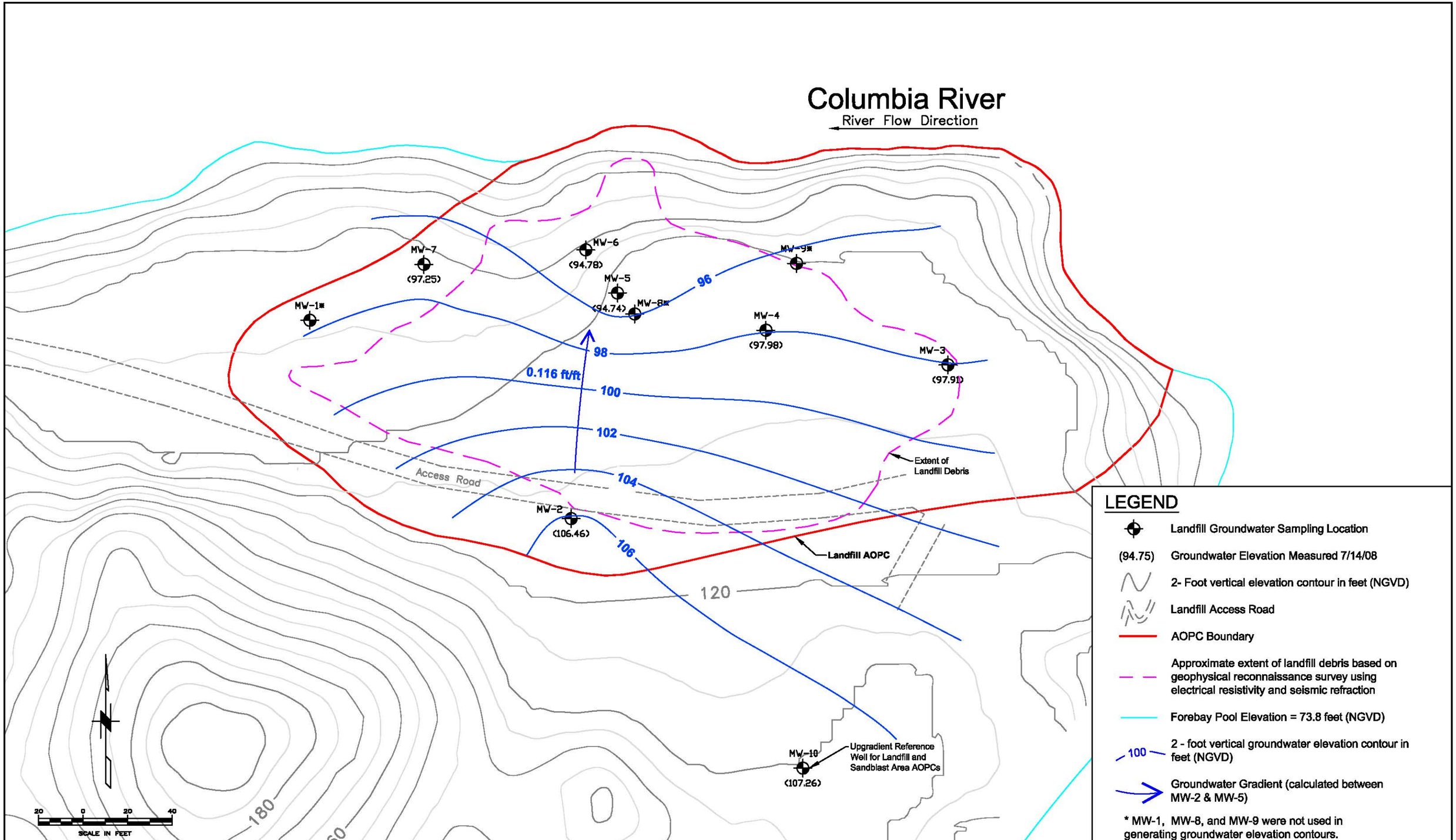

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GROUNDWATER ELEVATION CONTOURS
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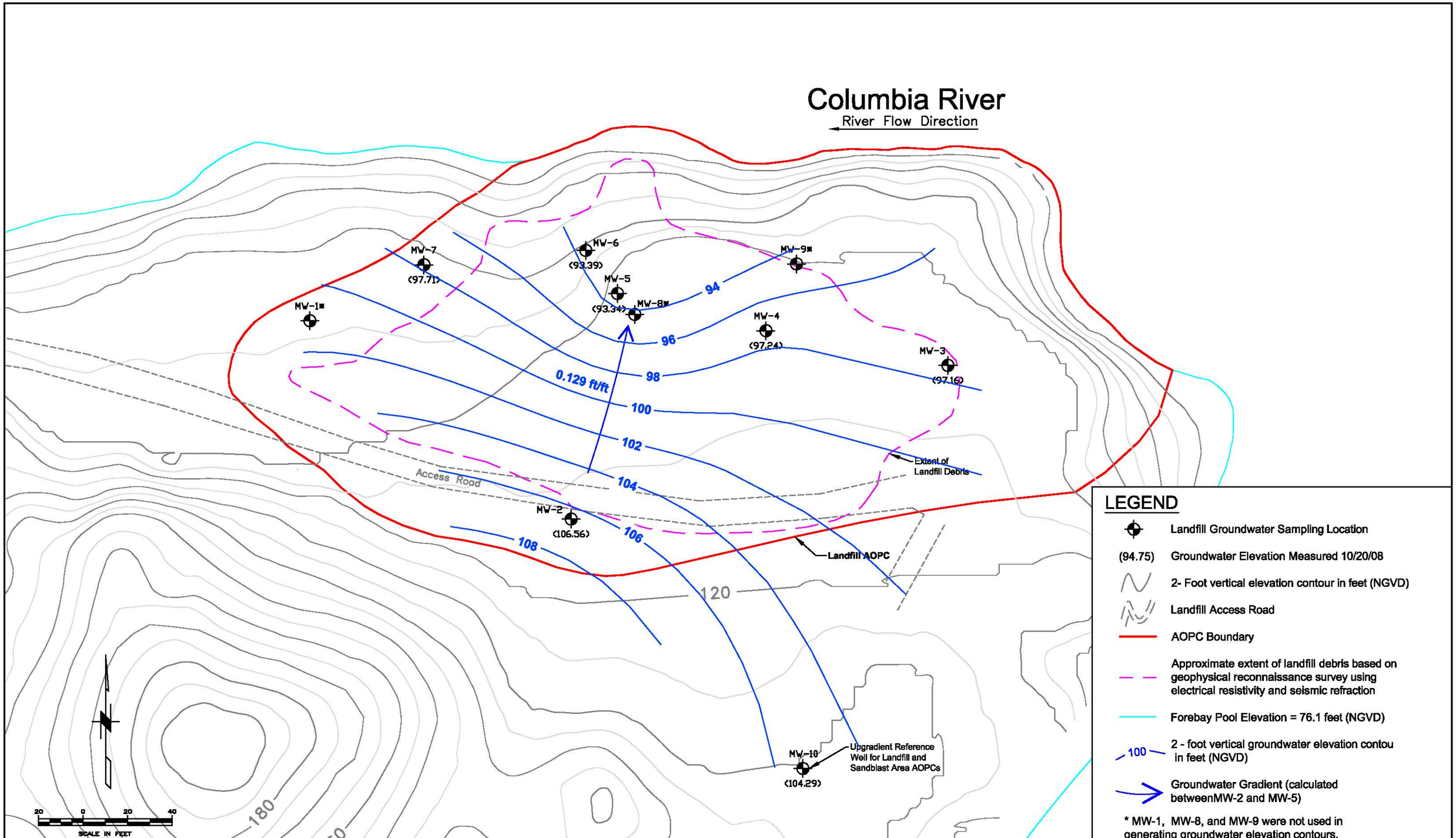

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GROUNDWATER ELEVATION CONTOURS
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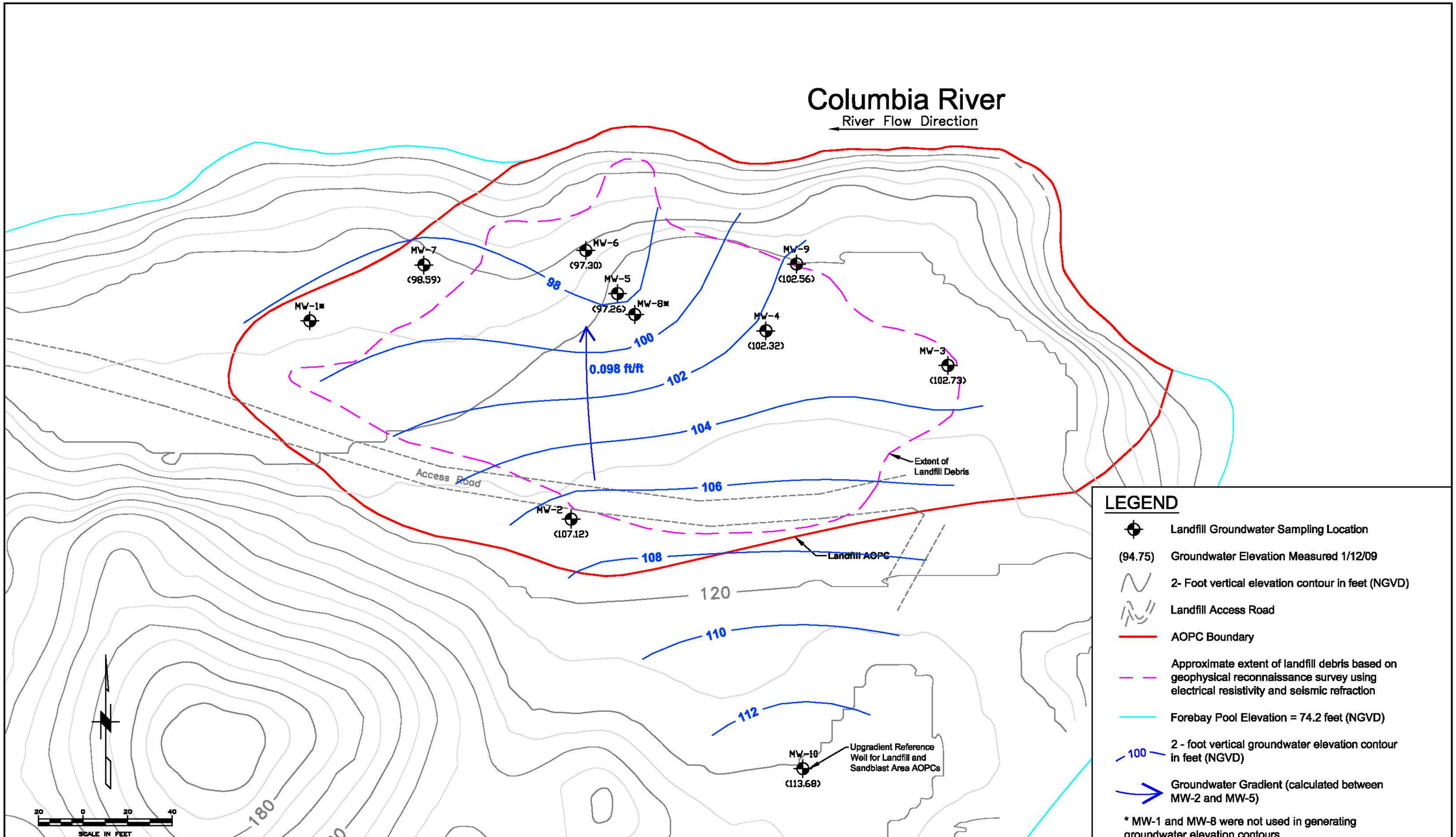

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GROUNDWATER ELEVATION CONTOURS
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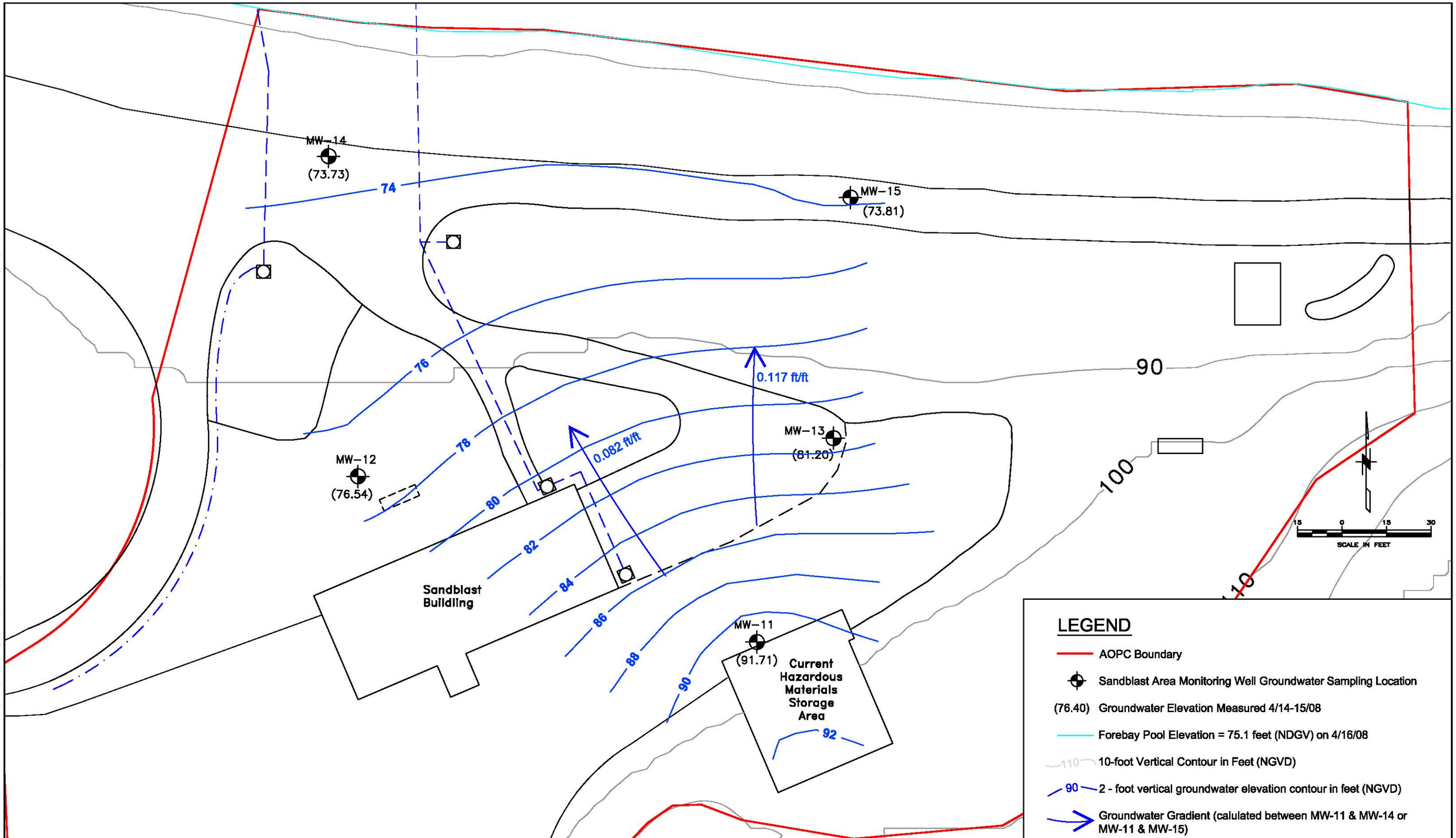

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SANDBLAST AREA AOPC

GROUNDWATER ELEVATON CONTOURS
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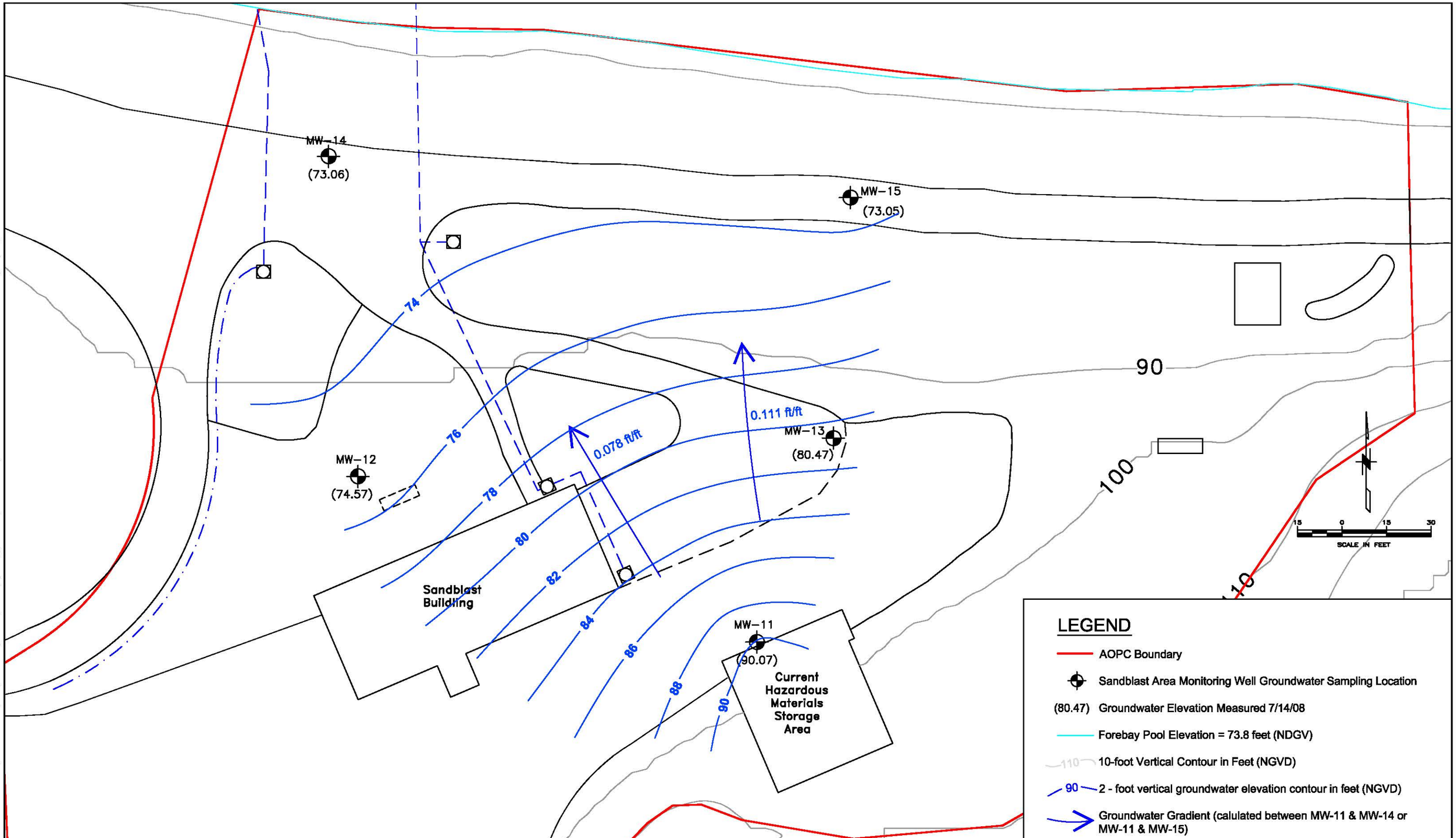

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GROUNDWATER ELEVATON CONTOURS
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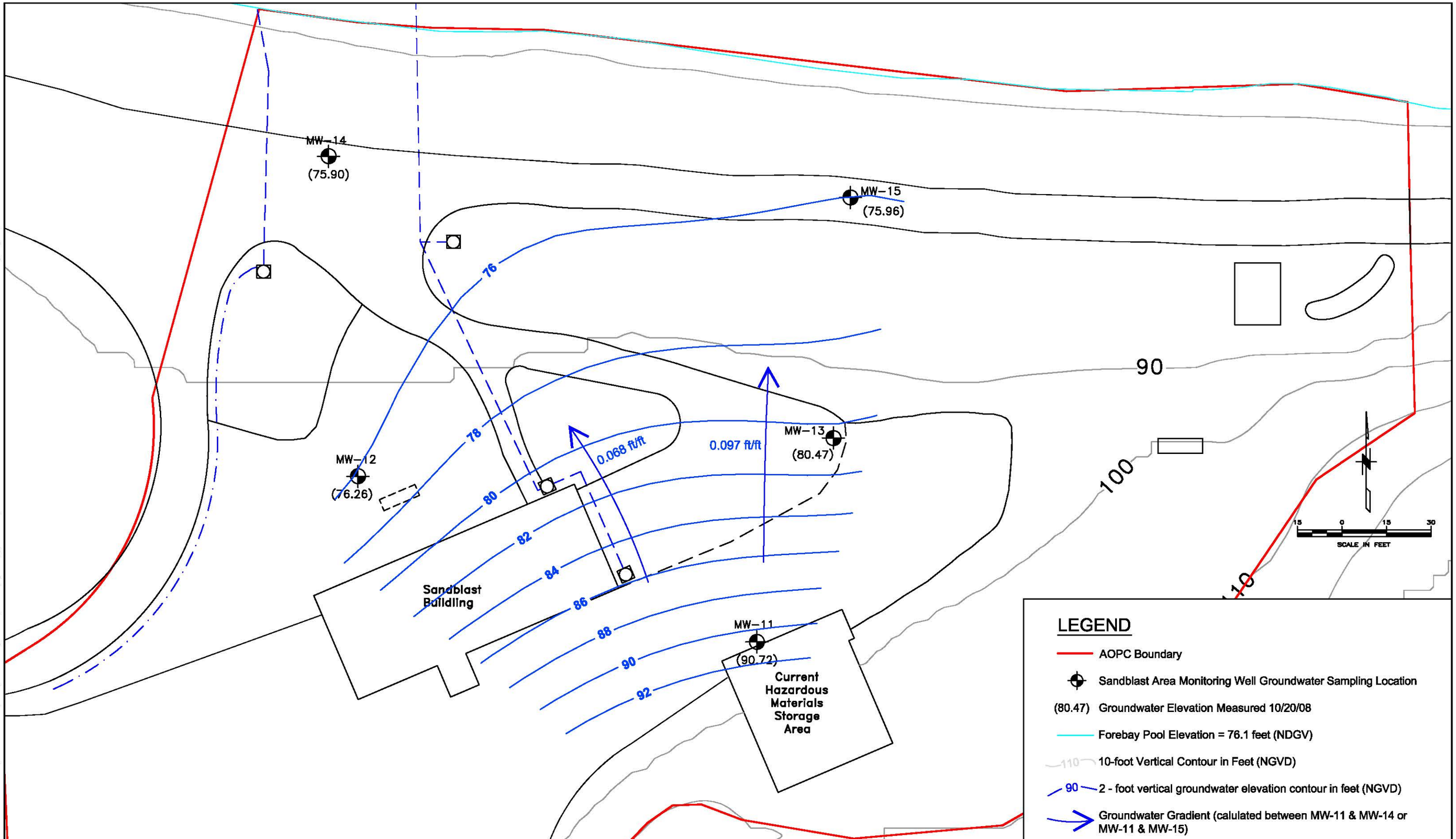

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GROUNDWATER ELEVATON CONTOURS
OCTOBER 2008 (DRY SEASON)

DRAWING NUMBER: FIGURE D-7
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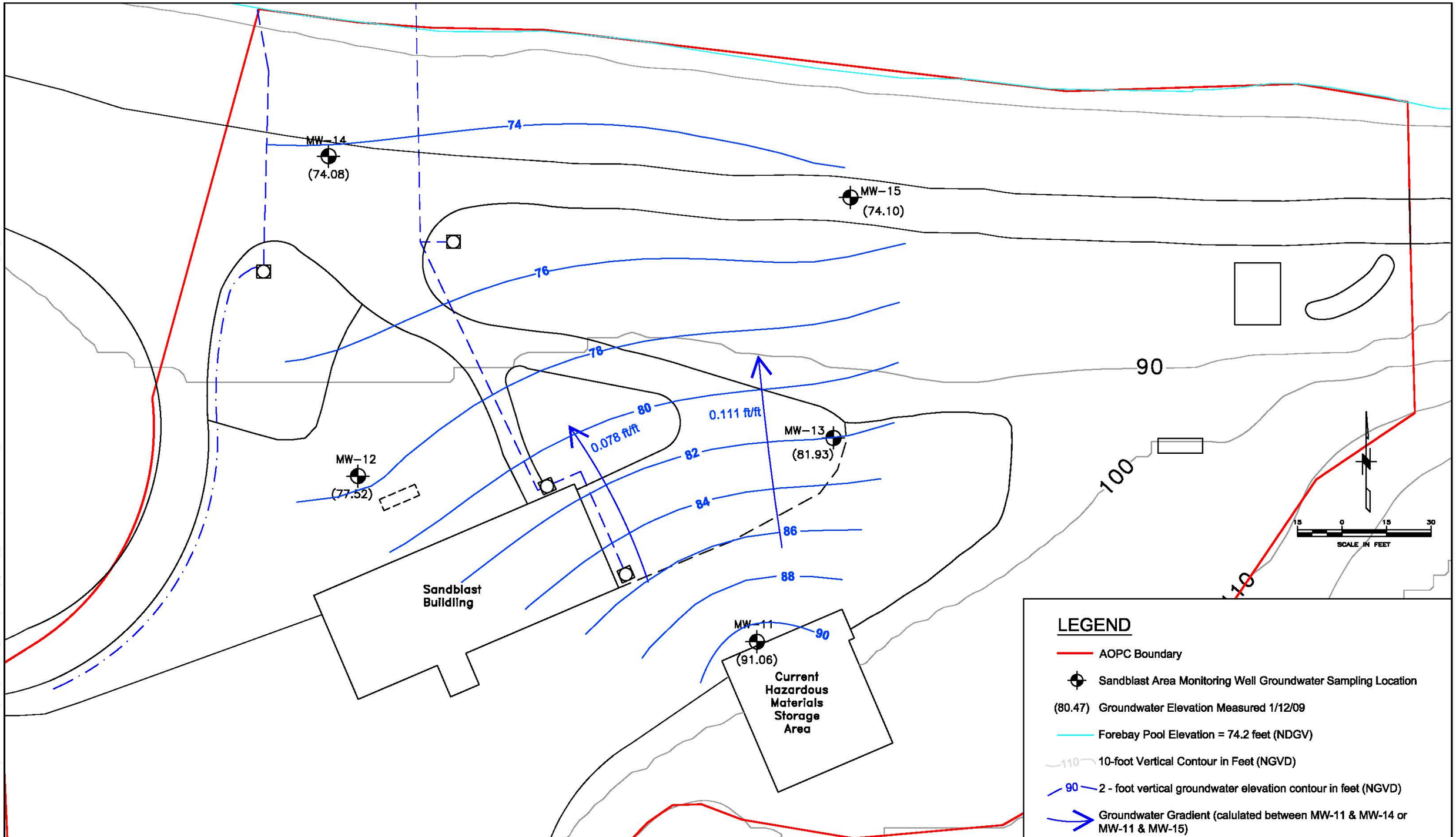

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GROUNDWATER ELEVATON CONTOURS
JANUARY 2009 (WET SEASON)

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APPENDIX F

DATA VALIDATION REPORTS

The analytical results for four water samples and one field duplicate collected July 12 and 13, 1999 at the Bradford Island landfill, were subject to a quality assurance/quality control (QA/QC) review.

This QA/QC review includes evaluation of analytical representativeness, accuracy, precision, and completeness. Representativeness is evaluated by examining chain of custody paperwork and verifying analysis was performed within allowable holding times; accuracy is evaluated using the analytical results for blanks, surrogates, matrix spikes and blank spikes; precision is evaluated by comparison of results for primary and sample duplicate analyses and laboratory duplicate analyses; and completeness is evaluated by calculating the percentage of acceptable data.

The data quality review process followed the procedures specified in the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review and Inorganic Data Review (EPA Guidelines) (EPA 1994)*.

MultiChem Analytical Services of Renton, Washington analyzed all samples, except the QA samples sent to the USACE lab in Omaha, Nebraska. Samples were collected and analyzed according to the Sampling and Analysis Plan (URS, September 1999). Samples were analyzed for one or more of the following methods: Metals (antimony, arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc) by EPA SW-846 Method 6010/7000 Series, Semivolatile Organic Compounds by EPA SW-846 Method 8270B, Volatile Organic Compounds by EPA SW-846 Method 8260B, Organochlorinated Pesticides and Polychlorinated Biphenyls by EPA SW-846 Method 8081A/8082, Chlorinated Herbicides by EPA SW-846 Method 8151A, and Total Petroleum Hydrocarbons by NWTPH-Dx and NWTPH-Gx. Well designation, chain of custody (COC) identification (ID), and laboratory ID are cross-referenced below.

WELL DESIGNATION	COC ID	LABORATOY ID
MW - 1	990712BIL08GW	907030-1
-	Trip Blank	907030-2
MW - 2	990712BIL07GW	907023-1
-	Trip Blank	907023-2
MW - 3	990712BIL06GW	907021-1
-	Trip Blank	907021-2
MW - 4	990712BIL01GW	907021-3
-	Trip Blank	907021-4
MW – 4 field duplicate	990712BIL02GW	907021-5
-	Trip Blank	907021-6

Sample 990712BIL08GW purge water was used for analyses because the well was unable to recharge quick enough to obtain well water. There was still insufficient volume; therefore, the purge water was not analyzed for all the required methods. USACE was notified and specified which methods to analyze.

All analytical data are usable as reported. No data were rejected during this review. Analytical deviations from the reference methods are presented below. Reporting limits meet the project objectives. Compounds detected below the reporting limit but above the method detection limit are considered estimates and are qualified "J" by the laboratory.

REPRESENTATIVENESS

Chain of Custody and Holding Times

Sample custody was maintained under the chain of custody (COC) forms. Forms were signed on release and receipt of samples. Samples were properly preserved; however, 990712BIL01GW and 990712BIL02GW did not maintain pH < 2 for the metals samples due to the sample matrix. The laboratory added additional preservative to the metals samples; no data were qualified.

Samples received by the laboratory were within 4° ± 2° C except for samples 990712BIL02GW, 990712BIL07GW, and corresponding trip blanks which were received at temperatures between 7.3 and 9.5°C. Receipt temperatures were not exceedingly high; therefore, no data were qualified. Extraction and analysis holding times were met for all samples.

ACCURACY

Initial and Continuing Calibration

Initial and continuing instrument calibration verification (ICV or CCV) were analyzed at the proper frequency. Prior to samples and quality control samples being analyzed, the laboratory analyzed calibration standards at the concentrations required by the method. The continuing calibration standard acceptance criteria was reported as the average response factor (percent difference, %D) for various organic analyses or as the percent recovery (%R) for inorganic analyses. The %Ds (less than 25%) and %Rs (±15%) were within laboratory control limits with the following exceptions.

- EPA SW-846 Methods 8081A CCV for samples 990712BIL01GW, 990712BIL02GW, 990712BIL06GW, and 990712BIL07GW exceed the control limit of 25% for 4,4'-DDD and 4,4'-DDT. Sample results were non-detect; therefore, results were qualified as estimated "UJ".
- EPA SW-846 Methods 8081A CCVs for sample 990712BIL08GW exceed the control limit of 25% for alpha-BHC, dieldrin, endrin, 4,4'-DDD, 4,4'-DDT, and endrin ketone. Sample results were non-detect for the out of compliant analytes; therefore, results were qualified as estimated "UJ".

Blanks

The laboratory analyzed one method blank with each analytical batch. Five trip blanks were analyzed for EPA SW-846 Method 8260B. Frequency requirements for method and trip blanks were met. Target analytes in the method and trip blanks were below method reporting limits.

Surrogate Recovery

Surrogate recoveries (%Rs) were within project-specific control limits.

Blank Spike

Blank spikes (BS) and if required blank spike duplicates (BSD) were analyzed with each analytical batch, which meets the frequency requirement of five percent. The BS/BSD were within laboratory control limits.

Matrix Spike/Matrix Spike Duplicate

Matrix spike/matrix spike duplicates (MS/MSD) were not analyzed with each analytical batch. Sufficient sample was collected for MS/MSD; however, the extra sample was extracted and analyzed as if they were primary samples in most cases. Holding times and insufficient sample volumes would not allow for re-extraction and re-analysis of these samples. USACE was notified that no MS/MSD was available. The frequency requirement of 5 percent was not met. Data was qualified and deemed acceptable based on blank spike, blanks spike duplicate, surrogate recoveries, and if available MS/MSD. The %Rs were within project-specific control limits.

PRECISION

Spike Duplicate

The laboratory analyzed blank and/or matrix spike duplicates with each analytical batch; the relative percent differences (RPDs) were within project-specific control limits.

MS/MSD and BS/BSD %Rs were within project-specific control limits or did not effect sample integrity for the out of compliant RPDs; therefore, no data were qualified.

Laboratory Duplicate

A laboratory duplicate was analyzed for the metals analyses. RPDs were within project-specific control limits.

Field Duplicate

One field duplicate was collected during the sampling event. The field duplicate RPDs were within project-specific control limits of less than 300%.

COMPLETENESS

The laboratory submitted all required deliverables for the requested analyses. The reported analytical results meet the project completeness goal of 95 percent. For all samples collected

and analyzed, no data were judged to be invalid. No data were rejected, so completeness for this sampling event is 100 percent.

Based on the QA/QC review, some data were qualified as estimated ("UJ") due to analytical deviations. The following table summarizes the COC IDs and qualified results for all samples covered by this review:

METHOD	COC ID	ANALYTE	QUALIFIER	ANALYTICAL DEVIATIONS
8081A	990712BIL01GW 990712BIL02GW 990712BIL06GW 990712BIL07GW	4,4'-DDD 4,4'-DDT	UJ	CCVs
8081A	990713BIL08GW	alpha-BHC Dieldrin Endrin 4,4'-DDD 4,4'-DDT Endrin Ketone	UJ	CCVs

The analytical results for five water samples and one field duplicate collected November 8 and 9, 1999 at the Bradford Island landfill, were subject to a quality assurance/quality control (QA/QC) review.

This QA/QC review includes evaluation of analytical representativeness, accuracy, precision, and completeness. Representativeness is evaluated by examining chain of custody paperwork and verifying analysis was performed within allowable holding times; accuracy is evaluated using the analytical results for blanks, surrogates, matrix spikes and blank spikes; precision is evaluated by comparison of results for primary and sample duplicate analyses and laboratory duplicate analyses; and completeness is evaluated by calculating the percentage of acceptable data.

The data quality review process followed the procedures specified in the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review and Inorganic Data Review (EPA Guidelines) (EPA 1994)*.

MultiChem Analytical Services of Renton, Washington analyzed all samples. Samples were collected and analyzed according to the Sampling and Analysis Plan (URS, September 1999). Samples were analyzed for one or more of the following methods: Metals (antimony, arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc) by EPA SW-846 Method 6010/7000 Series, Semivolatile Organic Compounds by EPA SW-846 Method 8270B, Volatile Organic Compounds by EPA SW-846 Method 8260B, Organochlorinated Pesticides and Polychlorinated Biphenyls by EPA SW-846 Method 8081A/8082, Chlorinated Herbicides by EPA SW-846 Method 8151A, and Total Petroleum Hydrocarbons by NWTPH-Dx and NWTPH-Gx. Well designation, chain of custody (COC) identification (ID), and laboratory ID are cross-referenced below.

WELL DESIGNATION	COC ID	LABORATORY ID
MW - 1	991108BIL14GW	911040-3
-	Trip Blank	911040-4
MW - 2	991108BIL12GW	911031-9
-	Trip Blank	911031-10
MW - 3	991108BIL11GW	911031-7
-	Trip Blank	911031-8
MW - 4	991108BIL09GW	911031-1
-	Trip Blank	911031-2
-	Trip Blank	911031-3
-	Trip Blank	911031-4
MW – 4 field duplicate	991108BIL10GW	911031-5
-	Trip Blank	911031-6
MW – 5	991109BIL13GW	911040-1
-	Trip Blank	911040-2

Sample 991109BIL14GW purge water was used for analyses because the well was unable to recharge quick enough to obtain well water. Sample 991109BIL13GW water is from a newly (1999) constructed well that has never been sampled, no previous data is available.

All analytical data are usable as reported. No data were rejected during this review. Analytical deviations from the reference methods are presented below. Reporting limits meet the project objectives. Compounds detected below the reporting limit but above the method detection limit are considered estimates and are qualified "J" by the laboratory.

REPRESENTATIVENESS

Chain of Custody and Holding Times

Sample custody was maintained under the chain of custody (COC) forms. Forms were signed on release and receipt of samples. Samples were properly preserved; however, 991108BIL09GW, 991108BIL10GW, and 991109BIL13GW did not retain pH < 2 for the metals samples due to the sample matrix. The laboratory added additional preservative to the metal samples; no data were qualified.

One VOA vial for 991108BIL14GW shattered during shipping – the VOA analysis was not effected.

Samples received by the laboratory were within 4° ± 2° C except for sample 991108BIL09GW MSD and corresponding trip blank. 991108BIL09GW MSD and its corresponding trip blank were received at a temperature of 0.9°C. Receipt temperatures were not grossly exceeded (usually defined as 2 times the criteria); therefore, no data were qualified. Extraction and analysis holding times were met for all samples except mercury and Methods 8081A/8082. Mercury was extracted 12 days after the 28 day holding time for 991108BIL09GW to 991108BIL12GW. Sample results were non-detect, no data qualified. Method 8081A/8082 samples 991108BIL09GW to 991108BIL12GW were re-extracted one day after the 7-day holding time due to low BS recoveries associated with Method 8082 analysis. All analytes were qualified as estimated ("UJ").

ACCURACY

Initial and Continuing Calibration

Initial and continuing instrument calibration verification (ICV or CCV) were analyzed at the proper frequency. Prior to samples and quality control samples being analyzed, the laboratory analyzed calibration standards at the concentrations required by the method. The continuing calibration standard acceptance criteria was reported as the average response factor (percent difference, %D) for various organic analyses or as the percent recovery (%R) for inorganic analyses. The %Ds (less than 25%) and %Rs (±15%) were within laboratory control limits with the following exceptions.

- EPA SW-846 Method 8081A CCVs for 4,4'-DDT exceeded the control limit of 25% for samples 991108BIL09GW to 991108BIL12GW, 991109BIL13GW, and 991108BIL14GW. Sample results for 4,4'-DDT were non-detect; therefore, data were qualified as estimated "UJ".

- EPA SW-846 Method 8270B CCV for pentachlorophenol exceeded the control limit of 25% for sample 991108BIL12GW. 991108BIL12GW was non-detect for pentachlorophenol; therefore, data was qualified as estimated "UJ".
- EPA SW-846 Method 8270B CCV for fluoranthene and di-n-octylphthalate exceeded the control limit of 25% for samples 991109BIL13GW and 991108BIL14GW. Both samples were non-detect for these two analytes; therefore, data was qualified as estimated "UJ".

Blanks

The laboratory analyzed one method blank with each analytical batch. Eight trip blanks were analyzed for EPA SW-846 Method 8260B. Frequency requirements for method and trip blanks were met. Target analytes in the method and trip blanks were below method reporting limits with the following exception. Bis (2-ethylhexyl) phthalate was detected in the method blank for EPA SW-846 Method 8270B. Sample results were below method reporting limits except for 991108BIL12GW and 991108BIL14GW. 991108BIL12GW and 991108BIL14GW results are less than 10x the blank concentration and were qualified "U". No other samples were qualified.

Surrogate Recovery

Surrogate recoveries (%Rs) were within project-specific control limits.

Blank Spike

Blank spikes (BS) and if required blank spike duplicates (BSD) were analyzed with each analytical batch, which meets the frequency requirement of five percent. The BS/BSD were within project-specific control limits.

Matrix Spike/Matrix Spike Duplicate

Project-specific matrix spike/matrix spike duplicates (MS/MSD) were not analyzed with each analytical batch. NWTPH-Dx and Methods 8081A/8082 for laboratory ID 911040-1 and –3 did not have an MS/MSD and Mercury for 911040-1 and -3 was not a project-specific sample.

Based on *EPA Guidelines*, no action is taken on MS/MSD organic data alone; therefore, the primary sample will not be qualified due to nonconformance with the organic MS/MSD %Rs. %Rs were within project-specific control limits for the inorganic methods except for mercury. Mercury was below the control limit but between 10 – 40% for samples 991109BIL13GW and 991108BIL14GW. Associated samples were non-detect; and therefore qualified as estimated ("UJ").

PRECISION

Spike Duplicate

The laboratory analyzed blank and/or matrix spike duplicates with each analytical batch; the relative percent differences (RPDs) were within project-specific control limits.

Laboratory Duplicate

A laboratory duplicate was analyzed for the metals analyses. RPDs were within project-specific control limits.

Field Duplicate

One field duplicate was collected during the sampling event. The field duplicate RPDs were within project-specific control limits of less than 300%.

COMPLETENESS

The laboratory submitted all required deliverables for the requested analyses. The reported analytical results meet the project completeness goal of 95 percent. For all samples collected and analyzed, no data were judged to be invalid. No data were rejected, so completeness for this sampling event is 100 percent.

Based on the QA/QC review, some data were qualified as estimated ("UJ") due to analytical deviations with the representativeness, precision, and accuracy. Some data were qualified not detected ("U") due to analytical deviations with accuracy. The following table summarizes the COC IDs and qualified results for all samples covered by this review:

METHOD	COC ID	ANALYTE	QUALIFIER	ANALYTICAL DEVIATIONS
7470	991109BIL13GW 991108BIL14GW	Mercury	UJ	MS/MSD Recoveries
8081A/8082	991108BIL09GW 991108BIL10GW 991108BIL11GW 991108BIL12GW	All analytes	UJ	Holding Times CCVs
8081A	991109BIL13GW 991108BIL14GW	4,4'-DDT	UJ	CCVs
8270B	991108BIL09GW 991108BIL10GW 991108BIL11GW 991109BIL13GW 991108BIL14GW	Acenaphthene Di-n-octylphthalate Pentachlorophenol	UJ	CCVs
8270B	991108BIL12GW 991108BIL14GW	Bis(2-ethylhexyl)phthalate	U	Blanks
8270B	991108BIL12GW	Pentachlorophenol	UJ	CCVs
8270B	991109BIL13GW 991108BIL14GW	Fluoranthene Di-n-octylphthalate	UJ	CCVs

The analytical results for five water samples and one field duplicate collected January 10, 2000 at the Bradford Island landfill, were subject to a quality assurance/quality control (QA/QC) review.

This QA/QC review includes evaluation of analytical representativeness, accuracy, precision, and completeness. Representativeness is evaluated by examining chain of custody paperwork and verifying analysis was performed within allowable holding times; accuracy is evaluated using the analytical results for blanks, surrogates, matrix spikes and blank spikes; precision is evaluated by comparison of results for primary and sample duplicate analyses and laboratory duplicate analyses; and completeness is evaluated by calculating the percentage of acceptable data.

The data quality review process followed the procedures specified in the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA, October 1999) and Inorganic Data Review (USEPA, February 1994).*

MultiChem Analytical Services of Renton, Washington analyzed all samples, except the QA samples sent to the USACE lab in Omaha, Nebraska. Samples were collected and analyzed according to the Sampling and Analysis Plan (URS, September 1999). Samples were analyzed for one or more of the following methods: Metals (antimony, arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc) by EPA SW-846 Method 6010/7000 Series, Semivolatile Organic Compounds by EPA SW-846 Method 8270B, Volatile Organic Compounds by EPA SW-846 Method 8260B, Organochlorinated Pesticides and Polychlorinated Biphenyls by EPA SW-846 Method 8081A/8082, Chlorinated Herbicides by EPA SW-846 Method 8151A, and Total Petroleum Hydrocarbons by NWTPH-Dx and NWTPH-Gx. Well designation, chain of custody (COC) identification (ID), and laboratory ID are cross-referenced below.

WELL DESIGNATION	COC ID	LABORATORY ID
MW – 2	000110BIL15GW	001023-1
-	Trip Blank	001023-2
MW – 4	000110BIL16GW	001023-3
-	Trip Blank	001023-4
-	Trip Blank	001023-5
-	Trip Blank	001023-6
MW – 4 field duplicate	000110BIL17GW	001023-7
-	Trip Blank	001023-8
MW – 3	000110BIL18GW	001023-9
-	Trip Blank	001023-10
MW – 5	000110BIL19GW	001023-11
-	Trip Blank	001023-12
MW – 1	000110BIL20GW	001023-13
-	Trip Blank	001023-14

All analytical data are usable as reported. No data were rejected during this review. Analytical deviations from the reference methods are presented below. The reporting limits for some analytes differed slightly from those listed in the Quality Assurance Plan (QAP, URS, September 1999). In general, the reported values were lower than those listed in the QAP and/or any applicable ARARs, and therefore the reporting limits meet the project objectives. Compounds detected below the reporting limit but above the method detection limit are considered estimates and are qualified "J" by the laboratory.

REPRESENTATIVENESS

Chain of Custody and Holding Times

Sample custody was maintained under the chain of custody (COC) forms. Forms were signed on release and receipt of samples. Samples were properly preserved, except for the following (since temperatures are a function of preservation).

Sample 000110BIL19GW and the corresponding trip blank were received by the laboratory within 4° ± 2° C. All other samples and trip blanks were received at temperatures below 2.0°C; no samples were received frozen. Receipt temperatures were not grossly exceeded (usually defined as 2 times the criteria); therefore, no data were qualified.

Extraction and analysis holding times were met for all samples.

ACCURACY

Initial and Continuing Calibration

Initial and continuing instrument calibration verification (ICV or CCV) were analyzed at the proper frequency. Prior to samples and quality control samples being analyzed, the laboratory analyzed calibration standards at the concentrations required by the method. The continuing calibration standard acceptance criteria was reported as the response factor percent difference (%D) for various organic analyses or as the percent recovery (%R) for inorganic analyses. Except where noted below, the %Ds and %Rs were within the method control limits and USEPA validation criteria.

- EPA SW-846 Method 8260B CCVs for acetone and/or 2-butanone exceeded the EPA control limit of 25% for all samples. All associated sample results for acetone and/or 2-butanone were non-detect; therefore, data were qualified as estimated "UJ".
- EPA SW-846 Method 8270C CCVs for aniline, bis(2-chloroisopropyl)ether, hexachlorocyclopentadiene, 4-nitroaniline, benzidine, indeno(1,2,3-cd)pyrene, and benzo(g,h,i)perylene exceeded the EPA control limit of 25% for all samples. All sample results for these compounds were non-detect; therefore, data were qualified as estimated "UJ".

- EPA SW-846 Method 8151A CCVs for Dalapon, MCPA, 2,4-D, Silvex, Dicamba, MCPP, 2,4,5-TP, and Dichlorprop exceeded the method control limit of 15%D for all samples (note: there is no specific EPA validation criteria for chlorinated herbicides; therefore, method control limits were used). The average %D for all compounds also exceeded the method control limit of 15%. All sample results for these compounds were non-detect; therefore, data were qualified as estimated "UJ".
- EPA SW-846 Method 7740A CCV for selenium exceeded the EPA upper control limit of 110% for sample 000110BIL20GW. The sample result for this compound was qualified as estimated "J". Selenium was not detected in the remaining samples; therefore, no qualification of the data was necessary.
- EPA SW-846 Method 6010B/7000A CCVs for lead and silver exceeded the EPA upper control limit of 110% for all samples. These analytes were not detected in the samples; therefore, no qualification of the data was necessary.

Blanks

The laboratory analyzed one method blank with each analytical batch. Eight trip blanks were analyzed for EPA SW-846 Method 8260B. Frequency requirements for method and trip blanks were met. Target analytes in the method and trip blanks were below method reporting limits.

Bis(2-ethylhexyl)phthalate and diethylphthalate were detected in the EPA SW-846 Method 8270C blank at concentrations of 0.59 ug/L and 0.15 ug/L, respectively. As stated, these values were below the reporting limits. EPA validation criteria require that sample concentrations of common laboratory contaminants (including bis(2-ethylhexyl)phthalate and diethylphthalate) less than ten times the associated blank concentration be qualified as non-detect "U". Bis(2-ethylhexyl)phthalate was detected in samples 000110BIL16GW, 000110BIL17GW, 000110BIL18GW, and 000110BIL19GW at concentrations less than ten times the associated blank concentration; therefore, the reported sample results were raised to the reporting limit and qualified as non-detect "U". Bis(2-ethylhexyl)phthalate was also detected in samples 000110BIL15GW and 000110BIL20GW. However, the concentrations in these samples were greater than ten times the associated blank value; therefore, no qualification of the data was necessary. Diethylphthalate was detected in samples 000110BIL15GW and 000110BIL20GW at concentrations less than ten times the associated blank concentration; therefore, the reported sample results were raised to the reporting limit and qualified as non-detect "U".

Surrogate Recovery

The recoveries of tetrachloro-m-xylene (TCX) were below the project-specific control limits for the EPA SW-846 Method 8081A/8082 method blank (pesticide/PCB) and laboratory control sample (pesticide only) associated with all of the samples. The recoveries for this surrogate were within the control limits in all of the samples, and no pesticides or PCBs were detected in the samples. Therefore, no qualification was made to the data. However, the recovery of decachlorobiphenyl (DCB) was below the control limits in the EPA SW-846 Method

8081A/8082 analysis of sample 000110BIL19. Sample results were non-detect; therefore, all results from this analysis were qualified as estimated "UJ".

All other surrogate recoveries for all fractions were within project-specific control limits.

Blank Spike

Blank spikes (BS) were analyzed with each analytical batch, which meets the frequency requirement of five percent.

The EPA SW-846 Method 8081A BS recoveries for gamma-BHC, heptachlor, and aldrin were below the project-specific control limits. However, the matrix spike/matrix spike duplicate recoveries were within the control limits, and these compounds were not detected in the samples. Therefore, no qualifications were made to the data.

The EPA SW-846 Method 8082 BS control limits reported by the laboratory were not those listed in the approved QAP. However, the QAP indicated that the control limits specified were only advisory, due to lack of sufficient data. Statistically-based control limits would be developed when sufficient data were available. All EPA SW-846 Method 8082 BS results were within the control limits reported by the laboratory.

The EPA SW-846 Method 8151A BS recoveries of Dalapon and Dinoseb were below the project-specific control limits. All sample results for Dalapon were previously qualified for CCV control limit exceedances; therefore, no further qualification of the data was necessary. In addition to low BS recovery, the matrix spike/matrix spike duplicate (MS/MSD) recoveries of Dinoseb were below the project-specific control limits. Based on the intent of EPA validation guidelines, the non-detect results for Dinoseb were qualified as estimated "UJ".

The EPA SW-846 Method 8151A BS recovery of 2,4,5-T was above the project-specific control limits. However, this compound was not detected in the associated samples, and no qualification was made to the data.

The BS recoveries for all other parameters were within project-specific control limits.

Matrix Spike/Matrix Spike Duplicate

Based on EPA Guidelines, no action is taken on MS/MSD organic data alone. However, used in conjunction with the BS results, and exercising professional judgement, the results for Dinoseb were qualified as estimated "UJ" in the EPA SW-846 Method 8151A analyses of all samples (see discussion in BS section above).

The percent recoveries for all other parameters were within project-specific control limits.

PRECISION

Spike Duplicate

The laboratory analyzed matrix spike duplicates with each analytical batch for the organic fractions. The MS/MSD relative percent differences (RPDs) for 4-nitrophenol and pentachlorophenol (EPA SW-846 Method 8270C) and for Dinoseb (EPA SW-846 Method

8151A) were outside the project-specific control limits. However, there are no EPA validation criteria for RPDs, and no qualification was made to the data. All other RPDs were within project-specific control limits

Laboratory Duplicate

A laboratory duplicate was analyzed for the metals analyses. RPDs were within project-specific control limits.

Field Duplicate

One field duplicate was collected during the sampling event. The field duplicate RPDs were within project-specific control limits of less than 300%.

COMPLETENESS

The laboratory submitted all required deliverables for the requested analyses. The reported analytical results meet the project completeness goal of 95 percent. For all samples collected and analyzed, no data were judged to be invalid. No data were rejected, so completeness for this sampling event is 100 percent.

Based on the QA/QC review, some data were qualified as estimate ("UJ") due to analytical deviations with the representativeness, precision, and accuracy. The following table summarizes the sample IDs and qualified results for all samples covered by this review:

METHOD	COC ID	ANALYTE	QUALIFIER	ANALYTICAL DEVIATIONS
8260B	000110BIL15GW 000110BIL16GW 000110BIL17GW 000110BIL18GW 000110BIL19GW 000110BIL20GW Trip Blanks (All 8)	Acetone	UJ	CCVs
8260B	000110BIL15GW 000110BIL16GW 000110BIL17GW 000110BIL18GW 000110BIL19GW 000110BIL20GW Trip Blanks (1 of 8)	2-Butanone	UJ	CCVs

METHOD	COC ID	ANALYTE	QUALIFIER	ANALYTICAL DEVIATIONS
8270C	000110BIL15GW 000110BIL16GW 000110BIL17GW 000110BIL18GW 000110BIL19GW 000110BIL20GW	Aniline Bis(2-chloroisopropyl)ether Hexachlorocyclopentadiene 4-Nitroaniline Benzidine Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	UJ	CCVs
8270C	000110BIL15GW 000110BIL20GW	Diethylphthalate	U	Method Blank
8270C	000110BIL16GW 000110BIL17GW 000110BIL18GW 000110BIL19GW	Bis(2-ethylhexyl)phthalate	U	Method Blank
8081A/8082	000110BIL19GW	All Pesticides/PCBs	UJ	Surrogates
8151A	000110BIL15GW 000110BIL16GW 000110BIL17GW 000110BIL18GW 000110BIL19GW 000110BIL20GW	Dinoseb	UJ	BS/MS/MSD
8151A	000110BIL15GW 000110BIL16GW 000110BIL17GW 000110BIL18GW 000110BIL19GW 000110BIL20GW	Dalapon MCPA 2,4-D Silvex 2,4,5-T Dicamba MCPP Dichlorprop	UJ	CCVs
7740A	000110BIL20GW	Selenium	J	CCV

The analytical results for one groundwater seep plus field duplicate, one surface soil plus one field duplicate and two trip blanks were collected April 13, 2000 at the Bradford Island landfill, were subject to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of analytical representativeness, accuracy, precision, and completeness. Representativeness is evaluated by examining chain-of-custody paperwork, verifying analysis was performed within allowable holding times, and comparing total versus dissolved analytes for metals analyses. Accuracy is evaluated using the analytical results for blanks, surrogates, internal standards, matrix spikes and laboratory control samples. Precision is evaluated by comparison of results for primary and sample duplicate analyses and laboratory duplicate analyses. Completeness is evaluated by calculating the percentage of acceptable data.

The data quality review process followed the procedures specified in the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA, October 1999) and Inorganic Data Review (USEPA, February 1994).*

North Creek Analytical (NCA) of Bothell, Washington analyzed the samples for volatiles, semivolatiles, pesticides/PCBs and metals, while Columbia Analytical Services, Inc. (CAS) of Kelso, Washington analyzed the samples for herbicides, NWTPH-Gx and NWTPH-Dx. Samples were collected and analyzed according to the Sampling and Analysis Plan (URSGWC, September 1999). Samples were analyzed for one or more of the following methods: Total/Dissolved/Leachable Metals (antimony, arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc) by EPA SW-846 Methods 1312/6010B/6020/7000A Series, Semivolatile Organic Compounds (SVOC) by EPA SW-846 Method 8270C, Volatile Organic Compounds (VOC) by EPA SW-846 Method 8260B, Organochlorinated Pesticides and Polychlorinated Biphenyls (PCBs) by EPA SW-846 Methods 8081A/8082, Chlorinated Herbicides by EPA SW-846 Method 8151A, and Total Petroleum Hydrocarbons by NWTPH-Dx and NWTPH-Gx. Field sample identifications (IDs) and laboratory IDs are cross-referenced below.

FIELD ID	LABORATORY ID	
	NCA	CAS
000413BIL21GW	BOD0283-01	K2002774-001
000413BIL22GW	BOD0283-02	K2002774-002
Trip Blank	BOD0283-03	K2002774-003
000413BIL13SS	BOD0284-01	K2002774-004
000413BIL14SS	BOD0284-02	K2002774-005

All analytical data are usable as reported, except for those results, which were rejected due to severe QC outliers. Analytical deviations requiring data validation qualification from the reference methods are presented below. The reporting limits for some analytes differed slightly from those listed in the Quality Assurance Project Plan (QAPP, URSGWC, September 1999). In general, the reported values were lower than those listed in the QAPP and/or any applicable ARARs.

The soil reporting limits for VOC analyses from the April 2000 sampling event are several orders of magnitude greater than previous sampling events. This was due to the use of methanol preservation/medium level analysis techniques. Therefore, the VOC reporting limits for soils exceed project-specific action levels for several compounds (i.e., 1,1,2-trichloroethane, 1,1-dichloroethene, 1,2,3-trichloropropane, 1,2-dibromoethane, 1,2-dichloroethane, bromodichloromethane, methylene chloride and vinyl chloride).

The laboratories do not report any values between the method detection limits and the method reporting limits. These values are typically qualified "J" and considered estimated. Also, the reported soil detection limits are on a wet-weight basis, rather than on a dry-weight basis. Therefore, the reported soil detection limits should be considered low-biased.

REPRESENTATIVENESS

Chain-of-Custody and Holding Times

Sample custody was maintained under the chain-of-custody (COC) forms, and was properly executed upon during sample transfer. Samples were properly preserved and received intact at the laboratories.

Extraction and analysis holding times were met for all samples.

Total versus Dissolved Concentrations

The dissolved metals concentrations were greater than their respective total concentrations for the following samples.

Field ID	Metal	Total Concentration	Dissolved Concentration
000413BIL21GW	Barium	71.4 μg/L	90.4 μg/L
	Manganese	1460 μg/L	1530 μg/L
	Zinc	<10.0 μg/L	<10.0 μg/L
000413BIL22GW	Antimony	<1.0 μg/L	2.28 μg/L
	Barium	77.0 μg/L	464 μg/L
	Zinc	<10.0 μg/L	85.6 μg/L

Since EPA Guidelines do not have any criteria for total versus dissolved concentration evaluation, no further qualifications were required.

ACCURACY

Initial and Continuing Calibration

Initial and continuing instrument calibration verifications (ICV or CCV) were analyzed at the proper frequency. Prior to field and QC sample analysis, the laboratories analyzed calibration standards at the concentrations required by the method. The ICV and CCV standard acceptance criteria was reported as the response factor relative percent difference (%RSD) and percent difference (%D), respectively, for various organic analyses or as the percent recovery (%R) for inorganic analyses. Except where noted below, the %RSDs, %Ds and %Rs were within the method control limits and USEPA validation criteria.

- EPA SW-846 Method 8260B CCV for 2,2-dichloropropane, toluene, dichlordifluoroethane, 1,2-dibromo-3-chloropropane and naphthalene exceeded the EPA QC limit of 25% for the soil samples. All associated sample results for these compounds were non-detect; therefore, data were qualified as estimated "UJ".
- EPA SW-846 Method 8260B CCV for acetone, 2-butanone, 2-hexanone and 4-methyl-2-pentanone exceeded the EPA QC limit of 25% for trip blank sample. Since these compounds were non-detect, the data were qualified as estimated "UJ".
- EPA SW-846 Method 8260B CCV for acetone and methylene chloride exceeded the EPA QC limit of 25% for groundwater seep samples. Since these compounds were non-detect in the associated samples, the data were qualified as estimated "UJ".
- EPA SW-846 Method 8270C CCV for 2-nitrophenol, 4-chloroaniline, hexachlorocyclo-pentadiene, 2,4-dinitrophenol, 2,4-dinitrotoluene, 4,6-dinitro-2-methylphenol, carbazole and 3,3'-dichlorobenzidine exceeded the EPA QC limit of 25% for the soil samples. All sample results for these compounds were non-detect; therefore, data were qualified as estimated "UJ".
- EPA SW-846 Method 8081A CCV percent breakdown of endrin exceeded the QC limit of 15% for the groundwater seep samples. Since endrin and its associated breakdown products (i.e., endrin aldehyde and endrin ketone) were not detected in the aqueous samples, no qualification of the data was necessary.

Blanks

The laboratories analyzed one method/preparation blank with each analytical batch. One trip blank was analyzed for EPA SW-846 Method 8260B and one for NWTPH-Gx. Frequency requirements for method/preparation and trip blanks were met. No target analytes were detected in the method/preparation and trip blanks, except where noted below.

Tetrachloroethene was detected in the EPA SW-846 Method 8260B trip blank at a concentration of 5.94 ug/L. Since this compound was not detected in the groundwater seep samples, no further qualifications were required.

Bis(2-ethylhexyl)phthalate was detected in the EPA SW-846 Method 8270C soil blank at a concentration of 113 μg/kg. EPA validation criteria require that sample concentrations of common laboratory contaminants (including bis(2-ethylhexyl)phthalate) less than ten times the associated blank concentration be qualified as non-detect "U". Bis(2-ethylhexyl)phthalate was detected in sample 000413BIL13SS at a concentrations less than ten times the associated blank concentration; therefore, the reported sample result was qualified as non-detect "U".

Iron was detected in the EPA SW-846 Method 6010B soil blank at a concentration of 0.368 mg/kg, and in samples 000413BIL21GW and 000413BIL22GW. However, the concentrations in these samples were greater than ten times the associated blank value; therefore, no qualification of the data was necessary.

Surrogate Recovery

The recovery of 1,2-dichloroethane-d_4 for the trip blank, soil sample 000413BIL13SS, soil method blank, aqueous/soil laboratory control samples (LCS) and soil matrix spike/matrix spike duplicate (MS/MSD) was below EPA SW-846 Method 8260B QC limits. It appears the surrogate outliers may be due to laboratory QA problems, rather than matrix interference. The VOC results for the trip blank and soil sample 000413BIL13SS were qualified as estimated "J"/"UJ".

The recoveries of nitrobenzene-d_5, 2-fluorobiphenyl and/or terphenyl-d_{14} for the groundwater seep sample 000413BIL21GW, aqueous LCS and aqueous MS were below EPA SW-846 Method 8270C QC limits. The SVOC base neutral results for groundwater seep sample 000413BIL21GW were qualified as estimated "J"/"UJ".

All other surrogate recoveries for all fractions were within project-specific control limits.

Internal Standard Recovery

The recovery of perylene-d_{12} for groundwater seep sample 000413BIL22GW and soil sample 000413BIL14SS was severely below (i.e., <10%) EPA SW-846 Method 8270C QC limits. The associated compounds for these two samples were rejected ("R") since they were non-detect. The samples were reanalyzed with similar results, which substantiates matrix interference. However, the laboratory did not report the reanalysis data.

All other internal standard recoveries for all fractions were within project-specific control limits.

Laboratory Control Sample

Laboratory control samples (LCS) were analyzed with each analytical batch, which meets the frequency requirement of five percent.

- The EPA SW-846 Method 8260B soil LCS recovery of 1,1-dichloroethene was below the project-specific QC limits. In addition to low LCS recovery, the soil MS/MSD recoveries of 1,1-dichloroethene were also below the project-specific QC limits. Based on the intent of EPA validation guidelines, the non-detect results for 1,1-dichloroethene were qualified as estimated "UJ" in soil sample 000413BIL14SS. The 1,1-dichloroethene result for soil sample

000413BIL13SS was previously qualified for a surrogate QC limit exceedance; therefore, no further qualification for this sample was necessary.

- The EPA SW-846 Method 8270CB aqueous LCS recoveries of acenaphthene, 2-chlorophenol, phenol and pyrene were below the project-specific QC limits. In addition to low LCS recoveries, the aqueous MS/MSD recoveries of pyrene were also below the project-specific QC limits. Based on the intent of EPA validation guidelines, only the non-detect results for pyrene were qualified as estimated "UJ" in the groundwater seep samples.
- The EPA SW-846 Method 8270CB soil LCS recoveries of acenaphthene and 2-chlorophenol were below the project-specific QC limits. However, the soil MS/MSD recoveries were within the project-specific QC limits, and these compounds were not detected in the samples. Therefore, no qualifications were made to the data.

The LCS recoveries for all other parameters were within project-specific control limits.

Matrix Spike/Matrix Spike Duplicate

Based on EPA Guidelines, no action is taken on MS/MSD organic data alone. However, used in conjunction with the LCS results, and exercising professional judgement, the soil results for 1,1-dichloroethene and the aqueous results for pyrene were qualified as estimated "UJ" in the EPA SW-846 Methods 8260B and 8270C analyses of all applicable samples (see discussion in LCS section above).

- As for inorganic analyses, MS/MSD exceedances require further qualification without review of other QC results. The EPA SW-846 Method 6020 aqueous recovery for dissolved manganese was below the project-specific QC limits. The results for groundwater seep samples were qualified as estimated "J".
- The EPA SW-846 Method 6020 soil MS/MSD recoveries of copper, nickel and selenium were below the project-specific QC limits. The results for soil samples were qualified as estimated "J". In addition, the soil antimony recoveries were 0% percent, therefore, the antimony results were qualified as rejected ("R"). The iron, manganese and barium recoveries were diluted out due to high levels in the parent sample (i.e., parent sample concentration greater than 4 times in the spike level), and require no further qualification.

The percent recoveries for all other parameters were within project-specific control limits.

PRECISION

Spike Duplicate

The laboratory analyzed matrix spike duplicates with each analytical batch for the organic and inorganic fractions. The aqueous MS/MSD relative percent differences (RPDs) for acenaphthalene, 4-nitrophenol, 2,4-dinitrotoluene, 4,6-dinitro-2-methylphenol, n-nitrosodi-n-propylamine and pyrene (EPA SW-846 Method 8270C) were outside the project-specific control

limits. However, there are no EPA validation criteria for organic RPDs, and no qualification was made to the groundwater seep data.

The aqueous RPD for manganese, and the soil RPD for copper and nickel (EPA SW-846 Method 6020) were outside the project-specific control limits. However, since these metal results were previously qualified as estimated, as noted above, no further qualification was necessary.

All other RPDs were within project-specific control limits.

Laboratory Duplicate

No laboratory duplicates were analyzed for the metals analyses. Instead, the laboratory analyzed MSDs, which supplemented laboratory duplicate analyses. The results for the MSDs were evaluated for precision, as noted above.

Field Duplicate

Two field duplicates were collected during this sampling event, one for each matrix. The field duplicate RPDs were within project-specific control limits of less than 300% for aqueous samples and less than 500% for soil samples.

COMPLETENESS

The laboratory submitted all required deliverables for the requested analyses. The total number of compounds/analytes expected is 394. A total of 14 compounds/analytes were rejected due to severe QC outliers, as noted above. The reported analytical results did not meet the project completeness goal of 98 percent, but did meet the analytical method percent completeness goal of 95 percent. For all samples collected and analyzed, the total completeness for this sampling event is 96 percent [(394-14)/394 x 100).

Of particular note, NCA did not report the following compounds, which were reported during previous investigations: 2-chlorovinyl vinyl ether (aqueous) and vinyl acetate (aqueous and soil) (Method 8260B); benzidine (soil) and n-nitrosodimethylamine (soil) (Method 8270C); and endrin ketone (aqueous and soil) (Method 8081A). This variance was not accounted for in the percent completeness tabulation.

Based on the QA/QC review, some data were qualified as estimate (“UJ”) and rejected (“R”) due to analytical deviations with the representativeness, precision, and accuracy. The following table summarizes the sample IDs and qualified results for all samples covered by this review:

METHOD	FIELD ID	ANALYTE	QUALIFIER	ANALYTICAL DEVIATIONS

METHOD	FIELD ID	ANALYTE	QUALIFIER	ANALYTICAL DEVIATIONS
8260B	000413BIL21GW 000413BIL22GW	Acetone Methylene Chloride	UJ	CCVs
8260B	000413BIL13SS Trip Blank	All Target Compounds	UJ	Surrogates
8260B	000413BIL13SS 000413BIL14SS	1,1-Dichloroethene	UJ	LCS/MS/MSD s
8260B	000413BIL13SS 000413BIL14SS	2,2-dichloropropane toluene dichlordifluoroethane 1,2-dibromo-3-chloropropane naphthalene	UJ	CCVs
8260B	Trip Blank	Acetone 2-Butanone 2-Hexanone 4-Methyl-2-pentanone	UJ	CCVs
8270C	000413BIL21GW	All Base Neutral Compounds	UJ	Surrogates
8270C	000413BIL22GW 000413BIL14SS	Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	R	Internal Standards
8270C	000413BIL13SS 000413BIL14SS	2-nitrophenol 4-chloroaniline hexachlorocyclopentadiene 2,4-dinitrophenol 2,4-dinitrotoluene 4,6-dinitro-2-methylphenol carbazole 3,3'-dichlorobenzidine	UJ	CCVs
8270C	000413BIL21GW 000413BIL22GW	Pyrene	UJ	LCS/MS/MSD s
8270C	000413BIL13SS	bis(2-Ethylhexyl)phthalate	U	Method Blank
6020	000413BIL21GW 000413BIL22GW	Dissolved Manganese	J	MS/MSD
6020	000413BIL13SS 000413BIL14SS	Copper Nickel Selenium	J	MS/MSD
6020	000413BIL13SS 000413BIL14SS	Antimony	R	MS/MSD

The analytical results for ten surface soil samples and one field duplicate collected September 20 and 21, 1999 at the Bradford Island landfill were subject to a quality assurance/quality control (QA/QC) review.

This QA/QC review includes evaluation of analytical representativeness, accuracy, precision, and completeness. Representativeness is evaluated by examining chain of custody paperwork and verifying analysis was performed within allowable holding times; accuracy is evaluated using the analytical results for blanks, surrogates, matrix spikes and blank spikes; precision is evaluated by comparison of results for primary and sample duplicate analyses and laboratory duplicate analyses; and completeness is evaluated by calculating the percentage of acceptable data.

The data quality review process followed the procedures specified in the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review and Inorganic Data Review (EPA Guidelines) (EPA 1994)*.

MultiChem Analytical Services of Renton, Washington analyzed all samples, except the QA samples sent to the USACE lab in Omaha, Nebraska. Samples were collected and analyzed according to the Sampling and Analysis Plan (URS, September 1999). Samples were analyzed for one or more of the following analyses: Moisture by CLP SOW ILM04.0, Total and Synthetic Precipitation Leaching Procedure (SPLP) Metals (antimony, arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc) by EPA SW-846 Method 6010/7000 Series, Semivolatile Organic Compounds by EPA SW-846 Method 8270B, Volatile Organic Compounds by EPA SW-846 Method 8260B, Organochlorinated Pesticides and Polychlorinated Biphenyls by EPA SW-846 Method 8081A/8082, Chlorinated Herbicides by EPA SW-846 Method 8151A, and Total Petroleum Hydrocarbons by NWTPH-HCID followed by NWTPH-Dx and NWTPH-Gx/BETX, if required. Site designation, chain of custody (COC) identification (ID), and laboratory ID are cross-referenced below.

SITE DESIGNATION	COC ID	LABORATORY ID
NW Corner Pesticide Pad	990920BIL01SS	909048-1
NE Corner Pesticide Pad	990920BIL02SS	909048-2
Test Pit 8	990920BIL03SS	909048-3
Test Pit 7	990920BIL04SS	909048-4
Test Pit 1	990920BIL05SS	909048-5
Test Pit 5	990920BIL06SS	909048-6
Test Pit 5 field duplicate	990920BIL08SS	909048-7
Between Test Pits 1 & 8	990920BIL09SS	909048-8
E of Test Pit 8	990920BIL10SS	909048-9
W of Test Pit 7	990920BIL11SS	909048-10
NW of MW – 3	990920BIL12SS	909048-11

All analytical data are usable as reported. No data were rejected during this review. Analytical deviations from the reference methods are presented below. Reporting limits meet the project

objectives. Compounds detected below the reporting limit but above the method detection limit are considered estimates and are qualified "J" by the laboratory.

REPRESENTATIVENESS

Chain of Custody and Holding Times

Sample custody was maintained under the chain of custody (COC) forms. Forms were signed on release and receipt of samples.

Samples received by the laboratory were within 4° ± 2° C. Extracting and analyses holding times were met for all samples with the following exception. Samples 990920BIL01SS to 990920BIL06SS and samples 990920BIL08SS to 990920BIL12SS were re-extracted 25 days after the recommended holding time for Method 8082 due the blank spike recoveries being below laboratory recovery limits. Sample results were non-detect for 990920BIL09SS to 990920BIL12SS and therefore qualified as estimated "UJ". Samples 990920BIL01SS to 990920BIL06SS and sample 990920BIL08SS were non-detect for all analytes except Aroclor 1260; therefore, the non-detects were qualified as estimated "UJ" and the Aroclor 1260 results were qualified estimated "J".

ACCURACY

Review of Initial and Continuing Calibration

Initial and continuing instrument calibration verification (ICV or CCV) were analyzed at the proper frequency. Prior to samples and quality control samples being analyzed, the laboratory analyzed calibration standards at the concentrations required by the method. The continuing calibration standard acceptance criteria was reported as the average response factor (percent difference, %D) for various organic analyses or as the percent recovery (%R) for inorganic analyses. The %Ds (less than 25%) and %Rs (±15%) were within laboratory control limits with the following exceptions.

- EPA SW-846 Method 7740 ending CCV for samples 990920BIL05SS, 990920BIL09SS, 990920BIL10SS, and 990920BIL12SS was below required control limit; however, the CCV fell between 75 – 89% range. Sample results were non-detect; therefore, results were qualified as estimated ("UJ").
- EPA SW-846 Method 8081A CCVs for samples 990920BIL01SS to 990920BIL06SS exceeded the control limit of 25% for alpha-BHC, gamma-BHC, heptachlor, and delta-BHC. Sample results were non-detect and therefore qualified as estimated "UJ".
- EPA SW-846 Method 8081A CCVs for samples 990920BIL08SS to 990920BIL12SS exceeded the control limit of 25% for alpha-BHC and 4,4'-DDT. Sample results were non-detect and therefore qualified as estimated "UJ".

- EPA SW-846 Method 8082 CCV for samples 990920BIL01SS to 990920BIL06SS and samples 990920BIL08SS to 990920BIL12SS exceeded the control limit of 25% for Aroclor 1260. Sample results were non-detect for 990920BIL09SS to 990920BIL12SS and therefore qualified as estimated "UJ". Samples 990920BIL01SS to 990920BIL06SS and sample 990920BIL08SS were non-detect for all analytes except Aroclor 1260; therefore, the non-detects were qualified as estimated "UJ" and the Aroclor 1260 results were qualified estimated "J".
- EPA SW-846 Method 8270B for samples 990920BIL03SS and 990920BIL05SS exceeded the control limit of 25% for di-n-octylphthalate. Samples were non-detect and therefore qualified as estimated "UJ".

Review of Blanks

The laboratory analyzed one method blank for each analytical batch. No rinse or trip blanks were required for this sampling round. Frequency requirements for method blanks were met. Target analytes in the method blanks were below method reporting limits.

Surrogate Recovery Review

Surrogate recoveries were within project-specific control limits with the following exceptions.

- EPA SW-846 Method 8082 surrogate recoveries for samples 990920BIL06SS, 990920BIL08SS, and 990920BIL09SS were below surrogate control limits for decachlorobiphenyl. Samples 990920BIL06SS and 990920BIL08SS were non-detect and therefore qualified as estimated "UJ". Sample 990920BIL09SS was non-detect for all analytes except Aroclor 1260. Non-detects were qualified as estimated "UJ" and Aroclor 1260 was qualified as estimate "J".
- EPA SW-846 Method 8260B surrogate recoveries for samples 990920BIL03SS, 990921BIL12SS, and samples 990920BIL08SS to 990920BIL10SS exceeded the upper surrogate control limits for bromofluorobenzene. Samples were qualified as estimated "UJ" for non-detects and "J" for detected analytes.

Blank Spike Review

Blank spikes (BS) and if required blank spike duplicates (BSD) were analyzed with each analytical batch, which meets the frequency of five percent. The BS/BSD recoveries were within project-specific control limits with the following exceptions. Methods 8081A, 8151A, and 8270B had BS recoveries that exceeded the upper control limits. However, the associated samples were all non-detect; therefore, no data were qualified.

Matrix Spike/Matrix Spike Duplicate Review

Project-specific matrix spike/matrix spike duplicates (MS/MSD) were analyzed with each analytical batch, which meets the frequency of five percent.

Based on *EPA* Guidelines, no action is taken on MS/MSD organic data alone; therefore, the primary sample will not be qualified due to nonconformance with the organic MS/MSD %Rs. The %Rs were within project-specific control limits for the inorganic methods with the following exceptions.

- EPA SW-846 Method 6010 Copper and Lead were outside the control limits for the MS. A post digest spike was analyzed for copper and lead; recoveries were within required control limits. Copper and Lead were detected for all samples; therefore, samples were qualified as estimated ("J").
- EPA SW-846 Method 6010 SPLP Iron exceeded the upper control limits for the MS. A post digest spike was analyzed; iron recovery was within required control limits. Iron was detected for all samples; therefore, samples were qualified as estimated ("J").

PRECISION

Spike Duplicate Review

The laboratory analyzed blank and/or matrix spike duplicates with each analytical batch; the relative percent differences (RPDs) were within project-specific control limits.

Laboratory Duplicate Review

A laboratory was analyzed for the metal analyses. RPDs were within project-specific control limits with the following exception.

SAMPLE ID	METHOD	ANALYTE	RESULT %RPD	QC LIMIT %RPD
990920BIL06SS	6010	Copper	34.4	20

- Results from a duplicate analysis fell outside the appropriate fixed control window for copper. All associated samples were detected; therefore, the samples were qualified as estimated ("J").

Serial Dilutions Review

One serial dilution was performed on this sample delivery group. The serial dilution was within the control limits of 10% with the following exceptions.

SAMPLE ID	METHOD	ANALYTE	RESULT %RPD	QC LIMIT %RPD
990920BIL06SS	6010	Lead	13.9	10
		Zinc	11.2	

- All associated samples were detected for Lead and Zinc; therefore, the associated data were qualified as estimated ("J").

Field Duplicate Review

One field duplicate was collected during the sampling event. The field duplicate RPDs were within project-specific control limit or less than 500%.

COMPLETENESS

The laboratory reported all requested analyses and the laboratory report is complete. The project completeness goal is 95 percent. For all samples collected and analyzed, no data were judged to be invalid. No data were rejected, so completeness for this sampling event is 100 percent.

The following table summarizes the sample IDs and qualified results for all samples covered by this review:

METHOD	COC ID	ANALYTE	QUALIFIER	ANALYTICAL DEVIATIONS
7740	990920BIL05SS 990920BIL09SS 990920BIL10SS 990920BIL12SS	Selenium	UJ	CCV
6010	990920BIL01SS 990920BIL02SS 990920BIL03SS 990920BIL04SS 990920BIL05SS 990920BIL06SS 990920BIL08SS 990920BIL09SS 990920BIL10SS 990920BIL11SS 990920BIL12SS	Copper, Lead, Zinc	J	Matrix Spike, Laboratory Duplicate, Serial Dilution
6010 SPLP	990920BIL01SS 990920BIL02SS 990920BIL03SS 990920BIL04SS 990920BIL05SS 990920BIL06SS 990920BIL08SS 990920BIL09SS 990920BIL10SS 990920BIL11SS 990920BIL12SS	Iron	J	Matrix Spike
8081A	990920BIL01SS	alpha-BHC	UJ	CCV

METHOD	COC ID	ANALYTE	QUALIFIER	ANALYTICAL DEVIATIONS
	990920BIL02SS 990920BIL03SS 990920BIL04SS 990920BIL05SS 990920BIL06SS	gamma-BHC Heptachlor delta-BHC		
8081A	990920BIL08SS 990920BIL09SS 990920BIL10SS 990920BIL11SS 990920BIL12SS	alpha-BHC 4,4'-DDT	UJ	CCV
8082	990920BIL01SS 990920BIL02SS 990920BIL03SS 990920BIL04SS 990920BIL05SS 990920BIL06SS 990920BIL08SS	Aroclor 1016	UJ	Holding Time, CCVs, Surrogates
		Aroclor 1221	UJ	
		Aroclor 1232	UJ	
		Aroclor 1242	UJ	
		Aroclor 1248	UJ	
		Aroclor 1254	UJ	
		Aroclor 1260	J	
8082	990920BIL09SS 990920BIL10SS 990920BIL11SS 990920BIL12SS	Aroclor 1016	UJ	Holding Time, CCVs, Surrogates
		Aroclor 1221	UJ	
		Aroclor 1232	UJ	
		Aroclor 1242	UJ	
		Aroclor 1248	UJ	
		Aroclor 1254	UJ	
		Aroclor 1260	UJ	
8260B	990920BIL03SS	All analytes except Tetrachloroethene	UJ	Surrogates
		Tetrachloroethene	J	
	990920BIL08SS	All analytes	UJ	
	990920BIL09SS			
	990920BIL10SS			
	990920BIL12SS			
8270B	990920BIL03SS	Di-n-octylphthalate	UJ	CCVs
	990920BIL05SS			

Forty-eight soil samples, six soil duplicate samples, one trip blank, and one equipment rinsate were collected by URS on December 4, 2001 through December 6, 2001 at the Bradford Island site in Cascade Locks, Oregon as part of the Bradford Island Preliminary Assessment and Site Investigation. The analytical results for the soil samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (degree to which the sample represents the environmental condition), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). This review addresses only those problems that affect data usability

The data quality review process followed the procedures outlined in the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, October 1999) and *Inorganic Data Review* (USEPA, February 1994), where applicable. No raw data were reviewed and no results were recalculated.

Samples were collected according to the Sampling and Analysis Plan (SAP) for the Bradford Island Landfill Phase II supplemental site investigation (URS, 2001). Severn Trent Laboratories – Seattle, Inc., (STL) (formerly Sound Analytical Resources, Inc.) located in Tacoma, Washington analyzed the samples for the following parameters:

Method	Analytical Parameter
8260B	Volatile Organic Compounds (VOCs)
8270C	Semivolatile Organic Compounds (SVOCs)
8081A	Organochlorinated Pesticides
8082	Polychlorinated Biphenyls (PCBs)
8151A	Chlorinated Herbicides
6010B/6020	Metals
7470A/7471A	Mercury
North West (NW) TPH-Dx	Total Petroleum Hydrocarbons – Diesel Range (TPH-Dx)
Krone (GC/MS) [(1)]	Organotin compounds

[1]The method is an Ion Trap GC/MS method for organotin compound analysis developed for the Puget Sound Estuary Program.

Table 1 summarizes the sample locations and analyses. Table 2 summarizes qualifiers added to the data. Final sample results and qualifiers are presented in the analytical tables in the Bradford Island Preliminary Assessment and Site Investigation Report.

REPRESENTATIVENESS

Chain-of-Custody and Holding Times

The chain-of-custody (COC) forms indicate that samples were maintained under chain of custody and forms were signed upon release and receipt. All coolers were submitted at temperatures within 4°C± 2°C and all samples were analyzed within the technical and contracted holding time.

STL misidentified several samples during the log in process. All samples with "DSA" in their designation were logged in as "DSH". In addition, the following misidentifications were made:

Laboratory Identification	Correct Identification
01120**4**TRA15SS	01120**6**TRA15SS
01120**4**TRA16SS	01120**6**TRA16SS
01120**5**SBB22SS	01120**6**SBB22SS
01120**5**SBB23SBG	01120**6**SBB23SBG
01120**5**SBB24SBG	01120**6**SBB24SBG
01120**4DSH**20SS	01120**5SBB**20SS

Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank for each analysis and for each batch, per method requirements. Target compounds were detected in the method blanks for SVOC and metals analyses as follows:

- Antimony was detected in the method blanks for sample batches SP127 and SP128. Associated samples with concentrations less than five times the method blank concentration were qualified non-detect at the reported value (U) (Table 2).
- Di-n-butylphthalate and bis(2-ethylhexyl)phthalate were detected in both SVOC method blanks. Associated sample results that were less than ten times the blank concentration were qualified U at the reported quantitation level (Table 2).

One equipment rinsate blank was collected in conjunction with the sandblast building samples and was analyzed for metals, NWTPH-Dx, PCBs, and organotin compounds. The equipment rinsate blank contained TPH-Dx (1.87 mg/L), motor oil (1.99 mg/L), and copper (0.366 mg/L). The equipment rinsate blank also contained eight other metals (barium, calcium, manganese, zinc, antimony, lead, selenium, silver) at concentrations less than the PQL but greater than the

method detection limit. The remaining samples were collected with dedicated equipment; therefore, an equipment blank was not collected in conjunction with the transformer release area or the drum storage area.

One trip blank was analyzed for VOCs. Methylene chloride was detected at 0.292 μg/L and styrene was detected at 0.113 μg/L in the trip blank.

Sample results were not qualified due to equipment rinsate or trip blank contamination.

ACCURACY

Tuning

The instrument tuning frequency and performance were acceptable for all GC/MS analyses (VOCs, SVOCs, organotin compounds).

Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the methods. Initial calibrations (ICAL) and continuing calibrations (CCAL) were analyzed at the proper frequency and at the appropriate concentrations required by the methods. Relative response factors (RRF) were greater than the minimum acceptance limit (0.05) and percent relative standard deviation (%RSD) values were less than the upper acceptance limits except for the following:

- The %RSD for bromomethane and chloroethane in the soil VOC ICAL exceeded the 30% QC limit. All positive sample results associated with the noncompliant standards were qualified as estimated (J). No qualifiers were applied to the compounds reported as undetected.
- The soil VOC CCAL exhibited a percent difference (%D) greater than the QC limit of 25% for 2-hexanone. In addition, the CCAL %D for carbon disulfide, chloromethane, bromomethane, chloroethane, and trichlorofluoromethane in the medium-level analysis of sample 011205SBB20SS were greater than 25%. All sample results associated with the noncompliant standards were qualified as estimated (J/UJ).
- The %RSD for nitrobenzene, benzoic acid, 2,4-dinitrophenol, di-n-butylphthalate, and n-nitrosodimethylamine in the SVOC ICAL exceeded the 30% QC limit. All positive sample results associated with the noncompliant standards were qualified as estimated (J). No qualifiers were applied to the compounds reported as undetected.
- The SVOC CCAL exhibited a %D greater than 25% for bis(2-chloroethyl)ether, bis(2-chloroisopropyl)ether, hexachlorocyclopentadiene, 2,6-dinitrotoluene, di-n-butylphthalate, benzidine, pentachlorophenol, and 2,4,6-trichlorophenol. All sample results associated with the noncompliant standards were qualified as estimated (J/UJ).

- The pesticide CCAL exhibited a %D greater than the QC limit of 15% for delta-BHC and endrin. All sample results associated with the noncompliant standards were qualified as estimated (J/UJ).

Surrogate Recovery Review

Each sample analyzed for organic compounds was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. Several surrogate outliers were noted in the VOC, SVOC, and organotin compound analyses as follows:

- Dibromofluoromethane surrogate recovery for the VOC analysis of the trip blank was greater than the laboratory QC limit. VOCs detected in this sample were qualified as estimated (J) with a potential high bias. No qualifiers were applied to the compounds reported as undetected.
- Several surrogate outliers were noted in the SVOC analyses. No qualifiers were assigned in cases where only one outlier per fraction was noted except for sample 011204DSA13SS. The percent recovery (% Rec) of phenol-d_5 in sample 011204DSA13SS was 0%. All detected acid compounds were qualified as estimated (J) with a potential low bias and the reporting limits for undetected acid compounds were rejected (R).
- The recoveries of two of the three SVOC acid surrogates were lower than the laboratory performance-based criteria in samples 011204DSA10SS and 011204DSA14SS. All acid compounds were qualified as estimated (J/UJ) with a potential low bias.
- The recoveries of two of the three SVOC acid surrogates were lower than the laboratory performance-based criteria and the % Rec for one base/neutral surrogate was 0% in sample 011205SBB20SS. All detected compounds were qualified as estimated (J) with a potential low bias and the reporting limits for undetected compounds were rejected (R).
- The recovery of tripentyltin in the organotin compound analysis of sample 011205SBB18SBG was greater than the QC limit. Detected compounds were qualified as estimated (J) with a potential high bias. No qualifiers were applied to the compounds reported as undetected.
- The recovery of tripentyltin in the organotin compound analyses of samples 011205SBB15SBG and 011205SBB21SS was 0%. All detected compounds were qualified as estimated (J) with a potential low bias and the reporting limits for undetected compounds were rejected (R).

- The recovery of the pesticide surrogate for sample 011204DSA12SS was greater than the laboratory performance-based criteria. Detected compounds were qualified as estimated (J) with a potential high bias. No qualifiers were applied to the compounds reported as undetected.

Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control samples (LCS) are used to monitor the laboratory's day-to-day performance of routine analytical methods, independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. STL analyzed at least one LCS and one MS/MSD (or one MS and one sample duplicate for metals analyses) for each analysis and for each batch per method requirements. Data were evaluated for % Rec of target compounds based on the project-specific QC limits established in the Management Plan.

QC for all LCS was within limits. QC for MS/MSD was within limits with the following exceptions:

- The recoveries of aluminum, chromium, iron, lead, magnesium, and manganese from the MS sample for batch SP227; the recoveries of aluminum and manganese from the MS sample for batch SP228; and the recovery of lead from the MS sample for batch SP229 were greater than 125 percent. Detected concentrations of these metals in their respective sample batches were qualified (J) with a potential high bias.
- The laboratory duplicate relative percent difference (RPD) values for chromium, magnesium, and nickel for batch SP227, aluminum, calcium, magnesium, manganese, and zinc for batch SP228, and the potassium for Batch 229 were greater than 35 percent. Detected concentrations of these metals in their respective sample batches were qualified (J).

PRECISION

Second Column Confirmation

Second column confirmation was performed for all PCB and pesticide results. All PCB sample analyses exhibited an RPD $\leq$ 40%. Second column confirmation for pesticide analyses exceeded 40% RPD for compounds in several samples. The method specifies that the higher of the two results should be reported, however for some compounds, the lower value was reported without explanation. These results were previously qualified as estimated (J) because the sample results were below the laboratory's practical quantitation limit (PQL); therefore, the results were not further qualified.

Duplicate Review

Six field duplicates were collected to verify acceptable field sampling techniques and the representativeness of the sample aliquots. The RPD for primary and field duplicate samples was was calculated when sample results were greater than 5 times the reporting limit. Reported concentrations for duplicate pairs are presented in Table 3 through Table 8. No data were qualified based on field duplicate precision. In general, duplicate precision was acceptable (±50%) with the exception of SVOCs for duplicate samples 011204DSA12SS/011204DSA14SS and metals for duplicate samples 011204TRA06SS/011204TRA08SS. QC exceedances are likely due to the following:

- High levels of target analytes in samples, which require secondary dilutions to bring the concentrations within the linear range of calibration. High dilution factors tend to cause RPD inaccuracies and also result in diluting out the MS analytes.
- Sample heterogeneity
- Primary and field duplicate results at or near the limit of detection tend to have RPDs outside QC limits.

COMPARABILITY

Compound Identification

For most samples, the detected concentrations of TPH-Dx and/or motor oil did "not appear to be typical product." Positive detections of TPH-Dx and/or motor oil were reported for only fourteen of fifty-four samples. Qualitative observations were noted on the laboratory report forms.

Reporting Limits

The sensitivity (i.e., reporting limits) of the analytical methods is driven by the project specific DQOs. Occasionally analyte PQLs were above levels specified in the QAPP. In all cases the method detection limit was below the specified levels. The laboratory reported all detections under the PQL and qualified those results as estimated (J) because the analyte concentrations were less than the lowest calibration standard.

The dilution factors listed on the STL report forms are based on the final volume of the sample or sample extract. They are not a true dilution factor because they do not account for the initial sample aliquot. In addition, a smaller volume of sample or additional dilution of a sample extract was sometimes required in order to bring the sample concentrations within the linear range of calibration. STL combines results for various dilutions on a single report form for each sample. Dilution factors

for individual analytes are listed adjacent to the corresponding analyte and are designated "D" (such as D20 or D10). The samples that required dilution due to elevated concentrations did not meet the requested reporting limits; however, data are not qualified based on high analyte concentrations that require dilution.

COMPLETENESS

The laboratory reported all requested analyses and the deliverable data reports were complete. Completeness is defined as the percentage of usable data out of the total amount of data generated. The project completeness goal is 100 percent. Based on the QA/QC review, the following sample data were qualified as rejected (R):

- All undetected SVOC compounds in sample 011205SBB20SS
- All undetected SVOC acid fraction compounds in sample 011204DSABSS
- All organotin compounds in samples 011205SBB155BG and 011205SBB21SS.

Completeness for the site investigation is greater than 99 percent based on rejection of 4 out of 442 analyses.

Table 1

SAMPLE LOCATION AND ANALYSES SUMMARY

Sample Number (Lab Sample ID)	Sample Date	Lab ID	Site Location	Method Analyses
011204TRA01SS	12-04-01	1	Transformer Release Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011204TRA02SS	12-04-01	7	Transformer Release Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011204TRA03SS	12-04-01	2	Transformer Release Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011204TRA04SS	12-04-01	8	Transformer Release Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011204TRA05SS	12-04-01	4	Transformer Release Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011204TRA06SS	12-04-01	9	Transformer Release Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011204TRA07SS	12-04-01	3	Transformer Release Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011204TRA08SS	12-04-01	10	Duplicate of 011204TRA06SS	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011204TRA09SS	12-04-01	6	Transformer Release Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011204TRA10SS	12-04-01	5	Duplicate of 011204TRA09SS	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011204TRA11SS	12-04-01	11	Transformer Release Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011204TRA12SS	12-04-01	12	Transformer Release Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011204TRA13SS	12-04-01	14	Transformer Release Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011204TRA14SS	12-06-01	13	Transformer Release Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011206TRA15SS	12-06-01	15	Transformer Release Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)

Sample Number (Lab Sample ID)	Sample Date	Lab ID	Site Location	Method Analyses
011206TRA16SS	12-04-01	16	Transformer Release Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011204DSA01SS	12-04-01	18	Drum Storage Area	6010B/6020, 7471A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides);NWTPH-Gx/Dx
011204DSA02SS	12-04-01	20	Drum Storage Area	6010B/6020, 7471A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides);NWTPH-Gx/Dx
011204DSA03SS	12-04-01	17	Drum Storage Area	6010B/6020, 7471A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides);NWTPH-Gx/Dx
011204DSA04SS	12-04-01	19	Drum Storage Area	6010B/6020, 7471A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides);NWTPH-Gx/Dx
011204DSA05SS	12-04-01	21	Drum Storage Area	6010B/6020, 7471A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides);NWTPH-Gx/Dx
011204DSA06SS	12-04-01	22	Drum Storage Area	6010B/6020, 7471A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides);NWTPH-Gx/Dx
011204DSA07SS	12-04-01	23	Drum Storage Area	6010B/6020, 7471A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides);NWTPH-Gx/Dx
011204DSA08SS	12-04-01	24	Drum Storage Area	6010B/6020, 7471A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides);NWTPH-Gx/Dx
011204DSA09SS	12-04-01	25	Drum Storage Area	6010B/6020, 7471A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides);NWTPH-Gx/Dx
011204DSA10SS	12-04-01	26	Drum Storage Area	6010B/6020, 7471A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides);NWTPH-Gx/Dx
011204DSA11SS	12-04-01	27	Drum Storage Area	6010B/6020, 7471A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides);NWTPH-Gx/Dx; Krone GC/MS (organotin)
011204DSA12SS	12-04-01	29	Drum Storage Area	6010B/6020, 7471A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides);NWTPH-Gx/Dx

Sample Number (Lab Sample ID)	Sample Date	Lab ID	Site Location	Method Analyses
011204DSA13SS	12-04-01	28	Duplicate of 011204DSA11SS	6010B/6020, 7471A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides); organotin, NWTPH-Gx/Dx
011204DSA14SS	12-06-01	30	Duplicate of 011204DSA12SS	6010B/6020, 7471A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides);NWTPH-Gx/Dx
Trip Blank-01	12-05-01	32		8260B (VOC)
011205SBB01SBG	12-05-01	33	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB02SBG	12-05-01	34	Duplicate of 011205SBB01SBG	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB03SBG	12-05-01	35	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB04SBG	12-05-01	36	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB05SBG	12-05-01	37	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB06SBG	12-05-01	38	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB07SBG	12-05-01	39	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB08SBG	12-05-01	40	Duplicate of 011205SBB07SBG	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB09SBG	12-05-01	41	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB10SBG	12-05-01	42	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB11SBG	12-05-01	43	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB12SBG	12-05-01	44	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB13SBG	12-05-01	45	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)

Sample Number (Lab Sample ID)	Sample Date	Lab ID	Site Location	Method Analyses
011205SBB14SBG	12-05-01	46	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB15SBG	12-05-01	47	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB16SBG	12-05-01	48	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB17SBG	12-05-01	49	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB18SBG	12-05-01	50	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB19SS	12-05-01	51	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB20SS	12-05-01	31	Sandblast Grit Building Area (Laboratory Identified as 011204DHS20SS)	6010B/6020, 7471A (metals);8260B (VOC); 8270C (SVOC); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011205SBB21SS	12-06-01	52	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
SBB Equipment Blank	12-06-01	53	Water	6010B/6020, 7470A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011206SBB22SS	12-06-01	54	Sandblast Grit Building Area	6010B/7000, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011206SBB23SBG	12-06-01	55	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)
011206SBB24SBG	12-06-01	56	Sandblast Grit Building Area	6010B/6020, 7471A (metals); 8082 (PCBs); NWTPH-Dx; Krone GC/MS (organotin)

TABLE 2
SUMMARY OF DATA QUALIFICATION

QUALIFIED SAMPLE ID[1]	QUALIFIED ANALYTE(S)	QUALIFIER	ANALYTICAL DEVIATIONS
VOC (8260B) - water			
Trip Blank	All detected compounds	J	Surrogate recovery
VOC (8260B) – soil			
All samples analyzed for VOC (except 011205SBB20SS)	Bromomethane Chloroethane	J	ICAL RSD ≥ 30%
	2-hexanone	J/UJ	Low level CCAL %D ≥ 25%
011205SBB20SS	Carbon disulfide Chloromethane Bromomethane Chloroethane Trichlorofluoromethane	J/UJ	Medium level CCAL %D ≥ 25%
SVOC (8270C)			
All samples analyzed for SVOC	Nitrobenzene Benzoic acid 2,4-Dinitrophenol di-n-Butylphthalate n-Nitrosodimethylamine	J	ICAL RSD ≥ 30%
All samples analyzed for SVOC	bis(2-Chloroethyl)ether bis(2-Chloroisopropyl)ether Hexachlorocyclopentadiene 2,6-Dinitrotoluene Di-n-butylphthalate Benzidine Pentachlorophenol 2,4,6-Trichlorophenol	J/UJ (low bias)	CCAL %D ≥ 25%
011204DSA01SS 011204DSA02SS 011204DSA03SS 011204DSA04SS 011204DSA05SS 011204DSA06SS 011204DSA07SS 011204DSA08SS 011204DSA09SS 011204DSA11SS 011204DSA12SS 011204DSA13SS	Di-n-butylphthalate	U (at the PQL) if < PQL UJ (at the reported concentration) if > PQL	Compound detected at < 10X method blank concentration

QUALIFIED SAMPLE ID[1]	QUALIFIED ANALYTE(S)	QUALIFIER	ANALYTICAL DEVIATIONS
011204DSA01SS 011204DSA02SS 011204DSA03SS 011204DSA04SS 011204DSA06SS 011204DSA07SS 011204DSA08SS 011204DSA09SS 011204DSA10SS 011204DSA14SS	bis(2-Ethylhexyl)phthalate	if < PQL, U (at the PQL) if > PQL, UJ (at the reported concentration)	Compound detected at < 10X method blank concentration
011205SBB20SS	All compounds	J/R (low bias)	Low surrogate recovery and 2 surrogate recoveries <10%
011204DSA13SS	All acid compounds	J/R (low bias)	Surrogate recovery <10%
011204DSA10SS 011204DSA14SS	All acid compounds	J/UJ (low bias)	Low surrogate recovery
Pesticides (8081)			
011204DSA01SS 011204DSA02SS 011204DSA03SS 011204DSA04SS 011204DSA05SS	Delta-BHC Endrin	J/UJ	CCAL ≥ 15% D
011204DSA12SS	All detected compounds	J (high bias)	High surrogate recovery
Organotin (Krone GC/MS)			
011205SBB15SBG 011205SBB21SS	All compounds	J/R (low bias)	Surrogate recovery <10%
011205SBB18SBG	All detected compounds	J (high bias)	High surrogate recovery
Metals (6010B)[2]			
All soil samples (Batch SP227)	Chromium, Iron , Magnesium, Manganese, Aluminum	J (high bias)	MS recovery > 125%
All soil samples (Batch SP228)	Aluminum, Manganese		
All soil samples (Batch SP227)	Chromium, Manganese, Nickel	J	Duplicate RPD ≥ 35%
All soil samples (Batch SP228)	Aluminum, Calcium, Magnesium, Manganese, Zinc		
All soil samples (Batch SP229)	Potassium		
Metals (6020)[2]			
011204TRA02SS 011204TRA12SS 011204TRA15SS 011204TRA16SS 011204DSA03SS	Antimony (Batch SP 127)	U	Compound detected at ≤ 5X method blank concentration

QUALIFIED SAMPLE ID[1]	QUALIFIED ANALYTE(S)	QUALIFIER	ANALYTICAL DEVIATIONS
011204DSA01SS 011204DSA02SS 011204DSA06SS 011204DSA07SS 011204DSA08SS 011204DSA09SS 011204DSA10SS 011204DSA12SS 011204DSA14SS 011205SBB01SBG 011205SBB02SBG 011205SBB04SBG 011205SBB05SBG 011205SSBB20SS	Antimony (Batch SP 128)	U	Compound detected at ≤ 5X method blank concentration
All soil samples (Batch SP227)	Lead (224%)	J	MS recovery > 125%
All soil samples (Batch SP229)	Lead (284%)		
Mercury (7470A/7471A)	None	None	None
PCBs (8082)	None	None	None
Herbicides (8151A)	None	None	None
NWTPH-Gasoline Mod.	None	None	None
NWTPH-Diesel Mod.	None	None	None

Notes:
[1]Methods taken from *Northwest Total Petroleum Hydrocarbons* and *SW-846 EPA Test Methods for Evaluating Solid Waste*
[2]Sample batches for metals analyses contain the following samples (refer to Table):

SP227	1-17
SP228	18-31, 33, 34, 36, 37
SP229	35, 38, 39-52, 54-56
TP224	53

CCAL – continuing calibration verification
ICAL – initial calibration
ID - identification
J - The analyte was positively identified; the associated numerical value is an estimate of the concentration of the analyte in the | sample.
% D = percent difference
% Rec – percent recovery
MS– matrix spike
PQL – practical quantitation limit
R - The analyte results are rejected due to serious deficiencies in the ability to analyze the sample and meet the quality control criteria. The presence or absence of the analyte cannot be verified.
RPD – relative percent difference
RSD – relative standard deviation
U – Undetected at the PQL
UJ – estimated PQL

Table 3
SUMMARY OF FIELD DUPLICATE PRECISION

Compound/Analyte[1]	Primary PQL	Dup. PQL	011204TRA10SS (102666-5) Primary Sample	011204TRA09SS (102666-6) Duplicate Sample	RPD (%)[2]
Metals (mg/Kg)					
Aluminum	45.4	47.5	7,710	10,100	**26.8**
Antimony	3.4	3.56	9.08	2.39 J	nc
Arsenic	1.13	1.19	13.5	10.5	**25**
Barium	1.13	1.19	80.1	92.2	**14.1**
Beryllium	0.454	0.475	0.454 U	0.241 J	nc
Cadmium	0.567	0.594	1.6	1.92	nc
Calcium	227	238	4,380	4,840	**10.0**
Chromium	2.27	2.38	249	160	**43.5**
Cobalt	1.13	1.19	13.3	15.1	**12.7**
Copper	2.27	2.38	69.6	66.9	**4.0**
Iron	22.7	23.8	30,100	31,800	**5.5**
Lead	0.567	0.594	550	544	**1.1**
Magnesium	227	238	9,860	9,860	**0**
Manganese	1.13	1.19	531	675	**23.9**
Mercury	0.0475	0.0363	0.0542	0.0802	nc
Nickel	2.27	2.38	117	76.4	**42.0**
Potassium	454	475	350 J	421 J	nc
Selenium	3.4	3.56	3.4 U	0.649 J	nc
Silver	0.567	0.594	0.155 J	0.178 J	nc
Thallium	0.567	0.594	0.0782 J	0.0962 J	nc
Vanadium	1.13	1.19	44.5	52	**15.5**
Zinc	2.27	2.38	238	279	**15.9**
PCBs (µg/Kg)					
Aroclor 1260	12.1	12	36.2	17.3	nc
TPH-Dx (mg/Kg)					
#2 Diesel	29.6	29.6	16.1 J	16.1 J	nc
Motor Oil	59.2	59.2	129	150	nc

[1] - samples were not analyzed for VOCs, SVOCs, herbicides, pesticides, or TPH-gasoline fraction. Organotin compounds were not detected in the sample or duplicate sample above the PQL
[2] – relative percent difference (RPD) was not calculated for analytes detected at less than 5X the PQL.
(µg/Kg) - micrograms per liter
mg/Kg – milligrams per liter
(%) - percent
PCBs – polychlorinated biphenyls
PQL - practical quantitation limits
nc – not calculated
TPH-Dx – total petroleum hydrocarbons-diesel range

Table 4
SUMMARY OF FIELD DUPLICATE PRECISION

Compound/Analyte[1]	Primary PQL	Dup. PQL	011204TRA06SS (102666-9) Primary Sample	011204TRA08SS (102666-10) Duplicate Sample	RPD (%)[2]
Metals (mg/Kg)					
Aluminum	41.6	42	1,840	1,990	**7.8**
Antimony	3.12	3.15	1.59 J	2.69 J	nc
Arsenic	1.04	1.05	5.86	13.6	**79.6**
Barium	1.04	1.05	43.8	36.4	**18.5**
Cadmium	0.52	0.525	1.08	1.45	nc
Calcium	208	210	3,120	2,400	**26.1**
Chromium	2.08	2.1	394	642	**47.9**
Cobalt	1.04	1.05	10.1	13.3	**27.4**
Copper	2.08	2.1	75.7	117	**42.9**
Iron	20.8	21	23,900	44,900	**61.1**
Lead	0.52	0.525	190	355	**60.6**
Magnesium	208	210	13,000	18,600	**35.4**
Manganese	1.04	1.05	311	540	**53.8**
Mercury	0.046	0.0428	0.046 U	0.044	nc
Nickel	2.08	2.1	190	334	**55.0**
Potassium	416	420	147 J	142 J	nc
Selenium	3.12	3.15	0.403 J	3.15 U	nc
Silver	0.52	0.525	0.111 J	0.108 J	nc
Vanadium	1.04	1.5	22.9	25	**8.8**
Zinc	2.08	2.1	122	228	**60.6**
Organotin (µg/Kg)					
Tributyltin	2.83	2.71	2.83 U	427	nc
Dibutyltin	2.13	2.03	2.13U	44.8	nc
Monobutyltin	2.83	2.71	2.83 U	10.5	nc
PCBs (µg/Kg)					
Aroclor 1260	11.1	11.7	61.9	69.6	**11.7**
TPH-Dx (mg/Kg)					
#2 Diesel	27.8	27.9	44.7	34.7	nc
Motor Oil	55.7	55.9	336	266	**23.3**

[1] - samples were not analyzed for VOCs, SVOCs, herbicides, pesticides, or TPH-gasoline fraction
[2] – relative percent difference (RPD) was not calculated for analytes detected at less than 5X the PQL.
(µg/Kg) - micrograms per liter
mg/Kg – milligrams per liter
(%) - percent
PCBs – polychlorinated biphenyls
PQL - practical quantitation limits
nc – not calculated
TPH-Dx – total petroleum hydrocarbons-diesel range

Table 5
SUMMARY OF FIELD DUPLICATE PRECISION

Compound/Analyte[1]	Primary PQL	Dup. PQL	011204DSA11SS (102666-27) Primary Sample	011204DSA13SS (102666-28) Duplicate Sample	RPD (%)[2]
Semivolatile Organic Compounds (µg/Kg)					
Naphthalene	14.4	12.7	24.4	29.3	nc
2-Methylnaphthalene	14.4	12.7	14.4 U	22.9	nc
Acenaphthylene	14.4	12.7	25.9	29.3	nc
Acenaphthene	14.4	12.7	105	158	40.3
Dibenzofuran	144	127	28.7 J	42 J	nc
Fluorene	14.4	12.7	86.2	103	17.8
Phenanthrene	14.4	12.7	938	1,170	22.0
Anthracene	14.4	12.7	269	339	23.0
Di-n-butylphthalate	718	637	816	383 J	nc
Fluoranthene	14.4	12.7	2,070	2,510	19.2
Pyrene	14.4	12.7	2,260	2,700	17.7
Butylbenzylphthalate	144	127	132 J	117 J	nc
Benzo(a)anthracene	28.7	25.5	1,460	1,820	22.0
Chrysene	28.7	25.5	1,460	1,820	22.0
bis(2-Ethylhexyl)phthalate	359	318	18,500	21,700	15.9
Benzofluoranthenes	28.7	25.5	2,540	3,130	20.8
Benzo(a)pyrene	14.4	12.7	1,730	2,360	30.8
Indeno(1,2,3-cd)pyrene	14.4	12.7	895	1,100	20.6
Dibenz(a,h)anthracene	14.4	12.7	363	472	26.1
Benzo(g,h,i)perylene	14.4	12.7	879	1,150	26.7
Carbazole	359	318	138 J	176 J	nc
Metals (mg/Kg)					
Aluminum	43.8	41.7	4,410	5,010	12.7
Antimony	3.28	3.13	4.37	5.78	nc
Arsenic	1.09	1.04	34.3	51.1	39.3
Barium	1.09	1.04	57.4	64.5	11.7
Cadmium	0.547	0.521	1.34	1.5	nc
Calcium	219	208	6,870	7,760	12.2
Chromium	2.19	2.08	1,310	1,420	8.1
Cobalt	1.09	1.04	22.3	25.1	11.8
Copper	2.19	2.08	159	157	1.3
Iron	21.9	20.8	37,400	43,500	15.1
Lead	0.547	0.521	288	399	32.3
Magnesium	219	208	40,200	44,300	9.7
Manganese	1.09	1.04	672	750	11.0
Mercury	0.0381	0.037	0.106	0.0576	nc
Nickel	2.19	2.08	431	522	19.1
Potassium	438	417	423 J	528	nc
Silver	0.547	0.521	0.22 J	0.208 J	nc
Thallium	0.547	0.521	0.547 U	0.0771 J	nc
Vanadium	1.09	1.04	26.9	34	23.3

Compound/Analyte[1]	Primary PQL	Dup. PQL	011204DSA11SS (102666-27) Primary Sample	011204DSA13SS (102666-28) Duplicate Sample	RPD (%)[2]
Zinc	2.19	2.08	497	607	19.9
Pesticides (μg/Kg)					
Endosulfan II	3.97	4.39	3.97 U	0.96 J	nc
Endrin Ketone	3.97	4.39	2.53 J	4.39 U	nc
Organotin (μg/Kg)					
Tributyltin	2.52	2.74	480	338	34.7
Dibutyltin	1.89	2.06	79	69.6	12.7
Monobutyltin	2.52	2.74	51.8	59.3	13.5
PCBs (μg/Kg)					
Aroclor 1260	11	11.6	22.2	19.9	nc
TPH-Dx (mg/Kg)					
#2 Diesel	27.9	28.1	42	140	nc
Motor Oil	55.8	56.2	266	490	59.3

[1] – No TPH-gasoline fraction, VOCs, or herbicides were detected in the samples
[2] – relative percent difference (RPD) was not calculated for analytes detected at less than 5X the PQL.
(μg/Kg) - micrograms per liter
mg/Kg – milligrams per liter
(%) - percent
PCBs – polychlorinated biphenyls
PQL - practical quantitation limits
nc – not calculated
TPH-Dx – total petroleum hydrocarbons-diesel range

Table 6
SUMMARY OF FIELD DUPLICATE PRECISION

Compound/Analyte[1]	Primary PQL	Dup. PQL	011204DSA12SS (102666-29) Primary Sample	011204DSA14SS (012666-30) Duplicate Sample	RPD (%)[2]
Semivolatile Organic Compounds (µg/Kg)					
Naphthalene	1.59	15	158	296	**60.8**
2-Methylnaphthalene	1.59	15	114	186	**48.0**
Acenaphthylene	1.59	15	49.4	126	**87.3**
Acenaphthene	1.59	15	366	573	**44.1**
Dibenzofuran	15.9	150	103	179	**53.9**
Fluorene	1.59	15	334	591	**55.6**
Phenanthrene	1.59	15	2,790	3,250	**15.2**
Anthracene	1.59	15	693	951	**31.4**
Di-n-butylphthalate	79.5	750	193	750 U	nc
Fluoranthene	1.59	15	2,460	2,760	**11.5**
Pyrene	1.59	15	3,190	3,780	**16.9**
Butylbenzylphthalate	15.9	150	15.7 J	150 U	nc
Benzo(a)anthracene	3.18	30	1,160	1,490	**24.9**
Chrysene	3.18	30	1,590	1,650	**3.7**
bis(2-Ethylhexyl)phthalate	39.7	375	1,500	440	**109**
Di-n-octylphthalate	15.9	150	31	150 U	nc
Benzofluoranthenes	3.18	30	1,870	1,830	**2.2**
Benzo(a)pyrene	1.59	15	1,530	1,630	**6.3**
Indeno(1,2,3-cd)pyrene	1.59	15	547	546	**0.2**
Dibenz(a,h)anthracene	1.59	15	1.59 U	216	nc
Benzo(g,h,i)perylene	1.59	15	572	545	**4.8**
Carbazole	39.7	375	213	267 J	nc
Metals (mg/Kg)					
Aluminum	43.5	42.2	10,400	8,280	**22.7**
Antimony	3.27	3.17	1.21 J	1.26 J	nc
Arsenic	1.09	1.06	6.14	7.83	**24.2**
Barium	1.09	1.06	89	75.7	**16.2**
Beryllium	0.435	0.422	0.24 J	0.231 J	nc
Cadmium	0.544	0.528	1.31	1.14	nc
Calcium	218	211	4,770	4,450	**6.9**
Chromium	2.18	2.11	44.4	53.2	**18.0**
Cobalt	1.09	1.06	12.7	12.4	**2.4**
Copper	2.18	2.11	41.1	44.6	**8.2**
Iron	21.8	21.1	21,800	22,500	**3.2**
Lead	0.544	0.528	151	137	**9.7**
Magnesium	218	211	5,500	5,700	**3.6**
Manganese	1.09	1.06	457	471	**3.0**
Mercury	0.0402	0.036	0.0297 J	0.048	nc
Nickel	2.18	2.11	34.5	32.1	**7.2**
Potassium	435	422	720	648	**10.5**
Selenium	3.27	3.17	3.27 U	0.424 J	nc

Compound/Analyte[1]	Primary PQL	Dup. PQL	011204DSA12SS (102666-29) Primary Sample	011204DSA14SS (012666-30) Duplicate Sample	RPD (%)[2]
Silver	0.544	0.528	0.151 J	0.174 J	nc
Thallium	0.544	0.528	0.102 J	0.0918 J	nc
Vanadium	1.09	1.06	56	49.1	**13.1**
Zinc	2.18	2.11	90.5	103	**12.9**
Pesticides (µg/Kg)					
4,4'-DDE	2.32	2.25	2.58	2.3	nc
4,4'-DDT	2.32	2.25	26.4	17.9	**38.4**
Endrin Ketone	2.32	2.25	4.58	2.64	nc
Organotin (µg/Kg)					
Tributyltin	2.52	2.74	480	338	**34.7**
Dibutyltin	1.89	2.06	79	69.6	**12.7**
Monobutyltin	2.52	2.74	51.8	59.3	**13.5**
PCB (µg/Kg)					
Aroclor 1260	11.4	11.4	8.67 J	7.92 J	nc
TPH-Dx (mg/Kg)					
#2 Diesel	29.3	28.6	43.9	58.7	nc
Motor Oil	58.6	57.3	102	127	nc

[1] - no TPH-gasoline fraction, VOCs, or herbicides were detected in the samples
[2] – relative percent difference (RPD) was not calculated for analytes detected at less than 5X the PQL.
(µg/Kg) - micrograms per liter
mg/Kg – milligrams per liter
(%) - percent
PCBs – polychlorinated biphenyls
PQL - practical quantitation limits
nc – not calculated
TPH-Dx – total petroleum hydrocarbons-diesel range

Table 7
SUMMARY OF FIELD DUPLICATE PRECISION

Compound/Analyte[1]	Primary PQL	Dup. PQL	011205SBB01SBG (102666-33) Primary Sample	011205SBB02SBG (102666-34) Duplicate Sample	RPD (%)[2]
Metals (mg/Kg)					
Aluminum	42.1	49.6	2,310	2,610	**12.2**
Antimony	3.16	3.72	1.35 J	0.788 J	nc
Arsenic	1.05	1.24	1.9	2.84	nc
Barium	1.05	1.24	21.3	23.5	**9.8**
Cadmium	0.527	0.62	0.705	0.728	nc
Calcium	211	248	1,730	1,950	**12.0**
Chromium	2.11	2.48	1,130	1,300	**14.0**
Cobalt	1.05	1.24	25.6	24.3	**5.2**
Copper	2.11	2.48	27	37.3	**32.0**
Iron	21.1	24.8	30,700	33,900	**9.9**
Lead	0.527	0.62	120	127	**5.7**
Magnesium	211	248	40,300	46,700	**14.7**
Manganese	1.05	1.24	481	537	**11.0**
Nickel	2.11	2.48	1,080	950	**12.8**
Potassium	421	496	138 J	138 J	nc
Silver	0.527	0.62	0.059 J	0.0744 J	nc
Thallium	0.527	0.62	0.0622 J	0.62 U	nc
Vanadium	1.05	1.24	21.4	20.7	**3.3**
Zinc	2.11	2.48	74.9	93.3	**21.9**
PCBs (µg/Kg)					
Aroclor 1260	11.7	12	7.24 J	5.63 J	nc
TPH-Dx (mg/Kg)					
#2 Diesel	29	29.4	61	127	nc
Motor Oil	58.1	58.7	358	417	**15.2**

[1] - samples were not analyzed for VOCs, SVOCs, herbicides, pesticides, or TPH-gasoline fraction. Organotin compounds were not detected in the sample or duplicate sample above the PQL
[2] – relative percent difference (RPD) was not calculated for analytes detected at less than 5X the PQL.
(µg/Kg) - micrograms per liter
mg/Kg – milligrams per liter
(%) - percent
PCBs – polychlorinated biphenyls
PQL - practical quantitation limits
nc – not calculated
TPH-Dx – total petroleum hydrocarbons-diesel range

Table 8
SUMMARY OF FIELD DUPLICATE PRECISION

Compound/Analyte[1]	Primary PQL	Dup. PQL	011205SBB07SBG (102666-39) Primary Sample	011205SBB08SBG (102666-40) Duplicate Sample	RPD (%)[2]
Metals (mg/Kg)					
Aluminum	54.9	45.6	7,350	7,890	**7.1**
Antimony	4.12	3.42	3.12 J	2.08 J	nc
Arsenic	1.37	1.14	4.6	5.64	nc
Barium	1.37	1.14	70.2	71.5	**1.8**
Beryllium	0.549	0.456	0.549 U	0.218 J	nc
Cadmium	0.687	0.571	1.1	0.979	nc
Calcium	275	228	5,470	4,640	**16.4**
Chromium	2.75	2.28	127	126	**0.8**
Cobalt	1.37	1.14	12.3	11.5	**6.7**
Copper	2.75	2.28	56.2	56.1	**0.2**
Iron	27.5	22.8	21,900	21,700	**0.9**
Lead	0.687	0.571	124	114	**8.4**
Magnesium	275	228	6,340	6,010	**5.3**
Manganese	1.37	1.14	407	376	**7.9**
Mercury	0.0476	0.0466	0.0476 U	0.0461 J	nc
Nickel	2.75	2.28	107	80.6	**28.1**
Potassium	549	456	554	647	nc
Selenium	4.12	3.42	0.674 J	0.637 J	nc
Silver	0.687	0.571	0.155 J	0.13 J	nc
Thallium	0.687	0.571	0.111 J	0.0913 J	nc
Vanadium	1.37	1.14	45	50.4	**11.3**
Zinc	2.75	2.28	109	105	**3.7**
PCBs (µg/Kg)					
Aroclor 1260	13.4	13	3.32 J	8.25 J	nc
TPH-Dx (mg/Kg)					
#2 Diesel	35.3	31.6	20.7 J	23.5 J	nc
Motor Oil	70.5	63.3	93.5	118	nc

[1] - samples were not analyzed for VOCs, SVOCs, herbicides, pesticides, or TPH-gasoline fraction. Organotin compounds were not detected in the sample or duplicate sample above the PQL
[2] – relative percent difference (RPD) was not calculated for analytes detected at less than 5X the PQL.
(µg/Kg) - micrograms per liter
mg/Kg – milligrams per liter
(%) - percent
PCBs – polychlorinated biphenyls
PQL - practical quantitation limits
nc – not calculated
TPH-Dx – total petroleum hydrocarbons-diesel range

Nine primary soil samples and one field duplicate sample were collected by URS Corporation (URS) on November 20, 2002 at the Bradford Island site in Cascade Locks, Oregon as part of the Bradford Island Bulb Slope Investigation. The analytical results were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness, accuracy, field and analytical precision, comparability, and completeness. Representativeness refers to the degree to which sample data accurately and precisely describe the characteristics of a population of samples, parameter variations at a sampling point, or environmental conditions, and in part, is evaluated by examining chain-of-custody documentation and verifying that sample analyses were performed within allowable holding times. Accuracy is evaluated by assessing the analytical results for blanks, surrogates, matrix spike/matrix spike duplicates (MS/MSDs), and laboratory control samples (LCS) to determine analytical bias. Precision is evaluated by comparison of results for primary, field duplicate, and laboratory duplicate analyses. Comparability is a qualitative objective of the data, expressing confidence with which one data set can be compared with another. Completeness is evaluated by calculating the percentage of acceptable data. This review addresses only those problems that potentially affect data usability.

The data quality review process followed the procedures outlined in the *United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, October 1999) and *Inorganic Data Review* (USEPA, February 1994), where applicable. No raw data were reviewed and no results were recalculated.

Samples were collected according to the Sampling and Analysis Plan (SAP) for the Bradford Island Landfill Phase II Supplemental Site Investigation (URS, 2001) and the Bulb Slope Investigation Phase II Supplemental Site Investigation Sampling and Analysis Plan Addendum (URS, 2002). Analytical Resource, Incorporated (ARI) of Tukwila, Washington analyzed the samples for the following parameters:

Method	Analytical Parameter
USEPA SW-846 6010B	Total Lead
USEPA SW-846 7471A	Total Mercury
USEPA SW-846 8082	Polychlorinated biphenyls (PCBs)
NWTPH-Dx	Diesel and Heavy Oil Range Organics
USEPA SW-846 9060M	Total Organic Carbon (TOC)

The laboratory sample group associated with this review is EZ88. Final sample results are presented in the analytical tables in the main body of the report. No data required qualification.

REPRESENTATIVENESS

Chain-of-Custody and Holding Times

The chain-of-custody (COC) forms indicate that samples were maintained under chain of custody and forms were signed and dated upon release and receipt. The following was noted by the laboratory upon sample receipt:

- The metals sample container for sample 021120BSC01SS and the diesel sample container for sample 021120BSC08SS arrived at the laboratory with broken lids. The containers were individually sealed in ziplock bags and the lids were replaced by the laboratory upon receipt. Data were not qualified.

All coolers were submitted at temperatures within 4°C± 2°C and all samples were analyzed within the technical and contractual holding time.

Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank per analytical batch, per method requirements. Target compounds were not detected in the method blanks.

Equipment rinsate blanks were not collected for the sampling conducted at the Bulb Slope area because the samples were collected using dedicated sampling equipment.

ACCURACY

Surrogate Recovery Review

Samples analyzed for organics were spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. Surrogate recoveries were within project-specific quality control criteria.

Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control samples (LCS) are used to monitor the laboratory's day-to-day performance of routine analytical methods, independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. ARI analyzed at least one LCS and one MS/MSD (or one MS and matrix duplicate for metals analyses) for each analysis and for each batch, per method requirements. Data were evaluated for percent recovery of target compounds based on the project-specific QC limits. All LCS and MS/MSD results were within project-specific control limits.

PRECISION

Laboratory Duplicate Review

One site-specific laboratory duplicate (i.e., matrix duplicate) was analyzed for metals per analytical batch. The relative percent differences (RPDs) were with project-specific control limits.

Field Duplicate Review

One field duplicate was collected to verify acceptable field sampling techniques and the representativeness of the sample aliquots. The RPD for primary and field duplicate samples was calculated when sample results were greater than 5 times the reporting limit. Field duplicate precision was acceptable (i.e., within ±50% RPD) with the exception listed in the table below.

SAMPLE ID/ DUPLICATE ID	ANALYTE	PRIMARY RESULT	DUPLICATE RESULT	RELATIVE PERCENT DIFFERENCE
021120BSC02SS/ 021120BSC03SS	Diesel Range Organics	24 mg/kg	12 mg/kg	67%

Data were not qualified as a result of this apparent sample heterogeneity.

COMPARABILITY

Reporting Limits

The sensitivity (i.e., reporting limits) of the analytical methods is driven by the project specific DQOs. The laboratory attained all requested reporting limits with the following exceptions. Analysis of PCB Aroclor 1254 for samples 021120BSA04SS and 021120BSB06SS exhibited elevated reporting limits of 54 μg/kg and 33 μg/kg, respectively, due to background interference. The requested reporting limit was 20 μg/kg. In both bases the method detection limit was below the specified level. Data were not qualified.

COMPLETENESS

The laboratory reported all requested analyses and the deliverable data reports were complete. Completeness is defined as the percentage of usable data out of the total amount of data generated. The project completeness goal of 100 percent was attained because no data were rejected.

Sixty-two primary soil samples, two primary wood samples, eight soil duplicate samples, and four equipment rinsates were collected by URS Corporation (URS) on November 19 and 21, 2002 at the Bradford Island site in Cascade Locks, Oregon as part of the Bradford Island Preliminary Assessment and Site Investigation at the former pistol range area. The analytical results were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness, accuracy, field and analytical precision, comparability, and completeness. Representativeness refers to the degree to which sample data accurately and precisely describe the characteristics of a population of samples, parameter variations at a sampling point, or environmental conditions, and in part, is evaluated by examining chain-of-custody documentation and verifying that sample analyses were performed within allowable holding times. Accuracy is evaluated by assessing the analytical results for blanks, surrogates, matrix spike/matrix spike duplicates (MS/MSDs), and laboratory control samples (LCS) to determine analytical bias. Precision is evaluated by comparison of results for primary, field duplicate, and laboratory duplicate analyses. Comparability is a qualitative objective of the data, expressing confidence with which one data set can be compared with another. Completeness is evaluated by calculating the percentage of acceptable data. This review addresses only those problems that potentially affect data usability.

The data quality review process followed the procedures outlined in the *United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, October 1999) and *Inorganic Data Review* (USEPA, February 1994), where applicable. No raw data were reviewed and no results were recalculated.

Samples were collected according to the Sampling and Analysis Plan (SAP) for the Bradford Island Landfill Phase II Supplemental Site Investigation (URS, 2001). Analytical Resources, Incorporated (ARI) of Tukwila, Washington analyzed the samples for the following parameters:

Method	Analytical Parameter
USEPA SW-846 8270C	Pentachlorophenol
USEPA SW-846 6010B	Total Metals – Lead, Copper, Zinc, Nickel, Arsenic, Selenium, Antimony
USEPA SW-846 7470A/7471A	Total Mercury
USEPA SW-846 1311/6010B	TCLP Lead

Laboratory sample groups associated with this review are EZ89, EZ90, EZ91, FA19, and FA20. Final sample results and associated qualifiers are presented in the analytical tables in the main body of the report. Table 1 summarizes the qualifiers added to the data as a result of the data review.

REPRESENTATIVENESS

Chain-of-Custody and Holding Times

The chain-of-custody (COC) forms indicate that samples were maintained under chain of custody and forms were signed and dated upon release and receipt with the following two exceptions.

- Page 2 of the COC form associated with sample group FA20 was not dated upon release. However, page 1 (associated with sample group FA19) was dated upon release on November 24, 2002. Both COC pages were signed and dated upon receipt at the laboratory on November 26, 2002. Data were not qualified as a result of this nonconformance.
- Page 3 of the COC form associated with sample group EZ91 was not signed upon receipt by the laboratory for samples collected on November 19, 2002. However, pages 1 and 2 (associated with sample groups EZ89 and EZ90, respectively), were signed upon receipt and dated on November 22, 2002. In addition, the laboratory cooler receipt form for sample group EZ91 was signed and dated on November 22, 2002. Data were not qualified as a result of this nonconformance.

The following sample identification discrepancy was noted by the laboratory during the sample log-in process.

- Two samples were mislabeled on the COC form. The samples labeled 021121PFR74SS and 021121PFR75SS on the COC were labeled 021121PFR74WD and 021121PFR75WD on the sample containers. The laboratory used the correct sample IDs as listed on the sample containers. Data were not qualified as a result of this discrepancy.

All coolers were submitted at temperatures within 4°C$\pm$ 2°C and all samples were analyzed within the technical and contractual holding time.

Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank per analytical batch, per method requirements. One target compounds was detected in one of the method blanks as follows:

- Zinc was detected in the method blank associated with rinsate blanks in sample group EZ91. Associated samples were non-detect for zinc. No data were qualified.

Four equipment rinsate blanks were collected in conjunction with the soil sampling at the pistol range and were analyzed for total metals (copper, lead, mercury, nickel, and zinc). These analytes were not detected in the rinsate blanks.

Equipment rinsate blanks were not collected for the wood sampling conducted at the pistol range area because the samples were collected using dedicated equipment.

ACCURACY

Surrogate Recovery Review

Each sample analyzed for pentachlorophenol was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. Surrogate recoveries were within project-specific criteria.

Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control samples (LCS) are used to monitor the laboratory's day-to-day performance of routine analytical methods, independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. ARI analyzed at least one LCS and one MS/MSD (or one MS and one matrix duplicate for metals analyses) for each analysis and for each batch per method requirements with one exception. An MS/MSD was not analyzed for the two wood samples, 021121PFR74WD and 021121PFR75WD, due to limited sample volume. All other QC was within control limits; data were not qualified.

Data were evaluated for percent recovery of target compounds based on the project-specific criteria. All LCS and MS/MSD results were within project-specific control limits with the following exception.

- The matrix spike recovery of antimony for sample 021121PFR51SS was below the project-specific criteria of 75% to 125% at 54.5%. Associated sample results were non-detect for antimony and were qualified as estimated and flagged with a "UJ".

PRECISION

Laboratory Duplicate Review

One site specific laboratory duplicate was analyzed for metals per analytical batch. The relative percent differences (RPDs) were with project-specific control limits with one exception.

- The laboratory duplicate analysis of nickel for sample 021119PFR10SS exhibited an RPD above the project-specific control limit of 25%, at 37%. Associated sample results were qualified as estimated and flagged with a "J".
- The laboratory duplicate analysis of copper for sample 021121PFR51SS exhibited an RPD above the project-specific control limit of 25%, at 31.4%. Associated sample results were qualified as estimated and flagged with a "J".

Field Duplicate Review

Eight field duplicates were collected to verify acceptable field sampling techniques and the representativeness of the sample aliquots. The RPD for primary and field duplicate samples was calculated when sample results were greater than 5 times the reporting limit. Field duplicate precision was acceptable (i.e., within ±50% RPD).

COMPARABILITY

Reporting Limits

The sensitivity (i.e., reporting limits) of the analytical methods is driven by the project specific DQOs. All reporting limits are below selected benchmark values.

COMPLETENESS

The laboratory reported all requested analyses and the deliverable data reports were complete. Completeness is defined as the percentage of usable data out of the total amount of data generated. The project completeness goal of 100 percent was attained because no data were rejected.

Based on the QA/QC review, some sample results were qualified as estimated and flagged with a 'J'. Qualified data are summarized in Table 1.

TABLE 1
SUMMARY OF DATA QUALIFICATION

QUALIFIED SAMPLE ID	QUALIFIED ANALYTE(S)	QUALIFIER	ANALYTICAL DEVIATIONS
Metals			
021119PFR01SS 021119PFR02SS 021119PFR03SS 021119PFR04SS 021119PFR05SS 021119PFR06SS 021119PFR07SS 021119PFR08SS 021119PFR09SS 021119PFR10SS	Nickel	J	Laboratory Duplicate RPD ≥ 25%
021121PFR03SS 021121PFR48SS 021121PFR49SS 021121PFR50SS 021121PFR51SS	Copper	J	Laboratory Duplicate RPD ≥ 25%
021121PFR03SS 021121PFR48SS 021121PFR49SS 021121PFR50SS 021121PFR51SS	Antimony	UJ	Matrix Spike Recovery < 75%

Notes:
J - The analyte was positively identified; the associated numerical value is an estimate of the concentration of the analyte in the sample.
UJ – The analyte was not detected. The reported quantitation limit is an estimate.
RPD – relative percent difference

Eight groundwater samples, one duplicate sample, and two trip blanks were collected by URS on May 1, 2002 through May 3, 2002 at the Bradford Island Landfill in Cascade Locks, Oregon as part of the Bradford Island Site Characterization. The analytical results for the groundwater samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (degree to which the sample represents the environmental condition), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). This review addresses only those problems that affect, or could potentially affect, data usability.

The data quality review process followed the procedures outlined in the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, October 1999) and *Inorganic Data Review* (USEPA, February 1994), where applicable. Raw data were not reviewed (with the exception of internal standards) and results were not recalculated.

Samples were collected according to the Sampling and Analysis Plan (SAP) for the Bradford Island Landfill Site Characterization (URS, 2001). Severn Trent Laboratories – Seattle, Inc., (STL) (formerly Sound Analytical Resources, Inc.) located in Tacoma, Washington analyzed the samples for the following parameters:

Method	Analytical Parameter
8260B	Volatile Organic Compounds (VOCs)
8270C	Semivolatile Organic Compounds (SVOCs)
8081A	Chlorinated Pesticides
8082	Polychlorinated Biphenyls (PCBs)
8151A by GC/MS	Chlorinated Herbicides
6010B/6020	Metals
7470A	Mercury
Northwest (NW) TPH-Gx and Dx	Total Petroleum Hydrocarbons (TPH) – Gasoline Range (Gx) and Diesel Range (Dx)
Krone (GC/MS) [(1)]	Organotin compounds

[1]The method is an Ion Trap GC/MS method for organotin compound analysis developed for the Puget Sound Estuary Program.

Table 1 summarizes the sample locations and analyses. Table 2 summarizes qualifiers added to the data. Final sample results and qualifiers are presented in the analytical tables in the Bradford Island Preliminary Assessment and Site Investigation Report.

REPRESENTATIVENESS

Chain-of-Custody and Holding Times

The chain-of-custody (COC) forms indicate that the samples were maintained under chain of custody and the COC forms were signed upon release and receipt. All coolers were submitted at temperatures within 4°C± 2°C and all samples were analyzed within the technical and contracted holding times.

Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank for each analysis and for each batch, per method requirements. Target compounds were detected in the method blanks for SVOC and metals analyses as follows:

- Antimony, barium, chromium, copper, lead, manganese, nickel, silver, and zinc were detected in the method blanks for samples analyzed by Method 6020 (ICP-MS). Associated samples with detected analyte concentrations less than five times the analyte concentrations in the method blank were qualified non-detect (U) at the reported value as shown in Table 2.
- Di-n-octylphthalate was detected in the SVOC method blank. Di-n-octylphtalate was also detected in three samples, but at concentrations that were greater than ten times the blank concentration; therefore, no data required qualification (Table 2).

The samples were collected with dedicated equipment; therefore, an equipment blank was not required.

Two trip blanks were analyzed for VOCs. Acetone was detected at 2.99 µg/L in one trip blank. Acetone was also detected in two (020503BIL09GW, 020503BIL10GW) of the five samples associated with this trip blank at concentrations less than 10 times the trip blank concentration. Primary samples are not qualified based on trip blank concentrations because the effect of trip blank contaminant concentrations on primary sample concentrations is unknown.

ACCURACY

Tuning

The instrument tuning frequency and performance were acceptable for all GC/MS analyses (VOCs, SVOCs, organotin compounds, and herbicides).

Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the methods. Initial calibrations (ICAL) and continuing calibrations (CCAL) were analyzed at the proper frequency and at the appropriate concentrations required by the methods. RRF were greater than the minimum acceptance limit (0.05) and percent relative standard deviation (%RSD) values were less than the upper acceptance limits except for the following:

- The RRF for 2-butanone in the VOC ICAL and CCAL was less than 0.05. 2-Butanone was qualified as estimated (J) in samples when it was detected and rejected (R) in samples when it was not detected.

Surrogate Recovery Review

Each sample analyzed for organic compounds was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. Surrogate outliers were noted in the SVOC, pesticide, and organotin compound analyses as follows:

- Surrogate recoveries did not meet QC criteria for several samples analyzed for SVOCs. No qualifiers were assigned in cases where only one outlier per fraction was noted. In sample 020501BIL01GW the recoveries of two surrogates, nitrobenzene-d5 (48.5%) and 2-fluorobiphenyl (40.6%), were lower than the QC limits (50% and 55% respectively). All detected base-neutral compounds were qualified as estimated (J) with a potential low bias and all undetected base-neutral compounds were qualified UJ.
- The recovery of tripentyltin (161%) in the organotin compound analysis of sample 020501BIL03GW was greater than the QC limit (144%). Detected compounds were qualified as estimated (J) with a potential high bias. No qualifiers were applied to the compounds reported as undetected, per the validation guidelines.
- The recoveries of tetrachloro-m-xylene in the pesticides analyses of seven samples were less than the laboratory performance-based criteria; however, no pesticide compounds were detected in these seven samples. Based on low surrogate recovery,

pesticide compounds were qualified as undetected estimated (UJ) with a potentially low bias.

Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control samples (LCS) are used to monitor the laboratory's day-to-day performance of routine analytical methods, independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. STL analyzed at least one LCS and one MS/MSD (or one MS and one sample duplicate for metals analyses) for each analysis and for each batch per method requirements. Data were evaluated for percent recovery of target compounds based on the project-specific QC limits established in the Sampling and Analysis Plan.

QC for all LCS was within limits. QC for MS/MSD was within limits with the following exception:

- Recoveries of two SVOCs (phenol and 4-nitrophenol) were 0% in the MS of sample 020503BIL08GW and only slightly above 10% in the MSD. Phenol was detected in the parent sample and is qualified as estimated (J). 4-nitrophenol was undetected in the parent sample and is qualified as rejected (R).

PRECISION

Second Column Confirmation

Second column confirmation was performed for all PCB and pesticide analyses. No PCBs were detected in the samples. Two pesticide compounds were detected in one sample (020502BIL05GW). Second column confirmation exceeded 40% RPD for these two compounds; therefore the results were qualified as estimated (J).

Duplicate Review

One field duplicate was collected to verify acceptable field sampling techniques and the representativeness of the sample aliquots. The RPD for primary and field duplicate samples was calculated only when sample results were greater than 5 times the reporting limit because analytes detected at less than 5 times the reporting limit are expected to have higher RPD values. Reported concentrations for duplicate pairs are presented in Table 3. Duplicate precision was acceptable (±50%) and no data were qualified.

COMPARABILITY

Compound Identification

According to the laboratory, the detected concentrations of TPH-Dx and/or motor oil in some samples did "not appear to be typical product." Qualitative observations were noted on the laboratory report forms with an "X" qualifier.

Reporting Limits

The sensitivity (i.e., reporting limits) of the analytical methods is driven by the project specific DQOs. Occasionally analyte PQLs were above the regulatory levels specified in the Sampling Plan. In all cases the method detection limit was below the specified levels. The laboratory reported all detections under the PQL and qualified those results as estimated (J) because the analyte concentrations were less than the lowest calibration standard.

SVOC concentrations for samples 020501BIL04GW, 020503BIL07GW, and 020503BIL08GW were reported from ten-fold dilutions due to high concentrations of phthalate esters and non-target analytes.

COMPLETENESS

The laboratory reported all requested analyses and the deliverable data reports were complete with the exception of CCAL summary sheets for SVOC analysis. Completeness is defined as the percentage of usable data out of the total amount of data generated. The project completeness goal is 100 percent. The following compound data were qualified as rejected (R):

- Undetected 2-butanone in all samples analyzed for VOCs
- Undetected 4-nitrophenol in sample 020503BIL08GW.

Completeness for the site investigation is approximately 100 percent based on the QA/QC review and satisfactory completion of 96 sample analyses.

OVERALL ASSESSMENT

All deliverables required by the project are present and the data packages are complete. All performance indicators reviewed are within specified limits with the exceptions indicated in the review report. Data qualifiers were applied to VOCs, SVOCs, pesticides, organotin compounds, and metals. Data for analyses of herbicides, PCBs, NWTPH-Gx, NWTPH-Dx, mercury, and iron are acceptable as reported. Overall, the data quality is sufficient for the intended purposes.

Table 1
SAMPLE LOCATION AND ANALYSES SUMMARY

Sample Number (Lab Sample ID)	Sample Date(s)	Lab ID	Site Location	Analytical Method
020501BIL01GW	5-01-02	105682-2 105690-1	MW-8	6010B/6020, 7470A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides); organotin, NWTPH-Gx/Dx
020501BIL02GW	5-01-02, 5-02-02	105682-4 105690-2 105690-3	MW-1	
020501BIL03GW	5-01-02	105682-1	MW-2	
020501BIL04GW	5-01-02, 5-02-02 5-03-02	106682-3 105681-2 105681-3 105722-4	MW-9	6010B/6020, 7470A (metals); 8260B (VOC); 8270C (SVOC);); NWTPH-Gx/Dx
020502BIL05GW	5-02-02	105682-6 105681-1	MW-3	6010B/6020, 7470A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides); organotin, NWTPH-Gx/Dx
020503BIL06GW	5-03-02	105727-2 105725-3	MW-4	
020503BIL07GW	5-03-02	105727-1 105725-2	MW-4 Field Duplicate	
020503BIL08GW	5-03-02	105721-1 105725-4 105724-1	MW-6	
020503BIL08GW MS/MSD	5-03-02	105721-1 105725-4 105724-1	MW-6 MS/MSD	6010B/6020, 7470A (metals); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides); organotin, NWTPH-Dx
020503BIL09GW	5-03-02	105725-5 105722-1	MW-5	6010B/6020, 7470A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides); organotin, NWTPH-Gx/Dx
020503BIL09GW MS/MSD	5-03-02	105725-5 105722-1	MW-5 MS/MSD	8260B (VOC): NWTPH-Gx
020503BIL10GW	5-03-02	105725-1	MW-7	6010B/6020, 7470A (metals);8260B (VOC); 8270C (SVOC); 8081A (pesticides); 8082 (PCBs); 8151A (herbicides); organotin, NWTPH-Gx/Dx
Trip Blank	5-03-02	105682-5	Trip Blank	8260B (VOC)
Trip Blank	5-04-02	105725-6	Trip Blank	8260B (VOC)

Table 2
SUMMARY OF DATA QUALIFICATION

QUALIFIED SAMPLE ID[1]	QUALIFIED ANALYTE(S)	QUALIFIER	ANALYTICAL DEVIATIONS
VOC (8260B)			
020501BIL01GW 020501BIL02GW 020501BIL03GW 020501BIL04GW 020502BIL05GW 020503BIL06GW 020503BIL07GW 020501BIL08GW 020503BIL09GW	2-Butanone	R (undetected)	ICAL RRF <0.05 CCAL RRF < 0.05
SVOC (8270C)			
020501BIL01GW	All base-neutral compounds	J/UJ (low bias)	Two low surrogate recoveries, (base-neutral fraction)
020501BIL08GW	Phenol	J (detected) R (undetected)	Matrix spike recovery 0% and low matrix spike duplicate recovery
	4-Nitrophenol		
Pesticides (8081)			
020501BIL01GW 020501BIL02GW 020501BIL03GW 020503BIL06GW 020503BIL07GW 020503BIL08GW 020503BIL09GW	All pesticide compounds	UJ (low bias)	Low surrogate recovery
020502BIL05GW	4,4'-DDE Dieldrin	J	Second column confirmation RPD ≥ 40%
Organotin (Krone GC/MS)			
020501BIL03GW	Monobutyltin Dibutyltin Tributyltin Tetrabutyltin	J detects (high bias)	High surrogate recovery
Metals (6020)			
020501BIL03GW	Silver	U at the reported concentration	Analyte detected at ≤ 5X method blank concentration
020501BIL04GW			
020502BIL05GW	Antimony, chromium, lead, silver		
020503BIL09GW	Chromium, lead, silver		

Notes:
[1]Methods taken from *Northwest Total Petroleum Hydrocarbons* and *SW-846 EPA Test Methods for Evaluating Solid Waste*
CCAL- continuing calibration verification
ICAL - initial calibration
ID - identification
J - The analyte was positively identified; the associated numerical value is an estimate of the concentration of the analyte in the sample.
% D = percent difference
% Rec - percent recovery
MS - matrix spike
PQL - practical quantitation limit
R - The analyte results are rejected due to serious deficiencies in the ability to analyze the sample and meet the quality control criteria. The presence or absence of the analyte cannot be verified.
RPD - relative percent difference
RSD - relative standard deviation
U - Undetected at the PQL
UJ - estimated PQL

Table 3
SUMMARY OF FIELD DUPLICATE PRECISION

Compound/Analyte[1]	Primary PQL	Dup. PQL	020503BIL06GW (105725/105727) Primary Sample	020503BIL07GW (105725/105727) Duplicate Sample	RPD (%)[2]
Volatile Organic Compounds (mg/L)					
Chloroform	1		1.69	1.86	nc
Semivolatile Organic Compounds (mg/L)					
Naphthalene	0.01	0.104	0.04	ND	nc
2-Methylnaphthalene	0.1	1.04	0.0316 J	0.434	nc
Phenanthrene	0.01	0.104	ND	0.211	nc
Diethylphthalate	0.1	1.04	0.192	ND	nc
bis(2-Ethylhexyl)phthalate	0.1	1.04	ND	1.79	nc
Di-n-octylphthalate	0.1	1.04	ND	2.85	nc
Metals (mg/L)					
Antimony	0.003		0.0037	0.0041	nc
Arsenic	0.001		0.0031	0.0018	nc
Barium	0.001		0.3	0.31	**3.3**
Beryllium	0.0005		0.00024 J	0.00029 J	nc
Cadmium	0.0005		0.0046	0.0047	**2.2**
Chromium	0.001		0.0055	0.0065	**17**
Copper	0.001		0.18	0.23	**24**
Iron	0.05		11.4	13	**13**
Lead	0.005		0.073	0.083	**13**
Manganese	0.001		0.32	0.34	**4.9**
Nickel	0.001		0.11	0.12	**8.7**
Silver	0.0001		0.00059	0.00072	**20**
Thallium	0.0005		0.00020 J	0.00019 J	nc
Zinc	0.003		1.72	1.77	**2.9**
TPH-Dx (mg/L)					
#2 Diesel	0.2		0.51 X	0.46 X	nc
Motor Oil	0.4		0.8 X	0.7 X	nc

[1] – No target compounds were detected in samples 020503BIL06GW and 020503BIL07GW for five analyses: TPH-gasoline fraction, organotin compounds, pesticides, PCBs, and herbicides
[2] – relative percent difference (RPD) was not calculated for analytes detected at less than 5X the PQL.
(µg/Kg) - micrograms per liter
mg/Kg – milligrams per liter
(%) - percent
PCBs – polychlorinated biphenyls
PQL - practical quantitation limits
nc – not calculated
TPH-Dx – total petroleum hydrocarbons-diesel range
X – Contaminant does not appear to be “typical” product

Twenty-nine primary soil samples and three field duplicates were collected by URS on October 15, 16 and 17, 2001 during the Bradford Island Phase II Supplemental Site Investigation in Cascade Locks, Oregon. The analytical results were subject to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (degree to which the sample represents the environmental condition), accuracy (spike and/or standard % recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). This report addresses only those problems that affect data usability. Validated sample results are presented in the analytical tables in the Bradford Island Site Characterization.

The data quality review process followed the procedures outlined in the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, October 1999) and *Inorganic Data Review* (USEPA, February 1994).

Samples were collected according to the Bradford Island Site Characterization Sampling and Analysis Plan (SAP) (URS, 2001). Severn Trent Laboratory-Seattle, Inc. (formerly know as Sound Analytical Service, Inc.) of Tacoma, Washington analyzed for the following parameters:

Method	Analytical Parameter
8082	Polychlorinated Biphenyls (PCBs)
8081	Chlorinated Pesticides
8151A	Chlorinated Herbicides
8260B	Volatile Organic Compounds (VOCs)
8270C	Semivolatile Organic Compounds (SVOCs)
6010B/6020	Metals[1]
7471A	Mercury
NWTPH-Gx	Northwest Total Petroleum Hydrocarbons – Gasoline Range Organics
NWTPH-Dx	Northwest Total Petroleum Hydrocarbons – Diesel and Heavy Oil Range Organics
Krone (GC/MS) [2]	Butyltins

[1]Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Ni, Na, Pb, Sb, Se, Tl, Va, Zn
[2]The method is an Ion Trap GC/MS method for organotin analysis developed for the Puget Sound Estuary Program.

The sample locations and analyses are summarized in Table 1. The Oregon Department of Environmental Quality (DEQ) requested additional analyses for the samples collected at the Mercury Vapor Lamp Removal area and for Investigation Derived Waste samples after the SAP was finalized. Additional analyses conducted at the request of DEQ are highlighted in Table 1.

Table 2 summarizes qualifiers added to the data.

REPRESENTATIVENESS

Chain-of-Custody and Holding Times

The chain-of-custody (COC) forms indicate that samples were maintained under chain of custody and forms were signed upon release and receipt. All coolers were submitted at temperatures within 4°C± 2°C. Samples were analyzed within the technical and contracted holding time (14 days) except for the undiluted VOC analyses of 011015BIL01IDW, 011015BIL02IDW, and 011015BIL04IDW which were analyzed one day out of hold time. Samples were extracted within the 14-day hold time; therefore, the sample results were not qualified.

Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank for each analysis and for each batch, per method requirements. Target compounds were detected in the method blanks for VOC and SVOC analyses as follows:

- The VOC analysis exhibited methylene chloride, bromomethane, and naphthalene method blank contamination. Associated samples were non-detect for bromomethane; therefore, the sample results were not qualified for this analyte. The associated sample results less than five times the naphthalene or ten times the methylene chloride blank contamination were qualified non-detect (U) at the appropriate quantitation level.
- The SVOC analysis exhibited di-n-butylphthalate method blank contamination. The associated sample results less than ten times the di-n-butylphthalate were qualified non-detect (U) at the appropriate quantitation level.

A trip blank was not analyzed. No data were qualified based on this field QC nonconformance.

The samples were collected with dedicated sampling equipment; therefore, it was not necessary to collect rinse blanks.

ACCURACY

Instrument Calibration

The laboratory performed initial multi-point calibrations for all target and surrogate compounds as required. Initial calibrations (ICAL) and continuing calibrations (CCAL) were analyzed at the proper frequency as required by the methods. Response factors (RFs) and relative response factors (RRF) were greater than the minimum acceptance limit (0.05), and percent relative

standard deviations (%RSD) and percent differences (%Ds) were within control limits except for the following:

- The VOC CCAL conducted on 10/30/01 exhibited a percent difference (%D) greater than the 25% limit for bromomethane, acetone, vinyl acetate, 1,2,4-trichlorobenzene, and naphthalene. All associated sample results were non-detect and were qualified as estimated (UJ).
- The VOC CCAL conducted on 10/25/01 exhibited a %D greater than the 25% limit for bromomethane. The associated sample result was non-detect; therefore, the result was qualified as estimated (UJ).
- The VOC CCAL conducted on 10/28/01 exhibited a %D greater than the 25% limit for bromomethane, trichloroethene, 2-hexanone, and naphthalene. The associated sample result was non-detect; therefore, the results were qualified as estimated (UJ).
- The SVOC ICAL conducted on 10/18/01 exhibited %RSDs greater than the 30% limit for benzoic acid, 2,4-dinitrophenol, 4-nitrophenol, 4,6-dinitro-2-methylphenol, and n-nitrosodimethylamine. All associated sample results were non-detect; therefore, no qualifiers were applied.
- The SVOC ICAL conducted on 10/25/01 exhibited %RSDs greater than the 30% limit for bis(2-ethylhexyl)phthalate, n-nitrosodimethylamine, and benzidine. All associated sample results for the affected analytes were quantified from a prior ICAL conducted at a lower dilution. No qualifiers were applied.
- The SVOC CCAL conducted on 10/18/01 exhibited RFs <0.05 for the following analytes: benzoic acid, 2,4-dinitrophenol, 4,6-dinitro-2-methylphenol, and n-nitrosodimethylamine. Analyte results were non-detect in associated samples and were rejected (R). The same CCAL exhibited %Ds greater than the 25% limit for 2,4-dinitrophenol, 4-nitrophenol, 4,6-dinitiro-2-methylphenol, di-n-octylphthalate, n-nitrosodimethylamine, benzidine, bis(2-ethylhexyl)phthalate, benzofluoroanthenes, and carbazole. Associated sample results were qualified as estimated (J/UJ).
- The SVOC CCAL conducted on 10/25/01 exhibited %Ds greater than the 25% limit for benzyl alcohol, 2,6-dinitrotoluene, 3-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline, 4,6-dinitro-2-methylphenol, di-n-butylphthalate, 3’3-dichlorobenzidine, di-n-octylphthalate, n-nitrosodimethylamine, and benzidine. Associated sample results were qualified as estimated (J/UJ).
- The SVOC CCAL conducted on 10/25/01 exhibited %Ds greater than the 25% limit for benzyl alcohol, 3,4-methylphenol, hexachlorocyclopentadiene, bis(2-ethylhexyl)phthalate, and n-nitrosodimethylamine. The associated sample result was non-detect; therefore, the results were qualified as estimated (UJ).
- The SVOC CCAL conducted on 10/25/01 exhibited %Ds greater than the 25% limit for benzyl alcohol, 3,4-methylphenol, hexachlorocyclopentadiene, 2-chloronaphthalene,

chrysene, n-nitrosodimethylamine, carbazole, and benzidine. This calibration affected only the 100-times dilution for chrysene for sample 011016BIL18SS. The analyte result was qualified as estimated (J).

- The pesticide CCAL conducted on 10/25/01 exhibited %Ds greater the 15% limit for endrin aldehyde and methoxychlor on the second column. Associated samples were non-detect for these analytes; therefore, the sample results were not qualified.

Surrogate Recovery Review

Each sample analyzed for organic compounds was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. Several surrogate outliers were noted in the NWTPH-Gx, butyltin, and pesticide analyses as follows:

- The SVOC analysis of sample 011015BIL04IDW exhibited zero surrogate recovery for nitrobenzene-d5. All detected base/neutral samples were qualified as estimated (J) and all non-detect base/neutral samples were rejected (R).
- The NWTPH-Gx analysis of samples 011015BIL04IDW and 011017BIL29IDW exhibited elevated surrogate %R (>130%) for bromofluorobenzene, indicating a potential high bias. The sample result was qualified as estimated (J).
- The butyltin analysis of samples 011016BIL12SS, 011016BIL09SS, 011016BIL20SS, and 011016BIL21SS exhibited elevated surrogate %R (> 120%), indicating a potential high bias. Sample results were non-detect; therefore, results were not qualified.
- The butyltin analysis of sample 011016BIL07SS exhibited 0 surrogate %R. Sample results were non-detect and were rejected (R).
- The pesticide analysis of 011016BIL19SS exhibited elevated %R for surrogate decachlorobiphenyl (>140%), indicating a potential high bias. Sample results were non-detect; therefore, results were not qualified.

Laboratory Control Sample and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control samples (LCS) are used to monitor the laboratory's day-to-day performance of routine analytical methods, independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recovery the target compounds from the sample matrix. The laboratory analyzed at least one LCS and one MS/MSD (or one MS and one sample duplicate for metals analyses) for each analysis and for each batch per method requirements. Data were evaluated for %R of target compounds based on the project-specific QC limits.

QC for all LCS' were within control limits. QC for MS/MSDs were within control limits with the following exceptions:

- The VOC MS/MSD analysis of parent sample 011016BIL22SS exhibited spike %Rs below criteria (70-130%). The associated LCS %Rs were within criteria; therefore, the parent sample results were not qualified.
- The SVOC MS/MSD analysis of parent samples 011015BIL03IDW and 011016BIL22SS exhibited spike %Rs above and below the criteria and RPDs above the criteria (45-135% and 60%, respectively). The associated LCS %Rs were within criteria; therefore, the parent sample results were not qualified.
- The butyltin MS/MSD analysis of parent samples 011015BIL03IDW and 011016BIL22SS exhibited spike %Rs below criteria for dibutyltin (30-120%). The associated LCS %Rs were within criteria; therefore, sample results were not qualified.
- The butyltin MS/MSD analysis of parent sample 011016BIL11SS exhibited zero spike %R for dibutyltin and monobutyltin due to a 200-fold dilution. The associated LCS %Rs were within criteria; therefore, the parent sample results were not qualified
- The PCB MS analysis of parent sample 011015BIL01IDW exhibited spike %R above the criteria (40-140%) while the MS/MSD analysis of parent sample 011017BIL28IDW exhibited spike %R below the criteria. The associated LCS %Rs were within criteria; therefore, sample results were not qualified.
- The NWTPH-Gx MS analysis of parent sample 011015BIL04IDW exhibited zero spike %R, while the MSD analysis exhibited 20 spike %R. The MS/MSD analysis of parent sample 011017BIL28IDW exhibited zero spike %R. Both parent samples exhibited gasoline concentrations more than ten times the spike amount. The associated LCS %Rs were within criteria; therefore, the parent sample result was not qualified.
- The metals MS analysis exhibited spike %R outside the criteria (75-125%) for copper, lead, manganese, and zinc for parent sample 011017BIL24SS and for nickel for parent sample 011016BIL22SS. Associated samples were qualified as estimated (J).

PRECISION

Second Column Confirmation

Second column confirmation was performed for all PCB and pesticide results. The higher of the two results was reported, per method requirements. Analytes exhibiting an RPD > 40% between columns results were qualified as estimated (J). Affected samples and analytes are listed in Table 2.

Duplicate Review

Laboratory Duplicates

Laboratory duplicates were analyzed to establish laboratory analytical precision. All laboratory duplicate results exhibited RPDs within QC limits with the following two exceptions:

- The NWTPH-Dx laboratory duplicate analysis of sample 011016BIL22SS exhibited an elevated RPD (59%) for motor oil range organics. The parent sample result was qualified as estimated (J).
- The laboratory duplicate analysis of sample 011017BIL29IDW for mercury and of sample 01101622SS for barium exhibited RPDs above the control limit of 25%. The parent and associated sample results were qualified as estimated (J).

Field Duplicates

Three field duplicates were collected to verify acceptable field sampling techniques and the representativeness of the sample aliquots. The RPD was calculated only when sample results were greater than 5 times the reporting limit. Duplicate pairs that exhibit RPDs above control limits are presented in the table below. No data were qualified based on field duplicate precision.

ANALYTE	UNITS	PRIMARY RESULT	DUPLICATE RESULT	RELATIVE PERCENT DIFFERENCE
011016BIL11SS/011016BIL12SS				
Antimony	mg/Kg	**2.55**	**11.6**	128%
Arsenic	mg/Kg	**4.69**	**9.56**	68%
Chromium	mg/Kg	**24.8**	**75.3**	101%
Copper	mg/Kg	**63.5**	**134**	71%
Lead	mg/Kg	**245**	**922**	116%
011016BIL22SS/011016BIL23SS				
Manganese	mg/Kg	**2520**	**905**	94%
PCB-Aroclor 1254	µg/Kg	**86.1**	**14**	144%
PCB-Aroclor 1260	µg/Kg	**64.5**	**118**	59%
Dibenz(a,h)anthracene	µg/Kg	**573**	14.8 U	190%
Indeno(1,2,3-cd)pyrene	µg/Kg	**3660**	**405**	160%
011017BIL24SS/011017BIL25SS				
Lead	mg/Kg	**815**	**413**	65%

COMPARABILITY

Compound Identification

The diesel range organics analysis was noted to exhibit ‘non-typical’ elution patterns by the laboratory for several samples. Qualitative observations were noted on the laboratory report forms and on the Analytical Results Summary Tables in the main body of the report.

Reporting Limits

The sensitivity (i.e., reporting limits) of the analytical methods is driven by the project specific Data Quality Objectives. Occasionally analyte practical quantitation limits (PQLs) were above levels specified in the QAPP. The laboratory reported all detections under the PQL and qualified those results as estimated (J) because the analyte concentrations were less than the lowest calibration standard.

Occasionally, a smaller volume of sample or additional dilution of a sample extract was required in order to bring the sample concentrations within the linear range of calibration. Because the samples required dilution, they did not meet the requested reporting limits. All data are acceptable based on high analyte concentrations in these samples.

COMPLETENESS

The laboratory reported all requested analyses and the deliverable data reports were adequate for data review. Completeness is defined as the percentage of usable data out of the total amount of data generated. The project completeness goal is 100 percent. Based on the QA/QC review three analyses were rejected out of 186 analyses. Project completeness is 98 percent.

Table 1

Sample Location and Analyses Summary

Site Location	Sample IDs	Analyses
Gully Area Investigation	011016BIL13SS 011016BIL14SS 011016BIL15SS 011016BIL16SS 011016BIL17SS 011016BIL18SS 011016BIL19SS 011016BIL20SS 011016BIL21SS 011016BIL22SS 011016BIL23SS	6010B/6020/7471[1], 8260B, 8270C, 8081A, 8082, 8151A, NWTPH-Gx, NWTPH-Dx, Krone (GC-MS)[2]
Mercury Vapor Lamps Removal	011016BIL05SS 011016BIL06SS 011016BIL07SS 011016BIL08SS 011016BIL09SS 011016BIL10SS 011016BIL11SS 011016BIL12SS	NWTPH-Dx, 6010B/6020/7471[1], 8082, Krone (GC-MS)[2]
Hot Spot Analysis	011017BIL24SS 011017BIL25SS 011017BIL26SS 011017BIL27SS 011017BIL30SS 011017BIL31SS 011017BIL32SS	6010B[3]
Investigation Derived Waste (Mercury and Gully Area)	011015BIL01IDW 011015BIL02IDW 011015BIL03IDW 011015BIL04IDW 011017BIL28IDW 011017BIL29IDW	1311/6010B/6020/74741[4], 8260B, 8082, NWTPH-Gx, NWTPH-Dx, 8270C, Krone (GC-MS)[2]

Note: [1]Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Ni, Na, Pb, Sb, Se, Tl, Va, Zn
[2]The method is an Ion Trap GC/MS method for organotin analysis developed for the Puget Sound Estuary Program.
[3]Pb (total)
[4]RCRA 8
Highlighted analyses indicate analyses added at the request of DEQ after the Field Sampling Plan was finalized.

TABLE 2

SUMMARY OF DATA QUALIFICATION

SAMPLE ID	ANALYTE	QUALIFIER	ANALYTICAL DEVIATIONS
Volatile Organic Compounds (8260B)			
011015BIL04IDW 011017BIL28IDW 011017BIL29IDW	Bromomethane	UJ	CCAL %D>25%
011015BIL01IDW 011015BIL02IDW 011015BIL03IDW 011016BIL13SS 011016BIL14SS 011016BIL15SS 011016BIL16SS 011016BIL17SS 011016BIL18SS 011016BIL20SS 011016BIL21SS 011016BIL22SS 011016BIL23SS	Bromomethane Acetone Vinyl acetate 1,2,4-Trichlorobenzene Naphthalene	UJ	CCAL %D>25%
011016BIL19SS	Bromomethane Trichloroethene 2-Hexanone Naphthalene	UJ	CCAL %D>25%
011015BIL01IDW 011015BIL02IDW 011015BIL03IDW 011016BIL13SS 011016BIL14SS 011016BIL15SS 011016BIL16SS 011016BIL17SS 011016BIL18SS 011016BIL19SS 011016BIL20SS 011016BIL21SS 011016BIL23SS	Methylene chloride	U	Method blank contamination
011016BIL19SS	Naphthalene	UJ	Method blank contamination (and CCAL %D>25%)

SAMPLE ID	ANALYTE	QUALIFIER	ANALYTICAL DEVIATIONS
Semivolatile Organic Compounds (8270C)			
011015BIL01IDW 011015BIL02IDW 011015BIL03IDW 011015BIL04IDW	Benzoic acid 2,4-Dinitrophenol 4,6-Dinitro-2-methylphenol N-Nitrosodimethylamine	R	CCAL RF <0.05
011015BIL01IDW 011015BIL02IDW 011015BIL03IDW	Di-n-Octylphthalate Bis(2-Ethylhexyl)phthalate Benzofluoranthenes Carbazole Benzidine	J/UJ	CCAL %D>25%
011015BIL04IDW	4-Nitrophenol	UJ	CCAL %D>25%
011016BIL18SS	Chrysene	J	CCAL %D>25%
011016BIL13SS 011016BIL14SS 011016BIL15SS 011016BIL18SS 011016BIL19SS 011016BIL20SS 011016BIL21SS 011016BIL22SS 011016BIL23SS	Benzyl alcohol 2,6-Dinitritoluene 3-Nitroaniline 2,4-Dinitrophenol 4-Nitrophenol 4-Nitroaniline 4,6-Dinitro-2-methylphenol Di-n-butylphthalate 3'3'-Dichlorobenzidine Di-n-octylphthalate N-Nitrosodimethylamine Benzidine	J/UJ	CCAL %D>25%
011016BIL16SS 011016BIL17SS	Benzyl alcohol 2,6-Dinitritoluene 3-Nitroaniline 2,4-Dinitrophenol 4-Nitrophenol 4-Nitroaniline 4,6-Dinitro-2-methylphenol 3'3'-Dichlorobenzidine Di-n-octylphthalate N-Nitrosodimethylamine Benzidine	J/UJ	CCAL %D>25%
011016BIL16SS 011016BIL17SS	Di-n-butylphthalate	UJ	Method blank contamination and CCAL %D>25%
011017BIL28IDW 011017BIL29IDW	Benzyl alcohol 3,4-Methylphenol Hexachlorocyclopentadiene Bis(2-ethylhexyl)phthalate N-Nitrosodimethylamine	UJ	CCAL %D>25%
011015BIL04IDW	Base/Neutral Detected Analytes	J	Base/Neutral Surrogate %R = 0
011015BIL04IDW	Base/Neutral Non-detect Analytes	R	Base/Neutral Surrogate %R = 0

SAMPLE ID	ANALYTE	QUALIFIER	ANALYTICAL DEVIATIONS
Gasoline Range Organics (NWTPH-Gx)			
011015BIL04IDW 011017BIL29IDW	Gasoline Range Organics	J	Surrogate %R>130
Diesel and Motor Oil Range Organics (NWTPH-Dx)			
011016BIL22SS	Motor Oil Range Organics	J	Laboratory duplicate RPD>50
Butyltins by GC/MS			
011016BIL07SS	Mono-, Di-, Tri-, Tetrabutyltin	R	Zero Surrogate %R
Pesticides (8081)			
011016BIL16SS 011016BIL18SS 011016BIL21SS 011016BIL22SS 011016BIL23SS	Chlordane	J	Second column confirmation RPD>40%
011016BIL17SS	Endosulfan II Endosulfan sulfate	J	Second column confirmation RPD>40%
Metals (6020/6010B/7470A)			
011016BIL05SS 011016BIL06SS 011016BIL07SS 011016BIL08SS 011016BIL09SS 011016BIL10SS 011016BIL11SS 011016BIL12SS 011016BIL13SS 011016BIL14SS 011016BIL15SS 011016BIL16SS 011016BIL17SS 011016BIL18SS 011016BIL19SS 011016BIL20SS 011016BIL21SS 011016BIL22SS 011016BIL23SS	Copper Nickel Manganese Zinc	J	MS %R <75%
	Lead	J	MS %R>125%
	Barium	J	Laboratory duplicate RPD>25%
011016BIL24SS 011016BIL25SS 011016BIL26SS 011016BIL27SS 011016BIL30SS 011016BIL31SS 011016BIL32SS	Lead	J	MS %R>125%

SAMPLE ID	ANALYTE	QUALIFIER	ANALYTICAL DEVIATIONS
011017BIL28IDW 011017BIL29IDW	Mercury	J	Laboratory duplicate RPD>25%

CCAL – continuing calibration verification
ICAL – initial calibration
ID- identification
J – The analyte was positively identified; the associated numerical value is an estimate of the concentration of the analyte in the sample.
% D – percent difference
% R – percent recovery
MS – matrix spike
R – The analyte results are rejected due to serious deficiencies in the ability to analyze the sample and meet the quality control criteria. The presence or absence of the analyte cannot be verified.
RF – response factor
RPD – relative percent difference
RSD – relative standard deviation
U – undetected at the quantitation limit
UJ – estimated quantitation limit

Some samples reported in the 2004 Lanfill Site Characterization Report were collected as samples of Ivestigation-Derived Waste ("IDW samples"). The soil from these stockpiles were returned to their respective excavations rather than shipped as waste. The names of these samples have been changed to reflect this status.

(Original Name)/New Name

(011015BIL01IDW)/011015BIL01TPG
(011015BIL02IDW)/011015BIL02TPG
(011015BIL03IDW)/011015BIL03TPG
(011015BIL04IDW)/011015BIL04TPG
(011017BIL28IDW)/011017BIL28TPM
(011017BIL29IDW)/011017BIL29TPM

Twenty-five soil samples, twelve groundwater samples, three sandblast grit samples, one blow-down water sample, one waste material sample, three soil duplicate samples, two groundwater duplicate samples, one sandblast grit duplicate sample, one blow-down water duplicate sample, seven trip blanks, and three equipment rinsates were collected by URS on November 16, 2004 through November 29, 2004 at the Bradford Island site in Cascade Locks, Oregon as part of the Phase II Supplemental Site Inspection Sandblast Area Investigation. Samples were collected according to the Sampling and Analysis Plan (SAP) for the Bradford Island Landfill Phase II supplemental site investigation (URS, 2001) and addendum (October 29, 2004). Samples were submitted to Severn Trent Laboratories – Seattle, Inc., (STL) located in Tacoma, Washington and analyzed for one or more of the following parameters in general accordance with the methods indicated:

Method	Analytical Parameter
EPA 8260B	Volatile Organic Compounds (VOCs)
EPA 8270C	Total and Dissolved Semivolatile Organic Compounds (SVOCs)
EPA 8081A	Chlorinated Pesticides
EPA 8082	Polychlorinated Biphenyls (PCBs)
EPA 6010B/6020/SPLP (1312)/TCLP (1311)	Total and Dissolved Metals[1]
EPA 7470A/7471A	Total and Dissolved Mercury
NWTPH-Gx (Ecology)	Total Petroleum Hydrocarbons – Gasoline Range (TPH-Gx)
NWTPH-Dx (Ecology)	Total Petroleum Hydrocarbons – Diesel and Motor Oil Range (TPH-Dx)
Krone (GC/MS)[2]	Butyltin compounds (Selected samples for SPLP Butyltins)
EPA 9060 mod.[3]	Total Organic Carbon (TOC)
EPA 160.2	Total Suspended Solids (TSS)
ASTM D422[3]	Grain Size Distribution/Particle Size

[1]Metals list: Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Ni, Na, Pb, Sb, Se, Tl, V, Zn
TCLP and SPLP analyses only for Pb and Cr
[2]Ion trap full scan GC/MS method for butyltin compound analysis developed for the Puget Sound Estuary Program (PSEP)
[3]Soil TOC and grain size analyses performed by STL Burlington, Vermont

Table G-1 summarizes the sample locations and requested analyses. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (degree to which the sample represents the environmental condition), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed in each laboratory report submitted: proper sample preservation and handling procedures, holding times, initial and continuing calibrations, quantitation limits, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results,

blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification and correctness of calculated results. The data review process for this investigation followed the procedures in EPA's *Contract Laboratory Program National Functional Guidelines (USEPA NFGs) for Organic Data Review (USEPA, October 1999)* and *USEPA NFGs for Inorganic Data Review (USEPA, July 2002)* modified for (in order of priority) the requirements of the investigation-specific criteria (Quality Assurance Project Plan - QAPP), the USACE *Requirements for the Preparation of Sampling and Analysis Plans,* EM 200-1-3, February 2001, Appendix I (Shell), and the USEPA SW-846 analytical methods used. A summary of qualifiers assigned to results in this investigation is included in Table G-2 on the attached compact disc. For ease of reference between the data review and other SSI documents the samples are represented in Table G-2 by their laboratory ID and the ID assigned in the field. Qualifiers that may be assigned to the results of this investigation include the following:

- U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. The level of estimation has not been quantified; reasons for qualification should be considered before use of the data in any calculation or numerical comparison.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR – Do Not Report. Multiple results from different analytical dates and/or dilutions. Value from another analysis should be used.

Final sample results and qualifiers are presented in the analytical tables in the SSI.

REPRESENTATIVENESS

Chain-of-Custody and Holding Times

The chain-of-custody (COC) forms indicate that samples were maintained under chain of custody and forms were signed upon release and receipt. With the exception of one cooler associated with laboratory sample delivery group (SDG) 124993 (1.4°C) and one cooler associated with SDG 124945 (0.2°C), all coolers were submitted at temperatures within the USEPA-recommended range of 4°C±2°C. Data were not qualified based on cooler temperatures. All samples were analyzed within the technical and contracted holding time.

Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank for each analysis and for each batch, per method requirements. Qualification of samples due to method blank contamination followed guidelines set forth in the USEPA NFGs. For organic analyses, sample results less than five times (5x) the method blank concentration (less than 10x in instances of common laboratory contaminants) and between the method detection limit (MDL) and practical quantitation limit (PQL) were flagged as non-detect (U) at the PQL. When sample results were less than 5x the blank concentration (less than 10x for common laboratory contaminants) but above the PQL, the reported result was qualified as non-detect (U) at the reported result. Target compounds detected in the method blanks but reported as not detected in the associated samples were not qualified.

Target compounds were detected in the method blanks for VOC analyses as follows:

- Acetone, chloroform, benzene, toluene, ethylbenzene, m&p-xylene, o-xylene, styrene, and 1,2,4-trimethylbenzene were detected in the method blank for analytical batch VOA1042. All blank contamination was less than the criteria set forth in the USACE Shell guidance (ie, ½ the reporting limit) with the exception of acetone contamination at 12.5 ug/L. The laboratory noted that the acetone contamination was likely a result of the sodium bisulfate preservative used for the soil samples. Associated results for chloroform, benzene, toluene, ethylbenzene, m&p-xylene, o-xylene, styrene, and/or 1,2,4-trimethylbenzene in soil samples 124945-03, 124993-02, 124993-03, 124993-04, 124993-06, 124993-07, 124993-17, 124993-18, 124993-19, and 124993-20 less than 5x the method blank concentration were qualified as non-detect at the reported value (U) or the PQL based on the guidelines previously described. Associated acetone detections less than 10x the method blank concentrations were qualified as non-detect (U).

- Bromomethane, 1,2-dichloropropane, chlorobenzene, bromoform, 1,2,4-trichlorobenzene, 1,2,3-trichlorobenzene, and naphthalene were detected in the method blank for analytical batch VOA1050 at levels less than one half the reporting limit. Associated results for bromomethane, 1,2-dichloropropane, chlorobenzene, bromoform, 1,2,4-trichlorobenzene, 1,2,3-trichlorobenzene, and/or naphthalene in water samples 124945-01, 124945-04, 124993-08, 124993-09, 124993-10, 124993-11, 124993-12, 124993-13, 124993-14, 124993-15, and 124993-16 with concentrations less than five times the method blank concentrations were qualified as non-detect at the reported value (U) or the PQL based on the guidelines previously described.

- Bromomethane, chlorobenzene, 1,2,3-trichlorobenzene, and naphthalene were detected in the method blank for analytical batch VOA1051 at levels less than one half the reporting limit. As cis-1,2-dichloroethene was the only compound reported from the dilutions of samples 124993-14 and 124993-15, data for these two samples were not qualified based on these method blank results. Associated results for bromomethane, chlorobenzene, 1,2,3-trichlorobenzene, and/or naphthalene in water samples 125010-01, 125010-02,

125010-03, 125010-04, 125010-05, and 125059-11 with concentrations less than five times the method blank concentrations were qualified as non-detect at the reported value (U) or the PQL based on the guidelines previously described.

- Chloromethane and naphthalene were detected in the method blank for analytical batch VOA1052 at levels less than half the reporting limit. Associated results for chloromethane and/or naphthalene in water samples 125060-01, 125060-02, 125060-09, 125060-10, 125060-11, and 125060-12 with concentrations less than 5x the method blank concentrations were qualified as non-detect at the reported value (U) or the PQL based on the guidelines previously described.
- Bromomethane, acetone, methylene chloride, 2-butanone, benzene, toluene, ethylbenzene, m,p-xylene, o-xylene, and styrene were detected in the method blank for analytical batch VOA1056. All blank contamination was at levels less than half the reporting limit with the exception of bromomethane at 0.585J ug/L, acetone at 60.9 ug/L, methylene chloride at 1.99 ug/L, and 2-butanone at 5.1 ug/L. The laboratory noted that the acetone, methylene chloride and 2-butanone contamination was likely due to the sodium bisulfate preservative used for the soil sample vials. Associated results in soil samples 125059-08, 125059-10, 125059-12, 125059-13, 125059-14, 125059-15, 125059-16, 125060-03, 125060-04, 125060-05, 125060-06, and 125060-08 with concentrations less than 5x (bromomethane, benzene, toluene, ethylbenzene, m,p-xylene, o-xylene, and/or styrene) or 10x (acetone, methylene chloride, and 2-butanone) the blank concentration were qualified as non-detect at the reported value (U) or the PQL based on the guidelines previously described.
- Methylene chloride and naphthalene were detected in the method blank for analytical batch VOA1057 at levels less than half the reporting limit. As trichloroethene, tetrachloroethene, and 1,2,4-trimethylbenzene were the only compounds reported for the dilution of sample 125059-08, data were not qualified based on these method blank results.

Per the laboratory, the glassware used for soil and water VOC analyses is certified to be free of contamination at concentrations 1.0 ug/L or 1.0 ug/kg; however, the MDLs for a number of compounds fall below these levels. In addition, the laboratory indicated that the sodium bisulfate used for soil VOC preservation may have contributed to the contamination seen in the above-referenced blanks. The USACE 'Shell' requires that all equipment used reflect the measurement accuracy required to meet project data quality objectives. The laboratory reported detections that fell between the MDL and the PQL and qualified these values as estimated (J). As previously stated, analytes detected in samples between the MDL and PQL that were also detected in the method blank were qualified as not detected at the PQL if the sample concentration was less than 5x (10x for common laboratory contaminants) the blank concentration.

Target compounds were detected in the method blanks for total and dissolved SVOC analyses as follows:

- Di-n-butylphthalate and butylbenzylphthalate were detected in the method blank for analytical batch SS1281 at levels less than one half the reporting limit. The associated di-n-butylphthalate and/or butylbenzylphthalate results in soil samples 124945-03, 124993-02, 124993-03, 124993-04, 124993-06, 124993-07, 124993-17, 124993-18, 124993-19, and 124993-20 less than 10x the method blank contamination were qualified as non-detect (U) at the reported value or the PQL based on the guidelines previously described.
- Phenol, di-n-butylphthalate, and butylbenzylphthalate were detected in the method blank for analytical batch SW1036. The di-n-butylphthalate and butylbenzylphthalate contamination of 0.151 ug/L and 0.198 ug/L were greater than one half the respective reporting limits of 0.2 and 0.3 ug/L. The phenol contamination of 0.0184 ug/L was less than half of the reporting limit. The associated phenol, di-n-butylphthalate, and/or butylbenzylphthalate results in water samples 125010-01 (total and dissolved) and 125010-02 (total and dissolved) less than 5x (phenol) or 10x (di-n-butylphthalate and butylbenzylphthalate) the method blank concentration were qualified as non-detect (U) at the reported value or the PQL based on the guidelines previously described.
- Di-n-butylphthalate was detected in the method blank for analytical batch SW1040 at 0.15 ug/l, greater than one half the reporting limit of 0.2 ug/L. The associated total di-n-butylphthalate water results in samples 125059-06, 125060-01, 125060-02, 125060-10, and 125060-11 less than 10x the method blank concentration were qualified as non-detect (U) at the reported value or the PQL based on the guidelines previously described.
- Di-n-butylphthalate and butylbenzylphthalate were detected in the method blank for analytical batch SS1285 at levels of 6.38 ug/L and 2.54 ug/L, respectively. The di-n-butylphthalate contamination was greater than one half the reporting limit of 10 ug/L. The associated di-n-butylphthalate and/or butylbenzylphthalate results in soil samples 125059-08, 125059-10, 125059-12, 125059-13, 125059-14, 125060-03, 125060-05, 125060-06, and 125060-08 with concentrations less than 10x the method blank concentration were qualified as non-detect (U) at the reported value or the PQL based on the guidelines previously described.

Target compounds were detected in the method blanks for pesticide analyses as follows:

- Endosulfan II was detected in the method blank for analytical batch PW0293 at 0.00169 ug/L, greater than half the reporting limit of 0.002. Second column confirmation was performed with a relative percent difference (RPD) <40%. Associated results for endosulfan II in water samples 124993-14 and 124993-15 less than 5x the method blank concentration were qualified as non-detect (U) at the reported value or the PQL based on the guidelines previously described.
- β-BHC was detected in the method blank for analytical batch PE1799 at 1.55 ug/kg, a level greater than one half the reporting limit of 1 ug/kg. Second column confirmation was performed with an RPD<40%. Associated results for β-BHC in soil samples 125059-12, 125059-13, 125059-14, and 125059-15 with concentrations less than five

times the method blank contamination were qualified as non-detect (U) at the reported value or the PQL based on the guidelines previously described.

Target compounds were detected in the method blanks for petroleum hydrocarbon analyses as follows:

- Gasoline-range hydrocarbons were detected in the method blanks for analytical batches GB4028, GB4029, and GB4030 at levels less than one half the reporting limit. Associated gasoline-range hydrocarbon results in soil samples 124945-03, 124993-02, 124993-03, 124993-04, 124993-06, 124993-07, 124993-18, 124993-19, 124993-20, 125059-10, 125059-12, 125059-13, 125059-14, 125059-15, 125059-16, 125060-03, 125060-08, and water samples 125060-10 and 125060-11 with concentrations less than 5x the method blank concentrations were qualified as non-detect (U) at the reported value or the PQL based on the guidelines previously described.

For metals analyses, sample results less than 10x the method blank concentration and between the method detection limit (MDL) and practical quantitation limit (PQL) were flagged as non-detect (U) at the PQL. Sample results less than 10x the blank concentration but above the PQL were qualified as estimated (J). Target compounds detected in the method blanks but reported as not detected in the associated samples were not qualified. Target compounds were detected in the method blanks for metals analyses as follows:

- Antimony, aluminum, barium, chromium, copper, lead, manganese, sodium, and/or zinc were detected in one or more method blanks associated with the soil samples. With one exception, these metals were either reported as not detected or detected at concentrations greater than 10x the respective method blank concentrations in associated samples and the results were not qualified. The result for sodium in soil sample 125059-13 was qualified as estimated (J).
- Antimony, aluminum, barium, calcium, chromium, copper, lead, manganese, nickel, vanadium, and/or zinc were detected in one or more method blanks associated with the water samples (total and dissolved). Associated results for antimony, calcium, copper, lead, manganese, nickel, vanadium, and/or zinc in water samples 124945-01 (dissolved), 124993-08 (total and dissolved), 124993-09 (total and dissolved), 124993-10 (total and dissolved), 124993-11 (total and dissolved), 124993-13 (dissolved), 124993-14 (total and dissolved), 124993-15 (total and dissolved), 125010-01 (total and dissolved), 125010-02 (total and dissolved), 125059-05 (dissolved), 125060-01 (total), 125060-02 (total), 125060-05 (total), 125060-10 (total), and 125082-01 (total) with concentrations less than 10x the method blank concentrations but greater than the PQL were qualified as estimated (J). Sample results between the MDL and PQL were qualified as non-detect (U) at the PQL. Associated results for aluminum, barium, and chromium were not qualified.

Two equipment rinsate blanks were collected on November 23, 2004 in conjunction with the sandblast area investigation, a hand auger rinsate and a pickaxe rinsate sample. Both rinsate

samples were analyzed for VOCs, SVOCs, NWTPH-Gx, NWTPH-Dx, and total organic carbon. The pickaxe rinsate was also analyzed for PCBs, pesticides, and butyltins. The hand auger rinsate was analyzed for total metals. A sample for the metals analyses associated with the hand auger was also collected on November 29, 2004. The hand auger was used in the collection of samples 125059-07, 125059-08, 125059-09, 125059-10, 125060-05, 125060-06, 125060-07, and 125060-08. The pickaxe was used in the collection of samples 125059-12, 125059-13, 125059-14, 125059-15, 125060-03, and 125060-04. The remaining samples were collected with dedicated equipment; therefore, an equipment blank was not collected for these samples. Several target analytes were detected in the equipment rinsates; however, all associated sample detections were either previously qualified or the sample concentrations were greater than five times the equipment rinsate concentrations. No data were qualified based on the equipment rinsate results.

Seven trip blanks were analyzed for VOCs. Target compounds were detected in the trip blanks as follows:

- Chloromethane, bromomethane, carbon disulfide, methylene chloride, and naphthalene were detected in trip blank #2715. The results for bromomethane and naphthalene were previously qualified as not detected based on method blank contamination. Samples 125010-01, 125010-02, 125010-04, and 125010-05 with concentrations less than 5x (chloromethane and carbon disulfide) or 10x (methylene chloride) the trip blank concentrations were qualified as non-detect (U) at the reported value or the PQL based on the guidelines previously described.
- Chloromethane, bromomethane, carbon disulfide, methylene chloride, and cis-1,2-dichloroethene were detected in trip blank #2716. The result for bromomethane in this trip blank was previously qualified as not detected based on the method blank result. Samples 124993-13, 124993-14, 124993-15, 124993-17, 124993-18, 124993-19, and 124993-20 with concentrations less than 5x (chloromethane, carbon disulfide, and cis-1,2-dichloroethene) or 10x (methylene chloride) the method blank concentrations were qualified as non-detect (U) at the reported value or the PQL based on the guidelines previously described.
- Chloromethane, bromomethane, carbon disulfide, methylene chloride, toluene, ethylbenzene, isopropylbenzene, 1,2,4-trimethylbenzene, n-butylbenzene, 1,2-dichlorobenzene, 1,2,4-trichlorobenzene, 1,2,3-trichlorobenzene, and naphthalene were detected in trip blank #2717. The results for bromomethane, 1,2,4-trichlorobenzene, 1,2,3-trichlorobenzene, and naphthalene were previously qualified as not detected in this trip blank based on the associated method blank results. Samples 124993-02, 124993-03, 124993-04, 124993-06, 124993-07, 124993-08, 124993-09, 124993-10, and 124993-11 with concentrations less than 5x (chloromethane, carbon disulfide, toluene, ethylbenzene, isopropylbenzene, 1,2,4-trimethylbenzene, n-butylbenzene, and 1,2-dichlorobenzene) and 10x (methylene chloride) the trip blank concentrations were qualified as non-detect (U) at the reported value or the PQL based on the guidelines previously described.

- Chloromethane, bromomethane, methylene chloride, bromoform, and naphthalene were detected in trip blank #2718 (124945-04). Bromomethane, bromoform, and naphthalene were previously qualified as not detected in this trip blank based on the associated method blank. Chloromethane and methylene chloride were either reported as not detected or detected at concentrations more than 10x the trip blank concentration in the associated samples and were not qualified based on the trip blank results.
- Bromomethane, carbon disulfide, methylene chloride, chloroform, benzene, toluene, ethylbenzene, m&p-xylene, 1,2,4-trimethylbenzene, 1,2,4-trichlorobenzene, and naphthalene were detected in trip blank #2718 (125059-11). The results for bromomethane and naphthalene were previously qualified as not detected based on the associated method blank results. The concentrations of carbon disulfide in samples 125059-08 and 125059-16 were less than 5x the trip blank concentration; therefore the results for carbon disulfide in these samples were qualified as non-detect (U) at the reported results. Methylene chloride, chloroform, benzene, toluene, ethylbenzene, m&p-xylene, 1,2,4-trimethylbenzene, and 1,2,4-trichlorobenzene were either not detected or detected at concentrations greater than 5x the trip blank concentration in the associated samples and were not qualified.
- Two trip blanks were submitted with laboratory SDG 125060 and identified as 125060-09 and 125060-12. Chloromethane was detected in trip blanks 125060-09 and 125060-12; however, these results were previously qualified as not detected based on the associated method blank results. No associated sample results were qualified based on these trip blank results.

ACCURACY

Tuning

The instrument tuning frequency and performance were acceptable for all GC/MS analyses (VOCs, SVOCs, and butyltin compounds).

Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the analytical methods. Initial calibrations (ICAL) and continuing calibrations (CCAL) were analyzed at the proper frequency and at the appropriate concentrations required by the methods.

Instrument calibrations were acceptable for VOC analyses with the following exceptions:

- The percent recovery for bromomethane in the second VOC continuing calibration analyzed on November 22, 2004 was below the method QC limits of 80-120%. The results for bromomethane in samples 124945-03, 124993-02, 124993-03, 124993-04, 124993-06, 124993-07, 124993-17, 124993-18, 124993-19, and 124993-20 were qualified as estimated (J or UJ).

- The percent recovery for bromomethane in the VOC continuing calibration analyzed on November 29, 2004 exceeded the method QC limits of 80-120%. Bromomethane was either not detected or previously qualified as not detected based on other QC issues detailed in this report in samples 124945-01, 124945-04, 124993-08, 124993-09, 124993-10, 124993-11, 124993-12, 124993-13, 124993-14, 124993-15, and 124993-16 and the results were not qualified based on the continuing calibration result.
- The percent recoveries for bromomethane and vinyl acetate in the VOC continuing calibration analyzed on November 30, 2004 exceeded the method QC limits of 80-120%. Bromomethane and vinyl acetate were not reported from the dilutions of samples 124993-14 and 124993-15 and the results were not qualified based on these continuing calibration results. Bromomethane and vinyl acetate were either not detected or previously qualified as not detected based on other QC issues detailed in this report in samples 125010-01, 125010-02, 125010-03, 125010-04, 125010-05, and 125059-11 and the results were not qualified based on these continuing calibration results.
- The percent recoveries for bromomethane, vinyl acetate, and 2,2-dichloropropane in the VOC continuing calibration analyzed on December 1, 2004 were outside the method QC limits of 80-120%. The results for vinyl acetate and 2,2-dichloropropane in samples 125060-01, 125060-02, 125060-09, 125060-10, 125060-11, and 125060-12 were qualified as estimated (J or UJ). As the percent recovery for bromomethane exceeded the method limit and bromomethane was reported as not detected in the associated samples, the results for bromomethane were not qualified based on this continuing calibration.
- The percent recoveries for bromomethane, bromoform, and 1,2-dibromo-3-chloropropane in the VOC continuing calibration analyzed on December 3, 2004 were outside the method QC limits of 80-120%. The results for bromoform and 1,2-dibromo-3-chloropropane in samples 125059-08, 125059-10, 125059-12, 125059-13, 125059-14, 125059-15, 125059-16, 125060-03, 125060-04, 125060-05, 125060-06, and 125060-08 were qualified as estimated (J or UJ). As the percent recovery for bromomethane exceeded the method limit and bromomethane was reported as not detected in the associated samples, the results for bromomethane were not qualified based on this continuing calibration.
- The percent recoveries for hexane, vinyl acetate, and hexachlorobutadiene in the VOC continuing calibration analyzed on December 6, 2004 were outside the method QC limits of 80-120%. Hexane, vinyl acetate, and hexachlorobutadiene were not reported from the dilution of sample 125059-08 and the results were not qualified based on these continuing calibration results.

Instrument calibrations were acceptable for SVOC analyses with the following exceptions:

- The percent relative standard deviations (%RSDs) for n-nitrosodimethylamine, nitrobenzene, benzoic acid, 2,4-dinitrotoluene, 4-nitrophenol, and diethylphthalate exceeded the method limit of 15% in the SVOC initial calibration analyzed on November 15, 2004. Results reported as detected for the above-referenced compounds in samples 124945-01 (total and dissolved), 124993-08 (total and dissolved), 124993-09 (total and dissolved), 124993-10 (total and dissolved), 124993-11 (total and dissolved), 124993-13 (total and dissolved), 124993-14 (total and dissolved), 124993-15 (total and dissolved),

125059-06 (total), 125060-01 (total), 125060-02 (total), and 125060-10 (total) were qualified as estimated (J). Results for the above-referenced compounds reported as not detected were not qualified.

- The %RSDs for hexachloroethane, benzoic acid, 4-chloroaniline, 2-methylnaphthalene, 2,6-dinitrotoluene, 3-nitroaniline, 2,4-dinitrophenol, 4,6-dinitro-2-methylphenol, 2,4,6-tribromophenol, and butylbenzylphthalate exceeded the method limit of 15% in the SVOC initial calibration analyzed on November 16, 2004. Results reported as detected for the above-referenced compounds in samples 124945-03, 124993-02, 124993-03, 124993-04, 124993-06, 124993-07, 124993-17, 124993-18, 124993-19, 124993-20, 125059-08, 125059-10, 125059-12, 125059-13, 125059-14, 125059-16, 125059-17, 125060-03, 125060-04, 125060-05, 125060-06, and 125060-08 were qualified as estimated (J). Results for the above-referenced compounds reported as not detected were not qualified.
- The %RSDs for n-nitrosodimethylamine, pyridine, 3&4-methylphenol, benzoic acid, 4-chloroaniline, 4-chloro-3-methylphenol, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline, 4,6-dinitro-2-methylphenol, n-nitrosodiphenylamine, di-n-butylphthalate, benzidine, butylbenzylphthalate, and bis(2-ethylhexyl)phthalate exceeded the method limit of 15% in the second SVOC initial calibration analyzed on November 16, 2004. These compounds were not reported from the 10x dilution of sample 125059-08 and were not qualified based on this continuing calibration. Results reported as detected for the above-referenced compounds in samples 125010-01 (total and dissolved), 125010-02 (total and dissolved), 125010-05 (total), and 125059-15 were qualified as estimated (J). Results for the above-referenced compounds reported as not detected were not qualified.
- The percent recoveries for n-nitrosodimethylamine, benzidine, butylbenzylphthalate, and indeno(1,2,3-c,d)pyrene in the SVOC continuing calibration analyzed on November 23, 2004 were outside the method QC limits of 80-120%. The results for n-nitrosodimethylamine, benzidine, and indeno(1,2,3-c,d)pyrene were qualified as estimated (J or UJ) in samples 124945-01 (total and dissolved), 124993-08 (total and dissolved), 124993-09 (total and dissolved), 124993-10 (total and dissolved), 124993-11 (total and dissolved), 124993-13 (total and dissolved), 124993-14 (total and dissolved), and 124993-15 (total and dissolved). As the percent recovery for butylbenzylphthalate exceeded the method limit, results reported as detected were qualified as estimated (J) in the above-referenced samples. Results reported as not detected for butylbenzylphthalate were not qualified.
- The percent recoveries for n-nitrosodimethylamine, bis(2-chloroisopropyl)ether, 3&4-methylphenol, 2,4-dimethylphenol, and 4-nitroaniline in the SVOC continuing calibration analyzed on November 24, 2004 were outside the method QC limits of 80-120%. The results for 2,4-dimethylphenol and 4-nitroaniline were qualified as estimated (J or UJ) in samples 124945-03, 124993-02, 124993-03, 124993-04, 124993-06, 124993-07, 124993-17, 124993-18, 124993-19, and 124993-20. As the percent recoveries for n-nitrosodimethylamine, bis(2-chloroisopropyl)ether, and 3&4-methylphenol exceeded the method limit and these compounds were not detected in the above-referenced samples, results for n-nitrosodimethylamine, bis(2-chloroisopropyl)ether, and 3&4-methylphenol in the associated samples were not qualified.

- The percent recoveries for benzyl alcohol, 4-chloroaniline, hexachlorocyclopentadiene, and 4-nitrophenol in the second SVOC continuing calibration analyzed on November 24, 2004 were outside the method QC limits of 80-120%. The results for 4-chloroaniline and hexachlorocyclopentadiene were qualified as estimated (J or UJ) in samples 125010-01 (total and dissolved), 125010-02 (total and dissolved), and 125010-05 (total). As the percent recoveries for benzyl alcohol and 4-nitrophenol exceeded the method limit and these compounds were not detected in the above-referenced samples, results for benzyl alcohol and 4-nitrophenol in the associated samples were not qualified.
- The percent recoveries for 2,4-dimethylphenol, bis(2-chloroethoxy)methane, 4-chloroaniline, 2,4,6-trichlorophenol, di-n-butylphthalate, butylbenzylphthalate, benzo(a)anthracene, 3,3'-dichlorobenzidine, indeno(1,2,3-c,d)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene in the SVOC continuing calibration analyzed on November 30, 2004 were outside the method QC limits of 80-120%. The results for 2,4-dimethylphenol, bis(2-chloroethoxy)methane, and di-n-butylphthalate were qualified as estimated (J or UJ) in samples 125059-10, 125059-12, 125059-13, 125059-14, 125059-16, 125059-17, 125060-03, 125060-04, 125060-05, 125060-06, and 125060-08. As the percent recoveries for 4-chloroaniline, 2,4,6-trichlorophenol, butylbenzylphthalate, benzo(a)anthracene, 3,3'-dichlorobenzidine, indeno(1,2,3-c,d)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene exceeded the method limit, results reported as detected were qualified as estimated (J) in the above-referenced samples. Results reported as not detected for 4-chloroaniline, 2,4,6-trichlorophenol, butylbenzylphthalate, benzo(a)anthracene, 3,3'-dichlorobenzidine, indeno(1,2,3-c,d)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene were not qualified.
- The percent recoveries for hexachlorocyclopentadiene, phenanthrene, di-n-butylphthalate, benzidine, butylbenzylphthalate, and 3,3'-dichlorobenzidine in the second SVOC continuing calibration analyzed on November 30, 2004 were outside the method QC limits of 80-120%. The results for hexachlorocyclopentadiene and benzidine were qualified as estimated (J or UJ) in samples 125059-06, 125060-01, 125060-02, 125060-10, and 125060-11. As the percent recoveries for phenanthrene, di-n-butylphthalate, butylbenzylphthalate, and 3,3'-dichlorobenzidine exceeded the method limit, results reported as detected were qualified as estimated (J) in the above-referenced samples. Results reported as not detected for phenanthrene, di-n-butylphthalate, butylbenzylphthalate, and 3,3'-dichlorobenzidine were not qualified.
- The percent recoveries for n-nitrosodimethylamine, bis(2-chloroethoxy)ether, bis(2-chloroisopropyl)ether, 1,2,4-trichlorobenzene, pyrene, and benzidine in the SVOC continuing calibration analyzed on December 2, 2004 were outside the method QC limits of 80-120%. n-Nitrosodimethylamine, bis(2-chloroethoxy)ether, bis(2-chloroisopropyl)ether, 1,2,4-trichlorobenzene, and benzidine were not reported from the 100x dilution of sample 125059-08 and the results for these compounds were not qualified based on the continuing calibration results. The result for pyrene in the 100x dilution of sample 125059-08 is qualified as estimated (J) based on the continuing calibration.
- The percent recoveries for benzyl alcohol, n-nitrosodi-n-propylamine, 2,4-dimethyphenol, benzoic acid, 4-nitrophenol, diethylphthalate, 4-nitroaniline, and di-n-

butylphthalate in the SVOC continuing calibration analyzed on December 7, 2004 were outside the method QC limits of 80-120%. As the above referenced compounds were not reported from the dilutions of samples 125059-08 (10x), 125059-15 (10x), and 125059-17 (100x), the results were not qualified in these samples based on the continuing calibration.

Instrument calibrations were acceptable for pesticide analyses with the following exceptions:

- The percent recoveries for 4,4'-DDT and decachlorobiphenyl (DCBP) on the primary column and DCBP on the secondary column were outside the method QC limits of 85-115% in the pesticide continuing calibration analyzed on November 19, 2004. The percent recoveries for 4,4'-DDT and methoxychlor on the primary column were outside the method QC limits of 85-115% in the continuing calibration analyzed on November 20, 2004. Data were not qualified for the surrogate DCBP based on continuing calibration results. As 4,4'-DDT and methoxychlor were reported from the column which exhibited acceptable results, associated sample data were not qualified for these compounds based on the continuing calibration.
- The percent recoveries for 4,4'-DDT, endosulfan sulfate, and DCBP on the primary column and DCBP on the secondary column were outside the method QC limits of 85-115% in the pesticide continuing calibration analyzed on December 2, 2004. The percent recoveries for 4,4'-DDT on the primary column and heptachlor and 4,4'-DDT on the secondary column were outside the method QC limits of 85-115% in the second continuing calibration analyzed on December 2, 2004. Data were not qualified for the surrogate, DCBP, based on continuing calibration results. As endosulfan sulfate and heptachlor were reported from the column, which exhibited acceptable results, associated sample data were not qualified for these compounds based on the continuing calibration. As the percent recoveries for 4,4'-DDT exceeded the method limit and 4,4'-DDT was reported as not detected in the associated samples, results for 4,4'-DDT in samples 125010-01, 125010-02, and 125060-11 were not qualified.
- The percent recoveries for heptachlor on the primary column and heptachlor and 4,4'-DDD on the secondary column were outside the method QC limits of 85-115% in the pesticide continuing calibration analyzed on December 9, 2004. The percent recoveries for heptachlor and 4,4'-DDD on the primary column and heptachlor on the secondary column were outside the method QC limits of 85-115% in the continuing calibration analyzed on December 10, 2004. As 4,4'-DDD was reported from the column which exhibited acceptable results, associated sample data were not qualified for 4,4'-DDD based on the continuing calibration. As the percent recoveries for heptachlor exceeded the method limit and heptachlor was reported as not detected in the associated samples, the results for heptachlor in samples 125060-03, 125060-04, 125060-05, and 125060-06 were not qualified.

Surrogate Recovery Review

Each sample analyzed for organic compounds was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each

individual sample. Surrogate recoveries were evaluated using control limits as specified in the QAPP (Table 3-1).

Surrogate recoveries were acceptable for VOC analyses with the following exceptions:

- The percent recovery for trifluorotoluene at 55.2% in the VOC analysis of sample 124945-01 was below the QAPP limits of 75-125%. The results for all VOCs in sample 124945-01 were qualified as estimated (J or UJ).

Surrogate recoveries were acceptable for SVOC analyses with the following exceptions:

- Two or more acid fraction surrogates in the SVOC analyses were below the QAPP limits of 45-135% as shown below. All samples had one or more non-compliant recoveries less than 10%. Due to potential low bias indicated by the percent recovery of one or more acid fraction surrogates being below 10%, associated sample results for acid fraction SVOC analytes were qualified as estimated (J); associated non-detects were rejected (R).

Sample ID	2-Fluorophenol	Phenol – d5	Nitrobenzene – d5	2-Fluorobiphenyl	2,4,6-Tribromophenol	p-Terphenyl-d14
	Acid	Acid	Base/Neutral	Base/Neutral	Acid	Base/Neutral
124945-01 (Diss.)	0%	1.21%	OK	OK	0%	OK
124993-08 (Diss.)	34.3%	9.2%	OK	OK	OK	OK
124993-09 (Total)	6.45%	11.9%	OK	OK	9.67%	OK
124993-10 (Total)	4.24%	9.76%	OK	OK	5.69%	OK
124993-11 (Total)	1.97%	8.3%	OK	OK	2.01%	OK
124993-11 (Diss.)	4.11%	7.02%	OK	OK	5.61%	OK
124993-13 (Diss.)	15.7%	1.3%	OK	OK	OK	OK
124993-14 (Total)	0%	1.39%	OK	OK	0%	OK
124993-14 (Diss.)	1.63%	0%	OK	OK	10.5%	OK
124993-15 (Total)	0%	0.914%	OK	OK	0%	OK
124993-15 (Diss.)	2.79%	1.77%	OK	OK	15.2%	OK
125010-01 (Diss.)	22.8%	2.92%	OK	OK	OK	OK

- Two or more acid fraction surrogates in the SVOC analyses were below the QAPP limits of 45-135%. Associated sample results for acid fraction SVOC analytes were qualified as estimated (J or UJ).

Sample ID	2-Fluorophenol	Phenol – d5	Nitrobenzene – d5	2-Fluorobiphenyl	2,4,6-Tribromophenol	p-Terphenyl-d14
	Acid	Acid	Base/Neutral	Base/Neutral	Acid	Base/Neutral
124945-01 (Total)	17.6%	17.2%	OK	OK	39.3%	OK
124993-08 (Total)	24.4%	19.3%	OK	OK	OK	OK
124993-09 (Diss.)	26.3%	12.4%	OK	OK	OK	OK

124993-10 (Diss.)	30.6%	16.8%	OK	OK	OK	OK
124993-13 (Total)	23.6%	16.1%	OK	OK	OK	OK
125010-01 (Total)	22.4%	14.8%	OK	OK	OK	OK
125010-02 (Total)	21.4%	11.7%	OK	OK	OK	OK
125010-02 (Diss.)	28.7%	16.2%	OK	OK	OK	OK
125059-06 (Total)	10.5%	11.2%	OK	OK	36.5%	OK
125060-01 (Total)	28.4%	16.2%	OK	OK	OK	OK
125060-02 (Total)	43.7%	25.7%	OK	OK	OK	OK

- Two or more acid fraction and two or more base-neutral fraction surrogates in the SVOC analysis of sample 125010-05 were below the QAPP limits of 45-135%. Non-compliant acid fraction surrogate recoveries included 2-Fluorophenol at 20.3%, Phenol-d5 at 13.7%, and 2,4,6-Tribromophenol at 33.8%. Non-compliant base/neutral fraction surrogate recoveries include Nitrobenzene-d5 at 35.6% and 2-Fluorobiphenyl at 38.1%. The results for all SVOC compounds in sample 125010-05 were qualified as estimated (J or UJ).
- The percent recoveries for two base-neutral surrogates exceeded the QAPP limits of 45-135% in the SVOC analysis of sample 125059-17. Non-compliant recoveries include Nitrobenzene-d5 at 145% and p-Terphenyl-d14 at 156%. Results reported as detected were qualified as estimated (J) in sample 125059-17. Results reported as not detected were not qualified.
- The percent recoveries of one or more surrogates were outside the QAPP limits of 45-135%. One surrogate from each fraction (base-neutral and acid) is allowed to be non-compliant. As only one surrogate was outside the control limits for each fraction, data were not qualified based on surrogate recoveries in these samples.

Sample ID	2-Fluorophenol	Phenol – d5	Nitrobenzene – d5	2-Fluorobiphenyl	2,4,6-Tribromophenol	p-Terphenyl-d14
	Acid	Acid	Base/Neutral	Base/Neutral	Acid	Base/Neutral
125059-08 (Total)	247%	OK	3100%	OK	OK	OK
125059-10 (Total)	OK	OK	OK	OK	OK	144%
125059-15 (Total)	OK	OK	OK	OK	148%	155%
125059-16 (Total)	OK	OK	145%	OK	139%	OK
125060-03 (Total)	OK	153%	OK	OK	OK	OK
125060-08 (Total)	OK	168%	OK	OK	OK	138%
125060-10 (Total)	OK	40.2%	OK	OK	OK	OK
125060-11 (Total)	OK	43.9%	OK	OK	OK	OK

Surrogate recoveries were acceptable for butyltin analyses with the following exceptions:

- The percent recoveries for tripentyl tin exceeded the QAPP limits of 30-120% in samples 124993-02 at 150%, 124993-03 at 156%, 124993-04 at 156%, 124993-06 at 137%, 124993-07 at 135%, 124993-08 at 133%, 124993-09 at 133%, 124993-10 at 127%, 124993-11 at 132%, 125059-02 at 144%, 125059-03 at 127%, 125059-04 at 146%, 125059-12 at 129%, 125059-13 at 146%, 125059-14 at 142%, 125059-15 at 131%, 125059-16 at 150%, 125059-17 at 154%, 125060-04 at 154%, and 125060-06 at 140%. Results reported as detected were qualified as estimated (J) in the associated samples. Results reported as not detected were not qualified.

Surrogate recoveries were acceptable for PCB analyses with the following exceptions:

- The percent recoveries for DCBP exceeded the QAPP control limits of 30-130% for the PCB analyses of groundwater samples 124993-09 at 142%, 124993-10 at 145%, 124993-14 at 132%, 124993-15 at 137%, 125010-01 at 134%, and 125010-02 at 143%. As the alternate surrogate, tetrachlorometaxylene, was compliant and all PCB results for these samples were non-detect, data were not qualified in these samples based on the elevated DCBP recoveries.

Surrogate recoveries were acceptable for NWTPH-Gx analyses with the following exceptions:

- The percent recovery for bromofluorobenzene in sample 125060-06 exceeded the QAPP limits of 70-130% at 145%. As the percent recoveries for the alternate surrogates, trifluorotoluene, 1-chloro-3-fluorobenzene, and pentafluorobenzene, were acceptable, data were not qualified in this sample based on the bromofluorobenzene percent recovery.

Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control samples (LCS) are used to monitor the laboratory's day-to-day performance of routine analytical methods independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. STL analyzed at least one LCS and one MS/MSD (or one MS and one sample duplicate for metals analyses) for each analysis and for each batch per method requirements. LCS and MS/MSD recoveries were evaluated using control limits as specified in the QAPP (Table 3-1).

LCS recoveries were acceptable for SVOC analyses with the following exceptions:

- The percent recoveries for phenol of 31.1% and 31.2% and pentachlorophenol (PCP) of 38.6% and 31.4% in the LCS and LCSD and 4-nitrophenol of 44.7% in the LCS for SVOC (total and dissolved) analytical batch SW1034 were below the QAPP limits of 45-135%. As the percent recovery in the LCSD and the RPD for the LCS/LCSD pair were acceptable, data were not qualified for 4-nitrophenol based on the LCS result. The results for phenol and PCP in samples 124945-01 (total and dissolved), 124993-08 (total and dissolved), 124993-09 (total and dissolved), 124993-10 (total and dissolved), 124993-11 (total and dissolved), 124993-13 (total and dissolved), 124993-14 (total and dissolved),

and 124993-15 (total and dissolved) were previously qualified based on surrogate recoveries.

- The percent recoveries for pyrene of 152% in the LCS and phenol of 14% and 17.1% and n-nitrosodi-n-propylamine of 146% and 142% in the LCS and LCSD for analytical batch SW1036 were outside the QAPP limits of 45-135%. As the percent recovery in the LCSD and the RPD for the LCS/LCSD pair were acceptable, data were not qualified for pyrene based on the LCS result. Phenol and n-nitrosodi-n-propylamine were either not detected or qualified as not detected in the associated samples based on other QC issues detailed in this report; therefore, the results for phenol and n-nitrosodi-n-propylamine were not qualified based on the LCS/LCSD results.
- The percent recoveries for n-nitrosodi-n-propylamine of 137% and 4-chloro-3-methylphenol of 143% in the LCSD for SVOC analytical batch SW1040 exceeded the QAPP limits of 45-135%. As the percent recoveries in the LCS and the RPD for the LCS/LCSD pair were acceptable, associated sample data were not qualified for these compounds.
- The percent recoveries for PCP of 35.9% and 21.4% in the LCS and LCSD for SVOC analytical batch SS1281 were below the QAPP limits of 45-135%. In addition, the 51% RPD for the LCS/LCSD pair for PCP exceeded the QAPP limits of 50%. The results for PCP in samples 124945-03, 124993-02, 124993-03, 124993-04, 124993-06, 124993-07, 124993-17, 124993-18, 124993-19, and 124993-20 were qualified as estimated (J or UJ).
- The 52% RPD for PCP for the LCS/LCSD pair for SVOC analytical batch SS1285 exceeded the QAPP limit of 50%. As the percent recoveries for PCP in the LCS and LCSD were acceptable, associated data were not qualified based on the RPD.

MS/MSD recoveries were acceptable for SVOC analyses with the following exceptions:

- The percent recoveries for 1,2,4-trichlorobenzene of 36.5% in the MS and 1,4-dichlorobenzene of 40.8% and 36.6% in the MS and MSD were below the QAPP limits of 45-135% in the SVOC MS/MSD performed on sample 124993-07. As the percent recoveries in the MSD and the RPDs for the MS/MSD pair were acceptable, data were not qualified for 1,2,4-trichlorobenzene based on the MS result. The result for 1,4-dichlorobenzene in sample 124993-07 was qualified as estimated (UJ).
- The percent recoveries for n-nitrosodi-n-propylamine (total only) of 35.2% in the MS, 4-chloro-3-methylphenol (total and dissolved) of 19.2% and 26.7% in the MSD, phenol of 17.6% and 5.6%, 2-chlorophenol (total) of 38.7% and 6.5%, 2-chlorophenol (dissolved) of 5.62% and 11.4%, 4-nitrophenol (total) of 16.1% and 0%, 4-nitrophenol (dissolved) of 4.1% and 4.35%, and PCP (total) of 15.9% and 0%, PCP (dissolved) of 0% and 0% in the MS and MSD were below the QAPP limits of 45-135% in the SVOC (total and dissolved) MS/MSD performed on sample 124993-11. The results for all acid fraction SVOCs in sample 124993-11 were previously rejected based on surrogate recoveries and

do not require further qualification. The result for n-nitrosodi-n-propylamine (total) in sample 124993-11 was qualified as estimated (UJ).

- The percent recoveries for 1,4-dichlorobenzene of 25.4% and 29%, 1,2,4-trichlorobenzene of 23.5% and 26%, and 2,4-dinitrotoluene of 42.2% and 41% in the MS and MSD were below the QAPP limits of 45-135% in the SVOC MS/MSD performed on sample 124993-20. The results for 1,4-dichlorobenzene, 1,2,4-trichlorobenzene, and 2,4-dinitrotoluene in sample 124993-20 were qualified as estimated (UJ).
- The percent recoveries for 1,4-dichlorobenzene of 39.8% in the MS and phenol of 9.76% and 10.8%, 2-chlorophenol of 30.4% and 29.3%, 1,2,4-trichlorobenzene of 42% and 43.8%, 4-chloro-3-methylphenol of 37.5% and 35.8%, and PCP of 25.6% and 26.7% in the MS and MSD were below the QAPP limits of 45-135% in the SVOC (total and dissolved) MS/MSD performed on sample 125010-02. As the percent recovery in the MSD and the RPD for the MS/MSD pair were acceptable, data were not qualified for 1,4-dichlorobenzene (total or dissolved) based on the MS result. The results (total and dissolved) for phenol, 2-chlorophenol, 1,2,4-trichlorobenzene, 4-chloro-3-methylphenol, and PCP in sample 125010-02 were qualified as estimated (J or UJ).
- The percent recoveries for n-nitrosodi-n-propylamine of 153% in the MS and acenaphthene of 4250% and 31.2% and pyrene of 9190% and 0% in the MS and MSD were outside the QAPP limits of 45-135% in the SVOC MS/MSD performed on sample 125059-15. 4-Nitrophenol, 2,4-dinitrotoluene, and PCP were not recovered from the MS and MSD and 4-chloro-3-methylphenol was not recovered from the MSD due to high concentrations of TPH compounds in sample 125059-15. As the percent recovery in the MSD and the RPD pair were acceptable, data were not qualified for n-nitrosodi-n-propylamine based on the MS result. As the parent sample concentration for acenaphthene was more than 4x the spike concentration, data were not qualified for acenaphthene based on the MS/MSD results. The results for 4-nitrophenol, 2,4-dinitrotoluene, PCP, and 4-chloro-3-methylphenol in sample 125059-15 were qualified as estimated (UJ).
- The percent recoveries for 4-nitrophenol of 24.8% in the MSD and phenol of 17.3% and 18% in the MS and MSD were below the QAPP limits of 45-135% in the SVOC MS/MSD performed on sample 125060-01. In addition, the RPD of 63% for the MS/MSD pair for 4-nitrophenol exceeded the QAPP limit of 60%. The results for 4-nitrophenol and phenol in sample 125060-01 were previously qualified based on surrogate recoveries and do not require further qualification.

MS/MSD recoveries were acceptable for NWTPH-Gx analyses with the following exceptions:

- The percent recovery of 64.5% for gasoline was below the QAPP limits of 70-130% in the NWTPH-Gx MS performed on sample 125010-02. In addition, the RPD of 38% for the MS/MSD pair exceeded the QAPP limit of 30%. The result for gasoline-range hydrocarbons in sample 125010-02 was qualified as estimated (UJ).

MS/MSD recoveries were acceptable for NWTPH-Dx analyses with the following exceptions:

- Diesel-range and heavy oil-range hydrocarbons were not recovered from the NWTPH-Dx MS/MSD performed on sample 125059-15. The sample results for diesel-range and heavy oil-range hydrocarbons in the parent sample were between two and four times the spike concentration; therefore, the results for diesel-range and heavy oil-range hydrocarbons in sample 125059-15 were qualified as estimated (J).

MS/Duplicate recoveries were acceptable for metals analyses with the following exceptions:

- The percent recovery of 184% for chromium exceeded the QAPP limits of 75-125% in the MS performed on sample 124945-03. The result for chromium in sample 124945-03 was qualified as estimated (J).
- The percent recovery for copper of 72% was below the QAPP limits of 75-125% in the MS performed on sample 124993-07. The percent recovery for sodium of 60% was below the QAPP limits of 75-125% in the MS performed on sample 124993-20. The results for copper and sodium in samples 124993-07 and 124993-20 were qualified as estimated (J). The area where the samples were collected consists of fill material; therefore, the remaining samples associated with this laboratory analytical batch were not deemed to be sufficiently similar to require qualification based on matrix spike recovery.

PRECISION

Second Column Confirmation

Second column confirmation was performed for all PCB and pesticide analyses. All PCB results reported as detected exhibited a relative percent difference (RPD) less than 40%. The laboratory flagged pesticide results with a 'C2' to indicate that the second column confirmation resulted in RPDs greater than 40%. The results for one or more pesticides in samples 124993-14, 124993-15, 125010-02, 125059-15, 125059-16, 125060-03, and 125060-06 were flagged with a 'C2' by the laboratory and are qualified as estimated (J).

Duplicate Review

Three soil field duplicate samples, two groundwater duplicate samples, one blow-down water sample, and one sandblast grit sample were collected to verify acceptable field sampling techniques and the representativeness of the sample aliquots. In addition, the laboratory performed in-house duplicate analyses for many samples. The RPD for field duplicate samples was calculated when sample results were greater than 5x the reporting limit. Reported concentrations for field duplicate pairs are presented in Tables G-3 through G-9. In general, field duplicate precision was within the QAPP limits of ±50% with the following exceptions:

- The RPDs for the parent sample/field duplicate pair exceeded the QAPP limits for samples 124993-03 and 124993-04 for cobalt, vanadium, arsenic, and chromium. The results for

cobalt, vanadium, arsenic, and chromium were qualified as estimated (J) in samples 124993-03 and 124993-04.

- The RPDs for the parent sample/field duplicate pair exceeded the QAPP limits for samples 124993-14 and 124993-15 for TSS. The results for TSS in samples 124993-14 and 124993-15 were qualified as estimated (J).
- The RPDs for the parent sample/field duplicate pair exceeded the QAPP limits for samples 125059-12 and 125059-13 for phenanthrene and pyrene. The results for phenanthrene and pyrene were qualified as estimated (J) in samples 125059-12 and 125059-13.

Laboratory duplicate precision was acceptable with the following exceptions:

- The RPD for gasoline-range hydrocarbons exceeded the QAPP limit of 30% in the laboratory duplicate performed on sample 125059-08. The result for gasoline-range hydrocarbons in sample 125059-08 was qualified as estimated (J).
- The RPD for sodium exceeded the QAPP limit of 25% in the laboratory duplicate performed on sample 124993-07. The result for sodium in sample 124993-07 was qualified as estimated (J).
- The RPD for iron exceeded the QAPP limit of 25% in the laboratory duplicate performed on sample 125059-15. The result for iron was qualified as estimated (J) in sample 125059-15. The samples of this QC batch were not deemed to be sufficiently similar for a matrix-wide qualification.

COMPARABILITY

Compound Identification

The laboratory flagged the diesel-range hydrocarbon results for samples 125059-08, 125059-12, and 125059-16 with a 'X1' indicating that the diesel-range results may be due to overlap from heavy oil range hydrocarbons. The laboratory flagged the diesel-range and heavy oil-range hydrocarbon results for sample 125059-15 with an 'X2' to indicate that the elution pattern for these compounds does not match the standard pattern. Qualitative observations were noted on the laboratory report forms.

Reporting Limits

The sensitivity (i.e., reporting limits) of the analytical methods is driven by the project specific DQOs. Analyte PQLs exceeded levels specified in the QAPP for one or more compounds in one or more samples. In all cases the method detection limit was below the specified levels. The laboratory reported all detections between the MDL and PQL and qualified those results as estimated (J).

Samples 124993-14, 124993-15, and 125059-08 required dilution to quantitate cis-1,2-dichloroethene, trichloroethene, tetrachloroethene, and/or 1,2,4-trimethylbenzene within the

linear range of the instrument. Sample results which exceeded the calibration range of the instrument were flagged 'E' by the laboratory and have been qualified with the flag 'DNR' for Do Not Report. As the reporting limits were lower for the undiluted analyses, results for compounds that were not flagged 'E' by the laboratory in the undiluted analyses of samples 124993-14, 124993-15, and 125059-08 are qualified 'DNR' for the diluted analysis.

The result for cis-1,2-dichloroethene in sample 125010-05 was flagged with an 'E' by the laboratory to indicate that the result exceeded the linear range of the instrument. Typically, the 'E'-flagged result would be qualified 'DNR' and the dilution result reported; however, the laboratory did not have sufficient sample volume to perform a dilution on this sample. The result for cis-1,2-dichloroethene in sample 125010-05 is therefore qualified as estimated and flagged 'J' based on the linear range exceedance.

STL combines results for various dilutions on a single report form for each sample. Dilution factors for individual analytes are listed adjacent to the corresponding analyte and are designated "D" (such as D10 or D100). The samples that required dilution due to elevated concentrations did not meet the requested reporting limits; however, data are not qualified based on high analyte concentrations that require dilution.

COMPLETENESS

The laboratory reported all requested analyses and the deliverable data reports were complete. Completeness is defined as the percentage of usable data out of the total amount of data generated. The project completeness goal is 100 percent. Some data were qualified as estimated (J) and some as non-detect (U). Some data were also rejected (R). A summary of qualifiers can be found in Table G-2. Completeness for the site investigation is greater than 95 percent based on rejection of 334 out of 7713 analytes.

Table G-1

SAMPLE LOCATION AND ANALYSES SUMMARY

Sample Number	Sample Date	Lab ID	Site Location	Method Analyses
041116SGA01GW	11-16-04	124945-01	Sandblast Area	VOCs, SVOCs (Total and Dissolved), Butyltins, PCBs, Metals (Total and Dissolved), TOC, TSS
041116SGA01SS	11-16-04	124945-02	Former Septic System	Hold
041116SGA02SS	11-16-04	124945-03	Former Septic System	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs (Total), Butyltins, Pesticides, PCBs, Metals (total)
Trip Blank #2718		124945-04		VOCs
041117SGA03SS	11-17-04	124993-01	Former Septic System	Hold
041117SGA04SS	11-17-04	124993-02	Former Septic System	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Butyltins, Pesticides, PCBs, Metals
041117SGA05SS	11-17-04	124993-03	Former Septic System	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Butyltins, Pesticides, PCBs, Metals
041117SGA06SS (Field Duplicate of 041117SGA05SS)	11-17-04	124993-04	Former Septic System	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Butyltins, Pesticides, PCBs, Metals
041117SGA07SS	11-17-04	124993-05	Former Septic System	Hold
041117SGA08SS	11-17-04	124993-06	Former Septic System	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Butyltins, Pesticides, PCBs, Metals
041117SGA09SS	11-17-04	124993-07	Former Septic System	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Butyltins, Pesticides, PCBs, Metals
041117SGA02GW	11-17-04	124993-08	Sandblast Area	VOCs, SVOCs (Total and Dissolved), Butyltins, PCBs, Metals (Total and Dissolved), TOC, TSS
041117SGA03GW	11-17-04	124993-09	Sandblast Area	VOCs, SVOCs (Total and Dissolved), Butyltins, PCBs, Metals (Total and Dissolved), TOC, TSS
041117SGA04GW (Field Duplicate of 041117SGA03GW)	11-17-04	124993-10	Sandblast Area	VOCs, SVOCs (Total and Dissolved), Butyltins, PCBs, Metals (Total and Dissolved), TOC, TSS
041117SGA05GW	11-17-04	124993-11	Sandblast Area	VOCs, SVOCs (Total and Dissolved), Butyltins, PCBs, Metals (Total and Dissolved), TOC, TSS
Trip Blank #2717	11-17-04	124993-12		VOCs
041118SGA06GW	11-18-04	124993-13	Hazardous Materials Storage Area	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs (Total and Dissolved), Metals (Total and Dissolved), TOC, TSS
041118SGA07GW	11-18-04	124993-14	Former Septic Area	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs (Total and Dissolved), Pesticides, PCBs, Metals (Total and Dissolved), TOC, TSS
041118SGA08GW (Field Duplicate of 041118SGA07GW)	11-18-04	124993-15	Former Septic Area	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs (Total and Dissolved), Pesticides, PCBs, Metals (Total and Dissolved), TOC, TSS
Trip Blank #2716	11-18-04	124993-16		VOCs
041118SGA10SS	11-18-04	124993-17	Hazardous Materials Storage Area	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Metals

Sample Number	Sample Date	Lab ID	Site Location	Method Analyses
041118SGA11SS	11-18-04	124993-18	Hazardous Materials Storage Area	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Metals
041118SGA12SS (Field Duplicate of 041118SGA11SS)	11-18-04	124993-19	Hazardous Materials Storage Area	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Metals
041118SGA13SS	11-18-04	124993-20	Hazardous Materials Storage Area	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Metals
041119SGA09GW	11-19-04	125010-01	Former Septic System	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs (Total and Dissolved), Pesticides, PCBs, Metals (Total and Dissolved), TOC, TSS
041119SGA10GW	11-19-04	125010-02		NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs (Total and Dissolved), Pesticides, PCBs, Metals (Total and Dissolved), TOC, TSS
Trip Blank #2715	11-19-04	125010-03		NWTPH-Gx, VOCs
041119SGA11GW	11-19-04	125010-04	Hazardous Materials Storage Area	NWTPH-Gx, VOCs, TSS
041119SGA12GW	11-19-04	125010-05	Hazardous Materials Storage Area	NWTPH-Gx, VOCs, SVOCs, Metals (Total and Dissolved), TSS
041122SGA24SG	11-22-04	125059-01	Sandblast Area	Butyltins, SPLP Butyltins, Metals, TCLP/SPLP Metals
041122SGA25SG	11-22-04	125059-02	Sandblast Area	Butyltins, SPLP Butyltins, Metals, TCLP/SPLP Metals
041122SGA26SG (Field Duplicate of 041122SGA25SG)	11-22-04	125059-03	Sandblast Area	Butyltins, SPLP Butyltins, Metals, TCLP/SPLP Metals
041122SGA27SG	11-22-04	125059-04	Sandblast Area	Butyltins, SPLP Butyltins, Metals, TCLP/SPLP Metals
041122SGA11GW	11-22-04	125059-05	Hazardous Materials Storage Area	Metals (Total and Dissolved)
041122SGA12GW	11-22-04	125059-06	Hazardous Materials Storage Area	SVOCs
041122SGA20SS	11-22-04	125059-07		Hold
041122SGA21SS	11-22-04	125059-08		NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Metals (Total)
041122SGA22SS	11-22-04	125059-09		Hold
041122SGA23SS	11-22-04	125059-10		NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Metals (Total)
TB#2718		125059-11		VOCs
041122SGA14SS	11-22-04	125059-12	Sandblast Area	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Butyltins, Pesticides, PCBs, Metals
041122SGA15SS (Field Duplicate of 041122SGA14SS)	11-22-04	125059-13	Sandblast Area	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Butyltins, Pesticides, PCBs, Metals
041122SGA16SS	11-22-04	125059-14	Sandblast Area	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Butyltins, Pesticides, PCBs, Metals
041122SGA17SS	11-22-04	125059-15	Sandblast Area	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Butyltins, Pesticides, PCBs, Metals
041122SGA18SS	11-22-04	125059-16	Catch Basin	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Butyltins, Pesticides, PCBs, Metals
041122SGA19SS	11-22-04	125059-17	Catch Basin	SVOCs, Butyltins, PCBs, Metals
041123SGA13BDW	11-23-04	125060-01	Sandblast Area	VOCs, SVOCs, Metals

Sample Number	Sample Date	Lab ID	Site Location	Method Analyses
041123SGA14BDW (Field Duplicate of 041123SGA13BDW)	11-23-04	125060-02	Sandblast Area	VOCs, SVOCs, Metals
041123SGA28SS	11-23-04	125060-03	Sandblast Area	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Butyltins, Pesticides, PCBs, Metals
041123SGA29SS	11-23-04	125060-04	Sandblast Area	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Butyltins, Pesticides, PCBs, Metals
041123SGA30SS	11-23-04	125060-05	Burn Pit Waste Sample	VOCs, SVOCs, Pesticides, PCBs, Metals
041123SGA31SS	11-23-04	125060-06	Burn Pit Soil Sample	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Butyltins, Pesticides, PCBs, Metals
041123SGA32SS	11-23-04	125060-07	Hazardous Materials Storage Area	Hold
041123SGA33SS	11-23-04	125060-08	Hazardous Materials Storage Area	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Metals
Trip Blank		125060-09		VOCs
041123SGA15ERW	11-23-04	125060-10	Equipment Rinsate – Hand Auger	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Metals (Total), TOC
041123SGA16ERW	11-23-04	125060-11	Equipment Rinsate - Pickaxe	NWTPH-Gx, NWTPH-Dx, VOCs, SVOCs, Butyltins, Pesticides, PCBs, TOC
Trip Blank		125060-12		VOCs
041129SGA15ERW	11-29-04	125082-01	Equipment Rinsate – Hand Auger	Metals

Table G-3
SUMMARY OF FIELD DUPLICATE PRECISION

ANALYSIS	ANALYTE	124993-09 041117SGA03GW	124993-10 041117SGA04GW	RPD	Qualification
TSS	None				
VOCs	2,2-Dichloropropane	0.106	0.128	NA	None
	cis-1,2-DCE	0.835	0.849	NA	None
	1,1,1-Trichloroethene	0.0711	0.0691	NA	None
	Trichloroethene	0.345	0.339	NA	None
	Tetrachloroethene	1.16	1.12	NA	None
SVOCs	Naphthalene	0.0254	0.248	NA	None
	2-Methylnaphthalene	0.0208	0.064	NA	None
	Phenanthrene	0.0042	0.0158	NA	None
	Di-n-butylphthalate	0.148	0.151	NA	None
	Butylbenzylphthalate	0.12	0.109	NA	None
Dissolved SVOCs	Phenol	0.0181	0.0202	NA	None
	Naphthalene	0.0257	0.0433	NA	None
	2-Methylnaphthalene	0.0171	0.0181	NA	None
	Fluorene	0.00472	0.00835	NA	None
	Phenanthrene	0.00691	0.0153	NA	None
	Di-n-butylphthalate	0.162	0.191	NA	None
	Butylbenzylphthalate	0.168	0.141	NA	None
Total Metals	Al	0.114	0.0734	NA	None
	Ca	25	24.7	1.21	None
	Fe	0.0838	0.085	NA	None
	Mg	5.83	5.84	0.17	None
	K	0.921	0.911	NA	None
	Na	6.39	6.5	1.71	None
	V	0.00266	0.00219	NA	None
	As	0.000506	0.00145	NA	None
	Sb	0.000525	0.000426	NA	None
	Ba	0.00375	0.00376	0.27	None
	Cr	0.00496	0.00434	13.33	None
	Cu	0.00136	0.0014	NA	None
	Mn	0.00208	0.00211	NA	None
	Se	0.00103	0.00114	NA	None
	Zn	0.00349	0.0043	NA	None

Table G-3
SUMMARY OF FIELD DUPLICATE PRECISION (continued)

ANALYSIS	ANALYTE	124993-09	124993-10	RPD	Qualification
Dissolved Metals	Ca	25.5	25.2	1.18	None
	Mg	6.11	6	1.82	None
	K	0.71	0.729	NA	None
	Na	7.13	7.14	0.14	None
	V	0.00154	0.00136	NA	None
	Ar	0.00117	0.00112	NA	None
	Sb	0.00025	0.000344	NA	None
	Ba	0.00352	0.00352	0.00	None
	Cr	0.00168	0.00201	NA	None
	Cu	0.000782	0.000825	NA	None
	Mn	0.000576	0.00284	NA	None
	Se	0.000662	0.000532	NA	None
	Ag	0.000027	0.000026	NA	None
TOC	TOC	1.88	1.1	NA	None

Note: Field duplicate RPDs calculated only when detections present in both the primary and duplicate samples and concentrations are greater than 5x the reporting limit.
NA – Not Applicable. Reported sample results were less than 5x the reporting limit.
Field duplicate RPDs were not calculated for butyltins and PCBs because target analytes were not detected in the parent sample and/or field duplicate.

Table G-4
SUMMARY OF FIELD DUPLICATE PRECISION

ANALYSIS	ANALYTE	124993-14 041118SGA07GW	124993-15 041118SGA08GW	RPD	Qualification
TSS	TSS	28	16	54.55	J
VOCs	1,1-Dichloroethene	1.2	1.13	NA	None
	trans-1,2-Dichloroethene	2.06	1.54	NA	None
	1,1-Dichloroethane	2.58	2.45	NA	None
	Chloroform	0.0979	0.0834	NA	None
	cis-1,2-Dichloroethene	335	347	3.52	None
	1,1,1-Trichloroethane	2.35	2.1	NA	None
	Benzene	0.0624	0.0618	NA	None
	Trichloroethene	2.26	1.98	NA	None
	Toluene	0.3	0.297	NA	None
	Tetrachloroethene	3.77	3.62	NA	None
	Ethylbenzene	0.0377	0.0429	NA	None
	m,p-xylene	0.088	0.0766	NA	None
	o-xylene	0.0275	0.0333	NA	None
SVOCs	Phenanthrene	0.0127	0.00883	NA	None
	Di-n-butylphthalate	0.162	0.149	NA	None
	butylbenzylphthalate	0.151	0.126	NA	None
Dissolved SVOCs	Naphthalene	0.0353	0.0255	NA	None
	Di-n-butylphthalate	0.171	0.143	NA	None
	butylbenzylphthalate	0.142	0.131	NA	None
Pesticides	Lindane	0.000863	0.000997	NA	None
Total Metals	Al	0.285	0.274	NA	None
	Ca	32.4	33.3	2.74	None
	Co	0.00373	0.00377	NA	None
	Fe	0.541	0.551	1.83	None
	Mg	10.3	10.5	1.92	None
	Ni	0.00331	0.00323	NA	None
	K	1.49	1.59	6.49	None
	Na	10.7	10.8	0.93	None
	V	0.00179	0.00236	NA	None
	Ba	0.0243	0.0254	NA	None
	Cr	0.00574	0.00374	42.19	None
	Cu	0.00253	0.00256	1.18	None
	Mn	0.687	0.73	6.07	None
	Se	0.00165	0.00174	NA	None
	Ag	0.00002	0.000019	NA	None
	Tl	0.000087	0.000084	NA	None
	Zn	0.00533	0.00504	NA	None

Table G-4
SUMMARY OF FIELD DUPLICATE PRECISION (continued)

ANALYSIS	ANALYTE	124993-14	124993-15	RPD	Qualification
Dissolved Metals	Ca	27.5	31.8	14.50	None
	Co	0.0031	0.0062	NA	None
	Fe	0.0905	0.119	NA	None
	Mg	8.84	10.1	13.31	None
	Ni	0.00169	0.00251	NA	None
	K	1.03	1.2	15.25	None
	Na	11.3	12.1	6.84	None
	As	0.0007	0.0007	NA	None
	Sb	0.000152	0.000266	NA	None
	Ba	0.0199	0.0214	7.26	None
	Cr	0.00291	0.00295	1.37	None
	Cu	0.000875	0.00104	NA	None
	Mn	0.527	0.647	20.44	None
	Se	0.00114	0.00135	NA	None
	Ag	0.000028	0.000025	NA	None
	Tl	0.000085	0.000086	NA	None
TOC	TOC	2.34	2.47	5.41	None

Note: Field duplicate RPDs calculated only when detections present in both the primary and duplicate samples and concentrations are greater than 5x the reporting limit.
NA – Not Applicable. Reported sample results were less than 5x the reporting limit.
Field duplicate RPDs were not calculated for NWTPH-Gx, NWTPH-Dx, and PCBs because target analytes were not detected in the parent sample and/or field duplicate.

Table G-5
SUMMARY OF FIELD DUPLICATE PRECISION

ANALYSIS	ANALYTE	124993-03 041117SGA05SS	124993-04 041117SGA06SS	RPD	Qualification
VOCs	Dichlorodifluoromethane	0.664	0.27	NA	None
	Trichloroethene	0.189	0.11	NA	None
SVOCs	bis(2-Ethylhexyl)phthalate	210	83.1	NA	None
Butyltins	Dibutyltin	25.8	7.32	NA	None
	Monobutyltin	9.38	5.48	NA	None
Total Metals	Al	12500	10600	16.45	None
	Ca	7500	6810	9.64	None
	Co	21	10	70.97	J
	Fe	27000	20600	26.89	None
	Mg	7270	6990	3.93	None
	Ni	27.1	16.3	49.77	None
	K	626	642	2.52	None
	V	73.3	42.4	53.41	J
	As	14.2	5.45	89.06	J
	Sb	0.638	0.228	NA	None
	Ba	93.6	89.4	4.59	None
	Be	0.411	0.349	NA	None
	Cr	28.1	14.5	63.85	J
	Cu	57.3	46.5	20.81	None
	Pb	8.15	5.12	45.67	None
	Mn	535	343	43.74	None
	Se	0.956	0.247	NA	None
	Ag	0.204	0.111	NA	None
	Tl	0.227	0.132	NA	None
	Zn	61.2	45.4	29.64	None
	Hg	0.0798	0.0289	NA	None

Note: Field duplicate RPDs calculated only when detections present in both the primary and duplicate samples and concentrations are greater than 5x the reporting limit
NA – Not Applicable. Reported sample results were less than 5x the reporting limit.
Field duplicate RPDs were not calculated for NWTPH-Gx, NWTPH-Dx, pesticides, and PCBs because target analytes were not detected in both the parent sample and field duplicate.

Table G-6
SUMMARY OF FIELD DUPLICATE PRECISION

ANALYSIS	ANALYTE	124993-18 041118SGA11SS	124993-19 041118SGA12SS	RPD	Qualification
VOCs	Dichlorodifluoromethane	0.0866	0.0814	NA	None
	cis-1,2-DCE	67.8	49.1	31.99	None
	Benzene	0.482	0.529	NA	None
	Trichloroethene	29.7	19.2	42.94	None
	Tetrachloroethene	64.4	43.5	38.74	None
SVOCs	bis(2-Ethylhexyl)phthalate	133	17	NA	None
Total Metals	Al	14900	12300	19.12	None
	Ca	4550	3310	31.55	None
	Co	12.6	16.5	26.80	None
	Fe	23600	20800	12.61	None
	Mg	5920	4330	31.02	None
	Ni	15	15.8	5.19	None
	K	774	635	19.73	None
	V	67.7	62.2	8.47	None
	As	3.13	4.23	29.89	None
	Sb	0.219	0.217	NA	None
	Ba	103	98.9	4.06	None
	Be	0.376	0.365	NA	None
	Cr	19.5	20.7	5.97	None
	Cu	33.2	26.8	21.33	None
	Pb	5.46	5.01	8.60	None
	Mn	338	484	35.52	None
	Se	0.314	0.333	NA	None
	Ag	0.134	0.154	NA	None
	Tl	0.105	0.165	NA	None
	Zn	45.2	44.5	1.56	None

Note: Field duplicate RPDs calculated only when detections present in both the primary and duplicate samples and concentrations are greater than 5x the reporting limit.
NA – Not Applicable. Reported sample results were less than 5x the reporting limit.
Field duplicate RPDs were not calculated for NWTPH-Gx and NWTPH-Dx because target analytes were not detected in both the parent sample and field duplicate.

Table G-7
SUMMARY OF FIELD DUPLICATE PRECISION

ANALYSIS	ANALYTE	125060-01 041123SGA13BDW	125060-02 041123SGA14BDW	RPD	Qualification
VOCs	Chloroform	0.333	0.341	NA	None
	Bromodichloromethane	0.473	0.403	NA	None
	Dibromochloromethane	0.41	0.396	NA	None
	Bromoform	0.62	0.776	NA	None
SVOCs	Benzyl Alcohol	0.0478	0.107	NA	None
	Butylbenzylphthalate	0.119	0.2	NA	None
Total Metals	Antimony	0.000112	0.000139	NA	None
	Barium	0.0022	0.00213	NA	None
	Chromium	0.00561	0.0061	NA	None
	Copper	0.0398	0.0383	3.84	None
	Selenium	0.00065	0.000693	NA	None
	Silver	0.000023	0.00027	NA	None
	Zinc	0.0888	0.0913	2.78	None
	Aluminum	0.012	0.0117	NA	None
	Calcium	10.1	10.1	0.00	None
	Magnesium	3.6	3.59	NA	None
	Potassium	2.31	2.32	NA	None
	Sodium	6.95	7.26	4.36	None
	Vanadium	0.00284	0.00308	NA	None

Note: Field duplicate RPDs calculated only when detections present in both the primary and duplicate samples and concentrations are greater than 5x the reporting limit.
NA – Not Applicable. Reported sample results were less than 5x the reporting limit.

Table G-8
SUMMARY OF FIELD DUPLICATE PRECISION

ANALYSIS	ANALYTE	125059-12 041122SGA14SS	125059-13 041122SGA15SS	RPD	Qualification
VOCs	Trichloroethene	0.209	0.133	NA	None
	1,3,5-trimethylbenzene	0.107	0.0787	NA	None
SVOCs	Benzoic Acid	101	115	NA	None
	Acenaphthene	14.4	7.48	NA	None
	Fluorene	8.19	8.87	52.60	None
	Phenanthrene	146	85.2	52.6	J
	Fluoranthene	261	175	39.45	None
	Pyrene	501	232	73.40	J
	Benzo(a)anthracene	210	156	29.51	None
	Chrysene	250	199	22.72	None
	bis(2-ethylhexyl)phthalate	1180	889	28.13	None
	Benzofluoranthenes	327	252	25.91	None
	Benzo(a)pyrene	191	128	39.50	None
	Indeno(1,2,3-cd)pyrene	89.9	77.3	15.07	None
	Benzo(g,h,i)perylene	99.5	89.6	10.47	None
Pesticides	4,4'-DDT	5.58	4.95	NA	None
Dx	Diesel	33.9	15.5	NA	None
	Motor oil	300	132	NA	None
Total Metals	Al	13100	9680	30.03	None
	Ca	7200	5290	30.58	None
	Co	17	14.7	14.51	None
	Fe	30300	26600	13.01	None
	Mg	9040	6660	30.32	None
	Ni	22.3	18	21.34	None
	K	847	726	15.38	None
	V	63.2	54.6	14.60	None
	As	4.78	4.1	15.32	None
	Ba	111	89.5	NA	None
	Be	0.337	0.27	NA	None
	Cr	20	18.6	7.25	None
	Cu	52.7	42.4	21.66	None
	Pb	103	152	38.43	None
	Se	0.262	0.282	NA	None
	Mn	596	512	15.16	None
	Ag	0.124	0.122	NA	None
	Tl	0.123	0.109	NA	None
	Zn	86.8	89.1	2.62	None

Note: Field duplicate RPDs calculated only when detections present in both the primary and duplicate samples and concentrations are greater than 5x the reporting limit.
NA – Not Applicable. Reported sample results were less than 5x the reporting limit.
Field duplicate RPDs were not calculated for NWTPH-Gx, butyltins and PCBs because target analytes were not detected in both the parent sample and field duplicate.

Table G-9
SUMMARY OF FIELD DUPLICATE PRECISION

ANALYSIS	ANALYTE	125059-02 041122SGA25SG	125059-03 041122SGA26SG	RPD	Qualification
Total Metals	Cr	2190	2420	9.98	None
	Pb	65.8	70.9	7.46	None
TCLP Metals	Cr	0.085	0.0841	1.06	None
	Pb	0.0622	0.0481	25.57	None
SPLP Metals	Pb	0.0677	0.0698	3.05	None
	Cr	0.0771	0.0686	11.67	None
Butyltins	Tributyltin	1.79	3.27	NA	None

Note: Field duplicate RPDs calculated only when detections present in both the primary and duplicate samples and concentrations are greater than 5x the reporting limit.
NA - Not Applicable. Reported sample results were less than 5x the reporting limit.
Field duplicate RPDs were not calculated for SPLP butyltins because target analytes were not detected in both the parent sample and field duplicate.

On April 10, 2007, Kitia Chambers (USACE) and Brian McNamara (URS) collected nine soil samples from Bradford Island to aid in the characterization of soil that potentially may become mobile. The soil samples were submitted to Analytical Resources Incorporated (ARI), located in Tukwila, Washington. Table 1 summarizes the URS and ARI sample IDs. The following is a list of the analyses performed on each soil sample in general accordance with the methods.

Method	Analytical Parameter
EPA 8082-M	Polychlorinated Biphenyls (PCBs) Aroclors
EPA 8270D	Semivolatile Organic Compounds (SVOCs)
EPA 6010B/200.8	Total Metals[1]
EPA 7471A	Total Mercury
EPA 8081A	Organochlorine Pesticides

[1]Metals include Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc

The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed in each laboratory report submitted: laboratory case narrative, proper sample preservation and handling procedures, holding times, quantitation limits, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The data review process for this investigation followed the most conservative criteria available in the following documents:

- Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 3, January 2006 (DoD, January 2006)
- EPA Test Methods for Evaluating Solid Waste (SW-846), Methods for Chemical Analysis of Water and Wastes
- EPA's Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Organic Data Review (USEPA, October 1999)
- EPA NFGs for Inorganic Data Review (USEPA, October 2004)

A summary of qualifiers assigned to results in this investigation is included in Table 2. For ease of reference the samples are represented in Table 2 by their laboratory ID and the ID assigned in the field. Qualifiers that may be assigned to the results of this investigation include the following:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.

- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

- DNR - Do Not Report

REPRESENTATIVENESS

Chain-of-Custody and Holding Times

The chain-of-custody (COC) forms indicate that samples were maintained under chain of custody and forms were signed upon release and receipt. The samples were submitted to the laboratory in two coolers. The cooler temperatures upon receipt exceeded the EPA-recommended range of 4°C± 2°C at 6.5°C and 10°C. Analytical results were not estimated based on the short duration of temperature exceedance. Samples were shipped on ice overnight via FedEx and were immediately placed in storage at 4°C upon receipt at the laboratory. All samples were analyzed within the technical and contracted holding time.

Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank for each analysis and for each batch, per method requirements. Qualification of samples due to method or field blank contamination followed guidelines set forth in the EPA NFGs.

Sample results less than five times (5x) the method blank or field blank concentration and between the method detection limit (MDL) and method reporting limit (MRL) were flagged as non-detect 'U' at the MRL. When sample results were less than 5x the blank concentration but above the MRL, the reported result was qualified as non-detect 'U'. Target compounds detected in the method or field blanks but reported as not detected in the associated samples were not qualified. Target compounds reported with concentrations greater than 5x the blank concentration were not qualified.

All analytical tests indicate non-detects for method blanks with the following exceptions:

- ARI assigned 'B' flags to bis(2-ethylhexyl phthalate) analytical results for all soil samples. The 'B' flag is used by the laboratory to indicate this analyte were detected in the method blank. All reported bis(2-ethylhexyl phthalate) results were above 5x the method blank concentration, therefore the associate results were not qualified,.
- Aluminum, Calcium and Zinc were detected in the associated method blank. The sample results for these metals were greater than 5x the method blank concentrations, thus data were not qualified based on the method blank results.

ACCURACY

Surrogate Recovery Review

Each sample analyzed for organic compounds was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample.

Surrogate recoveries were acceptable for all analyses with the following exceptions:

- SVOC surrogate d4-1,2-dichlorobenzene was outside the DoD recovery control limits of 45-95% for samples 070410BIL06SS-DL and 070410BIL08SS-DL, with 43.7% and 42.7% respectively. Two or more surrogate recoveries within either the acid or base fraction need to exceed the control criteria before the data is considered estimated and a qualifier is applied. Analytical results were not qualified based on this single surrogate recovery, all other surrogate recoveries were within control limits.

Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control samples (LCS) are used to monitor the laboratory's day-to-day performance of routine analytical methods, independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. ARI analyzed at least one LCS and one MS/MSD for each analysis and for each batch per method requirements.

LCS recoveries were acceptable for all analytical tests.

Sample 070410BIL09SS was used as MS/MSD for all analyses. The MS/MSD recoveries were acceptable for all analytical analyses with the following exceptions:

- The percent recovery for Pyrene in the MSD was 42.65 below the DoD control limits of 45-125%. The relative percent difference (RPD) for Pyrene in the MS/MSD pair was 40.1% above the DoD control limit of 30%. Pyrene in sample 070410BIL09SS was flagged 'J' based on MSD and RPD results.

- The percent recoveries for the following metals in the MS/MSD exceeded the DoD control limits of 80-120%. The following metals in the associated samples were flagged 'J/UJ' based on MS/MSD recoveries. Table 2 lists the specific flags applied to each analytical result.

	MS (%)	MSD (%)
Aluminum	79.7	40.2
Antimony	2.7	3.0
Cobalt	79.8	78.4
Iron	319	0.0
Lead	60.4	42.6
Manganese	62.3	74.0

PRECISION

Duplicate Review

Field duplicates were not collected as part of this sampling event. Laboratory precision was assessed through MS/MSD analyses. Laboratory duplicate precision was acceptable with the exceptions as stated above.

COMPARABILITY

Compound Identification

During analysis of PCB congeners for sample 070410BIL03SS a 'P' flag was applied to some Aroclor 1260 results. The 'P' flag is used by ARI to indicate the Aroclor was identified by both chromatographic columns but the quantification differed by more than 40%. As confirmed by Sue Dunihoo of ARI via a telephone conversation, the more conservative or higher Aroclor concentration is reported. The sample result for Aroclor 1260 in 070410BIL03SS was estimated and flagged 'J' based on sample quantification.

Additional Laboratory Flags

Analytical results were flagged 'E' by the laboratory to indicate that the analyte response was above the valid instrument calibration range have been qualified as Do Not Report 'DNR'. Sample results for these analytes from re-analysis of diluted samples were also reported and are usable.

COMPLETENESS

The laboratory reported all requested analyses and the deliverable data reports were complete. Completeness is defined as the percentage of usable data out of the total amount of data generated. The project completeness goal is 100 percent. Some data were qualified as estimated

'J' and some as non-detect 'U/UJ'. A summary of qualifiers can be found in Table 2. Completeness for the site investigation was 100%.

REFERENCES

DoD 2006. Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 3, January 2006.

USEPA 1999. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review. October 1999.

USEPA, 1998, Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846), 3rd Ed., September 1986: Final Update I, July 1992; Final Update IIA, August 1993; Final Update II, September 1994; Final Update IIB, January 1995, Final Update IIIB, April 1998, Final Update IIIB, June 2005.

USEPA 2004. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for In Organic Data Review. October 2004.

Table 1
Sample Location and Analyses Summary

URS Sample ID	Sample Matrix	Sample Date	Lab ID	Method Analyses
070410BIL01SS	Soil	4/10/2007	KU44A	Metals[1], SVOCs, PCB (Aroclors), Organochlorine Pesticides
070410BIL02SS			KU44B	
070410BIL03SS			KU44C	
070410BIL04SS			KU44D	
070410BIL05SS			KU44E	
070410BIL06SS			KU44F	
070410BIL07SS			KU44G	
070410BIL08SS			KU44H	
070410BIL09SS			KU44I	

[1]Metals include Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc

Table 2
SUMMARY OF QUALIFICATIONS

URS Sample ID	Lab ID	Analyte	Qualifier	Rational
070410BIL01SS	KU44A	Aluminum Antimony Cobalt Iron Lead Manganese	J UJ J J J J	MS/MSD recovery
070410BIL02SS	KU44B	Aluminum Antimony Cobalt Iron Lead Manganese	J UJ J J J J	MS/MSD recovery
070410BIL03SS	KU44C	Aluminum Antimony Cobalt Iron Lead Manganese	J UJ J J J J	MS/MSD recovery
		Aroclor 1260	J	2nd Column Quantification
070410BIL04SS	KU44D	Aluminum Antimony Cobalt Iron Lead Manganese	J UJ J J J J	MS/MSD recovery
070410BIL05SS	KU44E	Aluminum Antimony Cobalt Iron Lead Manganese	J UJ J J J J	MS/MSD recovery
070410BIL06SS	KU44F	Aluminum Antimony Cobalt Iron Lead Manganese	J UJ J J J J	MS/MSD recovery
070410BIL07SS	KU44G	Aluminum Antimony Cobalt Iron Lead Manganese	J UJ J J J J	MS/MSD recovery

URS Sample ID	Lab ID	Analyte	Qualifier	Rational
070410BIL08SS	KU44H	Aluminum Antimony Cobalt Iron Lead Manganese	J UJ J J J J	MS/MSD recovery
070410BIL09SS	KU44I	Pyrene	J	MSD recovery
		Aluminum Antimony Cobalt Iron Lead Manganese	J UJ J J J J	MS/MSD recovery

UPLAND OPERABLE UNIT REMEDIAL INVESTIGATION

QUALITY CONTROL SUMMARY REPORT FOR ANALYTICAL CHEMISTRY

1ST QUARTER UPLAND SAMPLING EVENT – APRIL 2008

JULY 2008

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TABLES

TABLE 1 SAMPLING ID AND ANALYSIS SUMMARY
TABLE 2 QUALIFIER SUMMARY

1.0 Executive Summary

The overall assessment of the 1st quarter groundwater, surface water and seep sample results show the quality of the data is acceptable to support project objectives. The contracted laboratory provided all requested analyses and delivered data reports were complete. Some data were qualified as estimated and flagged with a 'J' or 'UJ'. Some data were qualified as not detected and flagged with a 'U'. All data qualifiers resulting from this review have been added to both the project database and the data tables within the main body of the attached report.

2.0 Project Description

URS collected 18 groundwater samples (15 primary and three field duplicates), two seep samples, two surface water samples and one rinsate blank during the first quarter upland sampling event on Bradford Island. Samples were collected from April 14 through April 18, 2008. Table 1 summarizes the sample location, media, URS and laboratory identification numbers and the requested analyses.

3.0 Sampling and Analytical Procedures

Samples were collected according to the Quality Assurance Project Plan (QAPP) *Draft: Upland Operable Unit Remedial Investigation* (URS 2008). All water samples were submitted to Columbia Analytical Services (CAS) located in Kelso, WA and logged in by the laboratory under four CAS sample delivery groups (K0803288, K0803320, K0803393, and K0803410). The following table lists the parameters analyzed on one or more of the samples. Table 1 summarizes the specific requested analyses for each media by URS and laboratory identification numbers. (Note: ammonia was inadvertently included on the URS COC and was analyzed by CAS; ammonia results are included in this report but are not listed in the QAPP.)

Method	Analytical Parameter
EPA 8260B	VOCs
EPA 8270C	SVOCs
EPA 6000 series	Metals
Krone (Krone 1998)	Butyltins
Total Petroleum Hydrocarbons (Ecology 1997)	Northwest Total Petroleum Hydrocarbons – Diesel Range (NWTPH-Dx) NWTPH – Gasoline Range (NWTPH-Gx)
SM 5310C	Total Organic Carbon (TOC)
SM 5310C	Dissolved Organic Carbon (DOC)

Method	Analytical Parameter
EPA 300.0	Dissolved Anions (Bromide, Chloride, Fluoride, and/or Sulfate)
EPA 353.3	Nitrate/Nitrite
EPA 2320B	Alkalinity (Carbonate and/or Bicarbonate)
SM 4500-NH3 E	Dissolved Ammonia

4.0 Data Validation

Analyses were performed in general accordance with the above-referenced methods. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, chain-of-custody (COC), laboratory case narrative, proper sample preservation and handling procedures, holding times, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The following items were reviewed on 15% or greater of the data: initial and continuing calibrations, primary and secondary column verification, instrument calibration and a verification of the reported electronic data with the hard copy deliverable. The data were reviewed in accordance with the QAPP (URS 2008). The data results were reviewed in accordance with the criteria contained in the DoD QSM (DoD 2006) and the above-listed methods and the following EPA guidance documents in that order; EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Organic Data Review* (USEPA 1999) and EPA's *NFGs for Inorganic Data Review* (USEPA 2004). Project-specific QC criteria are listed in the QAPP.

A summary of qualifiers assigned to results in this investigation is included in Table 2. Samples are represented by their URS sample identification assigned in the field as well as the laboratory identification. The laboratory was requested to report analytical results above the method detection limit (MDL) but below the method reporting limit (MRL). These results were flagged 'J' by CAS and are not included in Table 2 for simplicity. These 'J' qualifiers are included in the database and are included in the data tables in the main body of the remedial investigation report. Qualifiers that may be assigned to the results of this investigation include the following:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.

- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

- DNR - Do Not Report. Another result is available that is more reliable or appropriate.

Final sample results and qualifiers are presented in the analytical tables provided in the sampling report.

4.1 Chain-of-Custody, Sample Preservation and Holding Time

The COC forms indicate that samples were maintained under chain-of-custody protocols and forms were signed upon release and receipt with the exception of the COC form associated with sample delivery group K0803393. A URS signature was missing on this form; however, all samples arrived intact at CAS. Data were not qualified based on missing signature. All samples were released by URS to a CAS courier and were received and logged in by the laboratory on the same day. All coolers were submitted at temperatures within the EPA-recommended temperature of 6°C or below, with the exception of two coolers associated with sample delivery group K0803393. These coolers were logged in at temperatures of 6.5°C and 6.1°C, respectively. Data were not qualified based on these slight temperature deviations.

The TPH samples were preserved with hydrochloric acid (HCl) to extend sample holding time from 7 days (listed in QAPP) to 14 days as described in TPH-Gx and TPH-Dx methods. All samples were analyzed within the technical and contracted holding time.

4.2 Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the analytical methods. Initial calibrations (ICALs) and continuing calibrations (CCALs) were analyzed at the proper frequency and at the appropriate concentrations required by the methods. Instrument calibrations were acceptable for all sample analyses.

4.3 Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank for each analysis and for each analytical batch, per QAPP requirements. Qualification of samples due to method, rinsate, or trip blank contamination followed guidelines set forth in the EPA NFGs.

Organic sample results less than five times (5x) and inorganic sample results less than ten times (10x) the associated blank concentration and between the method detection limit (MDL) and the method reporting limit (MRL) were qualified as non-detect and flagged with a 'U' at the MRL. When sample results were less than 5x (or 10x) the blank concentration but above the MRL, the reported result was qualified as non-detect and flagged with a 'U'. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Target compounds reported with concentrations greater than 5x (or 10x) the blank concentration were not qualified. All analytical tests indicate non-detects for method blanks with the following exceptions:

Rinsate Blank:

One rinsate blank was collected by running laboratory-provided deionized water through the *Monsoon* submersible pump used to sample well MW-8 (all other wells were sampled using dedicated tubing and a peristaltic pump). Sulfate, DOC, TOC, total iron, total and dissolved lead, dissolved arsenic, total and dissolved magnesium and dissolved sodium, and di-n-butyl tin were detected in the rinsate blank at concentrations above the MDLs and below the MRLs. All detected sample results for MW-8 were greater than 10x (inorganic constituents) and 5x (organic constituents) the concentrations detected in the rinsate blank; therefore, results were not qualified based on the rinsate blank detections.

Trip Blank:

VOCs and TPH-Gx samples were sent to CAS in three separate submittals which resulted in four sample delivery groups K0803288, K0803320, K0803393 and K0803410. A trip blank was included in only one of these submittals (K0803393) and inadvertently omitted in the other two. The sample team was made aware that trip blanks are required for all samples being analyzed for VOCs per QAPP requirements. Trip blanks will be included in all future submittals with VOC and/or TPH-Gx analyses. The trip blank submitted with K0803393 was non-detect for all VOCs and TPH-Gx. Samples were not qualified based on the trip blank.

Method and Calibration Blanks (Inorganics)

- Aluminum, arsenic, barium, cadmium, chromium, copper, iron, lead and silver were detected in the method blank associated with total metals in sample delivery group K0803320 at concentrations above the MDL and below the MRL. Additionally, aluminum, cadmium, cobalt, copper and silver were detected in the calibration blanks

bracketing the samples in this delivery group, indicting a possible instrument contamination and not a preparatory contamination. Detected total metals results for the above-listed metals were greater than 10x the method blank concentrations with the exception of a few metals in samples K0803320-001 and K0803320-002. These results were qualified as not detected and flagged 'U' using the criteria described above. (See Table 2).

- Cobalt, copper, sodium and zinc were detected in the method blank associated with dissolved metals in sample delivery group K0803320 at concentrations above the MDL and below the MRL. Additionally, aluminum, cadmium, cobalt, copper and silver were detected in the calibration blanks bracketing the samples in this delivery group, indicting a possible instrument contamination and not a preparatory contamination. Detected dissolved metals results for the above-listed metals were greater than 10x the method blank concentrations with the exception of a few metals in samples K0803320-001 and K0803320-002. These results were qualified as not detected and flagged 'U' using the criteria described above. (See Table 2).
- Arsenic and iron were detected in the method blank associated with total metals and arsenic and sodium were detected in the method blank associated with dissolved metals in sample delivery group K0803410. Additionally, arsenic, lead, magnesium and sodium were detected in the calibration blanks bracketing the samples in this delivery group, indicting a possible instrument contamination and not a preparatory contamination. All detected sample results were greater than 10x the blank concentrations except arsenic in samples K0803410-002 (total), K0803410-003 (dissolved), K0803410-004 (total), K0803410-004 (dissolved), and K0803410-005 (total), lead in sample K0803410-003 (total), and magnesium in samples K0803410-003 (total) and K0803410-005 (total). Results for these samples were qualified as not detected and flagged 'U' using the criteria described above (see Table 2).
- Iron was detected in the method blank associated with the total metals in sample delivery group K0803288 at a concentration above the MDL and below the MRL. Concentrations for total iron in samples K0803288-001 and K0803288-006 were less than 10x the method blank concentration and were qualified as not detected and flagged 'U' at the reported concentration as described above.
- Sodium was detected in the method blank associated with the dissolved metals in sample delivery group K0803288 at a concentration below the MRL. All sample results were greater than 10x this concentration; therefore, data were not qualified based on this method blank detection.
- Dissolved ammonia was detected in the method blank and continuing calibration blank at concentrations above the MDL and below the MRL in the sample delivery groups K0803410 and K0803393. All sample results were greater than 10x the blank

concentrations with the exception of dissolved ammonia in samples K0803410-003, K0803410-004, K0803410-005, K0803393-001, K0803393-002, K0803393-007, K0803393-009 and K0803393-010 which were qualified as not detected and flagged 'U' at the MRL.

- Dissolved chloride and dissolved fluoride were detected in continuing calibration blanks bracketing samples in delivery groups K0803410 and K0803393. All associated sample results were greater than 10x the calibration blank concentrations with the exception of dissolved fluoride in sample K0803393-006. Fluoride in this sample was qualified as not detected and flagged 'U' at the MRL.
- Arsenic was detected in the continuing calibration blanks bracketing samples in delivery group K0803393. All detected sample results were greater than 10x the blank concentrations with the exceptions of arsenic in samples K0803393-006 (dissolved) and K0803393-007 (dissolved). The dissolved arsenic results for these samples were qualified as not detected and flagged 'U' at the MRL.
- Magnesium was detected in the method blank associated with total and dissolved metals in sample delivery group K0803393 at a concentration above the MDL but below the MRL. All detected sample results were more than 10x the blank concentration with the exceptions of K0803393-001 (total), K0803393-001 (dissolved), K0803393-002 (total), and K0803393-006 (total). Magnesium results for these samples were qualified as not detected and flagged 'U' using the criteria described above (see Table 2).

Method Blanks (Organics)

- Diesel range organics (DRO) and residual range organics (RRO) were detected in the TPH-Dx method blank (extraction lot KWG0803683) associated with sample delivery groups K0803320, K0803288 and K0803393 at concentrations above the MDLs and below the MRLs. All detected sample results were greater than 5x the blank concentrations with the exception of RRO and DRO in samples K0803393-002, K0803393-004, K0803393-005, K0803393-006, K0803393-007, K0803393-009 and K0803393-010, RRO in samples K0803288-005 and K0803393-008, and DRO in sample K0803288-006. These results were qualified as not detected and flagged 'U' at the MRL as indicated in Table 2.
- The VOC method blank associated with sample delivery group K0803288 (extraction batch KWG0803826) had detections of carbon disulfide, methylene chloride, 1,2,3-trichlorobenzene, naphthalene and hexachlorobutadiene at concentrations above the MDLs and below the MRLs. All VOCs were included in this extraction lot with the exception of methylene chloride. Associated sample results were non-detect for carbon disulfide, 1,2,3-trichlorobenzene, naphthalene and hexachlorobutadiene with the exception of carbon disulfide results which were qualified as not detected and flagged

'U' at the MRL as described above (see Table 2 for details). Methylene chloride was detected in laboratory batches KWG0803826 and KWG083972. Methylene chloride was not detected in these method blanks and no qualification was required.

4.4 Surrogate Recovery Review

Each sample analyzed for organic compounds was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. When more than one surrogate per fraction (acid or base/neutral) was spiked in the sample, SVOCs were qualified if two or more surrogate recoveries for a given fraction exceeded DoD QSM sample criteria. When only one surrogate per fraction was spiked, all sample results associated with that fraction were qualified when the surrogate recovery exceeded DoD QSM sample criteria. Surrogate recoveries were acceptable for all analyses with the following exceptions:

- The percent recovery for the SVOC surrogate 2-fluorobiphenyl was below the lower DoD QSM control limit of 50% at 49% in the MS sample associated with sample delivery group K0803320. Recoveries of 2-fluorobiphenyl in the associated QC samples (method blank, LCS and MSD) were acceptable, indicating the analytical batch was in control. Additionally, the surrogate recoveries were in control within the associated parent sample. Sample results were not qualified based on surrogate recoveries in the MS.
- One SVOC surrogate, 2,4,6-tribromophenol, was below the lower DoD QSM control limit of 40% at 36% in sample K0803410-004. Recoveries of the four other SVOC surrogates within this sample were acceptable; therefore, results were not qualified based on the low 2,4,6-tribromophenol recovery in this sample.

4.5 Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control/laboratory control duplicate (LCS/LCSD) samples are used to monitor the laboratory's day-to-day performance of routine analytical methods independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. At least one LCS and one MS/MSD for each analysis and for each batch were analyzed per method requirements.

LCS/LCSD and MS/MSD recoveries were acceptable for all analytical tests with the following exceptions:

- The SVOC MS/MSD performed on sample K0803320-001 had percent recoveries of 1,4-dichlorobenzene below the lower DoD QSM limit of 30% at 27% and 29%, respectively. Results for 1,4-dichlorobenzene were non-detect in this sample. The associated LCS and

calibration standards indicate that the analytical batch was in control. Results for 1,4-dichlorobenzene were qualified and flagged 'UJ' based on bias low MS/MSD recoveries.

- The nitrate/nitrite MS/MSD pair performed on sample K0803393-003 had recoveries below the CAS derived control limit of 90% at 81% and 83%, respectively. The LCS recovery was in control suggesting the analytical batch was in control. Nitrate/nitrite results in the parent sample (K0803393-003) were qualified as estimated and flagged 'UJ'.
- The dissolved organic carbon (DOC) MS performed on sample K0803393-003 had a recovery above the CAS derived control limit of 156% at 206%. The LCS recovery was in control suggesting the analytical batch was in control. DOC in sample K0803393-003 was qualified as estimated and flagged 'J' due to bias high MS recovery.

4.6 Duplicate Review

Field duplicates are used to evaluate the variability associated with sample collection. Relative percent difference (RPD) calculations were performed on the analytical results from the three field duplicates associated with sample locations MW-7, MW-10 and MW-11, and identified as MW-22, MW-21, and MW-20, respectively. Specific field duplicate precision control limits were not defined in the QAPP; however, all field duplicate results were below the DoD QSM laboratory precision control of 30%, with the following exception:

- The RPD for carbonate results in the MW-11 duplicate pair exceeded the 30% criteria at 74%. Both the parent (K0803288-004) and the field duplicate (K0803288-005) were qualified as estimated and flagged 'J'.
- The RPD for total lead in the MW-10 duplicate pair exceeded an RPD of 30% with 47%. Both the parent (K0803320-001) and the field duplicate (K0803320-002) results for total lead were previously qualified as estimated and flagged 'U' based on blank detections, further qualification was not neccessary.

To evaluate laboratory precision, CAS performed duplicate analyses (i.e. LCS/LCSD and MS/MSD) as discussed above. No samples were qualified based exclusively on laboratory duplicate precision.

4.7 Compound Quantification

- DOC results associated with samples K0803288-002, K0803288-005, K0803393-004, K0803393-007, K0803393-009, K0803393-010, K0803410-002, and K0803410-005 were slightly higher than the TOC results. The samples were field filtered. The discrepancy could be due to sample heterogeneity or introduction of organic carbon into the sample by the sample filtration process. The DOC results for these samples were

qualified as estimated and flagged 'J' due to potential high bias. Currently, approximately 100mL of sample water is passed through the filters prior to sample collection; this volume will be increased in future sampling events to decrease the likelihood of TOC introduction by the sample filtration process.

- CAS assigned 'L' and/or 'Y' flags in reporting RRO and DRO sample results for samples K0803393-003, K0803393-007, and K0803393-008 to indicate that the chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents ('L') or the elution pattern does not match the calibration standard ('Y'). Further qualification was not necessary.

4.8 Reporting Limits

If sample results were detected at concentrations below the MRL but above the MDL, they were identified by the laboratory and flagged with a 'J'. As stated above, these flags are recorded within the database and are reported in the data tables included in the main body of this report but are not included in Table 2 of this report.

5.0 Completeness

The laboratory reported all requested analyses and the deliverable data reports were complete. Some data were qualified as estimated and flagged with a 'J' or a 'UJ'. Some data were qualified as not detected and flagged with a 'U.' A summary of qualifiers can be found in Table 2.

The electronic and .pdf versions of the deliverables were cross-checked for accuracy at a frequency of 20% or greater. Any minor discrepancies found between the deliverables were reported to CAS and corrected by updating the database to reflect the .pdf deliverable.

- *Technical Completeness* = (number of usable results/total reported results) x100

  = (1,156 compliant / 1,156 total results) = 100%

  All samples results are considered usable.

- *Analytical Completeness* = (number of unqualified results/total reported results) x100

  = (1,083 compliant / 1,156 total results) = 94%

  Data were qualified non-detect and flagged 'U' and some were qualified as estimated and flagged 'J' or 'UJ.' Data qualified 'J' due to detections between the MRL and the MRL were not included in this calculation.

- *Contract Completeness* = (number of contract compliant results/total reported results) x100

= (1,156 compliant /1,156 total results) = 100%

All samples analyzed met laboratory contract requirements.

- *Field Sampling Completeness* =(number samples collected/total reported results) x100

  = (23 compliant / 23 total results) = 100%

  All samples collected and submitted to CAS for analysis had acceptable results.

6.0 References

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URS 2008. Quality Assurance Project Plan, *Draft: Upland Operable Unit Remedial Investigation*, Bradford Island, Bonneville Lock and Dam Project, Cascade Locks, Oregon. May 2008.

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UPLAND OPERABLE UNIT REMEDIAL INVESTIGATION

QUALITY CONTROL SUMMARY REPORT FOR ANALYTICAL CHEMISTRY

2ND QUARTER UPLAND SAMPLING EVENT – JULY 2008

OCTOBER 2008

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TABLE 2 QUALIFIER SUMMARY ..... FOLLOWING REPORT

1.0 Executive Summary

The overall assessment of the 2nd quarter groundwater results show the quality of the data is acceptable to support project objectives. Seeps were dry at the time of sample collection and therefore seeps and the associated surface water were not collected during this sampling event. The contracted laboratory provided all requested analyses and delivered data reports were complete. Some data were qualified as estimated and flagged with a 'J' or 'UJ'. Some data were qualified as not detected and flagged with a 'U'. All data qualifiers resulting from this review have been added to both the project database and the data tables within the main body of the attached report.

2.0 Project Description

URS collected 17 groundwater samples (14 primary and three field duplicates), one rinsate blank, and five trip blanks during the second quarter upland sampling event on Bradford Island. Samples were collected from July 14 through July 18, 2008. Table 1 summarizes the sample stations, URS and laboratory identification numbers and the requested analyses.

3.0 Sampling and Analytical Procedures

Samples were collected according to the Quality Assurance Project Plan (QAPP) *Draft: Upland Operable Unit Remedial Investigation* (URS 2008). All water samples were submitted to Columbia Analytical Services (CAS) located in Kelso, Washington and logged in by the laboratory under three CAS sample delivery groups (K0806414, K0806516 and K0806519). The following table lists the parameters analyzed on one or more of the samples.

Method	Analytical Parameter
EPA 8260B	VOCs
EPA 8270C	SVOCs
EPA 6000 series	Metals
Krone (Krone 1998)	Butyltins
Total Petroleum Hydrocarbons (Ecology 1997)	Northwest Total Petroleum Hydrocarbons – Diesel Range (DRO) and Residual Range (RRO) (NWTPH-Dx) NWTPH – Gasoline Range (GRO) (NWTPH-Gx)

4.0 Data Validation

Analyses were performed in general accordance with the above-referenced methods. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample

collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, chain-of-custody (COC), laboratory case narrative, proper sample preservation and handling procedures, holding times, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The following items were reviewed on 15% or greater of the data: initial and continuing calibration verification (6000/7000 series), instrument calibration and a verification of the reported electronic data with the hard copy deliverable. The data were reviewed in accordance with the QAPP (URS 2008). The data results were reviewed in accordance with the criteria contained in the DoD QSM (DoD 2006), the above-listed methods, and the following EPA guidance documents; EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Organic Data Review* (USEPA 1999) and EPA's *NFGs for Inorganic Data Review* (USEPA 2004) in that order. Project-specific QC criteria are listed in the QAPP.

A summary of qualifiers assigned to results in this investigation is included in Table 2. Samples are represented by their URS sample identification assigned in the field as well as the laboratory identification. The laboratory was requested to report analytical results above the method detection limit (MDL) but below the method reporting limit (MRL). These results were flagged 'J' by CAS and for simplicity are not included in Table 2 unless otherwise qualified based on quality control issues identified in this report. The 'J' qualifiers assigned to results reported between the MDL and MRL are included in the database and are included in the data tables in the main body of the remedial investigation report. Qualifiers that may be assigned to the results of this investigation include the following:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.

- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

- DNR - Do Not Report. Another result is available that is more reliable or appropriate.

Final sample results and qualifiers are presented in the analytical tables provided in the sampling report.

4.1 Chain-of-Custody, Sample Preservation and Holding Time

The COC forms indicate that samples were maintained under chain-of-custody protocols and forms were signed upon release and receipt. Three separate COCs are associated with sample delivery group K0806516; however, two of these were inadvertently left out of the laboratory data package. These COCs have been added as an addendum to the end of the package. All samples were released by URS to a CAS courier and were received and logged in by the laboratory on the same day. All coolers were submitted at temperatures within the EPA-recommended temperature range of 6°C or below.

The TPH samples were preserved with hydrochloric acid (HCl) to extend sample holding time from 7 days (listed in QAPP) to 14 days as described in the NWTPH-Gx and NWTPH-Dx methods. All samples were analyzed within the technical and contracted holding time with the following exceptions:

- The extraction of butyltins for samples K0806516-007, K0806516-008, K0806516-009 and K0806516-0010 were performed 28 days past the recommended 7 day hold time. This was due to a laboratory tracking error, this error has been remedied and should not occur in the future. The analytical results for butyltins for these samples have been estimated and flagged 'J' due to potential low bias from possible sample degradation.

4.2 Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the analytical methods. Initial calibrations (ICALs) and continuing calibrations (CCALs) were analyzed at the proper frequency and at the appropriate concentrations required by the methods. Instrument calibrations were acceptable for all sample analyses.

4.3 Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank for each analysis and for each analytical batch, per QAPP requirements. Qualification of samples due to method, rinsate, or trip blank contamination followed guidelines set forth in the EPA NFGs.

Organic sample results less than five times (5x) and inorganic sample results and common organic laboratory contaminates less than ten times (10x) the associated blank concentration and between the method detection limit (MDL) and the method reporting limit (MRL) were qualified

as non-detect and flagged with a 'U' at the MRL. When sample results were less than 5x (or 10x) the blank concentration but above the MRL, the reported result was qualified as non-detect and flagged with a 'U'. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Target compounds reported with concentrations greater than 5x (or 10x) the blank concentration were not qualified.

Rinsate Blanks

One rinsate blank was collected by running laboratory-provided deionized water through the *Monsoon* submersible pump used to sample well MW-01 (all other wells were sampled using dedicated tubing and a peristaltic pump). Chloroform, 1,4-dichlorobenzene, total magnesium, DRO, and RRO were detected in the rinsate blank at concentrations above the MDLs and below the MRLs. All detected sample results for MW-01 were greater than 10x (inorganic constituents) and 5x (organic constituents) the concentrations detected in the rinsate blank.

Trip Blanks

VOCs and GRO samples were submitted to CAS in five separate submittals, which resulted in five trip blanks. All trip blanks were non-detect for all VOCs and GRO with the following exceptions:

- GRO and chloroform were detected above the MDL and below the MRL in trip blank 080718TB (K0806516-013) associated with sample delivery group K0806516. GRO and chloroform in the associated sample K0806516-012 and the associated method blank were both reported as non-detect. GRO and chloroform results were not qualified based on trip blank detections. *(Note: The COC showing this trip blank and the associated sample was inadvertently missing from the original laboratory data report and is added as an addendum to the data package K0806516).*

Method and Calibration Blanks (Inorganics)

- Vanadium was detected in the method blank associated with sample delivery group K0806414 at the MDL. All detected vanadium results were greater than 10x the method blank concentration with the exceptions of samples K0806414-001, K0806414-001 (dissolved), K0806414-002, K0806414-002 (dissolved), and K0806414-007 (dissolved). Vanadium was qualified as not detected and flagged 'U' at the MRL for these samples (See Table 2).
- Thallium and zinc were detected at or above the MDL but below the MRL in the method blank associated with sample delivery group K0806519. Additionally, antimony, lead, nickel, silver and thallium were detected above the MDL but below the MRL in the calibration blanks bracketing the samples in this delivery group indicating possible instrument contamination and not preparatory contamination. Detected results for the above-listed metals were greater than 10x the blank concentrations with the exceptions of lead in samples K0806519-001 (dissolved) and K0806519-002 (dissolved), and thallium

in sample K0806519-001. These results were qualified as not detected and flagged 'U' using the criteria described above. (see Table 2).

- Iron was detected above the MDL but below the MRL in the method blank associated with sample delivery group K0806516. Additionally, lead was detected above the MDL but below the MRL in the calibration blanks bracketing the samples in this delivery group indicating possible instrument contamination and not preparatory contamination. Detected results for iron and lead not exceeding 10x the blank were qualified as non-detect and flagged 'U' using the criteria described above. The specific sample results are listed in Table 2.

Method Blanks (Organics)

- DRO and RRO reported in sample delivery group K0806414 were reported from two extraction lots. The method blank associated with extraction lot KWG0806857 had detections of DRO and RRO above the MDLs and below the MRLs. The method blank associated with the extraction lot KWG0806970 had detections of RRO above the MDLs and below the MRLs. All detected sample results were greater than 5x the blank concentrations with the exception of DRO and RRO in samples K0806414-001 through K0806414-004 and RRO in samples K0806414-006 and K0806414-007. These results were qualified as not detected and flagged 'U' at the MRL as indicated in Table 2.
- DRO and RRO were detected above the MDLs and below the MRLs in the method blank associated with sample delivery group K0806516. All detected sample results were greater than 5x the blank concentration with the exception of DRO and RRO in samples K0806516-005, K0806516-007, K0806516-008, K0806516-009 and RRO in samples K0806516-001 and K0806516-010. These results were qualified as not detected and flagged 'U' at the MRL.

4.4 Surrogate Recovery Review

Each sample analyzed for organic compounds was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. When more than one surrogate per fraction (acid or base/neutral) was spiked in the sample, SVOCs were qualified if two or more surrogate recoveries for a given fraction were outside DoD QSM sample criteria. When only one surrogate per fraction was spiked, all sample results associated with that fraction were qualified when the surrogate recovery was outside DoD QSM sample criteria. Surrogate recoveries were acceptable for all analyses with the following exceptions:

- The percent recovery for the VOC surrogate toluene-d8 in one of the method blanks associated with sample delivery group K0806414 was above the upper control limit of 120% at 121%. No analytes were detected in the method blank and all other surrogates were in control for the primary samples and the associated QC samples. Data were not qualified based on this surrogate recovery exceedance in the method blank.

- The percent recovery for the SVOC surrogate 2-fluorobiphenyl was below the lower DoD QSM control limit of 50% at 43% for sample K0806516-001. Recoveries of four other SVOC surrogates within this sample were acceptable; therefore, results were not qualified based on the low 2-fluorobiphenyl recovery in this sample.

4.5 Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control/laboratory control duplicate (LCS/LCSD) samples are used to monitor the laboratory's day-to-day performance of routine analytical methods independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. At least one LCS and one MS/MSD for each analysis and for each batch were analyzed per method requirements.

LCS/LCSD and MS/MSD recoveries were acceptable for all analytical tests with the following exception:

- The MS/MSD performed on sample K0806516-002 had recoveries for iron and manganese below the DoD QSM control limit of 80%; however, sample concentrations for these analytes were greater than 4x the spike concentrations. Additionally, post-spike recoveries were in control. Data were not qualified based on MS/MSD recoveries.

4.6 Duplicate Review

Field duplicates are used to evaluate the variability associated with sample collection. Relative percent difference (RPD) calculations were performed on the analytical results from the three field duplicates associated with sample locations MW-06, MW-10 and MW-13, and identified as MW-21, MW-22, and MW-23, respectively. Specific field duplicate precision control limits were not defined in the QAPP; however, all field duplicate results were below the DoD QSM laboratory precision control of 30%.

To evaluate laboratory precision, CAS performed duplicate analyses (i.e. LCS/LCSD and MS/MSD) as discussed above. RPD precision was within project-specific control limits with the following exception:

- The n-butyltin RPD for the LSC/LCSD pair in extraction lot KWG0806964 and associated with sample delivery groups K0806414 and K0806516 exceeded the 30% laboratory criterion at 34%. The LCS and LCSD percent recoveries meet the laboratory-specific criterion for n-butyltin (DoD QSM criterion not available). Two of the three LCS control parameters were within the control limits; therefore, data were not qualified based the elevated RPD.

4.7 Compound Quantification

- CAS assigned 'L' and/or 'Y' flags in reporting RRO and DRO sample results for samples K0806516-001, K0806516-002, K0806516-003, and K0806516-004 to indicate that the chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents ('L') or the elution pattern does not match the calibration standard ('Y'). Further qualification was not necessary.
- CAS assigned 'O' and/or 'H' flags in reporting RRO and DRO sample results for samples K0806516-009 and K0806516-010 to indicate that the chromatographic fingerprint of the sample resembles a petroleum product, but the pattern indicates the presence of more heavier molecular weight constituents than the calibration standard (H) and the chromatographic fingerprint resembles an oil but does not match the calibration standard (O). Further qualification of the data was necessary.

4.8 Reporting Limits

If sample results were detected at concentrations below the MRL but above the MDL, they were identified by the laboratory and flagged with a 'J'. As stated above, these flags are recorded within the database and are reported in the data tables included in the main body of this report but are not included in Table 2 of this report.

5.0 Completeness

The laboratory reported all requested analyses and the deliverable data reports were complete. Some data were qualified as estimated and flagged with a 'J' or a 'UJ'. Some data were qualified as not detected and flagged with a 'U.' A summary of qualifiers can be found in Table 2.

The electronic and .pdf versions of the deliverables were cross-checked for accuracy at a frequency of 20% or greater. Any minor discrepancies found between the deliverables were reported to CAS and corrected by updating the database to reflect the .pdf deliverable.

- *Technical Completeness* = (number of usable results/total reported results) x100

  = (357 compliant / 357 total results) = 100%

  All samples results are considered usable.

- *Analytical Completeness* = (number of unqualified results/total reported results) x100

  = (304 compliant / 357 total results) = 85%

Data were qualified non-detect and flagged 'U' and some were qualified as estimated and flagged 'J' or 'UJ.' Data qualified 'J' due to detections between the MRL and the MRL were not included in this calculation.

- *Contract Completeness* = (number of contract compliant results/total reported results) x100

  = (348 compliant /357 total results) = 97%

  All samples analyzed met laboratory contract requirements with the exception of the above-mentioned holding time exceedance for butyltins in sample delivery group K0806516.

- *Field Sampling Completeness* =(number samples collected/total reported results) x100

  = (17 compliant / 17 total results) = 100%

  All samples collected and submitted to CAS for analysis had acceptable results.

6.0 References

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UPLAND OPERABLE UNIT REMEDIAL INVESTIGATION

QUALITY CONTROL SUMMARY REPORT FOR ANALYTICAL CHEMISTRY

3RD QUARTER UPLAND SAMPLING EVENT – OCTOBER 2008

JANUARY 2008

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TABLE 1 SAMPLING ID AND ANALYSIS SUMMARY ..... FOLLOWING REPORT
TABLE 2 QUALIFIER SUMMARY ..... FOLLOWING REPORT

1.0 Executive Summary

The overall assessment of the third quarter groundwater results show the quality of the data is acceptable to support project objectives. Seeps were dry at the time of sample collection and therefore seep samples and the associated surface water samples were not collected during this sampling event. The contracted laboratory provided all requested analyses and delivered data reports were complete. Some data were qualified as estimated and flagged with a 'J' or 'UJ'. Some data were qualified as not detected and flagged with a 'U'. All data qualifiers resulting from this review have been added to both the project database and the data tables within the main body of the attached report.

2.0 Project Description

URS collected 18 groundwater samples (14 primary and 3 field duplicates), 1 rinsate blank, and 2 trip blanks during the third quarter upland sampling event on Bradford Island. Additionally, MW-12 was sampled using Teflon tubing in addition to the standard high density polyethylene (HDPE) tubing (see Section 4.6). Samples were collected from October 20 through October 24, 2008. Table 1 summarizes the sample stations, URS and laboratory identification numbers, and the requested analyses.

3.0 Sampling and Analytical Procedures

Samples were collected according to the Quality Assurance Project Plan (QAPP) *Upland Operable Unit Remedial Investigation* (URS 2008). All water samples were submitted to Columbia Analytical Services (CAS) located in Kelso, Washington and logged in by the laboratory under three CAS sample delivery groups (SDGs, K0810359, K0810410, and K0810448). The following table lists the parameters analyzed on one or more of the samples.

Method	Analytical Parameter
EPA 8260B	VOCs
EPA 8270C	SVOCs
EPA 6000 series	Metals (total and dissolved)[1]
Krone (Krone 1998)	Butyltins
Total Petroleum Hydrocarbons (Ecology 1997)	Northwest Total Petroleum Hydrocarbons – Diesel Range (DRO) and Residual Range (RRO) (NWTPH-Dx) NWTPH – Gasoline Range (GRO) (NWTPH-Gx)

[1]One or more of the following metals: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium and zinc.

4.0 Data Validation

Analyses were performed in general accordance with the above-referenced methods. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, chain-of-custody (COC), laboratory case narrative, proper sample preservation and handling procedures, holding times, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The following items were reviewed on 15% or greater of the data: initial and continuing calibration verification (6000 series methods), instrument calibration, and a verification of the reported electronic data with the hard copy deliverable. The data were reviewed in accordance with the QAPP (URS 2008). The data results were reviewed in accordance with the criteria contained in the DoD QSM (DoD 2006), the above-listed methods, and the following EPA guidance documents, as applicable; EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Organic Data Review* (USEPA 1999) and EPA's *NFGs for Inorganic Data Review* (USEPA 2004) in that order. Project-specific QC criteria are listed in the QAPP.

A summary of qualifiers assigned to results in this investigation is included in Table 2. Samples are represented by their URS sample identification assigned in the field as well as the laboratory identification. The laboratory was requested to report analytical results above the method detection limit (MDL) but below the method reporting limit (MRL). These results were flagged 'J' by CAS and for simplicity these 'J' flags are not included in Table 2 unless the analytical result was otherwise qualified based on quality control issues identified in this report. The 'J' qualifiers assigned to results reported between the MDL and MRL are included in the database and are included in the data tables in the main body of the remedial investigation report. Qualifiers that may be assigned to the results of this investigation include the following:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.

- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

- DNR - Do Not Report. Another result is available that is more reliable or appropriate.

Final sample results and qualifiers are presented in the analytical tables provided in the sampling report.

4.1 Chain-of-Custody, Sample Preservation and Holding Time

The COC forms indicate that samples were maintained under chain-of-custody protocols and forms were signed upon release and receipt. All samples were released by URS to a CAS courier and were received and logged in by the laboratory on the same day. All coolers were submitted at temperatures within the EPA-recommended temperature range of 6°C or below.

Sample 081021MW12T was mislabeled on the COC as 081021MWGWT. The sample name was corrected and the results are reported under sample ID 081021MW12T.

The TPH samples were preserved with hydrochloric acid (HCl) to extend sample holding time from 7 days (listed in QAPP) to 14 days as described in the NWTPH-Gx and NWTPH-Dx methods. All samples were analyzed within the technical and contracted holding times.

All samples were received with adequate sample volume with the following exception:

- Due to insufficient groundwater in monitoring well 1 (MW-01), adequate sample volume to analyze all constituents was not collected; therefore, GRO, VOCs and total metals were given priority. Dissolved metals, butyltins, and SVOCs were not analyzed due to insufficient sample volume.

4.2 Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the analytical methods. Initial calibrations (ICALs) and continuing calibrations (CCALs) were analyzed at the proper frequency and at the appropriate concentrations required by the methods. Instrument calibrations were acceptable for all sample analyses with the following exception:

- Butlytins are analyzed using dual columns for confirmation. The result for tri-n-propyltin on the confirmation column was outside the laboratory-specific calibration criterion of 20% (at 23%) for the continuing calibration associated with data packages K0810359 and K0810410. Similarly, tri-n-propyltin and di-n-butyltin were outside the laboratory-specific criteria of 20% (at 23% and 22%, respectively) on the confirmation

column in the continuing calibration associated with data package K0810448. The associated results were reported from the column with acceptable continuing calibration results. Qualification of the data was not necessary.

4.3 Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank for each analysis and for each analytical batch, per QAPP requirements. Qualification of samples due to method, rinsate, or trip blank contamination followed guidelines set forth in the EPA NFGs.

Organic sample results less than five times (5x) and inorganic sample results and common organic laboratory contaminates less than ten times (10x) the associated blank concentration and between the method detection limit (MDL) and the method reporting limit (MRL) were qualified as non-detect and flagged with a 'U' at the MRL. When sample results were less than 5x (or 10x) the blank concentration but above the MRL, the reported result was qualified as non-detect and flagged with a 'U'. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Target compounds reported with concentrations greater than 5x (or 10x) the blank concentration were not qualified.

Method and Calibration Blanks (Inorganics)

- Iron was detected above the MDL but below the MRL in the calibration blanks bracketing the samples in delivery group K0810359, indicating possible instrument contamination and not preparatory contamination. Detected results for iron not exceeding 10x the blank concentration were qualified as non-detect and flagged 'U' using the criteria described above. The specific sample results are listed in Table 2.
- Chromium, manganese and zinc were detected at or above the MDL but below the MRL in one of the method blanks associated with sample delivery group K8010410. Additionally, antimony, chromium, lead, and silver were detected above the MDL but below the MRL in the calibration blanks bracketing the samples in this delivery group, indicating possible instrument contamination and not preparatory contamination. Detected results for above-listed metals not exceeding 10x the blank were qualified as non-detect and flagged 'U' using the criteria described above. The specific sample results are listed in Table 2.

Method Blanks (Organics)

- RRO was detected above the MDL and below the MRL in the method blanks associated with sample delivery groups K0810410 and K0810448. All detected sample results were greater than 5x the blank concentration with the exception of RRO in samples K0810410-001, K0810410-002, K0810410-003, K0810410-004, K0810410-006 and K08010448-

002. These results were qualified as not detected and flagged 'U' at the MRL as indicated in Table 2.

Rinsate Blanks

One rinsate blank was collected by running laboratory-provided deionized water through the *Monsoon* submersible pump used to sample monitoring wells MW-01, MW-08 and MW-10 (all other wells were sampled using dedicated tubing and a peristaltic pump). Manganese and RRO were detected in the rinsate blank, but were qualified as non-detect based on the associated method blank and/or calibration blank detections (as stated above and listed in Table 2). Iron and phenanthrene were detected in the rinsate blank. All detected sample results for the above-listed wells were greater than 10x (inorganic constituents) and 5x (organic constituents) the concentrations detected in the rinsate blank, with the exception of iron in sample MW-08 (K0810448-001) which was flagged non-detect (see Table 2).

Trip Blanks

VOCs and GRO samples were submitted to CAS in five separate submittals which resulted in five trip blanks. All trip blanks were non-detect for VOCs and GRO.

4.4 Surrogate Recovery Review

Each sample analyzed for organic compounds was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. When more than one surrogate per fraction (acid or base/neutral) was spiked in the sample, SVOCs were qualified if two or more surrogate recoveries for a given fraction were outside DoD QSM sample criteria. When only one surrogate per fraction was spiked, all sample results associated with that fraction were qualified when the surrogate recovery was outside DoD QSM sample criteria. Surrogate recoveries were acceptable for all analyses with the following exceptions:

- SVOCs were extracted and analyzed in two extraction lots (KWG081159 and KWG0811464) associated with sample delivery groups K0810410 and K0810448. The percent recovery for 2-fluorobiphenyl in samples K0810410-001, K0810410-002, K0810410-004, K0810410-005, K0810448-001 and K0810448-003 associated with extraction lot KWG081159 were below the lower DoD QSM control limit of 50% with a range of 42% to 47%. Recoveries of the four other SVOC surrogates for the above-listed samples were acceptable; therefore, results were not qualified based on the low 2-fluorobiphenyl recovery in these samples. (Note: surrogate 2-fluorobiphenyl is most closely associated with 1,4-dichlorobenzene, see discussion below in Section 4.5 for qualification of 1,4-dichlorobenzene sample results).

4.5 Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control/laboratory control duplicate (LCS/LCSD) samples are used to monitor the laboratory's day-to-day performance of routine analytical methods independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. At least one LCS and one MS/MSD for each analysis and for each batch were analyzed per method requirements.

LCS/LCSD and MS/MSD recoveries were acceptable for all analytical tests with the following exception:

- As mentioned above, SVOCs associated with sample delivery groups K0810410 and K0810448 were extracted and analyzed in two extraction lots, KWG081159 and KWG0811464. The recoveries of the SVOC surrogate 1,4-dichlorobenzene in the MS and MSD performed on sample K0810410-005 (extraction lot KWG081159) were below the lower DoD QSM control limit of 30% at 26% and 22%, respectively. Additionally, the LCS recovery in extraction lot KWG081159 was below the lower DoD QSM control limit of 30% at 27%. As stated in the case narrative and based on conversations with CAS, there appears to be a slight low bias for 1,4-dichlorobenzene for samples in extraction lot KWG081159. All sample results for 1,4-dichlorobenzene in this extraction lot were reported as non-detect. These results were qualified as estimated and flagged 'UJ' due to potential low bias, see Table 2.

4.6 Duplicate Review

Field duplicates are used to evaluate the variability associated with sample collection. Relative percent difference (RPD) calculations were performed on the analytical results from the three field duplicates associated with sample locations MW-06, MW-10 and MW-11, and identified as MW-26, MW-20, and MW-21, respectively. Specific field duplicate precision control limits were not defined in the QAPP; however, all field duplicate results were below the DoD QSM laboratory precision control of 30%, with the following exception:

- The RPD results for the parent sample/field duplicate pair MW-10/MW-20 for total chromium, total iron and total zinc exceeded the control limit of 30% at 43%, 47% and 49%, respectively. Total chromium, total iron and total zinc results were qualified and flagged 'J' based on field duplicate precision.
-

To evaluate laboratory precision, CAS performed duplicate analyses (i.e. LCS/LCSD and MS/MSD) as discussed above. RPD precision was within project-specific control limits with the following exception:

- The n-butyltin RPD for the MS/MSD pair associated with sample delivery group K08010359 exceeded the 30% laboratory criterion at 38%. The MS, MSD and LCS percent recoveries meet the laboratory-specific criterion for n-butyltin (DoD QSM criterion not available). Two of the three MS control parameters were within the control limits; therefore, data were not qualified based the elevated RPD.

Per the request of the USACE chemist, one monitoring well (MW-12) was sampled using Teflon tubing in addition to the standard HDPE tubing to evaluate whether HDPE could preferentially be adsorbing organics compounds. Relative percent difference (RPD) calculations were performed on the MW-12 sample results from the HDPE and Teflon tubing. All RPD calculations were below the above-mentioned 30% control limit with the following exceptions:

- The RPD for dissolved vanadium was 38%. The dissolved vanadium result for the Teflon tubing appeared to have a slight low bias in comparison to the HDPE. Both the HDPE and Teflon results for vanadium are reported in the attached data tables, data were not qualified based on RPD value.
- The RPDs for total and dissolved iron were 159% and 161%, respectively. Both results are reported in the attached data tables, data were not qualified based on RPD values.

4.7 Compound Quantification

- CAS assigned ‘L’ and/or ‘Y’ flags in reporting RRO and/or DRO sample results for samples K0810410-003, K0810410-004, K0810410-005, K0810410-006, K0810448-001 and K0810448-004 to indicate that the chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents (‘L’) or the elution pattern does not match the calibration standard (‘Y’). Further qualification was not necessary.
- CAS assigned a ‘Z’ flag in reporting RRO and DRO sample results for sample K0810448-003 to indicate the chromatographic fingerprint of the sample does not resemble a petroleum product. Further qualification was not necessary.

4.8 Reporting Limits

If sample results were detected at concentrations below the MRL but above the MDL, they were identified by the laboratory and flagged with a ‘J’. As stated above, these flags are recorded within the database and are reported in the data tables included in the main body of this report but are not included in Table 2 of this report.

5.0 Completeness

The laboratory reported all requested analyses and the deliverable data reports were complete. Some data were qualified as estimated and flagged with a 'J' or a 'UJ'. Some data were qualified as not detected and flagged with a 'U.' A summary of qualifiers can be found in Table 2.

The electronic and .pdf versions of the deliverables were cross-checked for accuracy at a frequency of 20% or greater. Any minor discrepancies found between the deliverables were reported to CAS and corrected by updating the database to reflect the .pdf deliverable.

- *Technical Completeness* = (number of usable results/total reported results) x100

  = (502 compliant / 502 total results) = 100%

  All samples results are considered usable.

- *Analytical Completeness* = (number of unqualified results/total reported results) x100

  = (462 compliant / 502 total results) = 92%

  Data were qualified non-detect and flagged 'U' and some were qualified as estimated and flagged 'J' or 'UJ.' Data qualified 'J' due to detections between the MRL and the MRL were not included in this calculation.

- *Contract Completeness* = (number of contract compliant results/total reported results) x100

  = (502 compliant / 502 total results) = 100%

  All samples analyzed met laboratory contract requirements.

- *Field Sampling Completeness* =(number samples collected/total reported results) x100

  = (17 compliant / 17 total results) = 100%

  All samples collected and submitted to CAS for analysis had acceptable results.

6.0 References

DOD 2006. Department of Defense Environmental Data Quality Workgroup. Department of Defense (DOD) Quality Systems Manual (QSM) for Environmental Laboratories. Final Version 3. January 2006. Retrieved from [http://www.navylabs.navy.mil/Archive/DoDV3.pdf] on 3/3/06

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UPLAND OPERABLE UNIT REMEDIAL INVESTIGATION

QUALITY CONTROL SUMMARY REPORT FOR ANALYTICAL CHEMISTRY

4TH QUARTER UPLAND SAMPLING EVENT – JANUARY 2009

MARCH 2009

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TABLE 1 SAMPLE ID AND ANALYSIS SUMMARY……..FOLLOWING REPORT
TABLE 2 QUALIFIER SUMMARY…….…..FOLLOWING REPORT

1.0 Executive Summary

The overall assessment of the fourth quarter groundwater results show the quality of the data is acceptable to support project objectives. The contracted laboratory provided all requested analyses and delivered data reports were complete. Some data were qualified as estimated and flagged with a 'J' or 'UJ'. Some data were qualified as not detected and flagged with a 'U'. All data qualifiers resulting from this review have been added to both the project database and the data tables within the main body of the attached report.

2.0 Project Description

URS collected 18 groundwater samples (15 primary and 3 field duplicates), 2 seep water samples, 2 surface water samples, 1 rinsate blank, and 4 trip blanks during the fourth quarter upland sampling event on Bradford Island. Samples were collected from January 11 through January 15, 2009. Table 1 summarizes the sample stations, URS and laboratory identification numbers, and the requested analyses.

3.0 Sampling and Analytical Procedures

Samples were collected according to the Quality Assurance Project Plan (QAPP) *Upland Operable Unit Remedial Investigation* (URS 2008). All water samples were submitted to Columbia Analytical Services (CAS) located in Kelso, Washington and logged in by the laboratory under four CAS sample delivery groups (SDGs, K0900280, K0900315, K0900316, and K0900366). The following table lists the parameters analyzed on one or more of the samples.

Method	Analytical Parameter
EPA 8260B	VOCs
EPA 8270C	SVOCs
EPA 6000 series	Metals (total and dissolved)[1]
Krone (Krone 1998)	Butyltins
Total Petroleum Hydrocarbons (Ecology 1997)	Northwest Total Petroleum Hydrocarbons – Diesel Range (DRO) and Residual Range (RRO) (NWTPH-Dx) NWTPH – Gasoline Range (GRO) (NWTPH-Gx)

[1]One or more of the following metals: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium and zinc.

4.0 Data Validation

Analyses were performed in general accordance with the above-referenced methods. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, chain-of-custody (COC), laboratory case narrative, proper sample preservation and handling procedures, holding times, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The following items were reviewed on 15% or greater of the data: initial and continuing calibration verification (6000 series methods), instrument calibration, and a verification of the reported electronic data with the hard copy deliverable. The data were reviewed in accordance with the QAPP (URS 2008). The data results were reviewed in accordance with the criteria contained in the DoD QSM (DoD 2006), the above-listed methods, and the following EPA guidance documents, as applicable; EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Organic Data Review* (USEPA 1999) and EPA's *NFGs for Inorganic Data Review* (USEPA 2004) in that order. Project-specific QC criteria are listed in the QAPP.

A summary of qualifiers assigned to results in this investigation is included in Table 2. Samples are represented by their URS sample identification assigned in the field as well as the laboratory identification. The laboratory was requested to report analytical results above the method detection limit (MDL) but below the method reporting limit (MRL). These results were flagged 'J' by CAS and for simplicity these 'J' flags are not included in Table 2 unless the analytical result was otherwise qualified based on quality control issues identified in this report. The 'J' qualifiers assigned to results reported between the MDL and MRL are included in the database and are included in the data tables in the main body of the remedial investigation report. Qualifiers that may be assigned to the results of this investigation include the following:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.

- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

- DNR - Do Not Report. Another result is available that is more reliable or appropriate.

Final sample results and qualifiers are presented in the analytical tables provided in the sampling report.

4.1 Chain-of-Custody, Sample Preservation and Holding Time

The project-specific analyte lists for metals, VOCs and SVOCs for monitoring wells MW-1 through MW-9 and MW-11 through MW-14 were misidentified on the associated COC forms. This was discovered and corrected during the sample confirmation process; all samples were analyzed for the appropriate analytes.

COC forms indicated samples were maintained under chain-of-custody protocols and forms were signed upon release and receipt with the following exceptions:

- The COC form associated with SDG K0900280 was signed but the date and time were inadvertently omitted. The COC form associated with SDG K0900315 relinquished on January 13 was not signed by URS. All subsequent courier and laboratory signatures with date and time are included. All samples were received intact by the laboratory. Data were not qualified.
- One 500 milliliter (mL) glass amber sample container for sample 090111S2SW (SDG K0900280) was missing a sample label. Through process of elimination CAS determined the proper sample identification. Data were not qualified.

All samples were released by URS to a CAS courier and were received and logged in by the laboratory on the same day. All coolers were submitted at temperatures within the EPA-recommended temperature range of 6°C or below. All samples were analyzed within the technical and contracted holding times.

All samples were received with adequate sample volume with the following exception:

- Due to insufficient groundwater in monitoring well 1 (MW-01), adequate sample volume to analyze all constituents could not be collected. Therefore, NWTPH-Gx, VOCs and metals were given priority. Butyltins, NWTPH-Dx and SVOCs were not analyzed due to insufficient sample volume.

4.2 Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the analytical methods. Initial calibrations (ICALs) and continuing calibrations (CCALs) were analyzed at the proper frequency and at the appropriate concentrations required by the methods. Instrument calibrations were acceptable for all sample analyses with the following exception:

- Butlytins are analyzed using dual columns for confirmation. Continuing calibration results for the confirmation column in analysis lot KWG0900568 were outside the laboratory-specific calibration criterion of 20% for n-butyltin and tri-n-propyltin. Results ranged from a percent difference of 25% to 35% for the post sample continuing calibration in this analysis lot. The samples analyzed in the analysis lot were K0900280-001, K0900280-002, K0900280-003, K0900280-004, K0900315-001, K0900315-002, K0900315-003, K0900315-004 and K0900315-005. The primary calibration results prior to sample analysis were in control. All associated results were reported from the column with acceptable continuing calibration results. Qualification of the data was not necessary. (Note: the original case narrative for data package K0900316 inadvertently stated samples associated with this SDG were analyzed in the analysis lot KWG0900568. This error was detected during the data review and an addendum narrative was issued by CAS correcting the error.)

4.3 Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank for each analysis and for each analytical batch, per QAPP requirements. Qualification of samples due to method, rinsate, or trip blank contamination followed guidelines set forth in the EPA NFGs.

Organic sample results less than five times (5x) and inorganic sample results and common organic laboratory contaminates less than ten times (10x) the associated blank concentration and between the method detection limit (MDL) and the method reporting limit (MRL) were qualified as non-detect and flagged with a ‘U’ at the MRL. When sample results were less than 5x (or 10x) the blank concentration but above the MRL, the reported result was qualified as non-detect and flagged with a ‘U’. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Target compounds reported with concentrations greater than 5x (or 10x) the blank concentration were not qualified.

Method and Calibration Blanks (Inorganics)

- Manganese was detected above the MDL but below the MRL in the method blank in delivery group K0900280. Detected results for manganese not exceeding 10x the blank

concentration were qualified as non-detect and flagged 'U' using the criteria described above. The specific sample results are listed in Table 2.

- Cadmium was detected at or above the MDL but below the MRL in the method blank associated with sample delivery group K0900366. Detected results not exceeding 10x the blank concentration of cadmium were qualified as non-detect and flagged 'U' using the criteria described above. Specific sample results are listed in Table 2.
- Two method blanks were analyzed with the metals in SDG K0900316, one was non-detect for all project specific metals, the second had a detection of arsenic at the MDL. Detected results for arsenic not exceeding 10x the blank concentration were qualified as non-detect and flagged 'U' using the criteria described above. The specific sample results are listed in Table 2.
- Iron and antimony were detected above the MDL but below the MRL in the calibration blanks bracketing the samples in SDGs K0900280 and K0900366, indicating possible instrument contamination and not preparatory contamination. Detected results for iron and antimony not exceeding 10x the blank concentration were qualified as non-detect and flagged 'U' using the criteria described above. The specific sample results are listed in Table 2.
- Iron, lead and manganese were detected above the MDL but below the MRL in the calibration blanks bracketing the samples in SDG K0900316. Detected results for iron, lead and manganese not exceeding 10x the blank concentration were qualified as non-detect and flagged 'U' using the criteria described above. The specific sample results are listed in Table 2.

Method Blanks (Organics)

- RRO was detected above the MDL and below the MRL in the method blanks associated with SDGs K0900280 and K0900315. These results were qualified as not detected and flagged 'U' at the MRL, using the criteria described above. Specific sample results are listed in Table 2.

Rinsate Blanks

One rinsate blank was collected by running laboratory-provided deionized water through the *Grundfos* submersible pump used to sample monitoring wells MW-01 and MW-08 (all other wells were sampled using dedicated tubing and a peristaltic pump). Analytical results for the rinsate blank were non-detect with the following exceptions:

- Iron, lead and manganese were detected at concentrations above the MDL and below the MRL, but were qualified as non-detect based on the associated method blank and/or calibration blank detections (as stated above and listed in Table 2).

- GRO was detected above the MDL and below the MRL. GRO analytical results for both MW-01 and MW-08 were non-detect; therefore, qualification of the data was not necessary.
- Phenol was detected above the MDL and below the MRL. Only MW-08 was analyzed for SVOCs. The phenol result for MW-08 was non-detect. Therefore, qualification of the data was not necessary.

Trip Blanks

VOCs and GRO samples were submitted to CAS under four independent submittals which resulted in four trip blanks. All analytical results for trip blanks were non-detect for VOCs and GRO.

Trip blank TB5 is associated with samples submitted to CAS on January 13, 2008. This trip blank was delivered to CAS in a cooler containing VOC and TPH-Gx sample containers associated with SDGs K0900315 and K0900316. This trip blank is listed on COC forms associated with both SDGs. The trip blank was analyzed once and reported in both SDGs. The same is true for trip blank TB 4 associated with samples from both SDGs delivered to CAS on January 14, 2009.

Both trip blanks TB4 and TB5 consisted of a single vial. The single vial for each sample was initially analyzed for GRO. After analysis, the remaining volume was analyzed for VOCs, however the vial used for VOC analysis contained headspace. Therefore, the VOC data is considered qualitative and flagged 'UJ', due to the headspace in the sample container prior to analysis. This problem has been remedied and all future sampling events will include adequate number of sample vials to complete requested analyses. It was not deemed necessary to qualify the analytical results of the primary samples.

4.4 Surrogate Recovery Review

Each sample analyzed for organic compounds was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. SVOCs contain acid and base/neutral components. When more than one surrogate per fraction (acid or base/neutral) were spiked in the sample, SVOCs were qualified if two or more surrogate recoveries for a given fraction were outside DoD QSM sample criteria. When only one surrogate per fraction was spiked, all sample results associated with that fraction were qualified when the surrogate recovery was outside DoD QSM sample criteria. Surrogate recoveries were acceptable for all analyses.

4.5 Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control/laboratory control duplicate (LCS/LCSD) samples are used to monitor the laboratory's day-to-day performance of routine analytical methods independent of matrix effects

and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. At least one LCS and one MS/MSD for each analysis and for each batch were analyzed per method requirements.

LCS/LCSD and MS/MSD recoveries were acceptable for all analytical tests with the following exception:

- The recovery of calcium within the MS performed on sample K0900366-001 was below the DOD QSM lower control limit of 80% at 74%. The associated MSD and RPD were within the control limits. The LCS and post spike recoveries were in control, indicating the analytical batch was in control. Because two of three matrix spike control parameters (MSD and RPD) were within the DOD QSM control limits the associated calcium analytical results were not qualified.

4.6 Duplicate Review

Field duplicates are used to evaluate the variability associated with sample collection. Relative percent difference (RPD) calculations were performed on the analytical results from the three field duplicates associated with sample locations MW-06, MW-10 and MW-11, and identified as MW-26, MW-20, and MW-21, respectively. Specific field duplicate precision control limits were not defined in the QAPP; however, all field duplicate results were below the DoD QSM laboratory precision control of 30%. To evaluate laboratory precision, CAS performed duplicate analyses (i.e. LCS/LCSD and MS/MSD) as discussed above. RPD precision was within project-specific control limits.

4.7 Compound Quantification

- CAS assigned ‘L’ and/or ‘Y’ flags in reporting RRO and/or DRO sample results for samples K0900316-006, K0900316-007, K0900316-008, K0900316-009, and K0900316-010 to indicate that the chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents (‘L’) or the elution pattern does not match the calibration standard (‘Y’). Further qualification was not necessary.
- CAS assigned a ‘Z’ flag in reporting RRO and DRO sample results for sample K0900280-003 to indicate the chromatographic fingerprint of the sample does not resemble a petroleum product. Further qualification was not necessary.

4.8 Reporting Limits

If sample results were detected at concentrations below the MRL but above the MDL, they were identified by the laboratory and flagged with a 'J'. As stated above, these flags are recorded within the database and are reported in the data tables included in the main body of this report but are not included in Table 2 of this report.

5.0 Completeness

The laboratory reported all requested analyses and the deliverable data reports were complete. Some data were qualified as estimated and flagged with a 'J' or a 'UJ'. Some data were qualified as not detected and flagged with a 'U.' A summary of qualifiers can be found in Table 2.

The electronic and .pdf versions of the deliverables were cross-checked for accuracy at a frequency of 15% or greater. Any minor discrepancies found between the deliverables were reported to CAS and corrected by updating the database to reflect the .pdf deliverable.

- *Technical Completeness* = (number of usable results/total reported results) x100

  = (527 compliant / 527 total results) = 100%

  All samples results are considered usable.

- *Analytical Completeness* = (number of unqualified results/total reported results) x100

  = (474 compliant / 527 total results) = 90%

  Some data were qualified non-detect and flagged 'U' and some were qualified as estimated and flagged 'J' or 'UJ.' Data qualified 'J' due to detections between the MDL and the MRL were not included in this calculation.

- *Contract Completeness* = (number of contract compliant results/total reported results) x100

  = (527 compliant / 527 total results) = 100%

  All samples analyzed met laboratory contract requirements.

- *Field Sampling Completeness* =(number samples collected/total reported results) x100

  = (22 compliant / 22 total results) = 100%

  All samples collected and submitted to CAS for analysis had acceptable results.

6.0 References

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UPLAND OPERABLE UNIT REMEDIAL INVESTIGATION

QUALITY CONTROL SUMMARY REPORT FOR ANALYTICAL CHEMISTRY

UPLAND OPERABLE UNIT SAMPLING – JANUARY-MARCH 2009

JUNE 2009

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TABLE 2 QUALIFIER SUMMARY ..... FOLLOWING REPORT

1.0 Executive Summary

The overall assessment of the sampling results show the quality of the data is acceptable to support project objectives. The contracted laboratory provided all requested analyses and the delivered data reports were complete. Some data were qualified as estimated and flagged with a 'J' or 'UJ'. Some data were qualified as not detected and flagged with a 'U'. All data qualifiers resulting from this review have been added to both the project database and the data tables within the main body of the attached report.

2.0 Project Description

URS collected soil, sediment, groundwater and soil gas from one or more of the four project-identified areas of potential concern (AOPCs) and the Reference Area. Quality control (QC) samples including field duplicates, rinsate blanks, and trip blanks were submitted when applicable with samples from each AOPC. Table 1 details the primary and quality control (QC) samples collected from each AOPC including URS and laboratory identification numbers, and requested analyses. Samples were collected on non-consecutive days between January 11 and March 20, 2009.

3.0 Sampling and Analytical Procedures

Samples were collected according to the Quality Assurance Project Plan (QAPP) *Upland Operable Unit Remedial Investigation* (URS 2008). Deviations from the QAPP (i.e. sample number and volume collected at each pre-determined location) are addressed in *Upland Operable Unit Data Gap Sampling* (URS 2009). All samples with the exception of the soil gas samples were submitted to Columbia Analytical Services (CAS) of Kelso, Washington and logged in under eight CAS sample delivery groups (SDGs, K0900272, K0900738, K0900782, K0900814, K0900927, K0902453, K0902454, K0902472 and K0902475).

Soil gas samples were submitted to AirToxics, Ltd. of Folsom, CA and assigned the SDG number 0901593R1. Soil gas results are reported in two different units within the laboratory data deliverable: parts per billion by volume (ppbv) and micrograms per cubic meter (ug/m^3). For brevity, the sample results will be reported and/or evaluated in this report in units of ug/m^3. Soil gas canisters were cleaned prior to shipment using AirToxics proprietary in-house Standard Operating Procedure (SOP). All canisters used during this sampling event (with the exception of the field blank canister) were certified clean using a batch certification process, in which a subset of the canisters (10%) cleaned by the process are evaluated by GC/MS analysis to certify the cleaning process. The field blank canister, however, was evaluated by GC/MS individually prior to shipment.

The following table lists the parameters analyzed on one or more of the samples.

Method	Analytical Parameter
EPA 8260B EPA TO-15	VOCs – Solid and Water Matrices VOCs – Soil Gas Matrix
EPA 8270C	SVOCs
EPA 6000 series	Metals (total and dissolved)[1]
Plumb (Plumb 1981) EPA 415.1	Total Organic Carbon (TOC) – Solid Matrices TOC – Water Matrices
PSEP (PSEP 1996)	Grain Size
SM2540C/D	Total Dissolved Solids (TDS)/ Total Suspended Solids (TSS)

[1]One or more of the following metals: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium and zinc.

The soil samples collected from the Sandblast Area AOPC were prepared and analyzed by CAS. Specific details on laboratory sample preparation were not included in the QAPP. The methodology detailed below was deemed appropriate after consultation between URS and Lynda Huckestein at CAS. The soil from the Sandblast Area AOPC was submitted for lead analysis in a single laboratory-provided 16 ounce glass container. It was believed that inadequate sample volume would be obtained for lead analysis if the samples were not dried prior to sieving. Drying at 60°C was suggested by CAS based on historic data for lead analysis on oven dried soil samples and is sufficient to remove water from the sample, while not compromising the lead concentrations. Therefore, a portion of the soil sample was removed from the container, dried at 60 degrees Celsius (°C) and split into equal fractions. One fraction was sieved using a 2 millimeter (2mm) mesh sieve, the other using a 250 micron mesh sieve. Due to the sampling methodology (i.e. drying the soil prior to sieving), the analytical results for these samples are reported in dry weight only.

4.0 Data Validation

Analyses were performed in general accordance with the above-referenced methods. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods), and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, chain-of-custody (COC), laboratory case narrative, proper sample preservation and handling procedures, holding times, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries

(laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The following items were reviewed on 20% or greater of the data: initial and continuing calibration verification (6000 series methods), instrument calibration, and verification of the reported electronic data with the hard copy deliverable. The data were reviewed in accordance with the QAPP (URS 2008). The data results were reviewed in accordance with the criteria contained in the DoD QSM (DoD 2006), the above-listed methods, and the following EPA guidance documents, as applicable; EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Organic Data Review* (USEPA 2008) and EPA's *NFGs for Inorganic Data Review* (USEPA 2004) in that order. Project-specific QC criteria are listed in the QAPP.

A summary of qualifiers assigned to results in this investigation is included in Table 2. Samples are represented by their URS sample identification assigned in the field as well as the laboratory identification. The laboratory was requested to report analytical results above the method detection limit (MDL) but below the method reporting limit (MRL). These results were flagged 'J' by CAS and for simplicity these 'J' flags are not included in Table 2 unless the analytical result was otherwise qualified based on quality control issues identified in this report. The 'J' qualifiers assigned to results reported between the MDL and MRL are included in the database and are included in the data tables in the main body of the remedial investigation report. Qualifiers that may be assigned to the results of this investigation include the following:

- U – The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J – The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. .
- UJ – The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R – The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR – Do Not Report. Another result is available that is more reliable or appropriate.

Final sample results and qualifiers are presented in the analytical tables provided in the sampling report.

4.1 Chain-of-Custody, Sample Preservation and Holding Time

COC forms indicated samples were maintained under chain-of-custody protocols and forms were signed upon release and receipt. All samples with the exception of soil gas were released by URS to a CAS courier and were received and logged in by the laboratory on the same day. All coolers were submitted to CAS at temperatures within the EPA-recommended temperature range of 6°C or below. The soil gas canisters were shipped at ambient temperatures to AirToxics per method guidelines. All samples were analyzed within the technical and contracted holding times. All samples were received with adequate sample volume.

4.2 Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the analytical methods. Initial calibrations (ICALs) and continuing calibrations (CCALs) were analyzed at the proper frequency and at the appropriate concentrations required by the methods. Instrument calibrations were acceptable for all sample analyses.

4.3 Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank for each analysis and for each analytical batch, per QAPP requirements. Qualification of samples due to method, rinsate, or trip blank contamination followed guidelines set forth in the EPA NFGs.

Organic sample results less than five times (5x), and inorganic sample results and common organic laboratory contaminates less than ten times (10x) the associated blank concentration, and between the method detection limit (MDL) and the method reporting limit (MRL) were qualified as non-detect and flagged with a 'U' at the MRL. When sample results were less than 5x (or 10x) the blank concentration but above the MRL, the reported result was qualified as non-detect and flagged with a 'U'. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Target compounds reported with concentrations greater than 5x (or 10x) the blank concentration were not qualified.

Method and Calibration Blanks (Inorganics)

- Copper was detected above the MDL but below the MRL in the method blank associated with SDG K0900272. Thallium was detected above the MDL but below the MRL in the method blank in SDG K0900782. All associated detected results for copper in SDG K0900272 and thallium in SDG K0900782 exceeded 10x the associated blank concentrations; therefore, no qualification was necessary.
- Copper was detected above the MDL but below the MRL in the method blank associated with SDG K0900927. All associated detected results for copper in SDG K0900927 were more than 10x the associated blank concentrations with the exception of sample

K0900927-004. The result for total copper in K0900927-004 was qualified as non-detect and flagged 'U' at the reporting limit using the criteria above.

- Calcium, iron, magnesium, selenium and/or thallium were detected at concentrations above the MDL but below the MRL in one or more continuing calibration blanks bracketing samples associated with SDG K0900782. Lead was detected at concentrations above the MDL but below the MRL in one or more continuing calibration blanks bracketing samples associated with SDG K0900927. Detections in the calibration blanks indicate possible instrument contamination and not laboratory preparatory contamination. Detected results for calcium, iron, magnesium, selenium and thallium in samples associated with SDG K0900782 and lead in samples associated with SDG K0900927 not exceeding 10x the blank concentration were qualified as non-detect and flagged 'U' using the criteria above. The specific results are listed in Table 2.
- Antimony, calcium, chromium, nickel and zinc were detected above the MDL and below the MRL in the method blank associated with SDG K0902453. Barium, calcium and thallium were detected in the continuing calibration blanks bracketing samples associated with SDG K0902453. Detections in the calibration blanks indicate possible instrument contamination and not laboratory preparatory contamination. Detected results for antimony, barium, calcium, chromium, nickel, thallium and zinc in samples associated with SDG K0902453 not exceeding 10x the blank concentration were qualified as non-detect and flagged 'U' using the criteria above. The specific results are listed in Table 2.

Method Blanks (Organics)

- Phenanthrene and chrysene were detected at concentrations above the MDL, but below the MRL in the method blank associated with SDG K0900814. All detected concentrations for these analytes in the associated samples were greater than 5x the blank concentration; therefore, qualification of the data was not necessary.
- The following TO-15 constituents were found in the AirToxics laboratory blank at concentration above the MDL, but below the MRL; acetone, carbon disulfide, methylene chloride, 2,2,4-trimethylpentane, 1,4-dioxane, trans-1,3-dichloropropene, 1,2-dibromoethane, 1,1,2,2-tetrachloroethane, 1,3-dichlorobenze, 1,4-dichlorobenze, alpha-chlorotoluene, and 1,2-dichlorobenze. Detected results for these analytes not exceeding 5x the blank concentration were qualified as non-detect and flagged 'U' using the criteria above. The specific results are listed in Table 2.

Rinsate Blanks

A total of four rinsate samples were collected during soil and sediment collection from the Reference Area, the Sandblast AOPC and the Pistol Range AOPC, as listed in Table 1. The sampling procedures for the rinsate samples are described in the sampling methodology sections of the *Upland Operable Unit Data Gap Sampling* (URS 2009) and for brevity will not be

reiterated in this report. Analytical results for the four rinsate samples were non-detect with the following exceptions.

Pistol Range AOPC Rinsate Samples

- Copper, nickel, zinc were detected in the rinsate blank sample K0900272-007 at concentrations above the MDL but below the MRL. All associated samples (Pistol Range AOPC lagoon sediments) had detections of copper, nickel and zinc at concentrations greater than 10x the rinsate blank concentrations, therefore qualification of the data was not necessary.
- Copper and lead were detected in the rinsate blank sample K0900927-004 at concentrations above the MDL but below the MRL. Both copper and lead in the associated samples were already qualified non-detect based on the associated method blank and continuing calibration blank detections as stated above; therefore, qualification of the data was not necessary.

Reference Area Rinsate Sample

- Aluminum, barium, iron, manganese and mercury were detected in the rinsate sample K0900782-016 above the MDL, but below the MRL and copper, nickel and zinc were detected above the MRL. Aluminum and mercury in the associated samples were qualified as non-detect based on associated method blank detections. All associated samples (Reference Area sediments) had detections of barium, iron, manganese, mercury, copper, nickel, and zinc at concentrations greater than 10x the rinsate blank concentrations; therefore, qualification of the data was not necessary.

Trip Blank

One trip blank (K0900814-010) was collected per QAPP guidance with the Landfill AOPC soil samples (SDG K0900814). The trip blank was submitted and analyzed for project-specific VOCs. All VOCs were reported as not detected; therefore, qualification of the data was not necessary.

Field Blank

One field blank was collected per QAPP guidance as part of the soil gas sampling in the Sandblast AOPC. The field blank sample was collected by drawing laboratory-supplied inert gas (nitrogen) through a clean laboratory-provided sampling manifold and into a 1 liter sample canister. As stated above, the field blank canister was individually certified clean prior to shipment from the laboratory, all TO-15 analytes were reported to be non-detect at the MRL during this certification process. All TO-15 analytes were non-detect in the field blank, with the exception of heptane and toluene which were reported at concentrations above the MDL, but below the MRL. Detected results for heptane and toluene not exceeding 5x the blank concentration were qualified as non-detect and flagged ‘U’ using the criteria above. The specific results are listed in Table 2.

4.4 Surrogate Recovery Review

Each sample analyzed for organic compounds was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. When more than one surrogate per fraction (acid or base/neutral) was spiked in the sample, SVOCs were qualified if two or more surrogate recoveries for a given fraction were outside DoD QSM sample criteria. When only one surrogate per fraction was spiked, all sample results associated with that fraction were qualified when the surrogate recovery was outside DoD QSM sample criteria. Surrogate recoveries were acceptable for all analyses, with the following exceptions:

- The percent recoveries of the VOC surrogate 1,2-dichloroethane-d4, exceeded the DOD QSM upper control limit of 123% for all VOC samples in SDG K0900814. Surrogate recoveries ranged from 128% to 143%. The remaining three VOC surrogates were within control limits. The project-specific analyte list for VOCs only consists of three analytes, tetrachloroethene (PCE), toluene and o-xylene. All detected concentrations for VOCs in SDG K0900814 were qualified based on the bias high surrogate recovery and flagged 'J'. VOCs not detected were not qualified.
- The SVOC surrogate fluorene-d10 had recoveries below the lower DOD QSM control limit of 60% in samples K0900814-001 (47%), K0900814-003 (45%), and K0900814-006 (57%). Additionally, SVOC surrogate fluoranthene-d10 had a recovery of 48% in sample K0900814-003, which was below the lower DOD QSM criteria of 60%. Surrogate recoveries were acceptable in the associated QC samples (i.e. method blank, LCS and LCSD) indicating analytical batch was in control. Following the EPA NFGs, only those samples with two or more surrogates (within the same fraction) out of specifications are qualified as estimated. Therefore, all SVOC analytical results for K0900814-003 were qualified 'J/UJ', based on the low surrogate recoveries. (Note: The only SVOCs analyzed were PAHs and therefore, all analytes and the associated surrogates are within the same base/neutral fraction.)

4.5 Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control/laboratory control duplicate (LCS/LCSD) samples are used to monitor the laboratory's day-to-day performance of routine analytical methods independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. At least one LCS and one MS/MSD for each analysis and for each batch were analyzed per method requirements.

LCS/LCSD and MS/MSD recoveries were acceptable for all analytical tests with the following exception:

- The percent recoveries of zinc in the MS (138%) and MSD (157%) performed on sample K0900272-002 were above the DOD QSM upper control limit of 120%. The LCS and post-digestion spike recoveries were in control, indicating the analytical batch was in

control. Zinc analytical results for the primary sample K0900272-002 and the field duplicate were flagged 'J' to indicate potential high bias due to the sample matrix. The other sediment samples collected from the Pistol Range AOPC lagoon were deemed a similar matrix based on available data and were therefore qualified as estimated and flagged 'J' also.

- The percent recoveries of antimony in the MS (47.2%) and MSD (42.8%) performed on sample K0900782-006 were below the DOD QSM lower control limit of 75%. The LCS and post-digestion spike recoveries were in control indicating the analytical batch was in control. The other samples collected from the Reference Area were deemed of a similar matrix based on available data, and therefore all analytical results for antimony were qualified as estimated and flagged 'J/UJ' to indicate potential bias due to the sample matrix.
- The percent recovery of zinc in the MSD performed on sample K0900782-006 (79%) was below the DOD QSM lower control limit of 80%. The associated MS and RPD were within the control limits. The LCS and post-digestion spike recoveries were in control indicating the analytical batch was in control. Because two of three matrix spike control parameters (MS and RPD) were within the DOD QSM control limits, the associated zinc analytical results were not qualified.
- The percent recovery of copper in the MS performed on sample K0900927-001 (78%) was below the DOD QSM lower control limit of 80%. The associated MSD and RPD were within the control limits. The LCS and post-digestion spike recoveries were in control, indicating the analytical batch was in control. Because two of three matrix spike control parameters (MSD and RPD) were within the DOD QSM control limits, the associated copper analytical results were not qualified.
- The MS and MSD percent recoveries for aluminum, chromium, iron, lead and manganese were outside the DoD QSM control limits of 80-120% in the MS/MSD performed on sample K0902454-002 and associated with samples in SDGs K0902453 and K0902454. However, the concentrations of these analytes in the primary sample (K0902454-002) were greater than 4x the spike concentrations; therefore, analytical results were not qualified based on MS/MSD recoveries. Recoveries of the following analytes were also outside the DoD QSM control criteria of 80-120% and the RPD criteria of 20% in the same MS/MSD sample:

	MS (%)	MSD(%)	RPD (%)
Antimony	34.7	37.5	--
Nickel	243	--	97
Zinc	130	79.7	48

The post-digestion spike and LCS recoveries were in control indicating the analytical batch was in control. Sample results for antimony, nickel and zinc in the primary sample (K0902454-002) were estimate and flagged 'J' due to MS/MSD recoveries. The other

samples within the same analytical batch were deemed to be different, therefore qualification was not needed.

- The percent recoveries of all project-specific SVOCs were outside control limits for the MS/MSD performed on sample K0900814-006. However, the MS/MSD results are not applicable because the samples results for all spikes compounds in K0900814-006 are greater than 4x the spike concentration. In addition, all associated QC samples (i.e LCS, LCSD) were in control indicating analytical batch was in control. Data were not qualified based on MS/MSD recoveries.

4.6 Duplicate Review

Field duplicates are used to evaluate the variability associated with sample collection. Relative percent difference (RPD) calculations were performed on the analytical results from the seven field duplicates shown in Table 1. For the soil gas field duplicate, the primary and duplicate sample canisters were filled concurrently. A more in-depth description of all the field duplicate collection methodologies is included in the *Upland Operable Data Gap Unit Sampling* (URS 2009). Specific field duplicate precision control limits were not defined in the QAPP. Field duplicate precision criteria was evaluated at 30% for waters and 50% for solid matrices. All field duplicate results were below these criteria with the following exceptions:

- RPDs calculated on the primary soil sample (K0900814-007) and the associated field duplicate (K0900814-009) collected from the Landfill AOPC were above the 50% control limit for all project-specific SVOCs. The calculated RPD ranged from 59% to 160%. All SVOCs in samples K0900814-007 and K0900814-009 were qualified and flagged 'J' due to field duplicate precision.
- RPDs calculated on the primary sediment sample (K0900272-003) and the associated field duplicate (K0900272-006) collected from the Pistol Range AOPC lagoon were above the 50% control limit for TOC. The calculated RPD was 72%. TOC results for K0900272-003 and K0900272-006 were qualified and flagged 'J' due to field duplicate precision.
- RPDs calculated on the primary groundwater sample (K0900927-002) and the associated field duplicate (K0900927-003) collected from the Pistol Range AOPC temporary groundwater wells were above the 30% control limit for total copper (92%), total lead (92%), total nickel (97%), total zinc (97%), dissolved lead (60%) and total suspended solids (199%). The above-listed analytes were qualified and flagged 'J' due to field duplicate precision.

To evaluate laboratory precision, CAS performed laboratory duplicate analyses as discussed above. RPD precision was within project-specific control limits with the following exceptions:

- RPDs calculated for the laboratory duplicate performed on the soil sample (K0902454-002) were above the DoD QSM control laboratory precision control limit of 20% for

chromium (60.6%) and nickel (60.5%). The laboratory noted in the case narrative that this particular sample had small rocks which make complete homogenization difficult. Chromium and nickel were qualified as estimated and flagged 'J' due to laboratory precision in sample K0902454-002.

4.7 Reporting Limits

If sample results were detected at concentrations below the MRL but above the MDL, they were identified by the laboratory and flagged with a 'J'. As stated above, these flags are recorded within the database and are reported in the data tables included in the main body of this report but are not included in Table 2 of this Quality Control Summary Report.

5.0 Completeness

The laboratory reported all requested analyses and the deliverable data reports were complete. Some data were qualified as estimated and flagged with a 'J' or a 'UJ'. Some data were qualified as not detected and flagged with a 'U.' A summary of qualifiers can be found in Table 2.

The electronic and .pdf versions of the deliverables were cross-checked for accuracy at a frequency of 15% or greater. Any minor discrepancies found between the deliverables were reported to CAS and corrected by updating the database to reflect the .pdf deliverable.

- *Technical Completeness* = (number of usable results/total reported results) x100

  = (5,314 compliant / 5,314 total results) = 100%

  All samples results are considered usable.

- *Analytical Completeness* = (number of unqualified results/total reported results) x100

  = (5,224 compliant / 5,314 total results) = 98%

  Some data were qualified as non-detect and flagged 'U' and some were qualified as estimated and flagged 'J' or 'UJ.' Data qualified 'J' due to detections between the MRL and the MRL were not included in this calculation.

- *Contract Completeness* = (contract compliant results/total reported results) x100

  = (111 compliant / 111 total results) = 100%

  All samples analyzed met laboratory contract requirements.

- *Field Sampling Completeness* =(samples collected/planned samples) x100

  = (110 compliant / 111 total results) = 99%

All planned samples were collected with the exception of one soil gas sample due to shallow groundwater at the time of sampling (this is discussed in detail in the sampling report [URS 2009]).

6.0 References

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Plumb 1981. *Procedures for Handling and Chemical Analysis of Sediment and Water Samples*, R.H. Plumb, prepared by USEPA and USACE, May 1981.

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URS 2008. Quality Assurance Project Plan, *Upland Operable Unit Remedial Investigation*, Bradford Island, Bonneville Lock and Dam Project, Cascade Locks, Oregon. October 2008.

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USEPA 2004. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. October 2004.

USEPA 2008. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review. June 2008.

Table 1
Sampling ID and Analysis Summary
Quality Control Summary Report for Analytical Chemistry
Upland Operable Unit Sampling Event - January/March 2009

Location	Matrix	URS ID	Laboratory ID	QA/QC Samples	Date Collected	Analytes												
						VOCs	SVOCs	PCBs (Aroclors)	Pesticides	Total Metals	Dissolved Metals	Total Lead (only)	TPH-Gx	TPH-Dx	Butyltins	TOC	Grain Size	TSS/TDS
Reference Area	Surface Soil (Grab)	090128-R-R1-0-0.5So	K0900782-001	-	1/28/09		X			X						X	X	
		090128-R-R2-0-0.5So	K0900782-002	-	1/28/09		X			X						X	X	
		090128-R-R3-0-0.5So	K0900782-003	-	1/28/09		X			X						X	X	
		090128-R-R4-0-0.5So	K0900782-004	-	1/28/09		X			X						X	X	
		090128-R-R5-0-0.5So	K0900782-005	-	1/28/09		X			X						X	X	
		090128-R-R6-0-0.5So	K0900782-006	MS/MSD	1/28/09		X			X						X	X	
		090128-R-R7-0-0.5So	K0900782-007	Primary	1/28/09		X			X						X	X	
		090128-R-R15-0-0.5So	*K0900782-008*	*Duplicate*	1/28/09		X			X						X	X	
		090128-R-R8-0-0.5So	K0900782-009	-	1/28/09		X			X						X	X	
		090128-R-R9-0-0.5So	K0900782-010	-	1/28/09		X			X						X	X	
		090128-R-R10-0-0.5So	K0900782-011	-	1/28/09		X			X						X	X	
		090128-R-R11-0-0.5So	K0900782-012	-	1/28/09		X			X						X	X	
		090128-R-R12-0-0.5So	K0900782-013	-	1/28/09		X			X						X	X	
		090128-R-R13-0-0.5So	K0900782-014	-	1/28/09		X			X						X	X	
		090128-R-R14-0-0.5So	K0900782-015	-	1/28/09		X			X						X	X	
	Water	090128-R-Rinsate	K0900782-016	Rinsate	1/28/09		X			X						X		
Landfill AOPC	Soil (Grab)	090129-L-L1-0-1So	K0900814-001	-	1/29/09	X	X											
		090129-L-L1-1-3So	K0900814-002	-	1/29/09	X	X											
		090129-L-L2-0-1So	K0900814-003	-	1/29/09	X	X											
		090129-L-L2-1-3So	K0900814-004	-	1/29/09	X	X											
		090129-L-L3-0-1So	K0900814-005	-	1/29/09	X	X											
		090129-L-L3-1-3So	K0900814-006	MS/MSD	1/29/09	X	X											
		090129-L-L4-0-1So	K0900814-007	Primary	1/29/09	X	X											
		090129-L-L4-1-3So	K0900814-008	-	1/29/09	X	X											
		090129-L-L5-0-1So	*K0900814-009*	*Duplicate*	1/29/09	X	X											
	Water	Trip Blank	K0900814-010	Trip Blank	1/29/09	X												
Sandblast Area AOPC	Soil (Grab)	090127-SB-SB1-0-1So	K0900738-001	-	1/27/09							X						
		090127-SB-SB1-0-1So (<2mm)	K0900738-002	-	1/27/09							X						
		090127-SB-SB1-0-1So (<250um)	K0900738-003	-	1/27/09							X						
		090127-SB-SB1-1-3So	K0900738-004	-	1/27/09							X						
		090127-SB-SB1-1-3So (<2mm)	K0900738-005	-	1/27/09							X						
		090127-SB-SB1-1-3So (<250um)	K0900738-006	-	1/27/09							X						
		090127-SB-SB2-0-1So	K0900738-007	-	1/27/09							X						
		090127-SB-SB2-0-1So (<2mm)	K0900738-008	-	1/27/09							X						
		090127-SB-SB2-0-1So (<250um)	K0900738-009	-	1/27/09							X						
		090127-SB-SB2-1-3So	K0900738-010	-	1/27/09							X						
		090127-SB-SB2-1-3So (<2mm)	K0900738-011	-	1/27/09							X						
		090127-SB-SB2-1-3So (<250um)	K0900738-012	-	1/27/09							X						
		090127-SB-SB3-0-1So	K0900738-013	-	1/27/09							X						
		090127-SB-SB3-0-1So (<2mm)	K0900738-014	-	1/27/09							X						
		090127-SB-SB3-0-1So (<250um)	K0900738-015	-	1/27/09							X						
		090127-SB-SB3-1-3So	K0900738-016	-	1/27/09							X						
		090127-SB-SB3-1-3So (<2mm)	K0900738-017	-	1/27/09							X						
		090127-SB-SB3-1-3So (<250um)	K0900738-018	-	1/27/09							X						
		090127-SB-SB4-0-1So	K0900738-019	-	1/27/09							X						
		090127-SB-SB4-0-1So (<2mm)	K0900738-020	-	1/27/09							X						
		090127-SB-SB4-0-1So (<250um)	K0900738-021	-	1/27/09							X						
		090127-SB-SB4-1-3So	K0900738-022	-	1/27/09							X						
		090127-SB-SB4-1-3So (<2mm)	K0900738-023	-	1/27/09							X						
		090127-SB-SB4-1-3So (<250um)	K0900738-024	-	1/27/09							X						
		090127-SB-SB5-0-1So	K0900738-025	-	1/27/09							X						
		090127-SB-SB5-0-1So (<2mm)	K0900738-026	-	1/27/09							X						
		090127-SB-SB5-0-1So (<250um)	K0900738-027	-	1/27/09							X						
		090127-SB-SB5-1-3So	K0900738-028	MS/MSD	1/27/09							X						
		090127-SB-SB5-1-3So (<2mm)	K0900738-029		1/27/09							X						
		090127-SB-SB5-1-3So (<250um)	K0900738-030		1/27/09							X						
		090127-SB-SB6-0-1So	K0900738-031	Primary	1/27/09							X						
		090127-SB-SB6-0-1So (<2mm)	K0900738-032	Primary	1/27/09							X						
		090127-SB-SB6-0-1So (<250um)	K0900738-033	Primary	1/27/09							X						
		090127-SB-SB6-1-3So	K0900738-034	-	1/27/09							X						
		090127-SB-SB6-1-3So (<2mm)	K0900738-035	-	1/27/09							X						
		090127-SB-SB6-1-3So (<250um)	K0900738-036	-	1/27/09							X						
		090127-SB-SB15-0-1So	*K0900738-049*	*Duplicate*	1/27/09							X						
		090127-SB-SB15-0-1So (<2mm)	*K0900738-050*	*Duplicate*	1/27/09							X						
		090127-SB-SB15-0-1So (<250um)	*K0900738-051*	*Duplicate*	1/27/09							X						
		090127-SB-SB7-0-1So	K0900738-037	-	1/27/09							X						
		090127-SB-SB7-0-1So (<2mm)	K0900738-038	-	1/27/09							X						
		090127-SB-SB7-0-1So (<250um)	K0900738-039	-	1/27/09							X						
		090127-SB-SB7-1-3So	K0900738-040	-	1/27/09							X						
		090127-SB-SB7-1-3So (<2mm)	K0900738-041	-	1/27/09							X						
		090127-SB-SB7-1-3So (<250um)	K0900738-042	-	1/27/09							X						

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Location	Matrix	URS ID	Laboratory ID	QA/QC Samples	Date Collected	Analytes												
						VOCs	SVOCs	PCBs (Aroclors)	Pesticides	Total Metals	Dissolved Metals	Total Lead (only)	TPH-Gx	TPH-Dx	Butyltins	TOC	Grain Size	TSS/TDS
Sandblast Area AOPC *(continued)*	Soil (Grab)	090127-SB-SB8-0-1So	K0900738-043	-	1/27/09							X						
		090127-SB-SB8-0-1So (<2mm)	K0900738-044	-	1/27/09							X						
		090127-SB-SB8-0-1So (<250um)	K0900738-045	-	1/27/09							X						
		090127-SB-SB8-1-3So	K0900738-046	-	1/27/09							X						
		090127-SB-SB8-1-3So (<2mm)	K0900738-047	-	1/27/09							X						
		090127-SB-SB8-1-3So (<250um)	K0900738-048	-	1/27/09							X						
	Water	090127-SB-Rinsate	K0900738-052	Rinsate	1/27/09							X						
	Soil Gas	090126-SB-SB10-3.5-4SG	0901593R1-01A	-	1/26/09	X												
		090126-SB-SB11-3.5-4SG	0901593R1-02A	-	1/26/09	X												
		090126-SB-SB12-3.5-4SG	0901593R1-03A	Primary	1/26/09	X												
		090126-SB-SB13-3.5-4SG	0901593R1-04A	-	1/26/09	X												
		090126-SB-SB14-3.5-4SG	0901593R1-05A	-	1/26/09	X												
		090126-SB-SB16-3.5-4SG	*0901593R1-06A*	*Duplicate*	1/26/09	X												
		090126-SB-SB17-3.5-4SG	0901593R1-07A	Field Blank	1/26/09	X												
	Laydown Area Test Pits Soil (Grab)	090320-LD-4So-0-1	K0902475-001	-	3/20/09	X	X	X	X	X			X	X	X	X		
		090320-LD-4So-1-3	K0902475-002	-	3/20/09	X	X	X	X	X			X	X	X	X		
		090320-LD-1So-0-1	K0902475-003	-	3/20/09	X	X	X	X	X			X	X	X	X		
		090320-LD-1So-1-3	K0902475-004	-	3/20/09	X	X	X	X	X			X	X	X	X		
		090320-LD-2So-0-1	K0902475-005	-	3/20/09	X	X	X	X	X			X	X	X	X		
		090320-LD-2So-1-3	K0902475-006	-	3/20/09	X	X	X	X	X			X	X	X	X		
		090320-LD-3So-0-1	K0902475-007	-	3/20/09	X	X	X	X	X			X	X	X	X		
		090320-LD-3So-1-3	K0902475-008	-	3/20/09	X	X	X	X	X			X	X	X	X		
		090320-LD-5So-0-1	K0902475-009	-	3/20/09	X	X	X	X	X			X	X	X	X		
		090320-LD-5So-1-3	K0902475-010	-	3/20/09	X	X	X	X	X			X	X	X	X		
	Water	090320-Rinsate	K0902472-001	-	3/20/09		X	X	X	X				X		X		
	Laydown Area Surface Soil Soil (Grab)	090319-LD-6-So	K0902453-001	-	3/19/09	X	X	X	X	X			X	X	X	X		
		090319-LD-7-So	K0902453-002	-	3/19/09	X	X	X	X	X			X	X	X	X		
		090319-LD-8-So	K0902453-003	-	3/19/09	X	X	X	X	X			X	X	X	X		
		090319-LD-9-So	K0902453-004	-	3/19/09	X	X	X	X	X			X	X	X	X		
		090319-LD-10-So	K0902453-005	-	3/19/09	X	X	X	X	X			X	X	X	X		
		090319-LD-11-So	K0902453-006	Primary	3/19/09	X	X	X	X	X			X	X	X	X		
		090319-LD-21-So	*K0902453-007*	*Duplicate*	3/19/09	X	X	X	X	X			X	X	X	X		
Pistol Range AOPC	Groundwater (Grab)	090202-PR-PR1-16-20GW	K0900927-001	-	2/2/09					X	X							X
		090202-PR-PR2D-9-19GW	K0900927-002	Primary	2/2/09					X	X							X
		090202-PR-PR4-9-19GW	*K0900927-003*	*Duplicate*	2/2/09					X	X							X
	Water	090202-PR-Rinsate	K0900927-004	Rinsate	2/2/09					X	X							X
	Sediment (Grab)	090111-PR4-0-1SD	K0900272-001	-	1/11/09					X						X	X	
		090111-PR5-0-1SD	K0900272-002	-	1/11/09					X						X	X	
		090111-PR6-0-1SD	K0900272-003	Primary	1/11/09					X						X	X	
		090111-PR7-0-1SD	K0900272-004	-	1/11/09					X						X	X	
		090111-PR8-0-1SD	K0900272-005	-	1/11/09					X						X	X	
		090111-PR9-0-1SD	*K0900272-006*	*Duplicate*	1/11/09					X						X	X	
	Water	090111-PR-SD-Rinsate	K0900272-007	Rinsate	1/11/09					X						X		
Erodable Unit Analytical Data is included in Attachment E of Sampling Report																		
Erodable Unit	Soil (Grab)	090318-SB-EUA-So	K0902454-001	-	3/18/09		X	X	X	X				X	X		X	
		090318-SB-EUB-So	K0902454-002	-	3/18/09		X	X	X	X				X	X		X	
		090318-SB-EUC-So	K0902454-003	-	3/18/09		X	X	X	X				X	X		X	
		090318-SB-EUA-2So	K0902454-004	-	3/18/09	X							X					
		090318-SB-EUA-4So	K0902454-005	-	3/18/09	X							X					
		090318-SB-EUA-6So	K0902454-006	-	3/18/09	X							X					
		090318-SB-EUA-8So	K0902454-007	-	3/18/09	X							X					
		090318-SB-EUB-2So	K0902454-008	-	3/18/09	X							X					
		090318-SB-EUB-3So	K0902454-009	-	3/18/09	X							X					
		090318-SB-EUB-12So	K0902454-010	-	3/18/09	X							X					
		090318-SB-EUB-15So	K0902454-011	-	3/18/09	X							X					
		090319-LF-EUA-So	K0902454-012	-	3/18/09												X	
		090319-PR-EUA-So	K0902454-013	-	3/19/09												X	
		090319-PR-EUB-So	K0902454-014	-	3/19/09												X	

Notes:
AOPC = area of potential concern
VOCs = volatile organic compounds
SVOCs = semivolatile organic compounds
TOC = total organic carbon
TSS/TDS = total suspended solids / total dissolved solids
= primary and *field duplicate* samples
- = not applicable
X = Analyzed

Table 2
Qualifier Summary
Quality Control Summary Report for Analytical Chemistry
Upland Operable Unit Sampling Event - January/March 2009

URS ID	CAS ID	Analyte	Qualifiers	Rationale
Reference Area				
090128-R-R3-0-0.5So	K0900782-003	thallium	0.100U	continuing calibration blank detection
090128-R-R5-0-0.5So	K0900782-005		0.103U	
090128-R-R10-0-0.5So	K0900782-011		0.098U	
090128-R-R12-0-0.5So	K0900782-013		0.042U	
090128-R-R13-0-0.5So	K0900782-014		0.093U	
090128-R-R14-0-0.5So	K0900782-015		0.081U	
090128-R-R1-0-0.5So	K0900782-001	antimony	J/UJ	bias low MS/MSD recoveries
090128-R-R2-0-0.5So	K0900782-002			
090128-R-R3-0-0.5So	K0900782-003			
090128-R-R4-0-0.5So	K0900782-004			
090128-R-R5-0-0.5So	K0900782-005			
090128-R-R6-0-0.5So	K0900782-006			
090128-R-R7-0-0.5So	K0900782-007 (primary)			
090128-R-R15-0-0.5So	K0900782-008 (duplicate)			
090128-R-R8-0-0.5So	K0900782-009			
090128-R-R9-0-0.5So	K0900782-010			
090128-R-R10-0-0.5So	K0900782-011			
090128-R-R11-0-0.5So	K0900782-012			
090128-R-R12-0-0.5So	K0900782-013			
090128-R-R13-0-0.5So	K0900782-014			
090128-R-R14-0-0.5So	K0900782-015			
Landfill AOPC				
090129-L-L2-0-1So	K0900814-003	SVOCs	J	bias low surrogate recoveries
090129-L-L4-0-1So	K0900814-007 (primary)	SVOCs	J	field duplicate precision
090129-L-L5-0-1So	K0900814-009 (duplicate)			
090129-L-L1-0-1So	K0900814-001	VOCs	J	bias low surroage recovery
090129-L-L1-1-3So	K0900814-002			
090129-L-L2-0-1So	K0900814-003			
090129-L-L2-1-3So	K0900814-004			
090129-L-L3-0-1So	K0900814-005			
090129-L-L3-1-3So	K0900814-006			
090129-L-L4-0-1So	K0900814-007			
090129-L-L4-1-3So	K0900814-008			
090129-L-L5-0-1So	K0900814-009			
Trip Blank	K0900814-010			
Sandblast Area AOPC				
090127-SB-Rinsate	K0900927-004	copper	0.11U	method blank detection(s)
090126-SB-SB10-3.5-4G	0901593R1-01A	carbon disulfide	4.7U	
090126-SB-SB11-3.5-4SG	0901593R1-02A	acetone	21U	
090319-LD-6So	K0902453-001	antimony	0.36U	
090319-LD-8So	K0902453-003		0.16U	
090319-LD-9So	K0902453-004		0.17U	
090126-SB-SB11-3.5-4SG	0901593R1-02A	heptane	9.0U	field blank detection(s)
Pistol Range AOPC				
090202-PR-PR1-16-20GW	K0900927-001 Diss	lead	0.020U	continuing calibration blank detection(s)
090202-PR-PR2D-9-19GW	K0900927-002 Diss		0.020U	
090202-PR-PR4-9-19GW	K0900927-003 Diss		0.020U	
090202-PR-Rinsate	K0900927-004		0.020U	
090111-PR6-0-1SD	K0900272-003 (primary)	TOC	J	field duplicate precision
090111-PR9-0-1SD	K0900272-006 (duplicate)			
090202-PR-PR2D-9-19-GW	K0900927-002	total lead, total nickel, total zinc	J	
		TSS	UJ	
090202-PR-PR4-9-19-GW	K0900927-003	total lead, total nickel, total zinc, TSS	J	
090111-PR4-0-1SD	K0900272-001	zinc	J	bias high MS/MSD recoveries
090111-PR5-0-1SD	K0900272-002			
090111-PR6-0-1SD	K0900272-003			
090111-PR7-0-1SD	K0900272-004			
090111-PR8-0-1SD	K0900272-005			
090111-PR9-0-1SD	K0900272-006			
Erodable Unit (Analytical Data is included in Attachment E of Sampling Report)				
090318-SB-EUB-So	K0902454-002	antimony	J	MS/MSD recoveries
		nickel		
		zinc		
	K0902454-002	nickel	J	laboratory duplicate precision
		chromium		

Notes:
Diss = field filtered dissolved phase
MS/MSD = Matrix Spike/Matrix Spike Duplicate
soil gas concentrations are in units of micrograms per cubic meter (ug/m3).
TSS = total suspended solids

URS retrieved twenty-two fish from the USACE storage facility near Bonneville Dam on September 20, 2007. The samples included nineteen smallmouth bass and three large-scale sucker. The three large-scale sucker were composited into one sample. Fish were captured from the Bonneville Dam forebay and vicinity under the supervision of the USACE in 2006 and 2007 and archived frozen by USACE until they were provided to URS for laboratory analysis. Table 1 summarizes the sample IDs, capture date and requested analyses. Whole-body fish samples were homogenized using an industrial blender by Columbia Analytical Services (CAS), located in Kelso Washington. An aliquot of the homogenized tissue was sent to Axys Analytical Services Ltd located in Sidney, British Columbia (Axys) to perform the PCB congener analysis by EPA Method 1668A, *Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by High Resolution Gas Chromatography/High Resolution Mass Spectrometry*. The Axys analytical data reports include a listing of Axys Method 1668A modifications.

The following table lists the parameters analyzed on one or more of the samples. Table 1 summarizes the samples by URS and laboratory IDs.

Method	Analytical Parameter
EPA 1668A	Polychlorinated Biphenyls (PCBs) - Congeners
EPA 8082M	Polychlorinated Biphenyls (PCBs) - Aroclors
EPA 8270C SIM	Semi-Volatile Organic Compounds (SVOCs)
6000/7000 Series	Metals
Puget Sound Estuary Program (PSEP 1996)	Percent Lipids
Freeze Dry	Percent Solids

Analyses were performed in general accordance with the referenced methods. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, chain of custody (COC), laboratory case narrative, proper sample preservation and handling procedures, holding times, initial and continuing calibrations, quantitation limits, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The following items were reviewed on 10% of the data: primary and secondary column verification, instrument calibration and a verification of the reported electronic data with the hard copy deliverable. The data review process for this investigation followed the Bradford Island Bonneville Lock and Dam Project, River Operable Unit Remedial Investigation Quality Assurance Project Plan (QAPP) (USACE 2007). Additionally, because the QAPP-referenced *Department of Defense Quality Systems Manual* does not discuss PCB congeners, the data

review process utilized guidance from EPA's *Contract Laboratory Program National Functional Guidelines (NFGs) for Organic Data Review (USEPA 1999)*, and *EPA Region 10 Standard Operating Procedure (SOP) for the Validation of Method 1668 Toxic, Dioxin-like, PCB data (USEPA 1995)* as appropriate for the methods performed. The non-congener data results were reviewed in accordance with the criteria contained in the DoD QSM (DoD QSM, 2006) and the above listed methods and the following EPA guidance documents in that order; EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Organic Data Review (USEPA, October 1999)*, EPA's *NFGs for Inorganic Data Review (USEPA, October 2004)* and *EPA Region 10 SOP for the Validation of Method 1668 Toxic, Dioxin-like, PCB data (USEPA 1995)*. Project-specific QC criteria are listed in the above mentioned QAPP. A summary of qualifiers assigned to results in this investigation as part of this review is included in Table 2. Samples are referenced by both by their URS sample identification assigned in the field as well as the laboratory identification. Qualifiers that may be assigned to the results of this investigation include the following:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.

- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

- J-EMPC – The analyte was not positively identified; the associated numerical value is the **E**stimated **M**aximum **P**otential **C**oncentration of the analyte in the sample used only for PCB congener results.

- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

- DNR - Do Not Report

Final sample results and qualifiers are presented in the analytical tables provided in the sampling report.

Multiple dilutions were required by Axys for most tissue samples and various extraction sample sizes were necessary for some tissue samples in order to reach appropriate concentration levels for analysis by Method 1668A. Axys indicated which congeners exceeded instrument calibration range in undiluted or less diluted samples in the analytical report. Only congeners exceeding instrument calibration range were reported from the more diluted analyses.

Additionally, as part of the electronic data deliverable, Axys only reported one result per congener per sample, selecting results from more diluted analyses to replace results exceeding calibration range in the less diluted analyses.

REPRESENTATIVENESS

Chain-of-Custody and Holding Times

The chain-of-custody (COC) forms from URS to CAS indicate that samples were maintained under chain of custody and forms were signed upon release and receipt. All coolers were submitted at temperatures within the EPA-recommended range of 4°C± 2°C. Data were not qualified based on cooler temperatures. USACE provided temperature logger data showing samples were maintained frozen between sample collection and URS receipt. USACE was made aware of the hold time exceedances detailed below and advised URS to proceed with the sample analysis despite these issues.

The chain-of-custody (COC) forms from CAS to Axys indicate that samples were maintained under COC and forms were signed upon release and receipt. The condition of samples upon receipt by Axys was appropriate and all samples listed on COC were present and analyzed with one exception. For samples reported in data package DPWG24485, two sample jars were labeled with the same client ID of 060815402SB and a jar listed as 0608403SB on the COC was missing. Axys contacted URS, and URS was able to identify which jar was sample ID 060815403SB using other identification labels on the jars. Jar number K0708602-016 was sample ID 060815402SB and logged in as Axys ID L10448-16, and jar number K0708602-017 was sample ID 060815403SB and logged in as Axys ID L10448-17. Because all samples listed on the COC were present and analyzed, data qualification based on sample custody was not considered necessary.

All coolers were received by the Axys laboratory at temperatures within the EPA-recommended range of less than 6 degrees Celsius (°C). Samples were kept frozen at -20°C prior to extraction and analysis.

Samples were analyzed outside of the technical hold time as detailed below:

- PCB (as congeners or Aroclors) hold times are one year from sampling date for fish tissue if frozen. All samples were analyzed outside this hold time with the exception of sample 070505LS. PCB Aroclors were only analyzed for 070505LS, therefore no qualification is necessary. All PCB congener sample results with the exception of 070505LS were qualified as estimated and flagged ‘J’ due to hold time.
- SVOC hold time is one year from sampling data for tissue if frozen. The hold time was exceeded for all samples except 070505LS by a maximum of five months. All SVOC sample results with the exception of 070505LS were qualified as estimated and flagged ‘J/UJ’ due to hold time.

- The hold time for inorganic mercury is 28 days for frozen solid matrixes. All samples were analyzed from six months to 17 months. The mercury data was not rejected based on hold time due to the fact that it is believed that a large percentage of the mercury in these samples is in the form of methyl mercury due to the higher tropic level of the sample. The short hold time for inorganic mercury is due to the loss of analyte from evaporation; however, methyl mercury is more resistant to loss via evaporation. Methyl mercury was not specifically analyzed in these samples nor are there specific hold times for methyl mercury listed in QSM DoD. All mercury results are qualified as estimated and flagged 'J'. The end user should be aware of the potential low bias of the mercury results due to hold time.

Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank for each batch, per QAPP requirements. Qualification of samples due to method or field blank contamination followed guidelines set forth in the EPA NFGs.

Non-congener Results

For non-congener organic analyses, sample results less than five times (5x) the associated method blank or field blank concentration and between the method detection limit (MDL) and the method reporting limit (MRL) were flagged as non-detect 'U' at the MRL. When sample results were less than 5x the blank concentration but above the MRL, the reported result was qualified as non-detect 'U' (10x for common laboratory contaminants). Target compounds detected in the method or field blanks but reported as not detected in the associated samples were not qualified. Target compounds reported with concentrations greater than 5x the blank concentration were not qualified. Field blanks were not collected during this sampling event.

All analytical tests indicate non-detects for method blanks with the following exceptions:

- Di-n-butyl phthalate was detected in the two method blanks associated will all samples. For those samples with results less than 10x the associated method blank detection, the reported di-n-butyl phthalate concentration was qualified non-detect and flagged 'U'. Results for the following four samples were estimated and flagged: 060605101SB (K0708602-002), 060605202SB (K0708602-005), 060605208SB (K0708602-010) and 060606103SB (K0708602-013). Those samples that were reported as non-detect for di-n-butyl phthalate were not qualified.

Congener Results

PCB congener sample results that were reported as detected at a concentration less than five times (5x) the associated method blank concentration were flagged 'U' or non-detect at the reported concentration. Target compounds reported with concentrations greater than 5x the blank concentration were not qualified. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified.

Method 1668A stipulates using a method blank as similar to the matrix as possible. Method blanks were prepared using corn oil to approximate the lipid content of the tissue matrices. Method blank analytical results were non-detects with the exception of some PCB congeners in the method blanks associated with the tissue samples. Table 2 indicates the results that were qualified non-detect based on method blank concentrations.

ACCURACY

Instrument Calibration

Non-congener Results

Initial calibrations (ICALs) and continuing calibrations (CCALs) were reviewed for all analyses. The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the analytical methods. ICALs and CCALs were analyzed at the proper frequency and at the appropriate concentrations required by the methods.

Instrument calibrations were acceptable for all analyses performed with the following exceptions:

- The ICAL performed on the SVOCs had %RSD recoveries slightly higher than the laboratory set limit of 15%: benzyl butyl phthalate (15.5%), bis(2-ethylhexyl) phthalate (16.3%) and di-n-octyl phthalate (18.3%). However, these analytes were within the 20% mean RSD limit set by the EPA method and the 20% limit set by DoD QSM (Box 52). Therefore, no further action was deemed necessary for these analytes.

Congener Results

Initial calibrations (ICALs) and continuing calibration verifications (CCVs) were reviewed for PCB congener analyses. The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the Method 1668A. ICALs, CCVs and OPR (ongoing precision recovery) standards were analyzed at the proper frequency and at the appropriate concentrations required by EPA Method 1668A. All calibration compounds analyzed associated with the tissue samples meet the acceptance criteria as listed in the method.

Labeled Internal Standard Recovery Review (congener analysis only)

PCB congener samples were spiked with labeled internal standards. These standards are used to quantitate target congeners and the calculations of target compound concentrations are designed to compensate for low extraction and/or cleanup efficiencies. In addition, their recovery is measured against recovery standards added after extraction to evaluate extraction and/or cleanup efficiency which could affect sensitivity and could also affect accuracy for target compounds not quantitated against a chemically identical, isotopically labeled standard. The percent recovery of the labeled standards is compared with the limits set forth in EPA Method 1668A.

PCB congener samples reported in data package DPWG24485 (Table 1) were spiked with labeled quantification standards prior to extraction. PCB congener samples reported in data package DPWG24050 (Table 1) were spiked with labeled quantification standards into the raw sample extracts after splitting rather than to the tissue subsamples prior to extraction. The data

for these samples (samples reported in data package DPWG24050) are therefore recovery-corrected for possible losses during cleanup, but not for any possible losses sustained during extraction. Efficient extraction was however demonstrated by monitoring the recoveries of the labeled extraction standards. Internal standard recoveries were acceptable for the tissue sample analyses performed.

Cleanup standards are added prior to cleanup and quantitated using injection standards added just prior to analysis. The cleanup standards were within the 30-135% control limits set by EPA Method 1668A.

Surrogate Recovery Review (non-congener analysis only)

Each sample analyzed for organic compounds was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample.

Surrogate recoveries were acceptable for all analytes with the following exceptions:

- The surrogate percent recoveries in sample 060605101SB (K0708602-002) for fluorene-d10 and fluoranthene-d10 were slightly below the lower control limit of 60% at 59% and 58%, respectively. Recoveries within the LCS/LCSD for these analytes were in control, indicating the QC batch was in control. Sample results for all SVOCs in this sample were previously qualified 'J/UJ' due to hold time, further qualifications are deemed unnecessary.

Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control samples (LCSs) are used to monitor the laboratory's day-to-day performance of routine analytical methods, independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. At least one LCS and one MS/MSD were analyzed for each batch per method requirements. MS/MSD samples are not required for PCB congener analysis, also ongoing precision and recovery (OPR) samples are used in place of LCS to monitor laboratory performance.

LCS, OPR and MS/MSD recoveries were acceptable for all analytical tests with the following exceptions:

- The typical LCS for metals was replaced by using two tissue standard reference materials (SRM) containing metals. The recovery of nickel in SRM Dolt-3 was slightly above the upper SRM limit. All other QC criteria were in control for nickel, including nickel recovery in the second SRM; therefore, data were not flagged based on the one SRM result.
- The MS for metals was performed on project sample 060605203SB (K0708602-006). Recovery of aluminum, lead and nickel were below the lower control limit. The post-spike, SRMs and a second MS performed on 070505LS (K0708602-020) were all within control limits, indicating the laboratory analysis was in control and that matrix inference with these analytes may account for the lower recovery in sample 060605203SB.

Aluminum, lead and nickel results were estimated and flagged 'J' in sample 060605203SB.

- PCB-Aroclor MS/MSD recoveries for Aroclor 1016 and 1260 were outside control limits due to elevated concentrations of Aroclor 1254 in the MS sample. The MS/MSD was performed on a project sample, however on a clam tissue matrix. Data was not qualified based on MS/MSD recoveries due to differences in sample matrix. This problem will be remedied in the future all MS/MSD samples will be performed on not only project-specific samples but samples of similar tissue matrices (i.e fish vs. clam tissue). The LCS and other QC samples within the analytical batch were in control, indicating the batch was in control.
- MS/MSD recoveries for 4-methylphenol, di-n-butyl phthalate and di-n-octyl phthalate in QC batch KWG0711371 were above the upper control limits. Sample results for all SVOCs associated with this analytical batch were previously qualified 'J/UJ' due to hold time, further qualifications are deemed unnecessary.
- LCS/LCSD recoveries in analytical batch KWG0711371 were slightly above the upper control limit of 115% for carbazole with 119% and 117%, respectively and above the control limit of 110% for di-n-butyl phthalate with 114% and 120%, respectively. All other laboratory-specific QC parameters were within control for these analytes. Again, sample results for all SVOCs associated with this analytical batch were previously qualified 'J/UJ' due to hold time, further qualifications are deemed unnecessary.
- LCS/LCSD recoveries in analytical batch KWG0711938, associated with sample 060605208SB (K0708602-010), were below the lower control limit of 40% for 4-methylphenol with 11% and 13%, respectively. The sample result was non-detect for this analyte in this sample. This does indicate a low bias in this analytical sample for this analyte, the end user should consider this in the data evaluation. Again, sample results for all SVOCs associated with this analytical batch were previously qualified 'J/UJ' due to hold time, further qualifications are deemed unnecessary.

PRECISION

Duplicate Review

Field duplicates were not collected for this sampling event due to the nature of sample matrix. Laboratory precision on the site matrix was evaluated based on the laboratory duplicate analyses and RPD results for MSD and LCSD analyses.

Laboratory duplicate precision was acceptable with the following exceptions:

- The RPD for aluminum exceeded the limit of 25% in the laboratory duplicate performed on sample 070505LS (K078602-020) with 26%. Results for aluminum in sample 070505LS were estimated and qualified 'J' due to hold RPD precision.

COMPARABILITY

Comparability is the qualitative parameter expressing confidence with which one data set can be compared with another. Comparability of data is attained by following established sampling protocol and method procedures for sample collection and analysis, respectively. The sample results from this sampling event are comparable to other sampling events because of the use of standard techniques to collect representative samples, consistent application of analytical method protocols, and reporting analytical results with appropriate units and reporting limits.

Compound Quantification

Congener results were reported on a wet weight basis without accounting for percent moisture or percent lipids. Homologue totals were obtained by summing the concentration of all detected congeners at each level of chlorination. Toxic Equivalents (TEQs) were calculated using World Health Organization 2005 Toxicity Equivalence Factors. Chromatographic peaks that did not meet the method ion abundance ratio criteria were not included in the homologue totals or TEQ calculations.

The area response of PCB 118 in samples 060605200SB and 060605205SB (Axys ID L10448-3 and L10448-8 from data package DPWG24050) was slightly above the calibrated linear range of the instrument after the extract dilution. As other congeners have a response in this range, the quantification of the data is not considered affected and further dilutions were not taken.

Due to the levels found for PCB 52, 101, and 138 in sample 060605209SB (Axys ID L10448-11 from data package DPWG24050), the standards used to quantify the surrogates (labeled PCB 52, 101, and 138) are elevated. This results in an apparent low recovery of the labeled compounds used for quantification. However, the target (native) congener quantification is not affected.

Sample 060605209SB (Axys ID L10448-11 from data package DPWG24050) required a higher-level dilution for congeners exceeding instrument calibration range such that the sample was refortified with labeled quantification standards (indicated by the “NK” suffix added to the Axys ID. Consequently, affected congener results (reported from Axys ID L10448-11NK) are not recovery corrected for losses during extraction and chromatographic cleanup.

Samples 060815403SB and 060815405SB (Axys IDs L10448-17 and L10448-18 from data package DPWG24485) required a higher-level dilution for congeners exceeding instrument calibration range such that the sample was refortified with labeled quantification standards (indicated by the “NK” suffix added to the Axys ID. Consequently, affected congener results (reported from Axys ID L10448-11NK) are not recovery corrected for losses during extraction and chromatographic cleanup.

Results for sample 060815403SB (Axys ID L10448-17 from data package DPWG24485) still exceeded calibration after several dilutions and the sample was re-extracted using a smaller sample size (2 grams) to account for the high level PCB congeners. The re-extraction was analyzed on February 2, 2008 for all PCB congeners exceeding the instrument calibration range for analysis of the initial sample extract. Results for this analysis were reported in data package DPWG24605 on February 21, 2008. Axys analytical reports indicated which PCB congeners

were to be reported from the various dilutions and analyses performed on sample 060815403SB (Axys ID L10448-17) to yield acceptable results within the instrument calibration range.

The internal standard method is used to calculate concentrations of PCB congeners that do not have chemically identical labeled standards. The internal standard method is dependent upon consistent detector response over the calibration range. If detector response varies concentrations can be biased high or low based on the variations in detector sensitivity.

During congener analysis, PFK (perfluororkerosene) is used as a lock mass reference standard to measure changes in detector sensitivity. Each lock mass must not vary more than 20% throughout its respective retention time window as required by Method 1668A. Variations of more than 20% indicate the presence of co-eluting interferences or decreased sensitivity. No PCB congener results were qualified due to lock mass variations.

As detailed in Table 2, some congener and homologue total results were qualified as non-detect due to method blank contamination. Results were qualified as non-detect at the reported concentrations; therefore, these non-detect results have elevated detection limits which should be considered by the data user as part of evaluating the data for end-use objectives.

Compound Identification

Ion abundance ratios are used to identify PCB congeners. Results that met all other qualitative identification criteria but were more than 15% different from the theoretical ion abundance criterion set by EPA Method 1668A are flagged in the laboratory report with a ‘K’ flag. Those results flagged ‘K’ with ion abundance ratios outside the identified quantitation criteria are considered estimated maximum possible concentrations (EMPC) and were re-flagged ‘J-EMPC’ during this review. If the analyte result was previously qualified ‘U’ by method blank detection, the result retained the ‘U’ qualifier and it was not qualified further because an ion ratio was out of limits (there is no ion ratio criterion for non-detects). Due to the volume of the J-EMPC qualifiers, they are not tabulated in this report; however, the database has been updated and the flags will appear in any future data tables that are created from the project database.

Ion ratios outside the control limits are generally a consequence of co-eluting interferences to either one or both quantitation peaks. In these cases, Axys chose to use the quantitation peak areas as recorded; no adjustments were made to force the peaks to match the theoretical ion abundance ratios. EMPC results should be considered by the data users as part of evaluating the data for end-use objectives.

COMPLETENESS

The laboratory reported all requested analyses and the deliverable data reports were complete. Completeness is defined as the percentage of usable data out of the total amount of data generated. The project completeness goal is 100 percent. Some data were qualified as estimated ‘J’ or ‘J-EMPC’ and some as non-detect ‘U’. A summary of qualifiers can be found in Tables 2 and 3. Completeness for the site investigation was 100%.

REFERENCES

DOD QSM 2006. Department of Defense Environmental Data Quality Workgroup. Department of Defense (DOD) Quality Systems Manual (QSM) for Environmental Laboratories. Final Version 3. January 2006. Retrieved from [http://www.navylabs.navy.mil/Archive/DoDV3.pdf] on 3/3/06

PSEP 1996. Puget Sound Estuary Program *Recommended Protocols for Measuring Selected Environmental Variables in Puget Sound*, January 1996 and subsequent chapter revisions.

URS 2007. Quality Assurance Project Plan, *River Operable Unit Remedial Investigation, Bradford Island*, Bonneville Lock and Dam Project, Cascade Locks, Oregon. September 2007.

USEPA 1999. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review. October 1999.

USEPA 1995. U.S. Environmental Protection Agency (USEPA) Region 10 SOP for the Validation of Method 1668 Toxic, Dioxin-like, PCB Data. December 1995.

Table 1
Sample Location and Analyses Summary

URS Sample ID	Sample Collection Date	CAS ID	Method Analyses
060605100SB	June 5, 2006	K0708602-001	SVOCs and Metals
060605101SB		K0708602-002	
060605200SB		K0708602-003	
060605201SB		K0708602-004	
060605202SB		K0708602-005	
060605203SB		K0708602-006	
060605204SB		K0708602-007	
060605205SB		K0708602-008	
060605207SB		K0708602-009	
060605208SB		K0708602-010	
060605209SB		K0708602-011	
060606102SB		K0708602-012	
060606103SB		K0708602-013	
060606104SB		K0708602-014	
060606210SB		K0708602-015	
060815402SB	August 15, 2006	K0708602-016	
060815403SB		K0708602-017	
060815405SB		K0708602-018	
060816406SB		K0708602-019	
070505LS	May 5, 2007	K0708602-020	SVOCs, Metals and PCB (as Aroclors and congeners)

URS ID	Sample Collection Date	Axys ID	Axys Data Package
060605100SB	June 5, 2006	L10448-1	DPWG24050 (PCB Congeners by Method 1668A)
060605101SB		L10448-2	
060605200SB		L10448-3	
060605201SB		L10448-4	
060605202SB		L10448-5	
060605203SB		L10448-6	
060605204SB		L10448-7	
060605205SB		L10448-8	
060605207SB		L10448-9	
060605208SB		L10448-10	
060605209SB		L10448-11	
060605102SB		L10448-12	
060605103SB		L10448-13	
060605104SB		L10448-14	DPWG24485 (PCB Congeners by Method 1668A)
060605210SB		L10448-15	
060815402SB	August 15, 2006	L10448-16	
060815403SB		L10448-17	
060815405SB		L10448-18	
060815406SB		L10448-19	
070505LS	May 5, 2007	L10448-20	

Table 2
Summary of Qualifiers (non-congener data only)

LAB ID	URS ID	ANALYTE	QUALIFIER	RATIONAL
060605100SB 060605101SB 060605200SB 060605201SB 060605202SB 060605203SB 060605204SB 060605205SB 060605207SB 060605208SB 060605209SB 060606102SB 060606103SB 060606104SB 060606210SB 060815402SB 060815403SB 060815405SB 060816406SB	K0708602-001 K0708602-002 K0708602-003 K0708602-004 K0708602-005 K0708602-006 K0708602-007 K0708602-008 K0708602-009 K0708602-010 K0708602-011 K0708602-012 K0708602-013 K0708602-014 K0708602-015 K0708602-016 K0708602-017 K0708602-018 K0708602-019	SVOCs PCB congeners	J/UJ	Hold Time
060605100SB 060605101SB 060605200SB 060605201SB 060605202SB 060605203SB 060605204SB 060605205SB 060605207SB 060605208SB 060605209SB 060606102SB 060606103SB 060606104SB 060606210SB 060815402SB 060815403SB 060815405SB 060816406SB 070505LS	K0708602-001 K0708602-002 K0708602-003 K0708602-004 K0708602-005 K0708602-006 K0708602-007 K0708602-008 K0708602-009 K0708602-010 K0708602-011 K0708602-012 K0708602-013 K0708602-014 K0708602-015 K0708602-016 K0708602-017 K0708602-018 K0708602-019 K0708602-020	Mercury	J/UJ	Hold Time
060605203SB	K0708602-006	aluminum lead nickel	J	MS recoveries
060605101SB 060605202SB 060605208SB 060606103SB	K0708602-002 K0708602-005 K0708602-010 K0708602-013	di-n-butyl phthalate	U	Method Blank Detection
070505LS	K0708602-020	aluminum	J	RPD

Table 3

Method Blank Qualifiers Assigned During Data Review (PCB Congeners)

Congener IUPAC #	Co-elutors	060605100SB[1]	060605101SB[1]	060605200SB[1]	060605201SB[1]	060605202SB[1]	060605203SB[1]	060605204SB[1]	060605205SB[1]	060605207SB[1]	060605208SB[1]
PCB001		0.186U			0.234U	0.189U		0.309U		0.243U	0.293U
PCB003		0.144U	0.437U	0.438U	0.125U	0.154U	0.378U	0.271U	0.442U	0.241U	0.253U
Homologue Totals											
Mono-chlorinated		0.33U			0.363U						

Table 3 cont.

Congener IUPAC #	Co-elutors	060605209SB[1]	060605102SB[1]	060605103SB[1]	060605104SB[2]	060605210SB[2]	060815402SB[2]	060815403SB[2]	060815405SB[2]	060815406SB[2]	070505LS[2]
PCB001					0.235U	0.194U				0.226U	
PCB003				0.328U	0.237U	0.263U			0.535U	0.279U	0.482U

Notes:

[1] Based on method blank results reported in data package DPWG24050.

[2] Based on method blank results reported in data package DPWG24485.

Concentrations reported in units of pg/g wet weight

URS collected five clam (*corbicula fluminea*) samples and six sediment samples, including one field duplicate for each matrix from the Columbia River near Bradford Island on September 25 through 27, 2007. Samples were collected according to the Quality Assurance Project Plan (QAPP) *River Operable Unit Remedial* (URS, 2007). Table 1 summarizes the sample locations, media, and requested analyses. Clams were shucked by URS personnel prior to submittal to the analytical laboratory. Clam tissue and sediment were analyzed by Columbia Analytical Services (CAS), located in Kelso, Washington. Tissue samples were stored frozen upon receipt by CAS and homogenized using a mechanical mixer prior to testing. Sediment samples were stored at 4°C prior to homogenization and analysis. Aliquots of each sample are archived in freezer storage at the CAS Kelso facility for potential future analysis. Analyses were performed in general accordance with the methods listed below. The specific analyses for each media and sample are provided in Table 1.

Method	Analytical Parameter
EPA 8082M	Polychlorinated Biphenyls (PCBs) as Aroclors
EPA 6000/7000 series	Metals
EPA 1630 – Modified	Methyl Mercury (Tissue only)
EPA 8270C-SIM	Semi-Volatile Organic Compounds (SVOCs)
TPH-Dx (Ecology 1997)	Northwest Total Petroleum Hydrocarbons Diesel Fraction (NWTPH-Dx)
Plumb (Plumb 1981)	Total Organic Carbon
Puget Sound Estuary Program (PSEP 1996)	Percent Lipids
Freeze Dry (Tissue) Gravimetric (Sediment)	Percent Solids
PSEP (PSEP 1996)	Grain Size

Analyses were performed in general accordance with the referenced methods. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed in each laboratory report submitted: compliance with the QAPP, chain of custody (COC), case narrative, proper sample preservation and handling procedures, holding times, quantitation limits, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The following items were reviewed on 10% of the data: primary and secondary column verification, instrument calibration and a verification of the reported electronic data with the hard copy deliverable. The data were

reviewed in accordance with the criteria contained in the DoD QSM (DoD QSM, January 2006), the above listed methods and the following EPA guidance documents in that order; EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Organic Data Review (USEPA, October 1999)*, EPA's *NFGs for Inorganic Data Review (USEPA, October 2004).* A summary of qualifiers assigned to results in this investigation is included in Table 2. For ease of reference, the samples are represented in Table 2 by both the URS sample identification and the laboratory identification. Qualifiers that may be assigned to the results of this investigation include the following:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR - Do Not Report

Final sample results and qualifiers are presented in the analytical tables provided in the sampling report.

REPRESENTATIVENESS

Chain-of-Custody and Holding Times

The chain-of-custody (COC) forms indicate that samples were maintained under chain of custody and forms were signed upon release and receipt. All coolers were submitted at temperatures within the EPA-recommended range of 4°C$\pm$ 2°C, with the exception of two coolers, one containing the clam tissue samples recorded at -0.6°C and one containing two sediment samples recorded at -0.8°C. Data were not qualified based on cooler temperatures.

Sediment samples were stored at 4°C and tissue samples were stored frozen at -20°C prior to homogenization. An aliquot of each sample is archived in freezer storage for potential future analysis. Tissue samples were removed from the freezer, homogenized and returned to the freezer and kept frozen prior to anlayis. Hold times were calculated to account for the fact that the tissue was frozen prior to analysis with the exception that mercury and methyl mercury

holding times were based on a 28 day hold time regardless of freezer storage. All samples were analyzed within the technical and contracted holding time with the following exceptions:

- The hold time was exceeded for the methyl mercury analysis in the tissue samples. Samples were analyzed up to 9 days past the recommended 28 day hold time from sampling to analysis. All methyl mercury results were estimated and flagged 'J' due to analysis outside of hold time.
- The frozen archived (-20°C) sediment samples were analyzed for TPH-Dx, TOC and grain size. Typically samples are not frozen prior to grain size analysis, however the freeze-thaw effects are considered to be minimal and the grain size results are used in a qualitative manor for this investigation. Additionally, the laboratory reextracted and reanalyzed sediment samples for 4-methylphenol, anthracene and benzo(a)pyrene using the frozen sediment previously archived. Sample results from the archived frozen sediment were not qualified based on hold time.

Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank for each analysis and for each batch, per DoD QSM requirements. Qualification of samples due to method or field blank contamination followed guidelines set forth in the EPA NFGs.

For organic and inorganic analyses, sample results less than five times (5x) the method blank or field blank concentration and between the method detection limit (MDL) and the method reporting limit (MRL) were flagged as non-detect 'U' at the MRL. When sample results were less than 5x the blank concentration but above the MRL, the reported result was qualified as non-detect 'U'. Target compounds detected in the method or field blanks but reported as not detected in the associated samples were not qualified. Target compounds reported with concentrations greater than 5x the blank concentration were not qualified.

All analytical results were non-detect for method blank analyses or all target compounds reported had concentrations greater than 5x the reported blank concentration; therefore data were not qualified based on method blank results.

ACCURACY

Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the analytical methods. Initial calibrations (ICALs) and continuing calibrations (CCALs) were analyzed at the proper frequency and at the appropriate concentrations required by the DoD QSM. Instrument calibrations were acceptable for all analyses performed.

Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control samples (LCSs) are used to monitor the laboratory's day-to-day performance of routine analytical methods, independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. At least one LCS and one MS/MSD for each analysis and for each batch was performed per DoD QSM requirements. LCS and MS/MSD recoveries were compared against project-specific control limits outlined in the QAPP and were acceptable for all analytical tests with the following exceptions:

Sediment Samples

- LCS/LCSD recoveries associated with sediment samples K0708772-001 through -006 were outside the project-specific control limits for 4-methylphenol, anthracene and benzo(a)pyrene. After consultation with CAS, it was discovered there was an a problem with an extraction solvent used during the GPC cleanup. A new solvent lot was purchased and additional QC checks were performed by CAS as described in the case narrative attached to data delieverable K0712241. CAS confirmed that no other samples were effected by the solvent. An aliquot of each of the frozen archived sediment samples was reextracted and reanalyzed for the above listed SVOCs under work order number (K0712241). The LCS results for the reanalyzed samples were within the control limits. The initial results were qualified and flagged 'DNR' and the results from the reanalysis were reported.
- MS/MSD recoveries in the QC batch associated with sediment samples K0708772-001 through -006 were outside the project-specific control limits for 4-methylphenol, anthracene and benzo(a)pyrene similar to the associated LCS/LCSD. As detailed above, the samples were reextracted and reanalyzed. The reanalysis results were within the control limits. The original data was flagged 'DNR' and the reanalysis results were reported.
- MS/MSD recoveries for the parent sediment sample (K0708772-001) were below the lower project-specific control limit of 45% for bis(2-ethylhexyl)phthalate with MS and MSD recoveries of 2% and 18%, respectively. The associated LCS/LCSD results were within control limits, indicating the analytical batch was in control. Normally, for low MS/MSD recoveries only the parent sample is qualified, however due to the nature of the recoveries all samples in the matrix were was qualified and flagged 'J/UJ' due to low matrix spike recoveries (shown in Table 2).
- MS/MSD recoveries were below the lower control limit of 80% for antimony in the parent sample K0708772-006 with recoveries of 37% and 33%, respectively. The LCS and post-spike recovery for antimony were in control indicating the analytical batch was in control, therefore a matrix interference may be the cause for low recoveries of

antimony. Antimony results were estimated and flagged 'J' in the parent sample (K0708772-006). Zinc and vanadium had recoveries slightly below the lower control of 80% for either the MS or MSD in the MS/MSD pair; zinc (MS:78%, MSD:80%) and vanadium (MS:81% and MSD:79%). The LCS recoveries for both analytes were in control indicating the analytical batch was in control, neither zinc or vanadium results were estimated based on MS/MSD recoveries.

Tissue Samples

- MS/MSD recoveries were above the control limits for tissue in the parent sample (K0708865-003) for the following Aroclors:

	MS(%)	MSD(%)	Control Limits(%)
Aroclor 1016	171	148	40-140
Aroclor 1260	196	200	60-130

  Recoveries for Aroclors 1016 and 1260 in the sample are likely biased high due to the presence of an elevated concentration of Aroclor 1254. Aroclors 1016 and 1260 were not detected in the associated samples (K0708865-001 through -005), therefore data was not estimated based on MS/MSD recoveries.

- MS/MSD recoveries for anthracene in the parent sample (K0708865-003) were below the lower control limit of 55% for tissue with recoveries of 46% and 45%, respectively. The LCS recovery was in control indicating the analytical batch was in control. Anthracene was estimated and flagged 'UJ' in the parent sample.

- MS/MSD recoveries in the parent sample (K0708865-003) were above the upper control limits for bis(2-ethylhexyl)phthalate, di-n-octyl phthalate and di-n-butyl phthalate. The LCS recoveries were in control indicating the analytical batch was in control. All sample results were non-detect for these three analytes in the parent sample with the exception of di-n-butyl phthalate for samples K0708865-001, -002 and -004. Non-detect sample results were not estimated based on MS/MSD recoveries and samples results reported above the MRL (as listed above) were estimated and flagged 'J' for di-n-butyl phthalate.

- MS recoveries in the parent sample (K0708865-003) associated with samples K0708865-001 through -005 were below the lower control limit of 80% for antimony and mercury with recoveries of 73% and 76%, respectively. Antimony and mercury results were estimated and flagged 'J' in the parent sample.

Surrogate Recovery Review

Each sample analyzed for organic compounds was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample.

Surrogate recoveries were acceptable with the following exceptions:

- The SVOC surrogate phenol-d6 recovery in samples K0708772-001 and -005 was below the lower DoD QSM control limit of 45% with 31% and 35%, respectively. Phenol-d6 is a surrogate for the acid fraction. The only acid fraction target compound, 4-methylphenol, was reported from another analytical batch after reextraction and reanalysis due to a problem that occurred during sample cleanup with the original analytical batch. The surrogate recoveries were acceptable in the reanalysis therefore, further action was not necessary.

PRECISION

Duplicate Review

One field duplicate sample was collected for both sediment and clam matrices to verify acceptable field sampling techniques and the representativeness of the sample aliquots. In addition the laboratory tested precision by analyzing both MSD and LCSD samples. The RPD for field duplicate samples was calculated when both sample results were greater than 5x the reporting limit.

- Laboratory duplicate precision was acceptable for both sediment and clam tissue matrices.
- Field duplicate precision was within the control limits outlined within QAPP with the exception of the following metals within the sediment matrix. The RPD for these metals exceeded the 25% control limit:

	Primary (mg/kg)	Field Duplicate (mg/kg)	RPD
Aluminum	12,000	15,900	28.0
Cadmium	0.365	0.851	79.9
Copper	32.1	24.2	28.1
Lead	14.6	22.1	40.9
Mercury	0.118	0.065	57.9
Thallium	0.218	0.124	55.0

The primary sample (K0708772-003) and the field duplicate (K0708772-005) for sample results listed above were qualified as estimated and flagged 'J'.

COMPARABILITY

Reporting Limits

The laboratory reported sample results between the MRL and MDL. Results reported between the MDL and MRL are reported as estimated and are flagged 'J'.

COMPLETENESS

The laboratory reported all requested analyses and the deliverable data reports were complete. Completeness is defined as the percentage of usable data out of the total amount of data generated. The project completeness goal is 100 percent. Some data were qualified as estimated 'J' or 'UJ'. A summary of qualifiers can be found in Table 2. Completeness for the site investigation was 100%.

REFERENCES

Plumb 1981. *Procedures for Handling and Chemical Analysis of Sediment and Water Samples,* R.H.Plumb, prepared by USEPA and USACE, May, 1981.

PSEP 1996. Puget Sound Estuary Program *Recommended Protocols for Measuring Selected Environmental Variables in Puget Sound*, January 1996 and subsequent chapter revisions.

URS 2007. Quality Assurance Project Plan, River Operable Unit Remedial Investigation, Bradford Island, Bonneville Lock and Dam Project, Cascade Locks, Oregon. September 2007.

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Table 1
Sample Location and Analyses Summary

Pre-Removal Area	URS ID	Lab ID	Collection Date	Method Analyses
Clam Tissue				
1	070926A1TC	K0708865-002	9/26/2007	PCBs (as Aroclors), Metals and SVOCs
1 (duplicate)	070926A7TC	K0708865-001	9/26/2007	
2	070926A2TC	K0708865-003	9/26/2007	
3	070927A3TC	K0708865-004	9/27/2007	
5	070925A5TC	K0708865-005	9/25/2007	PCBs (as Aroclors), Methyl Mercury, Metals and %lipids[1]
Sediment				
1	070926A1SD	K0708772-004 K0712241-004 K0800426-004	9/26/07	PCBs (as Aroclors), Metals, SVOCs, TPH-Dx, TOC, Grain Size
2	070926A2SD	K0708772-003 K0712241-003 K0800426-003	9/26/07	
2 (duplicate)	070926A6 SD	K0708772-005 K0712241-005 K0800426-005	9/26/07	
3	070927A3SD	K0708772-006 K0712241-006 K0800426-006	9/27/07	
4	070925A4SD	K0708772-001 K0712241-001 K0800426-001	9/25/07	
5	070925A5SD	K0708772-002 K0712241-002 K0800426-002	9/25/07	

Notes:
[1]Not enough tissue volume was collected to analyze SVOCs.
Data Package K0708772 = PCB Aroclors, Metals, and SVOCs
Data Package K0712241 = reanalysis of SVOCs
Data Package K0800426 = Grain Size, TOC and TPH-Dx

Table 2
Summary of Qualifications

LAB ID	URS ID	ANALYTE	QUALIFIER	RATIONAL
Clam Tissue				
K0708865-001 K0708865-002 K0708865-003 K0708865-004 K0708865-005	070926A7TC 070926A1TC 070926A2TC 070927A3TC 070925A5TC	methyl mercury	J	hold time exceeded
K0708865-003	070926A2TC	anthracene antimony mercury	J UJ J	MS/MSD recoveries
K0708865-001 K0708865-002 K0708865-004	070926A7TC 070926A1TC 070927A3TC	di-n-butyl phthalate	J	MS/MSD recoveries
Sediment				
K0708772-006	070927A3SD	antimony	J	MS/MSD recoveries
K0708772-001 K0708772-002 K0708772-003 K0708772-004 K0708772-005 K0708772-006	070925A4SD 070925A5SD 070926A2SD 070926A1SD 070926A6SD 070927A3SD	4-methylphenol anthracene benzo(a)pyrene	DNR	LCS recoveries (data reported from reanalysis)
K0708772-001 K0708772-002 K0708772-003 K0708772-004 K0708772-005 K0708772-006	070925A4SD 070925A5SD 070926A2SD 070926A1SD 070926A6SD 070927A3SD	bis(2-ethylhexyl)phthalate	J/UJ	MS/MSD recoveries
K0708772-003 K0708772-005	070926A2SD 070926A6SD	aluminum cadmium copper lead mercury thallium	J	RPD (field duplicate)

RIVER OPERABLE UNIT REMEDIAL INVESTIGATION REPORT

QUALITY CONTROL SUMMARY REPORT FOR ANALYTICAL CHEMISTRY

REFERENCE AREA SMALLMOUTH BASS COLLECTED MAY 2008 AND AROCLORS FOR FOREBAY AND REFERENCE AREA SMALLMOUTH BASS COLLECTED FROM JUNE 2006 TO NOVEMBER 2007

OCTOBER 2008

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1.0 Executive Summary

The overall assessment of the smallmouth bass sample results shows the quality of the data is acceptable to support project objectives. The contracted laboratory provided results for all requested analyses and laboratory data reports were complete. Some data were qualified as estimated and flagged 'J' or 'J-EMPC'. Some data were qualified as not detected and flagged 'U'. All data qualifiers resulting from this review have been added to both the project database and the data tables within the main body of this report. Refer to Section 4.0 of this report for a listing of qualifier definitions. The end user should be aware of the potential low bias of the mercury and Aroclor results due to hold time exceedances (as discussed in Section 4.1). Additionally, the identification and quantification of individual Aroclors may be subjective due to pattern degradation within the sample matrix (see Section 4.8).

2.0 Project Description

A total of 38 smallmouth bass were collected from both the forebay and reference area from June 2006 through May 2008 in support of the Bradford Island Bonneville Lock and Dam Project, River Operable Unit Remedial Investigation. These bass were submitted for chemical analysis in three separate groups, based on collection date. Table 1 summarizes the URS and analytical laboratory identification numbers, capture date, length, weight, and requested analyses for each smallmouth bass collected within these three groups.

The most recent smallmouth bass sample collection was conducted between May 17 and May 21, 2008. Twelve smallmouth bass were captured from the project defined reference area under the supervision of the United States Army Corp of Engineers (USACE), and stored at a USACE storage facility frozen. URS retrieved these twelve smallmouth bass from the USACE storage facility near Bonneville Dam on June 16, 2008 and submitted them for analysis (as described below).

Additionally, the twenty-six previously analyzed smallmouth bass from the forebay and reference area were authorized for PCB Aroclor analysis. Previous analytical results for these bass are reported in the *Forebay Fish Analyses and Summary Report*, March 10, 2008 and the *Reference Area Smallmouth Bass Collected October/November 2007 Analysis and Summary*, July 29, 2008 (URS 2008a and URS 2008c). Table 1 summarizes analytes previously analyzed and reported. Only the most recent Aroclor analytical results are included in this report.

3.0 Sampling and Analytical Procedures

Samples were analyzed according to the Bradford Island Bonneville Lock and Dam Project, River Operable Unit Remedial Investigation Quality Assurance Project Plan (QAPP) (URS 2007). The twelve reference area bass collected in May 2008 were submitted to Columbia Analytical Services (CAS) located in Kelso, Washington on June 17, 2008 for homogenization and analysis. Whole-body fish samples were homogenized using an industrial blender, then

stored frozen by CAS. An aliquot of the homogenized tissue was sent to Axys Analytical Services Ltd. (Axys) to perform the PCB congener analysis by EPA Method 1668A, *Chlorinated Biphenyl Congeners in Water, Soil, Sediment and Tissue by High Resolution Gas Chromatography/High Resolution Mass Spectrometry*. The Axys analytical data report includes a listing of the Axys Method 1668A modifications.

The twenty-six smallmouth bass previously submitted to CAS in two separate shipments were received on September 21, 2007 and February 12, 2008. Whole-body fish were homogenized using an industrial blender and then archived frozen by CAS.

The following table lists the parameters analyzed for one or more of the samples. Table 1 summarizes the specific requested analyses for each sample by URS and laboratory identification numbers. (Note: Semi-Volatile Organic Compounds (SVOCs) and Polycyclic Aromatic Hydrocarbons (PAHs) were both performed using Selective Ion Monitoring (SIM), but analyzed separately for tissue matrices and as such, discussed separately in this report).

Method	Analytical Parameter
EPA 8082M	Polychlorinated Biphenyls (PCBs) as Aroclors
EPA 1668A	PCBs as congeners
EPA 6000/7000 series	Metals
EPA 8270C-SIM	Semi-Volatile Organic Compounds (SVOCs)
EPA 8270C-SIM	Polycyclic Aromatic Hydrocarbons (PAHs)
Puget Sound Estuary Program (PSEP 1996)	Percent Lipids
Freeze Dry	Percent Solids

4.0 Data Validation

Analyses were performed in general accordance with the above-referenced methods. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, chain of custody (COC), laboratory case narrative, proper sample preservation and handling procedures, holding times, quantitation limits, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The following items were reviewed for 15% or greater of the data: primary and secondary column verification, initial and continuing instrument calibrations and a verification of the reported electronic data with the hard copy deliverable.

The data review process for this investigation followed the QAPP. Additionally, because the QAPP-referenced *Department of Defense Quality Systems Manual* does not discuss PCB congeners, the data review process utilized guidance from EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review* (USEPA 2005) and *EPA Region 10 Standard Operating Procedure (SOP) for the Validation of Method 1668 Toxic, Dioxin-like, PCB Data* (USEPA 1995) as appropriate for method performed. In the case of disagreement between the guidance documents and the analytical method, method criteria were utilized for data review. The SVOC and metals results were reviewed in accordance with the criteria contained in the DoD QSM (DoD 2006), the above listed methods, and EPA's *NFGs for Organic Data Review(USEPA 1999), and the NFGs for Inorganic Data Review* (USEPA 2004), in that order of precedence. Project-specific QC criteria are listed in the above mentioned QAPP.

A summary of qualifiers assigned to results in this investigation is included in Table 2 and Table 3. Samples are listed by their URS sample identification assigned in the field as well as the laboratory identification. CAS was requested to report analytical results above the method detection limit (MDL) but below the method reporting limit (MRL). These results were flagged 'J' by CAS and are not included in Table 2. These 'J' qualifiers are included in the database and are included in the data tables included in the main body of this report. Congeners are reported using sample-specific detection limits. Qualifiers that may be assigned to the results of this investigation include the following:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J-EMPC – The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration of the analyte in the sample - used only for PCB congener results.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR - Do Not Report. Another value is available that is more reliable or appropriate.

Final sample results and qualifiers are presented in the analytical tables provided in the sampling report.

Note: Data package K0805513, provided from CAS, has an addendum reporting the corrected dry weight concentrations for sample K0805513-015. Data package K0805409, also from CAS, has an addendum containing the missing COC form. Data package DPW26477, from Axys, has an addendum containing a corrected case narrative. Each of these addendums are attached to the final data reports and the corrections if applicable have been made to the database and the data tables within the body of this report.

4.1 Chain-of-Custody, Sample Preservation and Holding Time

Non-congener Results

Twenty-six archived bass were submitted as whole fish samples to CAS on September 21, 2007 and February 12, 2008. CAS stored all tissues samples frozen at -20°C until homogenization and analysis. As reported previously, the chain-of-custody (COC) forms indicate that samples were maintained under proper chain-of-custody and forms were signed upon release and receipt. All coolers were submitted at temperatures within the EPA-recommended temperature of 6°C or below.

URS submitted twelve additional whole fish tissue samples to CAS on June 17, 2008. CAS stored all tissue samples frozen at -20°C until homogenization and analysis. The COC forms indicate that samples were maintained under proper chain-of-custody and forms were signed upon release and receipt. The COC form for sample delivery group K0805409 indicated Ti (titanium) instead of TI (thallium), this was corrected and thallium was analyzed. PAHs were not specifically indicated on the COC for sample delivery group K0805409, as noted previously PAHs and SVOCs are analyzed separately only for tissue matrices; for project consistency both PAHs and SVOCs are represented as SVOCs on all project COC forms. Additionally, Aroclors were requested via email after the initial submission of the COC and therefore are not indicated on the COC form. All requested analyses (either on the COC or via email) were reported in sample delivery group K0805409.

All coolers were submitted at temperatures within the EPA-recommended temperature range of 6°C or below with the exception of one color temperature reading of 6.6°C. However, the temperature blanks within the cooler were between 0.5°C and 1.1°C therefore no data qualification was necessary. Data were not qualified based on sample receipt or COC forms.

All samples were analyzed within technical and contracted holding times with the following exceptions:

- Forebay bass collected June 5 and 6, 2006 and August 15 and 16, 2006 exceeded the 1 year holding time for PCB Aroclors (as specified in the QAPP), by 14 months and 12 months, respectively. As a result, all forebay smallmouth bass results have been qualified as estimated and flagged ‘J/UJ’ due to holding time exceedances (Table 2). It

should be noted that these results may be biased low due to sample degradation. (*Note: The date of sample collection is incorrectly reported in the data package (K0805513) as June 5 and August 16, 2007 and it should be June 5 and August 16, 2006*).

- The 28-day hold time for mercury was exceeded for samples K0805409-001 through K0805409-005 by 22 days. Samples K0805409-006 through K0805409-012 exceeded holding time by 18 days. All twelve of these mercury sample results were flagged 'J/UJ' due to hold time exceedance (Table 2). The data were not rejected due to holding time; however, the end user should be aware of the potential low bias of the mercury results due to sample degradation.

Congener Results

The chain-of-custody (COC) forms from CAS to Axys indicate that samples were maintained under chain of custody and forms were signed upon release and receipt. The condition and temperature of the samples upon receipt by Axys was appropriate and all samples listed on the COC form were present. Data were not qualified based COC and sample shipment procedures.

All samples were analyzed within the technical and contracted holding times.

4.2 Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the analytical methods. Initial calibrations (ICALs) and continuing calibrations (CCALs) were analyzed at the proper frequency and at the appropriate concentrations required by the methods.

Non-congener Results

Instrument calibrations were acceptable for all sample analyses performed.

Congener Results

ICALs and continuing calibration verifications (CCVs) were reviewed for PCB congener analyses. The laboratory performed initial multipoint calibrations for all target and standard compounds as required by the Method 1668A. ICALs, CCVs and OPR (ongoing precision recovery) standards were analyzed at the proper frequency and at appropriate concentrations as required by EPA Method 1668A. Calibration compounds met the acceptance criteria as listed in the method with the following exception:

- The 12-hour CCV bracketing the diluted extract for sample 080517R13SB (L11390-4W) was not acceptable due to a power issue with the instrument during the analysis of the CCV, therefore analytical results for this CCV have been omitted from the report. The initial CCV bracketing this sample (L11390-4W) was analyzed on 8/26/08 at 9:44am and the subsequent successful CCV was analyzed on 8/27/08 at 8:44am (23hrs later), both met acceptance criteria. The laboratory deemed there was no adverse affect to the sample (L11390-4W) and therefore it was not reanalyzed. The only congener reported from the diluted extract of sample L11390-4W was PCB 118, all other congeners were

reported from the original (undiluted extract). Results for PCB 118 in this sample were not qualified due to the omission of the 12-hour CCV.

4.3 Review of Blanks

Method blanks are used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank per analysis for each batch, per QAPP requirements. Initial calibration and continuing calibration blanks are also analyzed when appropriate per analytical method (i.e 6000/7000 series metal analyses) to check for laboratory contamination and instrument bias. Field blanks were not collected as part of this analytical program. Qualification of samples due to method blank and calibration blank contamination followed guidelines set forth in the EPA NFGs.

Non-congener Results

Non-congener organic sample results less than five times (5x) and inorganic sample results (or common laboratory organic contaminates such as phthalates) less than ten times (10x) the blank concentration and between the method detection limit (MDL) and the MRL were qualified as non-detect and flagged with a 'U' at the MRL. When sample results were less than 5x (or 10x for inorganics and phthalates) the blank concentration but above the MRL, the reported result was qualified as non-detect and flagged 'U'. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Target compounds reported with concentrations greater than 5x (or 10x) the blank concentration were not qualified. For solid matrices reported in both wet and dry weight concentrations, the above-noted guidelines were applied using the wet weight results and any qualifiers assigned were also assigned to the dry weight results.

All analytical tests indicate non-detects for all method blanks with the following exceptions:

- Nickel and zinc were detected in the method blank and nickel, chromium, thallium, and cobalt were detected in bracketing continuing calibration blanks associated with samples in CAS delivery group K0805409. All blank concentrations were above the MDL but below the MRL. All detected results for the above-listed metals were greater than 10x the associated blank concentrations. Metal analytical results were not qualified based on blank detections.

Congener Results

PCB congener sample results that were reported as detected at a concentration less than five times (5x) the associated blank concentration were flagged 'U' or non-detect at the reported concentration. Target compounds reported with concentrations greater than 5x the blank concentration were not qualified. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Method blank results reported as EMPCs were not considered appropriate for use in qualifying associated sample results. Method 1668A stipulates using a method blank as similar to the matrix as possible. The method blank was prepared using corn oil to approximate the lipid content of the samples.

The method blank associated with fish tissue samples had only low levels of few PCB congeners. No sample results were qualified based on method blank concentrations.

4.4 Surrogate Recovery Review (non-congener analyses only)

Each sample analyzed for organic compounds was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. When more than one surrogate per fraction (acid or base/neutral) was spiked in the sample, PAHs and/or SVOCs were qualified if two or more surrogate recoveries for a given fraction were outside DoD QSM sample criteria. When only one surrogate per fraction was spiked, all sample results associated with that fraction were qualified when the surrogate recovery was outside DoD QSM sample criteria. Surrogate recoveries were acceptable for all analyses with the following exceptions:

- Dilutions performed on samples K0805513-011 and K0805513-017 resulted in surrogate concentrations above the MDL, but below the MRL. The surrogate recoveries were in control, data were not qualified based on surrogate criteria.
- The PAH surrogate recovery for Fluorene-d10 in sample 080521R15SB was below the DoD QSM control limit of 60% with a recovery of 59%. Because the other two surrogates were in control, no data were qualified.

4.5 Labeled Internal Standard Recovery Review (congener analysis only)

Samples analyzed for PCB congeners are spiked with labeled internal (quantification) standards. These standards are used to quantitate target congeners and the calculations of target compound concentrations are designed to compensate for low extraction and/or cleanup efficiencies. In addition, their recovery is measured against injection standards added after extraction and cleanup to evaluate extraction and/or cleanup efficiency, which could affect sensitivity and could also affect accuracy for target compounds not quantitated against a chemically identical, isotopically labeled standard. The percent recovery of the labeled standards was compared with the limits set forth in EPA Method 1668A and those set by Axys detailed in Table 1 of the Axys narrative. All recoveries were acceptable with the following exception:

- The percent recoveries of ^{13}C-labeled PCB 1 and ^{13}C-labeled PCB 4 in sample L11390-3 were below the Axys control limits of 15% and 30%, with recoveries of 10.5% and 17.5%, respectively. Both PCB 1 and PCB 4 have chemically identical isotopic labeled standards. Given that isotopic dilution calculations produce recovery corrected quantitation results, only the non-chemically identical PCB congeners, quantitated using these labeled standards were estimated based on these internal standard recoveries. Associated analytical results for PCB 2, and PCB 5 through 14 for sample L11390-3 were qualified ‘J/UJ’.

Cleanup standards 28L, 111L, and 178L typically are added prior to cleanup and quantitated using injection standards added just prior to analysis to evaluate cleanup efficiency. The cleanup standards were within the 30-135% control limits set by EPA Method 1668A.

4.6 Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control/laboratory control duplicate (LCS/LCSD) samples are used to monitor the laboratory's day-to-day performance of routine analytical methods independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. At least one LCS and one MS/MSD were performed for each non-congener analysis and for each batch per method requirements.

Non-congener Results

LCS/LCSD and MS/MSD recoveries were acceptable for all non-congener analytical tests with the following exceptions:

- Recoveries of the MS/MSD sample K0805513-013 for Aroclor 1016 (142%/140%) and Aroclor 1260 (190%/188%) were at or above the DoD QSM upper control limits of 140% and 130% for Aroclor 1016 and Aroclor 1260, respectively. CAS reported that this was due to non-target compounds contributing to the MS concentration. The associated QC samples (LCS/LCSD) were in control indicating that the analytical batch was in control. All Aroclor results from the parent sample, K0805513-013, were reported as non-detect. Aroclor results were not qualified based on potential high bias MS/MSD recoveries. However, all Aroclor results for this sample were previously qualified as estimated 'J/UJ' due to hold time exceedance, Section 4.1.
- Similarly, MS/MSD recoveries for Aroclor 1260 (637%/574%) were above the upper control limit for sample K0805513-018, due to an apparent matrix interference. The associated QC samples (LCS/LCSD) were in control indicating that the analytical batch was in control. The Aroclor 1260 result from the parent sample, K0805513-013 was reported as non-detect. Therefore, the Aroclor 1260 result for parent sample, K0805513-013 was not qualified based on potential high bias MS/MSD recoveries. The Aroclor results for this sample were previously qualified as estimated 'J/UJ' due to hold time exceedance, Section 4.1.
- The percent recoveries for the mercury MS and MSD performed on sample K0805409-004 were below DoD QSM criteria of 80% with recoveries of 70% and 72%, respectively. The recovery of mercury in the standard reference material (SRM) analysis was in control, indicating the analytical batch was in control and the low recovery may have been due to matrix interference. As a result, all associated mercury results within the sample delivery group K0805409 were qualified as estimated 'J/UJ' reflecting the potential low bias.
- The percent recovery for benzo(a)pyrene in the PAH LCS was 115%. This was above the DoD QSM upper control limit of 110%. The expected bias direction is high and none of the samples contained a detectable concentration of this analyte; therefore, no data were qualified.

Congener Results

MS/MSD samples are not required by Method 1668A for PCB congener analysis. For Method 1668A, Ongoing Precision and Recovery (OPR) samples were used in place of LCS to monitor laboratory performance. The OPR was prepared using corn oil to approximate the lipid content of the samples. OPR recoveries were acceptable for congener analyses.

- The 23.8 percent recovery of ^{13}C-labeled PCB 4 (PCB 4L) in the OPR was below the Axys control limit of 30%. All unlabeled congeners were within control limits for the OPR, including PCB 4. Additionally the labeled and non-labeled standards had acceptable recoveries in the method blank (corn oil) and project samples, with the one exception stated above in section 4.5. Analytical results were not qualified as estimated based on the low recovery of PCB 4L within the OPR.

4.7 Duplicate Review

Non-congener Results

Field duplicates were not collected during this sampling event. To evaluate laboratory precision, CAS performed duplicate analyses (i.e. LCS/LCSD and MS/MSD) as discussed above. All duplicate analyses where within relative percent difference criteria. No samples were qualified exclusively on duplicate precision exceedances.

Congener Results

Axys performed a laboratory duplicate analysis on sample L11390-4. For these analytical results greater than 5x the sample specific detection limit and not reported as Estimated Maximum Potential Concentrations (EMPCs), the relative percent difference for individual congeners on average was less than 10%, indicating good analytical precision. The detailed evaluation can be found within the Axys analytical report.

4.8 Compound Quantification

Non-congener Results

All second column confirmations performed by CAS using Method 8082 were acceptable with the following exceptions:

- The second column confirmation criterion of a Relative Percent Difference (RPD) less than or equal to 40% was exceeded for Aroclor 1242 results in samples K0805513-016, K0805513-021, K0805513-026 and K0805409-001. For these samples, the lower Aroclor 1242 value was reported because of an apparent interference that produced the higher value. The Aroclor 1242 results for samples K0805513-016, K0805513-021, K0805513-026, and K0805409-001 were qualified as estimated, 'J/UJ' due to second column confirmation precision exceedance.

- Aroclors 1242 and 1254 exceeded the second column confirmation criterion of 40% for sample K0805409-004. For reasons discussed above, results for Aroclors 1242 and 1254 for sample K0805409-004 were qualified as estimated, and flagged 'J/UJ' due to second column confirmation exceedance.
- CAS reported that samples associated with sample delivery groups K0805409 and K0805513 *"appear to have been subjected to environmental stresses…causing pattern degradation and changing peak ratios. When pattern degradation occurs, correct identification and quantitative analysis of the individual Aroclors can be subjective*." *"Aroclor 1254 and Aroclor 1242 were difficult to differentiate and their assignment may be incorrect."* The data user should consider this when examining Aroclor results from these deliverables. All Aroclor 1242 and 1254 analytical results for sample delivery groups K0805409 and K0805513 were qualified 'J/UJ' based on pattern recognition.

Congener Results

Samples L11390-1, L11390-4, L11390-5, L11390-9, L11390-7, L11390-10, L11390-11 and L11390-12 were diluted and reanalyzed to bring area responses of some target congeners within the linear calibration range of the instrument. Only the affected target compounds are reported from the reanalysis. Relevant concentrations from both the undiluted and diluted analytical results are reported within the data deliverable. The reanalysis results are identified with a sample ID suffix of 'W' or 'Wi' within the report.

Sample L11390-8 was reanalyzed to confirm possible instrumental carry-over. The initial analysis was deemed affected by carry-over and therefore only the reanalysis results were reported.

The internal standard method is used to calculate concentrations of PCB congeners that do not have chemically identical labeled standards. The internal standard method is dependent upon consistent detector response over the calibration range. If the detector response varies, concentrations can be biased high or low based on variations in the detector sensitivity. During congener analysis, PFK (perfluorokerosene) is used as a lock mass reference standard to measure changes in detector sensitivity. Each lock mass must not vary more than 20% throughout its respective retention time window as required by Method 1668A. Variations of more than 20% indicate the presence of a co-eluting interference or decreased sensitivity. Lock mass was acceptable with the following exceptions:

- The lock mass signal had a small deflection at the retention time associated with the coelution PCB 86/87/97/108/119/125 for all samples within the Axys sample delivery group. Samples L11390-1 through L11390-6, and L11390-8 and L11390-10 demonstrated a drop in lock mass greater than 20% affecting these congeners. Similar deflections were not seen in the associated QC samples; therefore, due the frequency and repeated shape of the deviation, the cause is thought to be due to a matrix interference within these samples. The chromatograms for the diluted analyses for these samples showed a decrease in the lock mass deflection or none at all, pointing to a matrix interference that may be overcome by dilution. After a telephone conversation

with the project manager at Axys, it was discovered that the analytical results from the diluted analyses (where the deflection was not present) and undiluted analyses (where the deflection was present) were within 10-15% (i.e. within applicable analytical precision). These samples were not reanalyzed and the concentrations were reported from the undiluted analyses. Results for the coelution PCB 86/87/97/108/119/125 were estimated and flagged 'J', due to potential low bias from lock mass deviation. It should be noted that together these congeners only represent 1% to 3% of the total PCB concentration.

4.9 Target Compound Identification

Non-congener Results

- Two standard reference materials (SRM) were analyzed for metals. All recoveries were within CAS control limits.

Congener Results

Ion abundance ratios are used to identify PCB congeners. Results that met all other qualitative identification criteria but differ by more than 15% from the theoretical ion abundance criterion set by EPA Method 1668A were flagged in the laboratory report with a 'K' flag. Those results flagged 'K' with ion abundance ratios outside the identified quantitation criteria are considered estimated maximum possible concentrations (EMPC) and were re-flagged 'J-EMPC' during this review. If the analyte result was previously qualified 'U' by method blank detection, the result retained the 'U' qualifier and it was not qualified further because an ion ratio was out of limits (there is no ion ratio criterion for non-detects). These EMPC flags are listed in Table 3, appear within the data tables in the main body of this deliverable, and have been entered into the database.

Ion ratios outside the control limits are generally a consequence of co-eluting interferences to either one or both quantitation peaks. In these cases, Axys chose to use the quantitation peak areas as recorded; no adjustments were made to force the peaks to match the theoretical ion abundance ratios before reporting EMPC results. EMPC results should be considered by the data users as part of evaluating the data for end-use objectives.

Additionally, the flag 'C' was used in Table 3 to indicate co-eluting PCB isomers for this analysis. The concentrations of the co-eluting isomers were reported as a group, eliminating the need for any data qualification as part of this data review.

4.10 Reporting Limits

If sample concentrations were detected below the MRL but above the MDL, they were qualified as estimated by the laboratory and flagged with a 'J'. All laboratory J-flagged results are considered estimates. As stated above, these flags are recorded within the database and are reported in the data tables included in the main body of this report.

Several Aroclor results have elevated MDL and MRLs due to matrix interferences. These results were not qualified during this review, but should be considered as part of data use by the end users.

The dry weight basis Aroclor results for sample K0805513-015 were originally reported as non-detect with MDL and MRL of 98,000 ug/kg. CAS was contacted and stated that this was due to a reporting error. CAS reissued the results for sample K0805513-015. All results are still non-detect but the MDL and MRL are now reported as wet-weight basis results to be consistent with other sample results.

5.0 Completeness

The laboratory reported all requested analytes and the deliverable data reports were complete. Some data were qualified as estimated 'J' or 'J-EMPC' and some as non-detect 'U'. A summary of qualifiers can be found in Tables 2 and 3. A completeness summary follows; congener completeness was calculated using 209 congener results, considering coeluting congeners.

The electronic and portable delivery format (.pdf) versions of the deliverables were cross-checked for accuracy at a frequency of 20% or greater. Any minor discrepancies found between the deliverables were reported to CAS and corrected by updating the database to reflect the .pdf deliverable.

- *Technical Completeness* = (number of useable results/total reported results) x100

  All samples results are considered useable

  Non-congener = (774 compliant / 774 total results) = 100%

  Congener = (1,908 compliant / 1,908 total results) = 100%

- *Analytical Completeness* = (number of unqualified results/total reported results) x100

  Non-congener = (553 compliant / 774 total results) = 71%

  Data were qualified as estimated 'J', in particular a significant portion of the Aroclor data were qualified and estimated 'J' due to hold time exceedances and Aroclor pattern recognition. Non-congener data qualified 'J' due to detections between the MRL and the MRL were not included in this calculation.

  Congener = (1,838 compliant / 1,908 total results) = 96%

  Congener data were qualified as estimated and flagged 'J' or 'J-EMPC' and some qualified non-detect and flagged 'U'.

- *Contract Completeness* = (number of contract compliant results/total reported results) x100

  Non-congener = *(591 compliant /774 total results) = 76%*

  Congener = *(1,891 compliant /1,908 total results) = 99%*

All samples analyzed met laboratory contract requirements with the exception of the samples analyzed outside of the 28 day hold time for mercury and the 1 year hold time for PCB Aroclors. Due to the nature of the sampling event, samples were not received by CAS or authorized for analysis until after the hold time expired.

- *Field Sampling Completeness* =(number samples collected/total reported results) x100

  Non-congener = *(12 compliant / 12 total results) =100*%

  Congener = *(12 compliant / 12 total results) =100*%

  All smallmouth bass samples collected in May 2008 and submitted to CAS for analysis had a complete set of results. All samples had sufficient sample volume to analyze the full analyte list as detailed in the QAPP. Field completeness for the other smallmouth bass is documented with the reporting of the original data set.

6.0 References

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Table 1. Sample Identification and Analysis Summary
Forebay and Reference Area Smallmouth Bass
Collected June 2006 through May 2008

Quality Control Summary Report for Analytical Chemistry

URS ID	Length (mm)	Weight (grams)	Collection Date	CAS ID	Axys ID (congeners)	Anaytes					
						PCB (Aroclors)	PCB (Congeners) (Axys Analytical)	PAHs	SVOCs	Metals	%Solids
Forebay collected June/August 2006 (19 smallmouth bass)											
060605100SB	270	255	6/5/06	K0805513-001	--	X	--	--	--	--	--
060605101SB	330	730	6/5/06	K0805513-002	--	X	--	--	--	--	--
060605200SB	270	226	6/5/06	K0805513-003	--	X	--	--	--	--	--
060605201SB	299	397	6/5/06	K0805513-004	--	X	--	--	--	--	--
060605202SB	300	539	6/5/06	K0805513-005	--	X	--	--	--	--	--
060605203SB	476	1502	6/5/06	K0805513-006	--	X	--	--	--	--	--
060605204SB	343	652	6/5/06	K0805513-007	--	X	--	--	--	--	--
060605205SB	394	850	6/5/06	K0805513-008	--	X	--	--	--	--	--
060605207SB	330	369	6/5/06	K0805513-009	--	X	--	--	--	--	--
060605208SB	419	1191	6/5/06	K0805513-010	--	X	--	--	--	--	--
060605209SB	381	680	6/5/06	K0805513-011	--	X	--	--	--	--	--
060606102SB	265	387	6/6/06	K0805513-012	--	X	--	--	--	--	--
060606103SB	411	1074	6/6/06	K0805513-013	--	X	--	--	--	--	--
060606104SB	380	719	6/6/06	K0805513-014	--	X	--	--	--	--	--
060606210SB	298	284	6/6/06	K0805513-015	--	X	--	--	--	--	--
060815402SB	406	1063	8/15/06	K0805513-016	--	X	--	--	--	--	--
060815403SB	273	284	8/15/06	K0805513-017	--	X	--	--	--	--	--
060815405SB	406	964	8/15/06	K0805513-018	--	X	--	--	--	--	--
060816406SB	314	369	8/16/06	K0805513-019	--	X	--	--	--	--	--
Reference Area collected in October/November 2007 (7 smallmouth bass)											
071027R01SB	380	820	10/27/07	K0805513-020	--	X	--	--	--	--	--
071027R02SB	360	802	10/27/07	K0805513-021	--	X	--	--	--	--	--
071027R03SB	325	548	10/27/07	K0805513-022	--	X	--	--	--	--	--
071027R04SB	370	906	10/27/07	K0805513-023	--	X	--	--	--	--	--
071027R05SB	350	646	10/27/07	K0805513-024	--	X	--	--	--	--	--
071027R06SB	330	501	10/27/07	K0805513-025	--	X	--	--	--	--	--
071115R07SB	425	964	11/15/07	K0805513-026	--	X	--	--	--	--	--
Reference Area collected May 2008 (12 smallmouth bass)											
080517R10SB	394	986	5/17/08	K0805409-001	L11390-1	X	X	X	X	X	X
080517R11SB	343	646	5/17/08	K0805409-002	L11390-2	X	X	X	X	X	X
080517R12SB	305	336	5/17/08	K0805409-003	L11390-3	X	X	X	X	X	X
080517R13SB	419	1140	5/17/08	K0805409-004	L11390-4	X	X	X	X	X	X
080517R14SB	330	530	5/17/08	K0805409-005	L11390-5	X	X	X	X	X	X
080521R15SB	330	587	5/21/08	K0805409-006	L11390-6	X	X	X	X	X	X
080521R16SB	356	622	5/21/08	K0805409-007	L11390-7	X	X	X	X	X	X
080521R17SB	343	647	5/21/08	K0805409-008	L11390-8	X	X	X	X	X	X
080521R18SB	394	1124	5/21/08	K0805409-009	L11390-9	X	X	X	X	X	X
080521R19SB	406	936	5/21/08	K0805409-010	L11390-10	X	X	X	X	X	X
080521R20SB	330	640	5/21/08	K0805409-011	L11390-11	X	X	X	X	X	X
080521R21SB	305	442	5/21/08	K0805409-012	L11390-12	X	X	X	X	X	X

Notes:

CAS - Columbia Analytical Services
Axys - Axys Analytical Services, Ltd.
ID - Identification
mm - millimeter
PAHs - Polynuclear Aromatic Hydrocarbons
PCB - Polychlorinated Biphenyl
SVOCs - Semivolatile Organic Compound
-- previously reported, not included in this quality control summary report.

Table 2. Non-congener Qualifier Summary
Forebay and Reference Area Smallmouth Bass
Quality Control Summary Report for Analytical Chemistry

Laboratory ID	URS ID	Analyte	Qualifier	Rational
K0805513-001	060605100SB	Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260 Aroclor 1262 Aroclor 1268	J/UJ	hold time
K0805513-002	060605101SB			
K0805513-003	060605200SB			
K0805513-004	060605201SB			
K0805513-005	060605202SB			
K0805513-006	060605203SB			
K0805513-007	060605204SB			
K0805513-008	060605205SB			
K0805513-009	060605207SB			
K0805513-010	060605208SB			
K0805513-011	060605209SB			
K0805513-012	060606102SB			
K0805513-013	060606103SB			
K0805513-014	060606104SB			
K0805513-015	060606210SB			
K0805513-016	060815402SB			
K0805513-017	060815403SB			
K0805513-018	060815405SB			
K0805513-019	060816406SB			
K0805409-001	080517R10SB	mercury	J	hold time and MS/MSD recoveries
K0805409-002	080517R11SB			
K0805409-003	080517R12SB			
K0805409-004	080517R13SB			
K0805409-005	080517R14SB			
K0805409-006	080521R15SB			
K0805409-007	080521R16SB			
K0805409-008	080521R17SB			
K0805409-009	080521R18SB			
K0805409-010	080521R19SB			
K0805409-011	080521R20SB			
K0805409-012	080521R21SB			
K0805513-016	060815402SB	Aroclor 1242	J	secondary column confirmation
K0805513-021	071027R02SB			
K0805513-026	071115R07SB			
K0805409-001	080517R10SB			
K0805409-004	080517R13SB	Aroclor 1242 Aroclor 1254		
K0805513-001	060605100SB	Aroclor 1242 Aroclor 1254	J/UJ	Aroclor pattern recognition
K0805513-002	060605101SB			
K0805513-003	060605200SB			
K0805513-004	060605201SB			
K0805513-005	060605202SB			
K0805513-006	060605203SB			
K0805513-007	060605204SB			
K0805513-008	060605205SB			
K0805513-009	060605207SB			
K0805513-010	060605208SB			
K0805513-011	060605209SB			
K0805513-012	060606102SB			

Table 2. Non-congener Qualifier Summary
Forebay and Reference Area Smallmouth Bass

Quality Control Summary Report for Analytical Chemistry

Laboratory ID	URS ID	Analyte	Qualifier	Rational
K0805513-013	060606103SB	Aroclor 1242 Aroclor 1254	J/UJ	Aroclor pattern recognition
K0805513-014	060606104SB			
K0805513-015	060606210SB			
K0805513-016	060815402SB			
K0805513-017	060815403SB			
K0805513-018	060815405SB			
K0805513-019	060816406SB			
K0805513-020	071027R01SB			
K0805513-021	071027R02SB			
K0805513-022	071027R03SB			
K0805513-023	071027R04SB			
K0805513-024	071027R05SB			
K0805513-025	071027R06SB			
K0805513-026	071115R07SB			
K0805409-001	080517R10SB			
K0805409-002	080517R11SB			
K0805409-003	080517R12SB			
K0805409-004	080517R13SB			
K0805409-005	080517R14SB			
K0805409-006	080521R15SB			
K0805409-007	080521R16SB			
K0805409-008	080521R17SB			
K0805409-009	080521R18SB			
K0805409-010	080521R19SB			
K0805409-011	080521R20SB			
K0805409-012	080521R21SB			

Note:
Not included are J flags indicating detections above the method detection limit (MDL) and below the method reporting limit (MRL). These are included in the data tables associated with this report and the project database.

Table 3a
Reference Area Smallmouth Bass Collected May 2008 PCB Congener Analysis Results
Lab Sample ID's L10448-1 through L10448-7
Quality Control Summary Report for Analytical Chemistry

IUPAC #	COELUTING CONGENERS[1]	080517R10 L11390-1	Lab Qualifier	URS Review Qualifier	080517R11 L11390-2	Lab Qualifier	URS Review Qualifier	080517R12 L11390-3	Lab Qualifier	URS Review Qualifier	080517R13 L11390-4	Lab Qualifier	URS Review Qualifier	080517R14 L11390-5	Lab Qualifier	URS Review Qualifier	080521R15 L11390-6	Lab Qualifier	URS Review Qualifier	080521R16 L11390-7	Lab Qualifier	URS Review Qualifier
1		1.05			0.452	K	J-EMPC	0.43	K	J-EMPC	0.626			0.476	K	J-EMPC	0.403			0.566	K	J-EMPC
2		1.66			1.11			0.666		J	1.34			0.904			0.694			0.522		
3		0.748			0.488			0.34	K	J-EMPC	0.617			0.342	K	J-EMPC	0.398	K	J-EMPC	0.391	K	J-EMPC
4		9.61			3.81			2.37			3.55			3.44			3.34			2.23		
5		0.462			0.234	U		0.255	U	UJ	0.208			0.184	U		0.153	K	J-EMPC	0.261	U	
6		5.37			1.99			1.02		J	2.12			1.76			1.73			1.68		
7		1.04			0.466			0.236	U	UJ	0.561			0.436			0.421			0.339		
8		22.7			10.4			4.91		J	9.98			7.37			8.61			6.55		
9		1.84			0.652			0.294	K	J-EMPC	0.718			0.577			0.514			0.528		
10		0.377	K	J-EMPC	0.217	U		0.238	U	UJ	0.141	U		0.163	U		0.125	U		0.231	U	
11		342			377			173		J	320			223			206			75.5		
12	12 + 13	0.177	C U		0.228	C U		0.25	C U	UJ	0.153	C U		0.178	C U		3.04	C K	J-EMPC	0.251	C U	
13	12 + 13		C12			C12			C12			C12			C12			C12			C12	
14		0.17	U		0.219	U		0.239	U	UJ	0.151	U		0.176	U		0.134	U		0.248	U	
15		4.92			2.91			1.41			3.45			2.07			3.5			1.75		
16		31			13.3			7.42			22.5			8.8			9.25			7.26		
17		86			19.3			10.8			52.3			12.2			12.9			11.7		
18	18 + 30	131	C		43.8	C		22	C		96	C		28	C		26	C		24.6	C	
19		6.14			3.23			1.84			3.46			2.23			2.62			1.87		
20	20 + 28	1020	C		215	C		150	C		666	C		128	C		173	C		186	C	
21	21 + 33	152	C		42.8	C		30.2	C		125	C		22.7	C		29.2	C		34.9	C	
22		212			51			30.9			115			27.2			39.3			36.4		
23		0.775			0.197			0.172	K	J-EMPC	0.68			0.151			0.124	K	J-EMPC	0.149		
24		2.68			0.691			0.405	K	J-EMPC	1.45			0.427	K	J-EMPC	0.427			0.399		
25		37.9			7.91			5.36			18.3			3.44			7.01			23		
26	26 + 29	110	C		23.6	C		16	C		80	C		12.6	C		18.7	C		47.1	C	
27		6.74			2.85			1.85			6.12			2			1.87			1.64		
28	20 + 28		C20			C20			C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18			C18			C18	
31		596			125			78.9			338			59.7			94.4			99.6		
32		34.1			6.56			4.23			24.6			3.78			4.69			10.3		
33	21 + 33		C21			C21			C21			C21			C21			C21			C21	
34		1.8			0.507			0.497			1.44			0.326			0.501	K	J-EMPC	1.27		
35		0.163	U		0.127	K	J-EMPC	0.0726	U		0.118	U		0.0499	U		0.048	U		0.0832	U	
36		0.142	U		0.0498	U		0.0635	U		0.101	U		0.0484	U		0.048	U		0.0714	U	
37		28.1			20			7			26.8			11.5			17.6			16.5		
38		1.17			0.243	K	J-EMPC	0.247	K	J-EMPC	0.476			0.101	K	J-EMPC	0.154	K	J-EMPC	0.356	K	J-EMPC
39		7.43			1.95			1.45			6.04			0.998			1.49			2.02		
40	40 + 41 + 71	220	C		66.9	C		62.2	C		225	C		30	C		54.2	C		126	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40			C40			C40	
42		239			55			46.1			187			24.9			46			97.4		
43		38.4			8.38			8.71			31.2			5.23			5.3			9.49		
44	44 + 47 + 65	1090	C		271	C		260	C		824	C		182	C		270	C		781	C	
45	45 + 51	58.4	C		15.8	C		13.2	C		49.1	C		8.2	C		12.8	C		22.8	C	
46		9.01			3.98			2.53			10.8			1.93			3.65			5.61		
47	44 + 47 + 65		C44			C44			C44			C44			C44			C44			C44	
48		178			42.4			35			166			24.1			30.1			39.8		
49	49 + 69	866	C		203	C		192	C		657	C		113	C		218	C		697	C	
50	50 + 53	24.2	C		12.6	C		10	C		38.3	C		6.37	C		11.5	C		29.8	C	
51	45 + 51		C45			C45			C45			C45			C45			C45			C45	
52		1280			402			384			1140			304			438			1090		
53	50 + 53		C50			C50			C50			C50			C50			C50			C50	
54		0.37	K	J-EMPC	0.28			0.194			0.643			0.177			0.428			0.98		
55		0.249	U		0.406	U		0.485	U		0.228	U		0.136	U		0.208	U		0.333	U	
56		109			80.9			53.2			135			35			87.3			206		
57		8.57			2.09			2.15			5.13			1.61			2.5			7.77		
58		3.69			1.87			2.09			2.98			0.93			2.04			5.14		
59	59 + 62 + 75	107	C		25.4	C		23.3	C		81	C		14.5	C		23.4	C		35.3	C	
60		325			123			116			209			110			145			332		
61	61 + 70 + 74 + 76	2130	C		848	C		756	C		1690	C		664	C		974	C		4660	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59			C59			C59	
63		101			29.5			34			63.3			39.1			35.6			184		
64		554			147			121			427			83.5			136			190		
65	44 + 47 + 65		C44			C44			C44			C44			C44			C44			C44	
66		1590			534			601			1040			670			679			3880		
67		29.1			9.61			8.65			18.4			5.21			9.34			25.7		
68		16.3			7.78			9.79			13.8			9.84			9.61			69.5		
69	49 + 69		C49			C49			C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40			C40			C40	
72		22.7			8.21			8.94			18.2			7.29			12.8			55.4		
73		0.0486	U		0.0495	U		0.0484	U		0.0492	U		0.0484	U		0.048	U		0.0491	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61			C61	
77		75.4			36.2			43.6			70.1			54.8			49.3			172		
78		0.238	U		0.389	U		0.465	U		0.229	U		0.137	U		0.209	U		0.334	U	
79		17.1			13.4			11.8			27			8.15			15.2			247		
80		2.3			0.818			0.948			1.32			1			0.862			0.286	U	
81		5.52			2.56			2.63			3.26			2.63			2.35			15.9		
82		55.2			57			44.9			131			16.7			68.4			751		
83	83 + 99	5090	C		1410	C		1530	C		2670	C		1730	C		1800	C		23200	C D	
84		122			120			93.5			279			47.6			144			511		
85	85 + 116 + 117	1420	C		393	C		423	C		752	C		465	C		533	C		5890	C D	
86	86 + 87 + 97 + 108 + 119 + 125	1310	C G	J	758	C G	J	674	C G	J	1560	C G	J	441	C G	J	939	C G	J	10500	C D	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86			C86	
88	88 + 91	174	C		117	C		113	C		288	C		51.7	C		138	C		838	C	
89		3.79			3.01			2.84			6.39			1.16			3.3			5.9		
90	90 + 101 + 113	3510	C		1730	C		1670	C		3490	C		1180	C		2090	C		17900	C D	
91	88 + 91		C88			C88			C88			C88			C88			C88			C88	
92		812			353			342			665			278			429			2210		
93	93 + 95 + 98 + 100 + 102	979	C		563	C		552	C		1320	C		354	C		672	C		3370	C	
94		2.17			1.84			1.87			4.3			0.492			1.63			3.4		
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93			C93	
96		4.25			1.79			1.8			6.05			1.2			2.02			4.83		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93			C93	
103		14.1			9.48			10.8			21.8			3.76			11			47.8		
104		0.261	K	J-EMPC	0.163	K	J-EMPC	0.237			0.42			0.0808	U		0.22			0.223	K	J-EMPC
105		3500			940			1000			1910			1370			1310			23400	D	
106		0.874	U		0.583	U		0.544	U		0.304	U		0.436	U		0.316	U		1.96	U	
107	107 + 124	132	C		71	C		62.2	C		128	C		57.7	C		90	C		1540	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86			C86	
109		677			223			285			408			373			308			6030	D	
110	110 + 115	2460	C		1400	C		1230	C		2960	C		807	C		1770	C		10600	C D	
111		9.55			3.48			5.06			5.82			5.29			4.35			10.7		
112		0.147	U		0.387	U		0.531	U		0.246	U		0.314	U		0.382	U		0.181	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90			C90			C90	
114		272			59.9			80.2			123			145			87.2			2910		
115	110 + 115		C110			C110			C110			C110			C110			C110			C110	

Table 3a
Reference Area Smallmouth Bass Collected May 2008 PCB Congener Analysis Results
Lab Sample ID's L10448-1 through L10448-7
Quality Control Summary Report for Analytical Chemistry

IUPAC #	COELUTING CONGENERS[1]	080517R10 L11390-1	Lab Qualifier	URS Review Qualifier	080517R11 L11390-2	Lab Qualifier	URS Review Qualifier	080517R12 L11390-3	Lab Qualifier	URS Review Qualifier	080517R13 L11390-4	Lab Qualifier	URS Review Qualifier	080517R14 L11390-5	Lab Qualifier	URS Review Qualifier	080521R15 L11390-6	Lab Qualifier	URS Review Qualifier	080521R16 L11390-7	Lab Qualifier	URS Review Qualifier
116	85 + 116 + 117		C85			C85			C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85			C85			C85	
118		11800	D		2580			3630			4850	D		6210	D		3740			98600	D	
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86			C86	
120		57.3			17			24.2			29.3			29.9			21.9			57.7		
121		4.77			1.76			2.26			3.49			1.67			2.21			2.34		
122		7.66			12.1			5.37			22.8			6.75			15.3			234		
123		148			43			55.3			81.1			104			60.6			1830		
124	107 + 124		C107			C107			C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86			C86	
126		25.9			6.03			9.55			12.6			14.3			9.45			74.6		
127		0.9	U		0.6	U		0.561	U		0.326	U		0.469	U		0.339	U		2.1	U	
128	128 + 166	2400	C		545	C		551	C		1060	C		702	C		720	C		7850	C	
129	129 + 138 + 160 + 163	15500	C D		4390	C		5020	C		7510	C		6520	C		5160	C		66800	C D	
130		405			265			246			459			225			298			3900		
131		13.7			17.9			11.3			36.5			4.6			20.5			261		
132		378			406			324			922			167			532			3600		
133		280			87.2			105			163			134			105			804		
134	134 + 143	84.4	C		80	C		65.9	C		176	C		36.7	C		94.8	C		718	C	
135	135 + 151 + 154	1690	C		834	C		814	C		1590	C		648	C		936	C		2980	C	
136		178			119			116			274			74.2			140			558		
137		720			104			151			245			275			164			8560		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129			C129	
139	139 + 140	258	C		59.3	C		62.5	C		123	C		70.5	C		73.9	C		771	C	
140	139 + 140		C139			C139			C139			C139			C139			C139			C139	
141		660			191			225			432			182			244			3540		
142		0.798	U		0.703	U		0.731	U		0.625	U		0.628	U		0.484	U		2.21	U	
143	134 + 143		C134			C134			C134			C134			C134			C134			C134	
144		98.1			73.8			65.3			153			40.2			83.9			755		
145		0.0486	U		0.296	K	J-EMPC	0.235	K	J-EMPC	0.737			0.0484	U		0.283	K	J-EMPC	1.08		
146		2380			811			1080			1420			1550	D		924			11400	D	
147	147 + 149	1340	C		1470	C		1250	C		3160	C		640	C		1720	C		13000	C D	
148		12.3			7.27			8.56			13.9			4.53			7.54			12.8		
149	147 + 149		C147			C147			C147			C147			C147			C147			C147	
150		2.54			3.48			4.18			7.6			1.22			3.59			11.4		
151	135 + 151 + 154		C135			C135			C135			C135			C135			C135			C135	
152		3.06			1.08			1.18			2.32			0.993			1.28			4.3		
153	153 + 168	18200	C D		4080	C		5650	C		7260	C		9040	C D		5090	C		69500	C D	
154	135 + 151 + 154		C135			C135			C135			C135			C135			C135			C135	
155		15.2			4.36			4.97			7.66			6.33			4.8			3.55		
156	156 + 157	1890	C		290	C		430	C		638	C		882	C		447	C		20000	C D	
157	156 + 157		C156			C156			C156			C156			C156			C156			C156	
158		1420			328			302			616			402			406			4520		
159		14.1			10.9			10.6			19			7.57			11.4			71.6		
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129			C129	
161		0.574	U		0.506	U		0.525	U		0.44	U		0.442	U		0.341	U		1.55	U	
162		77.3			14.6			21			28.7			35.3			19			442		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129			C129	
164		228			115			130			232			97.1			145			2010		
165		11.3			3.51			5.19			6.6			5.19			4.18			12.9		
166	128 + 166		C128			C128			C128			C128			C128			C128			C128	
167		571			117			211			242			380			180			6540	D	
168	153 + 168		C153			C153			C153			C153			C153			C153			C153	
169		8.12	U		1.3	U		1.86	U		2.79	U		3.07	U		1.54	U		6.62	U	
170		2180			370			459			693			831			480			7510		
171	171 + 173	966	C		214	C		201	C		380	C		305	C		246	C		1020	C	
172		305			75.7			86.3			138			114			86.5			869		
173	171 + 173		C171			C171			C171			C171			C171			C171			C171	
174		231			198			194			375			121			212			1480		
175		58.6			25.8			27.6			46.7			28.3			27.7			142		
176		40.1			48.5			34.3			97.9			19			54.9			134		
177		633			496			437			829			417			512			2030		
178		848			275			283			470			338			307			584		
179		411			250			215			478			154			264			271		
180	180 + 193	6100	C D		1060	C		1550	C		1900	C		3000	C		1300	C		15600	C D	
181		45.2			6.76			9.23			12.9			15.7			9.11			258		
182		20.5			4.59			6.47			8.23			6.95			5.64			27.5		
183	183 + 185	2010	C		483	C		547	C		857	C		759	C		542	C		2520	C	
184		21.4			4.25			5.8			8.47			7.07			5			4.75		
185	183 + 185		C183			C183			C183			C183			C183			C183			C183	
186		0.0631	U		0.0495	U		0.0484	U		0.063	U		0.0484	U		0.0597	U		0.0594	U	
187		3880			1680			2180			2730			2640			1750			6820	D	
188		9.74			4.19			5.68			7.24			6.31			4.57			10.8		
189		102			14.7			21.7			31.3			44.4			19.7			532		
190		912			169			198			292			411			209			1520		
191		121			20.1			27.2			36			48.3			25.3			308		
192		0.0715	U		0.0495	U		0.0484	U		0.072	U		0.05	U		0.0682	U		0.0679	U	
193	180 + 193		C180			C180			C180			C180			C180			C180			C180	
194		661			133			153			244			344			163			1150		
195		510			97			97.8			177			219			105			385		
196		424			78.2			101			148			189			93.1			478		
197	197 + 200	85.6	C		27	C		25	C		52	C		31.1	C		27	C		57.7	C	
198	198 + 199	582	C		228	C		241	C		420	C		348	C		263	C		1020	C	
199	198 + 199		C198			C198			C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197			C197			C197	
201		127			42.6			53.9			87.4			71			46.1			113		
202		485			143			121			265			186			161			191		
203		1170			221			229			367			443			255			621		
204		1.66			0.365			0.472			0.738			0.657			0.459			0.633		
205		58.1			12.5			12.2			23.1			23.2			13.7			43.2		
206		357			86.2			77			137			131			96.9			245		
207		75.1			14.6			17.6			25.7			31.7			16.4			45.4		
208		90.6			37.3			32.8			60.2			44.9			37.9			71.8		
209		153			45.7			41.5			67.6			65			38.1			65.6		

Notes:

All results are in units of pg/g (picograms/gram)

C = Concentration represents coeluting congeners.
D = (Laboratory Qualifer) Analyte reported from a dilution.
J = The reported concentration is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = (Laboratory Qualifer) The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
PCBs = Polychlorinated Biphenyls
U = The analyte was not detected above the reported sample specific reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 3b
Reference Area Smallmouth Bass Collected May 2008 PCB Congener Analysis Results
Lab Sample ID's L10448-8 through L10448-14
Quality Control Summary Report for Analytical Chemistry

IUPAC #	COELUTING CONGENERS[1]	080521R17 L11390-8	Lab Qualifier	URS Review Qualifier	080521R18 L11390-9	Lab Qualifier	URS Review Qualifier	080521R19 L11390-10	Lab Qualifier	URS Review Qualifier	080521R20 L11390-11	Lab Qualifier	URS Review Qualifier	080521R21 L11390-12	Lab Qualifier	URS Review Qualifier	WG25830-101 Method Blank	Lab Qualifier
1		0.444			0.471	D		0.655	K D	J-EMPC	0.661	K D	J-EMPC	0.345	D		0.101	K
2		0.89			0.582	K D	J-EMPC	0.715	D		0.89	D		0.397	D		0.056	K
3		0.513			0.43	K D	J-EMPC	0.58	D		0.534	D		0.489	D		0.201	K
4		3.63			3.48	D		4.84	D		3.9	D		2.68	D		0.345	U
5		0.191			0.366	U D		0.213	U D		0.511	U D		0.34	U D		0.225	U
6		1.75			1.88	D		3.08	D		1.64	D		1.56	D		0.202	U
7		0.406			0.335	D		0.633	D		0.448	U D		0.35	D		0.209	U
8		8.9			7.56	D		11.5	D		8.04	D		8.52	D		0.187	U
9		0.611			0.476	D		0.689	D		0.44	U D		0.451	D		0.202	U
10		0.141			0.307	U D		0.179	U D		0.427	U D		0.284	U D		0.21	U
11		475			117	D		416	D		298	D		117	D		1.08	K
12	12 + 13	0.156	C U		0.358	C U D		0.209	C U D		0.499	C U D		0.332	C U D		0.22	C U
13	12 + 13		C12			C12			C12			C12			C12			C12
14		0.148	U		0.339	U D		0.198	U D		0.473	U D		0.315	U D		0.211	U
15		3.19			1.9	D		4.86	D		3.21	D		2.39	D		0.251	U
16		11.4			9.53	D		12.8	D		12.5	D		10	D		0.135	
17		15.7			13.8	D		18.7	D		16.3	D		14.2	D		0.133	K
18	18 + 30	34.6	C		30.1	C D		40.3	C D		35.9	C D		29.1	C D		0.303	C K
19		2.88			2.37	D		3.26	D		2.76	D		2.44	D		0.087	K
20	20 + 28	175	C		169	C D		193	C D		164	C D		139	C D		0.434	C
21	21 + 33	36.8	C		34.4	C D		43.2	C D		35	C D		30.2	C D		0.222	C
22		42.8			33.8	D		46.5	D		38.9	D		32.7	D		0.168	
23		0.148			0.214	D		0.172	U D		0.18	U D		0.145	U D		0.05	U
24		0.594	K	J-EMPC	0.409	K D	J-EMPC	0.688	D		0.138	U D		0.662	K D	J-EMPC	0.05	U
25		9.4			7.34	D		9.7	D		6.17	D		6.02	D		0.05	U
26	26 + 29	22.3	C		19.3	C D		23.3	C D		18.4	C D		16.2	C D		0.087	C K
27		2.76			2.43	D		3.03	D		3.11	D		2.31	D		0.05	U
28	20 + 28		C20			C20			C20			C20			C20			C20
29	26 + 29		C26			C26			C26			C26			C26			C26
30	18 + 30		C18			C18			C18			C18			C18			C18
31		101			82.5	D		110	D		84.5	D		81.7	D		0.304	K
32		4.44			4.63	D		6.09	D		3.91	D		5.54	D		0.091	K
33	21 + 33		C21			C21			C21			C21			C21			C21
34		0.566			0.729	D		0.627	D		0.555	K D	J-EMPC	0.353	K D	J-EMPC	0.05	U
35		0.107	U		0.203	U D		0.203	U D		0.213	U D		0.172	U D		0.05	U
36		0.0919	U		0.176	U D		0.175	U D		0.184	U D		0.148	U D		0.05	U
37		18.8			10	D		21	D		13.4	D		14	D		0.109	
38		0.261	K	J-EMPC	0.18	U D		0.251	K D	J-EMPC	0.188	U D		0.152	U D		0.05	U
39		1.68			1.51	D		2.03	D		1.75	D		0.15	U D		0.05	U
40	40 + 41 + 71	68.7	C		60	C D		90.6	C D		61.2	C D		65.1	C D		0.166	C
41	40 + 41 + 71		C40			C40			C40			C40			C40			C40
42		57.1			53.5	D		74.7	D		58	D		47.3	D		0.071	K
43		8.9			10.9	D		12.8	D		10.7	D		7.92	D		0.05	U
44	44 + 47 + 65	326	C		350	C D		432	C D		327	C D		300	C D		0.441	C
45	45 + 51	15.4	C		9.12	C K D	J-EMPC	21.3	C D		13	C D		15.2	C D		0.08	C K
46		4.01			2.93	D		4.92	D		3.37	D		3.51	D		0.05	U
47	44 + 47 + 65		C44			C44			C44			C44			C44			C44
48		38.1			39.8	D		53.4	D		44.5	D		32.9	D		0.071	
49	49 + 69	259	C		278	C D		342	C D		219	C D		248	C D		0.211	C
50	50 + 53	14.7	C		12.3	C D		19.8	C D		12.6	C D		13.2	C D		0.056	C K
51	45 + 51		C45			C45			C45			C45			C45			C45
52		495			544	D		658	D		520	D		487	D		0.556	
53	50 + 53		C50			C50			C50			C50			C50			C50
54		0.318			0.298	D		0.425	K D	J-EMPC	0.207	D		0.376	D		0.05	U
55		0.204	U		0.393	U D		0.393	U D		0.389	U D		0.326	U D		0.0731	U
56		112			73.3	D		128	D		74.8	D		88.8	D		0.073	
57		2.59			2.6	D		3.15	D		2.12	D		2.88	D		0.069	U
58		3.12			2.38	D		3.12	D		2.27	D		2.53	D		0.0721	U
59	59 + 62 + 75	28.2	C		31.7	C D		38.4	C D		30	C D		26	C D		0.05	C U
60		143			193	D		212	D		152	D		142	D		0.093	K
61	61 + 70 + 74 + 76	992	C		1120	C D		1390	C D		905	C D		1010	C D		0.451	C K
62	59 + 62 + 75		C59			C59			C59			C59			C59			C59
63		32.7			47.2	D		48.6	D		35.8	D		36.1	D		0.0666	U
64		151			158	D		204	D		156	D		146	D		0.106	
65	44 + 47 + 65		C44			C44			C44			C44			C44			C44
66		642			942	D		907	D		686	D		638	D		0.226	
67		10.6			9.5	D		15.6	D		8.27	D		10.7	D		0.0609	U
68		10.9			10.8	D		13.4	D		8.27	D		10.5	D		0.0651	U
69	49 + 69		C49			C49			C49			C49			C49			C49
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61
71	40 + 41 + 71		C40			C40			C40			C40			C40			C40
72		13.8			13.9	D		17.5	D		10.4	D		13.2	D		0.0645	U
73		0.0526	U		0.0707	U D		0.076	U D		0.111	U D		0.0875	U D		0.05	U
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61
75	59 + 62 + 75		C59			C59			C59			C59			C59			C59
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61
77		53.7			59.7	D		70.1	D		52.8	D		49.7	D		0.072	U
78		0.208	U		0.401	U D		0.401	U D		0.396	U D		0.333	U D		0.0701	U
79		22			19.3	D		29.7	D		21.7	D		21.5	D		0.057	U
80		0.177	U		0.341	U D		0.341	U D		0.337	U D		1.19	D		0.0647	U
81		3.4			4.06	D		3.76	D		2.02	D		3.11	D		0.0696	U
82		86.3			79.6	D		125	D		58.9	D		93.5	D		0.05	U
83	83 + 99	1780	C		2600	C D		3010	C D		1980	C D		2330	C D		0.271	C
84		149			126	D		240	D		125	D		177	D		0.127	
85	85 + 116 + 117	554	C		829	C D		902	C D		632	C D		654	C D		0.112	C
86	86 + 87 + 97 + 108 + 119 + 125	1100	C G	J	1170	C D		1730	C D G	J	1050	C D		1370	C D		0.397	C
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86
88	88 + 91	155	C		137	C D		253	C D		131	C D		196	C D		0.069	C
89		3.32			3.75	D		5.15	D		2.88	D		4.12	D		0.05	U
90	90 + 101 + 113	2320	C		2470	C D		3810	C D		2280	C D		2800	C D		0.526	C K
91	88 + 91		C88			C88			C88			C88			C88			C88
92		448			523	D		751	D		471	D		586	D		0.082	K
93	93 + 95 + 98 + 100 + 102	702	C		733	C D		1150	C D		694	C D		848	C D		0.463	C
94		2.08			1.47	D		3.51	D		1.31	D		2.9	D		0.05	U
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93
96		2.3			2.37	D		3.37	D		2.24	D		2.62	K D	J-EMPC	0.05	U
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93
99	83 + 99		C83			C83			C83			C83			C83			C83
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93
101	90 + 101 + 113		C90			C90			C90			C90			C90			C90
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93
103		12.7			12.1	D		22.1	D		10.1	D		16.8	D		0.05	U
104		0.231			0.23	D		0.408	K D	J-EMPC	0.245	U D		0.343	K D	J-EMPC	0.05	U
105		1320			2000	D		2090	D		1440	D		1680	D		0.291	
106		0.536	U		1.18	U D		0.686	U D		0.786	U D		0.548	U D		0.05	U
107	107 + 124	91.4	C		90.9	C D		141	C D		81.9	C D		118	C D		0.05	C U
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86
109		290			443	D		522	D		362	D		382	D		0.05	U
110	110 + 115	1960	C		2040	C D		2910	C D		1890	C D		2320	C D		0.498	C K
111		4.28			6.68	K D	J-EMPC	8.35	D		4	D		5.35	D		0.05	U
112		0.561	U		0.801	U D		0.217	U D		0.366	U D		0.439	U D		0.05	U
113	90 + 101 + 113		C90			C90			C90			C90			C90			C90
114		82.6			132	D		137	D		97.1	D		106	D		0.109	K
115	110 + 115		C110			C110			C110			C110			C110			C110

Table 3b
Reference Area Smallmouth Bass Collected May 2008 PCB Congener Analysis Results
Lab Sample ID's L10448-8 through L10448-14
Quality Control Summary Report for Analytical Chemistry

IUPAC #	COELUTING CONGENERS[1]	080521R17 L11390-8	Lab Qualifier	URS Review Qualifier	080521R18 L11390-9	Lab Qualifier	URS Review Qualifier	080521R19 L11390-10	Lab Qualifier	URS Review Qualifier	080521R20 L11390-11	Lab Qualifier	URS Review Qualifier	080521R21 L11390-12	Lab Qualifier	URS Review Qualifier	WG25830-101 Method Blank	Lab Qualifier
116	85 + 116 + 117		C85			C85			C85			C85			C85			C85
117	85 + 116 + 117		C85			C85			C85			C85			C85			C85
118		3650			5970	D		5350	D		4780	D		4460	D		0.617	
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86
120		22			32.8	D		37.4	D		28.1	D		27	D		0.05	U
121		2.3			2.98	D		4.51	D		2.56	D		2.73	D		0.05	U
122		19.8			10.3	D		28.4	D		9.82	D		20.6	D		0.05	U
123		64.8			84	D		80.2	D		76.1	D		69.1	D		0.051	
124	107 + 124		C107			C107			C107			C107			C107			C107
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86
126		9.01			13.4	D		12.9	D		10.7	D		8.65	D		0.05	K
127		0.575	U		1.27	U D		0.735	U D		0.843	U D		0.587	U D		0.05	U
128	128 + 166	727	C		1120	C D		1250	C D		849	C D		912	C D		0.122	C
129	129 + 138 + 160 + 163	5450	C		7870	C D		9990	C D		6720	C D		6760	C D		0.679	C K
130		292			296	D		570	D		303	D		407	D		0.052	
131		19.5			15	D		38.7	D		14.7	D		27.5	D		0.05	U
132		476			394	D		867	D		411	D		640	D		0.16	K
133		92.1			145	D		194	D		128	D		131	D		0.05	U
134	134 + 143	87.3	C		80.1	C D		176	C D		85.1	C D		117	C D		0.05	C U
135	135 + 151 + 154	914	C		1070	C D		1870	C D		1110	C D		1270	C D		0.159	C K
136		133			137	D		254	D		151	D		197	D		0.063	
137		171			299	D		271	D		203	D		218	D		0.05	K
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129
139	139 + 140	68.1	C		108	C D		136	C D		87	C D		96.9	C D		0.05	C U
140	139 + 140		C139			C139			C139			C139			C139			C139
141		288			420	D		484	D		313	D		351	D		0.122	
142		0.792	U		0.955	U D		1.19	U D		1.32	U D		0.984	U D		0.05	U
143	134 + 143		C134			C134			C134			C134			C134			C134
144		84.1			83.6	D		174	D		85.6	D		123	D		0.05	U
145		0.379			0.206	D		0.571	K D	J-EMPC	0.405	K D	J-EMPC	0.443	K D	J-EMPC	0.05	U
146		899			1320	D		1790	D		1210	D		1230	D		0.129	K
147	147 + 149	1610	C		1310	C D		3260	C D		1440	C D		2140	C D		0.317	C
148		7.57			8.46	D		17.6	D		8	D		11.2	D		0.05	U
149	147 + 149		C147			C147			C147			C147			C147			C147
150		3.71			2.87	D		9.05	D		3.21	D		5.99	D		0.05	U
151	135 + 151 + 154		C135			C135			C135			C135			C135			C135
152		1.24			1.5	D		2.29	D		1.57	D		1.75	K D	J-EMPC	0.05	U
153	153 + 168	4850	C		8170	C D		9180	C D		7410	C D		5650	C D		0.609	C
154	135 + 151 + 154		C135			C135			C135			C135			C135			C135
155		4.6			7.9	D		10.2	D		7.21	D		6.63	D		0.05	U
156	156 + 157	420	C		786	C D		714	C D		557	C D		544	C D		0.244	C
157	156 + 157		C156			C156			C156			C156			C156			C156
158		412			606	D		798	D		490	D		557	D		0.096	K
159		14.3			13.3	D		25.2	D		14.1	K D	J-EMPC	15.4	D		0.05	U
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129
161		0.555	U		0.67	U D		0.836	U D		0.928	U D		0.69	U D		0.05	U
162		20			36	D		38.6	D		27.9	D		23.5	D		0.05	U
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129
164		143			169	D		228	D		167	D		185	D		0.05	U
165		3.83			6.28	D		8.53	D		4.82	D		4.99	K D	J-EMPC	0.05	U
166	128 + 166		C128			C128			C128			C128			C128			C128
167		175			286	D		242	D		276	D		198	D		0.09	K
168	153 + 168		C153			C153			C153			C153			C153			C153
169		2.16	U		4.82	U D		5.96	U D		3.56	U D		2.1	U D		0.072	K
170		491			866	D		887	D		636	D		522	D		0.187	
171	171 + 173	245	C		389	C D		548	C D		345	C D		311	C D		0.091	C K
172		98			159	D		193	D		115	D		101	D		0.05	U
173	171 + 173		C171			C171			C171			C171			C171			C171
174		242			220	D		447	D		235	D		270	D		0.072	K
175		29.3			36	D		71.5	D		37.1	D		39.4	D		0.05	U
176		50.4			37.4	D		124	D		45.7	D		76.9	D		0.05	U
177		503			462	D		1220	D		550	D		675	D		0.07	
178		291			422	D		683	D		419	D		384	D		0.05	U
179		244			243	D		549	D		315	D		348	D		0.056	
180	180 + 193	1380	C		2670	C D		2870	C D		2110	C D		1460	C D		0.26	C
181		10			16.8	D		18.8	D		14.4	D		12	D		0.05	U
182		7.89			13.4	D		15.8	D		10.7	D		9.23	D		0.05	U
183	183 + 185	583	C		904	C D		1290	C D		843	C D		700	C D		0.091	C
184		4.51			8.34	D		10.9	D		8.55	D		6.7	D		0.05	U
185	183 + 185		C183			C183			C183			C183			C183			C183
186		0.0919	U		0.126	U D		0.158	U D		0.187	U D		0.175	U D		0.05	U
187		1800			2510	D		4090	D		2650	D		2330	D		0.142	K
188		4.36			6.67	D		10.1	D		6.91	D		6.04	D		0.05	U
189		20.9			38.6	D		37.5	D		29.5	D		20.5	D		0.088	K
190		217			381	D		431	D		345	D		243	D		0.05	U
191		28.4			52	D		59.5	D		42.3	D		31.9	D		0.05	U
192		0.119	U		0.163	U D		0.205	U D		0.242	U D		0.226	U D		0.05	U
193	180 + 193		C180			C180			C180			C180			C180			C180
194		157			285	D		289	D		204	D		134	D		0.058	
195		91.8			172	D		195	D		146	D		97.2	D		0.05	U
196		97.1			187	D		193	D		147	D		96.2	D		0.05	U
197	197 + 200	28.7	C		39.2	C D		64.3	C D		35.1	C D		35.1	C D		0.05	C U
198	198 + 199	277	C		465	C D		532	C D		315	C D		248	C D		0.068	C
199	198 + 199		C198			C198			C198			C198			C198			C198
200	197 + 200		C197			C197			C197			C197			C197			C197
201		43.6			66.9	D		110	D		67.6	D		55.1	D		0.05	U
202		144			232	D		348	D		198	D		166	D		0.05	U
203		252			468	D		506	D		364	D		234	D		0.053	
204		0.427			1.06	D		0.932	K D	J-EMPC	0.54	D		0.491	K D	J-EMPC	0.05	U
205		13.8			22.9	D		28.6	D		19.2	D		13.4	D		0.064	
206		94.4			185	D		171	D		107	D		70.8	D		0.201	U
207		14.9			34.4	D		30.8	D		23.3	D		15.2	D		0.157	U
208		37			65.3	D		73	D		38.9	D		31	D		0.156	U
209		43.1			67.2	D		77.6	D		52.2	D		31.7	D		0.137	K

Notes:

All results are in units of pg/g (picograms/gram)

C = Concentration represents coeluting congeners.
D = (Laboratory Qualifer) Analyte reported from a dilution.
J = The reported concentration is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = (Laboratory Qualifer) The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
PCBs = Polychlorinated Biphenyls
U = The analyte was not detected above the reported sample specific reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

RIVER OPERABLE UNIT REMEDIAL INVESTIGATION REPORT

QUALITY CONTROL SUMMARY REPORT FOR ANALYTICAL CHEMISTRY

SEDIMENT – FEBRUARY/MARCH 2008 SAMPLING EVENT

JULY 2008

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TABLES

Table 1 Sediment Sample ID and Analysis Summary ..... Following Report
Table 2 Sediment Qualifier Summary ..... Following Report

1.0 Executive Summary

The overall assessment of the sediment sample results shows the quality of the data is acceptable to support project objectives. The contracted laboratory provided results for all requested analyses and laboratory data reports were complete. Some data were qualified as estimated and flagged 'J' or 'UJ'. Some data were qualified as not detected and flagged 'U'. All data qualifiers resulting from this review have been added to both the project database and the data tables within the main body of the River Operable Unit Remedial Investigation Report.

2.0 Project Description

URS collected and authorized analysis of 45 sediment samples during the remedial investigation near Bradford Island at Bonneville Dam between February 11 and March 20, 2008. Table 1 summarizes the sample locations, media, URS and analytical laboratory identification numbers and the requested analyses.

3.0 Sampling and Analytical Procedures

Samples were collected according to the Quality Assurance Project Plan (QAPP) *River Operable Unit Remedial Investigation* (URS 2007). Deviations from the QAPP (i.e. number and volume per each pre-determined sample location) are addressed in the Post-Removal Sample Collection Memorandum (URS 2008). Deviations in sample locations and sample size do not affect data usability. All sediment samples were submitted to Columbia Analytical Services (CAS) located in Kelso, WA and were assigned to one of three CAS sample delivery group identification numbers (K0801328, K0801769, or K0802371). Not all samples logged in under these sample delivery groups were authorized for analysis (i.e only samples meeting project criteria were selected for analysis). Sediment was submitted in laboratory-provided 8oz glass containers, and each sample consisted of two to ten sample containers depending on availability of sample media at each location. CAS composited and homogenized all sample containers from each location using a mechanical mixer prior to subaliquoting for individual analyses. The remaining sediment is archived (frozen to -20°C) at CAS for potential future analyses.

The following table lists the parameters analyzed on one or more of the samples. Table 1 summarizes the specific requested analyses for each sample by URS and laboratory identification numbers.

Method	Analytical Parameter
EPA 8082M	Polychlorinated Biphenyls (PCBs) as Aroclors
EPA 6000/7000 series	Metals
EPA 8270C	Semi-Volatile Organic Compounds (SVOCs)
NWTPH-Dx (Ecology 1997)	Northwest Total Petroleum Hydrocarbons – Diesel and Residual Range (NWTPH-Dx)

Method	Analytical Parameter
Plumb (Plumb 1981)	Total Organic Carbon (TOC)
Gravimetric (EPA 1983)	Percent Solids
PSEP (PSEP 1996)	Grain Size

4.0 Data Validation

Analyses were performed in general accordance with the above-referenced methods. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, chain of custody (COC), laboratory case narrative, proper sample preservation and handling procedures, holding times, initial and continuing calibrations, quantitation limits, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The following items were reviewed for 15% or greater of the data: primary and secondary column verification, instrument calibration and a verification of the reported electronic data with the hard copy deliverable. The data were reviewed in accordance with the QAPP (URS 2007). The data results were reviewed in accordance with the criteria specified in the DoD QSM (DoD 2006), the above-listed methods, and the following EPA guidance documents in that order; EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Organic Data Review* (USEPA 1999) and EPA's *NFGs for Inorganic Data Review* (USEPA 2004). Project-specific QC criteria are listed in the QAPP (URS 2007).

A summary of qualifiers assigned to results in this investigation is included in Table 2. Samples are represented by their URS sample identification assigned in the field as well as the laboratory identification. The laboratory was requested to report analytical results above the method detection limit (MDL) but below the method reporting limit (MRL). These results were flagged 'J' by CAS and are not included in Table 2 for simplicity. These 'J' qualifiers are included in the database and are included in the data tables included in the main body of this report. Qualifiers that may be assigned to the results of this investigation include the following:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

- DNR - Do Not Report. Another value is available that is more reliable or appropriate.

Final sample results and qualifiers are presented in the analytical tables provided in the sampling report.

4.1 Chain-of-Custody, Sample Preservation and Holding Time

URS frequently submitted sediment samples to CAS throughout the six-week collection period. CAS archived all sample sediment by freezing to -20°C until authorization was given by URS to begin homogenization and analysis. The chain-of-custody (COC) forms indicate that samples were maintained under proper chain-of-custody and forms were signed upon release and receipt. All samples were sent via CAS courier in wet ice and were received and logged in by the laboratory on the same day. All coolers were submitted at temperatures within the EPA-recommended temperature of 6°C or below. Due to the length of the sampling event (six weeks) and the multitude of COC forms for sediment, CAS has included COC forms for the entire sampling event but not in every deliverable, therefore the COC forms must be evaluated concurrently for the three sediment sample delivery groups. Additionally, one of the COC forms associated with sample delivery group K0802371 was inadvertently left out, URS received this COC form from CAS as part of the sample confirmation and it is acceptable. It has been included as an addendum to the original K0802371 data deliverable.

The sample dates for the following three samples were misreported within the data reports, listed below and in Table 1 are the correct sample collection dates.

- K0801328-003 – February 11, 2008
- K0802371-015 – March 11, 2008
- K0802371-016 – March 11, 2008

Holding times listed in the QAPP were not explicit in specifying times for samples archived frozen with the exception of PCBs. Holding times listed in the Washington State Department of Ecology's document *The Development of Sediment Sampling and Analysis Plans* (Ecology 2008) were used for comparison (as shown below).

Analytical Parameter	Hold Time (Table 10, Ecology 2008)
Polychlorinated Biphenyls (PCBs)	1 year (Frozen, -18°C) (as reported in QAPP)
Metals Mercury	1 year (Frozen, -18°C) 28 days (Frozen, -18°C)
Semi-Volatile Organic Compounds (SVOCs)	1 year (Frozen, -18°C)
Northwest Total Petroleum Hydrocarbons – Diesel Range (NWTPH-Dx)	6 months (Frozen, -18°C)
Total Organic Carbon (TOC)	6 months (Frozen, -18°C)
Percent Solids	6 months (Frozen, -18°C)
Grain Size	6 months (4°C) (as reported in QAPP)

All sediment samples were analyzed within the above-listed holding times with the following exception:

- The 28-day hold time for mercury was exceeded for sample K0801328-003 by one day and sample K0802371-009 by three days. These sample results were flagged 'J' due to hold time exceedance.

4.2 Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the analytical methods. Initial calibrations (ICALs) and continuing calibrations (CCALs) were analyzed at the proper frequency and at the appropriate concentrations required by the methods.

Instrument calibrations were acceptable for all sample analyses performed with the following exception:

- One of the five CCALs for Aroclor 1016 measured on the confirmation column exceeded the DoD QSM percent difference (%D) limits of ± 20% in the ICAL value at 21%. The CCAL for the primary column and the remaining four CCALs (primary and confirmation columns) were acceptable. Aroclor 1016 was not detected in any associated project samples in this sequence. No qualifiers were assigned to the data based on this ICAL.

4.3 Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank for each analysis and for each batch, per QAPP requirements. Field blanks were not collected as part of this analytical program. Qualification of samples due to method blank contamination followed guidelines set forth in the EPA NFGs.

Organic sample results less than five times (5x) and inorganic sample results (or common laboratory organic contaminates such as phthalates) less than ten times (10x) the method blank concentration and between the method detection limit (MDL) and the method reporting limit (MRL) were qualified as non-detect and flagged with a 'U' at the MRL. When sample results were less than 5x (or 10x for phthalates) the blank concentration but above the MRL, the reported result was qualified as non-detect and flagged 'U'. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Target compounds reported with concentrations greater than 5x (or 10x) the blank concentration were not qualified. For solid matrices reported in both wet and dry weight concentrations, the above-noted guidelines were applied using the wet weight results and any qualifiers assigned were also assigned to the dry weight results. All analytes were reported as not detected in the associated method blanks with the following exceptions:

- Residual range organics (RRO) were detected in the method blank associated with sample delivery group K0802371. All associated sample results were detected at concentrations less than 5x the method blank concentration and between the MRL and MDL and were flagged 'U' at the MRL.
- Di-n-butyl phthalate, butyl benzyl phthalate and bis(2-ethylhexyl) phthalate were detected in the method blanks associated with sample delivery groups K0802371 and K0801328. All samples had at least one of these phthalates detected at concentrations less than 10x the method blank concentrations. The associated results were flagged 'U' according to the criteria outlined above (see Table 2 for specific analytes in each sample).
- Metals (aluminum, cadmium, cobalt, copper, lead, thallium) were detected at concentrations between the MDL and the MRL in the method blank associated with sample delivery group K0802371. All sample results were greater than 10x the method blank concentrations with the exceptions of cadmium in samples K0802371-005, K0802371-007, K0802371-008 and K0802371-010 and thallium in samples K0802371-002, K0802371-005, K0802371-006, K0802371-007 and K0802371-008, K0802371-010 and K0802371-013. These results were flagged 'U' according to the criteria outlined above (see Table 2).
- Copper was detected in the method blank associated with sample delivery group K0801328 at a concentration between the MDL and the MRL. All sample results were more than 10x the method blank concentration; therefore, data were not qualified based on this method blank detection.
- Aluminum and thallium were detected in the method blank associated with sample delivery group K0801769. Thallium was detected at a concentration between the MDL and the MRL and aluminum was detected at a concentration above the MRL. All sample concentrations were more than 10x the method blank concentration; therefore, data were not qualified based on this method blank detection.

- TPH results associated with sample delivery group K0801769 were analyzed in two extraction batches. Method blanks associated with both extraction batches had detections between the MDLs and the MRLs. Extraction batch KWG0803324 had a detection of diesel range organics (DRO). All associated DRO results were more than 5x the method blank concentration; therefore, data were not qualified based on this method blank detection. Extraction batch KWG0803155 had a detection of residual range organics (RRO). Samples K0801769-009, K0801769-011, K0801769-023, K0801769-029, and K0801769-030 had RRO concentrations less than 5x the method blank concentration and were flagged 'U' at the respective MRLs.

4.4 Surrogate Recovery Review

Each sample analyzed for organic compounds was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. When more than one surrogate per fraction (acid or base/neutral) was spiked in the sample, PAHs and/or SVOCs were qualified if two or more surrogate recoveries for a given fraction exceeded DoD QSM sample criteria. When only one surrogate per fraction was spiked, all sample results associated with that fraction were qualified when the surrogate recovery exceeded DoD QSM sample criteria. Surrogate recoveries were acceptable for all analyses with the following exceptions:

- The SVOC surrogate recovery for 2-fluorobiphenyl in sample K0801769-018 was below the lower DoD QSM limit of 45% at 39%. While above the lower control limits, surrogate recoveries for phenol-d6 and nitrobenzene-d5 were comparatively low with recoveries of 43% and 41% respectively, in this sample. All detected SVOC results in sample K0801769-018 were previously flagged 'J' by the laboratory due to detections between the MDL and the MRL. All SVOCs reported as not detected in this sample were qualified as estimated and flagged 'UJ' based on low recoveries for three of the four surrogate compounds. These low recoveries appear to be isolated within this single sample.

4.5 Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control/laboratory control duplicate (LCS/LCSD) samples are used to monitor the laboratory's day-to-day performance of routine analytical methods independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. At least one LCS and one MS/MSD were performed for each analysis and for each batch per method requirements.

LCS/LCSD and MS/MSD recoveries were acceptable for all analytical tests with the following exceptions:

- The percent recoveries for antimony in all three of the of the MS/MSD pairs associated with the three sample delivery groups were below lower DoD QSM control limit of 80%.
    - K0802371-001: MS/MSD = 44% and 30%, respectively.
    - K0801328-004: MS/MSD = 36.5% and 40.7%, respectively.
    - K0801769-021: MS/MSD = 41.5% and 43.3%, respectively.

  All associated LCS and post-digestion spike recoveries indicate analytical batches were in control. All associated antimony results were reported at concentrations between the MDL and the MRL and are flagged 'J.' Further qualification is not required; however, the antimony concentrations represented in these samples are potentially biased low.
- The percent recovery for aluminum in the MS performed on sample K0801769-21 exceeded DoD QSM criteria; however, the aluminum concentration in this sample was greater than 4x the spike concentration, thereby preventing accurate evaluation of the spike recovery. The data were not qualified based on MS recoveries for aluminum.
- The percent recoveries for mercury and vanadium in the MSD performed on sample K0801769-21 exceeded DoD QSM criteria. The percent recoveries in the MS and post-digestion spike and the relative percent differences (RPDs) for the MS/MSD pair were within acceptance criteria. The samples were not qualified based on these MSD recoveries.
- The percent recoveries for many SVOCs in the MS performed on sample K0802371-013 were low. The percent recoveries in the MSD were all within control limits; however, due to the low MS recoveries, the RPDs for the MS/MSD pair are above the DoD QSM control limit. The MS recovery losses appear to be isolated to this single MS and appear to be an error in the MS sampling and not a matrix interference because the MSD recoveries are acceptable for sample K0802371-013. Data was not qualified based on the MS or RPD recoveries.
- The percent recoveries for acenaphthene, fluorene, anthracene, and fluoranthene were below the DoD QSM lower limits in the MS performed on sample K0801769-021. The percent recoveries in the MSD and RPDs for MS/MSD pair were within the control limits. Fluorene and fluoranthene also had low recoveries in the associated LCS (as stated below). Only fluorene and fluoranthene were qualified and flagged 'UJ' in sample K0801769-021 based on the low MS recoveries and low LCS recoveries for this QC batch. Acenaphthene and anthracene were not qualified solely on MS recoveries.
- The LCS associated with K0801769 had percent recoveries below the DoD QSM lower limits for fluorene, di-n-butyl phthalate and fluoranthene. The results for these analytes were qualified as estimated and flagged 'J' or 'UJ' for all samples in sample delivery group K0801769 unless previously qualified as estimated based on reported concentrations between the associated MDLs and MRLs.

4.6 Duplicate Review

Field duplicates were not collected during this sampling event due to the statistical nature of the sampling event (as discussed in detail in the QAPP). To evaluate laboratory precision, CAS performed duplicate analyses (i.e. LCS/LCSD and MS/MSD) as discussed above. All values were acceptable with the following exceptions:

- The RPD for bis(2-ethylhexyl) phthalate for the MS/MSD pair performed on sample K0801769-021 was outside the 30% control limit at 62%. This analyte was previously qualified as estimated and flagged with a 'J' due to the concentration between the MDL and the MRL. Further qualification is not required based on the RPD.
- The RPDs for pyrene and indeno(1,2,3-cd)pyrene for the LCS/LCSD pair associated with sample delivery group K0801769 were above the 30% DoD QSM control limit at 36% and 32%, respectively. All associated detections for pyrene in this sample delivery group with the exception of K0801769-029 were previously flagged 'J' due to detections between the MDL and the MRL. Further qualification of these results was unnecessary. The result for pyrene in sample K0801769 -029 was qualified as estimated and flagged 'J'. All reported concentrations for indeno(1,2,3-cd)pyrene were likewise previously qualified as estimated and flagged with a 'J' due to detections between the MDL and the MRL. Results reported as not detected were qualified as estimated and flagged 'UJ'.

4.7 Compound Quantification

All second column confirmation performed by CAS on Method 8082 were acceptable.

4.8 Reporting Limits

If sample concentrations were detected below the MRL but above the MDL, they were qualified as estimated by the laboratory and flagged with a 'J'. All laboratory J-flagged results are considered estimates. As stated above, these flags are recorded within the database and are reported in the data tables included in the main body of this report.

5.0 Completeness

The laboratory reported all requested analytes and the deliverable data reports were complete. Some data were qualified as estimated and flagged with a 'J' or a 'UJ.' Some laboratory data was qualified as not detected and flagged with a 'U'. A summary of qualifiers can be found in Table 2.

The electronic and portable delivery format (.pdf) versions of the deliverables were cross-checked for accuracy at a frequency of 20% or greater. Any minor discrepancies found between

the deliverables were reported to CAS and corrected by updating the database to reflect the .pdf deliverable.

- *Technical Completeness* = (number of useable results/total reported results) x100

  = (2,315 compliant / 2,315 total results) = 100%

  All samples results are considered useable.

- *Analytical Completeness* = (number of unqualified results/total reported results) x100

  = (2162 compliant / 2,315 total results) = 93%

  Data were qualified non-detect 'U' and some as estimated 'UJ' or 'J'. Data qualified 'J' due to detections between the MRL and the MRL were not included in this calculation.

- *Contract Completeness* = (number of contract compliant results/total reported results) x100

  = (2,313 compliant /2,315 total results) = 99%

  All samples analyzed met laboratory contract requirements with the exception of two samples analyzed outside of the 28 day hold time for mercury. Due to the staged sampling event, sample authorization was not given to CAS until a few days prior to the hold time expiration for these samples.

- *Field Sampling Completeness* =(number samples collected/total reported results) x100

  = (45 compliant / 45 total results) =100%

  All samples collected and submitted to CAS for analysis had a complete set of results. All samples had sufficient sample volume to analyze the full analyte list as detailed in the QAPP.

6.0 References

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Table 1. Sediment Sample ID and Analysis Summary

Quality Control Summary Report for Analytical Chemistry

February/March 2008 Sampling Event

Station	URS ID	DATE COLLECTED	CAS ID	Anaytes						
				PCB (Aroclors)	SVOCs	Metals	TPH-Dx	%Solids	TOC	Grain Size
Sediment - Forebay										
4	08022604SD	26-Feb	K0801328-022	X	X	X	X	X	X	X
7	08021507SD	15-Feb	K0801328-007	X	X	X	X	X	X	X
8	08021508SD	15-Feb	K0801328-009	X	X	X	X	X	X	X
9	08021409SD	14-Feb	K0801328-004	X	X	X	X	X	X	X
10	08021410SD	14-Feb	K0801328-005	X	X	X	X	X	X	X
11	08021411SD	14-Feb	K0801328-006	X	X	X	X	X	X	X
15	08022115SD	21-Feb	K0801328-012	X	X	X	X	X	X	X
16	08022116SD	21-Feb	K0801328-013	X	X	X	X	X	X	X
17	08022117SD	21-Feb	K0801328-011	X	X	X	X	X	X	X
18	08021118SD	11-Feb	K0801328-003	X	X	X	X	X	X	X
21	08021221SD	12-Feb	K0801328-002	X	X	X	X	X	X	X
5	08031905SD	19-Mar	K0802371-005	X	X	X	X	X	X	X
6	08031806SD	18-Mar	K0802371-006	X	X	X	X	X	X	X
13	08031713SD	17-Mar	K0802371-001	X	X	X	X	X	X	X
14	08031814SD	18-Mar	K0802371-004	X	X	X	X	X	X	X
65	08022965SD	29-Feb	K0802371-009	X	X	X	X	X	X	X
67	08030367SD	3-Mar	K0802371-010	X	X	X	X	X	X	X
88	08031788SD	17-Mar	K0802371-003	X	X	X	X	X	X	X
89	08031789SD	17-Mar	K0802371-002	X	X	X	X	X	X	X
Sediment - Reference Area										
22	08030522SD	5-Mar	K0801769-010	X	X	X	X	X	X	X
24	08030524SD	5-Mar	K0801769-011	X	X	X	X	X	X	X
26	08030426SD	4-Mar	K0801769-005	X	X	X	X	X	X	X
27	08030427SD	4-Mar	K0801769-006	X	X	X	X	X	X	X
28	08030428SD	4-Mar	K0801769-007	X	X	X	X	X	X	X
29	08022229SD	22-Feb	K0801769-021	X	X	X	X	X	X	X
34	08022534SD	25-Feb	K0801769-024	X	X	X	X	X	X	X
35	08022535SD	25-Feb	K0801769-023	X	X	X	X	X	X	X
36	08022536SD	25-Feb	K0801769-022	X	X	X	X	X	X	X
37	08022637SD	26-Feb	K0801769-025	X	X	X	X	X	X	X
38	08022738SD	27-Feb	K0801769-026	X	X	X	X	X	X	X
39	08022739SD	27-Feb	K0801769-027	X	X	X	X	X	X	X
40	08022740SD	27-Feb	K0801769-028	X	X	X	X	X	X	X
41	08022741SD	27-Feb	K0801769-029	X	X	X	X	X	X	X
42	08022742SD	27-Feb	K0801769-030	X	X	X	X	X	X	X
85	08030685SD	6-Mar	K0801769-017	X	X	X	X	X	X	X
86	08030686SD	6-Mar	K0801769-009	X	X	X	X	X	X	X
87	08030687SD	6-Mar	K0801769-018	X	X	X	X	X	X	X
Sediment - Downstream										
46	08031046SD	10-Mar	K0802371-011	X	X	X	X	X	X	X
47	08031047SD	10-Mar	K0802371-012	X	X	X	X	X	X	X
48	08031048SD	10-Mar	K0802371-013	X	X	X	X	X	X	X
49	08031049SD	10-Mar	K0802371-014	X	X	X	X	X	X	X
50	08031150SD	11-Mar	K0802371-015	X	X	X	X	X	X	X
51	08031151SD	11-Mar	K0802371-016	X	X	X	X	X	X	X
Sediment - Eagle Creek										
43	08032043SD	20-Mar	K0802371-007	X	X	X	X	X	X	X
44	08032044SD	20-Mar	K0802371-008	X	X	X	X	X	X	X

Table 2. Sediment Qualifer Summary

Quality Control Summary Report for Analytical Chemistry

February/March 2008 Sampling Event

CAS ID	URS ID	Station Number	Analyte	Qualifer	Rational
K0801328-003	08021118SD	18	mercury	J	Hold time
K0802371-009	08022965SD	65			
K0802371-005	08031905SD	5	cadmium	0.121U	MB detection
K0802371-007	08032043SD	43		0.75U	
K0802371-008	08032044SD	44		0.131U	
K0802371-010	08030367SD	67		0.115U	
K0802371-002	08031789SD	89	thallium	0.113U	MB detection
K0802371-005	08031905SD	5		0.108U	
K0802371-006	08031806SD	6		0.132U	
K0802371-007	08032043SD	43		0.156U	
K0802371-008	08032044SD	44		0.122U	
K0802371-010	08030367SD	67		0.130U	
K0802371-013	08031048SD	48		0.122U	
K0802371-002	08031789SD	89	di-n-butyl phthalate butyl benzyl phthalate bis (2-ethylhexyl) phthalate	14U 9.8U 200U	MB detection
K0802371-003	08031788SD	88		14U 9.8U 200U	
K0802371-004	08031814SD	14		10U 7.3U 150U	
K0802371-005	08031905SD	5		11U 7.2U 150U	
K0802371-006	08031806SD	6		6.8U 6.8U 140U	
K0802371-007	08032043SD	43		6.8U 6.8U 140U	
K0802371-008	08032044SD	44		7.7U 6.9U 140U	
K0802371-010	08030367SD	67		8.3U 7.3U 150U	
K0802371-014	08031049SD	49		7.0U 6.8U 140U	
K0802371-001	08031713SD	13	di-n-butyl phthalate bis (2-ethylhexyl) phthalate	11U 160U	MB detection
K0802371-009	08022965SD	65		6.9U 140U	
K0802371-011	08031046SD	46		7.9U 150U	
K0802371-012	08031047SD	47		7.6U 140U	

Table 2. Sediment Qualifer Summary

Quality Control Summary Report for Analytical Chemistry

February/March 2008 Sampling Event

CAS ID	URS ID	Station Number	Analyte	Qualifer	Rational
K0802371-013	08031048SD	48	di-n-butyl phthalate bis (2-ethylhexyl) phthalate	10U 140U	MB detection
K0802371-015	08031150SD	50		5.6U 120U	
K0802371-016	08031151SD	51		6.8U 140U	
K0801328-002	08021221SD	21		10U 200U	
K0801328-003	08021118SD	18		10U 200U	
K0801328-004	08021409SD	9		9.9U 200U	
K0801328-005	08021410SD	10		9.9U 200U	
K0801328-006	08021411SD	11		10U 200U	
K0801328-007	08021507SD	7		9.9U 200U	
K0801328-009	08021508SD	8		9.8U 200U	
K0801328-011	08022117SD	17		10U 200U	
K0801328-012	08022115SD	15	di-n-butyl phthalate	10U	MB detection
K0801328-013	08022116SD	16		9.9U	
K0801328-022	08022604SD	4		10U	
K0802371-001	08031713SD	13	Residual Range Organics (RRO)	180U	MB detection
K0802371-002	08031789SD	89		150U	
K0802371-003	08031788SD	88		130U	
K0802371-004	08031814SD	14		140U	
K0802371-005	08031905SD	5		140U	
K0802371-006	08031806SD	6		150U	
K0802371-007	08032043SD	43		150U	
K0802371-008	08032044SD	44		150U	
K0802371-009	08022965SD	65		150U	
K0802371-010	08030367SD	67		140U	
K0802371-011	08031046SD	46		140U	
K0802371-012	08031047SD	47		140U	
K0802371-013	08031048SD	48		150U	
K0802371-014	08031049SD	49		150U	
K0802371-015	08031150SD	50		180U	
K0802371-016	08031151SD	51		150U	
K0801769-009	08030686SD	86		180U	
K0801769-011	08030524SD	24		180U	
K0801769-023	08022535SD	35		160U	
K0801769-029	08022741SD	41		150U	
K0801769-030	08022742SD	42		150U	
K0801769-018	08030687SD	87	SVOCs	J/UJ	Surrogate Recovery

Table 2. Sediment Qualifer Summary

Quality Control Summary Report for Analytical Chemistry

February/March 2008 Sampling Event

CAS ID	URS ID	Station Number	Analyte	Qualifer	Rational
K0801769-021	08022229SD	29	fluorene fluoranthene	J/UJ	MS recovery
K0801769-005	08030426SD	26	fluorene di-n-butyl phthalate fluoranthene	J/UJ	LCS recovery
K0801769-006	08030427SD	27			
K0801769-007	08030428SD	28			
K0801769-009	08030686SD	86			
K0801769-010	08030522SD	22			
K0801769-011	08030524SD	24			
K0801769-017	08030685SD	85			
K0801769-018	08030687SD	87			
K0801769-021	08022229SD	29			
K0801769-022	08022536SD	36			
K0801769-023	08022535SD	35			
K0801769-024	08022534SD	34			
K0801769-025	08022637SD	37			
K0801769-026	08022738SD	38			
K0801769-027	08022739SD	39			
K0801769-028	08022740SD	40			
K0801769-029	08022741SD	41			
K0801769-030	08022742SD	42			
K0801769-029	08022741SD	41	Pyrene	J	LCS/LCSD RPD
K0801769-009	08030686SD	86	indeno(1,2,3-cd) pyrene	UJ	LCS/LCSD RPD
K0801769-010	08030522SD	22			
K0801769-011	08030524SD	24			
K0801769-017	08030685SD	85			
K0801769-021	08022229SD	29			
K0801769-024	08022534SD	34			
K0801769-027	08022739SD	39			
K0801769-028	08022740SD	40			
K0801769-030	08022742SD	42			

Notes:

Not included are laboratory-assigned J flags indicating detections above the MDL and below the MRL.

Concentrations are reported in dry wet.

RIVER OPERABLE UNIT REMEDIAL INVESTIGATION REPORT

QUALITY CONTROL SUMMARY REPORT FOR ANALYTICAL CHEMISTRY

CLAM AND CRAYFISH TISSUE – FEBRUARY/MARCH 2008 SAMPLING EVENT

JULY 2008

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TABLES

Table 1 Clam and Crayfish Sample ID and Analysis Summary ..... Following Report
Table 2 Clam and Crayfish Qualifier Summary ..... Following Report

1.0 Executive Summary

The overall assessment of the tissue sample results shows the quality of the data is acceptable to support project objectives. The contracted laboratories provided all requested analyses and delivered data reports were complete. Some data were qualified as estimated and flagged with a 'J' or 'UJ'. Some data were qualified as not detected and flagged with a 'U'. All data qualifiers resulting from this review have been added to both the project database and the data tables within the main body of the River Operable Unit Remedial Investigation Report.

2.0 Project Description

URS collected and authorized analysis of 36 crayfish and 37 clam samples (for a total of 73 tissue samples) during the remedial investigation near Bradford Island at Bonneville Dam between February 11 and March 19, 2008. Table 1 summarizes the sample locations, media, URS and analytical laboratory identification numbers, and the requested analyses.

3.0 Sampling and Analytical Procedures

Samples were collected according to the Quality Assurance Project Plan (QAPP) *River Operable Unit Remedial Investigation* (URS 2007). Deviations from the sampling collection (i.e. number and volume per each pre-determined sample location) are addressed in the Post-Removal Sample Collection Memorandum (URS 2008). Deviations in sample locations and sample size do not affect data usability. Three crayfish samples (08021902CF, 08022003CF and 080314105CF) had insufficient sample volume to complete SVOC and PAH analyses as indicated in Table 1. The remaining 70 tissue samples had sufficient volume to analyze those analytes listed in the QAPP.

All samples were submitted to Columbia Analytical Services (CAS) located in Kelso, WA and logged in by the laboratory under five CAS sample delivery groups (K0801325, K0801458, K0801772, K0802375 and K0802503). Not all samples logged in under these sample delivery groups were authorized for analysis (i.e only tissue samples meeting project criteria were selected for analysis). The following table lists the parameters analyzed on one or more of the samples. Table 1 summarizes the specific analyses requested for each sample by URS and the corresponding laboratory identification numbers. (Note: SVOCs and PAHs were analyzed separately for tissue matrices and are discussed separately in this report).

Method	Analytical Parameter
EPA 8082M	Polychlorinated Biphenyls (PCBs) as Aroclors
EPA 6000/7000 series	Metals

Method	Analytical Parameter
EPA 1631-Modified	Methyl Mercury
EPA 8270C-SIM	Semi-Volatile Organic Compounds (SVOCs)
EPA 8270C-SIM	Polynuclear Aromatic Hydrocarbons (PAHs)
Puget Sound Estuary Program (PSEP 1996)	Percent Lipids
Freeze Dry	Percent Solids

4.0 Data Validation

Analyses were performed in general accordance with the above-referenced methods. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, chain-of-custody (COC), laboratory case narrative, proper sample preservation and handling procedures, holding times, initial and continuing calibrations, quantitation limits, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The following items were reviewed on 15% or greater of the data: primary and secondary column verification, instrument calibration and a verification of the reported electronic data with the hard copy deliverable. The data were reviewed in accordance with the QAPP (URS 2007). The data results were reviewed in accordance with the criteria contained in the DoD QSM (DoD 2006) and the above-listed methods and the following EPA guidance documents in that order; EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Organic Data Review* (USEPA 1999) and EPA's *NFGs for Inorganic Data Review* (USEPA 2004). Project-specific QC criteria are listed in the above-mentioned QAPP.

A summary of qualifiers assigned to results in this investigation is included in Table 2. Samples are represented by their URS sample identification assigned in the field as well as the laboratory identification. The laboratory was requested to report analytical results above the method detection limit (MDL) but below the method reporting limit (MRL). These results were flagged 'J' by CAS and are not included in Table 2 for simplicity. These 'J' qualifiers are included in the database and are included in the data tables included in the main body of the remedial investigation report. Qualifiers that may be assigned to the results of this investigation include the following:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.

- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

- DNR - Do Not Report. Another result is available that is more reliable or appropriate.

Final sample results and qualifiers are presented in the analytical tables provided in the sampling report.

4.1 Chain-of-Custody, Sample Preservation and Holding Time

Clam samples were stored on ice prior to shucking by URS and then archived by freezing to -20°C in laboratory-provided 16oz glass containers prior submission to CAS. Crayfish were euthanized by freezing, and then they were weighed and measured prior to submission to CAS in laboratory-provided 16oz glass containers. URS frequently submitted both clam and crayfish samples to CAS throughout the six-week collection period. CAS archived all sample tissue frozen (-20°C) until authorization was given by URS to begin homogenization and analysis.

The chain-of-custody (COC) forms indicate that samples were maintained under chain-of-custody protocols and forms were signed upon release and receipt. All samples were sent via CAS courier in wet ice and were received and logged in by the laboratory on the same day. All coolers were submitted at temperatures within the EPA-recommended temperature of 6°C or below.

All samples were analyzed within the technical and contracted holding time with the following exceptions:

- The QAPP specified hold time is 28 days (frozen) for both mercury and methyl mercury. The short hold time of 28 days for inorganic mercury is due to the loss of analyte from evaporation. The DoD QSM does not stipulate hold times for methyl mercury; therefore, 28 days was selected as a conservative value for the QAPP. CAS lyophilizes (freeze dries) a portion of all tissue samples for mercury, methyl mercury and percent solid

analyses. All tissue samples were freeze-dried prior to the typical 28 day hold time. The DoD QSM does not stipulate hold times for samples preserved by freeze drying. However, EPA Method 1631 *(Total Mercury in Tissue, Sludge, Sediment and Soil by Acid Digestion)* states freeze dried tissue can be stored unrefrigerated in a low-mercury atmosphere for a maximum of 1 year. There is no specific hold time guidance for methyl mercury analysis on freeze dried samples; however, the 1 year hold time stated above was deemed appropriate for methyl mercury as well. Tissue samples were not flagged based on hold time due to the samples being freeze dried prior to analysis.

4.2 Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the analytical methods. Initial calibrations (ICALs) and continuing calibrations (CCALs) were analyzed at the proper frequency and at the appropriate concentrations required by the methods.

Instrument calibrations were acceptable for all tissue sample analyses performed with the following exception:

- The ICAL for di-n-octyl phthalate exceeded the individual DoD QSM relative standard deviation (RSD) limit of ≤ 15% at 17.5%. The alternate criteria presented both in the DoD QSM (p.139) and EPA guidance was met. Additionally, the CCALs for this analyte were within the control limits. No qualification was assigned to the data based on this ICAL.

4.3 Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank for each analysis and for each analytical batch, per QAPP requirements. Field blanks were not collected as part of this analytical program. Qualification of samples due to method blank contamination followed guidelines set forth in the EPA NFGs.

Organic sample results less than five times (5x) and inorganic sample results (or common laboratory organic contaminates such as phthalates) less than ten times (x10) the method blank concentration and between the method detection limit (MDL) and the method reporting limit (MRL) were qualified as non-detect and flagged with a 'U' at the MRL. When sample results were less than 5x (or 10x) the blank concentration but above the MRL, the reported result was qualified as non-detect and flagged with a 'U'. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Target compounds reported with concentrations greater than 5x (or 10x) the blank concentration were not qualified. For solid matrices reported in both wet and dry weight concentrations, these guidelines were applied using wet weight results and any flags applied were also applied to the dry weight

results. All analytical tests indicate non-detects for method blanks with the following exceptions:

Clams

- Di-n-butyl phthalate was detected in the method blanks associated with sample delivery groups K0801325 and K0801772 at a concentration above the MRL (K0801325) and at a concentration below the MRL (K0801772). Samples K0801325-002, K0801325-006, K0801772-015, and K0801772-016 had results for di-n-butyl phthalate less than 10x the method blank concentration and were between the MDL and the MRL. These results were qualified as not detected and flagged 'U' at the MRL.
- PAHs in sample delivery group K0802503 were reextracted due to low surrogate recoveries (discussed below). The method blank associated with the reextraction (laboratory batch KWG0803570) had low-level detections for anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3,-cd)pyrene, dibenzo(a,h)anthracene and benzo(g,h,i)perylene. The concentrations for the above-noted PAHs in the samples associated with this method blank (all samples in sample delivery group K0802503 and samples K0801772-010 and K0801772-020 (reextracts)) were greater than 5x the method blank concentrations, with the exception a few analytes in samples K0802503-002 and K0802503-005 (see Table 2). The results for PAHs with concentrations less than 5x the method blank concentrations in samples K0802503-002 and K0802503-005 are qualified as not detected and flagged with a 'U'.

Crayfish

- Mercury was detected in the method blank associated with sample delivery group K0802375 at a concentration above the MDL, but below the MRL. All sample results were greater than 10x this concentration; therefore, data were not qualified based on this method blank detection.
- Di-n-butyl phthalate was detected in the method blank associated with sample delivery group K0801458 at a concentration above the MRL. Samples K0801458-003, K0801458-004, K0801458-008, K0801458-010, K0801458-012, K0801458-015 and K0801458-016 had concentrations for di-n-butyl phthalate less than 10x the method blank concentration and were qualified as not detected and flagged 'U' as described above and as indicated in Table 2.
- Di-n-butyl phthalate was detected in the method blank associated with sample delivery group K0802375 at a concentration below the MRL. Samples K0802375-003, K0802375-007, K0802375-008, K0802375-010, K0802375-012 through K0802375-018, K0802375-024 and K0802375-025 had concentrations for di-n-butyl phthalate less than

10x the method blank concentration and were qualified as not detected and flagged 'U' as described above and as indicated in Table 2.

- Fluoranthene, pyrene and benzo(g,h,i)perylene were detected in the method blank associated with sample delivery group K0802375 at concentrations between the MDL and the MRL. All associated sample results for these analytes were reported at concentrations between the MDL and the MRL; therefore, results less than 5x the method blank concentration were qualified as not detected and flagged 'U' at the MRL (see Table 2 for specifics).

4.4 Surrogate Recovery Review

Each sample analyzed for organic compounds was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. As noted above, PAHs and SVOCs were analyzed separately for all tissue matrices and both analyses utilized three surrogates. When more than one surrogate per fraction (acid or base/neutral) was spiked in the sample, PAHs and/or SVOCs were qualified if two or more surrogate recoveries for a given fraction exceeded DoD QSM sample criteria. When only one surrogate per fraction was spiked, all sample results associated with that fraction were qualified when the surrogate recovery exceeded DoD QSM sample criteria. Surrogate recoveries were acceptable for all analyses with the following exceptions:

Clams

- The percent recoveries for PAH surrogates fluorene-d10 and fluoranthene-d10 were below the lower DoD QSM control limit of 60% for some samples in extraction batch KWG0803121 associated with sample delivery group K0801772 (as shown below).

	fluorene-d10	fluoranthene-d10
K0801772-004	52	56
K0801772-010	34	32
K0801772-019	48	53
K0801772-020	36	44

  PAHs in this sample delivery group were reported from a combination of an undiluted analysis and a 5x dilution and the surrogates fluorene-d10 and fluoranthene-d10 for those above-listed samples were outside control limits for both runs (those shown above are from the full-strength run). All PAHs for these samples were qualified and flagged 'J/UJ' based on surrogate recoveries.

- The PAH surrogate recoveries associated with sample delivery group K0802503 were below the DoD QSM control limits (extraction batch KWG0803122). The entire analytical batch was reextracted for PAHs under extraction batch KWG0803570. All results were reported from the secondary analysis; therefore, the original results were flagged 'DNR'. All surrogate recoveries in the secondary analysis were acceptable with

the exception of fluorene-d10 and fluoranthene-d10 in sample K0802503-004 which had recoveries below the lower DoD QSM control limit of 60%. Results for sample K0802503-004 were reported from a combination of an undiluted analysis and a 5x dilution. The surrogate fluorene-d10 was below the lower control limit in both runs and fluoranthene-d10 was below the limit in the 5x dilution (most PAHs are reported from the 5x dilution). All PAH sample results were flagged 'UJ/J' for sample K0802503-004 based on surrogate recoveries.

- The percent recovery for the PAH surrogates fluoranthene-d10 and terphenyl-d14 in sample K0801325-012 were below the lower DoD QSM limits of 60% and 30% with recoveries of 59% and 24%, respectively. All PAHs in sample K0801325-012 were flagged 'J/UJ' to indicate potential low bias.

4.5 Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control/laboratory control duplicate (LCS/LCSD) samples are used to monitor the laboratory's day-to-day performance of routine analytical methods independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. At least one LCS and one MS/MSD for each analysis and for each batch were analyzed per method requirements.

LCS/LCSD and MS/MSD recoveries were acceptable for all analytical tests with the following exceptions:

Clams

- The MS/MSD performed on sample K0802503-005 had percent recoveries above DoD QSM limits for di-n-octyl phthalate and di-n-butyl phthalate. Both analytes were non-detect in the parent sample. The associated LCS and calibration standards indicate that the analytical batch was in control. Therefore, results for di-n-octyl phthalate and di-n-butyl phthalate were not qualified based on MS/MSD recoveries.
- The MSD percent recovery for sample K0802503-005 was below the DoD QSM control limit of 45% for bis(2-ethylhexyl) phthalate at 43%. Additionally, the RPD for the MS/MSD pair was above the 30% control limit at 33%. The associated MS, LCS and calibration standards indicate that the analytical batch was in control. The sample result for bis(2-ethylhexyl) phthalate was qualified as estimated and flagged 'J' in sample K0802503-005 due to the MSD and RPD results.
- MS/MSD percent recoveries were above the upper control limits for di-n-butyl phthalate and di-n-octyl phthalate in the MS/MSD performed on sample K0801772-007. The associated phthalates were non-detect in the parent sample. The associated MS, LCS and

calibration standards indicate that the analytical batch was in control. Analytical results for K0801772-007 were not qualified based on potential bias high MS recoveries.

- MS/MSD percent recoveries were above the upper control limit for di-n-butyl phthalate, butyl benzyl phthalate, bis(2-ethylhexyl) phthalate, and di-n-octyl phthalate in the MS/MSD performed on sample K0801325-005. The associated phthalates were non-detect in the parent sample with the exception of bis(2-ethylhexyl)phthalate which was previously qualified 'J' by the laboratory due to sample results being between the MRL and the MDL. No further qualification was necessary.
- LCS/LCSD percent recoveries associated with sample delivery group K0801325 were above the upper control limit for di-n-butyl phthalate, butyl benzyl phthalate, and di-n-octyl phthalate. The associated phthalates were not detected above the MRL in the associated samples. There were detections reported between the MDL and the MRL for di-n-butyl phthalate in samples K0801325-002 and K0801325-006; however, these detections were previously flagged 'J' by the laboratory. Further estimation of the data due to the potential high bias based on the LCS/LCSD recoveries was not necessary.

Crayfish

- MS/MSDs for copper were analyzed on four crayfish samples (two each from sample delivery groups K0802375 and K0801458). Either one or both of the MS/MSD recoveries in each of the four pairs were below the DoD QSM lower control limit of 80%, with values ranging from 58.5% to 77.4%. Associated QA/QC including LCS, SRM, post-spike and calibration standards indicate that the analytical batch was in control. All copper results in the crayfish samples were flagged 'J' to indicate the potential low bias in this matrix.
- An MS/MSD for aluminum was analyzed in sample K0802375-005 and had recoveries below the DoD limit of 80% at 67.8% and 62.2%, respectively. An MS/MSD analyzed for mercury in sample K0802375-007 had recoveries below the DoD QSM limit of 80% at 66.4% and 73.8%, respectively. Associated QA/QC including LCS, SRM, post-digestion spike and calibration standards indicate that the analytical batches were in control. MS/MSDs analyzed in similar crayfish matrixes were within control limits; therefore, only the parent samples were flagged 'J' to indicate potential low bias for aluminum and mercury in these samples.
- An MS/MSD analyzed for lead in sample K0801458-020 had percent recoveries below the DoD QSM limit of 80% at 73.2% and 75.2%, respectively. Associated QA/QC including LCS, SRM, post-digestion spike and calibration standards indicate that the analytical batch was in control. MS/MSDs analyzed in similar crayfish matrixes were within control limits, therefore only the parent sample was flagged 'J' to indicate potential low bias for lead in this sample.

- The MSD performed on sample K0802375-007 had percent recoveries below the DoD QSM limit of 80% for aluminum at 64.3% and copper at 65.9%. The MS, RPD and other QA/QC criteria were in control for this sample. The sample results were not flagged based solely on the MSD percent recoveries for aluminum and copper.
- The MS performed on sample K0802375-008 had a percent recovery below the DoD QSM limit of 80% for lead at 77.6% and the MS performed on sample K0802375-013 had a percent recovery below the lower limit of 80% for zinc at 72.9%. The MSDs, RPDs, and other QA/QC criteria were in control for these samples. The sample results were not flagged based solely on the MS percent recoveries.
- The percent recovery for lead in one of the standard reference material (SRM) samples (N.R.C.C Dorm-2) was slightly above the CAS control limits of 0.091 mg/kg with a concentration of 0.095 mg/kg in sample delivery group K0801458. The associated QA/QC samples including SRM (N.R.C.C. Tort-2) and the LCS indicate the analysis was in control. Data were not qualified based on the SRM recovery.

4.6 Duplicate Review

Field duplicates were not collected during this sampling event due to the statistical nature of the sampling event (as discussed in detail in the QAPP). To evaluate laboratory precision, CAS performed duplicate analyses (i.e. LCS/LCSD and MS/MSD) as discussed above. No samples were qualified based exclusively on duplicate precision.

4.7 Compound Quantification

Clam and Crayfish

- During the second column confirmation performed by CAS on Method 8082, the sample results for K0802503-001, K0802503-006, and K0801325-010 exceeded the confirmation column agreement criterion of RPD < 40% for Aroclor 1254 and were flagged 'P' by the laboratory. The lower of the results from the analyses on the two columns was selected for reporting due to the apparent interferences observed in the chromatogram for the column with the higher concentration. The sample results for Aroclor 1254 were qualified as estimated and flagged 'J' in the above listed samples.
- Two SRM samples were used to evaluate copper. One SRM (N.R.C.C Dorm-2) associated with sample delivery group K0801772 was above the CAS control limit (i.e. 3.23 mg/kg versus the control of 3.00 mg/kg). The concentration of copper in this SRM is near the sensitivity limit of the instrument. The LCS, MS, calibrations and the second SRM (31.2 mg/kg) were within control limits. Samples were not qualified due to the SRM recovery.

4.8 Reporting Limits

If sample results were detected at concentrations below the MRL but above the MDL, they were identified by the laboratory and flagged with a 'J'. As stated above, these flags are recorded within the database and are reported in the data tables included in the main body of this report.

5.0 Completeness

The laboratory reported all requested analyses and the deliverable data reports were complete. Some data were qualified as estimated and flagged with a 'J' or a 'UJ'. Some data were qualified as not detected and flagged with a 'U.' A summary of qualifiers can be found in Table 2.

Samples K0801772-010 and K0801772-020 were reextracted and reanalyzed in extraction lot KWG0803570. The primary results were flagged 'DNR' and data were reported from the reextracted analyses.

The electronic and .pdf versions of the deliverables were cross-checked for accuracy at a frequency of 20% or greater. Any minor discrepancies found between the deliverables were reported to CAS and corrected by updating the database to reflect the .pdf deliverable.

- *Technical Completeness* = (number of useable results/total reported results) x100

  = (3,371 compliant / 3,371 total results) = 100%

  All samples results are considered usable. In the case of the few samples reextracted and reanalyzed, the original samples flagged 'DNR' were not included in these calculations.

- *Analytical Completeness* = (number of unqualified results/total reported results) x100

  = (3,174 compliant / 3,371 total results) = 94%

  Data were qualified non-detect and flagged 'U' and some as estimated and flagged 'J' or 'UJ.' Data qualified 'J' due to detections between the MRL and the MRL were not included in this calculation.

- *Contract Completeness* = (number of contract compliant results/total reported results) x100

  = (3,371 compliant /3,371 total results) = 100%

  All samples analyzed met laboratory contract requirements.

- *Field Sampling Completeness* =(number samples collected/total reported results) x100

  = (70 compliant / 73 total results) = 96%

All samples collected and submitted to CAS for analysis had acceptable results with the exception of the 3 crayfish samples which had inadequate sample volume for the SVOC analyses.

6.0 References

DOD 2006. Department of Defense Environmental Data Quality Workgroup. Department of Defense (DOD) Quality Systems Manual (QSM) for Environmental Laboratories. Final Version 3. January 2006. Retrieved from [http://www.navylabs.navy.mil/Archive/DoDV3.pdf] on 3/3/06

PSEP 1996. Puget Sound Estuary Program *Recommended Protocols for Measuring Selected Environmental Variables in Puget Sound*, January 1996 and subsequent chapter revisions.

URS 2008. Memorandum: *Post-Removal Sample Collection*, Bradford Island Disposal Site, Bonneville Dam Forebay – Cascade Locks, Oregon May 12, 2008

URS 2007. Quality Assurance Project Plan, *River Operable Unit Remedial Investigation*, Bradford Island, Bonneville Lock and Dam Project, Cascade Locks, Oregon. September 2007.

USEPA 2004. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. October 2004.

USEPA 1999. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review. October 1999.

Table 1. Clam and Crayfish Sample ID and Analysis Summary

Quality Control Summary Report for Analytical Chemistry

February/March 2008 Sampling Event

Station Number	URS ID	DATE COLLECTED	CAS ID	Anaytes						
				PCB (Aroclors)	SVOCs	PAHs	Metals	Methyl Mercury	%Lipids	%Solids
Clam - Forebay										
4	08022604TC	19-Feb	K0801325-010	X	X	X	X	X	X	X
7	08021507TC	15-Feb	K0801325-004	X	X	X	X	X	X	X
8	08021508TC	15-Feb	K0801325-005	X	X	X	X	X	X	X
9	08021409TC	14-Feb	K0801325-006	X	X	X	X	X	X	X
10	08021410TC	14-Feb	K0801325-008	X	X	X	X	X	X	X
11	08021411TC	14-Feb	K0801325-007	X	X	X	X	X	X	X
15	08022115TC	21-Feb	K0801325-012	X	X	X	X	X	X	X
16	08022116TC	21-Feb	K0801325-013	X	X	X	X	X	X	X
17	08022117TC	21-Feb	K0801325-014	X	X	X	X	X	X	X
18	08021118TC	11-Feb	K0801325-003	X	X	X	X	X	X	X
21	08021221TC	12-Feb	K0801325-002	X	X	X	X	X	X	X
5	08031905TC	19-Mar	K0802503-006	X	X	X	X	X	X	X
6	08031806TC	18-Mar	K0802503-001	X	X	X	X	X	X	X
13	08031713TC	17-Mar	K0802503-002	X	X	X	X	X	X	X
14	08031814TC	14-Mar	K0802503-003	X	X	X	X	X	X	X
65	08022965TC	29-Feb	K0802503-008	X	X	X	X	X	X	X
67	08030367TC	3-Mar	K0802503-007	X	X	X	X	X	X	X
88	08031788TC	17-Mar	K0802503-004	X	X	X	X	X	X	X
89	08031789TC	17-Mar	K0802503-005	X	X	X	X	X	X	X
Clam - Reference Area										
22	08030522TC	5-Mar	K0801772-012	X	X	X	X	X	X	X
24	08030524TC	5-Mar	K0801772-011	X	X	X	X	X	X	X
26	08030427TC	4-Mar	K0801772-018	X	X	X	X	X	X	X
27	08030426TC	4-Mar	K0801772-019	X	X	X	X	X	X	X
28	08030428TC	4-Mar	K0801772-014	X	X	X	X	X	X	X
29	08022229TC	22-Feb	K0801772-020	X	X	X	X	X	X	X
34	08022534TC	25-Feb	K0801772-021	X	X	X	X	X	X	X
35	08022535TC	25-Feb	K0801772-001	X	X	X	X	X	X	X
36	08022536TC	25-Feb	K0801772-002	X	X	X	X	X	X	X
37	08022637TC	26-Feb	K0801772-003	X	X	X	X	X	X	X
38	08022738TC	27-Feb	K0801772-004	X	X	X	X	X	X	X
39	08022739TC	27-Feb	K0801772-005	X	X	X	X	X	X	X
40	08022740TC	27-Feb	K0801772-006	X	X	X	X	X	X	X
41	08022741TC	27-Feb	K0801772-007	X	X	X	X	X	X	X
42	08022742TC	27-Feb	K0801772-010	X	X	X	X	X	X	X
85	08030685TC	6-Mar	K0801772-015	X	X	X	X	X	X	X
86	08030686TC	6-Mar	K0801772-016	X	X	X	X	X	X	X
87	08030687TC	6-Mar	K0801772-017	X	X	X	X	X	X	X
Crayfish - Forebay										
1	08021901CF	19-Feb	K0801458-005	X	X	X	X	X	X	X
2	08021902CF	19-Feb	K0801458-006	X			X	X	X	X
3	08022003CF	20-Feb	K0801458-007	X			X	X	X	X
4	08021904CF	19-Feb	K0801458-008	X	X	X	X	X	X	X
5	08021505CF	15-Feb	K0801458-009	X	X	X	X	X	X	X

Table 1. Clam and Crayfish Sample ID and Analysis Summary
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

Station Number	URS ID	DATE COLLECTED	CAS ID	Anaytes						
				PCB (Aroclors)	SVOCs	PAHs	Metals	Methyl Mercury	%Lipids	%Solids
6	08021406CF	14-Feb	K0801458-001	X	X	X	X	X	X	X
7	08021407CF	14-Feb	K0801458-003	X	X	X	X	X	X	X
8	08021408CF	14-Feb	K0801458-002	X	X	X	X	X	X	X
13	08021413CF	14-Feb	K0801458-004	X	X	X	X	X	X	X
14	08022014CF	20-Feb	K0801458-010	X	X	X	X	X	X	X
15	08021915CF	19-Feb	K0801458-011	X	X	X	X	X	X	X
16	08022216CF	22-Feb	K0801458-020	X	X	X	X	X	X	X
17	08021917CF	19-Feb	K0801458-012	X	X	X	X	X	X	X
18	08021918CF	19-Feb	K0801458-013	X	X	X	X	X	X	X
19	08021919CF	19-Feb	K0801458-014	X	X	X	X	X	X	X
20	08021920CF	19-Feb	K0801458-015	X	X	X	X	X	X	X
21	08021921CF	19-Feb	K0801458-016	X	X	X	X	X	X	X
Crayfish - Reference Area										
22	08022622CF	19-Feb	K0802375-024	X	X	X	X	X	X	X
33	08022233CF	19-Feb	K0802375-025	X	X	X	X	X	X	X
38	08021838CF	20-Feb	K0802375-003	X	X	X	X	X	X	X
42	08022842CF	19-Feb	K0802375-004	X	X	X	X	X	X	X
72	08030372CF	15-Feb	K0802375-005	X	X	X	X	X	X	X
73	08030373CF	14-Feb	K0802375-006	X	X	X	X	X	X	X
74	08030374CF	14-Feb	K0802375-007	X	X	X	X	X	X	X
75	08030375CF	14-Feb	K0802375-008	X	X	X	X	X	X	X
76	08030376CF	14-Feb	K0802375-009	X	X	X	X	X	X	X
78	08030378CF	20-Feb	K0802375-010	X	X	X	X	X	X	X
79	08030379CF	19-Feb	K0802375-011	X	X	X	X	X	X	X
82	08030382CF	22-Feb	K0802375-012	X	X	X	X	X	X	X
90	08031290CF	19-Feb	K0802375-013	X	X	X	X	X	X	X
91	08031291CF	19-Feb	K0802375-014	X	X	X	X	X	X	X
92	08031292CF	19-Feb	K0802375-015	X	X	X	X	X	X	X
94	08031294CF	12-Mar	K0802375-016	X	X	X	X	X	X	X
98	08031298CF	12-Mar	K0802375-017	X	X	X	X	X	X	X
100	080312100CF	19-Feb	K0802375-018	X	X	X	X	X	X	X
105	080314105CF	19-Feb	K0802375-019	X			X	X	X	X

Notes:
SVOCs and PAHs are analyzed separately for tissue matrices.
= insufficient tissue volume to analyze SVOCs and PAHs

Table 2. Clam and Crayfish Qualifer Summary
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

Station Number	URS ID	CAS ID	Analyte	Qualifer	Rational
Clam					
21	08021221TC	K0801325-002	di-n-butyl phthalate	40U	MB detection
9	08021409TC	K0801325-006		56U	
85	08030685TC	K0801772-015		35U	
86	08030686TC	K0801772-016		38U	
89	08031789TC	K0802503-005	benzo(b)fluoranthene	0.74U	MB detection
			benzo(k)fluoranthene	0.58U	
			benzo(a)pyrene	0.86U	
			indeno(1,2,3-cd)pyrene	0.26U	
			dibenzo(a,h)anthracene	0.11U	
			benzo(g,h,i)perylene	0.38U	
13	08031713TC	K0802503-002	benzo(g,h,i)perylene	0.56U	MB detection
38	08022738TC	K0801772-004	acenapthene fluorene phenanthrene anthracene fluoranthene pyrene benzo(a)anthracene chrysene benzo(a)fluoranthene benzo(k)fluoranthene benzo(a)pyrene indeno(1,2,3-cd)pyrene dibenzo(a,h)anthracene benzo(g,h,i)perylene	J/UJ	PAH surrogate recovery *(fluorene-d10 and fluoranthene-d10)*
42	08022742TC	K0801772-010			
27	08030426TC	K0801772-019			
29	08022229TC	K0801772-020			
88	08031788TC	K0802503-004			
15	08022115TC	K0801325-012	PAHs (see list above)	J/UJ	PAH surrogate recovery *(fluorene-d10 and terphenyl-d14)*
4	08022604TC	K0801325-010	Aroclor 1254	J	second column confirmation
5	08031905TC	K0802503-006			
6	08031806TC	K0802503-001			
89	08031789TC	K0802503-005	bis(2-ethylhexyl) phthalate	J	MSD and RPD recoveries
42	08022742TC	K0801772-010	PAHs	DNR	Report data from reextraction
29	08022229TC	K0801772-020			
PAH results in K0802503					
Crayfish					
4	08021904CF	K0801458-008	di-n-butyl phthalate	180U	MB detection
7	08021407CF	K0801458-003		58U	
13	08021413CF	K0801458-004		39U	
14	08022014CF	K0801458-010		48U	
20	08021920CF	K0801458-015		37U	
21	08021921CF	K0801458-016		38U	
17	08021917CF	K0801458-012		76U	
38	08021838CF	K0802375-003		92U	
74	08030374CF	K0802375-007		110U	
75	08030375CF	K0802375-008		79U	
78	08030378CF	K0802375-010		45U	
82	08030382CF	K0802375-012		70U	
90	08031290CF	K0802375-013		73U	
91	08031291CF	K0802375-014		40U	
92	08031292CF	K0802375-015		38U	
94	08031294CF	K0802375-016		55U	
98	08031298CF	K0802375-017		57U	
100	080312100CF	K0802375-018		39U	
22	08022622CF	K0802375-024		80U	
33	08022233CF	K0802375-025		50U	
22	08022622CF	K0802375-024	fluoranthene pyrene	0.49U	MB detection
33	08022233CF	K0802375-025			
38	08021838CF	K0802375-003	fluoranthene pyrene	0.50U	
42	08022842CF	K0802375-004			
91	08031291CF	K0802375-014			
92	08031292CF	K0802375-015			
94	08031294CF	K0802375-016			
73	08030373CF	K0802375-006			

Table 2. Clam and Crayfish Qualifer Summary
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

Station Number	URS ID	CAS ID	Analyte	Qualifer	Rational
72	08030372CF	K0802375-005	fluoranthene pyrene benzo(g,h,i)perylene	0.48U	MB detection
74	08030374CF	K0802375-007	fluoranthene pyrene benzo(g,h,i)perylene	0.50U	
75	0803075CF	K0802375-008	fluoranthene pyrene	0.48U	
76	08030376CF	K0802375-009	fluoranthene pyrene	0.49U	
78	08030378CF	K0802375-010			
79	08030379CF	K0802375-011			
82	08030382CF	K0802375-012			
90	08031290CF	K0802375-013	fluoranthene pyrene	0.45U	
98	08031298CF	K0802375-017	fluoranthene pyrene benzo(g,h,i)perylene	0.49U	
100	080312100CF	K0802375-018	fluoranthene pyrene	0.49U	
1	08021901CF	K0801458-005	copper	J	MS/MSD recoveries
2	08021902CF	K0801458-006			
3	08022003CF	K0801458-007			
4	08021904CF	K0801458-008			
5	08021505CF	K0801458-009			
6	08021406CF	K0801458-001			
7	08021407CF	K0801458-003			
8	08021408CF	K0801458-002			
13	08021413CF	K0801458-004			
14	08022014CF	K0801458-010			
15	08021915CF	K0801458-011			
16	08022216CF	K0801458-020			
17	08021917CF	K0801458-012			
18	08021918CF	K0801458-013			
19	08021919CF	K0801458-014			
20	08021920CF	K0801458-015			
21	08021921CF	K0801458-016			
22	08022622CF	K0802375-024			
33	08022233CF	K0802375-025			
38	08021838CF	K0802375-003			
42	08022842CF	K0802375-004			
72	08030372CF	K0802375-005			
73	08030373CF	K0802375-006			
74	08030374CF	K0802375-007			
75	08030375CF	K0802375-008			
76	08030376CF	K0802375-009			
78	08030378CF	K0802375-010			
79	08030379CF	K0802375-011			
82	08030382CF	K0802375-012			
90	08031290CF	K0802375-013			
91	08031291CF	K0802375-014			
92	08031292CF	K0802375-015			
94	08031294CF	K0802375-016			
98	08031298CF	K0802375-017			
100	080312100CF	K0802375-018			
105	080314105CF	K0802375-019			
16	08022216CF	K0801458-020	lead	J	MS/MSD recoveries
72	08030372CF	K0802375-005	aluminum		
74	08030374CF	K0802375-007	mercury		

Notes:
Not included are laboratory-assigned J flags indicating detections above the MDL and below the MRL.
Concentrations are reported in weight wet.

RIVER OPERABLE UNIT REMEDIAL INVESTIGATION REPORT

QUALITY CONTROL SUMMARY REPORT FOR ANALYTICAL CHEMISTRY

WATER – FEBRUARY/MARCH 2008 SAMPLING EVENT

JULY 2008

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1.0 Executive Summary

The overall assessment of the grab water and high volume water sample results shows the quality of the data is acceptable to support project objectives. The contracted laboratories provided all requested analyses and delivered data reports were complete. Some data were qualified as estimated 'J' or 'J-EMPC' and some as non-detect 'U'. All data qualifiers resulting from this review have been added to both the project database and the data tables within the main body of the River Operable Unit Remedial Investigation Report.

2.0 Project Description

URS collected and authorized analysis of 11 grab water samples (10 primary and one field duplicate) and 11 high volume water samples (10 primary and one field blank) during the remedial investigation near Bradford Island at Bonneville Dam between February 11 and March 20, 2008. Tables 1 summarizes the sample location, media, URS and laboratory identification numbers and the requested analyses.

3.0 Sampling and Analytical Procedures

Samples were collected according to the Quality Assurance Project Plan (QAPP) *River Operable Unit Remedial Investigation* (URS 2007). Deviations from the QAPP protocol were not necessary, specific details of the sample collection are addressed in the Post-Removal Sample Collection Memorandum (URS 2008). Briefly, high-volume water samples were collected using an Infiltrex 300 Organic Sampling System (Infiltrex) supplied by Axys Environmental Systems in Sidney, British Columbia, Canada. Water is pumped in series through a wound-glass filter to remove particulate-bound analytes, and through a column packed with macroreticular porous resin (XAD resin) where dissolved-phase analytes are absorbed. During this field effort, approximately 600 liters of water were filtered for each sample. The filter and column at each sample location were analyzed separately to represent the particulate and dissolved phase of the water column. Flow rate was measured both on the Infiltrex's internal digital flow meter and verified periodically by hand using a graduated cylinder and a stopwatch. The reported concentrations are calculated using the total volume from the digital flow meter. Additionally, grab water samples were collected at each sample station using a peristaltic pump and dedicated tubing.

All Infiltrex samples were submitted to Axys Analytical Services, Ltd. Located in Sidney, British Columbia (Axys) for analysis. Grab water samples were sent to Columbia Analytical Services (CAS) located in Kelso, WA. Axys uses specialized methods to analyze PAHs and phthalate esters, these methods are modeled after EPA Method 1668A, in that target concentrations are determined by a either isotope dilution or isotopically labeled internal standards using high resolution gas chromatography/low resolution mass spectroscopy (HRGC/LRMS). Sample-specific detection limits are also calculated similar to EPA 1668A.

Axys provides details about these methods in the case narratives within the data deliverables. The PAH and phthalate ester data qualifiers applied during this review are similar to those applied to the congener data.

The following table lists the parameters analyzed on one or more of the samples. Axys was not able to analyze for two analytes in the project-specific SVOC list (carbazole and p-cresol), the remaining four analytes in the project-specific SVOC list were phthalate esters and therefore, Axys refers to the SVOCs as phthalates esters in the reporting of the data. For clarity, the SVOCs are referred to as phthalate esters in this report. Table 1 summarizes the specific requested analyses for each media by URS and laboratory identification numbers.

Method	Analytical Parameter
EPA 1668A (Axys MLA-010) – HRGC/HRMS	Polychlorinated Biphenyls (PCBs) – Congeners
Axys MLA-021 – HRGC/LRMS	Polycyclic Aromatic Hydrocarbons (PAHs)
Axys MLA-027 – HRGC/LRMS	SVOCs (Phthalate Esters)
NWTPH-Dx (Ecology 1997)	Northwest Total Petroleum Hydrocarbons – Diesel Range (NWTPH-Dx)
415.1	Total Organic Carbon (TOC)
415.1	Dissolved Organic Carbon (DOC)
EPA 300.0	Chloride, Sulfate
EPA 353.2	Nitrate/Nitrite

HR – High Resolution
LR – Low Resolution
GC – Gas Chromatography
MS – Mass Spectrometry

4.0 Data Validation

Analyses were performed in general accordance with the above reference methods. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, chain of custody (COC), laboratory case narrative, proper sample preservation and handling procedures, holding times, initial and continuing calibrations, quantitation limits, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The following items will be reviewed on 15% or greater of the data: primary and secondary

column verification, instrument calibration and a verification of the reported electronic data with the hard copy deliverable.

The data were reviewed in accordance with the Quality Assurance Project Plan (QAPP) *River Operable Unit Remedial Investigation* (URS 2007). Additionally, because the QAPP-referenced *Department of Defense Quality Systems Manual* does not discuss PCB congeners, the data review process utilized guidance from EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review (September 2005) and EPA Region 10 Standard Operating Procedure (SOP) for the Validation of Method 1668 Toxic, Dioxin-like*. For the specialized PAH and phthalate ester method developed by Axys, laboratory derived quality criteria in conjunction with the above listed guidance were used in this review.

All remaining non-congener data results were reviewed in accordance with the criteria contained in the DoD QSM (DoD QSM, 2006) and the above listed methods and the following EPA guidance documents in that order; EPA's *NFGs for Organic Data Review (USEPA 1999)* and EPA's *NFGs for Inorganic Data Review (USEPA 2004)*. Project-specific QC criteria are listed in the above mentioned QAPP. A summary of qualifiers assigned to results in this investigation as part of this review is included in Table 2. Samples are referenced by both by their URS sample identification assigned in the field as well as the laboratory identification. CAS was requested to report analytical results above the method detection limit (MDL) but below the method reporting limit (MRL). These results were flagged 'J' by CAS Kelso and are not included in Table 2. Non-detect values for PCBs, PAHs and SVOCs (phthalate esters) as analyzed by Axys are reported at their respective sample-specific detection limits as discussed above. Qualifiers that may be assigned to the results of this investigation include the following:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.

- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

- J-EMPC – The analyte was not positively identified; the associated numerical value is the **E**stimated **M**aximum **P**otential **C**oncentration of the analyte in the sample used only for PCB congener results.

- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

- DNR - Do Not Report

Final sample results and qualifiers are presented in the analytical tables provided in the sampling report.

4.1 Chain-of-Custody, Sample Preservation and Holding Time

Grab Water Samples

The chain-of-custody (COC) forms indicate that samples were maintained under chain of custody and forms were signed upon release and receipt, with the exception of one COC form associated with sample delivery group K0802104. This COC form was not signed by URS upon release to the sample courier, the sample courier did sign the COC and all samples arrived intact at the laboratory. Data within this sample delivery group were not qualified based on missing COC signature.

All samples were sent via CAS courier in wet ice and were received and logged in the same day. All coolers were submitted at temperatures within the EPA-recommended temperature of 6°C or below. Data were not qualified based COC or cooler temperature.

The QAPP stated unpreserved sample containers would be used for TPH samples, however HCl preserved containers were used to extend the holding time from 7 to 14 days per guidance from the NWTPH method. All water samples were analyzed within the technical and contracted holding times.

Infiltrex Samples

Infiltrex columns and filters were stored at or below 6°C by URS until the completion of the last Infiltrex sampling event. All Infiltrex samples were shipped with gel ice packs via FedEx to Axys on March 17, 2008. The chain-of-custody (COC) forms indicate that samples were maintained under chain of custody, and forms were signed upon release and receipt. All Infiltrex samples were analyzed within the technical holding times.

4.2 Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the analytical methods. Initial calibrations (ICAL) and continuing calibrations (CCAL) were analyzed at the proper frequency and at the appropriate concentrations required by the methods.

Grab Water

Instrument calibrations were acceptable for all samples analyses performed.

Infiltrex (congeners)

Initial calibrations (ICALs) and continuing calibration verifications (CCVs) were reviewed for PCB congener analyses. The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the Method 1668A. ICALs, CCVs and OPR (ongoing precision recovery) standards were analyzed at the proper frequency and at the appropriate concentrations required by EPA Method 1668A. All calibration compounds analyzed associated with the Infiltrex samples meet the acceptance criteria as listed in Method 1668A.

Infiltrex (PAHs and phthalate esters)

ICAL and CCVs were reviewed for PAHs and phthalate esters. Similar to Method 1668A the ICAL is performed using a series of solutions including the suite of labeled surrogates and recovery standards that encompass the working concentration range of the instrument. CCVs are analyzed bracketing the samples as well as once every twelve hours. All calibration compounds analyzed associated with the Infiltrex samples meet Axys derived acceptance criteria.

Labeled Internal Standard Recovery Review (Infiltrex samples only)

PCB congeners

PCB congener samples were spiked with labeled internal standards prior to extraction or cleanup. These standards are used to quantitate target congeners and the calculations of target compound concentrations are designed to compensate for low extraction and/or cleanup efficiencies. In addition, their recovery is measured against labeled injection standards added after extraction and cleanup to evaluate extraction and/or cleanup efficiency which could affect sensitivity and could also affect accuracy for target compounds not quantitated against a chemically identical, isotopically labeled standard. The percent recovery of the labeled standards is compared with the limits set forth in EPA Method 1668A. All recoveries were acceptable.

Cleanup standards are added prior to cleanup and quantitated using injection standards added just prior to analysis to evaluate cleanup efficiency. The cleanup standards were within the 30-135% control limits set by EPA Method 1668A.

PAHs and phthalate esters

Similar to the above mentioned Method 1668A, labeled standards are spiked into the sample prior to the beginning of analysis. These labeled standards (called ‘surrogates’ within the Axys data packages) are deuterated versions of the PAH and phthalate ester parent analytes. All samples are recovery-corrected based on the concentration of these labeled standards. The percent recovery of these deuterated standards were within Axys derived control limits with the following exceptions:

- d4-dimethyl phthalate associated with sample L10998-4 was below the Axys control limit of 40% with 33.5%. As stated above all results are recovery corrected, therefore the results for dimethyl phthalate were not flagged based this labeled standard recovery.

Cleanup standards are not used for PAH and phthalate ester analysis.

4.3 Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank for each analysis and for each batch, per QAPP requirements. Qualification of samples due to method or field blank contamination followed guidelines set forth in the EPA NFGs .

Grab Water

For organic and inorganic analyses, sample results less than five times (5x) (or 10x for phthalates) the method blank or field blank concentration and between the method detection limit (MDL) and the method reporting limits (MRL) were flagged as non-detect 'U' at the MRL. When sample results were less than 5x (or 10x for phthalates) the blank concentration but above the MRL, the reported result was qualified as non-detect 'U'. Target compounds detected in the method but reported as not detected in the associated samples were not qualified. Target compounds reported with concentrations greater than 5x the blank concentration were not qualified. For inorganic analyses initial and continuing calibration blanks were examined in addition to the standard method blank samples. Field blanks were not collected for the grab water during this sampling event. All analytical tests indicate non-detects for method blanks with the following exceptions:

- Chloride was detected in the method blank below the MRL in sample delivery group K0801765. All sample results were above 5x the method blank concentration therefore, data were not qualified based on this method blank detection.
- Arsenic, beryllium, copper and thallium were detected in the continuing calibration blank (CCB) below the MRLs in sample delivery group K0801765. All associated detected results were greater than 10x the CCB concentrations with the exception of arsenic in samples K0801765-003 Diss and K0801765-005 Diss, cadmium in samples K0801765-003 and K0801765-005 and thallium in samples K0801765-001, K0801765-001 Diss, K0801765-003, K0801765-003 Diss, K0801765-005 and K0801765-005 Diss. Results for these samples were flagged 'U' following guidance described above.
- Aluminum, antimony, mercury and nickel were detected below the MRLs in the method blank and beryllium was detected below the MRL in the continuing calibration blank in sample delivery group K0801289. All associated detected results were greater than 10x the MB concentrations with the exception of aluminum in sample K0801289-001, K0801289-001 Diss, K0801289-002 and K0801289-002 Diss, results for aluminum were flagged 'U' at the MRL.
- Antimony and mercury were detected below the MRLs in the method blank in sample delivery group K0801530. All samples results were non-detect for mercury. All associated detected results for antimony were below the MRL and above the MDL. Detected results for antimony for samples K0801530-005, K0801530-005 Diss and K0801530–009 were flagged 'U' at the MRL.

- Residual Range Organics (RRO) were detected below the MRL in the method blank in sample delivery groups K0801289 and K0801530. Samples results detected below 5x the MB concentration and below the MRL and were flagged 'U' at the MRL.
- Arsenic, beryllium, cadmium, copper and thallium were detected in the continuing calibration blank (CCB) below the MRLs in sample delivery group K0802104. All associated detected results were greater than 10x the CCB concentrations with the exception of arsenic in samples K0802104-001 and K0802104-001 Diss, cadmium in sample K0802104-001 and thallium in sample K0802104-001. Results for these samples were flagged 'U' as described above.

Infiltrex

Sample results that were reported as detected at a concentration less than five times (5x) (or 10x for phthalates) the associated method blank concentration were flagged 'U' or non-detect at the reported concentration. Target compounds reported with concentrations greater than 5x (or 10x for phthalates) the laboratory or field blank concentration were not qualified. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified.

Method 1668A stipulates using a method blank as similar to the sample matrix as possible. Method blanks were prepared using clean filters and XAD resin. Method blank analytical results were non-detects with the exception of some PCB congeners and phthalate esters.

A field blank was collected on the Infiltrex to measure background levels of chemicals of potential concern in the atmosphere, instrument tubing and XAD column and filters. The field blank was collected by pumping laboratory provided deionized (6 liters) water through the Infiltrex system. Field blank analytical results were non-detects with the exception of some PCB congeners, PAHs and phthalate esters.

The sample concentrations in the data deliverables are reported as picograms per liter (pg/L) or absolute picograms measured divided by volume (in liters) pumped through the Infiltrex system. Since the volume of each sample varies and the method blank and field blank do not have comparable volumes to the samples, both the blank comparisons were performed using the absolute picograms concentrations. Picograms concentrations were calculated by multiplying the total volume (in liters) by the reported concentration in pg/L. Tables 4 and 5 indicate the results that were qualified non-detect 'U' based on method blank and field blank concentrations.

4.4 Surrogate Recovery Review

Each sample analyzed for organic compounds other than the HRGC/HRMS and HRGC/LRMS analyses was spiked with surrogates (system monitoring compounds) prior to extraction. Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. Surrogate recoveries were acceptable for all analyses with the following exceptions:

- Surrogates o-terphenyl and n-triacontane in the LCS standard for NWTPH in sample delivery group K0802104 had recoveries above control limits of 150% with 152% and

155% respectively. All samples were non-detect, therefore data were not qualified based on the potential high bias indicated by the recoveries of the surrogates.

- Surrogate recoveries for o-terphenyl and n-triacontane in the LCS associated with the NWTPH analysis for sample delivery group K0801289 were below the lower control limits of 50%. The duplicate LCS and all other surrogate recoveries within project samples were within the control limits, the bias low recoveries appears to be isolated to the single LCS sample, data were not qualified based on surrogate recoveries in the LCS.

4.5 Infiltrex Sampling Recovery Standards

Analytes can both adsorb and desorb from the XAD resin during the high volume sampling process. In order to understand analyte retention on the XAD resin during sampling, labeled standards are spiked onto the Infiltrex columns prior to sample collection. Axys spiked carbon-13 labeled PCBs (PCB 31, PCB 95 and PCB 153) as well as deuterated anthracene (d10-anthracene) onto the Infiltrex columns prior to shipment to URS. High recoveries of these labeled standards suggest little to no net loss of adsorbed analytes on the XAD column during this sampling event. The recoveries of these analytes shown in Table 6 and are presented in the Axys data deliverables as 'client standards'.

4.6 Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control samples (LCS) are used to monitor the laboratory's day-to-day performance of routine analytical methods, independent of matrix effects and to assess accuracy of the analysis for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. At least one LCS and one MS/MSD for each analysis and for each batch per method requirements. MS/MSD samples are not required for PCB congener analysis and not used for PAHs and phthalate esters as analyzed per Axys method. Ongoing precision and recovery (OPR) samples are used in place of LCS to monitor laboratory performance.

LCS, OPR and MS/MSD recoveries were acceptable for all analytical tests with the following exceptions:

- The LCS associated with the NWTPH-Dx analysis in sample delivery group K0801269 had low surrogate recoveries as discussed above. LCS recoveries for this LCS sample were also low. The low recoveries appear to be isolated with the LCS, the duplicate LCS recoveries were within control limits and the associated surrogates in the samples were acceptable. NWTPH-Dx results were not considered to need qualification as estimated based on the LCS recoveries.

- OPR recovery of acenaphthene was over the Axys derived control limit of 130% with 152% in DPW25236, all associated sample results for acenaphthene in the XAD filters were non-detect. Therefore, data was not qualified based on the potential high bias indicated by the high OPR recovery.

4.7 Duplicate Review

A field duplicate was collected at one grab water sampling location by simultaneously filling duplicate sets of laboratory-provided sample containers to verify acceptable field sampling techniques and representativeness of sample aliquots to the medium sampled. Field duplicates were not collected for the Infiltrex samples. The RPD for field duplicates was calculated when both sample results were greater than 5x the reporting limit. Field duplicate precision was acceptable.

To evaluate laboratory precision, CAS performed duplicate analyses (i.e. LCS/LCSD and MS/MSD) as discussed above. All values were expectable with the following exceptions:

- As previously discussed the LCS for NWTPH-Dx in sample delivery group K0801289 had low recoveries, resulting in RPD values for the LCS/LSCD pair being outside the control limits. The data were not considered to need qualification as estimated due to the LCS recoveries and likewise the RPD values for the reasons described above under LCS evaluation.

4.8 Compound Quantification

As detailed in Table 2, some congener results were qualified as non-detect due to method blank contamination. Results were qualified as non-detect at the MRL; therefore, these non-detect results do not have elevated detection limits which should be considered by the data user as part of evaluating the data for end-use objectives.

The internal standard method is used to calculate concentrations of PCB congeners that do not have chemically identical labeled standards. The internal standard method is dependent upon consistent detector response over the calibration range. If the detector response varies, concentrations can be biased high or low based on variations in the detector sensitivity. During congener analysis, PFK (perfluorokerosene) is used as a lock mass reference standard to measure changes in detector sensitivity. Each lock mass must not vary more than 20% throughout its respective retention time window as required by Method 1668A. Variations of more than 20% indicate the presence of a co-eluting interference or decreased sensitivity. A slight deviation was seen in the lock mass spectra associated with the mono-chlorinated PCBs in the XAD filter samples (DPWG25357). This deviation in lock mass did not effect the quantification of the target PCBs. No congener results were qualified based on lock mass variations.

4.9 Compound Identification

Ion abundance ratios are used to identify PCB congeners, PAHs and phthalate esters. Results that met all other qualitative identification criteria but were more than 15% different from the theoretical ion abundance criterion for PCBs as set by EPA Method 1668A are flagged in the laboratory report with a ‘K’ flag. PAHs and phthalate esters with relative ion abundance ratios

greater than 20% different from the opening calibration values are flagged 'K'. Those results flagged 'K' with ion abundance ratios outside the identified quantitation criteria are considered estimated maximum possible concentrations (EMPC) and were re-flagged 'J-EMPC' during this review. If the analyte result was previously qualified 'U' by method blank detection, the result retained the 'U' qualifier and it was not qualified further because an ion ratio was out of limits (there is no ion ratio criterion for non-detects). J-EMPC qualifiers are shown in Tables 4 and 5, the database has been updated and the flags will appear in any future data tables that are created from the project database.

Ion ratios outside the control limits are generally a consequence of co-eluting interferences to either one or both quantitation peaks. In these cases, Axys chose to use the quantitation peak areas as recorded; no adjustments were made to force the peaks to match the theoretical ion abundance ratios. EMPC results should be considered by the data users as part of evaluating the data for end-use objectives.

4.9 Reporting Limits

If sample concentrations were detected below the MRL but above the MDL, they were identified by CAS and flagged estimated, 'J'. This laboratory flag was carried over to a "J" as the URS Review Qualifier and is recorded in the database and in the data tables included in the main body of this report.

5.0 Completeness

The laboratory reported all requested analyses and the deliverable data reports were complete. Some results were considered to be estimated and were qualified 'J', 'J-EMPC' and others were considered non-detects, 'U', based on blank contamination. A summary of qualifiers can be found in Tables 2 through 5.

The electronic and pdf versions of the deliverables were cross-checked for accuracy at a frequency of 20% or greater. Any minor discrepancies found between the deliverables were reported to the associated laboratory and corrected by updating the database to reflect the .pdf deliverable.

- *Technical Completeness* = (number of useable results/total reported results) x100

  = (5,742 compliant / 5,742 total results) = 100%

  All samples results are considered useable.
- *Analytical Completeness* = (number of unqualified results/total reported results) x100

  = (4,732 compliant / 5,742 total results) = 82%

  Data were qualified non-detect 'U' and some as estimated 'J' of 'J-EMPC'. Data qualified 'J' due to detections between the MRL and the MRL were not included in this calculation.

- *Contract Completeness* = (number of contract compliant results/total reported results) x100

  = (5,742 compliant /5,742 total results) = 99%

  All samples analyzed met laboratory contract requirements.

- *Field Sampling Completeness* =(number samples collected/total reported results) x100

  11 grab water + 22 Infiltrex = 33 samples collected

  =(33 compliant / 33 total results) =100%

  All samples collected and submitted to CAS and Axys for analysis had a complete set of results. All samples had sufficient sample volume to analyze the full analyte list as detailed in the QAPP.

6.0 References

Axys MLA–027. *Determination of Polycyclic Aromatic Hydrocarbons (PAHs), Alkylated PAH and Alkanes in Sediment, Tissue, Water, Hexane Extracts, XAD Resin and Filter Samples by GC/MS*. MSU-009 Rev 3. November 27, 2007.

Axys MLA–021. *Determination of Phthalate Esters in Sediment, Tissue, Water, Hexane Extracts, XAD Resin and Filter Samples by GC/MS*. MSU-009 Rev 8. December 17, 2007.

DOD 2006. Department of Defense Environmental Data Quality Workgroup. Department of Defense (DOD) Quality Systems Manual (QSM) for Environmental Laboratories. Final Version 3. January 2006. Retrieved from [http://www.navylabs.navy.mil/Archive/DoDV3.pdf] on 3/3/06

Ecology 1997. Washington State Department of Ecology, *Analytical Methods for Petroleum Hydrocarbons*, Publication ECY 97-602, June 1997.

URS 2008. Memorandum: *Post-Removal Sample Collection*, Bradford Island Disposal Site, Bonneville Dam Forebay – Cascade Locks, Oregon May 12, 2008

URS 2007. Quality Assurance Project Plan, *River Operable Unit Remedial Investigation*, Bradford Island, Bonneville Lock and Dam Project, Cascade Locks, Oregon. September 2007.

USEPA 2005. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review. September 2005.

USEPA 2004. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. October 2004.

USEPA 1999. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review. October 1999.

USEPA 1995. U.S. Environmental Protection Agency (USEPA) Region 10 for the Validation of Method 1668 Toxic, Dioxin-like, PCB Data. December 1995.

Table 1. Infiltrex Water Sample ID and Analysis Summary

Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

Station Number	URS ID	Date Collected	Axys ID (Filter)	Axys ID (Column)	PCB (congeners)	PAHs	SVOCs (Phthalate Esters)
52	08021252XAD	12-Feb-08	L11001-1	L10998-1	X	X	X
53	08022453XAD	24-Feb-08	L11001-2	L10998-2	X	X	X
54	08021354XAD	13-Feb-08	L11001-3	L10998-3	X	X	X
55	08022555XAD	25-Feb-08	L11001-4	L10998-4	X	X	X
56	08022156XAD	21-Feb-08	L11001-5	L10998-5	X	X	X
57	08022757XAD	27-Feb-08	L11001-6	L10998-6	X	X	X
58	08030758XAD	7-Mar-08	L11001-7	L10998-7	X	X	X
59	08022959XAD	29-Feb-08	L11001-8	L10998-8	X	X	X
60	08030460XAD	4-Mar-08	L11001-9	L10998-9	X	X	X
61	08030661XAD	6-Mar-08	L11001-10	L10998-10	X	X	X
Field Blank	080306FBXAD	6-Mar-08	L11001-11	L10998-11	X	X	X

Notes:
Columns and filters analyzed separately.

Axys Data Package Identification Numbers
(Axys reported the four phthalates separately from the PAHs)

DPWG25235 PAHs - Column Phase
DPWG25236 PAHs - Filter Phase
DPWG25265 SVOCs (Phthalate Esters) - Filter Phase
DPWG25339 SVOCs (Phthalate Esters) - Column Phase
DPWG25357 Congeners - Filter Phase
DPWG25531 Congeners - Column Phase
DPWG25552 Reanalysis of Ester - Column Phase

Table 2. Grab Water Sample ID and Analysis Summary

Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

Station Number	URS ID	Date Collected	CAS ID	Analytes						
				Metals (Total)	Metals (Dissolved)	TPH-Dx (Total)	TPH-Dx (Dissolved)	Anions (Chloride, Sulfate, Nitrate/Nitrite)	TOC	DOC
52	08021252SW	12-Feb-08	K0801289-001	X		X		X	X	
	08021252SW-F		K0801289-001 Diss		X		X			X
53	08022453SW	24-Feb-08	K0801530-003	X		X		X	X	
	08022453SW-F		K0801530-003 Diss		X		X			X
54	08021354SW	13-Feb-08	K0801289-002	X		X		X	X	
	08021354SW-F		K0801289-002 Diss		X		X			X
55	08022555SW	25-Feb-08	K0801530-005	X		X		X	X	
	08022555SW-F		K0801530-005 Diss		X		X			X
56	08022156SW	21-Feb-08	K0801530-001	X		X		X	X	
	08022156SW-F		K0801530-001 Diss		X		X			X
57	08022757SW	27-Feb-08	K0801530-009	X		X		X	X	
	08022757SW-F		K0801530-009 Diss		X		X			X
58	08030758SW	7-Mar-08	K0802104-001	X		X		X	X	
	08030758SW-F		K0802104-001 Diss		X		X			X
59	08022959SW	29-Feb-08	K0801765-001	X		X		X	X	
	08022959SW-F		K0801765-001 Diss		X		X			X
60	08030460SW	4-Mar-08	K0801765-003	X		X		X	X	
	08030460SW-F		K0801765-003 Diss		X		X			X
61	08030661SW	6-Mar-08	K0801765-005	X		X		X	X	
	08030661SW-F		K0801765-005 Diss		X		X			X
62	08022762SW	27-Feb-08	K0801530-007	X		X		X	X	
(duplicate of 57)	08022762SW-F		K0801530-007 Diss		X		X			X

Table 3. Summary of Qualifiers for Grab Water Samples

Quality Control Summary Report for Analytical Chemistry

February/March 2008 Sampling Event

CAS ID	URS ID	Analyte	Qualifier	Rational
K0801289-001	08021252SW	aluminum	145U	method blank detection
K0801289-001 Diss	08021252SW-F		50U	
K0801289-002	08021354SW		152U	
K0801289-002 Diss	08021354SW-F		50U	
K0801530-005	08022555SW	antimony	50U	
K0801530-005 Diss	08022555SW-F		50U	
K0801530-009	08022757SW		50U	
K0801289-001	08021252SW	residual range organics (RRO)	110U	
K0801289-001 Diss	08021252SW-F		120U	
K0801289-002	08021354SW		110U	
K0801289-002 Diss	08021354SW-F		120U	
K0801530-001 Diss	08022156SW-F		100U	
K0801530-003	08022453SW		100U	
K0801530-005	08022555SW		100U	
K0801530-005 Diss	08022555SW-F		100U	
K0801530-007	08022762SW		100U	
K0801530-007 Diss	08022762SW-F		100U	
K0801530-009	08022757SW		100U	
K0801530-009 Diss	08022757SW-F		100U	
K0801765-003 Diss	0803060SW-F	arsenic	1.10U	continuing calibration blank detection
K0801765-005 Diss	08030661SW-F		1.14U	
K0802104-001	08030758SW		1.05U	
K0802104-001 Diss	08030758SW-F		1.15U	
K0801765-003	0803060SW	cadmium	0.020U	
K0801765-005	08030661SW		0.020U	
K0802104-001	08030758SW		0.020U	
K0801765-001	08022959SW	thallium	0.037U	
K0801765-001 Diss	08022959SW-F		0.024U	
K0801765-003	0803060SW		0.024U	
K0801765-003 Diss	0803060SW-F		0.020U	
K0801765-005	08030661SW		0.027U	
K0801765-005 Diss	08030661SW-F		0.020U	
K0802104-001	08030758SW		0.020U	

Table 4. Summary of Qualifers for Infiltrex Samples (PAHs and Phthalate Esters)
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

Parameter: Polynuclear Aromatic Hydrocarbons (PAHs) (units = ng/L or ppt)
Method: Axys Labs Method MLA-021

Sample Station	URS ID	Lab ID	Acenaphthene	Lab Qualifer	URS Review Qualifer	Anthracene	Lab Qualifer	URS Review Qualifer	Benz(a)anthracene	Lab Qualifer	URS Review Qualifer	Benzo(a)pyrene	Lab Qualifer	URS Review Qualifer	Benzo(b)fluoranthene	Lab Qualifer	URS Review Qualifer
Column Fraction																	
P52	08021252X	L10998-1	0.706			0.08	K	U	0.01	U		0.02	U		0.02	U	
P53	08022453X	L10998-2	1.12			0.08	K	U	0.01	K	J-EMPC	0.02	U		0.01	U	
P54	08021354X	L10998-3	0.894			0.06	K	U	0.01			0.03	U		0.02	U	
P55	08022555X	L10998-4	1.26			0.1	K	U	0.02			0.02	U		0.01	U	
P56	08022156X	L10998-5	1.03			0.08	K	U	0.01			0.01	U		0.01	K	J-EMPC
P57	08022757X	L10998-6	1.28			0.08	K	U	0.01	K	J-EMPC	0.02	U		0.01	U	
P58	08030758X	L10998-7	0.862			0.07	K	U	0.02	U		0.01	U		0.01	U	
P59	08022959X	L10998-8	2.41			0.13	K	U	0.02			0.02	U		0.01	U	
P60	08030460X	L10998-9	1.57			0.08	K	U	0.02			0.02	U		0.01	U	
P61	08030661X	L10998-10	0.971			0.06	K	U	0.01			0.01	U		0.01	U	
Filter Fraction																	
P52	08021252X	L11001-1	0.0329	U		0.03			0.05	K	U	0.04		U	0.07		
53	08022453X	L11001-2	0.0282	U		0.03			0.03		U	0.05	U		0.03		U
54	08021354X	L11001-3	0.015	U		0.03			0.05		U	0.05		U	0.08	K	J-EMPC
55	08022555X	L11001-4	0.0191	U		0.02			0.03		U	0.02	K	U	0.04		U
56	08022156X	L11001-5	0.0275	U		0.03			0.05		U	0.06	K	U	0.08		
57	08022757X	L11001-6	0.0161	U		0.01			0.02		U	0.02		U	0.02		U
58	08030758X	L11001-7	0.0262	U		0.02			0.02		U	0.02	U		0.02	K	U
59	08022959X	L11001-8	0.0213	U		0.02			0.03		U	0.03	K	U	0.03	K	U
60	08030460X	L11001-9	0.0328	U		0.02			0.04		U	0.04		U	0.06		
61	08030661X	L11001-10	0.0141	U		0.02			0.04		U	0.04		U	0.05		

Sample Station	URS ID	Lab ID	Benzo(g,h,i)perylene	Lab Qualifer	URS Review Qualifer	Benzo(j,k)flouranthenes	Lab Qualifer	URS Review Qualifer	Chrysene	Lab Qualifer	URS Review Qualifer	Dibenz(a,h)anthracene	Lab Qualifer	URS Review Qualifer	Fluoranthene	Lab Qualifer	URS Review Qualifer	Indeno(1,2,3-cd)pyrene	Lab Qualifer	URS Review Qualifer	Phenanthrene	Lab Qualifer	URS Review Qualifer
Column Fraction																							
P52	08021252X	L10998-1	0.01	U		0.02	U		0.05			0.02	U		0.52		U	0.01	U		1.39		
P53	08022453X	L10998-2	0.01	U		0.02	U		0.04			0.02	U		0.54		U	0.01	U		1.27		
P54	08021354X	L10998-3	0.01	U		0.02	U		0.05			0.01	U		0.56		U	0.01	U		1.5		
P55	08022555X	L10998-4	0.02	U		0.01	U		0.05			0.02	U		0.56		U	0.02	U		1.28		
P56	08022156X	L10998-5	0.02	U		0.01	U		0.05			0.01	U		0.57		U	0.02	U		1.39		
P57	08022757X	L10998-6	0.02	U		0.01	U		0.04			0.02	U		0.49		U	0.02	U		1.26		
P58	08030758X	L10998-7	0.01	U		0.01	U		0.05			0.02	U		0.59		U	0.01	U		1.2		
P59	08022959X	L10998-8	0.01	U		0.02	U		0.05			0.02	U		0.63			0.02	U		1.52		
P60	08030460X	L10998-9	0.02	U		0.01	U		0.07			0.01	U		0.63			0.02	U		1.46		
P61	08030661X	L10998-10	0.02	U		0.01	U		0.06			0.02	U		0.62			0.02	U		1.23		
Filter Fraction																							
P52	08021252X	L11001-1	0.04		U	0.04		U	0.08		U	0.02	U		0.14			0.05	K	U	0.09		U
53	08022453X	L11001-2	0.02	U		0.03		U	0.06		U	0.03	U		0.12			0.03	K	U	0.11		U
54	08021354X	L11001-3	0.05		U	0.05		U	0.11			0.04	U		0.19			0.04	K	U	0.11		U
55	08022555X	L11001-4	0.03	K	U	0.04		U	0.07		U	0.02	U		0.11			0.03	K	U	0.07		U
56	08022156X	L11001-5	0.04	K	U	0.04		U	0.13			0.02	U		0.21			0.04	K	U	0.19		
57	08022757X	L11001-6	0.03	K	U	0.02		U	0.05		U	0.02	U		0.08		U	0.03	K	U	0.06		U
58	08030758X	L11001-7	0.02	U		0.02		U	0.06		U	0.03	U		0.10			0.02	U		0.09		U
59	08022959X	L11001-8	0.02	K	U	0.03		U	0.07		U	0.02	U		0.13			0.01	U		0.07		U
60	08030460X	L11001-9	0.03	K	U	0.03		U	0.08		U	0.02	U		0.14			0.03	K	U	0.11		U
61	08030661X	L11001-10	0.04	K	U	0.06		U	0.09		U	0.02	U		0.16			0.04	K	U	0.11		U

Parameter: Phthalate Esters (units = ng/L or ppt)
Method: Axys Labs Method MLA-027

Sample Station	URS ID	Lab ID	Bis(2-ethylhexyl) Phthalate	Lab Qualifer	URS Review Qualifer	Butyl Benzyl Phthalate	Lab Qualifer	URS Review Qualifer	Di-n-butyl Phthalate	Lab Qualifer	URS Review Qualifer	Di-n-octyl Phthalate	Lab Qualifer	URS Review Qualifer
Column Fraction														
P52	08021252X	L10998-1	11.8		U	0.42		U	1.97		U	0.31	K	U
P53	08022453X	L10998-2	10.5		U	0.32		U	0.8		U	0.15		U
P54	08021354X	L10998-3	8.77		U	2.29	K	U	0.93		U	0.85		U
P55	08022555X	L10998-4	7.92		U	0.27		U	0.57		U	0.13		U
P56	08022156X	L10998-5	6.52		U	0.26		U	0.56		U	0.11		U
P57	08022757X	L10998-6	17		U	0.45		U	0.66		U	0.19		U
P58	08030758X	L10998-7	15.5		U	0.50		U	0.73		U	0.20		U
P59	08022959X	L10998-8	9.13		U	0.32		U	0.64	K	U	0.16	K	U
P60	08030460X	L10998-9	5.77		U	0.30		U	0.63		U	0.10	K	U
P61	08030661X	L10998-10	8.37		U	0.26		U	0.52		U	0.09		U
Filter Fraction														
P52	08021252X	L11001-1	4.51		U	0.20		U	0.27		U	0.25	K	U
53	08022453X	L11001-2	3.74		U	0.16		U	0.28		U	0.1	K	U
54	08021354X	L11001-3	4.63		U	0.16		U	0.25		U	0.16	K	U
55	08022555X	L11001-4	3.47		U	0.15		U	0.2		U	0.21	K	U
56	08022156X	L11001-5	3.41		U	0.18		U	0.3		U	0.14		U
57	08022757X	L11001-6	2.76		U	0.20		U	0.29		U	0.13	K	U
58	08030758X	L11001-7	6.76		U	5.47	K	U	0.55		U	1.1	K	U
59	08022959X	L11001-8	2.75		U	0.16		U	0.24		U	0.12	K	U
60	08030460X	L11001-9	13		U	0.45	K	U	0.6		U	0.29	K	U
61	08030661X	L11001-10	5.01		U	0.40	K	U	0.32		U	0.18	K	U

Notes:
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Peak detected but did not meet quantification criteria; the reported value may be interpreted as an 'estimated' maximum possible concentration.
NE = Not Established
ng/L = nanogram per Liter
ppt = parts per trillion
U = The analyte was not detected above the reported MRL.
UJ = The analyte was not detected. The reported sample quanitification limit is an estimate.

Table 5a. Summary of Qualifiers for Infiltrex Samples (Congeners)
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

IUPAC #	COELUTING CONGENERS[1]	08021252XAD L10998-1 (Column)	Lab Qualifier	URS Review Qualifier	08021354XAD L10998-3 (Column)	Lab Qualifier	URS Review Qualifier	08022156XAD L10998-5 (Column)	Lab Qualifier	URS Review Qualifier	08022453XAD L10998-2 (Column)	Lab Qualifier	URS Review Qualifier
1		0.385			0.267			0.211			0.191		
2		0.371			0.293			0.282			0.27		
3		0.324			0.249			0.192		U	0.162		U
4		0.369			0.42			0.496			0.409		
5		0.014	K	J-EMPC	0.012			0.02			0.022		
6		0.101			0.109			0.127			0.115		
7		0.036		U	0.033		U	0.038		U	0.031		U
8		0.416			0.487			0.487			0.518		
9		0.029		U	0.039			0.045			0.039		
10		0.015	K	J-EMPC	0.021			0.021	K	J-EMPC	0.017		
11		83.5			82.4			125			137		
12	12 + 13	0.0091	C U		0.0049	C U		0.0052	C U		0.0051	C U	
13	12 + 13		C12			C12			C12			C12	
14		0.009			0.008			0.009	K	J-EMPC	0.01		
15		0.654			0.531			0.275		U	0.741		
16		0.261			0.279			0.287			0.287		
17		0.24			0.253			0.292			0.267		
18	18 + 30	0.588	C		0.64	C		0.666	C		0.637	C	
19		0.097			0.101			0.106			0.1		
20	20 + 28	0.67	C		0.656	C		0.717	C		0.741	C	
21	21 + 33	0.269	C		0.257	C		0.283	C		0.3	C	
22		0.25			0.235			0.268			0.271		
23		0.006	K	U	0.0038	U		0.004		U	0.003	K	U
24		0.015	K	J-EMPC	0.012	K	J-EMPC	0.013	K	J-EMPC	0.014	K	J-EMPC
25		0.047	K	J-EMPC	0.044			0.044			0.052		
26	26 + 29	0.112	C		0.116	C		0.127	C		0.126	C	
27		0.045			0.05			0.05			0.051		
28	20 + 28		C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18	
31		0.532			0.555			0.609			0.632		
32		0.121			0.138			0.141			0.14		
33	21 + 33		C21			C21			C21			C21	
34		0.005	U		0.0038	U		0.006		U	0.003	K	U
35		0.079			0.081			0.101			0.121		
36		0.02	K	J-EMPC	0.02			0.032			0.031		
37		0.12			0.121			0.131			0.147		
38		0.0049	U		0.007			0.006	K	J-EMPC	0.003	K	J-EMPC
39		0.006	K		0.0037	U		0.0035	U		0.0029	U	
40	40 + 41 + 71	0.21	C		0.198	C		0.196	C		0.213	C	
41	40 + 41 + 71		C40			C40			C40			C40	
42		0.101			0.097			0.101			0.113		
43		0.0033	U		0.021			0.0024	U		0.027		
44	44 + 47 + 65	0.53	C		0.506	C	U	0.525	C	U	0.707	C	
45	45 + 51	0.096	C	U	0.088	C	U	0.09	C	U	0.11	C	U
46		0.033			0.032			0.031	K	J-EMPC	0.035	K	J-EMPC
47	44 + 47 + 65		C44			C44			C44			C44	
48		0.0027	U		0.085			0.0019	U		0.0013	U	
49	49 + 69	0.289	C		0.275	C		0.274	C		0.309	C	
50	50 + 53	0.083	C K		0.085	C		0.079	C		0.08	C	
51	45 + 51		C45			C45			C45			C45	
52		0.878			0.856			0.846			0.941		
53	50 + 53		C50			C50			C50			C50	
54		0.004		U	0.004		U	0.004	K	U	0.002		U
55		0.0096	U		0.01			0.0077	U		0.006	K	J-EMPC
56		0.121	K	J-EMPC	0.12			0.134			0.147		
57		0.009	U		0.0061	U		0.0073	U		0.0055	U	
58		0.0091	U		0.0061	U		0.0073	U		0.0056	U	
59	59 + 62 + 75	0.045	C		0.046	C K	J-EMPC	0.043	C		0.047	C	
60		0.076			0.074			0.073			0.086		
61	61 + 70 + 74 + 76	0.669	C		0.664	C		0.678	C		0.744	C	
62	59 + 62 + 75		C59			C59			C59			C59	
63		0.019	K		0.009			0.011	K	J-EMPC	0.017		
64		0.201			0.198			0.205			0.225		
65	44 + 47 + 65		C44			C44			C44			C44	
66		0.276			0.283			0.281			0.277		
67		0.01			0.0055	U		0.012	K	J-EMPC	0.012		
68		0.014	K	U	0.0065	U		0.0079	U		0.021		U
69	49 + 69		C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40	
72		0.0089	U		0.006	U		0.0072	U		0.0054	U	
73		0.015	K		0.003			0.01	K	J-EMPC	0.016		
74	61 + 70 + 74 + 76		C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61	
77		0.033		U	0.033		U	0.029		U	0.077	K	J-EMPC
78		0.0096	U		0.0064	U		0.0077	U		0.0059	U	
79		0.0085	U		0.0057	U		0.0069	U		0.009	K	J-EMPC
80		0.0083	U		0.0056	U		0.0067	U		0.0051	U	
81		0.0098	U		0.0064	U		0.0076	U		0.0059	U	
82		0.047			0.049	K	J-EMPC	0.045	K	J-EMPC	0.063		
83	83 + 99	0.257	C		0.243	C		0.244	C		0.31	C	
84		0.147			0.141			0.141			0.168		
85	85 + 116 + 117	0.065	C K	J-EMPC	0.076	C		0.078	C		0.104	C	
86	86 + 87 + 97 + 108 + 119 + 125	0.339	C		0.332	C		0.335	C		0.463	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
88	88 + 91	0.069	C K	J-EMPC	0.065	C K	J-EMPC	0.064	C		0.071	C	
89		0.006	K	J-EMPC	0.005	K	J-EMPC	0.0023	U		0.007	K	J-EMPC
90	90 + 101 + 113	0.54	C		0.505	C		0.532	C		0.633	C	
91	88 + 91		C88			C88			C88			C88	
92		0.104			0.1			0.109			0.117		
93	93 + 95 + 98 + 100 + 102	0.548	C		0.51	C		0.514	C		0.627	C	
94		0.004			0.0025	U		0.0024	U		0.003	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
96		0.004			0.002	K	J-EMPC	0.003			0.005	K	J-EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
103		0.0029	U		0.003	K	J-EMPC	0.003			0.0024	U	
104		0.002	K	U	0.0012	U		0.0011	U		0.001	U	
105		0.119			0.114			0.119			0.163		
106		0.0049	U		0.0038	U		0.0053	U		0.007		
107	107 + 124	0.01	C K	J-EMPC	0.017	C K	J-EMPC	0.017	C K	J-EMPC	0.021	C K	J-EMPC
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
109		0.034			0.027	K	J-EMPC	0.041			0.041	K	J-EMPC
110	110 + 115	0.575	C		0.551	C		0.57	C		0.721	C	
111		0.0025	U		0.0017	U		0.0017	U		0.0021	U	
112		0.0025	U		0.0017	U		0.0017	U		0.0021	U	
113	90 + 101 + 113		C90			C90			C90			C90	
114		0.012		U	0.008	K	U	0.01	K	U	0.009	K	U
115	110 + 115		C110			C110			C110			C110	

Table 5a. Summary of Qualifiers for Infiltrex Samples (Congeners)
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

IUPAC #	COELUTING CONGENERS[1]	08021252XAD L10998-1 (Column)	Lab Qualifier	URS Review Qualifier	08021354XAD L10998-3 (Column)	Lab Qualifier	URS Review Qualifier	08022156XAD L10998-5 (Column)	Lab Qualifier	URS Review Qualifier	08022453XAD L10998-2 (Column)	Lab Qualifier	URS Review Qualifier
116	85 + 116 + 117		C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85	
118		0.36			0.325			0.361			0.499		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
120		0.0023	U		0.0016	U		0.0016	U		0.002	U	
121		0.0024	U		0.0017	U		0.0017	U		0.0021	U	
122		0.0053	U		0.0041	U		0.0057	U		0.0034	U	
123		0.007		U	0.0037	U		0.01	K	J-EMPC	0.009	K	J-EMPC
124	107 + 124		C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
126		0.0054	U		0.0042	U		0.0057	U		0.006	K	U
127		0.0047	U		0.0036	U		0.005	U		0.003	U	
128	128 + 166	0.04	C		0.036	C		0.033	C		0.053	C	
129	129 + 138 + 160 + 163	0.288	C		0.246	C		0.255	C		0.379	C	
130		0.019			0.018			0.018	K	J-EMPC	0.024		
131		0.004	U		0.003	U		0.004	K	J-EMPC	0.006	K	J-EMPC
132		0.094			0.081			0.088	K	J-EMPC	0.115		
133		0.0038	U		0.006		U	0.004	K	U	0.007	K	U
134	134 + 143	0.019	C K	J-EMPC	0.017	C		0.018	C K	J-EMPC	0.021	C	
135	135 + 151 + 154	0.124	C		0.105	C		0.116	C		0.116	C	
136		0.038			0.031			0.033			0.039		
137		0.012	K	J-EMPC	0.009			0.013	K	J-EMPC	0.015		
138	129 + 138 + 160 + 163		C129			C129			C129			C129	
139	139 + 140	0.0036	C U		0.003	C K	J-EMPC	0.004	C K	J-EMPC	0.008	C	
140	139 + 140		C139			C139			C139			C139	
141		0.044			0.039			0.034	K	J-EMPC	0.05		
142		0.004	U		0.003	U		0.0026	U		0.0014	U	
143	134 + 143		C134			C134			C134			C134	
144		0.016			0.012			0.014	K	J-EMPC	0.014	K	J-EMPC
145		0.0015	U		0.0013	U		0.0012	U		0.0011	U	
146		0.047			0.044			0.044			0.055		
147	147 + 149	0.257	C		0.228	C		0.23	C		0.275	C	
148		0.0018	U		0.0016	U		0.0015	U		0.0013	U	
149	147 + 149		C147			C147			C147			C147	
150		0.0014	U		0.0012	U		0.0011	U		0.001	U	
151	135 + 151 + 154		C135			C135			C135			C135	
152		0.0013	U		0.0012	U		0.0011	U		0.001	U	
153	153 + 168	0.261	C		0.214	C		0.239	C		0.301	C	
154	135 + 151 + 154		C135			C135			C135			C135	
155		0.002	K	U	0.002	K	U	0.001	K	U	0.001	K	U
156	156 + 157	0.026	C	U	0.023	C K	U	0.023	C	U	0.036	C	
157	156 + 157		C156			C156			C156			C156	
158		0.029			0.021	K	J-EMPC	0.022			0.031		
159		0.0027	U		0.002	U		0.0018	U		0.003	K	J-EMPC
160	129 + 138 + 160 + 163		C129			C129			C129			C129	
161		0.0027	U		0.0021	U		0.0018	U		0.001	U	
162		0.0029	U		0.0022	U		0.0019	U		0.001	U	
163	129 + 138 + 160 + 163		C129			C129			C129			C129	
164		0.018			0.014			0.018			0.025		
165		0.0031	U		0.0023	U		0.0021	U		0.0011	U	
166	128 + 166		C128			C128			C128			C128	
167		0.014			0.01			0.011	K	J-EMPC	0.013		
168	153 + 168		C153			C153			C153			C153	
169		0.0029	U		0.0021	U		0.0018	U		0.0014	U	
170		0.033			0.019		U	0.02		U	0.032		
171	171 + 173	0.011	C		0.006	C K	J-EMPC	0.008	C		0.011	C K	J-EMPC
172		0.009	K	J-EMPC	0.006			0.007	K	J-EMPC	0.006		
173	171 + 173		C171			C171			C171			C171	
174		0.051	K	U	0.03		U	0.033		U	0.046		U
175		0.0016	U		0.002	K	J-EMPC	0.0016	U		0.001	K	J-EMPC
176		0.008	K	J-EMPC	0.005	K	J-EMPC	0.007	K	J-EMPC	0.006	K	J-EMPC
177		0.033			0.023			0.026			0.03		
178		0.016			0.011	K	J-EMPC	0.013	K	J-EMPC	0.015	K	J-EMPC
179		0.023	K	J-EMPC	0.015			0.016			0.02		
180	180 + 193	0.115	C	U	0.061	C	U	0.067	C	U	0.107	C	U
181		0.0016	U		0.0014	U		0.0016	U		0.0012	U	
182		0.002	K	U	0.0013	U		0.0016	U		0.002	K	U
183	183 + 185	0.04	C K	J-EMPC	0.023	C K	U	0.025	C	U	0.039	C	U
184		0.0011	U		0.001	U		0.0012	U		0.0009	U	
185	183 + 185		C183			C183			C183			C183	
186		0.0012	U		0.0011	U		0.0013	U		0.0009	U	
187		0.112		U	0.07		U	0.078		U	0.09		U
188		0.001	U		0.0009	U		0.0011	U		0.0008	U	
189		0.004		U	0.0025	U		0.0018	U		0.0022	U	
190		0.008			0.006	K	J-EMPC	0.004	K	J-EMPC	0.009		
191		0.002	K	J-EMPC	0.001	U		0.0013	U		0.0009	U	
192		0.0014	U		0.0012	U		0.0014	U		0.001	U	
193	180 + 193		C180			C180			C180			C180	
194		0.032		U	0.01	K	U	0.014		U	0.029	K	U
195		0.008			0.005	K	J-EMPC	0.008	K	J-EMPC	0.01	K	J-EMPC
196		0.031			0.013	K	U	0.013		U	0.027		
197	197 + 200	0.016	C K	J-EMPC	0.006	C		0.007	C K	J-EMPC	0.013	C K	J-EMPC
198	198 + 199	0.101	C	U	0.041	C K	U	0.054	C	U	0.102	C	U
199	198 + 199		C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197	
201		0.012	K	J-EMPC	0.006	K	J-EMPC	0.005			0.013		
202		0.024	K	J-EMPC	0.01		U	0.012		U	0.023		
203		0.075			0.03	K	J-EMPC	0.035			0.081		
204		0.001	U		0.0009	U		0.0012	U		0.001	U	
205		0.003	K	U	0.002	U		0.0016	U		0.003	K	U
206		0.034			0.018	K	J-EMPC	0.019	K	J-EMPC	0.036		
207		0.014	K	J-EMPC	0.0048	U		0.008			0.016	K	J-EMPC
208		0.034			0.011	K	U	0.012	K	U	0.028		U
209		0.017	K	U	0.012	K	U	0.009		U	0.012	K	U

Notes:

All results are in units of pg/L (picograms/Liter)

C = concentration represents coeluting congeners
U = The analyte was not detected above the reported sample quantification limit.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = A peak was detected that did not meet all criteria for identification as the target analyte; the reported value is the estimated maximum possible concentration of analyte present.
Non-detect values reported at the analytical reporting limit
PCBs = Polychlorinated Biphenyls
RL = method reporting limit
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 5b. Summary of Qualifers for Infiltrex Samples (Congeners)
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

IUPAC #	COELUTING CONGENERS1	08022555XAD L10998-4 (Column)	Lab Qualifier	URS Review Qualifier	08022757XAD L10998-6 (Column)	Lab Qualifier	URS Review Qualifier	08022959XAD L10998-8 (Column)	Lab Qualifier	URS Review Qualifier	08030460XAD L10998-9 (Column)	Lab Qualifier	URS Review Qualifier
1		0.197			0.164			0.209			0.213		
2		0.256			0.291			0.256			0.292		
3		0.133			0.132			0.147			0.17		
4		0.43			0.364			0.634			0.554		
5		0.02			0.023			0.0051	U		0.0046	U	
6		0.108			0.114			0.144			0.129		
7		0.034		U	0.029		U	0.032	K	U	0.027	K	U
8		0.487			0.497			0.512			0.5		
9		0.037			0.038			0.041	K	J-EMPC	0.039		
10		0.016			0.018			0.026			0.017		
11		139			140			133			130		
12	12 + 13	0.0054	C U		0.0081	C U		0.0052	C U		0.0046	C U	
13	12 + 13		C12			C12			C12			C12	
14		0.011			0.0077	U		0.0049	U		0.0044	U	
15		0.586	K	J-EMPC	0.261			0.839			0.543	K	J-EMPC
16		0.295			0.288			0.348			0.322		
17		0.261			0.244			0.303			0.28		
18	18 + 30	0.647	C		0.6	C		0.763	C		0.729	C	
19		0.097			0.093			0.139			0.115		
20	20 + 28	0.745	C		0.655	C		0.749	C		0.736	C	
21	21 + 33	0.284	C		0.306	C		0.284	C		0.289	C K	J-EMPC
22		0.29			0.283			0.271			0.288		
23		0.004	U		0.0057	U		0.017		U	0.0032	U	
24		0.012			0.011			0.014	K	J-EMPC	0.013		
25		0.047	K	J-EMPC	0.05			0.051			0.05		
26	26 + 29	0.125	C		0.123	C		0.136	C		0.131	C	
27		0.051			0.047			0.062			0.056		
28	20 + 28		C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18	
31		0.61			0.559			0.622			0.612		
32		0.142			0.145	K	J-EMPC	0.16			0.149		
33	21 + 33		C21			C21			C21			C21	
34		0.006	K	U	0.0057	U		0.026		U	0.005	K	U
35		0.122			0.11			0.118			0.125		
36		0.029			0.025			0.027	K	J-EMPC	0.027		
37		0.124			0.127			0.147			0.145		
38		0.0039	U		0.0056	U		0.003	K	J-EMPC	0.01		
39		0.006	K	J-EMPC	0.0056	U		0.006	K	J-EMPC	0.01		
40	40 + 41 + 71	0.215	C		0.185	C		0.221	C		0.224	C	
41	40 + 41 + 71		C40			C40			C40			C40	
42		0.113			0.102			0.129	K	J-EMPC	0.127		
43		0.022	K	J-EMPC	0.017	K	J-EMPC	0.02			0.023		
44	44 + 47 + 65	0.617	C		0.543	C		0.644	C		0.654	C	
45	45 + 51	0.093	C		0.085	C		0.103	C		0.091	C	
46		0.033			0.03			0.034	K	J-EMPC	0.033		
47	44 + 47 + 65		C44			C44			C44			C44	
48		0.0024	U		0.08	K	J-EMPC	0.0017	U		0.0014	U	
49	49 + 69	0.304	C		0.243	C		0.318	C		0.281	C	
50	50 + 53	0.091	C		0.071	C		0.091	C		0.09	C	
51	45 + 51		C45			C45			C45			C45	
52		0.935			0.754			0.973			0.898		
53	50 + 53		C50			C50			C50			C50	
54		0.002		U	0.004		U	0.018		U	0.002	K	U
55		0.01			0.0072	U		0.01	K	J-EMPC	0.0061	U	
56		0.149			0.126			0.153			0.162		
57		0.0057	U		0.0068	U		0.0064	U		0.0059	U	
58		0.0057	U		0.0069	U		0.0067	U		0.0062	U	
59	59 + 62 + 75	0.045	C		0.042	C K	J-EMPC	0.051	C		0.053	C	
60		0.076			0.068	K	J-EMPC	0.088			0.087		
61	61 + 70 + 74 + 76	0.687	C		0.624	C		0.739	C		0.746	C	
62	59 + 62 + 75		C59			C59			C59			C59	
63		0.011	K	J-EMPC	0.01			0.016	K	J-EMPC	0.015		
64		0.21			0.184			0.0013	U		0.209		
65	44 + 47 + 65		C44			C44			C44			C44	
66		0.302			0.26			0.299			0.324		
67		0.01			0.012	K	J-EMPC	0.015	K	J-EMPC	0.012	K	J-EMPC
68		0.011	K	U	0.014	K	U	0.0068	U		0.014	K	U
69	49 + 69		C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40	
72		0.0056	U		0.0067	U		0.0063	U		0.0058	U	
73		0.013	K	J-EMPC	0.003			0.0013	U		0.013		
74	61 + 70 + 74 + 76		C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61	
77		0.048	K	J-EMPC	0.047			0.043		U	0.041		U
78		0.0061	U		0.0072	U		0.0071	U		0.0066	U	
79		0.009			0.007	K	J-EMPC	0.009	K	J-EMPC	0.01	K	J-EMPC
80		0.0052	U		0.0063	U		0.0057	U		0.0053	U	
81		0.006	U		0.0073	U		0.007	K	U	0.0062	U	
82		0.05			0.042			0.05			0.055		
83	83 + 99	0.281	C		0.229	C		0.296	C		0.302	C	
84		0.161			0.137			0.153			0.142		
85	85 + 116 + 117	0.092	C		0.075	C		0.088	C		0.089	C	
86	86 + 87 + 97 + 108 + 119 + 125	0.387	C		0.333	C		0.387	C		0.411	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
88	88 + 91	0.071	C		0.05	C K	J-EMPC	0.067	C		0.067	C	
89		0.005			0.0034	U		0.005			0.005		
90	90 + 101 + 113	0.589	C		0.485	C		0.607	C		0.606	C	
91	88 + 91		C88			C88			C88			C88	
92		0.111			0.092			0.115			0.112		
93	93 + 95 + 98 + 100 + 102	0.584	C		0.497	C		0.632	C		0.613	C	
94		0.002			0.0035	U		0.0034	U		0.003	K	J-EMPC
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
96		0.004			0.003	K	J-EMPC	0.004	K	J-EMPC	0.004	K	J-EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
103		0.005	K	J-EMPC	0.003			0.0028	U		0.002	K	J-EMPC
104		0.001	U		0.0018	U		0.017		U	0.001	K	U
105		0.147			0.125			0.149			0.144		
106		0.005			0.0067	U		0.005			0.0039	U	
107	107 + 124	0.02	C		0.016	C K	J-EMPC	0.022	C		0.023	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
109		0.039			0.032	K	J-EMPC	0.033	K	J-EMPC	0.036	K	J-EMPC
110	110 + 115	0.66	C		0.549	C		0.692	C		0.705	C	
111		0.0013	U		0.0025	U		0.0025	U		0.0016	U	
112		0.0013	U		0.0025	U		0.0025	U		0.0016	U	
113	90 + 101 + 113		C90			C90			C90			C90	
114		0.015	K	U	0.011	K	U	0.017	K	U	0.01	K	U
115	110 + 115		C110			C110			C110			C110	

Table 5b. Summary of Qualifers for Infiltrex Samples (Congeners)
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

IUPAC #	COELUTING CONGENERS1	08022555XAD L10998-4 (Column)	Lab Qualifier	URS Review Qualifier	08022757XAD L10998-6 (Column)	Lab Qualifier	URS Review Qualifier	08022959XAD L10998-8 (Column)	Lab Qualifier	URS Review Qualifier	08030460XAD L10998-9 (Column)	Lab Qualifier	URS Review Qualifier
116	85 + 116 + 117		C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85	
118		0.448			0.378			0.489			0.553		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
120		0.0012	U		0.0023	U		0.0023	U		0.002	K	J-EMPC
121		0.0013	U		0.0025	U		0.0025	U		0.0016	U	
122		0.006	K	J-EMPC	0.0072	U		0.004	U		0.005	K	J-EMPC
123		0.006	K	U	0.007	K	U	0.009		U	0.014		U
124	107 + 124		C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
126		0.006	K	U	0.0068	U		0.0039	U		0.0041	U	
127		0.0023	U		0.0063	U		0.0039	U		0.0041	U	
128	128 + 166	0.043	C		0.038	C K	J-EMPC	0.044	C		0.045	C	
129	129 + 138 + 160 + 163	0.319	C		0.29	C		0.351	C		0.381	C	
130		0.022			0.017	K	J-EMPC	0.02			0.02		
131		0.004	K	J-EMPC	0.0044	U		0.004	K	J-EMPC	0.003	K	J-EMPC
132		0.102			0.078			0.091			0.091		
133		0.006		U	0.004	K	U	0.006		U	0.004	K	U
134	134 + 143	0.016	C K	J-EMPC	0.019	C		0.018	C K	J-EMPC	0.016	C	
135	135 + 151 + 154	0.127	C		0.101	C		0.111	C		0.127	C	
136		0.04	K	J-EMPC	0.0021	U		0.032			0.035		
137		0.014			0.013			0.016			0.01		
138	129 + 138 + 160 + 163		C129			C129			C129			C129	
139	139 + 140	0.003	C U		0.004	C U		0.006	C K	J-EMPC	0.005	C K	J-EMPC
140	139 + 140		C139			C139			C139			C139	
141		0.041			0.033			0.037			0.037		
142		0.0033	U		0.0044	U		0.0013	U		0.0023	U	
143	134 + 143		C134			C134			C134			C134	
144		0.013	K	J-EMPC	0.012	K	J-EMPC	0.01	K	J-EMPC	0.015		
145		0.0012	U		0.0022	U		0.0011	U		0.0006	U	
146		0.053			0.049			0.059			0.063		
147	147 + 149	0.282	C		0.225	C		0.288	C		0.298	C	
148		0.0015	U		0.0027	U		0.0014	U		0.0008	U	
149	147 + 149		C147			C147			C147			C147	
150		0.0011	U		0.0021	U		0.0011	U		0.002	K	J-EMPC
151	135 + 151 + 154		C135			C135			C135			C135	
152		0.0011	U		0.002	U		0.001	U		0.001	K	J-EMPC
153	153 + 168	0.304	C		0.28	C		0.327	C		0.356	C	
154	135 + 151 + 154		C135			C135			C135			C135	
155		0.002	K	U	0.0018	U		0.012		U	0.001	K	U
156	156 + 157	0.028	C	U	0.026	C	U	0.032	C	U	0.03	C	U
157	156 + 157		C156			C156			C156			C156	
158		0.029			0.022			0.027			0.025		
159		0.0022	U		0.003	U		0.002			0.0017	U	
160	129 + 138 + 160 + 163		C129			C129			C129			C129	
161		0.0023	U		0.003	U		0.0009	U		0.0016	U	
162		0.0024	U		0.0032	U		0.002	K	J-EMPC	0.0018	U	
163	129 + 138 + 160 + 163		C129			C129			C129			C129	
164		0.021			0.014			0.022			0.02		
165		0.0026	U		0.0034	U		0.0011	U		0.0019	U	
166	128 + 166		C128			C128			C128			C128	
167		0.014		U	0.013	K	U	0.015		U	0.016		U
168	153 + 168		C153			C153			C153			C153	
169		0.0023	U		0.003	U		0.001	U		0.0016	U	
170		0.026		U	0.027		U	0.022		U	0.019		U
171	171 + 173	0.012	C		0.008	C		0.01	C		0.009	C	
172		0.007	K	J-EMPC	0.007	K	J-EMPC	0.005	K	J-EMPC	0.006	K	J-EMPC
173	171 + 173		C171			C171			C171			C171	
174		0.05	K	J-EMPC	0.043			0.034			0.031		
175		0.002	K	J-EMPC	0.0023	U		0.0011	U		0.001	K	J-EMPC
176		0.006	K	J-EMPC	0.006	K	J-EMPC	0.006	K	J-EMPC	0.0005	U	
177		0.031			0.025			0.024			0.021		
178		0.015			0.011	K	J-EMPC	0.012			0.011		
179		0.021			0.018			0.022	K	J-EMPC	0.018		
180	180 + 193	0.125	C		0.109	C		0.087	C		0.07	C K	J-EMPC
181		0.0012	U		0.0023	U		0.0011	U		0.0008	U	
182		0.0012	U		0.0023	U		0.003	K	U	0.001	K	U
183	183 + 185	0.044	C		0.026	C		0.03	C		0.026	C	
184		0.0009	U		0.0017	U		0.001			0.001	K	J-EMPC
185	183 + 185		C183			C183			C183			C183	
186		0.001	U		0.0018	U		0.0009	U		0.0006	U	
187		0.113			0.101			0.105			0.09		
188		0.0008	U		0.0016	U		0.006		U	0.001	K	U
189		0.0022	U		0.0036	U		0.002	K	U	0.002	K	U
190		0.01			0.007			0.007	K	J-EMPC	0.008		
191		0.001			0.0018	U		0.0009	U		0.001	K	J-EMPC
192		0.001	U		0.002	U		0.001	U		0.0006	U	
193	180 + 193		C180			C180			C180			C180	
194		0.034			0.037			0.019	K	J-EMPC	0.01		
195		0.015	K	J-EMPC	0.013	K	J-EMPC	0.005			0.004	K	J-EMPC
196		0.045			0.033	K	J-EMPC	0.016			0.009	K	J-EMPC
197	197 + 200	0.021	C		0.013	C		0.006	C		0.004	C	
198	198 + 199	0.135	C		0.111	C		0.054	C		0.029	C	
199	198 + 199		C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197	
201		0.016	K	J-EMPC	0.012			0.005			0.004		
202		0.029			0.02	K	J-EMPC	0.016	K	U	0.008		U
203		0.099			0.083			0.037			0.021		
204		0.0008	U		0.0016	U		0.0009	U		0.0006	U	
205		0.003		U	0.0025	U		0.002	K	U	0.001	K	U
206		0.049			0.053	K	J-EMPC	0.027	K	J-EMPC	0.01		
207		0.02	K	J-EMPC	0.015			0.005	U		0.0037	U	
208		0.041			0.041			0.015		U	0.007	K	U
209		0.015	K	U	0.016	K	U	0.012	K	U	0.01		U

Notes:

All results are in units of pg/L (picograms/Liter)

C = concentration represents coeluting congeners
U = The analyte was not detected above the reported sample quantification limit.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = A peak was detected that did not meet all criteria for identification as the target analyte; the reported value is the estimated maximum possible concentration of analyte present.
Non-detect values reported at the analytical reporting limit
PCBs = Polychlorinated Biphenyls
RL = method reporting limit
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 5c. Summary of Qualifers for Infiltrex Samples (Congeners)
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

IUPAC #	COELUTING CONGENERS[1]	08030661XAD L10998-10 (Column)	Lab Qualifier	URS Review Qualifier	08030758XAD L10998-7 (Column)	Lab Qualifier	URS Review Qualifier
1		0.18			0.185		
2		0.237			0.236		
3		0.155			0.135		
4		0.391			0.392		
5		0.009	K	J-EMPC	0.013		
6		0.103			0.106		
7		0.033		U	0.037		U
8		0.462			0.501		
9		0.038			0.037		
10		0.016			0.017		
11		107			91.6		
12	12 + 13	0.0055	C U		0.385	C	
13	12 + 13		C12			C12	
14		0.0052	U		0.01		
15		0.737			0.761		
16		0.302			0.289		
17		0.243			0.25		
18	18 + 30	0.657	C		0.646	C	
19		0.09			0.091		
20	20 + 28	0.728	C		1.02	C	
21	21 + 33	0.286	C		0.0022	C U	
22		0.282			0.267		
23		0.002	K	U	0.0025	U	
24		0.013			0.012		
25		0.043	K	J-EMPC	0.049		
26	26 + 29	0.121	C		0.124	C	
27		0.052			0.054		
28	20 + 28		C20			C20	
29	26 + 29		C26			C26	
30	18 + 30		C18			C18	
31		0.588			0.612		
32		0.136			0.149		
33	21 + 33		C21			C21	
34		0.006	K	U	0.003	K	U
35		0.103			0.091		
36		0.022			0.021		
37		0.146			0.146		
38		0.004			0.013	K	J-EMPC
39		0.005	K	J-EMPC	0.005		
40	40 + 41 + 71	0.229	C		0.219	C	
41	40 + 41 + 71		C40			C40	
42		0.125			0.123		
43		0.02			0.021		
44	44 + 47 + 65	0.736	C		0.801	C	
45	45 + 51	0.105	C		0.11	C	
46		0.031			0.033		
47	44 + 47 + 65		C44			C44	
48		0.0015	U		0.002	U	
49	49 + 69	0.294	C		0.3	C	
50	50 + 53	0.094	C		0.092	C	
51	45 + 51		C45			C45	
52		0.0014	U		0.99		
53	50 + 53		C50			C50	
54		0.001		U	0.0014	U	
55		0.008			0.008		
56		0.165			0.14		
57		0.0062	U		0.0068	U	
58		0.0065	U		0.0069	U	
59	59 + 62 + 75	0.048	C		0.052	C	
60		0.089			0.075		
61	61 + 70 + 74 + 76	0.783	C		0.791	C	
62	59 + 62 + 75		C59			C59	
63		0.018			0.016		
64		0.213			0.217		
65	44 + 47 + 65		C44			C44	
66		0.318			0.313		
67		0.014			0.013	K	J-EMPC
68		0.0066	U		0.017		U
69	49 + 69		C49			C49	
70	61 + 70 + 74 + 76		C61			C61	
71	40 + 41 + 71		C40			C40	
72		0.0061	U		0.0068	U	
73		0.012			0.0015	U	
74	61 + 70 + 74 + 76		C61			C61	
75	59 + 62 + 75		C59			C59	
76	61 + 70 + 74 + 76		C61			C61	
77		0.08			0.092		
78		0.0068	U		0.0067	U	
79		0.011			0.021		
80		0.0055	U		0.0061	U	
81		0.0066	U		0.007	U	
82		0.057			0.061		
83	83 + 99	0.324	C		0.342	C	
84		0.165			0.175		
85	85 + 116 + 117	0.104	C		0.101	C	
86	86 + 87 + 97 + 108 + 119 + 125	0.468	C		0.482	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
88	88 + 91	0.076	C		0.08	C	
89		0.005	K	J-EMPC	0.004	K	J-EMPC
90	90 + 101 + 113	0.649	C		0.675	C	
91	88 + 91		C88			C88	
92		0.125			0.125		
93	93 + 95 + 98 + 100 + 102	0.637	C		0.691	C	
94		0.003			0.0027	U	
95	93 + 95 + 98 + 100 + 102		C93			C93	
96		0.004	K	J-EMPC	0.004	K	J-EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93	
99	83 + 99		C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93	
101	90 + 101 + 113		C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93	
103		0.005	K	J-EMPC	0.004		
104		0.0009	U		0.0009	U	
105		0.16			0.178		
106		0.0061	U		0.003	U	
107	107 + 124	0.024	C K	J-EMPC	0.019	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
109		0.034			0.033		
110	110 + 115	0.781	C		0.74	C	
111		0.0018	U		0.0018	U	
112		0.0018	U		0.0018	U	
113	90 + 101 + 113		C90			C90	
114		0.009		U	0.011		U
115	110 + 115		C110			C110	

Table 5c. Summary of Qualifers for Infiltrex Samples (Congeners)
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

IUPAC #	COELUTING CONGENERS[1]	08030661XAD L10998-10 (Column)	Lab Qualifier	URS Review Qualifier	08030758XAD L10998-7 (Column)	Lab Qualifier	URS Review Qualifier
116	85 + 116 + 117		C85			C85	
117	85 + 116 + 117		C85			C85	
118		0.552			0.593		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
120		0.002	K	J-EMPC	0.002		
121		0.0018	U		0.0019	U	
122		0.0066	U		0.004	K	J-EMPC
123		0.011		U	0.014	K	U
124	107 + 124		C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
126		0.007	K	U	0.006		U
127		0.0064	U		0.0029	U	
128	128 + 166	0.049	C		0.044	C	
129	129 + 138 + 160 + 163	0.388	C		0.375	C	
130		0.021			0.02		
131		0.005			0.0034	U	
132		0.106			0.111		
133		0.007	K	U	0.005	K	U
134	134 + 143	0.019	C		0.021	C K	J-EMPC
135	135 + 151 + 154	0.128	C		0.133	C	
136		0.036			0.043		
137		0.017			0.012		
138	129 + 138 + 160 + 163		C129			C129	
139	139 + 140	0.007	C K	J-EMPC	0.0031	C U	
140	139 + 140		C139			C139	
141		0.042	K	J-EMPC	0.044		
142		0.0019	U		0.0034	U	
143	134 + 143		C134			C134	
144		0.015			0.015		
145		0.0009	U		0.0013	U	
146		0.063			0.061		
147	147 + 149	0.307	C		0.322	C	
148		0.0011	U		0.0016	U	
149	147 + 149		C147			C147	
150		0.0008	U		0.0012	U	
151	135 + 151 + 154		C135			C135	
152		0.0008	U		0.001	K	J-EMPC
153	153 + 168	0.402	C		0.406	C	
154	135 + 151 + 154		C135			C135	
155		0.002		U	0.001		U
156	156 + 157	0.034	C	U	0.036	C	U
157	156 + 157		C156			C156	
158		0.031			0.031		
159		0.002			0.002	K	J-EMPC
160	129 + 138 + 160 + 163		C129			C129	
161		0.0013	U		0.0024	U	
162		0.0014	U		0.0023	U	
163	129 + 138 + 160 + 163		C129			C129	
164		0.021			0.022		
165		0.0015	U		0.0027	U	
166	128 + 166		C128			C128	
167		0.018	K	U	0.018		U
168	153 + 168		C153			C153	
169		0.0014	U		0.0024	U	
170		0.02	K	U	0.025	K	U
171	171 + 173	0.005	C K	J-EMPC	0.009	C	
172		0.005			0.006		
173	171 + 173		C171			C171	
174		0.033			0.036		
175		0.002			0.002	K	J-EMPC
176		0.004	K	J-EMPC	0.005		
177		0.024			0.023		
178		0.009			0.012	K	J-EMPC
179		0.018			0.019		
180	180 + 193	0.078	C		0.105	C	
181		0.001	U		0.0015	U	
182		0.001	K	U	0.0015	U	
183	183 + 185	0.031	C		0.032	C	
184		0.0007	U		0.0012	U	
185	183 + 185		C183			C183	
186		0.0008	U		0.0012	U	
187		0.098			0.09		
188		0.0007	U		0.0011	U	
189		0.0014	U		0.0021	U	
190		0.01			0.008		
191		0.002	K	J-EMPC	0.0012	U	
192		0.0009	U		0.0013	U	
193	180 + 193		C180			C180	
194		0.016	K	J-EMPC	0.029		
195		0.005	K	J-EMPC	0.009		
196		0.011			0.03		
197	197 + 200	0.007	C		0.009	C	
198	198 + 199	0.046	C		0.086	C	
199	198 + 199		C198			C198	
200	197 + 200		C197			C197	
201		0.006	K	J-EMPC	0.008		
202		0.01	K	U	0.015	K	U
203		0.032			0.076		
204		0.0008	U		0.0013	U	
205		0.002	K	U	0.002	K	U
206		0.014	K	J-EMPC	0.04		
207		0.005	K	J-EMPC	0.013		
208		0.011		U	0.027		
209		0.009		U	0.016	K	U

Notes:

All results are in units of pg/L (picograms/Liter)

C = concentration represents coeluting congeners
U = The analyte was not detected above the reported sample quantification limit.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = A peak was detected that did not meet all criteria for identification as the target analyte; the reported value is the estimated maximum possible concentration of analyte present.
Non-detect values reported at the analytical reporting limit
PCBs = Polychlorinated Biphenyls
RL = method reporting limit

1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 5d. Summary of Qualifers for Infiltrex Samples (Congeners)
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

IUPAC #	COELUTING CONGENERS[1]	08021252XAD L11001-1 (Filter)	Lab Qualifier	URS Review Qualifier	08021354XAD L11001-3 (Filter)	Lab Qualifier	URS Review Qualifier	08022156XAD L11001-5 (Filter)	Lab Qualifier	URS Review Qualifier	08022453XAD L11001-2 (Filter)	Lab Qualifier	URS Review Qualifier
1		0.13			0.051		U	0.026		U	0.021		U
2		0.265			0.125			0.069			0.042		U
3		0.201			0.14			0.057		U	0.041	K	U
4		0.02		U	0.082		U	0.033		U	0.063		U
5		0.007	U		0.0069	U		0.0053	U		0.004	U	
6		0.009		U	0.011	K	U	0.017		U	0.0037	U	
7		0.011		U	0.0064	U		0.015		U	0.009		U
8		0.043		U	0.051		U	0.09		U	0.0034	U	
9		0.007		U	0.0061	U		0.006		U	0.005	K	U
10		0.0058	U		0.011	K	J-EMPC	0.0045	U		0.006		
11		4.12			7.16			9.18			10.8		
12	12 + 13	0.054	C		0.0069	C U		0.0053	C U		0.004	C U	
13	12 + 13		C12			C12			C12			C12	
14		0.0067	U		0.0064	U		0.005	U		0.0038	U	
15		0.054		U	0.073		U	0.141			0.07		U
16		0.034		U	0.034	K	U	0.074			0.039		U
17		0.032		U	0.11			0.073			0.104		
18	18 + 30	0.071	C	U	0.079	C	U	0.146	C	U	0.104	C	U
19		0.01	K	U	0.306			0.018	K	U	0.208		
20	20 + 28	0.165	C	U	0.216	C		0.452	C		0.259	C	
21	21 + 33	0.053	C	U	0.081	C	U	0.198	C		0.096	C	U
22		0.051		U	0.068			0.158			0.077	K	J-EMPC
23		0.0017	U		0.018		U	0.0022	U		0.004		U
24		0.0014	U		0.0014	U		0.003	K	J-EMPC	0.0008	U	
25		0.01	K	U	0.028			0.029			0.028		
26	26 + 29	0.023	C	U	0.041	C		0.064	C		0.046	C	
27		0.007		U	0.074			0.014			0.062		
28	20 + 28		C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18	
31		0.121		U	0.148			0.356			0.178		
32		0.015		U	0.078			0.032		U	0.066		
33	21 + 33		C21			C21			C21			C21	
34		0.0016	U		0.016	K	U	0.0022	U		0.006	K	U
35		0.018			0.028			0.038			0.035		
36		0.006	K	J-EMPC	0.003	K	J-EMPC	0.009			0.009		
37		0.057	K	U	0.078	K	J-EMPC	0.12			0.082		
38		0.0017	U		0.02	K	J-EMPC	0.006	K	J-EMPC	0.004	K	J-EMPC
39		0.0017	U		0.0028	U		0.003	K	J-EMPC	0.002		
40	40 + 41 + 71	0.081	C		0.223	C		0.153	C		0.204	C	
41	40 + 41 + 71		C40			C40			C40			C40	
42		0.037			0.083			0.084			0.082		
43		0.004	K	J-EMPC	0.03			0.014	K	J-EMPC	0.025		
44	44 + 47 + 65	0.202	C	U	1.95	C		0.46	C		1.61	C	
45	45 + 51	0.031	C	U	0.483	C		0.048	C	U	0.381	C	
46		0.006	K	U	0.022	K	J-EMPC	0.014	K	J-EMPC	0.023	K	J-EMPC
47	44 + 47 + 65		C44			C44			C44			C44	
48		0.03			0.047			0.057			0.051		
49	49 + 69	0.104	C		0.574	C		0.214	C		0.484	C	
50	50 + 53	0.021	C		0.344	C		0.031	C		0.262	C	
51	45 + 51		C45			C45			C45			C45	
52		0.254			0.629			0.556			0.629		
53	50 + 53		C50			C50			C50			C50	
54		0.002		U	0.175			0.001	K	U	0.121		
55		0.005	K	J-EMPC	0.009	K	J-EMPC	0.0081	U		0.0051	U	
56		0.101			0.125			0.181			0.135		
57		0.0045	U		0.01			0.0078	U		0.005		
58		0.0047	U		0.0048	U		0.0079	U		0.0052	U	
59	59 + 62 + 75	0.016	C		0.086	C		0.027	C		0.076	C	
60		0.056	K	J-EMPC	0.065			0.104			0.073		
61	61 + 70 + 74 + 76	0.429	C		0.558	C		1	C		0.574	C	
62	59 + 62 + 75		C59			C59			C59			C59	
63		0.009			0.015	K	J-EMPC	0.014			0.012		
64		0.083			0.106			0.17			0.118		
65	44 + 47 + 65		C44			C44			C44			C44	
66		0.23			0.319			0.43			0.314		
67		0.007	K	J-EMPC	0.009	K	J-EMPC	0.009			0.006		
68		0.007	K	U	0.025		U	0.015		U	0.022		U
69	49 + 69		C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40	
72		0.0044	U		0.012			0.0079	U		0.008	K	J-EMPC
73		0.0015	U		0.038			0.0009	U		0.027		
74	61 + 70 + 74 + 76		C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61	
77		0.031		U	0.046			0.051			0.056		
78		0.005	U		0.0051	U		0.0084	U		0.0055	U	
79		0.008	K	J-EMPC	0.013			0.01	K	J-EMPC	0.013		
80		0.004	U		0.0045	U		0.0074	U		0.0044	U	
81		0.0045	U		0.006		U	0.0084	U		0.0052	U	
82		0.06			0.073			0.107			0.082		
83	83 + 99	0.295	C		0.973	C		0.494	C		0.922	C	
84		0.091			0.202			0.165			0.19		
85	85 + 116 + 117	0.101	C		0.173	C		0.18	C		0.178	C	
86	86 + 87 + 97 + 108 + 119 + 125	0.358	C		0.685	C		0.609	C		0.717	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
88	88 + 91	0.057	C		0.249	C		0.089	C		0.202	C	
89		0.005	K	J-EMPC	0.009	K	J-EMPC	0.006	K	J-EMPC	0.007	K	J-EMPC
90	90 + 101 + 113	0.542	C		1.78	C		0.856	C		1.54	C	
91	88 + 91		C88			C88			C88			C88	
92		0.108			0.421			0.142			0.337		
93	93 + 95 + 98 + 100 + 102	0.323	C		1.43	C		0.515	C		1.25	C	
94		0.0025	U		0.079			0.002	K	J-EMPC	0.054		
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
96		0.003			0.028			0.003			0.026		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
103		0.003			0.082			0.004	K	J-EMPC	0.062		
104		0.001	K	U	0.035	K	J-EMPC	0.002		U	0.022		U
105		0.221			0.332			0.421			0.339		
106		0.0039	U		0.0097	U		0.005	U		0.0049	U	
107	107 + 124	0.023	C		0.035	C		0.049	C		0.037	C K	J-EMPC
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
109		0.046			0.078			0.075			0.075		
110	110 + 115	0.644	C		1.04	C		1.09	C		1.08	C	
111		0.0018	U		0.0012	U		0.002	K	J-EMPC	0.003		
112		0.0018	U		0.072			0.0014	U		0.0017	U	
113	90 + 101 + 113		C90			C90			C90			C90	
114		0.017	K	U	0.025		U	0.02		U	0.02		U
115	110 + 115		C110			C110			C110			C110	

Table 5d. Summary of Qualifers for Infiltrex Samples (Congeners)
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

IUPAC #	COELUTING CONGENERS[1]	08021252XAD L11001-1 (Filter)	Lab Qualifier	URS Review Qualifier	08021354XAD L11001-3 (Filter)	Lab Qualifier	URS Review Qualifier	08022156XAD L11001-5 (Filter)	Lab Qualifier	URS Review Qualifier	08022453XAD L11001-2 (Filter)	Lab Qualifier	URS Review Qualifier
116	85 + 116 + 117		C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85	
118		0.518			0.947			1.07			1.07		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
120		0.0017	U		0.009	K	J-EMPC	0.004	K	J-EMPC	0.007		
121		0.0018	U		0.009			0.0014	U		0.007		
122		0.008	K	J-EMPC	0.0106	U		0.007	K		0.01	K	J-EMPC
123		0.013	K	U	0.018	K	U	0.023	K	U	0.017	K	U
124	107 + 124		C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
126		0.004	K	U	0.0112	U		0.0059	U		0.0057	U	
127		0.0041	U		0.0097	U		0.005	U		0.0051	U	
128	128 + 166	0.13	C		0.389	C		0.154	C		0.344	C	
129	129 + 138 + 160 + 163	0.864	C		4.43	C		1	C		4.18	C	
130		0.052			0.159			0.06			0.15		
131		0.008			0.024	K	J-EMPC	0.012			0.024		
132		0.209			0.799			0.255			0.74		
133		0.015	K	J-EMPC	0.076			0.015	K	J-EMPC	0.061		
134	134 + 143	0.038	C		0.175	C		0.041	C K	J-EMPC	0.134	C	
135	135 + 151 + 154	0.209	C		1.6	C		0.25	C		1.19	C	
136		0.063	K	J-EMPC	0.393			0.074			0.32		
137		0.04			0.07	K	J-EMPC	0.041			0.08		
138	129 + 138 + 160 + 163		C129			C129			C129			C129	
139	139 + 140	0.012	C		0.031	C		0.019	C		0.027	C K	J-EMPC
140	139 + 140		C139			C139			C139			C139	
141		0.129			1			0.123			0.8		
142		0.0023	U		0.012	U		0.0033	U		0.009	U	
143	134 + 143		C134			C134			C134			C134	
144		0.027			0.188			0.035			0.143		
145		0.0008	U		0.002	K	J-EMPC	0.0008	U		0.001	K	J-EMPC
146		0.115			0.686			0.142			0.563		
147	147 + 149	0.54	C		2.94	C		0.65	C		2.75	C	
148		0.002			0.016			0.002	K	J-EMPC	0.012		
149	147 + 149		C147			C147			C147			C147	
150		0.001	K	J-EMPC	0.016			0.001	K	J-EMPC	0.011		
151	135 + 151 + 154		C135			C135			C135			C135	
152		0.001	K	J-EMPC	0.017			0.0008	U		0.011		
153	153 + 168	0.686	C		4.99	C		0.881	C		4.13	C	
154	135 + 151 + 154		C135			C135			C135			C135	
155		0.002	K	U	0.011		U	0.004	K	U	0.006		U
156	156 + 157	0.085	C		0.359	C		0.101	C		0.319	C	
157	156 + 157		C156			C156			C156			C156	
158		0.07			0.351			0.084			0.284		
159		0.008	K	J-EMPC	0.056			0.008			0.036	K	J-EMPC
160	129 + 138 + 160 + 163		C129			C129			C129			C129	
161		0.0016	U		0.0085	U		0.0023	U		0.0062	U	
162		0.0017	U		0.0088	U		0.004	K	J-EMPC	0.0068	U	
163	129 + 138 + 160 + 163		C129			C129			C129			C129	
164		0.056			0.209			0.06			0.169		
165		0.0019	U		0.0096	U		0.0026	U		0.0072	U	
166	128 + 166		C128			C128			C128			C128	
167		0.033			0.148			0.044			0.139		
168	153 + 168		C153			C153			C153			C153	
169		0.0017	U		0.0088	U		0.0024	U		0.0066	U	
170		0.161			2.08			0.142			1.51		
171	171 + 173	0.056	C K	J-EMPC	0.539	C		0.051	C		0.398	C	
172		0.028			0.343			0.032			0.247		
173	171 + 173		C171			C171			C171			C171	
174		0.168			1.18			0.141			0.878		
175		0.008	K	J-EMPC	0.069			0.009			0.047		
176		0.019			0.178			0.021			0.131		
177		0.121	K	J-EMPC	1.19			0.124			0.835		
178		0.043			0.337			0.043			0.245		
179		0.068			0.499			0.072			0.391		
180	180 + 193	0.359	C		4.82	C		0.341	C		3.51	C	
181		0.001	U		0.012			0.002	K	J-EMPC	0.006		
182		0.002	K	U	0.012		U	0.003	K	U	0.008	K	U
183	183 + 185	0.129	C		1.27	C		0.117	C		0.907	C	
184		0.002	K	J-EMPC	0.002	K	J-EMPC	0.004	K	J-EMPC	0.003	K	J-EMPC
185	183 + 185		C183			C183			C183			C183	
186		0.0008	U		0.0009	U		0.0008	U		0.0009	U	
187		0.265			2.47			0.284			1.7		
188		0.002	K	U	0.008	K	U	0.0008	U		0.004		U
189		0.007	K	U	0.09	K	J-EMPC	0.008	K	U	0.064		
190		0.038			0.409			0.039			0.287		
191		0.01	K	J-EMPC	0.076			0.007			0.055		
192		0.0009	U		0.001	U		0.0008	U		0.001	U	
193	180 + 193		C180			C180			C180			C180	
194		0.075			0.88			0.067			0.656		
195		0.028			0.302			0.027			0.241		
196		0.038			0.374			0.04	K	J-EMPC	0.257		
197	197 + 200	0.014	C K	J-EMPC	0.09	C		0.017	C K	J-EMPC	0.064	C	
198	198 + 199	0.099	C K	J-EMPC	0.711	C		0.096	C		0.489	C	
199	198 + 199		C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197	
201		0.012	K	J-EMPC	0.078			0.01	K	J-EMPC	0.049		
202		0.028	K	J-EMPC	0.109			0.027			0.077		
203		0.063			0.466			0.066			0.331		
204		0.0008	U		0.001			0.0008	U		0.0008	U	
205		0.003		U	0.048			0.006	K	U	0.033		
206		0.054			0.15			0.061			0.118		
207		0.008			0.021	K	J-EMPC	0.012			0.016		
208		0.021		U	0.035			0.024			0.028		
209		0.067			0.073			0.105			0.071		

Notes:

All results are in units of pg/L (picograms/Liter)

C = concentration represents coeluting congeners
U = The analyte was not detected above the reported sample quantification limit.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = A peak was detected that did not meet all criteria for identification as the target analyte; the reported value is the estimated maximum possible concentration of analyte present.
Non-detect values reported at the analytical reporting limit
PCBs = Polychlorinated Biphenyls
RL = method reporting limit
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 5e. Summary of Qualifers for Infiltrex Samples (Congeners)
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

IUPAC #	COELUTING CONGENERS[1]	08022555XAD L11001-4 (Filter)	Lab Qualifier	URS Review Qualifier	08022757XAD L11001-6 (Filter)	Lab Qualifier	URS Review Qualifier	08022959XAD L11001-8 (Filter)	Lab Qualifier	URS Review Qualifier	08030460XAD L11001-9 (Filter)	Lab Qualifier	URS Review Qualifier
1		0.019		U	0.01		U	0.015		U	0.019		U
2		0.055			0.033		U	0.042	K	U	0.056		
3		0.033		U	0.016	K	U	0.032	K	U	0.036		U
4		0.03		U	0.024	K	U	0.026		U	0.038		U
5		0.0065	U		0.0071	U		0.008	U		0.0047	U	
6		0.011		U	0.009	K	U	0.011		U	0.019		U
7		0.013		U	0.008		U	0.011		U	0.014		U
8		0.055		U	0.045		U	0.046		U	0.004	U	
9		0.007	K	U	0.0063	U		0.0071	U		0.007		U
10		0.0054	U		0.006	U		0.0067	U		0.004	U	
11		9.26			13.3			9.81			11.3		
12	12 + 13	0.0065	C U		0.0071	C U		0.008	C U		0.0047	C U	
13	12 + 13		C12			C12			C12			C12	
14		0.0061	U		0.0067	U		0.0075	U		0.0044	U	
15		0.065		U	0.044		U	0.059		U	0.081		U
16		0.032		U	0.031		U	0.042		U	0.052		U
17		0.035		U	0.039		U	0.048		U	0.052		U
18	18 + 30	0.081	C	U	0.072	C K	U	0.093	C	U	0.116	C	U
19		0.014		U	0.013		U	0.015		U	0.017	K	U
20	20 + 28	0.202	C		0.198	C		0.195	C		0.237	C	
21	21 + 33	0.073	C	U	0.082	C	U	0.063	C	U	0.094	C	U
22		0.069	K	J-EMPC	0.07			0.072	K	J-EMPC	0.089		
23		0.0018	U		0.002	U		0.0043	U		0.006		U
24		0.001	K	J-EMPC	0.0018	U		0.003	K	J-EMPC	0.003		
25		0.013		U	0.013		U	0.013		U	0.015		
26	26 + 29	0.029	C K	U	0.027	C K	U	0.028	C	U	0.035	C K	U
27		0.007		U	0.007	K	U	0.009	K	U	0.01	K	U
28	20 + 28		C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18	
31		0.156			0.151			0.144		U	0.179		
32		0.018	K	U	0.016		U	0.023		U	0.029		U
33	21 + 33		C21			C21			C21			C21	
34		0.0018	U		0.003	K	U	0.0043	U		0.005	K	U
35		0.029	K	J-EMPC	0.043			0.03			0.039		
36		0.009	K	J-EMPC	0.01			0.005	K	J-EMPC	0.007	K	J-EMPC
37		0.061		U	0.065			0.067			0.08		
38		0.0019	U		0.002	K	J-EMPC	0.0045	U		0.003	K	J-EMPC
39		0.002			0.002	K	J-EMPC	0.0044	U		0.002	K	J-EMPC
40	40 + 41 + 71	0.091	C		0.097	C		0.089	C		0.101	C	
41	40 + 41 + 71		C40			C40			C40			C40	
42		0.057			0.055			0.067			0.075		
43		0.008	K	J-EMPC	0.007	K	J-EMPC	0.007	K	J-EMPC	0.013		
44	44 + 47 + 65	0.268	C	U	0.27	C	U	0.302	C		0.368	C	
45	45 + 51	0.033	C K	U	0.033	C	U	0.038	C	U	0.045	C	U
46		0.009	K	J-EMPC	0.009			0.01	K	J-EMPC	0.01	K	J-EMPC
47	44 + 47 + 65		C44			C44			C44			C44	
48		0.037			0.04			0.039			0.046		
49	49 + 69	0.14	C		0.126	C		0.134	C		0.146	C	
50	50 + 53	0.021	C		0.02	C	U	0.027	C		0.03	C	
51	45 + 51		C45			C45			C45			C45	
52		0.359			0.333			0.335			0.393		
53	50 + 53		C50			C50			C50			C50	
54		0.001	K	U	0.003	K	U	0.001	K	U	0.005		U
55		0.0073	U		0.0056	U		0.0046	U		0.0046	U	
56		0.116			0.114			0.104			0.118		
57		0.007	U		0.0054	U		0.0044	U		0.0044	U	
58		0.0071	U		0.0055	U		0.0045	U		0.0045	U	
59	59 + 62 + 75	0.021	C		0.021	C		0.021	C		0.023	C	
60		0.071			0.062			0.064	K	J-EMPC	0.067		
61	61 + 70 + 74 + 76	0.563	C		0.515	C		0.495	C		0.571	C	
62	59 + 62 + 75		C59			C59			C59			C59	
63		0.011	K	J-EMPC	0.01			0.01	K	J-EMPC	0.011	K	J-EMPC
64		0.11			0.097			0.097			0.114		
65	44 + 47 + 65		C44			C44			C44			C44	
66		0.282			0.251			0.261			0.279		
67		0.008			0.006			0.008	K	J-EMPC	0.008	K	J-EMPC
68		0.0069	U		0.0053	U		0.0043	U		0.011		U
69	49 + 69		C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40	
72		0.0071	U		0.0055	U		0.0045	U		0.0045	U	
73		0.001	U		0.001	U		0.0014	U		0.0008	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61	
77		0.039		U	0.032		U	0.039		U	0.057		
78		0.0076	U		0.0058	U		0.0048	U		0.0048	U	
79		0.0065	U		0.007	K	J-EMPC	0.01	K	J-EMPC	0.015		
80		0.0066	U		0.0051	U		0.0042	U		0.0042	U	
81		0.0073	U		0.0055	U		0.0047	U		0.0047	U	
82		0.079	K	J-EMPC	0.057			0.058			0.068		
83	83 + 99	0.422	C		0.351	C		0.388	C		0.448	C	
84		0.12			0.112			0.109			0.124		
85	85 + 116 + 117	0.14	C		0.112	C		0.12	C		0.136	C K	J-EMPC
86	86 + 87 + 97 + 108 + 119 + 125	0.476	C		0.409	C		0.442	C		0.512	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
88	88 + 91	0.075	C		0.057	C		0.07	C		0.074	C	
89		0.0019	U		0.006	K	J-EMPC	0.004	K	J-EMPC	0.006	K	J-EMPC
90	90 + 101 + 113	0.73	C		0.609	C		0.684	C		0.779	C	
91	88 + 91		C88			C88			C88			C88	
92		0.126			0.114	K	J-EMPC	0.123			0.128		
93	93 + 95 + 98 + 100 + 102	0.453	C		0.405	C		0.46	C		0.512	C	
94		0.0019	U		0.0027	U		0.0032	U		0.0019	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
96		0.003			0.002	K	J-EMPC	0.003			0.003		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
103		0.005	K	J-EMPC	0.003			0.004			0.003	K	J-EMPC
104		0.001	K	U	0.003	K	U	0.002	K	U	0.004		U
105		0.339			0.262			0.297			0.327		
106		0.004	U		0.0049	U		0.0057	U		0.0051	U	
107	107 + 124	0.038	C K	J-EMPC	0.03	C		0.036	C K	J-EMPC	0.037	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
109		0.064			0.054			0.058			0.065		
110	110 + 115	0.836	C		0.721	C		0.765	C		0.869	C	
111		0.0014	U		0.002	U		0.0024	U		0.0014	U	
112		0.002	K	J-EMPC	0.0019	U		0.0023	U		0.0014	U	
113	90 + 101 + 113		C90			C90			C90			C90	
114		0.021		U	0.014		U	0.017		U	0.02		U
115	110 + 115		C110			C110			C110			C110	

Table 5e. Summary of Qualifers for Infiltrex Samples (Congeners)
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

IUPAC #	COELUTING CONGENERS[1]	08022555XAD L11001-4 (Filter)	Lab Qualifier	URS Review Qualifier	08022757XAD L11001-6 (Filter)	Lab Qualifier	URS Review Qualifier	08022959XAD L11001-8 (Filter)	Lab Qualifier	URS Review Qualifier	08030460XAD L11001-9 (Filter)	Lab Qualifier	URS Review Qualifier
116	85 + 116 + 117		C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85	
118		0.825			0.743			0.884			1.08		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
120		0.005	K	J-EMPC	0.004	K	J-EMPC	0.004			0.004		
121		0.0014	U		0.0019	U		0.0023	U		0.0014	U	
122		0.0044	U		0.006	K	J-EMPC	0.0062	U		0.009		
123		0.015	K	U	0.017	K	U	0.02	K	U	0.026	K	U
124	107 + 124		C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
126		0.0046	U		0.0055	U		0.0063	U		0.008	K	U
127		0.004	U		0.0049	U		0.0057	U		0.0051	U	
128	128 + 166	0.167	C		0.121	C		0.137	C		0.146	C	
129	129 + 138 + 160 + 163	1.07	C		0.809	C		1.04	C		1.28	C	
130		0.067			0.043	K	J-EMPC	0.053			0.057		
131		0.008	K	J-EMPC	0.007	K	J-EMPC	0.01	K	J-EMPC	0.012	K	J-EMPC
132		0.238			0.176			0.213			0.226		
133		0.015			0.012	K	J-EMPC	0.014			0.013		
134	134 + 143	0.04	C		0.026	C		0.033	C		0.032	C	
135	135 + 151 + 154	0.276	C		0.194	C		0.247	C		0.278	C	
136		0.075			0.053			0.063			0.071		
137		0.043	K	J-EMPC	0.033			0.035	K	J-EMPC	0.047		
138	129 + 138 + 160 + 163		C129			C129			C129			C129	
139	139 + 140	0.016	C		0.013	C K	J-EMPC	0.014	C K	J-EMPC	0.016	C	
140	139 + 140		C139			C139			C139			C139	
141		0.126			0.093			0.089			0.116		
142		0.0055	U		0.0023	U		0.0027	U		0.0042	U	
143	134 + 143		C134			C134			C134			C134	
144		0.03			0.023			0.027			0.027		
145		0.0008	U		0.0008	U		0.0011	U		0.0008	U	
146		0.159			0.125			0.156			0.183		
147	147 + 149	0.672	C		0.506	C		0.644	C		0.778	C	
148		0.003	K	J-EMPC	0.002	K	J-EMPC	0.0013	U		0.0008	U	
149	147 + 149		C147			C147			C147			C147	
150		0.001	K	J-EMPC	0.002	K	J-EMPC	0.002	K	J-EMPC	0.0008	U	
151	135 + 151 + 154		C135			C135			C135			C135	
152		0.0008	U		0.001	K	J-EMPC	0.001	U		0.0008	U	
153	153 + 168	1.04	C		0.834	C		1.19	C		1.52	C	
154	135 + 151 + 154		C135			C135			C135			C135	
155		0.002	K	U	0.002		U	0.003	K	U	0.004		U
156	156 + 157	0.11	C		0.085	C		0.099	C		0.115	C	
157	156 + 157		C156			C156			C156			C156	
158		0.082			0.062			0.073			0.083		
159		0.007			0.005	K	J-EMPC	0.008			0.005		
160	129 + 138 + 160 + 163		C129			C129			C129			C129	
161		0.0039	U		0.0016	U		0.0019	U		0.003	U	
162		0.004	U		0.004			0.003	K	J-EMPC	0.0031	U	
163	129 + 138 + 160 + 163		C129			C129			C129			C129	
164		0.057			0.041	K	J-EMPC	0.044			0.053		
165		0.0043	U		0.0018	U		0.0022	U		0.0033	U	
166	128 + 166		C128			C128			C128			C128	
167		0.049			0.041			0.056			0.07		
168	153 + 168		C153			C153			C153			C153	
169		0.004	U		0.0017	U		0.002	U		0.0032	U	
170		0.152			0.099			0.132			0.123		
171	171 + 173	0.049	C		0.037	C		0.05	C		0.054	C	
172		0.031			0.02			0.025			0.027		
173	171 + 173		C171			C171			C171			C171	
174		0.152			0.111			0.128			0.131		
175		0.009	K	J-EMPC	0.007	K	J-EMPC	0.009	K	J-EMPC	0.008	K	J-EMPC
176		0.022			0.015			0.02			0.021		
177		0.13			0.079			0.104			0.112		
178		0.045			0.036			0.044	K	J-EMPC	0.042		
179		0.074			0.057			0.068			0.077		
180	180 + 193	0.365	C		0.265	C		0.369	C		0.392	C	
181		0.003	K	J-EMPC	0.002	K	J-EMPC	0.002	K	J-EMPC	0.002	K	J-EMPC
182		0.003		U	0.002	K	U	0.001		U	0.003		U
183	183 + 185	0.129	C		0.09	C		0.131	C		0.142	C	
184		0.002			0.002			0.001			0.002	K	J-EMPC
185	183 + 185		C183			C183			C183			C183	
186		0.0008	U		0.001	U		0.001	U		0.0008	U	
187		0.295			0.224			0.319			0.349		
188		0.0008	U		0.0008	U		0.001		U	0.003		U
189		0.006	K	U	0.005		U	0.006	K	U	0.004	K	U
190		0.038			0.035			0.045			0.048		
191		0.008			0.005			0.001	U		0.007		
192		0.0008	U		0.0011	U		0.0011	U		0.0008	U	
193	180 + 193		C180			C180			C180			C180	
194		0.063			0.043			0.054			0.052		
195		0.026			0.019	K	J-EMPC	0.029			0.024		
196		0.035			0.027			0.036			0.036		
197	197 + 200	0.016	C		0.01	C K	J-EMPC	0.014	C K	J-EMPC	0.013	C K	J-EMPC
198	198 + 199	0.096	C		0.079	C K	J-EMPC	0.093	C		0.087	C	
199	198 + 199		C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197	
201		0.013			0.01			0.012			0.01	K	J-EMPC
202		0.029			0.024	K	J-EMPC	0.024	K	J-EMPC	0.028	K	J-EMPC
203		0.071			0.052			0.084			0.078		
204		0.0008	U		0.0008	U		0.0008	U		0.0008	U	
205		0.005	K	U	0.002	K	U	0.004		U	0.005	K	U
206		0.049			0.04			0.047			0.056		
207		0.01	K	J-EMPC	0.006	K	J-EMPC	0.007			0.006		
208		0.02		U	0.016		U	0.022	K	U	0.021		U
209		0.056			0.106			0.062			0.064		

Notes:

All results are in units of pg/L (picograms/Liter)

C = concentration represents coeluting congeners
U = The analyte was not detected above the reported sample quantification limit.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = A peak was detected that did not meet all criteria for identification as the target analyte; the reported value is the estimated maximum possible concentration of analyte present.
Non-detect values reported at the analytical reporting limit
PCBs = Polychlorinated Biphenyls
RL = method reporting limit
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once fc
all the coeluting congeners, to eliminate possible errors during congener summation.

Table 5f. Summary of Qualifers for Infiltrex Samples (Congeners)
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

IUPAC #	COELUTING CONGENERS[1]	08030661XAD L11001-10 (Filter)	Lab Qualifier	URS Review Qualifier	08030758XAD L11001-7 (Filter)	Lab Qualifier	URS Review Qualifier
1		0.015		U	0.016		U
2		0.047		U	0.034		U
3		0.034		U	0.028		U
4		0.026		U	0.024		U
5		0.0056	U		0.005	U	
6		0.012		U	0.012	K	U
7		0.0052	U		0.005	K	U
8		0.064		U	0.056		U
9		0.005	U		0.0045	U	
10		0.0047	U		0.0042	U	
11		8.97			7.85		
12	12 + 13	0.0056	C U		0.005	C U	
13	12 + 13		C12			C12	
14		0.0052	U		0.0047	U	
15		0.072		U	0.056		U
16		0.04		U	0.038		U
17		0.042		U	0.039		U
18	18 + 30	0.09	C	U	0.088	C	U
19		0.015		U	0.014		U
20	20 + 28	0.293	C		0.205	C	
21	21 + 33	0.129	C		0.08	C	U
22		0.115			0.076		
23		0.0019	U		0.0029	U	
24		0.002	K	J-EMPC	0.002		
25		0.018			0.012	K	U
26	26 + 29	0.042	C		0.028	C	U
27		0.01		U	0.007	K	U
28	20 + 28		C20			C20	
29	26 + 29		C26			C26	
30	18 + 30		C18			C18	
31		0.22			0.156		
32		0.025		U	0.026		U
33	21 + 33		C21			C21	
34		0.002	K	U	0.0029	U	
35		0.041			0.03	K	J-EMPC
36		0.006	K	J-EMPC	0.007		
37		0.105			0.071		
38		0.004			0.0031	U	
39		0.002	K	J-EMPC	0.003	U	
40	40 + 41 + 71	0.121	C		0.098	C	
41	40 + 41 + 71		C40			C40	
42		0.075			0.065		
43		0.009	K	J-EMPC	0.008		
44	44 + 47 + 65	0.432	C		0.341	C	
45	45 + 51	0.044	C	U	0.038	C	U
46		0.009	K	J-EMPC	0.01	K	J-EMPC
47	44 + 47 + 65		C44			C44	
48		0.045			0.04		
49	49 + 69	0.164	C		0.135	C	
50	50 + 53	0.028	C		0.026	C	
51	45 + 51		C45			C45	
52		0.45			0.37		
53	50 + 53		C50			C50	
54		0.003		U	0.002	K	U
55		0.0058	U		0.004	U	
56		0.163			0.131		
57		0.0056	U		0.0039	U	
58		0.0056	U		0.0039	U	
59	59 + 62 + 75	0.027	C		0.022	C K	J-EMPC
60		0.088			0.069		
61	61 + 70 + 74 + 76	0.816	C		0.583	C	
62	59 + 62 + 75		C59			C59	
63		0.012			0.011		
64		0.136			0.102		
65	44 + 47 + 65		C44			C44	
66		0.363			0.276		
67		0.008	K	J-EMPC	0.008		
68		0.012	K	U	0.009	K	U
69	49 + 69		C49			C49	
70	61 + 70 + 74 + 76		C61			C61	
71	40 + 41 + 71		C40			C40	
72		0.0057	U		0.0039	U	
73		0.0008	U		0.0008	U	
74	61 + 70 + 74 + 76		C61			C61	
75	59 + 62 + 75		C59			C59	
76	61 + 70 + 74 + 76		C61			C61	
77		0.071			0.047		
78		0.006	U		0.0042	U	
79		0.015	K	J-EMPC	0.012		
80		0.0053	U		0.0037	U	
81		0.0057	U		0.0043	U	
82		0.084			0.074		
83	83 + 99	0.479	C		0.397	C	
84		0.144			0.115		
85	85 + 116 + 117	0.164	C		0.13	C	
86	86 + 87 + 97 + 108 + 119 + 125	0.616	C		0.483	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
88	88 + 91	0.078	C		0.074	C	
89		0.006			0.004	K	J-EMPC
90	90 + 101 + 113	0.857	C		0.72	C	
91	88 + 91		C88			C88	
92		0.14			0.127		
93	93 + 95 + 98 + 100 + 102	0.537	C		0.472	C	
94		0.004	K	J-EMPC	0.002	K	J-EMPC
95	93 + 95 + 98 + 100 + 102		C93			C93	
96		0.003	K	J-EMPC	0.002	K	J-EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93	
99	83 + 99		C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93	
101	90 + 101 + 113		C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93	
103		0.004			0.004		
104		0.001	K	U	0.002		U
105		0.403			0.282		
106		0.0041	U		0.0037	U	
107	107 + 124	0.044	C		0.032	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
109		0.075			0.062		
110	110 + 115	1.08	C		0.793	C	
111		0.0011	U		0.0012	U	
112		0.0011	U		0.0012	U	
113	90 + 101 + 113		C90			C90	
114		0.022		U	0.02	K	U
115	110 + 115		C110			C110	
116	85 + 116 + 117		C85			C85	

Table 5f. Summary of Qualifers for Infiltrex Samples (Congeners)
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

IUPAC #	COELUTING CONGENERS[1]	08030661XAD L11001-10 (Filter)	Lab Qualifier	URS Review Qualifier	08030758XAD L11001-7 (Filter)	Lab Qualifier	URS Review Qualifier
117	85 + 116 + 117		C85			C85	
118		1.22			0.932		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
120		0.002			0.005		
121		0.0011	U		0.0012	U	
122		0.008			0.007		
123		0.026	K	U	0.019	K	U
124	107 + 124		C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
126		0.008	K	U	0.007		U
127		0.0041	U		0.0037	U	
128	128 + 166	0.156	C		0.127	C	
129	129 + 138 + 160 + 163	1.11	C		1.04	C	
130		0.058			0.049		
131		0.01	K	J-EMPC	0.007		
132		0.247			0.2		
133		0.017			0.011	K	J-EMPC
134	134 + 143	0.035	C		0.025	C K	J-EMPC
135	135 + 151 + 154	0.285	C		0.237	C	
136		0.07			0.061		
137		0.048			0.037		
138	129 + 138 + 160 + 163		C129			C129	
139	139 + 140	0.016	C		0.012	C	
140	139 + 140		C139			C139	
141		0.122			0.1		
142		0.0034	U		0.0043	U	
143	134 + 143		C134			C134	
144		0.033			0.025		
145		0.0008	U		0.0009	U	
146		0.167			0.161		
147	147 + 149	0.725	C		0.634	C	
148		0.002			0.001	K	J-EMPC
149	147 + 149		C147			C147	
150		0.001	K	J-EMPC	0.001	K	J-EMPC
151	135 + 151 + 154		C135			C135	
152		0.0008	U		0.0008	U	
153	153 + 168	1.26	C		1.18	C	
154	135 + 151 + 154		C135			C135	
155		0.003	K	U	0.003	K	U
156	156 + 157	0.104	C		0.094	C	
157	156 + 157		C156			C156	
158		0.084			0.074		
159		0.007	K	J-EMPC	0.005	K	J-EMPC
160	129 + 138 + 160 + 163		C129			C129	
161		0.0024	U		0.0031	U	
162		0.003	K	J-EMPC	0.0032	U	
163	129 + 138 + 160 + 163		C129			C129	
164		0.055			0.048	K	J-EMPC
165		0.0027	U		0.0034	U	
166	128 + 166		C128			C128	
167		0.06			0.057		
168	153 + 168		C153			C153	
169		0.0024	U		0.0034	U	
170		0.14			0.106		
171	171 + 173	0.054	C		0.04	C K	J-EMPC
172		0.031			0.024		
173	171 + 173		C171			C171	
174		0.145			0.108		
175		0.008			0.009		
176		0.02			0.017	K	J-EMPC
177		0.11			0.09		
178		0.037			0.033	K	J-EMPC
179		0.07			0.068		
180	180 + 193	0.389	C		0.321	C	
181		0.002	K	J-EMPC	0.002		
182		0.0008	U		0.0008	U	
183	183 + 185	0.122	C		0.119	C	
184		0.002	K	J-EMPC	0.002	K	J-EMPC
185	183 + 185		C183			C183	
186		0.0008	U		0.0008	U	
187		0.323			0.276		
188		0.001		U	0.002	K	U
189		0.005	K	U	0.004	K	U
190		0.05	K	J-EMPC	0.043	K	J-EMPC
191		0.006			0.005	K	J-EMPC
192		0.0008	U		0.0008	U	
193	180 + 193		C180			C180	
194		0.069			0.048		
195		0.033			0.018		
196		0.041			0.031		
197	197 + 200	0.013	C		0.01	C	
198	198 + 199	0.096	C		0.075	C	
199	198 + 199		C198			C198	
200	197 + 200		C197			C197	
201		0.013	K	J-EMPC	0.008		
202		0.029			0.021		
203		0.073			0.064		
204		0.0008	U		0.001	K	J-EMPC
205		0.006		U	0.004	K	U
206		0.048			0.039		
207		0.007	K	J-EMPC	0.007	K	J-EMPC
208		0.02		U	0.02		U
209		0.062			0.048		

Notes:

All results are in units of pg/L (picograms/Liter)

C = concentration represents coeluting congeners
U = The analyte was not detected above the reported sample quantification limit.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = A peak was detected that did not meet all criteria for identification as the target analyte; the reported value is the estimated maximum possible concentration of analyte present.
Non-detect values reported at the analytical reporting limit
PCBs = Polychlorinated Biphenyls
RL = method reporting limit
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 6. Infiltrex Sampling Recovery Standards
Quality Control Summary Report for Analytical Chemistry
February/March 2008 Sampling Event

Station Number	URS ID	Date Collected	Axys ID (Column)	Anthracene-d10	PCB 31L	PCB 95L	PCB 153L
				% recovery			
52	08021252XAD	12-Feb-08	L10998-1	106	100	101	91.1
53	08022453XAD	24-Feb-08	L10998-2	105	94.1	93.8	96.4
54	08021354XAD	13-Feb-08	L10998-3	105	106	95.2	95.7
55	08022555XAD	25-Feb-08	L10998-4	105	96.3	94.3	95.8
56	08022156XAD	21-Feb-08	L10998-5	103	101	90.0	93.7
57	08022757XAD	27-Feb-08	L10998-6	105	92.6	93.7	94.1
58	08030758XAD	7-Mar-08	L10998-7	101	97.5	99.8	99.7
59	08022959XAD	29-Feb-08	L10998-8	104	89.1	96.3	88.4
60	08030460XAD	4-Mar-08	L10998-9	101	92.7	91.7	91
61	08030661XAD	6-Mar-08	L10998-10	104	90.4	94.4	96.1
Field Blank	080306FBXAD	6-Mar-08	L10998-11	111	95.6	102	93.9

Notes:

Axys spiked carbon-13 labeled PCBs and deuterated anthracene onto the Infiltrex columns prior to shipment to URS. High recoveries of these standards indicate little to no loss of adsorbded analytes during the sampling event.

BRADFORD ISLAND REMEDIAL INVESTIGATION PROJECT

QUALITY CONTROL SUMMARY REPORT FOR ANALYTICAL CHEMISTRY

REFERENCE AREA SMALLMOUTH BASS COLLECTED FALL 2008

JULY 2008

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1.0 Executive Summary

The overall assessment of the sample results shows the quality of the data is acceptable for supporting project objectives. The contracted laboratories provided all requested analyses, and delivered data reports were complete. Some data were qualified as estimated 'J' or 'J-EMPC' and some as non-detect, 'U'. All data qualifiers resulting from this review have been added to both the project database and the data tables within the main body of this deliverable. The end user should be aware of the potential low bias of the mercury results due to hold time (as discussed in Section 4.1). Additionally, the 27 standards used to quantify PCB congeners were added post extraction and were not exposed to the potential losses encountered during extraction, all fish tissue sample results have the potential to be biased slightly low (see Section 4.5 and 4.8).

2.0 Project Description

URS retrieved seven archived smallmouth bass fish samples from the United States Army Corp of Engineers (USACE) storage facility near Bonneville Dam on February 11, 2008. The fish were collected from October to November 2007 in support of the Bradford Island Bonneville Lock and Dam Project, River Operable Unit Remedial Investigation. Fish were captured under the supervision of the USACE and archived frozen by USACE for future analysis as described below.

3.0 Sampling and Analytical Procedures

Samples were analyzed according to the Quality Assurance Project Plan (QAPP) *River Operable Unit Remedial Investigation* (URS 2007). Table 1 summarizes the sample IDs, capture dates, fish length and weight, and requested analyses for each sample. Whole-body fish samples were homogenized using an industrial blender, then stored frozen by Columbia Analytical Services (CAS), located in Kelso Washington. An aliquot of the homogenized tissue was sent to Axys Analytical Services Ltd located in Sidney, British Columbia (Axys) to perform the PCB congener analysis by EPA Method 1668A, *Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by High Resolution Gas Chromatography/High Resolution Mass Spectrometry*. The Axys analytical data report includes a listing of Axys Method 1668A modifications.

The following table lists the parameters analyzed for one or more of the samples. Table 1 summarizes the specific requested analyses for each medium by URS and laboratory identification numbers. (Note: SVOCs and PAHs were analyzed separately for tissue matrices and are discussed separately in this report).

Method	Analytical Parameter
EPA 1668A	Polychlorinated Biphenyls (PCBs) - Congeners

Method	Analytical Parameter
EPA 8270C-SIM	Semivolatile Organic Compounds (SVOCs)
EPA 8270C-SIM	Polynuclear Aromatic Hydrocarbons (PAHs)
EPA 6000/7000 series	Metals
Puget Sound Estuary Program (PSEP 1996)	Percent Lipids
Freeze Dry	Percent Solids

4.0 Data Validation

Analyses were performed in general accordance with the above reference methods and variations from method requirements were well-documented. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, chain of custody (COC), laboratory case narrative, proper sample preservation and handling procedures, holding times, initial and continuing calibrations, quantitation limits, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The following items were reviewed on 15% or greater of the data: primary and secondary column verification (method 8270C and 6000/7000 series), instrument calibration and a verification of the reported electronic data with the hard copy deliverable.

The data review process for this investigation followed the Bradford Island Bonneville Lock and Dam Project, River Operable Unit Remedial Investigation Quality Assurance Project Plan (QAPP) (USACE 2007). Additionally, because the QAPP-referenced *Department of Defense Quality Systems Manual* does not discuss PCB congeners, the data review process utilized guidance from EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review (September 2005)* and *EPA Region 10 Standard Operating Procedure (SOP) for the Validation of Method 1668 Toxic, Dioxin-like, PCB data (USEPA 1995)* as appropriate for method performed. In the case of disagreement between the documents listed as guidance or the analytical method, method criteria were utilized for data review. The SVOC and Metals results were reviewed in accordance with the criteria contained in the DoD QSM (DoD 2006) and the above listed methods and EPA's *NFGs for Organic Data Review, and the NFGs for Inorganic Data Review* (USEPA 2004), in that order of precedence. Project-specific QC criteria are listed in the above mentioned QAPP.

A summary of qualifiers assigned to results in this investigation is included in Tables 2. Samples are listed by their URS sample identification assigned in the field as well as the laboratory identification. Qualifiers that may be assigned to the results of this investigation include the following:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit (for SVOCs and metals) or above the noise-based sample-specific detection limit for PCB congeners.

- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

- J-EMPC – The analyte was not positively identified; the associated numerical value is the **E**stimated **M**aximum **P**otential **C**oncentration of the analyte in the sample - used only for PCB congener results.

- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

- DNR - Do Not Report

Final sample results and qualifiers are presented in the analytical tables provided in the sampling report.

4.1 Chain-of-Custody, Sample Preservation and Holding Time

Fish Tissue (non-congeners)

The chain-of-custody (COC) forms indicate that samples were maintained under chain of custody and forms were signed upon release and receipt. All coolers were submitted at temperatures within the EPA-recommended temperature of 6°C or below. Data were not qualified based on cooler temperatures.

All samples were analyzed within the technical and contracted holding time with the following exceptions:

- All samples were analyzed from 88 to 113 days past the 28 day holding time for inorganic mercury in solid matrixes. The mercury data were not rejected based on hold time due to the fact that it is believed that a large percentage of the mercury in these samples is in the form of methyl mercury due to the higher tropic level of the sample.

The short hold time for inorganic mercury is due to the loss of analyte from evaporation; however, methyl mercury is more resistant to loss via evaporation. Methyl mercury was not specifically analyzed in these samples nor are there specific hold times for methyl mercury listed in QSM DoD. All mercury results are qualified as estimated and flagged 'J'. The end user should be aware of the potential low bias of the mercury results due to hold time.

Fish Tissue (congeners)

The chain-of-custody (COC) forms from CAS to Axys indicate that samples were maintained under chain of custody and forms were signed upon release and receipt. The Axys receipt date of March 5, 2007, printed on the COC form appears to be in error, as it is before the sample collection date of October and November 2007. The CAS relinquish date on the COC form is listed as March 4, 2008, the Axys Sample Receiving Record included as page 12 in data package DPWG25561 lists March 5, 2008 as the sample receipt date, and the sample shipping information included as page 11 in data package DPWG25561 lists March 4, 2008 as the sample shipment date. For these reasons, it is concluded the March 5, 2007 Axys receipt date printed on the COC form should be March 5, 2008.

Sample temperature during transport from CAS to Axys was not indicated on the COC form or on the Axys Sample Receiving Record. However, the sample shipping information included as page 11 in data package DPWG25561 lists dry ice in the description field of the Federal Express paperwork. The samples were stored at -20°C by Axys prior to extraction and analysis. The condition of the samples upon receipt by Axys was appropriate, custody seals were intact, and all samples listed on the COC form were present. Data were not qualified based COC and sample shipment procedures.

All samples were analyzed within the technical and contracted holding times.

4.2 Instrument Calibration

The laboratory performed initial multipoint calibrations for target and surrogate compounds as required by the analytical methods. Initial calibrations (ICAL) and continuing calibrations (CCAL) were performed at the proper frequency and at the appropriate concentrations required by the methods.

Fish Tissue (non-congeners)

Instrument calibrations were acceptable for non-congener sample analyses performed with the following exceptions:

- The ICAL for di-n-butyl phthalate, di-n-octyl phthalate and terphenyl-d4 exceeded the DoD QSM RSD limit of ≤15% with 16.4%, 15.9%, 15.5%, respectively. The alternative criteria presented in both the DoD QSM (p.139) and EPA guidance were met. Additionally, CCALs for these analytes were within the control limits. No qualification was given to the data based on ICAL values.

Fish Tissue (congeners)

ICALs and continuing calibration verifications (CCVs) were reviewed for PCB congener analyses. The laboratory performed initial multipoint calibrations for all target and standard compounds as required by the Method 1668A. ICALs, CCVs and OPR (ongoing precision recovery) standards were analyzed at the proper frequency and at appropriate concentrations required by EPA Method 1668A. Calibration compounds analyzed associated with the fish tissue samples met the acceptance criteria as listed in the method.

4.3 Review of Blanks

Method blanks were used to check for laboratory contamination and instrument bias. The laboratories analyzed at least one method blank for each analysis and for each batch, per QAPP requirements. Qualification of samples due to method or field blank contamination followed guidelines set forth in the EPA NFGs.

Fish Tissue (non-congeners)

For non-congener organic analyses, sample results less than five times (5x) and inorganic sample results (or common laboratory organic contaminates such as phthalates) less than ten times (x10) the method blank or field blank concentration and between the method detection limit (MDL) and the method reporting limits (MRL) were flagged as non-detect 'U' at the MRL. When sample results were less than 5x the blank concentration but above the MRL, the reported result was qualified as non-detect 'U'. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Target compounds reported with concentrations greater than 5x the blank concentration were not qualified. For solid matrices reported in both wet and dry weight concentrations, the above guidelines were applied using wet weight results and any flags applied were also applied to the dry weight results. Field blanks were not collected as part of this sampling event. All analytical tests indicate non-detects for all method blanks with the following exceptions:

- Lead and nickel were detected above the MDL and below the MRLs in the method blank associated with sample delivery group K0801240, additionally, cobalt was detected in the calibration blanks bracketing the samples. Sample results were above 10x the blank concentrations with the exception of cobalt in samples K0801240-001 through K0801240-007 and lead in samples K0801240-001 through K0801240-007 and nickel in samples K0801240-004, K0801240-005 and K0801240-006. These samples were qualified and flagged 'U' as described above and reported in Table 2.
- Di-n-butyl phthalate was detected in the SVOC method blank associated with delivery group K0801240 at a concentration above the MRL. The following samples had results below 10x the method blank concentration and were detected above the MRL and were flagged 'U' at the reported sample concentration, K0801240-001, -003 through -007.

Fish Tissue (congeners)

PCB congener sample results that were reported as detected at a concentration less than five times (5x) the associated blank concentration were flagged 'U' or non-detect at the reported concentration. Target compounds reported with concentrations greater than 5x the blank concentration were not qualified. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Method blank results reported as EMPCs were not considered appropriate for use in qualifying associated sample results. Method 1668A stipulates using a method blank as similar to the matrix as possible. The method blank was prepared using corn oil to approximate the lipid content of the samples.

The method blank associated with fish tissue samples had only low levels of few PCBs. No sample results were qualified based on method blank concentrations.

4.4 Surrogate Recovery Review (non-congener analyses only)

Each sample analyzed for organic compounds other than PCBs was spiked with surrogates (system monitoring compounds). Surrogate recoveries are a measure of accuracy for the overall extraction and analysis of each individual sample. Surrogate recoveries were acceptable for all analyses with the following exceptions:

- PAH surrogate recoveries for fluorene-d10 and fluoranthene-d10 were below the lower DoD QSM control limit of 60% for samples K0801240-001 and -004. The associated MS/MSD and LCS/LCSD were within control limits for fluorene and fluoranthene suggesting analytical batch was in control. All PAHs in samples K0801240-001 and K0801240-004 were estimated and flagged 'J/UJ' to indicate potential low bias.

4.5 Labeled Internal Standard Recovery Review (congener analysis only)

Samples analyzed for PCB congeners were spiked with labeled internal (quantification) standards. These standards are used to quantitate target congeners and the calculations of target compound concentrations are designed to compensate for low extraction and/or cleanup efficiencies. In addition, their recovery is measured against injection standards added after extraction and cleanup to typically evaluate extraction and/or cleanup efficiency which could affect sensitivity and could also affect accuracy for target compounds not quantitated against a chemically identical, isotopically labeled standard. The percent recovery of the labeled standards was compared with the limits set forth in EPA Method 1668A and those set by Axys detailed in Table 1 of the Axys narrative. Cleanup standards 28L, 111L, and 178L typically are added prior to cleanup and quantitated using injection standards added just prior to analysis to evaluate cleanup efficiency.

Because Axys anticipated high level congener concentrations in these tissue samples based on previous fish tissue samples collected [Bonneville Dam Forebay, 2006/2007], the three standards typically used as cleanup standards (28L, 111L, and 178L) were introduced prior to extraction and used as "extraction standards." The internal standards (27 labeled congeners used to quantitate target congeners) were introduced after extraction and prior to cleanup and should therefore be considered "cleanup standards" for these samples. This approach was taken as a

result of the anticipated high congener levels and resulting volumetric amount of standard necessary to be introduced prior to extraction, and the relative cost of the three labeled congener standard solution to that of the 27 labeled congener standard solution. Section 4.8 presents additional details on the target congener quantification effects of this approach by Axys. The internal standards were within the 25-150% control limits set by EPA Method 1668A, and cleanup standards were within the 30-135% control limits set by EPA Method 1668A.

Isotopic dilution calculations are designed to compensate for recovery or loss. Therefore, PCB congeners quantified against chemically identical ^{13}C-labeled standards were not considered for qualification based upon internal standard recoveries. However, congeners with concentrations calculated based upon internal standards that are not chemically identical have the accuracy of the results potentially affected by low extraction and/or cleanup efficiency since the efficiency for the standard may not match the target compound exactly. These congeners were considered for qualification if recoveries were outside specified limits. Internal standard recoveries were within Method 1668A specified control limits for the samples reported in this data package, and data qualification was not necessary.

As described later in Section 4.8, Axys analyzed each sample extract twice due to the levels observed in the first analyses. The standards used to monitor the efficiency of the extraction were reported from the original analyses and the remainder of the data was reported from the repeat analyses.

4.6 Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control samples (LCS) are used to monitor the laboratory's day-to-day performance of routine analytical methods, independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. Per method requirements, at least one LCS and one MS/MSD were analyzed for each analysis and for each batch.

Fish Tissue (non-congeners)

LCS/LCSD and MS/MSD recoveries were acceptable for all non-congener analytical tests with the following exceptions:

- MS recoveries for sample K0801240-006 were over the DoD QSM control limit of 120% for arsenic and zinc with 121% and 131%, respectively. The MSD performed on the same sample had arsenic and zinc recoveries of 122% and 135%, respectively. The LCS and SRM recoveries for arsenic and zinc were in control indicating batch was in control. Arsenic and zinc were flag 'J' in sample K0801240 due to potential high bias due to sample matrix.
- SVOC MS/MSD recoveries for sample K0801240-006 were outside control limits for di-n-butyl phthalate and bis(2-ethylhexyl) phthalate. Accurate quantification of these analytes was prevented due to unknown matrix interferences in the chromatograms even

after additional gel-permeation chromatography (GPC) cleanup was performed. Recovery in the associated LCS/LCSD was acceptable suggesting analytical batch was in control; data were not flagged based on MS/MSD recoveries of these analytes. Recoveries for di-n-octyl phthalate within the same MS/MSD pair were above the upper control limit of 130% with recoveries of 206% and 220%, respectively. Sample results in the associated sample delivery group were all non-detect for di-n-octyl phthalate. Results were not qualified based on the potential bias high for di-n-octyl phthalate. Additionally, recoveries for 4-methylphenol in the same MSD were below the lower control limit of 40% with 18%. The 4-methylphenol recovery in the associated MS was 40%. The resulting RPD for the MS/MSD pair for 4-methylphenol was above the control limit. Therefore, results for 4-methylphenol in the parent sample (K0801240-006) were flagged 'UJ' due to potentially low bias.

- The MSD recovery for sample K0801240-001 was below the DoD QSM control limit of 45% for pyrene with 43%, additionally, the RPD for the MS/MSD pair was above the 30% control limit with 54%. The associated MS, LCS and calibration standards indicate analytical batch was in control. The sample result for pyrene was estimated and flagged 'UJ' for sample K0801240-001 due to MSD and RPD results.

Fish Tissue (congeners)

MS/MSD samples are not required by Method 1668A for PCB congener analysis. For Method 1668A, Ongoing Precision and Recovery (OPR) samples were used in place of LCS to monitor laboratory performance. The OPR was prepared using corn oil to approximate the lipid content of the samples. OPR recoveries were acceptable for congener analyses.

4.7 Duplicate Review (non-congener analyses only)

Field duplicates were not collected as part of this sampling event. Laboratory precision was evaluated through duplicate analyses (i.e. LCS/LCSD and MS/MSD). No samples were qualified exclusively on duplicate precision exceedances.

4.8 Compound Quantification

Fish Tissue (congeners)

An accurately weighed, approximately 2 gram subsample of the tissue was spiked with extraction standards (28L, 111L, and 178L, Section 4.5) then extracted and the resulting extract was split by weight into two uneven portions; 95% of the extract was reserved as backup. The remaining five percent of the extract was spiked with quantification standards, cleaned up, and used for initial analyses on April 24, 2008. This approach was taken by Axys due to high level congener concentrations expected in these samples based on previous fish tissue samples collected (as stated above). Due to the low levels of target analytes observed in these initial analyses, repeat analyses were conducted using the reserved portion of the extract on May 15, 2008. Repeat analyses are indicated by the "RX" suffix added to the laboratory sample ID.

A combination of the two analyses was reported by Axys. As described in Section 4.5 above, labeled standards 28L, 111L, and 178L were used to monitor extraction efficiency. Following routine sample preparation and cleanup procedures, Axys staff inadvertently introduced more cleanup standard solution (28L, 111L, and 178L) to the 95% portion of the extract prior to its cleanup (forgetting that the cleanup and internal standards were reversed for these samples as discussed in Section 4.5). For this reason, the standards used to monitor the efficiency of the extraction were reported from the initial analyses (five percent extract aliquot) and the remainder of the data were reported from the repeat analyses (95% extract aliquot).

Because the labeled quantification standards were introduced to the extract (post extraction and pre cleanup as described in Section 4.5), these standards were not exposed to the potential loss one might expect during the extraction process. Rather the "extraction standards" 28L, 111L, and 178L were used as a measure of aggregate loss encountered during extract and cleanup. Because the quantification standards used to quantify congener results were not exposed to the potential losses encountered during extraction, all fish tissue sample results have the potential to be biased slightly low. The presence and magnitude of this bias are indicated by the recoveries of the 28L, 111L, and 178L standards. As all labeled standards were recovered within method limits, no data qualification was considered necessary.

Congener results were reported by Axys as picograms per gram (pg/g) on a wet weight basis. The removal of an aliquot for the lipid determination has been accounted for in the quantification procedures such that the final results are in terms of the whole subsample extracted.

Homologue totals were obtained by summing the concentration of all detected congeners at each level of chlorination. Toxic Equivalents (TEQs) were calculated using World Health Organization 2005 Toxicity Equivalence Factors. Chromatographic peaks that met all other qualitative identification criteria but did not meet the method ion abundance ratio criteria were not included in the homologue totals or TEQ calculations.

The internal standard method is used to calculate concentrations of PCB congeners that do not have chemically identical labeled standards. The internal standard method is dependent upon consistent detector response over the calibration range and over time. If detector response varies between the retention time of the standard and that of the target compound, concentrations can be biased high or low based on the variations in detector sensitivity. During congener analysis, PFK (perfluororkerosene) is used as a lock mass reference standard to measure changes in detector sensitivity. Each lock mass must not vary more than 20% throughout its respective retention time window as required by Method 1668A. Variations of more than 20% indicate the presence of co-eluting interferences or decreased sensitivity. No PCB congener results were qualified due to lock mass variations.

4.9 Target Compound Identification

Fish Tissue (non-congeners)

- Two metal standard reference materials (SRM) were analyzed. One (N.R.C.C Dolt-3) exceeded the upper CAS control limit for lead (i.e. 0.460 mg/kg versus control limit of 0.437 mg/kg) in sample delivery group K0801240. The LCS, MS/MSD, calibration standard and second SRM were all within the recovery control limits set by either the DoD QSM or CAS. Lead sample results were not flagged due to the SRM recovery.

Fish Tissue (congeners)

Ion abundance ratios are used to identify PCB congeners. Results that met all other qualitative identification criteria but were more than 15% different from the theoretical ion abundance criterion set by EPA Method 1668A are flagged in the laboratory report with a 'K' flag. Those results flagged 'K' with ion abundance ratios outside the identified quantitation criteria are considered estimated maximum possible concentrations (EMPC) and were re-flagged 'J-EMPC' during this review. If the analyte result was previously qualified 'U' by method blank detection, the result retained the 'U' qualifier and it was not qualified further because an ion ratio was out of limits (there is no ion ratio criterion for non-detects). These EMPC flags are not tabulated in this report but appear within the data tables in the main body of this deliverable. In addition, these flags are entered into the database.

Ion ratios outside the control limits are generally a consequence of co-eluting interferences to either one or both quantitation peaks. In these cases, Axys chose to use the quantitation peak areas as recorded; no adjustments were made to force the peaks to match the theoretical ion abundance ratios before reporting EMPC results. EMPC results should be considered by the data users as part of evaluating the data for end-use objectives.

Additionally, the flag 'C' was used in Table 3 to indicate co-eluting PCB isomers for this analysis. The concentrations of the co-eluting isomers were reported as a group, eliminating the need for any data qualification.

5.0 Completeness

The laboratory reported all requested analyses, and the deliverable data reports were complete. Some data were qualified as estimated 'J' or 'J-EMPC' and some as non-detect 'U'. A summary of qualifiers can be found in Tables 2. A completeness summary follows; congener completeness was calculated using 209 congener results.

The electronic and pdf versions of the deliverables were cross-checked for accuracy at frequency of 20% for the congener data and 20% for non-congener data. No discrepancies were found between the deliverables.

- *Technical Completeness* = (number of useable results/total reported results) x100
  All samples results are considered useable.
  Congener = *(1,463 compliant / 1,463 total results) = 100%*
  Non-congener = *(259 compliant / 259 total results)*= 100%

- *Contract Completeness* = (number of contract compliant results/total reported results) x100
  Congener = *(1,463 compliant / 1,463 total results)* = 100%

Non-congener = *(259 compliant / 259 total results)*= 100%

- *Analytical Completeness* = (number of unqualified results/total reported results) x100

  Congener = *(1,317 compliant / 1,463 total results) = 90%*
  Non-congener = *(230 compliant / 259 total results)* = 88%
  Some congener data were qualified as estimated 'J-EMPC'.

- *Field Sampling Completeness* =(number samples collected/total reported results) x100
  All proposed field samples were successfully collected.
  Congener = *(1,463 compliant / 1,463 total results)* = 100%
  Non-congener = *(259 compliant / 259 total results)*= 100%

6.0 References

URS 2007. Quality Assurance Project Plan, *Water Quality Monitoring for the In-Water Removal Action*, Bradford Island, Bonneville Lock and Dam Project, Cascade Locks, Oregon. July 2007.

DOD 2006. Department of Defense Environmental Data Quality Workgroup. Department of Defense (DOD) Quality Systems Manual (QSM) for Environmental Laboratories. Final Version 3. January 2006. Retrieved from [http://www.navylabs.navy.mil/Archive/DoDV3.pdf] on 3/3/06

USEPA 1995. U.S. Environmental Protection Agency (USEPA) Region 10 SOP for the Validation of Method 1668 Toxic, Dioxin-like, PCB Data. December 1995.

USEPA 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. October 1999.

USEPA 2004. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. October 2004.

USEPA 2005. USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review. September 2005.

Table 1. Reference Area Smallmouth Bass Collected Fall 2007

Quality Control Summary Report for Analytical Chemistry
Reference Area Smallmouth Bass Collected October/November 2007

URS ID	Length (mm)	Weight (grams)	Collection Date	CAS ID	Axys ID (congeners)	Analytes				
						PCB (congeners) (Axys Analtyical)	SVOCs	Metals	%Lipids	%Solids
071027R01SB	380	820	10/27/07	K0801240-001	L10965-1	X	X	X	X	X
071027R02SB	360	802	10/27/07	K0801240-002	L10965-2	X	X	X	X	X
071027R03SB	325	548	10/27/07	K0801240-003	L10965-3	X	X	X	X	X
071027R04SB	370	906	10/27/07	K0801240-004	L10965-4	X	X	X	X	X
071027R05SB	350	646	10/27/07	K0801240-005	L10965-5	X	X	X	X	X
071027R06SB	330	501	10/27/07	K0801240-006	L10965-6	X	X	X	X	X
071115R07SB	425	964	11/15/07	K0801240-007	L10965-7	X	X	X	X	X

Notes:

CAS – Columbia Analytical Services
ID – Identification
mm – millimeter
PCB – Polychlorinated biphenyl
SVOCs – Semivolatile Organic Compounds

Table 2. Smallmouth Bass Non-congener Qualifer Summary
Quality Control Summary Report for Analytical Chemistry
Reference Area Smallmouth Bass Collected October/November 2007

CAS ID	URS ID	Analyte	Qualifer	Rational
K0801240-001	071027R01SB	mercury	J	hold time
K0801240-002	071027R02SB			
K0801240-003	071027R03SB			
K0801240-004	071027R04SB			
K0801240-005	071027R05SB			
K0801240-006	071027R06SB			
K0801240-007	071115R07SB			
K0801240-001	071027R01SB	lead	13U	MB detections
K0801240-002	071027R02SB		14U	
K0801240-003	071027R03SB		14U	
K0801240-004	071027R04SB		15U	
K0801240-005	071027R05SB		14U	
K0801240-006	071027R06SB		13U	
K0801240-007	071115R07SB		14U	
K0801240-004	071027R04SB	nickel	298U	
K0801240-005	071027R05SB		306U	
K0801240-006	071027R06SB		277U	
K0801240-001	071027R01SB	di-n-butyl phthlate	220U	
K0801240-003	071027R03SB		150U	
K0801240-004	071027R04SB		280U	
K0801240-005	071027R05SB		150U	
K0801240-006	071027R06SB		230U	
K0801240-007	071115R07SB		87U	
K0801240-001	071027R01SB	cobalt	25.5U	calibration blank detections
K0801240-002	071027R02SB		30.9U	
K0801240-003	071027R03SB		27.8U	
K0801240-004	071027R04SB		24.8U	
K0801240-005	071027R05SB		25.5U	
K0801240-006	071027R06SB		26.7U	
K0801240-007	071115R07SB		36.1U	
K0801240-001	071027R01SB	acenapthene fluorene phenanthrene anthracene fluoranthene pyrene benzo(a)anthracene chrysene benzo(b)fluoranthene benzo(k)fluoranthene benzo(a)pyrene indeno(1,2,3-cd)pyrene dibenzo(a,h)anthracene benzo(g,h,i)perylene	J/UJ	PAH surrogate recovery (*fluorene-d10 and fluoranthene-d10*)
K0801240-004	071027R04SB			
K0801240-006	071027R06SB	arsenic zinc	J	MS/MSD recoveries
K0801240-006	071027R06SB	4-methylphenol	UJ	MSD recovery and RPD
K0801240-001	071027R01SB	pyrene	UJ	MSD recovery and RPD

Notes:
Not included are J flags indicating detections above the MDL and below the MRL.
Concentrations are reported in weight wet (µg/kg).

RIVER OPERABLE UNIT REMEDIAL INVESTIGATION REPORT

QUALITY CONTROL SUMMARY REPORT FOR ANALYTICAL CHEMISTRY

CONGENER RESULTS FOR FOREBAY AND REFRENCE AREA CLAMS AND CRAYFISH COLLECTED FROM FEBRUARY THROUGH MARCH 2008

JANUARY 2009

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1.0 Executive Summary

The overall assessment of the clam and crayfish Polychlorinated Biphenyl (PCB) results show the quality of the data is acceptable to support project objectives. The contracted laboratory provided results for all requested analyses and laboratory data reports were complete. Some data were qualified as estimated and flagged 'J' or 'J-EMPC'. Some data were qualified as not detected and flagged 'U'. Refer to Section 4.0 of this report for a listing of qualifier definitions. All data qualifiers resulting from this review have been added to both the project database and the data tables within the main body of this report.

2.0 Project Description

A total of 67 tissue samples (35 clam samples and 32 crayfish samples) were submitted to Axys Analytical Services Ltd. of Sidney, British Columbia, Canada (Axys) for PCB congener analysis. These samples were collected from both the forebay and reference area during the February/March 2008 sampling event in support of the Bradford Island Bonneville Lock and Dam Project, River Operable Unit Remedial Investigation. Table 1 summarizes the URS sample and analytical laboratory identification numbers, collection dates and requested analyses. These samples were previously analyzed for PCB Aroclors, polynuclear aromatic hydrocarbons (PAHs), semivolatile organic compounds (SVOCs) and selected metals by Columbia Analytical Services (CAS) of Kelso, Washington. The analytical results for these analyses were presented in the *River Operable Unit Remedial Investigation Data Summary Report*, July 29, 2008 (URS 2008). This quality control summary report and attached tables only address PCB congener analytical results for the 67 clam and tissue samples. The other CAS-reported analytical results for these tissue samples and the PCB congener results reported for sediment samples are addressed in separate quality control summary reports.

3.0 Sampling and Analytical Procedures

Samples were analyzed according to the Bradford Island Bonneville Lock and Dam Project, *River Operable Unit Remedial Investigation Quality Assurance Project Plan* (QAPP) (URS 2007). The clam and tissue samples were submitted to CAS of Kelso, Washington in discrete batches throughout the February/March 2008 sampling event. The specifics of the sample receipts are detailed in the quality summary report attached with the original data report (URS 2008). In summary, all tissue samples arrived intact at CAS and were archived frozen prior to and following whole-body homogenization using an industrial blender. Authorization to release the remainder of the homogenized tissue samples to Axys to perform PCB congener analysis by EPA Method 1668A, *Chlorinated Biphenyl Congeners in Water, Soil, Sediment and Tissue by High Resolution Gas Chromatography/High Resolution Mass Spectrometry* was given on June 25, 2008 by URS. The Axys analytical data reports include a listing of the Axys Method 1668A modifications. The PCB congener results for the clam and crayfish samples are reported in six Axys sample delivery groups, as outlined in Table 1.

Note: Clam samples from stations 9 and 67 and crayfish samples from stations 2 and 3 had insufficient sample volume (<3 grams) for congener analysis. Crayfish samples from stations 38 and 42 were analyzed as a composite to overcome inadequate individual sample volume. Refer to Section 4.10 for additional details regarding sample volume and sample specific reporting limits.

4.0 Data Validation

Analyses were performed in general accordance with the above-referenced method. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, chain of custody (COC), laboratory case narrative, proper sample preservation and handling procedures, holding times, reporting limits, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. As appropriate for the analytical method, the following items were reviewed for 20% or greater of the data: primary and secondary column verification, instrument calibration and a verification of the reported electronic data with the hard copy deliverable.

The data review process for this investigation followed the QAPP. Additionally, because the QAPP-referenced *Department of Defense Quality Systems Manual* (DOD 2006) does not discuss PCB congeners, the data review process utilized guidance from EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review (USEPA 2005a)* and *EPA Region 10 Standard Operating Procedure (SOP) for the Validation of Method 1668 Toxic, Dioxin-like, PCB Data* (USEPA 1995) as appropriate for method performed. In the case of disagreement between the documents listed as guidance or the analytical method, method criteria were utilized for data review. Project-specific QC criteria are listed in the above mentioned QAPP.

A summary of qualifiers assigned during this review is provided Tables 2 and 3. Samples are listed by their URS sample identification number assigned in the field as well as the laboratory identification number. All qualifiers are included in the database and are included in the data tables included in the main body of this report. Congeners are reported using sample-specific detection limits. Qualifiers that may be assigned to the results of this investigation as part of this QA/QC review include the following:

- U - The analyte was analyzed for but was not detected above the reported sample reporting limit.

- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

- J-EMPC – The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration of the analyte in the sample. This qualifier is used only for PCB congener results.

- UJ - The analyte was not detected above the reported sample reporting limit. However, the reported reporting limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

- DNR - Do Not Report. Another value is available that is more reliable or appropriate.

4.1 Chain-of-Custody, Sample Preservation and Holding Time

As stated above in Section 3.0, all tissue samples arrived intact at CAS and were archived frozen prior to and following whole-body homogenization using an industrial blender. As reported previously, the COC forms indicate that samples were maintained under proper chain-of-custody and forms were signed upon release and receipt. All coolers were submitted to CAS at temperatures within the EPA-recommended temperature of 6 degrees Celsius (°C) or below. Representativeness was maintained during the sampling effort by completing all samples using similar sampling procedures and in accordance with approved QAPP.

The chain-of-custody (COC) forms from CAS to Axys indicate that samples were maintained under chain of custody and forms were signed upon release and receipt. All samples listed on the COC forms were present. The condition and temperature of the samples upon receipt by Axys was appropriate with the following exceptions:

- The coolers containing clam samples L11379-1 through L11379-37 and crayfish samples L11380-13 through L11380-19, L11380-22 through L11380-30, L11380-33 through L11380-35 and L11512-6 were recorded upon receipt by Axys at 12°C. (*Note*: sample L11512-6 was originally logged in under sample name L11380-21). All samples were frozen prior to shipment and packaged on dry ice per Method 1668A. Samples were shipped from CAS to Axys on June 30, 2008. Due to complications at customs the samples were received on July 3, 2008 by Axys, two days beyond the anticipated date of arrival. The samples were immediately frozen upon receipt by Axys. PCBs are known for long term stability (USEPA 2005b). The sample results were not qualified based on the slight elevation in temperature during the last day of shipment.

- Sample L11433-1 was shipped frozen separately. The cooler temperature upon receipt on July 16, 2008 was recorded at 9°C. The cooler was in transit for two days. Due to reasons previously stated above, sample results were not qualified based on cooler temperature upon receipt by Axys.
- If individual clams or crayfish were collected from the same sample station over the course of two or more sampling days the earliest acquisition date was used in both the sample identification number and reported on the chain of custody. In most instances, CAS was asked to composite and homogenize the sample specimens from multiple acquisition dates and relabel the sample containers prior to shipping the samples Axys. However, there were a few sample containers with inaccurate sample dates (i.e. not the oldest sample date); these are documented in the login notes taken by Axys. All sample acquisition dates were resolved and properly reported within the data deliverables by Axys.

All samples were analyzed within the technical and contracted holding times.

4.2 Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and standard compounds as required by the Method 1668A. ICALs, CCVs and OPR (ongoing precision recovery) standards were analyzed at the proper frequency and at appropriate concentrations as required by EPA Method 1668A. Calibration compounds met the acceptance criteria as listed in the method with the following exception:

- The 12-hour CCV bracketing clam samples L11379-21WI, L11379-24WI, L11379-25WI, L11379-26WI and L11379-27WI within data deliverable DPWG26457 was inadvertently omitted. The initial CCV bracketing the above-listed samples was analyzed on August 26, 2008 at 9:44 am and the subsequent successful CCV was analyzed on August 27, 2008 at 8:44 am (23hrs later), both met acceptance criteria (only the initial CCV is listed in the report). The 'WI' suffix for the five above-listed samples indicates the extracts were diluted and instrumentally reanalyzed. The only congener reported from the diluted extracts was PCB 11, all other congeners were reported from the original (undiluted extract). Results for PCB 11 in these clam samples were not qualified due to the omission of the 12-hour CCV.

4.3 Review of Blanks

Method blanks are used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank per analysis for each batch, per QAPP requirements. Qualification of samples due to method blank and calibration blank contamination followed guidelines set forth in the EPA NFGs and EPA Region 10 SOP.

PCB congener sample results that were reported as detected at a concentration less than five times (5x) the associated blank concentration were flagged 'U' or non-detect at the reported concentration. Target compounds reported with concentrations greater than 5x the blank concentration were not qualified. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Method blank results reported as EMPCs were not considered appropriate for use in qualifying associated sample results. Method 1668A stipulates using a method blank as similar to the matrix as possible. The method blank was prepared using corn oil to approximate the lipid content of the samples.

Method blanks associated with the clam and crayfish samples had only low levels of a few PCBs. Samples qualified non-detect and flagged 'U' as a result of method blank detected PCB congeners are indentified in the URS Review Qualifier field of Tables 2 and 3.

4.4 Labeled Internal Standard Recovery Review

Samples analyzed for PCB congeners are spiked with labeled internal (quantification) standards. These standards are used to quantitate target congeners and the calculations of target compound concentrations are designed to compensate for low extraction and/or cleanup efficiencies. In addition, their recovery is measured against injection standards added after extraction and cleanup to typically evaluate extraction and/or cleanup efficiency which could affect sensitivity and could also affect accuracy for target compounds not quantitated against a chemically identical, isotopically labeled standard. The percent recovery of the labeled standards was compared with the limits set forth in EPA Method 1668A and those set by Axys detailed in Table 1 of the Axys narratives. All recoveries were acceptable with the following exception:

- The percent recoveries of ^{13}C-labeled PCB 1 and ^{13}C-labeled PCB 4 in clam sample L11379-3 were below the Axys control limits of 15% and 30% with 12.7% and 20.0%, respectively. Recovery of ^{13}C-labeled PCB 4 in clam sample L11379-6 was also below the control of 30% with 23.6%. Both PCB 1 and PCB 4 have chemically identical isotopic labeled standards. Given that isotopic dilution calculations produce recovery corrected quantitation results, only the non-chemically identical PCB congeners, quantitated using these labeled standards were estimated based on these internal standard recoveries. Associated analytical results for PCB 2, and PCB 5 through 14 for clam sample L11379-3 and results PCB 5 through 14 for clam sample L11379-6 were qualified 'J/UJ'.

Cleanup standards 28L, 111L, and 178L typically are added prior to cleanup and quantitated using injection standards added just prior to analysis to evaluate cleanup efficiency. The cleanup standards were within the 30-135% control limits set by EPA Method 1668A with the following exception:

- The cleanup standards were inadvertently omitted from clam sample L11379-27 during sample preparation, the sample was not reanalyzed. All the labeled extraction standards were recovered within the acceptance criteria; therefore, no further action was taken.

4.5 Ongoing Precision and Recovery

MS/MSD samples are not required by Method 1668A for PCB congener analysis. For Method 1668A, Ongoing Precision and Recovery (OPR) samples were used in place of LCS to monitor laboratory performance. The OPR was prepared using corn oil to approximate the lipid content of the samples. OPR recoveries were acceptable for congener analyses.

4.6 Duplicate Review

Field duplicates were not collected due to the statistical nature of the sampling event (as discussed in detail in the QAPP). Laboratory precision however, was monitored through laboratory duplicate analysis. Axys performed duplicate analysis on clam samples L11379-12, L11379-14, L11379-32 and crayfish samples L11380-15 and L11380-25. There is no guidance on laboratory duplicate precision for individual PCB congeners in the NFGs, the EPA Region 10 SOP, or Method 1668A. Axys uses the general rule that: if any one congener has an RPD greater than 40%, the data is flagged (at a minimum) and corrective action may be taken (i.e. reextraction or reanalysis). For analytical results greater than 5x the sample specific detection limit and not reported as EMPCs, the relative percent difference for individual congeners were on average less than 20%, indicating good analytical precision. Detailed evaluations of duplicate results can be found within the associated Axys analytical reports.

- The one exception was PCB 55 reported from the duplicate analysis of clam sample L11379-14 with a reported RPD of 57.4%. All other PCB congeners for this duplicate pair and the associated QC samples were in control, no further action was taken. Analytical results for PCB 55 in clam sample L11379-14 were estimated and flagged ‘J’ due to duplicate precision.

4.7 Compound Quantification

Multiple crayfish samples and clam samples were diluted and reanalyzed to bring area responses of some target congeners to within the linear calibration range of the instrument. Only the affected target compounds are reported from the reanalysis. Relevant concentrations from both the undiluted and diluted analytical results are reported within the data deliverable. The diluted reanalysis results are identified with a ‘W’ or ‘Wi’ within the Axys data deliverables. If a congener result is reported from the diluted analysis, Axys flagged the result with a ‘D’, these are shown in the Lab Qualifier columns of Tables 2 and 3.

The internal standard method is used to calculate concentrations of PCB congeners that do not have chemically identical labeled standards. The internal standard method is dependent upon consistent detector response over the calibration range. If the detector response varies, concentrations can be biased high or low based on variations in the detector sensitivity. During congener analysis, PFK (perfluorokerosene) is used as a lock mass reference standard to measure changes in detector sensitivity. Each lock mass must not vary more than 20% throughout its

respective retention time window as required by Method 1668A. Variations of more than 20% indicate the presence of a co-eluting interference or decreased sensitivity. Lock mass stability and its effect on analyte quantification was acceptable with the following exceptions:

- Crayfish sample L11380-7 had deflections in lock mass, interfering with several analytical analytes. The sample was re-injected and the lock mass stability was method compliant in the second analysis; the affected target analytes were reported from the re-injection. The re-injection results were reported with an 'i' suffix within the Axys data deliverables. No qualification was necessary.
- For clam sample L11379-15, a disturbance in the lock mass ion was observed at the retention time associated with PCB 54. Results for PCB 54 were flagged 'G' by Axys to indicate lock mass interference during the retention time window for PCB 54. The sample was not reanalyzed. PCB 54 for clam sample L11379-15 was qualified J-EMPC (J-EMPC is defined in Section 4.8 below), further qualification was not necessary.

4.8 Target Compound Identification

The flag 'C' assigned by Axys and listed in Tables 2 and 3 is used to indicate co-eluting PCB isomers. The concentrations of the co-eluting isomers were reported as a group, eliminating the need for any data qualification.

Ion abundance ratios are used to identify PCB congeners. Results that met all other qualitative identification criteria but were more than 15% different from the theoretical ion abundance criterion set by EPA Method 1668A are flagged in the laboratory report with a 'K' flag. Those results flagged 'K' with ion abundance ratios outside the identified quantitation criteria were considered estimated maximum possible concentrations (EMPC) and were re-flagged 'J-EMPC' during this review. If the analyte result was previously qualified 'U' by method blank detection, the result retained the 'U' qualifier and it was not qualified further because an ion ratio was out of limits (there is no ion ratio criterion for non-detects). These EMPC flags are tabulated in Tables 2 and 3 of this report and appear within the data tables in the main body of this deliverable. In addition, these flags are entered into the database.

Ion ratios outside the control limits are generally a consequence of co-eluting interferences to either one or both quantitation peaks. In these cases, Axys chose to use the quantitation peak areas as recorded; no adjustments were made to force the peaks to match the theoretical ion abundance ratios before reporting EMPC results. EMPC results should be considered by the data users as part of evaluating the data for end-use objectives. Additionally, it is important to note EMPC results were not included in the Axys-reported homologue totals or Toxicity Equivalent Quotient (TEQ) calculations.

All analytes flagged 'K' by Axys were due to the above-mentioned ion abundance ratio exceedance with the following exception:

- PCB 81 results for clam samples L11379-1 through L11379-13 and PCB 122 results for clam sample L11379-12 were flagged 'K' by Axys to indicate that the elution of peaks for PCB 81 and PCB 122 were on the tail of an adjacent peak with no distinct peak separation. While the ion abundance ratios met acceptance criteria, the peak integration

and therefore quantification may be biased due to coeluting congeners. PCB 81 and PCB 122 in the above-listed samples were estimated and flagged 'J-EMPC'.

Relative retention times (RRTs) are used for qualitative determination of congener identification. All RRTs were within the guidelines presented in Table 2 of Method 1668A with the following exceptions:

- Clam samples L11379-2, L11379-3, L11379-5, L11379-6, L11379-7 and L11379-8 (within data package DPWG26475) all had a RRT for PCB 39 of 0.948 which was outside the acceptance window of 0.943-0.947.
- Clam samples L11379-32, L11379-34 and L11379-36 (within data package DPWG26479) all had a RRT for PCB 39 of 0.948 which was outside the acceptance window of 0.943-0.947.
- Clam sample L11379-12 (within data package DPWG26475) had a RRT for PCB 15 of 0.998 which was outside the acceptance window of 1.163-1.169.

Congener identification in the above-listed samples was determined based on comparisons between sample and calibration chromatograms. Analytical results for PCB 39 in the above-listed clam samples and PCB 15 in clam sample L11379-12 were qualified estimated and flagged 'J' due to RRT exceedance.

4.9 Comparability

The results from this sampling event are comparable to other sampling events because of the use of standard techniques to collect representative samples, consistent application of analytical method protocols, and reporting analytical results with appropriate units and reporting limits.

4.10 Reporting Limits

All non-detect congener results are reported at sample specific reporting limits. All clam and crayfish samples were analyzed using approximately 10 grams as recommended by Method 1668A, with the below-listed exceptions. Based on historical experience, Axys suggested 3 grams as the absolute minimum sample volume for standard Method 1668A analysis. Therefore, if the sample mass was below 10 grams, but above 3 grams, URS authorized Axys to analyze the sample.

- Crayfish samples L11380-32, L11380-33 and L11433-1 were analyzed using 3.19 grams, 7.67 grams and 7.03 grams, respectively. Axys used all available sample tissue, but there was not enough tissue to meet the above-mentioned 10 gram recommended criteria. The data user should be aware that the sample-specific detection limits reported for these samples, are on average slightly higher than those reported for the other tissue samples. As a result the total congener concentration, summed using non-detected congeners as zero, may have a slight low bias for these samples, the precise bias can not be determined. The overall data usability is considered sufficient to meet project objectives.

Axys performed dilution on both crayfish and clam samples due to calibration exceedances for some PCB congeners. The dilutions appear to have little to no impact on the reporting limits. Only those PCB congener results exceeding the calibration range in the initial analysis were selected for reporting from the diluted analysis.

5.0 Completeness

The laboratory reported all requested analytes and the deliverable data reports were complete. As part of this review, some data were qualified as estimated 'J' or 'J-EMPC' and some as non-detect 'U'. A summary of qualifiers can be found in Tables 2 and 3. A completeness summary follows; analysis completeness was calculated using 159 congener results, 209 total congeners minus the 50 co-eluting congeners which were reported with the lowest numbered congener in the co-eluting set.

The electronic and portable delivery format (.pdf) data package versions of the deliverables were cross-checked for accuracy at a frequency of 20% or greater. Any minor discrepancies found between the deliverables were reported to Axys and corrected by updating the database to reflect the .pdf deliverable.

- *Technical Completeness* = (number of useable results/total reported results) x100

  All samples results are considered useable

  = (10,653 compliant / 10,653 total results) = 100%

- *Analytical Completeness* = (number of unqualified results/total reported results) x100

  = (9,866 compliant / 10,653 total results) = 93%

  Data were qualified as estimated and flagged 'J' or 'J-EMPC' and some qualified non-detect and flagged 'U'.

- *Contract Completeness* = (number of contract compliant results/total reported results) x100

  = (10,653 compliant / 10,653 total results) = 100%

  All samples analyzed met laboratory contract requirements.

- *Field Sampling Completeness* =(number samples collected/total reported results) x100

  = (68 compliant / 72 total results) = 94%

  Two clam and two crayfish samples submitted for analysis did not have adequate sample mass for congener analysis. Additionally crayfish mass collected from two different sample stations were combined to create enough sample mass for congener analysis; congener results were reported for one composite crayfish sample representing these two stations.

6.0 References

DOD 2006. Department of Defense Environmental Data Quality Workgroup. Department of Defense (DOD) Quality Systems Manual (QSM) for Environmental Laboratories. Final Version 3. January 2006. Retrieved from [http://www.navylabs.navy.mil/Archive/DoDV3.pdf] on 3/3/06

URS 2007. Quality Assurance Project Plan, *River Operable Unit Remedial Investigation*, Bradford Island, Bonneville Lock and Dam Project, Cascade Locks, Oregon, September 2007.

URS 2008. *River Operable Unit Remedial Investigation Data Summary Report*, Bradford Island Remedial Investigation, July 29, 2008.

USEPA 1995. *EPA Region 10 Standard Operating Procedure (SOP) for the Validation of Method 1668 Toxic, Dioxin-like, PCB Data.*

USEPA 2005a. *National Functional Guidelines (EPA NFGs) for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review.* September 2005.

USEPA 2005b. *Environmental Protection Agency (EPA) Sample Holding Time Reevaluation*, EPA/600/R-05/124, October 2005.

Table 1. Sample ID and Analysis Summary
Bradford Island Remedial Investigation - Tissue Samples

						Anaytes					
Station Number	**URS ID**	**Collection Date**	**CAS ID (non-congeners)**	**Axys ID (congeners)**	**Sample Delievery Group**	**PCB (Aroclors) (CAS)**	**PCB (congeners) (Axys Analytical)**	**PAHs**	**SVOCs**	**Metals**	**%Solids**
Clams											
4	08022604TC	02/19/08	K0801325-010	L11379-1	DPWG26475	--	X	--	--	--	--
7	08021507TC	02/15/08	K0801325-004	L11379-2		--	X	--	--	--	--
8	08021508TC	02/15/08	K0801325-005	L11379-3		--	X	--	--	--	--
9	08021409TC	02/14/08	K0801325-006	Insufficient Volume (no sample)		--		--	--	--	--
10	08021410TC	02/14/08	K0801325-008	L11379-5		--	X	--	--	--	--
11	08021411TC	02/14/08	K0801325-007	L11379-6		--	X	--	--	--	--
15	08022115TC	02/21/08	K0801325-012	L11379-7		--	X	--	--	--	--
16	08022116TC	02/21/08	K0801325-013	L11379-8		--	X	--	--	--	--
17	08022117TC	02/11/08	K0801325-014	L11379-9		--	X	--	--	--	--
18	08021118TC	02/11/08	K0801325-003	L11379-10		--	X	--	--	--	--
21	08021221TC	02/12/08	K0801325-002	L11379-11		--	X	--	--	--	--
6	08031806TC	03/18/08	K0802503-001	L11379-13		--	X	--	--	--	--
5	08031905TC	03/19/08	K0802503-006	L11379-12		--	X	--	--	--	--
13	08031713TC	03/17/08	K0802503-002	L11379-14	DPWG26457	--	X	--	--	--	--
14	08031814TC	03/14/08	K0802503-003	L11379-15		--	X	--	--	--	--
65	08022965TC	02/29/08	K0802503-008	L11379-16		--	X	--	--	--	--
67	08030367TC	03/03/08	K0802503-007	Insufficient Volume (no sample)		--		--	--	--	--
88	08031788TC	03/17/08	K0802503-004	L11379-18		--	X	--	--	--	--
89	08031789TC	03/17/08	K0802503-005	L11379-19		--	X	--	--	--	--
22	08030522TC	03/05/08	K0801772-012	L11379-20		--	X	--	--	--	--
24	08030524TC	03/05/08	K0801772-011	L11379-21		--	X	--	--	--	--
28	08030428TC	03/04/08	K0801772-014	L11379-24		--	X	--	--	--	--
29	08022229TC	02/22/08	K0801772-020	L11379-25		--	X	--	--	--	--
34	08022534TC	02/25/08	K0801772-021	L11379-26		--	X	--	--	--	--
35	08022535TC	02/25/08	K0801772-001	L11379-27		--	X	--	--	--	--
36	08022536TC	02/25/08	K0801772-002	L11379-28	DPWG26479	--	X	--	--	--	--
37	08022637TC	02/26/08	K0801772-003	L11379-29		--	X	--	--	--	--
38	08022738TC	02/27/08	K0801772-004	L11379-30		--	X	--	--	--	--
39	08022739TC	02/27/08	K0801772-005	L11379-31		--	X	--	--	--	--
40	08022740TC	02/27/08	K0801772-006	L11379-32		--	X	--	--	--	--
41	08022741TC	02/27/08	K0801772-007	L11379-33		--	X	--	--	--	--
42	08022742TC	02/27/08	K0801772-010	L11379-34		--	X	--	--	--	--
85	08030685TC	03/06/08	K0801772-015	L11379-35		--	X	--	--	--	--
86	08030686TC	03/06/08	K0801772-016	L11379-36		--	X	--	--	--	--
87	08030687TC	03/06/08	K0801772-017	L11379-37		--	X	--	--	--	--
26	08030426TC	03/04/08	K0801772-018	L11379-22	DPWG26795	--	X	--	--	--	--
27	08030427TC	03/04/08	K0801772-019	L11379-23		--	X	--	--	--	--
Crayfish											
1	08021901CF	02/19/08	K0801458-005	L11380-1	DPWG26607	--	X	--	--	--	--
2	08021902CF	02/19/08		Insufficient Volume (no sample)		--				--	--
3	08022003CF	02/20/08				--				--	--
4	08021904CF	02/19/08	K0801458-008	L11380-4		--	X	--	--	--	--
5	08021505CF	02/15/08	K0801458-009	L11380-5		--	X	--	--	--	--
6	08021406CF	02/14/08	K0801458-001	L11380-6		--	X	--	--	--	--
7	08021407CF	02/14/08	K0801458-003	L11380-7		--	X	--	--	--	--
8	08021408CF	02/14/08	K0801458-002	L11380-8		--	X	--	--	--	--
13	08021413CF	02/14/08	K0801458-004	L11380-9		--	X	--	--	--	--
14	08022014CF	02/20/08	K0801458-010	L11380-10		--	X	--	--	--	--
15	08021915CF	02/19/08	K0801458-011	L11380-11		--	X	--	--	--	--
16	08022216CF	02/22/08	K0801458-019	L11433-1		--	X	--	--	--	--
17	08021917CF	02/19/08	K0801458-012	L11380-13		--	X	--	--	--	--
18	08021918CF	02/19/08	K0801458-013	L11380-14		--	X	--	--	--	--
19	08021919CF	02/19/08	K0801458-014	L11380-15		--	X	--	--	--	--
20	08021920CF	02/19/08	K0801458-015	L11380-16		--	X	--	--	--	--
21	08021921CF	02/19/08	K0801458-016	L11380-17		--	X	--	--	--	--
22	08022622CF	02/26/08	K0802375-024	L11380-18		--	X	--	--	--	--
33	08022233CF	02/22/08	K0802375-025	L11380-19	DPWG26606	--	X	--	--	--	--
38	08021838CF	02/18/08	K0802375-003	Composite (38+42)		--	X	--	--	--	--
42	08022842CF	02/28/08	K0802375-004	L11512-6		--	X	--	--	--	--
72	08030372CF	03/03/08	K0802375-005	L11380-22		--	X	--	--	--	--
73	08030373CF	03/03/08	K0802375-006	L11380-23		--	X	--	--	--	--
74	08030374CF	03/03/08	K0802375-007	L11380-24		--	X	--	--	--	--
75	08030375CF	03/03/08	K0802375-008	L11380-25		--	X	--	--	--	--
76	08030376CF	03/03/08	K0802375-009	L11380-26		--	X	--	--	--	--
78	08030378CF	03/03/08	K0802375-010	L11380-27		--	X	--	--	--	--
79	08030379CF	03/03/08	K0802375-011	L11380-28		--	X	--	--	--	--
82	08030382CF	03/03/08	K0802375-012	L11380-29		--	X	--	--	--	--
90	08031290CF	03/12/08	K0802375-013	L11380-30		--	X	--	--	--	--
91	08031291CF	03/12/08	K0802375-014	L11380-31		--	X	--	--	--	--
92	08031292CF	03/12/08	K0802375-015	L11380-32		--	X	--	--	--	--
94	08031294CF	03/12/08	K0802375-016	L11380-33		--	X	--	--	--	--
98	08031298CF	03/12/08	K0802375-017	L11380-34		--	X	--	--	--	--
100	080312100CF	03/12/08	K0802375-018	L11380-35		--	X	--	--	--	--
105	080314105CF	03/14/08	K0802375-019	Insufficient Volume (no sample)		--		--		--	--

Notes:
CAS - Columbia Analytical Services
Axys - Axys Analytical Services, Ltd.
ID - Identification
PCB - Polychlorinated Biphenyl
PAHs - Polyaromatic Hydrocarbons
SVOCs - Semivolatile Organic Compounds
-- previously reported, not included in this quality control summary report.

Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-1 through L11379-6
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26475

IUPAC #	COELUTING CONGENERS[1]	08022604TC L11379-1	Lab Qualifier	URS Review Qualifier	08021507TC L11379-2	Lab Qualifier	URS Review Qualifier	08021508TC L11379-3	Lab Qualifier	URS Review Qualifier	08021410TC L11379-5	Lab Qualifier	URS Review Qualifier	08021411TC L11379-6	Lab Qualifier	URS Review Qualifier
1		2.74			1.68			2.18			1.41			1.66		
2		3.68			3.01			4.21		J	2.54			3.06		
3		0.763			0.592			0.795			0.435			0.654		
4		100			59.5			39.8			32.8			36.8		
5		1.08			0.834			0.805		J	0.629			0.828		J
6		13.9			8.19			7.02		J	6.5			7.86		J
7		0.503			0.472			0.358		J	0.29	U		0.347		J
8		26.5			19.4			18.5		J	14.3			17.6		J
9		0.799			0.789			0.487		J	0.405			0.539		J
10		0.872			0.669			0.39		J	0.371			0.428	K	J-EMPC
11		8810	D		6810	D		8370	D	J	5260			6580	D	J
12	12 + 13	0.124	C U		0.212	C U		0.268	C U	UJ	0.308	C U		0.186	C U	UJ
13	12 + 13		C12			C12			C12			C12			C12	
14		0.167			0.202	U		0.255	U	UJ	0.293	U		0.178	U	UJ
15		25.7			18.5			22.9			27.4			26.3		
16		127			63.8			62.4			52.7			58		
17		208			85.9			64.1			47.4			50.7		
18	18 + 30	346	C		144	C		131	C		110	C		121	C	
19		24.8			14.3			8			6.35			7.4		
20	20 + 28	142	C		80.2	C		86.1	C		62.1	C		77.6	C	
21	21 + 33	70.4	C		38.2	C		42.3	C		30.3	C		38.6	C	
22		159			84.1			90.5			70.1			84		
23		0.115	U		0.0991	U		0.12	U		0.0879	U		0.083		
24		0.0417	U		0.758			0.0469	U		0.734	K	J-EMPC	0.0473	U	
25		33.9			9.37			7.96			5.64			6.52		
26	26 + 29	34	C		15.9	C		15.6	C		11.1	C		14.4	C	
27		107			36.2			22.6			15.8			14.4		
28	20 + 28		C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18	
31		83.6			47.1			51.4			35.6			48.1		
32		23.3			7.95			5			3.75			4.66		
33	21 + 33		C21			C21			C21			C21			C21	
34		0.351			0.183	K	J-EMPC	0.187			0.18			0.191		
35		14			12.6			12.7			8.72			11.9		
36		3.86			3.07			3.54			2.45			3.13		
37		58.1			35.1			35.9			27.7			35.3		
38		2.77			1.04			1.15			0.815			0.832	K	J-EMPC
39		7.79			2.26		J	2.44		J	1.79		J	1.98		J
40	40 + 41 + 71	494	C		104	C		83.8	C		63.7	C		68.1	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40	
42		982			255			195			133			121		
43		14.3			5.57			6.01			4.04			4.35		
44	44 + 47 + 65	8950	C D		1710	C		1050	C		633	C		456	C	
45	45 + 51	65.2	C		19.9	C		17.5	C		13.4	C		14.7	C	
46		7.57			3.13			2.86			2.15			2.69		
47	44 + 47 + 65		C44			C44			C44			C44			C44	
48		209			63.1			63.1			45.3			51.1		
49	49 + 69	771	C		140	C		121	C		85.9	C		92.9	C	
50	50 + 53	455	C		90.4	C		58.8	C		37.8	C		31.7	C	
51	45 + 51		C45			C45			C45			C45			C45	
52		3660			501			392			284			279		
53	50 + 53		C50			C50			C50			C50			C50	
54		0.452	K	J-EMPC	0.219			0.124			0.075			0.073		
55		0.968	U		0.34	U		0.339	U		0.241	U		0.421	U	
56		697			147			115			89			91		
57		1.2			0.579			0.566			0.45			0.624		
58		0.91	U		0.328	U		0.328	U		0.233	U		0.406	U	
59	59 + 62 + 75	74.6	C		28.8	C		30.1	C		22.8	C		25.5	C	
60		178			60			58.1			42.5			51.8		
61	61 + 70 + 74 + 76	3230	C D		542	C		446	C		317	C		344	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59	
63		42.6			11.6			10.7			7.84			9.51		
64		368			90.3			82.3			59.8			68.3		
65	44 + 47 + 65		C44			C44			C44			C44			C44	
66		1680			387			337			244			280		
67		20.9			8.22			8.43			6.66			8.23		
68		5.15			2.48			2.36			1.78			2.36		
69	49 + 69		C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40	
72		5.58			2.37			2.33			1.76			2.05		
73		0.0417	U		0.0468	U		0.0469	U		0.0488	U		0.0473	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
77		69			35.9			34.8			26.9			33.6		
78		0.92	U		0.343	U		0.343	U		0.244	U		0.425	U	
79		613			125			78.5			43.8			23.9		
80		0.83	U		0.298	U		0.298	U		0.212	U		0.369	U	
81		3.3	K	J-EMPC	1.56	K	J-EMPC	1.42	K	J-EMPC	0.693	K	J-EMPC	1.42	K	J-EMPC
82		357			43.2			31.9			24.6			19.3		
83	83 + 99	9730	C D		1520	C		1210	C		726	C		621	C	
84		834			110			81.8			57.3			52.3		
85	85 + 116 + 117	1880	C		291	C		242	C		157	C		145	C	
86	86 + 87 + 97 + 108 + 119 + 125	17400	C D		2880	C		1860	C		1070	C		615	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
88	88 + 91	1010	C		129	C		105	C		69.7	C		61.1	C	
89		31.7			3.9			2.99			2.17			1.99		
90	90 + 101 + 113	15900	C D		2200	C		1790	C		1100	C		992	C	
91	88 + 91		C88			C88			C88			C88			C88	
92		1290			187			162			112			115		
93	93 + 95 + 98 + 100 + 102	15200	C D		2410	C		1620	C		899	C		593	C	
94		10.5			1.53			1.28			0.906			0.943		
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
96		8.86			1.27			0.979			0.732			0.662		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
103		16.2			3.03			2.92			2.1			2.26		
104		0.366			0.101	K	J-EMPC	0.091	K	J-EMPC	0.0598	U		0.094	K	J-EMPC
105		6200	D		924			741			455			407		
106		1.06	U		0.453	U		0.405	U		0.301	U		0.167	U	
107	107 + 124	521	C		77.4	C		62.7	C		37.4	C		32.8	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
109		653			120			102			66.5			69.8		
110	110 + 115	12400	C D		1720	C		1360	C		928	C		852	C	
111		0.359	U		0.295	U		0.321			0.26	K	J-EMPC	0.524	K	J-EMPC
112		0.359	U		0.275	U		0.261	U		0.225	U		0.206	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90	
114		445			65.5			52.5			28.1			23.8		
115	110 + 115		C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85	

Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-1 through L11379-6
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26475

IUPAC #	COELUTING CONGENERS[1]	08022604TC L11379-1	Lab Qualifier	URS Review Qualifier	08021507TC L11379-2	Lab Qualifier	URS Review Qualifier	08021508TC L11379-3	Lab Qualifier	URS Review Qualifier	08021410TC L11379-5	Lab Qualifier	URS Review Qualifier	08021411TC L11379-6	Lab Qualifier	URS Review Qualifier
117	85 + 116 + 117		C85			C85			C85			C85			C85	
118		64700	D		12100	D		7970	D		4090	D		2260		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
120		15.5			6.92			7.21			5.52			7.17		
121		0.506			0.297	U		0.339			0.266			0.309		
122		60.9			13.4			12.7			6.55			4.83		
123		1150			229			152			83.7			46.2		
124	107 + 124		C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
126		11			4.57			4.17			3.37			4.13		
127		23.4			5.19			2.92			1.68			0.178	U	
128	128 + 166	1220	C		231	C		200	C		130	C		128	C	
129	129 + 138 + 160 + 163	30900	C D		5610	C		4250	C		2590	C		2080	C	
130		488			112			96.1			65.3			68.5		
131		87.8			14.5			11.8			7.5			7		
132		1420			265			223			157			152		
133		80			23.5			21.9			14.9			17.9		
134	134 + 143	253	C		50.1	C		43.3	C		28.9	C		29	C	
135	135 + 151 + 154	1440	C		343	C		323	C		223	C		258	C	
136		406			67.2			59.2			41.6			41.4		
137		956			164			113			65.6			37.9		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
139	139 + 140	183	C		31.9	C		27.6	C		16.5	C		15.5	C	
140	139 + 140		C139			C139			C139			C139			C139	
141		299			61.6			58.8			43.3			35.9		
142		0.834	U		0.433	U		0.443	U		0.546	U		0.596	U	
143	134 + 143		C134			C134			C134			C134			C134	
144		204			36.1			33			21.7			23.4		
145		2.16			0.288			0.29			0.232			0.108		
146		2310			584			501			327			331		
147	147 + 149	10000	C D		1910	C		1640	C		1070	C		1070	C	
148		5.32			1.86			1.94			1.42			1.71		
149	147 + 149		C147			C147			C147			C147			C147	
150		5.1			1.31			1.38			0.918			1.09		
151	135 + 151 + 154		C135			C135			C135			C135			C135	
152		4.02			0.611			0.541			0.349			0.332		
153	153 + 168	61300	C D		14400	C D		10100	C D		5270	C		3560	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135	
155		1.06			0.802			0.869	K	J-EMPC	0.664			0.894		
156	156 + 157	3610	C		584	C		405	C		228	C		136	C	
157	156 + 157		C156			C156			C156			C156			C156	
158		1480			264			215			126			115		
159		5.83			2.11			1.77			1.47			1.85		
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
161		0.554	U		0.304	U		0.311	U		0.383	U		0.418	U	
162		25.6			5.18			4.23			2.51			2.71		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
164		255			46			42.1			30.7			32		
165		1.63			0.636			0.575			0.439	U		0.587		
166	128 + 166		C128			C128			C128			C128			C128	
167		3800	D		944			566			302			146		
168	153 + 168		C153			C153			C153			C153			C153	
169		16.5	U		5.6	U		4.73	U		3.37	U		3.27	U	
170		188			49.4			44.6			32.9			38.9		
171	171 + 173	283	C		88.2	C		79.6	C		55.6	C		62.4	C	
172		18.4			6.23			5.91			4.7			5.65		
173	171 + 173		C171			C171			C171			C171			C171	
174		129			41.6			39.7			31.6			36.1		
175		28.9			9.62			9.47			6.5			7.84		
176		86.4			31			29.8			21.7			25.6		
177		485			196			188			136			164		
178		179			88.2			88			62.9			80.6		
179		245			116			115			84.2			105		
180	180 + 193	2720	C		874	C		692	C		491	C		476	C	
181		30.8			5.6			4.57			2.73			2.16		
182		3.27			1.4			1.51			1.19			1.21		
183	183 + 185	865	C		265	C		243	C		171	C		194	C	
184		2			1.29			1.43			1			1.31		
185	183 + 185		C183			C183			C183			C183			C183	
186		0.0417	U		0.0468	U		0.0469	U		0.0488	U		0.0473	U	
187		1490			679			671			479			602		
188		1.86			1.27			1.22			0.917			1.11		
189		10.1			2.22			2.12			1.52			1.71		
190		435			130			114			78.7			79.8		
191		32.2			8.64			7.73			5.5			5.77		
192		0.0417	U		0.0468	U		0.0495	U		0.0488	U		0.0473	U	
193	180 + 193		C180			C180			C180			C180			C180	
194		19.5			8.22			8.38			6.54			8.52		
195		54			24.7			24.5			18			22.2		
196		34.2			13.9			14			10.5			12.7		
197	197 + 200	17	C		7.61	C		7.75	C		5.7	C		6.96	C	
198	198 + 199	61.1	C		29.1	C		28.6	C		22.6	C		28	C	
199	198 + 199		C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197	
201		40.6			19.7			19.2			14.2			17.8		
202		101			60.9			61.2			45.2			57.8		
203		324			144			136			98.7			111		
204		0.082			0.074	K	J-EMPC	0.081			0.093			0.073	K	J-EMPC
205		9.52			4.16			4.14			2.98			3.65		
206		30.2			15.7			15.9			11.8			14.7		
207		5.44			3.05			3.05			2.26			2.84		
208		11.7			7.24			7.2			5.51			7		
209		13.5			10.8			11.2			8.26			10.8		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL.
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the analyte-specific reporting limit.

1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-7 through L11379-11
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26475

IUPAC #	COELUTING CONGENERS[1]	0802115TC L11379-7	Lab Qualifier	URS Review Qualifier	0802116TC L11379-8	Lab Qualifier	URS Review Qualifier	0802117TC L11379-9	Lab Qualifier	URS Review Qualifier	0802118TC L11379-10	Lab Qualifier	URS Review Qualifier	0802122TC L11379-11	Lab Qualifier	URS Review Qualifier
1		1.65			1.32			1.78			1.91			1.8		
2		3.31			3.05			3.56			3.45			3.64		
3		0.642	K	J-EMPC	0.654			0.677			0.634			0.576	K	J-EMPC
4		36.6			36.2			33.1			37.1			38.9		
5		0.8			0.728			0.74			0.719			0.61		
6		7.64			7.43			7.39			8.01			8.3		
7		0.379			0.297			0.321			0.355			0.296		
8		19.7			16.3			17.5			19.8			17		
9		0.51	K	J-EMPC	0.456	K	J-EMPC	0.504			0.576			0.444		
10		0.493			0.426			0.408			0.443			0.392		
11		6630	D		6220	D		6080	D		6840	D		6470	D	
12	12 + 13	0.27	C U		0.225	C U		0.132	C U		0.108	C U		0.15	C U	
13	12 + 13		C12			C12			C12			C12			C12	
14		0.258	U		0.214	U		0.128	U		0.127			0.146	U	
15		20.1			23.3			16.4			17.3			20.4		
16		60.9			62			63.7			66			68.7		
17		52.3			51.9			53.1			55.3			54		
18	18 + 30	123	C		127	C		127	C		132	C		133	C	
19		7.74			6.67			6.71			7.63			6.96		
20	20 + 28	79.4	C		74.7	C		75.5	C		77.8	C		69.8	C	
21	21 + 33	38.3	C		35.2	C		37.6	C		41.8	C		34.2	C	
22		80.3			77.8			82.4			86.6			76.3		
23		0.077			0.086			0.0996	U		0.082			0.075		
24		0.0481	U		0.0484	U		0.723	K	J-EMPC	0.0466	U		0.0457	U	
25		6.53			6.13			6.55			6.53			5.8		
26	26 + 29	14.1	C		13.4	C		13.4	C		14.4	C		13	C	
27		14.5			15.5			14.3			14.5			15.8		
28	20 + 28		C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18	
31		47.6			42.7			45.1			48.4			39.3		
32		4.81			4.43			5.03			5.87			4.41		
33	21 + 33		C21			C21			C21			C21			C21	
34		0.227			0.183			0.215			0.225			0.213		
35		11.9			9.93			9.6			10.4			9.54		
36		3.15			2.84			2.76			2.98			2.75		
37		35.2			30.6			31.8			36.1			32.4		
38		0.868			0.797			0.845			0.887			0.791		
39		1.91		J	1.85		J	2.06			2.26			1.95		
40	40 + 41 + 71	64.4	C		64.3	C		66.5	C		77.6	C		63.2	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40	
42		124			128			132			141			122		
43		3.83			4.33			4.24			4.68			4.15		
44	44 + 47 + 65	458	C		484	C		484	C		504	C		452	C	
45	45 + 51	15.6	C		14.2	C		16.7	C		18	C		14.8	C	
46		2.6			2.45			2.77			3.03			2.51		
47	44 + 47 + 65		C44			C44			C44			C44			C44	
48		48			49.9			54			58			49.7		
49	49 + 69	88.1	C		83.7	C		95	C		101	C		83.7	C	
50	50 + 53	32.9	C		34.1	C		37.4	C		38.3	C		34.2	C	
51	45 + 51		C45			C45			C45			C45			C45	
52		262			261			277			296			261		
53	50 + 53		C50			C50			C50			C50			C50	
54		0.135			0.0484	U		0.066			0.071			0.058	K	J-EMPC
55		0.395	U		0.488	U		0.424	U		0.496	U		0.449	U	
56		86.5			80			89.6			101			79.6		
57		0.496			0.535			0.563			0.6			0.497		
58		0.381	U		0.472	U		0.399	U		0.466	U		0.422	U	
59	59 + 62 + 75	24.7	C		26.3	C		26.6	C		28.1	C		26.3	C	
60		51.2			45.3			49			56.2			46.6		
61	61 + 70 + 74 + 76	319	C		307	C		330	C		358	C		300	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59	
63		8.78			8.57			9.25			10			8.44		
64		67.9			61.6			69.2			76.2			61.9		
65	44 + 47 + 65		C44			C44			C44			C44			C44	
66		258			249			269			300			253		
67		7.55			6.99			8.06			8.39			7.32		
68		2.15			1.94			2.22			2.18			1.76		
69	49 + 69		C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40	
72		1.99			1.87			2.13			2.07			1.81		
73		0.0481	U		0.0484	U		0.0469	U		0.0466	U		0.0457	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
77		33.3			30.1			30.7			33.9			32		
78		0.398	U		0.493	U		0.403	U		0.471	U		0.427	U	
79		24.5			22.8			22.8			23.6			22.1		
80		0.346	U		0.429	U		0.363	U		0.425	U		0.385	U	
81		1.31	K	J-EMPC	1.54	K	J-EMPC	1.55	K	J-EMPC	1.42	K	J-EMPC	1.38	K	J-EMPC
82		19.1			15.6			18.7			19			16		
83	83 + 99	579	C		567	C		583	C		592	C		554	C	
84		51.2			45.9			52.6			54.2			48.8		
85	85 + 116 + 117	142	C		129	C		136	C		143	C		134	C	
86	86 + 87 + 97 + 108 + 119 + 125	614	C		583	C		599	C		600	C		573	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
88	88 + 91	59.4	C		55.3	C		64.2	C		63.6	C		57.9	C	
89		2.04			1.8			1.98			2.21			1.9		
90	90 + 101 + 113	923	C		899	C		968	C		967	C		927	C	
91	88 + 91		C88			C88			C88			C88			C88	
92		109			104			114			117			109		
93	93 + 95 + 98 + 100 + 102	603	C		605	C		676	C		648	C		591	C	
94		0.923			0.766			0.894			0.95			0.735		
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
96		0.667			0.591			0.743			0.724			0.647		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
103		2.1			2.13			2.47			2.49			2.04		
104		0.084	K	J-EMPC	0.074	K	J-EMPC	0.074			0.081			0.072	K	J-EMPC
105		397			361			365			377			371		
106		0.293	U		0.28	U		0.314	U		0.212	U		0.287	U	
107	107 + 124	32.4	C		29.4	C		29.9	C		30.1	C		30.8	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
109		69.1			64.5			60.9			62.5			61.4		
110	110 + 115	812	C		738	C		786	C		796	C		784	C	
111		0.495	K	J-EMPC	0.383	K	J-EMPC	0.545			0.412	K	J-EMPC	0.418		
112		0.185	U		0.124	U		0.184	U		0.205	U		0.22	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90	
114		23.1			20.9			20.2			22.8			21.6		
115	110 + 115		C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85	
118		2300			2170			2080			2130			2050		

Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-7 through L11379-11
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26475

IUPAC #	COELUTING CONGENERS[1]	0802115TC L11379-7	Lab Qualifier	URS Review Qualifier	0802116TC L11379-8	Lab Qualifier	URS Review Qualifier	0802117TC L11379-9	Lab Qualifier	URS Review Qualifier	0802118TC L11379-10	Lab Qualifier	URS Review Qualifier	0802122TC L11379-11	Lab Qualifier	URS Review Qualifier
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
120		6.72			6.52			6.4			6.56			6.4		
121		0.319			0.321			0.363			0.321			0.311		
122		5.1			3.84			3.95			3.8			3.87		
123		47.1			42			38.4			41.3			39.2		
124	107 + 124		C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
126		3.86			4.02			3.39			3.63			4		
127		1.04			1.13			0.319	U		1.03			1.15		
128	128 + 166	135	C		114	C		114	C		122	C		118	C	
129	129 + 138 + 160 + 163	2070	C		1970	C		1800	C		1890	C		1890	C	
130		69.4			61.2			57.6			58.6			57.4		
131		6.9			6.11			5.92			5.9			5.96		
132		147			131			129			132			127		
133		17.7			16.3			14.8			15.3			14.7		
134	134 + 143	29.2	C		26.4	C		26.4	C		26.9	C		24.8	C	
135	135 + 151 + 154	256	C		241	C		246	C		259	C		243	C	
136		41.3			39.3			44.2			44.5			39.3		
137		37.5			37.3			28.8			33.8			30.6		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
139	139 + 140	15.3	C		14.5	C		13.6	C		14.5	C		13.4	C	
140	139 + 140		C139			C139			C139			C139			C139	
141		39.5			33.2			33			37.5			33.7		
142		0.759	U		0.745	U		0.588	U		0.589	U		0.754	U	
143	134 + 143		C134			C134			C134			C134			C134	
144		22.3			21.6			21			23.5			20.9		
145		0.143	K	J-EMPC	0.097	K	J-EMPC	0.117			0.116			0.107		
146		324			311			270			290			286		
147	147 + 149	1040	C		993	C		941	C		1000	C		962	C	
148		1.54			1.58			1.64			1.74			1.66		
149	147 + 149		C147			C147			C147			C147			C147	
150		1.01			1.05			1.14			1.21			1.06		
151	135 + 151 + 154		C135			C135			C135			C135			C135	
152		0.314			0.325	K	J-EMPC	0.357			0.371			0.322		
153	153 + 168	3830	C		3740	C		2980	C		3160	C		2950	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135	
155		0.856			0.72			0.822	K	J-EMPC	0.826			0.732		
156	156 + 157	133	C		128	C		120	C		124	C		121	C	
157	156 + 157		C156			C156			C156			C156			C156	
158		115			103			98.8			104			103		
159		1.78			1.56			1.49			1.62			1.71		
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
161		0.533	U		0.523	U		0.39	U		0.392	U		0.501	U	
162		2.92			2.06			2.23			2.24			2.2		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
164		33.2			27.4			29.3			31.3			29.8		
165		0.61	U		0.599	U		0.521			0.58			0.58	U	
166	128 + 166		C128			C128			C128			C128			C128	
167		157			149			134			131			125		
168	153 + 168		C153			C153			C153			C153			C153	
169		3.56	U		3.53	U		3.4	U		3.66	U		3.62	U	
170		39.3			32.3			32.2			34.7			34.3		
171	171 + 173	66.8	C		56.3	C		55.5	C		55.1	C		57.2	C	
172		5.45			4.6			4.53			5.02			4.75		
173	171 + 173		C171			C171			C171			C171			C171	
174		37.9			31.1			30.8			32.9			32.1		
175		8.34			7.2			6.9			7.01			7.22		
176		25.8			23.3			21.2			21.1			22.2		
177		170			148			146			141			151		
178		82.3			72.4			70.3			70			72.9		
179		105			95.7			88.2			86.2			88.3		
180	180 + 193	509	C		489	C		420	C		424	C		433	C	
181		2.34			2.13			1.95			2.04			2.07		
182		1.14			0.0484	U		1.18			1.23			1.12		
183	183 + 185	201	C		183	C		170	C		175	C		184	C	
184		1.38			1.2			1.1			1.05			1.09		
185	183 + 185		C183			C183			C183			C183			C183	
186		0.0481	U		0.0484	U		0.0469	U		0.0466	U		0.0463	U	
187		617			549			502			520			556		
188		1.2			1.08			1.02			1.06			1		
189		1.56			1.56			1.67			1.6			1.66		
190		84.1			76.5			68.5			71.6			77.5		
191		6.07			5.28			5.26			5.28			5.14		
192		0.0481	U		0.0484	U		0.0469	U		0.0466	U		0.0539	U	
193	180 + 193		C180			C180			C180			C180			C180	
194		7.72			6.83			7.11			7.23			7.74		
195		22.6			19.9			19.5			18.5			19.3		
196		12.4			11.4			11.9			11.8			11.6		
197	197 + 200	7.31	C		6.44	C		6.39	C		6.3	C		6.09	C	
198	198 + 199	27.3	C		24	C		25.2	C		25.1	C		23.9	C	
199	198 + 199		C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197	
201		18.6			16.4			16.3			15.8			15.6		
202		58.2			52.1			49.2			47.4			49.4		
203		116			111			106			107			104		
204		0.053			0.066	K	J-EMPC	0.066	K	J-EMPC	0.067	K	J-EMPC	0.061	K	J-EMPC
205		3.69			3.36			3.35			3.26			3.22		
206		14.8			13.1			13.1			12.5			12.7		
207		2.77			2.58			2.71			2.51			2.64		
208		7.09			6.1			6.13			5.82			5.95		
209		10.9			9.41			9.45			8.11			8.91		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL.
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the analyte-specific reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-12 through L11379-13
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26475

IUPAC #	COELUTING CONGENERS[1]	08031905TC L11379-12	Lab Qualifier	URS Review Qualifier	08031806TC L11379-13	Lab Qualifier	URS Review Qualifier
1		2.83			4.56		
2		2.78			3.68		
3		0.763			0.914		
4		93.7			227		
5		0.956			1.11		
6		9.6			12.9		
7		0.493			1.06		
8		24			37		
9		0.801			1.64		
10		1.02			2.45		
11		7750			9620	D	
12	12 + 13	0.229	C U		0.173	C U	
13	12 + 13		C12			C12	
14		0.218	U		0.168	U	
15		23		J	25.7		
16		77.3			97		
17		105			159		
18	18 + 30	193	C		235	C	
19		13.8			40.9		
20	20 + 28	97.1	C		115	C	
21	21 + 33	46.7	C		56.9	C	
22		107			117		
23		0.219	U		0.175	U	
24		0.571			0.0487	U	
25		12.6			15.4		
26	26 + 29	18.7	C		23.8	C	
27		42.1			68.1		
28	20 + 28		C20			C20	
29	26 + 29		C26			C26	
30	18 + 30		C18			C18	
31		61.3			76.2		
32		8.09			17.8		
33	21 + 33		C21			C21	
34		0.259			0.348		
35		14.3			16.5		
36		3.68			4.31		
37		43			53.7		
38		1.49			1.53		
39		3.32			3.85		
40	40 + 41 + 71	114	C		182	C	
41	40 + 41 + 71		C40			C40	
42		262			341		
43		4.49			10.9		
44	44 + 47 + 65	1760	C		2430	C	
45	45 + 51	22.2	C		34.2	C	
46		3.71			6.15		
47	44 + 47 + 65		C44			C44	
48		72.2			101		
49	49 + 69	171	C		310	C	
50	50 + 53	104	C		158	C	
51	45 + 51		C45			C45	
52		665			1320		
53	50 + 53		C50			C50	
54		0.175	K	J-EMPC	0.544		
55		1.08	U		0.575	U	
56		180			243		
57		0.948	U		0.813		
58		1.06	U		0.541	U	
59	59 + 62 + 75	35	C		43.4	C	
60		76.2			104		
61	61 + 70 + 74 + 76	729	C		1210	C	
62	59 + 62 + 75		C59			C59	
63		15.1			21.5		
64		110			186		
65	44 + 47 + 65		C44			C44	
66		516			714		
67		11.6			15		
68		2.5			3.66		
69	49 + 69		C49			C49	
70	61 + 70 + 74 + 76		C61			C61	
71	40 + 41 + 71		C40			C40	
72		2.61			3.33		
73		0.0495	U		0.0487	U	
74	61 + 70 + 74 + 76		C61			C61	
75	59 + 62 + 75		C59			C59	
76	61 + 70 + 74 + 76		C61			C61	
77		41			52.3		
78		1.02	U		0.547	U	
79		152			160		
80		0.903	U		0.493	U	
81		2.7	K	J-EMPC	1.97	K	J-EMPC
82		57.4			120		
83	83 + 99	1540	C		2710	C	
84		123			301		
85	85 + 116 + 117	330	C		591	C	
86	86 + 87 + 97 + 108 + 119 + 125	2790	C		4080	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
88	88 + 91	146	C		303	C	
89		4.63			9.91		
90	90 + 101 + 113	2310	C		4200	C	
91	88 + 91		C88			C88	
92		207			423		
93	93 + 95 + 98 + 100 + 102	2390	C		3930	C	
94		1.68			4.22		
95	93 + 95 + 98 + 100 + 102		C93			C93	
96		1.57			3.71		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93	
99	83 + 99		C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93	
101	90 + 101 + 113		C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93	
103		3.57			6.7		
104		0.167	K	J-EMPC	0.132	K	J-EMPC
105		1020			1730		
106		0.391	U		0.715	U	
107	107 + 124	88.9	C		136	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
109		148			224		
110	110 + 115	1920	C		3490	C	
111		0.657	U		0.68	U	
112		0.636	U		0.68	U	
113	90 + 101 + 113		C90			C90	
114		77.4			126		
115	110 + 115		C110			C110	
116	85 + 116 + 117		C85			C85	

Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-12 through L11379-13
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26475

IUPAC #	COELUTING CONGENERS[1]	08031905TC L11379-12	Lab Qualifier	URS Review Qualifier	08031806TC L11379-13	Lab Qualifier	URS Review Qualifier
117	85 + 116 + 117		C85			C85	
118		10300	D		15900	D	
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
120		8.05			9.61		
121		0.649	U		0.699	U	
122		19.9	K	J-EMPC	22.3		
123		239			293		
124	107 + 124		C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
126		5.27			5.74		
127		5.67			7.75		
128	128 + 166	244	C		416	C	
129	129 + 138 + 160 + 163	5880	C		7400	C	
130		125			176		
131		13.3			27.3		
132		272			497		
133		24.9			35.1		
134	134 + 143	51	C		96	C	
135	135 + 151 + 154	362	C		579	C	
136		71.9			143		
137		163			237		
138	129 + 138 + 160 + 163		C129			C129	
139	139 + 140	29.6	C		54.8	C	
140	139 + 140		C139			C139	
141		104			100		
142		2.04	U		0.91	U	
143	134 + 143		C134			C134	
144		39.9			69.2		
145		0.34			0.686		
146		591			776		
147	147 + 149	1920	C		2760	C	
148		2.12			2.99		
149	147 + 149		C147			C147	
150		1.45			2.49		
151	135 + 151 + 154		C135			C135	
152		0.702			1.45		
153	153 + 168	13300	C D		18100	C D	
154	135 + 151 + 154		C135			C135	
155		1.09			1.18		
156	156 + 157	614	C		828	C	
157	156 + 157		C156			C156	
158		259			397		
159		2.58			2.88		
160	129 + 138 + 160 + 163		C129			C129	
161		1.43	U		0.604	U	
162		4.31			8.18		
163	129 + 138 + 160 + 163		C129			C129	
164		60.4			88.6		
165		1.62	U		0.7	U	
166	128 + 166		C128			C128	
167		956			1180		
168	153 + 168		C153			C153	
169		1.73	U		6.6	U	
170		58.5			78.4		
171	171 + 173	91.8	C		119	C	
172		7.22			8.92		
173	171 + 173		C171			C171	
174		46.6			61.2		
175		10.6			13.7		
176		31.3			41.3		
177		217			266		
178		90.9			118		
179		116			149		
180	180 + 193	929	C		1050	C	
181		5.76			8.24		
182		1.55			2.18		
183	183 + 185	288	C		343	C	
184		1.44			1.67		
185	183 + 185		C183			C183	
186		0.0929	U		0.0487	U	
187		736			879		
188		1.18			1.64		
189		2.77			4.03		
190		142			162		
191		10.7			12.7		
192		0.11	U		0.0563	U	
193	180 + 193		C180			C180	
194		10			11.8		
195		25.3			30.9		
196		15.2			18.9		
197	197 + 200	8.14	C		9.58	C	
198	198 + 199	31.4	C		38.5	C	
199	198 + 199		C198			C198	
200	197 + 200		C197			C197	
201		19.9			25		
202		59.7			73.6		
203		144			171		
204		0.097			0.132	K	J-EMPC
205		4.26			5.31		
206		16.7			19.7		
207		3.29			3.9		
208		7.88			9		
209		11			12.7		

Notes:

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PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the analyte-specific reporting limit.

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Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-14 through L11379-19
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26457

IUPAC #	COELUTING CONGENERS[1]	08031713TC L11379-14	Lab Qualifier	URS Review Qualifier	08031814TC L11379-15	Lab Qualifier	URS Review Qualifier	08022965TC L11379-16	Lab Qualifier	URS Review Qualifier	08031788TC L11379-18	Lab Qualifier	URS Review Qualifier	08031789TC L11379-19	Lab Qualifier	URS Review Qualifier
1		1.66			1.87			1.87			1.69			1.85		
2		3.32			3.72			3.48			3.25			3.31		
3		0.716		U	0.777		U	0.846		U	0.755		U	0.723		U
4		42.9			44.6			46.3			39.3			34.7		
5		0.94			1.16			1.14			1.08			0.946		
6		11.4			10.9			11.4			9.06			8.02		
7		0.443			0.46			0.474			0.446			0.567		
8		24.8			25			25.6			23.4			22.3		
9		0.647			0.752			0.714			0.668			0.648	K	J-EMPC
10		0.596			0.729			0.664			0.674			0.647		
11		7780	D		7370	D		8450	D		8120	D		7760		
12	12 + 13	51.1	C		59.3	C		71.7	C		59.9	C K	J-EMPC	59.1	C	
13	12 + 13		C12			C12			C12			C12			C12	
14		0.174			0.24	K	J-EMPC	0.201			0.182			0.194	K	J-EMPC
15		16.2			15.3			18.7			14.2			13.5		
16		89.6			86.3			96.8			81.9			71.1		
17		80.6			76.3			81.1			69.7			62.4		
18	18 + 30	195	C		188	C		195	C		164	C		146	C	
19		7.78			8.22			8.42			8.38			8.24		
20	20 + 28	102	C		104	C		99.8	C		89.2	C		86.6	C	
21	21 + 33	47.3	C		48.6	C		49.1	C		44.1	C		43.4	C	
22		109			109			105			97.9			87.7		
23		0.121	K	J-EMPC	0.127	K	J-EMPC	0.104	K	J-EMPC	0.096	K	J-EMPC	0.118	K	J-EMPC
24		1.5			0.956			1.25			1.14			1.05		
25		9.05			8.79			9.06			8.33			7.62		
26	26 + 29	18.3	C		18.2	C		19.2	C		17.1	C		16.7	C	
27		21.1			20.6			20.9			18			16.4		
28	20 + 28		C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18	
31		58.6			60.7			61.3			55.4			57.4		
32		7.07			7.58			6.82			5.9			6		
33	21 + 33		C21			C21			C21			C21			C21	
34		0.294			0.295			0.273			0.286	K	J-EMPC	0.258	K	J-EMPC
35		12.4			13.3			13.6			14.4			13.7		
36		3.6			3.83			4.07			3.8			3.55		
37		39			41.7			45.1			42.5			39.9		
38		1.12			1.3			1.13			1.25	K	J-EMPC	1.09	K	J-EMPC
39		2.44			2.66			2.59			2.52			2.34		
40	40 + 41 + 71	81.1	C		80.6	C		87.8	C		79.8	C		77.5	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40	
42		184			179			163			154			149		
43		3.92			3.72			4.21			3.47			3.65		
44	44 + 47 + 65	665	C		647	C		610	C		592	C		558	C	
45	45 + 51	21.4	C		20.6	C		22.4	C		20.2	C		19.8	C	
46		3.53			3.43			3.78			3.55			3.72		
47	44 + 47 + 65		C44			C44			C44			C44			C44	
48		69.5			67			72.5			63.1			60		
49	49 + 69	117	C		115	C		132	C		122	C		122	C	
50	50 + 53	51.4	C		47.9	C		49.2	C		45.1	C		42.1	C	
51	45 + 51		C45			C45			C45			C45			C45	
52		347			339			376			356			342		
53	50 + 53		C50			C50			C50			C50			C50	
54		0.086			0.06	K G	J-EMPC	0.136			0.126	K	J-EMPC	0.118	K	J-EMPC
55		2.38		J	4.37			4.43			4.02	K	J-EMPC	5.2		
56		106			115			106			108			100		
57		0.839			0.912	K	J-EMPC	1.01			0.737			0.853		
58		0.929			1.02			1.22			1.3			1.23		
59	59 + 62 + 75	32.1	C		31.5	C		33.7	C		30	C		26.9	C	
60		57.9			60.6			65.3			63.1			61.4		
61	61 + 70 + 74 + 76	425	C		446	C		459	C		444	C		432	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59	
63		11.9			12.4			12.9			12.1			12		
64		83.3			83.6			92.3			88			87.4		
65	44 + 47 + 65		C44			C44			C44			C44			C44	
66		347			361			362			347			328		
67		11.4			11.6			11.6			10.6			10		
68		2.77			2.78			3.26			2.87			2.58		
69	49 + 69		C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40	
72		2.47			2.62			3			2.69			2.39		
73		0.0481	U		0.0488	U		0.0492	U		0.0471	U		0.0495	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
77		37.5			38.8			42			39.8			35.9		
78		0.404	U		0.428	U		0.309	U		0.319	U		0.325	U	
79		25			29.5			26.1			29.1			27.3		
80		0.356	U		0.377	U		0.278	U		0.287	U		0.293	U	
81		1.94			2.08	K	J-EMPC	2.46			2.01			2.38		
82		17.9			20.1			20.5			20.9			20.6		
83	83 + 99	709	C		729	C		771	C		764	C		701	C	
84		60.5			61.6			66.6			68.2			65.3		
85	85 + 116 + 117	163	C		173	C		186	C		189	C		172	C	
86	86 + 87 + 97 + 108 + 119 + 125	777	C		803	C		744	C		792	C		753	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
88	88 + 91	76.1	C		75.6	C		83.9	C		81.2	C		76.1	C	
89		2.36			2.25			2.51			2.47			2.55		
90	90 + 101 + 113	1160	C		1190	C		1250	C		1240	C		1130	C	
91	88 + 91		C88			C88			C88			C88			C88	
92		132			135			146			140			134		
93	93 + 95 + 98 + 100 + 102	835	C		811	C		768	C		796	C		753	C	
94		1.1			1.09			1.2			1.22			1.14		
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
96		0.923			0.857			0.944			0.949			0.998		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
103		2.91			2.92			3.29			3.08			2.89		
104		0.123	K	J-EMPC	0.104	K	J-EMPC	0.149			0.09	K	J-EMPC	0.088	K	J-EMPC
105		437			464			478			476			444		
106		2.73	U		2.96	U		2.41	U		3.02	U		2.56	U	
107	107 + 124	37.1	C		41.6	C		41.3	C		41.6	C		39.2	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
109		79.8			82.3			89.3			84.9			77.4		
110	110 + 115	956	C		1010	C		1050	C		1050	C		955	C	
111		0.4	K	J-EMPC	0.445	K	J-EMPC	0.624	K	J-EMPC	0.645			0.59		
112		0.0793	U		0.0904	U		0.058	U		0.173	U		0.148	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90	
114		26			27.4			29.1			28.7			27.3		
115	110 + 115		C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85	

Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-14 through L11379-19
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26457

IUPAC #	COELUTING CONGENERS[1]	08031713TC L11379-14	Lab Qualifier	URS Review Qualifier	08031814TC L11379-15	Lab Qualifier	URS Review Qualifier	0802296 5TC L11379-16	Lab Qualifier	URS Review Qualifier	08031788TC L11379-18	Lab Qualifier	URS Review Qualifier	08031789TC L11379-19	Lab Qualifier	URS Review Qualifier
117	85 + 116 + 117		C85			C85			C85			C85			C85	
118		2730			2870			2540			2760			2670		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
120		8.1			8.63			8.59			8.27			7.57		
121		0.352			0.459			0.498			0.401			0.392	K	J-EMPC
122		4.18			4.47	K	J-EMPC	3.65			4.77			4.8	K	J-EMPC
123		51.2			59.5			43.8			52			54.4		
124	107 + 124		C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
126		5.06			5.31			5.3			5.1			4.72		
127		2.78	U		3	U		2.56	U		3.22	U		2.72	U	
128	128 + 166	145	C		157	C		170	C		164	C		151	C	
129	129 + 138 + 160 + 163	2550	C		2740	C		2610	C		2650	C		2430	C	
130		78.6			84			85.7			80.9			73.9		
131		7.82			8.42			8.56			8.61			7.99		
132		170			181			182			191			173		
133		19.9			21.2			23.6			21.6			19.8		
134	134 + 143	32	C		36.3	C		36.3	C		35.3	C		32.4	C	
135	135 + 151 + 154	318	C		333	C		353	C		347	C		322	C	
136		53.8			55.7			58.9			60.3			55.4		
137		43.6	K	J-EMPC	44.5			42.5			47.8			41.9		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
139	139 + 140	18.5	C		19.8	C		19.8	C		20	C		18.1	C	
140	139 + 140		C139			C139			C139			C139			C139	
141		37.3			38.5			34.9			40.6			37.4		
142		0.45	U		0.594	U		0.401	U		0.378	U		0.28	U	
143	134 + 143		C134			C134			C134			C134			C134	
144		29.5			30.3			32.2			32.1			29.6		
145		0.171	K	J-EMPC	0.174			0.218	K	J-EMPC	0.17	K	J-EMPC	0.207	K	J-EMPC
146		402			434			412			401			377		
147	147 + 149	1270	C		1330	C		1340	C		1340	C		1220	C	
148		2.13			2.2	K	J-EMPC	2.42			2.19			2		
149	147 + 149		C147			C147			C147			C147			C147	
150		1.44			1.48			1.63			1.51			1.38		
151	135 + 151 + 154		C135			C135			C135			C135			C135	
152		0.459			0.405			0.471	K	J-EMPC	0.477			0.474		
153	153 + 168	5180	C		5530	C		4140	C		4590	C		4620	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135	
155		0.952			1.14			1.18	K	J-EMPC	1.03			0.919		
156	156 + 157	157	C		171	C		156	C		168	C		158	C	
157	156 + 157		C156			C156			C156			C156			C156	
158		125			134			141			139			128		
159		1.91			1.98			2.52			2.47			2.4	K	J-EMPC
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
161		0.305	U		0.403	U		0.284	U		0.267	U		0.198	U	
162		2.43			3			3.31			2.89			2.66	K	J-EMPC
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
164		36.8			41.3			42.7			42.1			41.3		
165		0.675	K	J-EMPC	0.596			0.75			0.594			0.601		
166	128 + 166		C128			C128			C128			C128			C128	
167		209			213			154			185			201		
168	153 + 168		C153			C153			C153			C153			C153	
169		1.35	U		1.09	U		0.94	U		0.901	U		1.1	U	
170		38.8			43.3			44.5			45.4			40.8		
171	171 + 173	66.7	C		72.5	C		73.6	C		71.2	C		63.9	C	
172		5.74			6			6.35			6.37			6.01		
173	171 + 173		C171			C171			C171			C171			C171	
174		39.1			40.7			44			46.2			42.2		
175		8.71			9.35			9.56			9.44			8.02		
176		27.8			29.4			30.9			30.1			26.3		
177		177			189			203			189			166		
178		87.2			93			97.5			89.8			78.9		
179		114			119			128			122			108		
180	180 + 193	657	C		696	C		508	C		558	C		540	C	
181		2.45			2.64			2.42			2.57			2.4		
182		1.01			1.03			0.916			0.989			0.901		
183	183 + 185	225	C		242	C		227	C		229	C		209	C	
184		1.47			1.52			1.69			1.44			1.44		
185	183 + 185		C183			C183			C183			C183			C183	
186		0.0481	U		0.0713	U		0.0492	U		0.0498	U		0.0495	U	
187		656			709			700			672			615		
188		1.25			1.36			1.39			1.36			1.21		
189		1.66			2.03			2.21			2.18			1.81		
190		95.5			102			90.3			94.1			85.6		
191		6.11			6.48			6.27			6.56			5.92		
192		0.0481	U		0.0807	U		0.0492	U		0.056	U		0.0495	U	
193	180 + 193		C180			C180			C180			C180			C180	
194		8.78			9.54			10.7			10.3			9.1		
195		24.7			26.7			27.8			26.5			23.7		
196		14.4			14.9			15.8			16			13.9		
197	197 + 200	7.73	C		8.23	C		9.13	C		8.9	C		7.85	C	
198	198 + 199	31.6	C		32.4	C		35.1	C		33.5	C		29.3	C	
199	198 + 199		C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197	
201		19.6			21.6			21.9			21.4			18.8		
202		62.8			66.4			69.5			60.8			54.4		
203		155			159			123			131			129		
204		0.053	K	J-EMPC	0.082	K	J-EMPC	0.132	K	J-EMPC	0.079			0.089		
205		3.97			4.34			4.66			4.3			3.78		
206		16.7			17.2			18.3			16.1			14.6		
207		3.24			3.46			3.56			3.38			2.94		
208		7.78			8.28			8.63			7.69			6.97		
209		12			12.6			12.8			10.4			10.3		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL.
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the analyte-specific reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-20 through L11379-27
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26457

IUPAC #	COELUTING CONGENERS[1]	08030522TC L11379-20	Lab Qualifier	URS Review Qualifier	08030524TC L11379-21	Lab Qualifier	URS Review Qualifier	08030428TC L11379-24	Lab Qualifier	URS Review Qualifier	08022229TC L11379-25	Lab Qualifier	URS Review Qualifier	08022534TC L11379-26	Lab Qualifier	URS Review Qualifier	08022535TC L11379-27	Lab Qualifier	URS Review Qualifier
1		1.73			1.41			1.57			3.03			2.71			2.98		
2		5.27			3.57			3.59			7.28			5.79			5.12		
3		0.699		U	0.686		U	0.687		U	0.92			0.853	K	U	1.02		
4		37.7			35.8			40.3			126			142			95.4		
5		1.09			0.917			1.01			1.78			1.82			1.66		
6		9.53			9.05			9.62			35.3			39.9			25.8		
7		0.447			0.544			0.38			0.81			0.905			0.896		
8		20.3			19.1			19.3			46.9			49.6			43.7		
9		0.583			0.552			0.488			1.44			1.5			1.53		
10		0.62			0.528			0.544			1.56			1.62			1.5		
11		8040	D		6830	D		7030	D		6960	D		6720	D		8190	D	
12	12 + 13	40.7	C		46.1	C K	J-EMPC	33.1	C		31.7	C		32.8	C		55.4	C	
13	12 + 13		C12			C12			C12			C12			C12			C12	
14		0.193	K	J-EMPC	0.129			0.152	K	J-EMPC	0.17			0.126	K	J-EMPC	0.221		
15		12.8			15			14.8			19.8			21.8			19.7		
16		84.7			90			99.2			187			208			147		
17		64.4			68			74.1			165			197			142		
18	18 + 30	164	C		174	C		192	C		406	C		457	C		315	C	
19		7.95			6.96			7.71			18.2			19.2			15.6		
20	20 + 28	83.8	C		81.9	C		86	C		154	C		163	C		147	C	
21	21 + 33	41.8	C		40.1	C		40.8	C		95.9	C		103	C		79.3	C	
22		93.1			91.3			101			170			191			149		
23		0.127	K	J-EMPC	0.101			0.099	K	J-EMPC	0.127	K	J-EMPC	0.136			0.201	K	J-EMPC
24		1.01			1.11			0.986			2.21			1.84			1.56		
25		7.56			7.13			7.5			15.3			17			13.8		
26	26 + 29	16.7	C		15.3	C		16.3	C		35	C		37.5	C		31.9	C	
27		17.4			18.4			20.7			38.4			43.6			32.1		
28	20 + 28		C20			C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18			C18	
31		49.2			46.8			46.9			95.4			100			103		
32		5.55			5.06			5.41			19.6			22.3			15.1		
33	21 + 33		C21			C21			C21			C21			C21			C21	
34		0.307			0.252			0.228			0.419			0.436			0.499	K	J-EMPC
35		13.2			11.1			11.9			12.4			11.6			16		
36		3.58			3.17			3.25			3.27			3.08			4.22		
37		38.5			35.2			36.8			56.3			58.2			54.6		
38		1.32			1.12			1.2			1.44			1.53			1.41		
39		2.47			2.26			2.42			3.86			4.37			3.39		
40	40 + 41 + 71	76.3	C		74.7	C		79.1	C		138	C		150	C		132	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
42		148			156			179			235			261			233		
43		3.19			3.61			3.48			6.01			6.02			5.77		
44	44 + 47 + 65	556	C		591	C		680	C		784	C		818	C		791	C	
45	45 + 51	18.3	C		20.2	C		20.9	C		37.4	C		41.4	C		35.4	C	
46		3.18			3.14			3.23			5.74			6.16			6.1		
47	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
48		59.6			63.7			66.9			111			126			105		
49	49 + 69	104	C		109	C		108	C		159	C		170	C		172	C	
50	50 + 53	41.7	C		47.7	C		52.6	C		75	C		81.9	C		70.4	C	
51	45 + 51		C45			C45			C45			C45			C45			C45	
52		319			327			337			431			442			462		
53	50 + 53		C50			C50			C50			C50			C50			C50	
54		0.109	K	J-EMPC	0.089	K	J-EMPC	0.108			0.138			0.171			0.176	K	J-EMPC
55		3.08			4.4			3.34			4.1			5.26			2.65		
56		108			93.8			106			106			108			121		
57		0.964			0.82	K	J-EMPC	0.643			1.24			1.08			1.4		
58		0.98			1.19	K	J-EMPC	1.35			1.14			1.12	K	J-EMPC	1.89		
59	59 + 62 + 75	28.8	C		30.9	C		33	C		46.2	C		49.7	C		45	C	
60		56.9			52.2			54.2			58.9			60.2			70.5		
61	61 + 70 + 74 + 76	395	C		366	C		381	C		445	C		454	C		521	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
63		10.7			10.5			10.8			13.3			13.7			15.3		
64		77.7			77			78			112			117			122		
65	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
66		319			301			319			336			348			397		
67		10			9.85			10.5			13.2			14			14.4		
68		2.67			2.52			2.76			2.88			2.97			3.67		
69	49 + 69		C49			C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
72		2.65			2.52			2.49			2.93			3.1			3.47		
73		0.0477	U		0.0476	U		0.0499	U		0.0492	U		0.0491	U		0.0491	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
77		37.8			33.8			37.3			36.4			36.1			42.8		
78		0.308	U		0.363	U		0.356	U		0.305	U		0.318	U		0.274	U	
79		26.8			21.7			26.9			22.2			24.2			26.3		
80		0.277	U		0.327	U		0.32	U		0.274	U		0.286	U		0.247	U	
81		1.89			2.04			2.11			2.07			2.23	K	J-EMPC	2.6		
82		19			16.5			16.4			18.2			18.5			22		
83	83 + 99	683	C		663	C		716	C		668	C		690	C		806	C	
84		60.7			56.8			59.3			63.2			64.5			78.3		
85	85 + 116 + 117	169	C		161	C		165	C		159	C		166	C		198	C	
86	86 + 87 + 97 + 108 + 119 + 125	694	C		652	C		760	C		644	C		662	C		768	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
88	88 + 91	69.8	C		70.7	C		73.4	C		75.4	C		78.3	C		91.4	C	
89		2.14			2.06			2.17			2.47			2.64			3		
90	90 + 101 + 113	1110	C		1070	C		1160	C		1090	C		1130	C		1320	C	
91	88 + 91		C88			C88			C88			C88			C88			C88	
92		129			122			128			133			136			163		
93	93 + 95 + 98 + 100 + 102	710	C		742	C		854	C		742	C		754	C		862	C	
94		1.09			1.09			1.06			1.25			1.42			1.5		
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
96		0.772			0.786			0.843			1.04			1.05			1.27		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
103		2.79			2.94			2.77			3.11			3.37			3.85		
104		0.127			0.095			0.099			0.089			0.104			0.125	K	J-EMPC
105		438			399			434			406			424			484		
106		1.95	U		2.29	U		2.28	U		1.85	U		1.65	U		1.41	U	
107	107 + 124	41	C		36.1	C		39.6	C		36.6	C		37.5	C		44.2	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
109		80			72.6			75.6			76.1			79.4			89		
110	110 + 115	978	C		892	C		954	C		936	C		954	C		1120	C	
111		0.609			0.601	K	J-EMPC	0.52			0.549			0.674	K	J-EMPC	0.664		
112		0.174	U		0.132	U		0.0861	U		0.0997	U		0.151	U		0.093	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
114		26.7			22.8			25.8			23.6			24.6			29.9		
115	110 + 115		C110			C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
118		2420			2220			2660			2140			2200			2470		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
120		8.63			7.84			8.51			7.58			7.98			9.18		
121		0.353			0.358			0.333			0.444	K	J-EMPC	0.49			0.513		
122		5.96			4.09			4.21	K	J-EMPC	4.18	K	J-EMPC	4.37			6.06		
123		48.4			42.3			54			40.3			38.4			46.1		

Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-20 through L11379-27
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26457

IUPAC #	COELUTING CONGENERS[1]	08030522TC L11379-20	Lab Qualifier	URS Review Qualifier	08030524TC L11379-21	Lab Qualifier	URS Review Qualifier	08030428TC L11379-24	Lab Qualifier	URS Review Qualifier	08022229TC L11379-25	Lab Qualifier	URS Review Qualifier	08022534TC L11379-26	Lab Qualifier	URS Review Qualifier	08022535TC L11379-27	Lab Qualifier	URS Review Qualifier
124	107 + 124		C107			C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
126		5.01			4.44			5.04			4.05			4.03			5.35		
127		2.08			2.44	U		2.42	U		1.96	U		1.94	K	J-EMPC	1.9		
128	128 + 166	158	C		144	C		140	C		144	C		147	C		178	C	
129	129 + 138 + 160 + 163	2410	C		2270	C		2550	C		2150	C		2210	C		2590	C	
130		75.4			72.7			71			71.4			73.6			92.3		
131		7.87			7.4			7.07			7.81			7.94			9.53		
132		175			161			162			160			169			207		
133		20.5			20.2			18.8			20			19.8			25.4		
134	134 + 143	34.2	C		32.4	C		30.5	C		32.9	C		35.1	C		40	C	
135	135 + 151 + 154	320	C		314	C		305	C		316	C		328	C		405	C	
136		52.5			53.9			51.7			54.1			56.9			70.3		
137		38.3			36.7			40.3			33.9			35.2			44.1		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
139	139 + 140	17.8	C		17.5	C		17.2	C		17.2	C		17.8	C		21.9	C	
140	139 + 140		C139			C139			C139			C139			C139			C139	
141		32.3			31			33.7			28.9			31.2			37.2		
142		0.437	U		0.417	U		0.533	U		0.313	U		0.326	U		0.452	U	
143	134 + 143		C134			C134			C134			C134			C134			C134	
144		28.8			27.9			27			27.6			29			36.4		
145		0.143			0.175	K	J-EMPC	0.165	K	J-EMPC	0.155	K	J-EMPC	0.205	K	J-EMPC	0.231	K	J-EMPC
146		367			343			386			335			348			421		
147	147 + 149	1230	C		1210	C		1280	C		1140	C		1200	C		1460	C	
148		2.09			2.07			2.04			2.11			2.18			2.7		
149	147 + 149		C147			C147			C147			C147			C147			C147	
150		1.31			1.47			1.44			1.48			1.56			1.89		
151	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
152		0.449			0.416			0.406			0.441			0.472			0.6		
153	153 + 168	4070	C		3660	C		4570	C		3450	C		3500	C		3970	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
155		1.01			0.948			0.861			0.956			1.02			1.25		
156	156 + 157	138	C		126	C		152	C		125	C		129	C		148	C	
157	156 + 157		C156			C156			C156			C156			C156			C156	
158		129			120			129			117			124			149		
159		2.36			1.95			2.16	K	J-EMPC	1.95			2.26			2.45		
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
161		0.309	U		0.295	U		0.377	U		0.221	U		0.231	U		0.32	U	
162		3.1			2.99			2.64	K	J-EMPC	3			2.87			3.69		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
164		41.3			35.5			38.1			36			38.3			45.7		
165		0.647			0.639	K	J-EMPC	0.476			0.589			0.257	U		0.791	K	J-EMPC
166	128 + 166		C128			C128			C128			C128			C128			C128	
167		149			127			170			130			127			139		
168	153 + 168		C153			C153			C153			C153			C153			C153	
169		0.809	U		0.933	U		0.872	U		0.9	U		0.939	U		0.901	U	
170		42.6			36.4			38.8			36.5			39.9			45.6		
171	171 + 173	70.1	C		65.8	C		67	C		65.2	C		68.4	C		78.9	C	
172		6.14			5.3			5.47			5.27			5.93			6.78		
173	171 + 173		C171			C171			C171			C171			C171			C171	
174		42.4			36.9			40			37.6			41.2			47.7		
175		8.78			8.31			8.63			8.38			8.54			10.4		
176		27.5			27.4			27.2			27.8			28.4			34		
177		184			171			174			172			174			205		
178		87.8			83.9			83.9			85.5			86.9			101		
179		115			112			111			112			116			140		
180	180 + 193	512	C		440	C		584	C		422	C		431	C		474	C	
181		2.45			2.16			2.39			2.2			2.32			2.49		
182		0.938	K	J-EMPC	0.889	K	J-EMPC	0.991	K	J-EMPC	0.803			0.998			0.986		
183	183 + 185	214	C		195	C		220	C		191	C		198	C		231	C	
184		1.43			1.45			1.32			1.55			1.45			1.83		
185	183 + 185		C183			C183			C183			C183			C183			C183	
186		0.0477	U		0.0476	U		0.0499	U		0.058	U		0.0491	U		0.0598	U	
187		656			605			661			615			631			733		
188		1.35			1.23			1.27			1.33			1.31			1.5		
189		1.83			1.75			1.85			1.68			1.98			2.23		
190		90.1			79.1			98.6			78			78.5			89.2		
191		6.18			5.39			6.2			5.33			5.86			6.52		
192		0.0477	U		0.0476	U		0.0499	U		0.0653	U		0.0491	U		0.0673	U	
193	180 + 193		C180			C180			C180			C180			C180			C180	
194		8.77			7.58			8.56			7.56			8.38			9.99		
195		26.3			23.9			26.2			24			25.1			29.8		
196		14.8			12.9			15			13.3			14.5			16.3		
197	197 + 200	8.37	C		7.77	C		8.04	C		8.07	C		8.11	C		10	C	
198	198 + 199	32.3	C		29.9	C		32	C		30.6	C		33.5	C		38	C	
199	198 + 199		C198			C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197			C197	
201		19.9			19.4			20.2			20.1			20.6			24.8		
202		62.4			58.7			61.8			61.6			62			71		
203		130			113			146			114			115			131		
204		0.094			0.081			0.082			0.1			0.094			0.102		
205		4.12			3.75			4.03			3.97			4			4.76	K	J-EMPC
206		17			15.7			16.6			17.5			19.3			20.6		
207		3.55			3.26			3.44			3.42			4			4.26		
208		8.18			7.31			8			8.87			9.49			10.1		
209		11.2			10.2			11.4			12.4			13.1			14.1		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL.
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the analyte-specific reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-28 through L11379-32
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26479

IUPAC #	COELUTING CONGENERS[1]	08022536TC L11379-28	Lab Qualifier	URS Review Qualifier	08022637TC L11379-29	Lab Qualifier	URS Review Qualifier	08022738TC L11379-30	Lab Qualifier	URS Review Qualifier	08022739TC L11379-31	Lab Qualifier	URS Review Qualifier	08022740TC L11379-32	Lab Qualifier	URS Review Qualifier
1		3.16			2.89			2.59			2.42			2.64		
2		4.7			4.12			3.88			4.08			4.58		
3		0.929			0.891			0.863			0.777			0.853		
4		95			93.8			80.3			77			79.2		
5		1.02			1.53			1.3			1.18			1.43		
6		23			22.7			19.1			17.9			16.9		
7		0.774			0.701			0.721			0.686			0.618		
8		43.2			40			35			34.2			32.1		
9		1.53			1.44			1.34			1.22			1.14		
10		1.52			1.33			1.19			1.13			1.12		
11		8770	D		7370	D		7100	D		8990	D		8260	D	
12	12 + 13	83.8	C		53	C K	J-EMPC	70.1	C		113	C		90.6	C	
13	12 + 13		C12			C12			C12			C12			C12	
14		0.226			0.187			0.157			0.187			0.251	U	
15		23.8			20.3			30.4	K	J-EMPC	35.6	K	J-EMPC	35.1	K	J-EMPC
16		133			127			111			111			107		
17		133			122			106			104			103		
18	18 + 30	310	C		300	C		252	C		252	C		242	C	
19		15.6			15.2			13.4			13			12.9		
20	20 + 28	161	C		163	C		138	C		133	C		128	C	
21	21 + 33	80.7	C		79.8	C		68.9	C		66.5	C		65.7	C	
22		165			162			138			141			135		
23		0.148			0.123	K	J-EMPC	0.184			0.134	U		0.12	K	J-EMPC
24		2.35			1.69			1.95			1.55			1.56		
25		14.5			14.2			11.9			11.7			12.1		
26	26 + 29	31.1	C		30.9	C		26.8	C		25.3	C		25.2	C	
27		31			30.6			26.4			25.5			25.9		
28	20 + 28		C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18	
31		103			95.8			83			83.2			83.9		
32		16.3			16.5			13.4			11.1			11.3		
33	21 + 33		C21			C21			C21			C21			C21	
34		0.418			0.395			0.365			0.328	K	J-EMPC	0.366		
35		13.5			12.1			11.1			13.7			14.3		
36		3.86			3.29			3.08			3.79			3.71		
37		53			49.8			43.9			48			53.7		
38		1.15	K	J-EMPC	1.06			0.913			1.08			1.1		
39		2.43			2.13			2			2.31			2.95		J
40	40 + 41 + 71	121	C		98.3	C		98.1	C		103	C		102	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40	
42		207			203			168			185			183		
43		7.01			5.94			6.44			6.63			7.4		
44	44 + 47 + 65	699	C		689	C		599	C		665	C		681	C	
45	45 + 51	31.2	C		31.2	C		26.9	C		27	C		28.7	C	
46		5.76			5.4			4.93			4.81			4.83		
47	44 + 47 + 65		C44			C44			C44			C44			C44	
48		98.1			90.6			77.5			83.4			84.2		
49	49 + 69	159	C		143	C		126	C		138	C		141	C	
50	50 + 53	62.6	C		63.1	C		53.7	C		57.4	C		60	C	
51	45 + 51		C45			C45			C45			C45			C45	
52		416			385			353			394			420		
53	50 + 53		C50			C50			C50			C50			C50	
54		0.158			0.149			0.172			0.144			0.133		
55		6.3			3.85			7.14			7.25			7.12		
56		117			107			102			114			112		
57		1.03			0.936			0.977	K	J-EMPC	0.93	K	J-EMPC	0.874		
58		1.12	K	J-EMPC	0.924			0.987			1.01	K	J-EMPC	1.35		
59	59 + 62 + 75	41.8	C		39.8	C		36	C		39.2	C		40	C	
60		75.3			64.2			60.8			66.6			63.8		
61	61 + 70 + 74 + 76	518	C		437	C		434	C		493	C		455	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59	
63		14			12			11.4			12.1			12.7		
64		114			102			91.1			101			101		
65	44 + 47 + 65		C44			C44			C44			C44			C44	
66		420			360			345			387			366		
67		13			11.2			10.5			11.4			11.5		
68		3.14			2.73			2.46			2.97			2.91		
69	49 + 69		C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40	
72		3.11			2.73			2.41			2.86			3.11		
73		0.0491	U		0.0484	U		0.0475	U		0.0499	U		0.0497	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
77		44.3			38.4			37.1			43.2			46.3		
78		0.516	U		0.348	U		0.453	U		0.593	U		0.509	U	
79		19.7			17.8			17.6			22.8			23		
80		0.484	U		0.326	U		0.425	U		0.556	U		0.476	U	
81		2.51			1.67	K	J-EMPC	1.99	K	J-EMPC	2.13	K	J-EMPC	2.75		
82		24.5			20.6			21.5			25.1			21.7		
83	83 + 99	833	C		720	C		717	C		849	C		738	C	
84		79.1			69.4			64.2			78.4			70.9		
85	85 + 116 + 117	202	C		173	C		166	C		203	C		175	C	
86	86 + 87 + 97 + 108 + 119 + 125	773	C		692	C		668	C		792	C		702	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
88	88 + 91	94.7	C		82.7	C		75.7	C		91.9	C		83.8	C	
89		2.86			2.47			2.51			2.97			2.47		
90	90 + 101 + 113	1350	C		1170	C		1140	C		1350	C		1220	C	
91	88 + 91		C88			C88			C88			C88			C88	
92		160			143			133			163			146		
93	93 + 95 + 98 + 100 + 102	821	C		761	C		701	C		855	C		811	C	
94		1.33			1.22			1.15	K	J-EMPC	1.43			1.34		
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
96		1.22			1.08			1.06			1.16			1.1	K	J-EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
103		3.76			3.24			2.95			3.5			3.46		
104		0.111			0.118	K	J-EMPC	0.108	K	J-EMPC	0.091	K	J-EMPC	0.126		
105		484			419			416			484			535		
106		2.6	U		1.74	U		2.55	U		3.1	U		2.93	U	
107	107 + 124	49.1	C		37.6	C		38.7	C		44.5	C		41.6	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
109		97.9			82.4			80.1			96.6			83.5		
110	110 + 115	1120	C		982	C		972	C		1140	C		999	C	
111		0.778			0.688	K	J-EMPC	0.635	K	J-EMPC	0.669			0.59	K	J-EMPC
112		0.233	U		0.275	U		0.283	U		0.232	U		0.292	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90	
114		27.2			24			23.3			28.7			30.8		
115	110 + 115		C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85	

Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-28 through L11379-32
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26479

IUPAC #	COELUTING CONGENERS[1]	08022536TC L11379-28	Lab Qualifier	URS Review Qualifier	08022637TC L11379-29	Lab Qualifier	URS Review Qualifier	08022738TC L11379-30	Lab Qualifier	URS Review Qualifier	08022739TC L11379-31	Lab Qualifier	URS Review Qualifier	08022740TC L11379-32	Lab Qualifier	URS Review Qualifier
117	85 + 116 + 117		C85			C85			C85			C85			C85	
118		2420			2180			2140			2520			2770		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
120		9.24			8.11			7.9			9.36			8.34		
121		0.5	K	J-EMPC	0.416			0.372			0.435	K	J-EMPC	0.446		
122		6.07			5.46			5.39			6.58			4.83		
123		43.9			41.8			36.8			46.9			53.2		
124	107 + 124		C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
126		5.19			4.64			4.74			5.33			5.64		
127		2.71	U		1.8	U		2.65	U		3.22	U		3	U	
128	128 + 166	159	C		166	C		144	C		168	C		165	C	
129	129 + 138 + 160 + 163	2240	C		2170	C		2050	C		2370	C		2440	C	
130		87.2			77.9			75.8			88.1			85.2		
131		9.27			7.82			7.84			9.01			9.07		
132		188			177			171			202			192		
133		24.1			20.9			18.8			22.3			22.9		
134	134 + 143	38.8	C		35.7	C		35.8	C		41.9	C		38.9	C	
135	135 + 151 + 154	367	C		332	C		321	C		376	C		362	C	
136		63.5			58.6			55.2			64.4			60		
137		37.3			35.6			34.4			46.8			41.8		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
139	139 + 140	21.9	C		18.8	C		18.1	C		20.1	C		20.3	C	
140	139 + 140		C139			C139			C139			C139			C139	
141		32.6			30.4			32.8			40.7			40.9		
142		1.57	U		0.46	U		0.935	U		1.18	U		0.673	U	
143	134 + 143		C134			C134			C134			C134			C134	
144		33			30.1			29.4			34.6			32.8		
145		0.158			0.165			0.171	K	J-EMPC	0.241	K	J-EMPC	0.185		
146		374			342			319			389			397		
147	147 + 149	1290	C		1190	C		1190	C		1360	C		1360	C	
148		2.53			2.1			1.98			2.54			2.35		
149	147 + 149		C147			C147			C147			C147			C147	
150		1.72			1.46			1.42			1.73			1.6		
151	135 + 151 + 154		C135			C135			C135			C135			C135	
152		0.495			0.475			0.41			0.522			0.447		
153	153 + 168	3420	C		3340	C		3030	C		3800	C		3670	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135	
155		1.28			1.06			1.06			1.37			1.27		
156	156 + 157	154	C		138	C		135	C		166	C		158	C	
157	156 + 157		C156			C156			C156			C156			C156	
158		139			125			124			147			142		
159		1.98			1.41	K	J-EMPC	1.54			2.03	K	J-EMPC	1.98		
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
161		1.06	U		0.312	U		0.634	U		0.801	U		0.469	U	
162		3.68			3.38			2.99			3.8			3.76		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
164		43.1			38			36.9			41.5			41.1		
165		1.26	U		0.825			0.752	U		0.949	U		0.7	K	J-EMPC
166	128 + 166		C128			C128			C128			C128			C128	
167		139			146			123			154			146		
168	153 + 168		C153			C153			C153			C153			C153	
169		1.32	U		0.698	U		0.987	U		1.01	U		1.25	U	
170		52.1			43.2			43.9			54.3			46.5		
171	171 + 173	84.3	C		71.2	C		70.7	C		83.9	C		76	C	
172		7.29			6.24			6.01			6.98			6.32		
173	171 + 173		C171			C171			C171			C171			C171	
174		46.2			40.1			38.1			46.9			42.6		
175		10.4			8.84			8.54			10.3			9.73		
176		33.6			28.8			28			33			31.7		
177		220			188			181			216			198		
178		110			90.5			87.9			107			97.4		
179		136			116			113			134			129		
180	180 + 193	494	C		489	C		414	C		547	C		476	C	
181		2.53			2.23			2.38			2.84			2.31		
182		1.24			1.11			0.0475	U		1.55			1.61		
183	183 + 185	228	C		202	C		197	C		243	C		220	C	
184		1.87			1.54			1.59			2.05			1.93		
185	183 + 185		C183			C183			C183			C183			C183	
186		0.0491	U		0.0484	U		0.0475	U		0.0499	U		0.068	U	
187		734			625			625			758			704		
188		1.52			1.3			1.25			1.39			1.57		
189		2.4			2.09			1.95			2.34			2.41		
190		93.8			84.8			80.3			102			88.7		
191		6.81			6.2			6.01			7.62			6.69		
192		0.0491	U		0.0484	U		0.0475	U		0.0499	U		0.0766	U	
193	180 + 193		C180			C180			C180			C180			C180	
194		10.2			9.1			8.85			10.9			10.3		
195		29.6			26.4			24.4			29.6			28.8		
196		17.4			14.9			14.6			16.6			15.8		
197	197 + 200	9.91	C		8.47	C		7.81	C		9.62	C		8.9	C	
198	198 + 199	37.7	C		32.9	C		29.4	C		36.7	C		33.8	C	
199	198 + 199		C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197	
201		23.7			20.3			19.1			23			22.1		
202		77.3			65.6			60.3			73.2			69.3		
203		122			120			101			130			122		
204		0.129			0.092	K	J-EMPC	0.082	K	J-EMPC	0.15	K	J-EMPC	0.123		
205		5.01			4.33			4.04			4.93			4.93		
206		21.2			18.8			17.1			20.3			19.4		
207		4			3.58			3.37			4.18			3.76		
208		10.3			9.2			8.06			9.69			8.93		
209		17			15			12.8			16.1			13.3		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL.
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the analyte-specific reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-33 through L11379-37
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26479

IUPAC #	COELUTING CONGENERS[1]	08022741 TC L11379-33	Lab Qualifier	URS Review Qualifier	08022742 TC L11379-34	Lab Qualifier	URS Review Qualifier	08030685 TC L11379-35	Lab Qualifier	URS Review Qualifier	08030686 TC L11379-36	Lab Qualifier	URS Review Qualifier	08030687 TC L11379-37	Lab Qualifier	URS Review Qualifier
1		2.41			1.95			1.68			1.66			1.84		
2		4.36			3.4			3.81			3.71			3.68		
3		0.785			0.61	K	J-EMPC	0.811			0.697			0.686	K	J-EMPC
4		70.6			54.1			37.1			38.4			38.9		
5		1.33			1.18			0.997			0.876			0.929		
6		15.4			11.1			8.17			8.41			8.15		
7		0.674	K	J-EMPC	0.5	K	J-EMPC	0.362			0.351	K	J-EMPC	0.363		
8		29			23.1			21.6			18.9			19.4		
9		0.988			0.752	K	J-EMPC	0.543			0.47			0.524		
10		0.982			0.736	K	J-EMPC	0.517			0.452			0.524		
11		8070	D		7380	D		7720	D		6790	D		7180	D	
12	12 + 13	62.5	C K	J-EMPC	118	C		109	C		93.8	C		62.3	C K	J-EMPC
13	12 + 13		C12			C12			C12			C12			C12	
14		0.235	U		0.203	U		0.241	U		0.263	U		0.245	U	
15		21.8			20.1	K	J-EMPC	30.8	K	J-EMPC	32.8	K	J-EMPC	17.8		
16		105			85.4			75.7			74.4			72		
17		98.9			75.9			67.8			65.8			59.3		
18	18 + 30	236	C		186	C		159	C		156	C		151	C	
19		11.7			9.16			7.22			7.21			7.72		
20	20 + 28	122	C		101	C		94.5	C		81.9	C		80.3	C	
21	21 + 33	60.1	C		49.4	C		46.5	C		41.4	C		42.1	C	
22		131			109			104			98.5			93.2		
23		0.116			0.116	U		0.0965	U		0.0738	U		0.114	K	J-EMPC
24		1.44			1.4			1.08			1.22			1.08		
25		11.2			9.22			8.62			7.68			7.61		
26	26 + 29	23.6	C		18.7	C		16.8	C		15.3	C		15.6	C	
27		24.9			20.2			18.2			17.2			16.4		
28	20 + 28		C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18	
31		78.4			64.1			59			50.6			49.2		
32		9.77			7.08			6.09			5.53			5.44		
33	21 + 33		C21			C21			C21			C21			C21	
34		0.34			0.235	K	J-EMPC	0.256			0.225			0.271		
35		14.8			13.3			13.1			11.3			11.6		
36		3.81			3.47			3.6			2.86			2.91		
37		52.1			45.1			43.2			39.1			37.7		
38		0.946			0.923			1.02			0.888			0.951		
39		2.85			2.34		J	2.43			2.18		J	1.99		
40	40 + 41 + 71	98.7	C		81.9	C		78.2	C		74.3	C		71.8	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40	
42		178			151			165			148			137		
43		7.19			6.16			5.06			4.8			5.18		
44	44 + 47 + 65	678	C		598	C		619	C		567	C		538	C	
45	45 + 51	27.8	C		22.6	C		21.1	C		20.5	C		20	C	
46		4.82			3.86			3.48			3.45			3.27		
47	44 + 47 + 65		C44			C44			C44			C44			C44	
48		81.7			67.9			67.4			64.8			58.4		
49	49 + 69	139	C		119	C		121	C		113	C		104	C	
50	50 + 53	59	C		50.4	C		46.3	C		46.7	C		44.9	C	
51	45 + 51		C45			C45			C45			C45			C45	
52		419			368			346			332			329		
53	50 + 53		C50			C50			C50			C50			C50	
54		0.144			0.108	K	J-EMPC	0.069			0.066	K	J-EMPC	0.088	K	J-EMPC
55		6.01			8.15			5.8			7.86			7.59		
56		112			98.9			97.8			97.1			92.6		
57		1.01			0.723			0.802			0.776	K	J-EMPC	0.662		
58		1.63			1.37	K	J-EMPC	1.3	K	J-EMPC	1.14			1.07		
59	59 + 62 + 75	38.9	C		33.5	C		32.2	C		31.2	C		29.8	C	
60		64.9			58.9			58.7			54			50.6		
61	61 + 70 + 74 + 76	458	C		411	C		406	C		373	C		346	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59	
63		13			11.4			11.5			10.5			9.72		
64		99.7			85.8			85.3			79.1			74.5		
65	44 + 47 + 65		C44			C44			C44			C44			C44	
66		368			332			332			313			287		
67		11.3			9.74			9.98			9.56			8.51		
68		2.91			2.6			2.79			2.62			2.52		
69	49 + 69		C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40	
72		3.04			2.68			2.75			2.43			2.44		
73		0.0495	U		0.0481	U		0.0487	U		0.0452	U		0.0476	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
77		46.8			41.4			40.8			38.4			35.7		
78		0.453	U		0.522	U		0.433	U		0.482	U		0.435	U	
79		22			20.3			20.9			19.5			18.7		
80		0.423	U		0.488	U		0.405	U		0.451	U		0.407	U	
81		2.21			2.03			1.88	K	J-EMPC	1.8			1.51	K	J-EMPC
82		20.9			18.8			18.8			16.8			17.1		
83	83 + 99	750	C		674	C		686	C		629	C		590	C	
84		73.1			64.4			62.4			56			52.7		
85	85 + 116 + 117	174	C		158	C		164	C		145	C		136	C	
86	86 + 87 + 97 + 108 + 119 + 125	707	C		645	C		684	C		596	C		578	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
88	88 + 91	85.7	C		75.1	C		77.8	C		71	C		65.9	C	
89		2.53			2.25			2.36			2.06			2.01		
90	90 + 101 + 113	1260	C		1130	C		1140	C		1030	C		965	C	
91	88 + 91		C88			C88			C88			C88			C88	
92		152			136			129			116			113		
93	93 + 95 + 98 + 100 + 102	829	C		746	C		769	C		687	C		682	C	
94		1.3	K	J-EMPC	1.15			1.1			1.03			1.08	K	J-EMPC
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
96		1			0.923			0.913			0.785			0.76		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
103		3.35			3.27			3.13			2.96			2.68		
104		0.128	K	J-EMPC	0.0652	U		0.0564	U		0.078			0.05	K	J-EMPC
105		556			488			478			440			414		
106		3.39	U		3.3	U		4.08	U		3.05	U		2.77	U	
107	107 + 124	41.6	C		36.4	C		35.8	C		32.9	C		30.8	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
109		88			79.4			76.9			70.2			66.6		
110	110 + 115	999	C		910	C		877	C		809	C		779	C	
111		0.464			0.639	K	J-EMPC	0.582	K	J-EMPC	0.385			0.413		
112		0.308	U		0.286	U		0.271	U		0.244	U		0.262	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90	
114		33			28.1			27.1			24.9			24.7		
115	110 + 115		C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85	

Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-33 through L11379-37
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26479

IUPAC #	COELUTING CONGENERS[1]	08022741 TC L11379-33	Lab Qualifier	URS Review Qualifier	08022742 TC L11379-34	Lab Qualifier	URS Review Qualifier	08030685 TC L11379-35	Lab Qualifier	URS Review Qualifier	08030686 TC L11379-36	Lab Qualifier	URS Review Qualifier	08030687 TC L11379-37	Lab Qualifier	URS Review Qualifier
117	85 + 116 + 117		C85			C85			C85			C85			C85	
118		2820			2530			2640			2290			2270		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
120		8.56			8.04			7.81			6.36			6.68		
121		0.362			0.415	K	J-EMPC	0.416			0.305	K	J-EMPC	0.289		
122		6.65			6.11	K	J-EMPC	4.58	U		5.52	K	J-EMPC	6.59		
123		50.6			43.8			50			41.2			40.9		
124	107 + 124		C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
126		5.36			5.12			5.88	U		4.46			4.51		
127		3.47	U		3.38	U		4.17	U		3.12	U		2.84	U	
128	128 + 166	171	C		154	C		150	C		140	C		127	C	
129	129 + 138 + 160 + 163	2470	C		2260	C		2270	C		2060	C		1990	C	
130		87.7			78.3			77.8			71.3			64.1		
131		9.29			8.15			7.96			7.22			6.33		
132		193			171			165			156			146		
133		23.6			20.8			20.9			17.3			16.9		
134	134 + 143	39.1	C		34.5	C		34.1	C		31.1	C		28.6	C	
135	135 + 151 + 154	355	C		324	C		316	C		282	C		268	C	
136		59.7			53.7			53.6			50			44.4		
137		40.2			37.3			32.6			32.6			32.6		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
139	139 + 140	20.4	C		17.8	C		18.6	C		17.1	C		15.3	C	
140	139 + 140		C139			C139			C139			C139			C139	
141		44.8			40.7			39.1			38.3			39.6		
142		1.09	U		1.14	U		1.05	U		1.1	U		0.806	U	
143	134 + 143		C134			C134			C134			C134			C134	
144		33.6			29.4			30			26.5			23.5		
145		0.209	K	J-EMPC	0.2			0.21	K	J-EMPC	0.22	K	J-EMPC	0.173		
146		395			361			353			302			314		
147	147 + 149	1350	C		1240	C		1230	C		1140	C		1080	C	
148		2.32			2.1			2.04			1.61			1.64		
149	147 + 149		C147			C147			C147			C147			C147	
150		1.57			1.5			1.45			1.38			1.23		
151	135 + 151 + 154		C135			C135			C135			C135			C135	
152		0.421			0.426			0.448			0.383			0.375		
153	153 + 168	3630	C		3380	C		4070	C		3060	C		3190	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135	
155		1.35			1.18	K	J-EMPC	1.09			0.946	K	J-EMPC	0.846		
156	156 + 157	161	C		145	C		137	C		123	C		125	C	
157	156 + 157		C156			C156			C156			C156			C156	
158		144			129			126			117			108		
159		2.16			1.72			1.61	K	J-EMPC	1.53	K	J-EMPC	1.51		
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
161		0.761	U		0.793	U		0.733	U		0.767	U		0.561	U	
162		3.56			3.07			2.68			2.74			2.41	K	J-EMPC
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
164		43.5			39.1			37			34			32.9		
165		0.868	U		0.905	U		0.836	U		0.875	U		0.64	U	
166	128 + 166		C128			C128			C128			C128			C128	
167		146			137			165			123			131		
168	153 + 168		C153			C153			C153			C153			C153	
169		1.03	U		1.01	U		1.73	U		1.17	U		1.57	U	
170		47.9			43.4			37			37.3			35.6		
171	171 + 173	78.5	C		70.4	C		68	C		64.4	C		56	C	
172		6.59			6.01			5.19			5.14			4.85		
173	171 + 173		C171			C171			C171			C171			C171	
174		43.3			40.1			34.6			34.5			32.5		
175		10.1			8.98			8.11			7.15			6.96		
176		32			29.5			27.3			25.5			23.4		
177		206			188			180			169			153		
178		99.9			90.4			87			78.2			73.3		
179		131			119			116			108			97.9		
180	180 + 193	476	C		458	C		474	C		390	C		384	C	
181		2.46			2.22	K	J-EMPC	2.07			1.97			2.17		
182		1.57	K	J-EMPC	1.25			1.28	K	J-EMPC	1.2	K	J-EMPC	1.21	K	J-EMPC
183	183 + 185	223	C		209	C		189	C		171	C		168	C	
184		1.74			1.53			1.41			1.12			1.13		
185	183 + 185		C183			C183			C183			C183			C183	
186		0.0649	U		0.0481	U		0.0533	U		0.0452	U		0.055	U	
187		705			660			614			555			541		
188		1.48			1.41			1.48			1.16			1.24		
189		2.37			2.17			2.01			1.71			1.72		
190		89.6			84.7			79.4			72.8			72.4		
191		7.04			6.73			5.99			5.43			5.45		
192		0.073	U		0.0481	U		0.06	U		0.0467	U		0.0618	U	
193	180 + 193		C180			C180			C180			C180			C180	
194		10.6			10.4			7.99			7.57			8.29		
195		30.2			27.1			24.5			25			21.6		
196		16.3			14.7			12.2			12			11.7		
197	197 + 200	9.36	C		8.25	C		7.71	C		6.94	C		6.61	C	
198	198 + 199	35.9	C		32	C		29	C		29.2	C		27.6	C	
199	198 + 199		C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197	
201		23.2			20.2			19.6			16.8			16.7		
202		72.1			64.9			67.4			58.8			58.2		
203		122			115			117			97.3			99.5		
204		0.096	K	J-EMPC	0.068			0.084			0.082	K	J-EMPC	0.109	K	J-EMPC
205		5.16			4.65			4.26			4.02			3.78		
206		20.1			17.7			16.5			15.9			15.7		
207		3.99			3.45			3.14			2.96			3.02		
208		9.49			8.61			7.81			7.63			7.36		
209		14.3			12.5			11.9			10.6			10.6		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL.
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the analyte-specific reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-22 and L11379-23
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26795

IUPAC #	COELUTING CONGENERS[1]	08030427TC L11379-22	Lab Qualifier	URS Review Qualifier	08030426TC L11379-23	Lab Qualifier	URS Review Qualifier
1		1.59			1.41		
2		4.31			3.24		
3		0.675		U	0.584		U
4		33.3			31.8		
5		0.399	U		0.236	U	
6		10.9			9.35		
7		0.376	U		0.222	U	
8		24.6			22		
9		0.359	U		0.212	U	
10		0.331	U		0.195	U	
11		8520			7970	D	
12	12 + 13	0.401	C U		0.237	C U	
13	12 + 13		C12			C12	
14		0.369	U		0.218	U	
15		11			8.81		
16		88.4			88		
17		78.3			73.8		
18	18 + 30	193	C		184	C	
19		8.54			8.48		
20	20 + 28	101	C		99.2	C	
21	21 + 33	45.8	C		46.5	C	
22		103			105		
23		0.183	U		0.157	U	
24		0.946			1.08		
25		8.61			8.64		
26	26 + 29	18.2	C		18.4	C	
27		21.9			20.4		
28	20 + 28		C20			C20	
29	26 + 29		C26			C26	
30	18 + 30		C18			C18	
31		60.4			60.3		
32		6.1			6.19		
33	21 + 33		C21			C21	
34		0.349			0.246	K	J-EMPC
35		13.9			13.2		
36		3.96			3.97		
37		31.5			30.6		
38		1.24			1.2		
39		2.92			2.79	K	J-EMPC
40	40 + 41 + 71	82.5	C		84.9	C	
41	40 + 41 + 71		C40			C40	
42		180			168		
43		0.122	U		0.0799	U	
44	44 + 47 + 65	648	C		630	C	
45	45 + 51	20.3	C		23.3	C	
46		3.47			3.82		
47	44 + 47 + 65		C44			C44	
48		65.1			71.6		
49	49 + 69	112	C		124	C	
50	50 + 53	48.7	C		52.6	C	
51	45 + 51		C45			C45	
52		339			381		
53	50 + 53		C50			C50	
54		0.0789	U		0.0485	U	
55		0.353	U		0.192	U	
56		111			95.5		
57		1.01			0.862		
58		0.364	U		0.198	U	
59	59 + 62 + 75	32.7	C		35.2	C	
60		65.4			56.5		
61	61 + 70 + 74 + 76	426	C		382	C	
62	59 + 62 + 75		C59			C59	
63		11.6			10.9		
64		0.0694	U		84.7		
65	44 + 47 + 65		C44			C44	
66		342			306		
67		10.8			9.84		
68		3.11			2.86		
69	49 + 69		C49			C49	
70	61 + 70 + 74 + 76		C61			C61	
71	40 + 41 + 71		C40			C40	
72		2.86			2.68		
73		2.69			2.78		
74	61 + 70 + 74 + 76		C61			C61	
75	59 + 62 + 75		C59			C59	
76	61 + 70 + 74 + 76		C61			C61	
77		34.3			33.2		
78		0.36	U		0.196	U	
79		32.3			26.3		
80		0.309	U		0.169	U	
81		0.961	K	J-EMPC	1.43	K	J-EMPC
82		18.5			18.9		
83	83 + 99	728	C		760	C	
84		60.4			63.9		
85	85 + 116 + 117	166	C		170	C	
86	86 + 87 + 97 + 108 + 119 + 125	779	C		785	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
88	88 + 91	74.2	C		75.9	C	
89		2.2			2.29		
90	90 + 101 + 113	1200	C		1240	C	
91	88 + 91		C88			C88	
92		132			127		
93	93 + 95 + 98 + 100 + 102	787	C		822	C	
94		1.11	K	J-EMPC	1.21	K	J-EMPC
95	93 + 95 + 98 + 100 + 102		C93			C93	
96		0.735			1.05		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93	
99	83 + 99		C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93	
101	90 + 101 + 113		C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93	
103		2.94			2.95		
104		0.122	U		0.116	U	
105		370			350		
106		1.97	U		1.56	U	
107	107 + 124	42.7	C		36.9	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
109		84.2			73.5		
110	110 + 115	981	C		986	C	
111		0.233	U		0.218	U	
112		0.225	U		0.211	U	
113	90 + 101 + 113		C90			C90	
114		24.2			21.3		
115	110 + 115		C110			C110	
116	85 + 116 + 117		C85			C85	

Table 2
PCB Congener Qualifer Summary - Clams
Lab Sample ID's L11379-22 and L11379-23
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26795

IUPAC #	COELUTING CONGENERS[1]	08030427TC L11379-22	Lab Qualifier	URS Review Qualifier	08030426TC L11379-23	Lab Qualifier	URS Review Qualifier
117	85 + 116 + 117		C85			C85	
118		2130			1910		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
120		8.78			8.71		
121		0.392	K	J-EMPC	0.217	U	
122		6.44			4.53		
123		42.1			39		
124	107 + 124		C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86	
126		4.51			4.07		
127		1.86	U		1.48	U	
128	128 + 166	184	C		174	C	
129	129 + 138 + 160 + 163	2700	C		2650	C	
130		79.6			72.8		
131		8.12			0.674	U	
132		172			169		
133		22.2			21.4		
134	134 + 143	31.1	C		33.1	C	
135	135 + 151 + 154	325	C		352	C	
136		0.0686	U		0.0753	U	
137		45.5			40.8		
138	129 + 138 + 160 + 163		C129			C129	
139	139 + 140	19.3	C		19.4	C	
140	139 + 140		C139			C139	
141		39.2			35.3		
142		0.668	U		0.686	U	
143	134 + 143		C134			C134	
144		29.6			30.7		
145		0.0724	U		0.181	K	J-EMPC
146		432			412		
147	147 + 149	1400	C		1370	C	
148		2.26			2.32	K	J-EMPC
149	147 + 149		C147			C147	
150		1.55			1.74		
151	135 + 151 + 154		C135			C135	
152		0.445	K	J-EMPC	0.0748	U	
153	153 + 168	5010	C		4530	C	
154	135 + 151 + 154		C135			C135	
155		1.01			1.05		
156	156 + 157	149	C		137	C	
157	156 + 157		C156			C156	
158		140			136		
159		1.94			1.92		
160	129 + 138 + 160 + 163		C129			C129	
161		0.412	U		0.423	U	
162		3.18			2.8		
163	129 + 138 + 160 + 163		C129			C129	
164		39.2			38.1		
165		0.48	U		0.493	U	
166	128 + 166		C128			C128	
167		167			151		
168	153 + 168		C153			C153	
169		1.7	U		1.53	U	
170		41			37.8		
171	171 + 173	70.8	C		66.3	C	
172		6.08			5.7		
173	171 + 173		C171			C171	
174		38.5			37		
175		9.04			8.29		
176		28.8			28.3		
177		179			165		
178		86.8			83.4		
179		0.0805	U		113		
180	180 + 193	529	C		465	C	
181		2.58			2.47		
182		0.102	U		0.933		
183	183 + 185	216	C		202	C	
184		1.54			1.58		
185	183 + 185		C183			C183	
186		0.0816	U		0.0602	U	
187		691			650		
188		1.54			1.32		
189		1.51	K	J-EMPC	1.44		
190		90.9			80.3		
191		6.14			5.82		
192		0.0834	U		0.0615	U	
193	180 + 193		C180			C180	
194		9.49			9.21		
195		26.3			25.3		
196		14.8			13.9		
197	197 + 200	7.8	C		8.48	C	
198	198 + 199	29.3	C		29.2	C	
199	198 + 199		C198			C198	
200	197 + 200		C197			C197	
201		19.8			19.7		
202		72.1			65.4		
203		131			126		
204		0.0638	U		0.087	K	J-EMPC
205		4.21			3.85		
206		17.2			15.5		
207		3.47			3.37		
208		7.67			7.34		
209		11.5			10		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL.
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the analyte-specific reporting limit.

1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 3
PCB Congener Qualifier Summary - Crayfish
Lab Sample ID's L11380-1 through L11380-7
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26607

IUPAC #	COELUTING CONGENERS[1]	08021901CF L11380-1	Lab Qualifier	URS Review Qualifier	08021904CF L11380-4	Lab Qualifier	URS Review Qualifier	08021505CF L11380-5	Lab Qualifier	URS Review Qualifier	08021406CF L11380-6	Lab Qualifier	URS Review Qualifier	08021407CF L11380-7	Lab Qualifier	URS Review Qualifier
1		0.135			0.196			0.26			0.243			0.255	K	J-EMPC
2		0.078			0.109			0.146			0.236			0.0531	U	
3		0.175	K	J-EMPC	0.23			0.192			0.215	K	J-EMPC	0.22	K	J-EMPC
4		0.474		U	0.535		U	2.29			0.919			0.706		U
5		0.0959	U		0.163	U		0.101	U		0.0854	U		0.137	U	
6		0.235			0.248			0.217			0.235			0.239		
7		0.091			0.144	U		0.096	K	J-EMPC	0.0757	U		0.121	U	
8		1.05		U	0.991		U	0.895		U	0.661		U	0.9		U
9		0.101			0.164	K	J-EMPC	0.184	K	J-EMPC	0.087	K	J-EMPC	0.121	U	
10		0.0826	U		0.14	U		0.114	K	J-EMPC	0.0736	U		0.118	U	
11		50.1			30.2			36.9			75.9			16.4		
12	12 + 13	0.092	C U		0.156	C U		0.0967	C U		0.0819	C U		0.131	C U	
13	12 + 13		C12			C12			C12			C12			C12	
14		0.0888	U		0.151	U		0.0934	U		0.0791	U		0.127	U	
15		1.98	K	J-EMPC	1.35			3.55	K	J-EMPC	2.5	K	J-EMPC	2.44	K	J-EMPC
16		0.53			0.369	K	J-EMPC	0.411	K	J-EMPC	0.655			0.373	K	J-EMPC
17		0.51			0.537			1.11			0.806			0.504		
18	18 + 30	1.71	C	U	1.04	C	U	2.12	C	U	2.31	C	U	1.27	C	U
19		0.131	K	U	0.189	K	U	0.847			0.235		U	0.179		U
20	20 + 28	2.63	C	U	2.58	C	U	3.24	C		3	C		2.13	C	U
21	21 + 33	0.746	C	U	0.687	C	U	0.804	C	U	0.774	C	U	0.507	C K	U
22		0.544			0.568			0.489			0.695			0.501	K	J-EMPC
23		0.0636	U		0.0652	U		0.0634	U		0.0497	U		0.0696	U	
24		0.0489	U		0.0592	U		0.05	U		0.0497	U		0.0785	U	
25		0.086	K	J-EMPC	0.177	K	J-EMPC	0.256			0.169	K	J-EMPC	0.115	K	J-EMPC
26	26 + 29	0.443	C K	U	0.474	C	U	1.22	C		0.58	C		0.336	C	U
27		0.107	K	J-EMPC	0.233			0.348			0.332			0.106	K	J-EMPC
28	20 + 28		C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18	
31		1.29		U	1.28		U	1.63		U	1.19		U	1.06		U
32		0.289			0.266			0.453			0.246			0.327		
33	21 + 33		C21			C21			C21			C21			C21	
34		0.0649	U		0.0665	U		0.0647	U		0.0497	U		0.071	U	
35		0.271	K	J-EMPC	0.143			0.28			0.351			0.069	U	
36		0.07	K	J-EMPC	0.0569	U		0.0554	U		0.092			0.0607	U	
37		3.31			2.55			4.15			4.29			8.02		
38		0.059	U		0.0606	U		0.0589	U		0.0497	U		0.0646	U	
39		0.062	U		0.0636	U		0.151			0.0497	U		0.0678	U	
40	40 + 41 + 71	0.487	C K	J-EMPC	0.987	C		1.34	C		1.57	C		0.751	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40	
42		0.608			1.44			0.791			2.24			0.591		
43		0.0514	U		0.0696	U		0.182	K	J-EMPC	0.143	K	J-EMPC	0.109	K	J-EMPC
44	44 + 47 + 65	4.56	C		12.4	C		7.96	C		24	C		6.23	C	
45	45 + 51	0.141	C		0.258	C		0.431	C		0.311	C		0.25	C	
46		0.0489	U		0.075			0.149			0.071			0.0755	U	
47	44 + 47 + 65		C44			C44			C44			C44			C44	
48		0.291		U	0.372		U	0.431		U	0.672			0.395		U
49	49 + 69	0.743	C		2.91	C		3.89	C		2.79	C		1.62	C	
50	50 + 53	0.275	C K	J-EMPC	0.573	C		1.02	C		1.14	C		0.346	C	
51	45 + 51		C45			C45			C45			C45			C45	
52		2.76			10			16.9			17.8			4.46		
53	50 + 53		C50			C50			C50			C50			C50	
54		0.0489	U		0.0641	U		0.052			0.0497	U		0.0586	U	
55		0.157	U		0.259	U		0.135	U		0.112	U		0.33	U	
56		0.544	K	U	1.6			1.47			2.13			1.23		
57		0.143	U		0.235	U		0.141	K	J-EMPC	0.101	U		0.3	U	
58		0.167	U		0.275	U		0.143	U		0.119	U		0.351	U	
59	59 + 62 + 75	0.158	C K	U	0.119	C K	U	0.192	C	U	0.396	C K	J-EMPC	0.163	C	U
60		0.84	K	J-EMPC	1.78			1.59			1.89			1	K	J-EMPC
61	61 + 70 + 74 + 76	13.9	C		44.6	C		213	C		140	C		109	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59	
63		1.7			10.6			23.5			33.8			14.6		
64		0.494		U	1.51			2.1			1.18			0.819		U
65	44 + 47 + 65		C44			C44			C44			C44			C44	
66		13.2			35.7			57.7			96.7			142		
67		0.174			0.237	U		0.292	K	J-EMPC	0.459			0.303	U	
68		0.353			1.02	K	J-EMPC	1.8			0.911			0.539		
69	49 + 69		C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40	
72		0.13	U		0.214	U		0.25			0.18			0.273	U	
73		0.0489	U		0.0496	U		0.05	U		0.0497	U		0.05	K	J-EMPC
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
77		3.76			6.54			14.8			20.7			10.5		
78		0.166	U		0.273	U		0.142	U		0.118	U		0.348	U	
79		0.516	K	J-EMPC	2.67			0.87			2.47			0.711		
80		0.142	U		0.234	U		0.122	U		0.101	U		0.299	U	
81		0.239	K	J-EMPC	0.446			0.823	K	J-EMPC	1.32			0.361	U	
82		0.396	K	J-EMPC	2.73			1.96			1.45			0.831	K	J-EMPC
83	83 + 99	18.6	C		92.8	C		69	C		87.2	C		276	C	
84		0.47	K	U	4.02			4.02			2.46			0.894		
85	85 + 116 + 117	6.37	C		123	C		92.4	C		347	C		94.4	C	
86	86 + 87 + 97 + 108 + 119 + 125	7.22	C		42.5	C		10	C		39.8	C		14.6	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
88	88 + 91	0.513	C		3.48	C		2.5	C		2.15	C		1.08	C	
89		0.0615	U		0.0834	U		0.119			0.1	U		0.155	U	
90	90 + 101 + 113	11.6	C		57.7	C		60.8	C		169	C		70.6	C	
91	88 + 91		C88			C88			C88			C88			C88	
92		1.83			6.84			5.38			6.39			2.43		
93	93 + 95 + 98 + 100 + 102	6.85	C		34.1	C		18.1	C		40.1	C		11.6	C	
94		0.0611	U		0.0828	U		0.0893	U		0.0997	U		0.154	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
96		0.0489	U		0.0496	U		0.104	K	J-EMPC	0.0497	U		0.0565	U	
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
103		0.05	U		0.189			0.166			0.11			0.171		
104		0.0489	U		0.0496	U		0.05	U		0.0497	U		0.0796	U	
105		14.6			93.1			56.6			86.3	K	J-EMPC	134		
106		0.481	U		2.58	U		2.31	U		4.51	U		5.36	U	
107	107 + 124	0.887	C		3.94	C		2.61	C		4.95	C U		5.89	C U	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
109		16.1			301			401			1040			227		
110	110 + 115	4.32	C		31.8	C		19.4	C		24.7	C		9.47	C	
111		0.229	K	J-EMPC	0.605			0.661			0.842	K	J-EMPC	0.194		
112		0.0489	U		0.0645	U		0.0695	U		0.0777	U		0.12	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90	
114		6.61			351			355			804			121		
115	110 + 115		C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85	

Table 3
PCB Congener Qualifier Summary - Crayfish
Lab Sample ID's L11380-1 through L11380-7
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26607

IUPAC #	COELUTING CONGENERS[1]	08021901CF L11380-1	Lab Qualifier	URS Review Qualifier	08021904CF L11380-4	Lab Qualifier	URS Review Qualifier	08021505CF L11380-5	Lab Qualifier	URS Review Qualifier	08021406CF L11380-6	Lab Qualifier	URS Review Qualifier	08021407CF L11380-7	Lab Qualifier	URS Review Qualifier
117	85 + 116 + 117		C85			C85			C85			C85			C85	
118		206			3520			6340	D		14000	D		4400		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
120		1.1			2.95			2.51			3.74			1.17		
121		0.0489	U		0.0639	U		0.0689	U		0.077	U		0.119	U	
122		0.595	U		3.19	U		2.85	U		5.57	U		6.62	U	
123		4.75			247			206			460			69		
124	107 + 124		C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
126		0.8			3.51	U		3.6			7.83			2.6	U	
127		0.56	U		34.8			29.5			78.5			15.2		
128	128 + 166	3.34	C		132	C		59.7	C		112	C		28.7	C	
129	129 + 138 + 160 + 163	136	C		1490	C		1250	C		3840	C		983	C	
130		6.23			13.1			15.7			31			89.7		
131		0.16	U		0.521			0.226	U		0.281	U		0.632	U	
132		1.64	K	J-EMPC	8.32			4.01			3.69			3.12		
133		3.9			11.3			32.3			39.5			26.8		
134	134 + 143	0.164	C U		2.94	C		0.988	C		0.288	C U		0.648	C U	
135	135 + 151 + 154	7.02	C		13.2	C		11.8	C		8.25	C		34.1	C	
136		0.679			3.94			3.02			1.79			27.8		
137		11.9			698			662			1770			291		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
139	139 + 140	0.444	C K	J-EMPC	1.84	C		1.4	C		0.26	C U		13.9	C	
140	139 + 140		C139			C139			C139			C139			C139	
141		0.154	U		0.204	U		0.218	U		0.271	U		0.609	U	
142		0.166	U		0.22	U		0.235	U		0.292	U		0.657	U	
143	134 + 143		C134			C134			C134			C134			C134	
144		0.433			1.45			0.977			0.957			0.853	K	J-EMPC
145		0.0489	U		0.0496	U		0.0514	U		0.0497	U		0.0641	U	
146		52.3			483			601			1790			323		
147	147 + 149	11.8	C		52.2	C		27.4	C		92.6	C		57.3	C	
148		0.091			0.084			0.113			0.085	K	J-EMPC	0.737		
149	147 + 149		C147			C147			C147			C147			C147	
150		0.0489	U		0.082	K	J-EMPC	0.05	U		0.0497	U		0.317		
151	135 + 151 + 154		C135			C135			C135			C135			C135	
152		0.0489	U		0.0496	U		0.05	U		0.0497	U		0.0532	U	
153	153 + 168	242	C		2060	C		2870	C		7730	C		2320	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135	
155		0.082			0.0496	U		0.112			0.191	K	J-EMPC	0.19	K	J-EMPC
156	156 + 157	38.2	C		2280	C		1620	C		3910	C		655	C	
157	156 + 157		C156			C156			C156			C156			C156	
158		2.61			10.5			5.41			7.03			9.62		
159		0.198	K	J-EMPC	0.36	K	J-EMPC	0.177	U		0.22	U		1.01	K	J-EMPC
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
161		0.117	U		0.155	U		0.165	U		0.205	U		0.462	U	
162		1.46			38.2			31.8			74.6			13.1		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
164		0.124	U		0.164	U		0.175	U		0.217	U		0.489	U	
165		0.133	U		0.524			0.866	K	J-EMPC	0.234	U		0.528	U	
166	128 + 166		C128			C128			C128			C128			C128	
167		23			1180			629			1530			222		
168	153 + 168		C153			C153			C153			C153			C153	
169		0.597	U		2.95	U		1.8	U		1.2	U		2.22	U	
170		21.6			137			160			326			239		
171	171 + 173	2.99	C		5.3	C		4.06	C		3.04	C		18.8	C	
172		2.97			5.77			10.3			11.5			24.4		
173	171 + 173		C171			C171			C171			C171			C171	
174		2.39			8.43			6.02			3.65			16.2		
175		0.921			1.56			2.38			3.3			5.92		
176		0.531			1.08			0.443	K	J-EMPC	0.351			1.39		
177		22.1			34.2			25.9			36.4			58.5		
178		7.12			9.28			13.6			10.2			21.1		
179		1.62			2.86			2.26			1.89			2.8		
180	180 + 193	143	C		1710	C		0.0552	C U		2450	C		495	C	
181		0.776	K	J-EMPC	28.1			14.7			30.6			8.48		
182		0.0596	U		0.0594	U		0.0632	U		0.0593	U		1.47		
183	183 + 185	16.8	C		28.4	C		40.5	C		42.5	C		81.3	C	
184		0.094			0.0496	U		0.05	U		0.0497	U		0.147	K	J-EMPC
185	183 + 185		C183			C183			C183			C183			C183	
186		0.0489	U		0.0496	U		0.05	U		0.0497	U		0.0574	U	
187		165			792			424			896			238		
188		0.349	K	J-EMPC	1.27			0.657			0.755			0.422		
189		2.69			68.3			41.4			82.1			16		
190		14.1			130			49.4			40.3			51.9		
191		1.75			13.3			13.6			33.6			11.6		
192		0.056	U		0.0558	U		0.0593	U		0.0557	U		0.0697	U	
193	180 + 193		C180			C180			C180			C180			C180	
194		11			39.5			36.3			37.8			47.1		
195		7.44			19.1			14.7			12.6			15.9		
196		9.34			35.9			19.8			22.1			27.4		
197	197 + 200	1.05	C		2.37	C		1.36	C		0.678	C		3.82	C	
198	198 + 199	19	C		57.7	C		38.6	C		38.9	C		62.9	C	
199	198 + 199		C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197	
201		3.7			8.46			5.73			4.9			8.53		
202		2.79			3.73			3.95			3.21			11		
203		16.1			43.4			18.8			13			44.2		
204		0.0489	U		0.0615	U		0.0572	U		0.0702	U		0.0597	U	
205		0.689	K	J-EMPC	1.5			1.37			0.796			2.02		
206		4.4			6.06			7.23			4.38			25.4		
207		1.88			4.24			2.49			1.54			4.31		
208		2.57			4.14			3.5			2.98			7.18		
209		5.07			4.84			5.75			4.94			4.45		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL.
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the analyte-specific reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 3
PCB Congener Qualifer Summary - Crayfish
Lab Sample ID's L11380-8 through L11380-11 and L11433-1
Bradford Island - Remedial Investigation
Sample Delivery Group WG26097

IUPAC #	COELUTING CONGENERS[1]	08021408CF L11380-8	Lab Qualifier	URS Review Qualifier	08021413CF L11380-9	Lab Qualifier	URS Review Qualifier	08022014CF L11380-10	Lab Qualifier	URS Review Qualifier	08021915CF L11380-11	Lab Qualifier	URS Review Qualifier	08022216CF L11433-1	Lab Qualifier	URS Review Qualifier
1		0.144	K	J-EMPC	0.138			0.134			0.153			0.224		
2		0.121	K	J-EMPC	0.097	K	J-EMPC	0.123	K	J-EMPC	0.139			0.175		
3		0.167			0.193	K	J-EMPC	0.209	K	J-EMPC	0.203	K	J-EMPC	0.191	K	J-EMPC
4		0.462		U	0.224	K	U	0.275		U	0.52		U	0.884	U	
5		0.139	U		0.156	U		0.114	U		0.129	U		0.745	U	
6		0.156			0.138	U		0.147			0.192			0.653	U	
7		0.123	U		0.142	U		0.104	U		0.118	U		0.655	U	
8		0.505		U	0.339		U	0.579		U	0.782		U	0.585	U	
9		0.123	U		0.14	U		0.102	U		0.116	U		0.654	U	
10		0.12	U		0.144	U		0.105	U		0.12	U		0.648	U	
11		31			12			16.7			32.3			56.4		
12	12 + 13	0.134	C U		0.156	C U		0.114	C U		0.13	C U		0.714	C U	
13	12 + 13		C12			C12			C12			C12			C12	
14		0.129	U		0.147	U		0.108	U		0.122	U		0.677	U	
15		1.35	K	J-EMPC	0.931			0.832			3.11			1.03	U	
16		0.328	K	J-EMPC	0.172			0.321			0.365			0.378	K	J-EMPC
17		0.314	K	J-EMPC	0.143	K	J-EMPC	0.34	K	J-EMPC	0.341			0.389		
18	18 + 30	1.06	C	U	0.46	C	U	0.668	C K	U	1.16	C	U	1.3	C	U
19		0.121		U	0.0964	U		0.0679	U		0.097	K	U	0.157	K	U
20	20 + 28	1.44	C	U	1.27	C	U	1.87	C	U	2.61	C	U	2.21	C	U
21	21 + 33	0.386	C	U	0.395	C K	U	0.507	C K	U	0.743	C K	U	0.48	C K	U
22		0.369	K	J-EMPC	0.32			0.399	K	J-EMPC	0.564			0.362		
23		0.0669	U		0.0692	U		0.0515	U		0.0709	U		0.0981	U	
24		0.0498	U		0.0682	U		0.0509	U		0.0683	U		0.0802	U	
25		0.075	K	J-EMPC	0.0618	U		0.063			0.122			0.101	K	J-EMPC
26	26 + 29	0.283	C	U	0.239	C K	U	0.247	C	U	0.479	C	U	0.488	C K	U
27		0.056			0.0659	U		0.052	K	J-EMPC	0.103			0.0748	U	
28	20 + 28		C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18	
31		0.701		U	0.607		U	0.932		U	1.14		U	1.05		U
32		0.145			0.125	K	J-EMPC	0.199			0.239			0.185		
33	21 + 33		C21			C21			C21			C21			C21	
34		0.0682	U		0.0709	U		0.0527	U		0.0726	U		0.0998	U	
35		0.124	K	J-EMPC	0.087	K	J-EMPC	0.068	K	J-EMPC	0.12	K	J-EMPC	0.157		
36		0.0584	U		0.0672	U		0.05	U		0.0689	U		0.095	K	J-EMPC
37		1.79			1.52			1.01			5.58			3.88		
38		0.0621	U		0.0692	U		0.0515	U		0.0709	U		0.0956	U	
39		0.0652	U		0.149			0.0567	U		0.0781	U		0.106	U	
40	40 + 41 + 71	0.461	C		0.343	C		0.435	C		0.627	C		0.502	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40	
42		0.577	K	J-EMPC	0.154	K	U	0.174		U	0.464			0.409	K	U
43		0.0716	U		0.0837	U		0.0849	U		0.088	U		0.118	U	
44	44 + 47 + 65	4.23	C		1.13	C		1.28	C		2.98	C		3.12	C	
45	45 + 51	0.159	C K	J-EMPC	0.129	C K	J-EMPC	0.09	C		0.144	C		0.261	C K	J-EMPC
46		0.0673	U		0.0852	U		0.0864	U		0.0896	U		0.11	U	
47	44 + 47 + 65		C44			C44			C44			C44			C44	
48		0.22	K	U	0.145	K	U	0.184		U	0.189		U	0.275	K	U
49	49 + 69	0.776	C		0.603	C		0.659	C		0.716	C		0.892	C K	J-EMPC
50	50 + 53	0.219	C		0.137	C		0.107	C K	J-EMPC	0.195	C		0.194	C	
51	45 + 51		C45			C45			C45			C45			C45	
52		2.56			1.56			1.72			2.28			2.58		
53	50 + 53		C50			C50			C50			C50			C50	
54		0.0498	U		0.0644	U		0.0578	U		0.0616	U		0.0711	U	
55		0.194	U		0.191	U		0.109	U		0.234	U		0.268	U	
56		0.383	K	U	0.287		U	0.329		U	0.414	K	U	0.612		U
57		0.176	U		0.172	U		0.0979	U		0.211	U		0.254	U	
58		0.206	U		0.187	U		0.106	U		0.229	U		0.285	U	
59	59 + 62 + 75	0.096	C K	U	0.096	C K	U	0.0573	C U		0.151	C K	U	0.13	C K	U
60		0.474		U	0.222	K	U	0.282	K	U	0.462	K	U	0.691		
61	61 + 70 + 74 + 76	16.1	C		6.77	C		4.72	C		7.95	C		14	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59	
63		5.17			1.75			1.24			1.88			2.48		
64		0.473		U	0.339		U	0.458		U	0.563		U	0.578		U
65	44 + 47 + 65		C44			C44			C44			C44			C44	
66		18			7.05			3.86			8.47			19		
67		0.178	U		0.161	U		0.0917	U		0.197	U		0.25	U	
68		0.741			0.87	K	J-EMPC	0.424			0.52			0.741		
69	49 + 69		C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40	
72		0.16	U		0.165	U		0.0936	U		0.201	U		0.234	U	
73		0.0498	U		0.059	U		0.0598	U		0.062	U		0.0715	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
77		4.33			2.11			1.74			4.38			5.14		
78		0.204	U		0.195	U		0.111	U		0.238	U		0.286	U	
79		0.529			0.15	U		0.0854	U		0.227	K	J-EMPC	0.24	K	J-EMPC
80		0.175	U		0.167	U		0.0951	U		0.205	U		0.228	U	
81		0.228	U		0.215	U		0.125	U		0.273	U		0.289	U	
82		0.203	K	J-EMPC	0.206	K	J-EMPC	0.198			0.237	K	J-EMPC	0.259	K	J-EMPC
83	83 + 99	37.8	C		7.35	C		3.17	C		7.66	C		18.9	C	
84		0.519		U	0.402		U	0.453		U	0.597	K	J-EMPC	0.533	K	U
85	85 + 116 + 117	28.7	C		4.58	C		3.1	C		4.28	C		6.45	C	
86	86 + 87 + 97 + 108 + 119 + 125	9.11	C		1.73	C		1.62	C	U	3.39	C		4.91	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
88	88 + 91	0.504	C		0.256	C K	U	0.29	C	U	0.375	C		0.276	C K	U
89		0.131	U		0.0941	U		0.0759	U		0.095	U		0.108	U	
90	90 + 101 + 113	17.2	C		5.43	C		4.32	C		6.03	C		9.84	C	
91	88 + 91		C88			C88			C88			C88			C88	
92		1.76			0.626	K	J-EMPC	0.515	K	J-EMPC	0.781	K	J-EMPC	1.98		
93	93 + 95 + 98 + 100 + 102	7.46	C		1.88	C	U	1.82	C	U	3.68	C		7.5	C	
94		0.13	U		0.0971	U		0.0783	U		0.098	U		0.111	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
96		0.0498	U		0.0491	U		0.0726	U		0.05	U		0.0711	U	
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
103		0.106	U		0.0806	U		0.0651	U		0.0814	U		0.0926	U	
104		0.0498	U		0.0541	U		0.0771	U		0.0501	U		0.0711	U	
105		34.7			4.89	K	J-EMPC	3.67	K	J-EMPC	7.46			13.2		
106		0.856	U		0.193	U		0.168	U		0.285	U		0.778	U	
107	107 + 124	2.35	C K	J-EMPC	0.441	C		0.176	C U		0.694	C K	J-EMPC	1.15	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
109		57.5			10.7			10.9			9.05			16.2		
110	110 + 115	4.96	C		2.42	C		2.52	C		3.48	C		3.06	C	
111		0.238			0.303			0.283			0.159	K	J-EMPC	0.326		
112		0.101	U		0.0655	U		0.0529	U		0.0662	U		0.0826	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90	
114		48.4			3.7			5.69			4.07			6.61		
115	110 + 115		C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85	
118		847			95.5			112			122			248		

Table 3
PCB Congener Qualifer Summary - Crayfish
Lab Sample ID's L11380-8 through L11380-11 and L11433-1
Bradford Island - Remedial Investigation
Sample Delivery Group WG26097

IUPAC #	COELUTING CONGENERS[1]	08021408CF L11380-8	Lab Qualifier	URS Review Qualifier	08021413CF L11380-9	Lab Qualifier	URS Review Qualifier	08022014CF L11380-10	Lab Qualifier	URS Review Qualifier	08021915CF L11380-11	Lab Qualifier	URS Review Qualifier	08022216CF L11433-1	Lab Qualifier	URS Review Qualifier
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
120		1.2			0.985			1.2			0.778			1.41		
121		0.1	U		0.0702	U		0.0567	U		0.0708	U		0.0799	U	
122		1.06	U		0.214	U		0.186	U		0.316	U		0.899	U	
123		30.2			2.42			5.81			3.37			6.82		
124	107 + 124		C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
126		1.3	U		0.306			0.238			0.468			1.1	U	
127		3.46			0.438			0.494	K	J-EMPC	0.34	U		0.852	U	
128	128 + 166	11.4	C		1.63	C K	J-EMPC	1.61	C		1.91	C		2.59	C	
129	129 + 138 + 160 + 163	260	C		60.4	C		54.7	C		69.1	C		122	C	
130		11.2			3.21			0.988	K	J-EMPC	3.58			7.22		
131		0.164	U		0.147	U		0.226	U		0.207	U		0.185	U	
132		1.25			0.857			0.819			0.999			0.945	K	J-EMPC
133		5.97			2.55			1.6			1.64			3.42		
134	134 + 143	0.907	C		0.143	C U		0.22	C U		0.45	C K	J-EMPC	0.185	C U	
135	135 + 151 + 154	5.84	C		0.0574	C U		1.54	C		3.26	C		7.56	C	
136		1.05			0.433			0.329			0.548			1.05		
137		83.3			6.57			9.31			5.97			10.9		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
139	139 + 140	0.878	C		0.236	C		0.203	C U		0.187	C		0.435	C K	J-EMPC
140	139 + 140		C139			C139			C139			C139			C139	
141		0.158	U		0.133	U		0.205	U		1.64			0.183	U	
142		0.171	U		0.149	U		0.23	U		0.211	U		0.185	U	
143	134 + 143		C134			C134			C134			C134			C134	
144		0.461			0.186	K	J-EMPC	0.174	K	J-EMPC	0.244			0.516		
145		0.055	U		0.0491	U		0.0499	U		0.0654	U		0.0711	U	
146		101			30.9			26.1			27			55		
147	147 + 149	14.5	C		4.72	C		3.96	C		6.55	C		9.04	C	
148		0.0724	U		0.059	U		0.0587	U		0.0828	U		0.113		
149	147 + 149		C147			C147			C147			C147			C147	
150		0.0508	U		0.0491	U		0.0499	U		0.0626	U		0.0711	U	
151	135 + 151 + 154		C135			C135			C135			C135			C135	
152		0.0498	U		0.0491	U		0.0499	U		0.0592	U		0.0711	U	
153	153 + 168	570	C		122	C		201	C		151	C		322	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135	
155		0.077			0.15	K	J-EMPC	0.0499	U		0.0722	U		0.082		
156	156 + 157	211	C		13.8	C		26.3	C		16.9	C		28	C	
157	156 + 157		C156			C156			C156			C156			C156	
158		3.49			0.898			0.612			1.44			2.55	K	J-EMPC
159		0.189	K	J-EMPC	0.157			0.172	U		0.158	U		0.221		
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
161		0.12	U		0.102	U		0.157	U		0.144	U		0.133	U	
162		4.77			0.973			1.28			0.82	K	J-EMPC	1.18		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
164		0.127	U		0.108	U		0.166	U		0.153	U		0.137	U	
165		0.172	K	J-EMPC	0.201	K	J-EMPC	0.174	U		0.159	U		0.153	U	
166	128 + 166		C128			C128			C128			C128			C128	
167		97.1			8.53			22.8			12.1			21.5		
168	153 + 168		C153			C153			C153			C153			C153	
169		0.487	U		0.249	U		0.257	U		0.35	U		0.539	U	
170		29.3			9.04			12.5			11.3			14.4		
171	171 + 173	1.86	C		0.958	C K	J-EMPC	0.571	C		1.05	C		2.27	C	
172		3.38			1.75			0.953			1.85			2.17		
173	171 + 173		C171			C171			C171			C171			C171	
174		2.45	K	J-EMPC	1.34			1.09	K	J-EMPC	2.33			2.37		
175		1.01			0.571			0.341	K	J-EMPC	0.595			0.925		
176		0.299			0.134	K	J-EMPC	0.156	K	J-EMPC	0.292	K	J-EMPC	0.474		
177		17.4			8.44			4.28			10.6			19.1		
178		6.02			3.88			1.81			3.77			7.59		
179		1.62			0.599			0.549			1.06			2.48		
180	180 + 193	194	C		0.061	C U		111	C		73.9	C		0.0766	C U	
181		2.06			0.34			0.507			0.363			0.631		
182		0.0879	U		0.0648	U		0.0788	U		0.167	K	J-EMPC	0.584		
183	183 + 185	13.6	C		6.59	C		3.75	C		8.26	C		14.8	C	
184		0.0613	U		0.091			0.0574	U		0.05	U		0.0711	U	
185	183 + 185		C183			C183			C183			C183			C183	
186		0.068	U		0.0519	U		0.0631	U		0.05	U		0.0711	U	
187		160			78.2			101			81.1			138		
188		0.317			0.38			0.408			0.267	K	J-EMPC	0.354		
189		5.48			1.17			1.62	K	J-EMPC	1.26			1.55	K	J-EMPC
190		13.8			4.84			2.85			7.76			11.9		
191		3.01			0.982			1.45			1.1			1.59		
192		0.0826	U		0.0651	U		0.0791	U		0.061	U		0.0798	U	
193	180 + 193		C180			C180			C180			C180			C180	
194		9.33			6.3			7.03			6.69			6.53		
195		4.55			2.18			3.96			3.12			3.95		
196		6.12			4.04			6.38			4.03			4.69		
197	197 + 200	0.475	C		0.407	C		0.298	C		0.5	C		0.533	C K	J-EMPC
198	198 + 199	14.1	C		11.1	C		9.4	C		12.1	C		12.9	C	
199	198 + 199		C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197	
201		2.42			1.79			2.67			1.85			2.77		
202		2.74			1.87			0.89	K	J-EMPC	2.29			4.22		
203		9.43			5.37			2.53			10.2			13.1		
204		0.072	U		0.0509	U		0.0561	U		0.0543	U		0.0711	U	
205		0.545	K	J-EMPC	0.305			0.216			0.421			0.633		
206		3.63			2.23			1.62			3.5			3.32		
207		1.03			0.852			1.38			0.853	K	J-EMPC	0.931		
208		1.91			1.42			1.01			1.84			1.84		
209		3.19			2.17	K	J-EMPC	2.83			2.76			3.47		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL.
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the analyte-specific reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 3
PCB Congener Qualifer Summary - Crayfish
Lab Sample ID's L11380-13 through L11380-18
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26607

IUPAC #	COELUTING CONGENERS[1]	08021917CF L11380-13	Lab Qualifier	URS Review Qualifier	08021918CF L11380-14	Lab Qualifier	URS Review Qualifier	08021919CF L11380-15	Lab Qualifier	URS Review Qualifier	08021920CF L11380-16	Lab Qualifier	URS Review Qualifier	08021921CF L11380-17	Lab Qualifier	URS Review Qualifier	08022622CF L11380-18	Lab Qualifier	URS Review Qualifier
1		0.151			0.128	K	J-EMPC	0.161	K	J-EMPC	0.182	K	J-EMPC	0.142			0.13		
2		0.108	K	J-EMPC	0.139	K	J-EMPC	0.106	K	J-EMPC	0.167	K	J-EMPC	0.123			0.138		
3		0.239	K	J-EMPC	0.227	K	J-EMPC	0.222	K	J-EMPC	0.261			0.13			0.186		
4		0.483	K	U	0.308		U	0.467	K	U	0.514		U	0.79	U		0.889	U	
5		0.163	U		0.161	U		0.168	U		0.13	U		0.655	U		0.735	U	
6		0.145	U		0.143	U		0.149	K	J-EMPC	0.251			0.573	U		0.644	U	
7		0.149	U		0.147	U		0.153	U		0.118	U		0.576	U		0.647	U	
8		0.53	K	U	0.466		U	0.477		U	0.889		U	0.514	U		0.577	U	
9		0.146	U		0.144	U		0.15	U		0.116	U		0.574	U		0.645	U	
10		0.151	U		0.149	U		0.155	U		0.12	U		0.569	U		0.639	U	
11		37.9			41.9			49.4			48.2			49.7			15.1		
12	12 + 13	0.164	C U		0.162	C U		0.168	C U		0.13	C U		0.627	C U		0.705	C U	
13	12 + 13		C12			C12			C12			C12			C12			C12	
14		0.155	U		0.152	U		0.159	U		0.123	U		0.595	U		0.668	U	
15		1.02	K	J-EMPC	1.15			1.73	K	J-EMPC	1.57	K	J-EMPC	4.5	K	J-EMPC	0.998	U	
16		0.409	K	J-EMPC	0.278			0.397	K	J-EMPC	0.519			0.408			0.225	K	J-EMPC
17		0.488			0.306	K	J-EMPC	0.274			0.524	K	J-EMPC	0.359	K	J-EMPC	0.188		
18	18 + 30	1.03	C	U	0.828	C K	U	1.55	C	U	1.52	C	U	1.64	C	U	0.447	C	U
19		0.104		U	0.147	K	U	0.0967	U		0.119		U	0.145		U	0.087	K	U
20	20 + 28	1.91	C	U	2.07	C	U	2.3	C	U	3.1	C		2.53	C	U	0.883	C	U
21	21 + 33	0.481	C	U	0.544	C	U	0.386	C	U	0.722	C K	U	0.482	C K	U	0.31	C K	U
22		0.786			0.492	K	J-EMPC	0.386	K	J-EMPC	0.587			0.522			0.26		
23		0.0862	U		0.0598	U		0.0855	U		0.0751	U		0.0952	U		0.075	U	
24		0.0615	U		0.0606	U		0.083	U		0.0614	U		0.0797	U		0.0633	U	
25		0.085			0.0535	U		0.121	K	J-EMPC	0.105			0.0834	U		0.0657	U	
26	26 + 29	0.31	C	U	0.358	C	U	0.378	C	U	0.414	C	U	0.951	C		0.149	C K	U
27		0.085	K	J-EMPC	0.0586	U		0.109			0.072			0.131	K	J-EMPC	0.059	U	
28	20 + 28		C20			C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18			C18	
31		1.03		U	0.88		U	0.782		U	1.58		U	1.1		U	0.495	K	U
32		0.148			0.161			0.101	K	J-EMPC	0.27			0.168			0.118	K	J-EMPC
33	21 + 33		C21			C21			C21			C21			C21			C21	
34		0.0883	U		0.0613	U		0.0876	U		0.077	U		0.0968	U		0.0763	U	
35		0.0961	U		0.149			0.254			0.147	K	J-EMPC	0.157	K	J-EMPC	0.079	U	
36		0.0838	U		0.0582	U		0.0831	U		0.0731	U		0.089	U		0.0701	U	
37		1.51			2.84			2.37			2.81			6.25			1.02		
38		0.0862	U		0.0598	U		0.0855	U		0.0752	U		0.0928	U		0.0731	U	
39		0.095	U		0.0659	U		0.0941	U		0.0828	U		0.103	U		0.0809	U	
40	40 + 41 + 71	0.666	C		0.534	C		0.46	C K	J-EMPC	0.553	C		0.513	C		0.277	C K	J-EMPC
41	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
42		0.916			0.369		U	0.459	K	J-EMPC	0.564	K	J-EMPC	0.673	K	J-EMPC	0.187		U
43		0.0942	U		0.0936	U		0.105	U		0.0913	U		0.126	U		0.0919	U	
44	44 + 47 + 65	3.28	C		2.17	C		3.98	C		3.41	C		4.45	C		1.05	C	
45	45 + 51	0.194	C		0.184	C		0.171	C		0.213	C		0.187	C K	J-EMPC	0.138	C	
46		0.0959	U		0.0953	U		0.107	U		0.093	U		0.118	U		0.0857	U	
47	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
48		0.454	K	U	0.204	K	U	0.185		U	0.343		U	0.342		U	0.089	K	U
49	49 + 69	1.36	C		0.738	C K	J-EMPC	0.499	C		0.911	C K	J-EMPC	0.991	C		0.368	C	
50	50 + 53	0.212	C		0.124	C		0.224	C K	J-EMPC	0.239	C		0.258	C K	J-EMPC	0.08	C K	J-EMPC
51	45 + 51		C45			C45			C45			C45			C45			C45	
52		2.72			2.14			2.03			2.63			2.93			0.872		
53	50 + 53		C50			C50			C50			C50			C50			C50	
54		0.0655	U		0.0733	U		0.0692	U		0.0558	U		0.0742	U		0.0567	U	
55		0.14	U		0.13	U		0.192	U		0.125	U		0.191	U		0.133	U	
56		0.822		U	0.427		U	0.362	K	U	0.502		U	0.744	K	U	0.269		U
57		0.126	U		0.117	U		0.173	U		0.112	U		0.182	U		0.126	U	
58		0.137	U		0.127	U		0.188	U		0.122	U		0.203	U		0.141	U	
59	59 + 62 + 75	0.124	C	U	0.085	C	U	0.156	C K	U	0.113	C K	U	0.128	C K	U	0.0568	C U	
60		0.726			0.619			0.857			1.08			1.01			0.207	K	U
61	61 + 70 + 74 + 76	8.04	C		8.64	C		9.75	C		11.3	C		14.5	C		2.66	C	U
62	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
63		0.615			1.91			1.1			1.59			1.69			0.612		
64		0.892		U	0.488		U	0.321		U	0.536		U	0.599		U	0.247	K	U
65	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
66		6.72			10.8			10.3			10.5			17.6			2.43		
67		0.118	U		0.11	U		0.162	U		0.13	K	J-EMPC	0.307	K	J-EMPC	0.124	U	
68		0.225			0.629	K	J-EMPC	0.304	K	J-EMPC	0.342	K	J-EMPC	0.352			0.235	K	J-EMPC
69	49 + 69		C49			C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
72		0.121	U		0.112	U		0.165	U		0.108	U		0.167	U		0.116	U	
73		0.0664	U		0.0659	U		0.0737	U		0.0644	U		0.0763	U		0.0555	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
77		1.57			4.12			2.67			3.38			3.66			1.3		
78		0.143	U		0.133	U		0.196	U		0.127	U		0.204	U		0.142	U	
79		0.189	K	J-EMPC	0.206	K	J-EMPC	0.343			0.338			0.368			0.115	U	
80		0.123	U		0.114	U		0.168	U		0.109	U		0.163	U		0.113	U	
81		0.164	U		0.313	K	J-EMPC	0.218	U		0.211			0.25			0.135	U	
82		0.372	K	J-EMPC	0.224			0.139	K	J-EMPC	0.204	K	J-EMPC	0.257	K	J-EMPC	0.088	K	J-EMPC
83	83 + 99	8.36	C		9.81	C		13.8	C		13.4	C		17.4	C		2.57	C	
84		0.657			0.419	K	U	0.311		U	0.371		U	0.489		U	0.219		U
85	85 + 116 + 117	2.8	C		5.87	C		3.21	C		3.9	C K	J-EMPC	3.71	C		1.31	C	
86	86 + 87 + 97 + 108 + 119 + 125	5.21	C		2.83	C		5.66	C		4.85	C		6.75	C		1.12	C	U
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
88	88 + 91	0.788	C		0.343	C		0.324	C	U	0.426	C K	J-EMPC	0.576	C		0.141	C K	U
89		0.129	U		0.0851	U		0.117	U		0.0794	U		0.104	U		0.073	U	
90	90 + 101 + 113	9.08	C		7.35	C		6.68	C		7.56	C		9.91	C		2.15	C	
91	88 + 91		C88			C88			C88			C88			C88			C88	
92		1.32			0.9			1.27			1.09			1.88			0.267	K	J-EMPC
93	93 + 95 + 98 + 100 + 102	4.28	C		3.13	C		5.14	C		4.75	C		6.91	C		1.07	C	U
94		0.133	U		0.0878	U		0.121	U		0.0819	U		0.107	U		0.075	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
96		0.052	U		0.0491	U		0.0557	U		0.0637	U		0.058	U		0.0494	U	
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
103		0.111	U		0.073	U		0.1	U		0.0681	U		0.0886	U		0.0624	U	
104		0.0559	U		0.0532	U		0.0626	U		0.0611	U		0.0633	U		0.0494	U	
105		6.36			7.37			11.1			11			12.7			1.97		
106		0.278	U		0.339	U		0.462	U		0.5	U		0.435	U		0.153	U	
107	107 + 124	0.363	C		0.577	C		0.53	C K	J-EMPC	0.609	C K	J-EMPC	0.711	C		0.16	C U	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
109		5.55			16.3			8			10.8			8.96			3.9		
110	110 + 115	7.22	C		3.33	C		3.35	C		3.46	C		5.81	C		1.36	C	U
111		0.131			0.311			0.131	K	J-EMPC	0.171	K	J-EMPC	0.117			0.081	K	J-EMPC
112		0.09	U		0.0593	U		0.0816	U		0.0553	U		0.079	U		0.0556	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
114		2.14			6.1			2.61	K	J-EMPC	3.61			3.89			2.62		
115	110 + 115		C110			C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
118		82.4			173			111			152			156			52.6		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
120		0.561			1.32			0.668			0.903			0.754			0.418	K	J-EMPC
121		0.0964	U		0.0635	U		0.0874	U		0.0592	U		0.0764	U		0.0538	U	
122		0.308	U		0.376	U		0.513	U		0.554	U		0.503	U		0.177	U	
123		2.11			5.06			3.11	K	J-EMPC	3.62			4			1.93		

Table 3
PCB Congener Qualifer Summary - Crayfish
Lab Sample ID's L11380-13 through L11380-18
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26607

IUPAC #	COELUTING CONGENERS[1]	08021917CF L11380-13	Lab Qualifier	URS Review Qualifier	08021918CF L11380-14	Lab Qualifier	URS Review Qualifier	08021919CF L11380-15	Lab Qualifier	URS Review Qualifier	08021920CF L11380-16	Lab Qualifier	URS Review Qualifier	08021921CF L11380-17	Lab Qualifier	URS Review Qualifier	08022622CF L11380-18	Lab Qualifier	URS Review Qualifier
124	107 + 124		C107			C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
126		0.397	U		0.469			0.65	U		0.748	U		0.547	U		0.207	U	
127		0.331	U		0.54	K	J-EMPC	0.551	U		0.596	U		0.476	U		0.265		
128	128 + 166	2.3	C K	J-EMPC	2.21	C		1.84	C		1.6	C		2.97	C		0.887	C K	J-EMPC
129	129 + 138 + 160 + 163	44.8	C		99.8	C		73.8	C		81	C		79.1	C		23.2	C	
130		1.47			4.35			3.33			3.48			4.29			0.614		
131		0.188	U		0.141	U		0.265	U		0.246	U		0.249	U		0.171	U	
132		1.72			0.871			1.35			1.36			1.98			0.407		U
133		1.11			2.83			1.84			2			1.95			0.574	K	J-EMPC
134	134 + 143	0.457	C K	J-EMPC	0.431	C		0.487	C K	J-EMPC	0.24	C U		0.249	C U		0.171	C U	
135	135 + 151 + 154	3.32	C		3.24	C		5.73	C		4.19	C		6.96	C		0.856	C	U
136		0.678			0.561	K	J-EMPC	0.641			0.472	K	J-EMPC	0.867			0.246		U
137		4.34			10.1			4.72			6.25			6			4.35		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
139	139 + 140	0.297	C K	J-EMPC	0.31	C K	J-EMPC	0.262	C K	J-EMPC	0.221	C U		0.419	C		0.156	C U	
140	139 + 140		C139			C139			C139			C139			C139			C139	
141		0.171	U		0.128	U		0.241	U		0.224	U		0.247	U		0.17	U	
142		0.192	U		0.143	U		0.27	U		0.251	U		0.25	U		0.171	U	
143	134 + 143		C134			C134			C134			C134			C134			C134	
144		0.314	K	J-EMPC	0.235			0.341			0.404			0.453			0.08		
145		0.0711	U		0.0502	U		0.0621	U		0.0498	U		0.0572	U		0.0494	U	
146		13.9			46.9			24.8			32.5			27.9			9.49		
147	147 + 149	9.22	C		6.66	C		9.47	C		8.93	C		11	C		1.72	C	
148		0.09	U		0.0635	U		0.0786	U		0.061	U		0.0712	U		0.0494	U	
149	147 + 149		C147			C147			C147			C147			C147			C147	
150		0.068	U		0.0491	U		0.0594	U		0.0498	U		0.0541	U		0.0494	U	
151	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
152		0.0644	U		0.0491	U		0.0563	U		0.0498	U		0.0513	U		0.0494	U	
153	153 + 168	76	C		220	C		158	C		192	C		181	C		77.4	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
155		0.0662	U		0.0518	U		0.111	K	J-EMPC	0.066			0.113	K	J-EMPC	0.0494	U	
156	156 + 157	13.6	C		25.7	C		13.9	C		19.2	C		19.1	C		14.3	C	
157	156 + 157		C156			C156			C156			C156			C156			C156	
158		1.41	K	J-EMPC	1.4			2.07			1.37	K	J-EMPC	2.35			0.216		
159		0.144	U		0.123	K	J-EMPC	0.202	U		0.188	U		0.191	U		0.132	U	
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
161		0.131	U		0.0975	U		0.184	U		0.171	U		0.179	U		0.123	U	
162		0.454	K	J-EMPC	1.42			0.616			0.82	K	J-EMPC	0.741	K	J-EMPC	0.389	K	J-EMPC
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
164		0.139	U		0.104	U		0.195	U		0.182	U		0.721	K	J-EMPC	0.127	U	
165		0.145	U		0.178			0.204	U		0.189	U		0.206	U		0.142	U	
166	128 + 166		C128			C128			C128			C128			C128			C128	
167		11.8			17.7			12			14.1			14.4			9.8		
168	153 + 168		C153			C153			C153			C153			C153			C153	
169		0.167	U		0.254	U		0.24	U		0.298	U		0.265	U		0.18	U	
170		4.86			13.8			6.75			8.53			9.35			6.33		
171	171 + 173	1.18	C K	J-EMPC	1.25	C		1.5	C K	J-EMPC	1.25	C K	J-EMPC	2.69	C		0.341	C	
172		0.456			1.45			0.835	K	J-EMPC	0.829			1.18			0.314	K	J-EMPC
173	171 + 173		C171			C171			C171			C171			C171			C171	
174		0.855	K	J-EMPC	1.36			1.18			1.01			2.02			0.395		
175		0.203	K	J-EMPC	0.617			0.475	K	J-EMPC	0.42	K	J-EMPC	0.647	K	J-EMPC	0.141	K	J-EMPC
176		0.345			0.164			0.376	K	J-EMPC	0.335	K	J-EMPC	0.648			0.087	K	J-EMPC
177		3.6			11.6			9.27			11.5			12.5			2.34		
178		1.92			4.27			4.25			3.43			5.11			0.892		
179		1.17			0.911	K	J-EMPC	1.53			0.765			2.41			0.253		
180	180 + 193	47.3	C		104	C		54.2	C		66.8	C		73.8	C		63	C	
181		0.241			0.613	K	J-EMPC	0.272	K	J-EMPC	0.43			0.445	K	J-EMPC	0.323	K	J-EMPC
182		0.0719	U		0.0521	U		0.294	K	J-EMPC	0.0717	U		0.0912	U		0.0601	U	
183	183 + 185	4.09	C		8.75	C		7.93	C		8.16	C		11.9	C		2.89	C	
184		0.0524	U		0.0491	U		0.083	K	J-EMPC	0.057			0.103			0.0494	U	
185	183 + 185		C183			C183			C183			C183			C183			C183	
186		0.0576	U		0.0491	U		0.0632	U		0.0575	U		0.0744	U		0.0494	U	
187		50.9			136			67.1			87.6			77.7			27.8		
188		0.219	K	J-EMPC	0.474			0.197	K	J-EMPC	0.237			0.383	K	J-EMPC	0.153		
189		0.926			1.58			0.923			1.09	K	J-EMPC	1.23			1.24		
190		2.82			7.41			5.92			6.14			7.38			2.39		
191		0.565	K	J-EMPC	1.49			0.684			0.867			0.814			0.688	K	J-EMPC
192		0.0722	U		0.0523	U		0.0792	U		0.072	U		0.0902	U		0.0595	U	
193	180 + 193		C180			C180			C180			C180			C180			C180	
194		2.14			8.18			3.41			4.08			4.48			2.79		
195		1.67			4.16			2.43			3.11			3.38			2.34	K	J-EMPC
196		2.51			5.9			2.6			3.24			4.02			3.2		
197	197 + 200	0.504	C		0.44	C		0.364	C		0.396	C		0.979	C		0.215	C K	J-EMPC
198	198 + 199	4.2	C		13.4	C		6.57	C		7.03	C		7.98	C		2.93	C	
199	198 + 199		C198			C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197			C197	
201		1.45			3			1.7			2.09			2.35			0.705	K	J-EMPC
202		1.09			2.54			2.16			1.65			2.88			0.575	K	J-EMPC
203		2.84			6.41			6.31			5.08			8.24			1.79		
204		0.0564	U		0.0491	U		0.067	U		0.0572	U		0.051	U		0.0494	U	
205		0.123			0.363			0.26			0.242			0.428			0.162		
206		1.26			2.22			1.75			1.56			2.51			0.714		
207		0.763			1.27			0.609			0.816			1.17			0.808		
208		0.541			1.64			0.977	K	J-EMPC	1.1			1.47			0.442		
209		1.77			2.61			2.16			2.41			3.43			2.95		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL.
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the analyte-specific reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 3
PCB Congener Qualifer Summary- Crayfish
Lab Sample ID's L11512-6 and L113380-19 through L11380-24
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26606

IUPAC #	COELUTING CONGENERS[1]	08021838/42CF L11512-6	Lab Qualifier	URS Review Qualifier	08022233CF L11380-19	Lab Qualifier	URS Review Qualifier	08030372CF L11380-22	Lab Qualifier	URS Review Qualifier	08030373CF L11380-23	Lab Qualifier	URS Review Qualifier	08030374CF L11380-24	Lab Qualifier	URS Review Qualifier
1		0.176		U	0.156		U	0.152	K	U	0.191		U	0.14		U
2		0.186			0.186	K	J-EMPC	0.665			0.474			0.09		
3		0.156			0.188	K	J-EMPC	0.109	K	J-EMPC	0.213			0.175		
4		0.695	U		0.445			0.367	U		0.434			0.313		
5		0.532	U		0.184	U		0.257	U		0.229	U		0.165	U	
6		0.466	U		0.164	U		0.228	U		0.204	U		0.147	U	
7		0.468	U		0.168	U		0.234	U		0.209	U		0.15	U	
8		0.627			0.682			0.588			0.559			0.334		
9		0.467	U		0.162	U		0.227	U		0.202	U		0.146	U	
10		0.463	U		0.163	U		0.227	U		0.202	U		0.146	U	
11		64.3			35.8			57			40			30.9		
12	12 + 13	0.51	C U		0.181	C U		0.253	C U		0.226	C U		0.163	C U	
13	12 + 13		C12			C12			C12			C12			C12	
14		0.484	U		0.17	U		0.237	U		0.212	U		0.153	U	
15		2.12			1.87			1.35			1.24			0.891		
16		0.488			0.497			0.284			0.264			0.298		
17		0.578			0.614	K	J-EMPC	0.317			0.281	K	J-EMPC	0.22		
18	18 + 30	1.4	C	U	1.28	C	U	0.756	C	U	0.804	C	U	0.733	C	U
19		0.142			0.111			0.126			0.14	K	J-EMPC	0.0717	U	
20	20 + 28	4.7	C		3.94	C		1.8	C	U	1.95	C	U	2.54	C	
21	21 + 33	0.625	C	U	0.78	C	U	0.464	C	U	0.364	C	U	0.379	C	U
22		0.638			0.691			0.342			0.344			0.297		
23		0.0709	U		0.0497	U		0.0683	U		0.0717	U		0.049	U	
24		0.0527	U		0.0497	U		0.0534	U		0.0587	U		0.049	U	
25		0.072			0.177			0.077			0.0603	U		0.075	K	J-EMPC
26	26 + 29	0.544	C		0.46	C		0.267	C		0.27	C		0.208	C	
27		0.09			0.088			0.0496	U		0.0546	U		0.065		
28	20 + 28		C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18	
31		1.54		U	1.6		U	0.904		U	0.779		U	0.705		U
32		0.24		U	0.264		U	0.178		U	0.229	K	U	0.129	K	U
33	21 + 33		C21			C21			C21			C21			C21	
34		0.0721	U		0.0497	U		0.0659	U		0.08	K	J-EMPC	0.049	U	
35		0.408	K	J-EMPC	0.112	K	J-EMPC	0.348			0.384			0.0502	U	
36		0.177			0.0497	U		0.116	K	J-EMPC	0.143			0.049	U	
37		4.39			3.32			2.4			3.36			2.38		
38		0.0691	U		0.0497	U		0.0667	U		0.0699	U		0.049	U	
39		0.0765	U		0.0497	U		0.0689	U		0.0723	U		0.049	U	
40	40 + 41 + 71	0.652	C K	U	0.594	C K	U	0.5	C	U	0.412	C	U	0.433	C	U
41	40 + 41 + 71		C40			C40			C40			C40			C40	
42		0.46			0.51			0.24	K	J-EMPC	0.255	K	J-EMPC	0.433	K	J-EMPC
43		0.09			0.0742	U		0.0705	U		0.0838	U		0.062	U	
44	44 + 47 + 65	2.87	C		2.3	C	U	1.82	C	U	1.63	C K	U	2.45	C	
45	45 + 51	0.276	C K	J-EMPC	0.223	C		0.21	C		0.211	C K	J-EMPC	0.141	C	
46		0.0827	U		0.0748	U		0.071	U		0.0844	U		0.0625	U	
47	44 + 47 + 65		C44			C44			C44			C44			C44	
48		0.362			0.365	K	J-EMPC	0.25	K	J-EMPC	0.179	K	J-EMPC	0.239		
49	49 + 69	1.1	C	U	1.05	C	U	0.722	C	U	0.504	C K	U	0.722	C	U
50	50 + 53	0.235	C		0.266	C K	J-EMPC	0.124	C K	J-EMPC	0.195	C K	J-EMPC	0.173	C K	J-EMPC
51	45 + 51		C45			C45			C45			C45			C45	
52		2.94			2.36		U	1.84		U	1.36		U	1.87		U
53	50 + 53		C50			C50			C50			C50			C50	
54		0.05	U		0.0497	U		0.0497	U		0.082			0.049	U	
55		0.158	U		0.138	U		0.16	U		0.132	U		0.107	U	
56		0.542			0.429	K	J-EMPC	0.423			0.365			0.416		
57		0.148	U		0.127	U		0.147	U		0.122	U		0.0987	U	
58		0.152	U		0.128	U		0.149	U		0.123	U		0.0998	U	
59	59 + 62 + 75	0.162	C K	J-EMPC	0.177	C		0.102	C K	J-EMPC	0.076	C K	J-EMPC	0.112	C K	J-EMPC
60		1.01			0.957			0.392			0.583			1.56		
61	61 + 70 + 74 + 76	11.6	C		9.41	C		7.41	C		8.95	C		10.3	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59	
63		1.2			1.06			1.19			1.23			1.22		
64		0.653			0.718			0.48			0.379			0.483		
65	44 + 47 + 65		C44			C44			C44			C44			C44	
66		11.9			7.92			5.78			8.94			13.6		
67		0.152	K	J-EMPC	0.109	U		0.126	U		0.104	U		0.1	K	J-EMPC
68		0.384			0.446			0.444			0.414			0.405		
69	49 + 69		C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40	
72		0.145	U		0.121	U		0.14	U		0.116	U		0.0939	U	
73		0.0536	U		0.0526	U		0.0499	U		0.0593	U		0.049	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
77		2.88			2.39			2.62			3.29			2.99		
78		0.154	U		0.138	U		0.16	U		0.132	U		0.107	U	
79		0.141			0.155			0.139	K	J-EMPC	0.208			0.208		
80		0.133	U		0.123	U		0.143	U		0.118	U		0.096	U	
81		0.175	U		0.176			0.169	U		0.161	K	J-EMPC	0.167		
82		0.18			0.144			0.247	K	J-EMPC	0.166			0.0707	U	
83	83 + 99	12.7	C		9.17	C		5.76	C		9.09	C		16.3	C	
84		0.424			0.489			0.421			0.272			0.365		
85	85 + 116 + 117	3.47	C		2.87	C		3.64	C		3.53	C		3.68	C	
86	86 + 87 + 97 + 108 + 119 + 125	3.23	C		2.99	C		2.03	C		2.21	C		3.49	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
88	88 + 91	0.353	C		0.477	C K	J-EMPC	0.319	C		0.325	C		0.403	C	
89		0.0798	U		0.0798	U		0.0601	U		0.106	U		0.0655	U	
90	90 + 101 + 113	6.46	C		5.33	C		4.97	C		4.86	C		6.91	C	
91	88 + 91		C88			C88			C88			C88			C88	
92		1.22			0.852			0.781			0.546			0.926		
93	93 + 95 + 98 + 100 + 102	3.46	C		2.43	C		2.31	C		2.3	C		3.17	C	
94		0.0819	U		0.0814	U		0.0614	U		0.108	U		0.0668	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
96		0.05	U		0.0497	U		0.0496	U		0.0512	U		0.049	U	
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
103		0.0682	U		0.066	U		0.0497	U		0.0877	U		0.0542	U	
104		0.0507	U		0.0497	U		0.0496	U		0.0549	U		0.049	U	
105		8.98			7.62			3.57			6.03			12.7		
106		0.281	U		0.197	U		0.186	U		0.258	U		0.266	U	
107	107 + 124	0.526	C K	J-EMPC	0.33	C K	J-EMPC	0.327	C		0.402	C		0.405	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
109		7.79			6.8			8.91			8.22			7.05		
110	110 + 115	3.13	C		3.44	C		2.71	C		2.03	C		3.33	C	
111		0.099	K	J-EMPC	0.172			0.205	K	J-EMPC	0.123			0.137	K	J-EMPC
112		0.059	U		0.0565	U		0.0496	U		0.0752	U		0.049	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90	
114		2.92			3.2			3.69			3.51			3.9		
115	110 + 115		C110			C110			C110			C110			C110	

Table 3
PCB Congener Qualifer Summary- Crayfish
Lab Sample ID's L11512-6 and L113380-19 through L11380-24
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26606

IUPAC #	COELUTING CONGENERS[1]	08021838/42CF L11512-6	Lab Qualifier	URS Review Qualifier	08022233CF L11380-19	Lab Qualifier	URS Review Qualifier	08030372CF L11380-22	Lab Qualifier	URS Review Qualifier	08030373CF L11380-23	Lab Qualifier	URS Review Qualifier	08030374CF L11380-24	Lab Qualifier	URS Review Qualifier
116	85 + 116 + 117		C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85	
118		107			95.3			95.8			111			138		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
120		0.585			0.669			0.737			0.704			0.865		
121		0.0588	U		0.0583	U		0.0496	U		0.0775	U		0.049	U	
122		0.324	U		0.221	U		0.209	U		0.29	U		0.299	U	
123		2.45			2.71			2.47			3.07			3.76		
124	107 + 124		C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
126		0.377			0.273	U		0.45			0.455			0.376	U	
127		0.307	U		0.221	U		0.209	U		0.29	U		0.299	U	
128	128 + 166	1.58	C		1.84	C		1.46	C		1.46	C		2.7	C	
129	129 + 138 + 160 + 163	58	C		51	C		59.5	C		62.7	C		61.4	C	
130		3.3			1.8			2.94			3.43			2.66		
131		0.13	U		0.0961	U		0.124	U		0.137	U		0.0754	U	
132		1.08			1.18			0.919			0.957			1.08		
133		1.69			1.33			1.99			1.85			1.21		
134	134 + 143	0.488	C		0.277	C K	J-EMPC	0.229	C		0.438	C		0.312	C	
135	135 + 151 + 154	4.01	C		2.61	C		2.8	C		3.23	C		2.78	C	
136		0.454			0.403	K	J-EMPC	0.435			0.401			0.425		
137		4.02			5.15			5.78			5.84			5.1		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
139	139 + 140	0.361	C		0.262	C K	J-EMPC	0.158	C		0.258	C		0.339	C	
140	139 + 140		C139			C139			C139			C139			C139	
141		0.13	U		1.33			1			0.132	U		0.0731	U	
142		0.131	U		0.1	U		0.13	U		0.142	U		0.0786	U	
143	134 + 143		C134			C134			C134			C134			C134	
144		0.374			0.259			0.141	K	J-EMPC	0.201	K	J-EMPC	0.261	K	J-EMPC
145		0.05	U		0.0497	U		0.0496	U		0.0598	U		0.049	U	
146		22.7			23.5			27.9			25.2			21.6		
147	147 + 149	5.57	C		5.76	C		4.56	C		4.97	C		6.85	C	
148		0.05	U		0.0594	U		0.0496	U		0.0764	U		0.0511	U	
149	147 + 149		C147			C147			C147			C147			C147	
150		0.05	U		0.0497	U		0.0496	U		0.0574	U		0.049	U	
151	135 + 151 + 154		C135			C135			C135			C135			C135	
152		0.05	U		0.0497	U		0.0496	U		0.0547	U		0.049	U	
153	153 + 168	113	C		115	C		115	C		142	C		174	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135	
155		0.05	U		0.0497	U		0.055	K	J-EMPC	0.063	K	J-EMPC	0.057	K	J-EMPC
156	156 + 157	12.7	C		14.7	C		17.3	C		16.9	C		18.8	C	
157	156 + 157		C156			C156			C156			C156			C156	
158		1.52			1.16			0.855			0.957			1.88		
159		0.1	U		0.077			0.0966	U		0.106	U		0.0586	U	
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
161		0.0936	U		0.0693	U		0.0898	U		0.0985	U		0.0544	U	
162		0.47			0.572			0.847			0.642	K	J-EMPC	0.522	K	J-EMPC
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
164		0.514			0.308			0.24			0.0989	U		0.357		
165		0.108	U		0.085			0.102	U		0.118	K	J-EMPC	0.067	K	J-EMPC
166	128 + 166		C128			C128			C128			C128			C128	
167		8.88			9.44			10.6			10.6			13.6		
168	153 + 168		C153			C153			C153			C153			C153	
169		0.126	U		0.158	U		0.0992	U		0.154	U		0.103	U	
170		7.25			7.41			12.6			13.2			7.82		
171	171 + 173	1.59	C		1.06	C		0.879	C		1.33	C		1.32	C	
172		1.06			0.75			1.3	K	J-EMPC	1.17			0.535		
173	171 + 173		C171			C171			C171			C171			C171	
174		1.53			0.943			1.26			1.04			0.802		
175		0.372			0.254	K	J-EMPC	0.391			0.493			0.316		
176		0.265			0.227			0.172	K	J-EMPC	0.233			0.324		
177		10			5.32			8.23			10.9			7.16		
178		4.64			2.18			3.61			4.15			2.71		
179		0.916			0.681			0.504	K	J-EMPC	0.474			0.75		
180	180 + 193	47.6	C		52.3	C		59.1	C		61.3	C		55.5	C	
181		0.247			0.325			0.393	K	J-EMPC	0.343			0.324		
182		0.0571	U		0.242			0.0496	U		0.0718	U		0.049	U	
183	183 + 185	7.37	C		5.09	C		6.19	C		7.93	C		7.07	C	
184		0.05	U		0.0497	U		0.0496	U		0.0541	U		0.049	U	
185	183 + 185		C183			C183			C183			C183			C183	
186		0.05	U		0.0497	U		0.0496	U		0.0585	U		0.049	U	
187		69.8			65.6			75.8			69.5			55.2		
188		0.197			0.159			0.147			0.275			0.214		
189		0.767			0.956			1.33			1.19			1.04		
190		4.95			3.57			5.05			5.69			5		
191		0.651			0.74			0.75			0.639			0.727		
192		0.0565	U		0.0509	U		0.0496	U		0.0726	U		0.049	U	
193	180 + 193		C180			C180			C180			C180			C180	
194		3.38			3.76			6.01			5.36			3.88		
195		2.28			2.33			3.41			3.75			3.38		
196		2.42			2.87			3.28			3.72			3.42		
197	197 + 200	0.421	C K	J-EMPC	0.36	C		0.395	C		0.359	C		0.521	C	
198	198 + 199	7.41	C		6.53	C		8.55	C		8.71	C		5.1	C	
199	198 + 199		C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197	
201		1.56			1.23			1.45			1.74			1.5		
202		2.45			0.948			1.31			1.88			1.84		
203		5.5			2.7			4.17			5.11			5.08		
204		0.05	U		0.0497	U		0.0496	U		0.0494	U		0.049	U	
205		0.322			0.238			0.335			0.3			0.287		
206		2.25			1.62			2.11			2.18			1.63		
207		0.606			0.787			0.787			0.789	K	J-EMPC	0.772	K	J-EMPC
208		1.34			0.999			1.24			1.18			0.799		
209		2.07			2.6			2.48			2.46			2.43		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL.
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the analyte-specific reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 3
PCB Congener Qualifer Summary- Crayfish
Lab Sample ID's L113380-25 through L11380-29
Bradford Island - Remedial Investigation
Sample Delivery Group WG26606

IUPAC #	COELUTING CONGENERS[1]	08030375CF L11380-25	Lab Qualifier	URS Review Qualifier	08030376CF L11380-26	Lab Qualifier	URS Review Qualifier	08030378CF L11380-27	Lab Qualifier	URS Review Qualifier	08030379CF L11380-28	Lab Qualifier	URS Review Qualifier	08030382CF L11380-29	Lab Qualifier	URS Review Qualifier
1		0.1		U	0.152		U	0.228		U	0.238		U	0.127		U
2		0.457	K	J-EMPC	0.268			0.235	K	J-EMPC	0.324			0.13		
3		0.122	K	J-EMPC	0.114			0.204			0.185			0.166	K	J-EMPC
4		0.648	U		0.32			0.627			0.544			0.337		
5		0.531	U		0.249	U		0.197	U		0.26	U		0.215	U	
6		0.465	U		0.221	U		0.324			0.273			0.191	U	
7		0.467	U		0.227	U		0.179	U		0.237	U		0.195	U	
8		0.417	U		0.639			1.05			0.937			0.433		
9		0.466	U		0.22	U		0.174	U		0.229	U		0.189	U	
10		0.462	U		0.22	U		0.174	U		0.23	U		0.19	U	
11		50.5			40.5			42.9			71.1			60		
12	12 + 13	0.509	C U		0.245	C U		0.194	C U		0.256	C U		0.212	C U	
13	12 + 13		C12			C12			C12			C12			C12	
14		0.483	U		0.23	U		0.182	U		0.24	U		0.199	U	
15		0.721	U		0.782			0.898			1.41			1.35		
16		0.523			0.249			0.365			0.349			0.414		
17		0.407			0.376			0.516			0.524			0.367		
18	18 + 30	1.29	C	U	0.836	C	U	1.3	C	U	1.49	C	U	1.29	C	U
19		0.0991	U		0.078	K	J-EMPC	0.15			0.138	K	J-EMPC	0.098		
20	20 + 28	2.43	C		1.32	C	U	1.93	C	U	2.59	C		4.47	C	
21	21 + 33	0.405	C	U	0.38	C K	U	0.622	C	U	0.671	C	U	0.554	C K	U
22		0.604			0.285			0.467			0.369			0.413	K	J-EMPC
23		0.0882	U		0.057	U		0.0536	U		0.0721	U		0.0675	U	
24		0.0782	U		0.055	U		0.0498	U		0.0529	U		0.0497	U	
25		0.0772	U		0.075			0.106	K	J-EMPC	0.101			0.0568	U	
26	26 + 29	0.274	C K	J-EMPC	0.228	C		0.311	C		0.5	C		0.355	C	
27		0.087	K	J-EMPC	0.0511	U		0.066			0.076	K	J-EMPC	0.094	K	J-EMPC
28	20 + 28		C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18	
31		0.874		U	0.725		U	1.3		U	1.18		U	1.29		U
32		0.137		U	0.205		U	0.324		U	0.203		U	0.16		U
33	21 + 33		C21			C21			C21			C21			C21	
34		0.0897	U		0.055	U		0.0516	U		0.0695	U		0.0651	U	
35		0.251			0.281	K	J-EMPC	0.431			0.854			0.152	K	J-EMPC
36		0.0913	U		0.074	K	J-EMPC	0.0539	U		0.491			0.0679	U	
37		2.68			1.33			1.96			3.13			4.2		
38		0.0859	U		0.0557	U		0.0523	U		0.0704	U		0.0658	U	
39		0.0951	U		0.0575	U		0.054	U		0.0728	U		0.0681	U	
40	40 + 41 + 71	0.505	C	U	0.441	C	U	0.552	C K	U	0.536	C	U	0.657	C	U
41	40 + 41 + 71		C40			C40			C40			C40			C40	
42		0.794			0.267			0.348	K	J-EMPC	0.342			0.762		
43		0.139	U		0.077	U		0.064	U		0.0859	U		0.0871	U	
44	44 + 47 + 65	3.92	C		1.43	C	U	1.68	C	U	2.42	C		4.31	C	
45	45 + 51	0.243	C		0.181	C		0.287	C		0.227	C K	J-EMPC	0.262	C K	J-EMPC
46		0.13	U		0.0776	U		0.071			0.0866	U		0.0877	U	
47	44 + 47 + 65		C44			C44			C44			C44			C44	
48		0.339			0.189	K	J-EMPC	0.271			0.267			0.394	K	J-EMPC
49	49 + 69	1.06	C	U	0.535	C K	U	0.658	C	U	0.872	C	U	1.14	C	U
50	50 + 53	0.281	C K	J-EMPC	0.132	C K	J-EMPC	0.146	C K	J-EMPC	0.198	C		0.271	C	
51	45 + 51		C45			C45			C45			C45			C45	
52		2.23	K	U	1.39		U	1.79		U	2.31		U	3.57		
53	50 + 53		C50			C50			C50			C50			C50	
54		0.0745	U		0.0497	U		0.0498	U		0.0529	U		0.0497	U	
55		0.168	U		0.115	U		0.0898	U		0.141	U		0.16	U	
56		0.543	K	J-EMPC	0.266			0.405			0.428			0.501		
57		0.158	U		0.106	U		0.0828	U		0.13	U		0.147	U	
58		0.162	U		0.107	U		0.0837	U		0.132	U		0.149	U	
59	59 + 62 + 75	0.189	C		0.104	C		0.096	C		0.135	C		0.183	C	
60		1.18	K	J-EMPC	0.324			0.468	K	J-EMPC	0.764			2.63		
61	61 + 70 + 74 + 76	12.3	C		4.04	C		5.99	C		9.99	C		26.6	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59	
63		1.19			0.811			0.752			1.49			2.13		
64		0.678	K	J-EMPC	0.358			0.467			0.596			0.671		
65	44 + 47 + 65		C44			C44			C44			C44			C44	
66		12.9			3.81			5.43			9.4			27.9		
67		0.142	U		0.0909	U		0.071	U		0.151			0.203		
68		0.352			0.215			0.232			0.524			0.745		
69	49 + 69		C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40	
72		0.154	U		0.101	U		0.0787	U		0.124	U		0.191		
73		0.0841	U		0.0545	U		0.0498	U		0.0609	U		0.0617	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
77		2.57			1.87			2.09			3.49			4.66		
78		0.164	U		0.115	U		0.0897	U		0.141	U		0.159	U	
79		0.246	K	J-EMPC	0.0941	U		0.114	K	J-EMPC	0.264			0.434		
80		0.142	U		0.103	U		0.0805	U		0.126	U		0.143	U	
81		0.194	U		0.127	U		0.104	U		0.162	U		0.25	K	J-EMPC
82		1.31	U		0.0854	U		0.187			0.153	K	J-EMPC	0.212		
83	83 + 99	16.2	C		4.44	C		5.29	C		10.6	C		41.2	C	
84		1.3	U		0.373			0.365			0.47			0.6		
85	85 + 116 + 117	3.51	C		2.47	C		2.44	C		4.25	C		7.65	C	
86	86 + 87 + 97 + 108 + 119 + 125	6.42	C		1.63	C		1.61	C		3.53	C		10.2	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
88	88 + 91	1.16	C U		0.26	C		0.263	C		0.404	C		0.657	C	
89		1.22	U		0.0791	U		0.0653	U		0.0734	U		0.0927	U	
90	90 + 101 + 113	9	C		3.68	C		3.55	C		7.01	C		17.1	C	
91	88 + 91		C88			C88			C88			C88			C88	
92		1.19	U		0.546			0.515			1.39			2.4		
93	93 + 95 + 98 + 100 + 102	5.36	C		1.86	C	U	1.88	C	U	3.47	C		6.93	C	
94		1.25	U		0.0807	U		0.0666	U		0.0749	U		0.0947	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
96		0.344	U		0.0497	U		0.0498	U		0.0496	U		0.0497	U	
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
103		1.04	U		0.0654	U		0.054	U		0.0607	U		0.0767	U	
104		0.339	U		0.0497	U		0.0498	U		0.0496	U		0.0497	U	
105		10.6			3.01			3.34			7.99			24.8		
106		1.42	U		0.171	U		0.188	U		0.281	U		0.514	U	
107	107 + 124	1.49	C U		0.265	C K	J-EMPC	0.217	C K	J-EMPC	0.665	C		1.67	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
109		9.24			5.65			5.37			9.59			16.7		
110	110 + 115	5.47	C		2.11	C		2.04	C		3.44	C		4.76	C	
111		0.916	U		0.066	K	J-EMPC	0.093	K	J-EMPC	0.189	K	J-EMPC	0.266	K	J-EMPC
112		0.904	U		0.0561	U		0.0498	U		0.052	U		0.0657	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90	
114		3.64			2.52			2.36			3.56			8.15		
115	110 + 115		C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85	

Table 3
PCB Congener Qualifer Summary- Crayfish
Lab Sample ID's L113380-25 through L11380-29
Bradford Island - Remedial Investigation
Sample Delivery Group WG26606

IUPAC #	COELUTING CONGENERS[1]	08030375CF L11380-25	Lab Qualifier	URS Review Qualifier	08030376CF L11380-26	Lab Qualifier	URS Review Qualifier	08030378CF L11380-27	Lab Qualifier	URS Review Qualifier	08030379CF L11380-28	Lab Qualifier	URS Review Qualifier	08030382CF L11380-29	Lab Qualifier	URS Review Qualifier
117	85 + 116 + 117		C85			C85			C85			C85			C85	
118		157			63.6			69.7			122			323		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
120		0.866	U		0.517	K	J-EMPC	0.438	K	J-EMPC	0.769	K	J-EMPC	1.41		
121		0.901	U		0.0578	U		0.0498	U		0.0536	U		0.0677	U	
122		1.64	U		0.217			0.212	U		0.316	U		0.578	U	
123		3.72			1.96			2.05			3.26			7.36		
124	107 + 124		C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
126		1.96	U		0.231	U		0.267	U		0.53			0.792	U	
127		1.56	U		0.192	U		0.212	U		0.315	U		0.587	K	J-EMPC
128	128 + 166	2.94	C		1.19	C		0.835	C		2.66	C		3.35	C	
129	129 + 138 + 160 + 163	78.4	C		37.8	C		38.9	C		74.5	C		167	C	
130		3			1.58			2.07			4.19			8.8		
131		0.2	U		0.0938	U		0.1	U		0.117	U		0.168	U	
132		1.88			0.655			0.763			0.965	K	J-EMPC	2.19		
133		1.92			0.878			1.14			2.11			3.55		
134	134 + 143	0.674	C		0.183	C K	J-EMPC	0.18	C		0.443	C		0.58	C	
135	135 + 151 + 154	5.26	C		1.67	C		2.13	C		4.33	C		8.38	C	
136		0.679			0.34			0.435	K	J-EMPC	0.597			0.701		
137		7			3.8			4.02			6.47			14.5		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
139	139 + 140	0.354	C		0.105	C		0.214	C		0.277	C K	J-EMPC	0.653	C	
140	139 + 140		C139			C139			C139			C139			C139	
141		0.199	U		0.0909	U		0.0973	U		0.113	U		0.163	U	
142		0.201	U		0.0977	U		0.105	U		0.122	U		0.175	U	
143	134 + 143		C134			C134			C134			C134			C134	
144		0.343			0.131	K	J-EMPC	0.137			0.284	K	J-EMPC	0.994		
145		0.0591	U		0.0497	U		0.0498	U		0.0496	U		0.0497	U	
146		29.4			16.5			17.2			31.9			66		
147	147 + 149	10.1	C		3.54	C		3.72	C		6.69	C		15.9	C	
148		0.0736	U		0.0521	U		0.0498	U		0.0579	U		0.055	U	
149	147 + 149		C147			C147			C147			C147			C147	
150		0.0559	U		0.0497	U		0.0498	U		0.0496	U		0.0497	U	
151	135 + 151 + 154		C135			C135			C135			C135			C135	
152		0.0531	U		0.0497	U		0.0498	U		0.0496	U		0.0497	U	
153	153 + 168	199	C		83.2	C		90.6	C		155	C		472	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135	
155		0.0524	U		0.0497	U		0.0498	U		0.056	K	J-EMPC	0.084	K	J-EMPC
156	156 + 157	22.2	C		12.3	C		13	C		18.8	C		39.1	C	
157	156 + 157		C156			C156			C156			C156			C156	
158		2.25			0.41			0.537			1.58			3.55		
159		0.154	U		0.0729	U		0.087			0.133	K	J-EMPC	0.172	K	J-EMPC
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
161		0.144	U		0.0677	U		0.0725	U		0.0844	U		0.122	U	
162		0.679			0.54	K	J-EMPC	0.478			0.851	K	J-EMPC	1.48		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
164		0.345	K	J-EMPC	0.264	K	J-EMPC	0.0728	U		0.525			1.17	K	J-EMPC
165		0.175			0.0771	U		0.0825	U		0.141	K	J-EMPC	0.138	U	
166	128 + 166		C128			C128			C128			C128			C128	
167		16.7			8.46			8.16			11.2			30.1		
168	153 + 168		C153			C153			C153			C153			C153	
169		0.171	U		0.105	U		0.0911	U		0.114	U		0.2	U	
170		7.37			6.92			6.83			14.5			22		
171	171 + 173	2	C		0.56	C K	J-EMPC	1.02	C		1.5	C		2.96	C	
172		0.414			0.551			0.632			1.42			2.5		
173	171 + 173		C171			C171			C171			C171			C171	
174		0.888			0.87			0.777			1.69			2.36		
175		0.476			0.206			0.26			0.497			0.99		
176		0.526			0.108	K	J-EMPC	0.158			0.309			0.577		
177		9.14			4.52			6.63			11.1			19.9		
178		5.19			1.45			2.81			4.35			8.53		
179		1.48			0.478	K	J-EMPC	0.387			1.05			0.97		
180	180 + 193	74.1	C		39.2	C		41.9	C		70.1	C		145	C	
181		0.381	K	J-EMPC	0.267			0.303			0.457			0.789	K	J-EMPC
182		0.0807	U		0.067	U		0.0498	U		0.0563	U		0.0725	U	
183	183 + 185	9	C		3.55	C		4.61	C		8.46	C		22.7	C	
184		0.0591	U		0.0505	U		0.0498	U		0.0496	U		0.0546	U	
185	183 + 185		C183			C183			C183			C183			C183	
186		0.0658	U		0.0546	U		0.0498	U		0.0496	U		0.0591	U	
187		87.9			47.6			47.4			85.3			167		
188		0.238			0.163			0.132			0.189			0.268		
189		1.25			0.851			0.907			1.31			2.2		
190		5.95			3.09			3.11			7.28			12.9		
191		0.997			0.304			0.452			0.996			2.02		
192		0.0798	U		0.0678	U		0.0498	U		0.0569	U		0.0734	U	
193	180 + 193		C180			C180			C180			C180			C180	
194		3.73			3.47			2.9			6.15			9.42		
195		2.76			1.97			2.28			3.87			5.8		
196		3.07			2.06			2.31			4.18			6.28		
197	197 + 200	0.565	C		0.14	C		0.296	C		0.479	C		0.713	C	
198	198 + 199	6.56	C		3.64	C		4.93	C		9.03	C		14.9	C	
199	198 + 199		C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197	
201		1.83			0.856			1.26			1.84			2.85		
202		2.76			0.635			1.27			1.98			2.91		
203		4.41			2.46			2.7			8.67			11.8		
204		0.057	U		0.0511	U		0.0498	U		0.0496	U		0.0514	U	
205		0.286			0.156			0.207	K	J-EMPC	0.378			0.71		
206		1.31			1.06			1.14			2.76			3.22		
207		0.76			0.414			0.599			0.766			1.27		
208		0.735			0.506			0.669			1.23			1.4		
209		1.82			1.68			2			2.5			2.95		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL.
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the analyte-specific reporting limit.

1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 3
PCB Congener Qualifer Summary - Crayfish
Lab Sample ID's L113380-30 through L11380-35
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26606

IUPAC #	COELUTING CONGENERS[1]	08031290CF L11380-30	Lab Qualifier	URS Review Qualifier	08031291CF L11380-31	Lab Qualifier	URS Review Qualifier	08031292CF L11380-32	Lab Qualifier	URS Review Qualifier	08031294CF L11380-33	Lab Qualifier	URS Review Qualifier	08031298CF L11380-34	Lab Qualifier	URS Review Qualifier	080312100CF L11380-35	Lab Qualifier	URS Review Qualifier
1		0.097		U	0.132		U	0.341		U	0.162		U	0.145		U	0.135		U
2		0.079			0.13			0.327	K	J-EMPC	1.14			0.171			0.492		
3		0.106			0.176	K	J-EMPC	0.936			0.238			0.166			0.191		
4		0.262	U		0.297			0.61	U		0.41			0.28			0.369		
5		0.251	U		0.113	U		0.415	U		0.165	U		0.119	U		0.123	U	
6		0.223	U		0.104	U		0.383	U		0.164	K	J-EMPC	0.11	U		0.152	K	J-EMPC
7		0.228	U		0.106	U		0.39	U		0.188			0.112	U		0.122		
8		0.38			0.418			0.892	K	J-EMPC	0.718			0.414			0.586		
9		0.221	U		0.101	U		0.369	U		0.147	U		0.106	U		0.109	U	
10		0.222	U		0.1	U		0.369	U		0.147	U		0.105	U		0.109	U	
11		25.9			51			37.3			61.9			28.1			58		
12	12 + 13	0.247	C U		0.119	C U		0.436	C U		0.174	C U		0.125	C U		0.129	C U	
13	12 + 13		C12			C12			C12			C12			C12			C12	
14		0.232	U		0.11	U		0.403	U		0.16	U		0.115	U		0.119	U	
15		0.527			1.21			1	K	J-EMPC	1			0.932			1.24		
16		0.263			0.32			0.326	U		0.323			0.214			0.407		
17		0.357			0.332			0.463	K	J-EMPC	0.424			0.202			0.452		
18	18 + 30	0.767	C	U	1.34	C	U	0.854	C K	U	1.02	C	U	0.611	C K	U	1.31	C	U
19		0.076			0.0696	U		0.269	U		0.101			0.117	K	J-EMPC	0.117	K	J-EMPC
20	20 + 28	2.65	C		2.75	C		1.68	C	U	1.79	C	U	1.15	C	U	2.6	C	
21	21 + 33	0.433	C	U	0.336	C	U	0.582	C	U	0.552	C	U	0.311	C	U	0.439	C	U
22		0.384			0.328			0.43			0.431			0.286			0.433		
23		0.057	U		0.0644	U		0.215	U		0.0928	U		0.0604	U		0.0513	U	
24		0.05	U		0.0517	U		0.201	U		0.067	U		0.0577	U		0.0496	U	
25		0.071			0.066			0.187	U		0.119			0.065			0.1		
26	26 + 29	0.195	C		0.252	C		0.263	C		0.303	C K	J-EMPC	0.193	C		0.375	C	
27		0.0498	U		0.069			0.189	U		0.0652	U		0.0542	U		0.066		
28	20 + 28		C20			C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18			C18	
31		0.833		U	0.866		U	1.03	K	U	1.06		U	0.553		U	0.911		U
32		0.177		U	0.12	K	U	0.255	K	U	0.251	K	U	0.099		U	0.221		U
33	21 + 33		C21			C21			C21			C21			C21			C21	
34		0.0549	U		0.0633	U		0.212	U		0.0912	U		0.0594	U		0.0505	U	
35		0.0647	U		0.186			0.249	U		0.65			0.171			0.389		
36		0.0573	U		0.0635	U		0.212	U		0.231			0.0596	U		0.112	K	J-EMPC
37		1.96			4.04			1.6			2.06			2.18			3.58		
38		0.0556	U		0.0633	U		0.212	U		0.0912	U		0.0594	U		0.0504	U	
39		0.0575	U		0.0653	U		0.218	U		0.0941	U		0.0613	U		0.052	U	
40	40 + 41 + 71	0.59	C	U	0.411	C	U	0.672	C	U	0.419	C	U	0.269	C K	U	0.522	C K	U
41	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
42		0.608			0.841			0.286	U		0.31	K	J-EMPC	0.248			0.67		
43		0.0837	U		0.0782	U		0.303	U		0.102	U		0.0911	U		0.0799	U	
44	44 + 47 + 65	2.24	C	U	4.11	C		1.59	C	U	1.72	C	U	1.32	C	U	2.84	C	
45	45 + 51	0.234	C K	J-EMPC	0.157	C K	J-EMPC	0.263	C U		0.21	C K	J-EMPC	0.0792	C U		0.225	C	
46		0.0843	U		0.0789	U		0.305	U		0.103	U		0.0919	U		0.0806	U	
47	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
48		0.301			0.272	K	J-EMPC	0.303			0.214			0.15			0.27		
49	49 + 69	0.852	C	U	0.738	C	U	0.866	C	U	0.659	C	U	0.475	C	U	0.759	C	U
50	50 + 53	0.171	C		0.227	C		0.255	C U		0.185	C		0.0768	C U		0.205	C	
51	45 + 51		C45			C45			C45			C45			C45			C45	
52		1.87		U	2.06		U	2.15	K	U	1.45		U	1.18		U	2.07		U
53	50 + 53		C50			C50			C50			C50			C50			C50	
54		0.0498	U		0.0492	U		0.188	U		0.0742	U		0.076			0.0496	U	
55		0.166	U		0.167	U		0.36	U		0.145	U		0.0796	U		0.146	U	
56		0.36			0.436			0.349	U		0.3	K	J-EMPC	0.294			0.347		
57		0.153	U		0.153	U		0.328	U		0.132	U		0.0725	U		0.133	U	
58		0.155	U		0.15	U		0.323	U		0.13	U		0.0712	U		0.131	U	
59	59 + 62 + 75	0.169	C K	J-EMPC	0.166	C		0.205	C U		0.069	C		0.0618	C U		0.134	C K	J-EMPC
60		1.47			1.55			0.425	K	J-EMPC	0.383	K	J-EMPC	0.404			0.977		
61	61 + 70 + 74 + 76	10.6	C		17.6	C		4.9	C		5.52	C		5.15	C		13.2	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
63		0.626			1.34			0.762	K	J-EMPC	0.887	K	J-EMPC	1.02			1.42		
64		0.566	K	J-EMPC	0.429			0.5	K	J-EMPC	0.42			0.355			0.462	K	J-EMPC
65	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
66		14.4			16.5			3.39			5.75			5.65			14		
67		0.131	U		0.201	K	J-EMPC	0.288	U		0.116	U		0.0636	U		0.117	U	
68		0.327	K	J-EMPC	0.403			0.313	U		0.316			0.252	K	J-EMPC	0.423	K	J-EMPC
69	49 + 69		C49			C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
72		0.145	U		0.143	U		0.309	U		0.124	U		0.0681	U		0.125	U	
73		0.0592	U		0.055	U		0.213	U		0.0714	U		0.0641	U		0.0562	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
77		1.87			3.8			1.9			2.74			2.28			4.02		
78		0.166	U		0.164	U		0.353	U		0.142	U		0.078	U		0.143	U	
79		0.176	K	J-EMPC	0.387			0.296	U		0.119	U		0.118	K	J-EMPC	0.379		
80		0.149	U		0.143	U		0.307	U		0.124	U		0.0678	U		0.124	U	
81		0.204	U		0.188	U		0.401	U		0.151	U		0.146	K	J-EMPC	0.193	K	J-EMPC
82		0.0887	U		0.17	K	J-EMPC	0.362	U		0.135	K	J-EMPC	0.137			0.15		
83	83 + 99	24.3	C		20.3	C		3.59	C		5.65	C		5.64	C		16.4	C	
84		0.432			0.396			0.545	K	J-EMPC	0.375			0.208			0.491		
85	85 + 116 + 117	2.14	C		4.15	C		2.28	C		2.21	C		2.34	C		3.93	C	
86	86 + 87 + 97 + 108 + 119 + 125	3.29	C		6.91	C		1.7	C		1.52	C		1.69	C		4.78	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
88	88 + 91	0.527	C		0.699	C K	J-EMPC	0.383	C K	J-EMPC	0.287	C		0.243	C		0.439	C	
89		0.0822	U		0.0955	U		0.333	U		0.0861	U		0.0579	U		0.0594	U	
90	90 + 101 + 113	5.3	C		9.27	C		3.57	C		3.67	C		3.28	C		6.61	C	
91	88 + 91		C88			C88			C88			C88			C88			C88	
92		0.693	K	J-EMPC	1.25			0.475			0.548			0.504			0.951		
93	93 + 95 + 98 + 100 + 102	2.75	C		5.56	C		2.78	C		1.78	C	U	1.71	C K	U	3.65	C	
94		0.0839	U		0.0971	U		0.339	U		0.0875	U		0.0588	U		0.0604	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
96		0.0498	U		0.0492	U		0.172	U		0.0652	U		0.0496	U		0.0496	U	
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
103		0.068	U		0.0797	U		0.278	U		0.0718	U		0.0495	U		0.0496	U	
104		0.0498	U		0.0492	U		0.184	U		0.0744	U		0.068	K	J-EMPC	0.0496	U	
105		15.5			14.3			2.25			4			4.33			11.8		
106		0.237	U		0.0985	U		0.24	U		0.152	U		0.0804	U		0.0962	U	
107	107 + 124	0.264	C		0.945	C		0.254	C U		0.208	C K	J-EMPC	0.271	C		0.674	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
109		5.82			10			5.65			6.22			5.98			10		
110	110 + 115	3.4	C		3.36	C		1.88	C K	J-EMPC	1.9	C		1.93	C		2.86	C	
111		0.0607	U		0.221			0.248	U		0.095	K	J-EMPC	0.132	K	J-EMPC	0.178	K	J-EMPC
112		0.0582	U		0.0687	U		0.24	U		0.0652	U		0.0495	U		0.0496	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
114		4.71			4.17			2.86			3.02			3.47			4.58		
115	110 + 115		C110			C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
118		264			163			69.7			112			101			149		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
120		1.1			0.97			0.5	K	J-EMPC	0.584			0.685			0.891	K	J-EMPC
121		0.06	U		0.0706	U		0.246	U		0.0652	U		0.0495	U		0.0496	U	
122		0.267	U		0.109	U		0.264	U		0.167	U		0.0885	U		0.106	U	
123		6.45			3.72			2.26			2.91			3			4.17		
124	107 + 124		C107			C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	

Table 3
PCB Congener Qualifer Summary - Crayfish
Lab Sample ID's L113380-30 through L11380-35
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26606

IUPAC #	COELUTING CONGENERS[1]	08031290CF L11380-30	Lab Qualifier	URS Review Qualifier	08031291CF L11380-31	Lab Qualifier	URS Review Qualifier	08031292CF L11380-32	Lab Qualifier	URS Review Qualifier	08031294CF L11380-33	Lab Qualifier	URS Review Qualifier	08031298CF L11380-34	Lab Qualifier	URS Review Qualifier	080312100CF L11380-35	Lab Qualifier	URS Review Qualifier
126		0.329	U		0.402			0.275	U		0.243	K	J-EMPC	0.261	K	J-EMPC	0.481		
127		0.267	U		0.107	U		0.261	U		0.165	U		0.0875	U		0.105	U	
128	128 + 166	2.56	C		2.85	C		1.18	C		1.33	C		1.3	C		2.55	C	
129	129 + 138 + 160 + 163	67.9	C		91.9	C		37.3	C		40.1	C		44.3	C		82.1	C	
130		2.09	K	J-EMPC	4.86			1.09			1.45			1.74			3.5		
131		0.0908	U		0.159	K	J-EMPC	0.368	U		0.174	U		0.0844	U		0.136	K	J-EMPC
132		1.16			2.32			0.558			0.534			0.584			1.07		
133		0.786			2.12			1.01			1.17			0.994			2.3		
134	134 + 143	0.355	C K	J-EMPC	0.358	C		0.354	C U		0.176	C K	J-EMPC	0.229	C K	J-EMPC	0.271	C K	J-EMPC
135	135 + 151 + 154	2.25	C		5.58	C		1.47	C		1.69	C		1.73	C		4.5	C	
136		0.476			0.545			0.394			0.391			0.38			0.659		
137		8.45			5.64			4.2			3.77			4.24			5.77		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
139	139 + 140	0.296	C K	J-EMPC	0.347	C		0.314	C U		0.148	C U		0.111	C K	J-EMPC	0.321	C K	J-EMPC
140	139 + 140		C139			C139			C139			C139			C139			C139	
141		0.088	U		0.923	K	J-EMPC	0.344	U		0.597			0.322	K	J-EMPC	0.711		
142		0.0946	U		0.158	U		0.368	U		0.173	U		0.0843	U		0.124	U	
143	134 + 143		C134			C134			C134			C134			C134			C134	
144		0.205	K	J-EMPC	0.487			0.256	U		0.097			0.1	K	J-EMPC	0.366	K	J-EMPC
145		0.0498	U		0.0595	U		0.204	U		0.0652	U		0.0495	U		0.0496	U	
146		19			31			15.6			17.7			17.4			31.8		
147	147 + 149	5.17	C		12	C		2.98	C		3.12	C		3.29	C		8.45	C	
148		0.0514	U		0.0753	U		0.259	U		0.0779	U		0.0495	U		0.0496	U	
149	147 + 149		C147			C147			C147			C147			C147			C147	
150		0.0498	U		0.055	U		0.189	U		0.0652	U		0.0495	U		0.0496	U	
151	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
152		0.0498	U		0.0527	U		0.181	U		0.0652	U		0.0495	U		0.0496	U	
153	153 + 168	323	C		204	C		78.8	C		140	C		129	C		171	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
155		0.0498	U		0.098			0.21	U		0.0684	U		0.16			0.066		
156	156 + 157	29.6	C		20.4	C		15.1	C		16.7	C		20.1	C		24.4	C	
157	156 + 157		C156			C156			C156			C156			C156			C156	
158		2.29			2.14			0.249	U		0.652			0.625			1.69		
159		0.073	K	J-EMPC	0.117	U		0.272	U		0.128	U		0.0624	U		0.0914	U	
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
161		0.0655	U		0.104	U		0.242	U		0.114	U		0.0554	U		0.0812	U	
162		0.464			0.895			0.678	K	J-EMPC	0.57	K	J-EMPC	0.757			0.882		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
164		0.0658	U		0.377	K	J-EMPC	0.266	U		0.126	U		0.0611	U		0.356	K	J-EMPC
165		0.0746	U		0.135	K	J-EMPC	0.289	U		0.136	U		0.0663	U		0.0971	U	
166	128 + 166		C128			C128			C128			C128			C128			C128	
167		27.3			13.4			9.47			12.3			16.6			18		
168	153 + 168		C153			C153			C153			C153			C153			C153	
169		0.223	U		0.237	U		0.301	U		0.307	U		0.0971	U		0.325	U	
170		7.97			10.7			7.26			8.06			7.72			9.43		
171	171 + 173	2.87	C		2.6	C		0.667	C K	J-EMPC	0.817	C		0.768	C K	J-EMPC	1.89	C	
172		0.262	K	J-EMPC	0.808			0.75	K	J-EMPC	0.531			0.472			0.921	K	J-EMPC
173	171 + 173		C171			C171			C171			C171			C171			C171	
174		0.846	K	J-EMPC	0.949			0.723	K	J-EMPC	0.623			0.759			1.17		
175		0.214	K	J-EMPC	0.578	K	J-EMPC	0.281	U		0.317			0.219			0.435	K	J-EMPC
176		0.298	K	J-EMPC	0.665			0.21	U		0.174	K	J-EMPC	0.15			0.463	K	J-EMPC
177		4.96			18.2			5.45			7.3			5.6			10.3		
178		2.81			5.7			2.29	K	J-EMPC	2.64			2.36			4.95		
179		0.608			1.41			0.305	K	J-EMPC	0.463			0.556			0.882		
180	180 + 193	98.6	C		71.1	C		58.7	C		57.2	C		65.5	C		79.3	C	
181		0.409			0.389	K	J-EMPC	0.336			0.344			0.278	K	J-EMPC	0.507		
182		0.0589	U		0.086	U		0.274	U		0.0857	U		0.0549	U		0.123		
183	183 + 185	15	C		12.4	C		4.21	C		6.21	C		4.69	C		9.06	C	
184		0.0498	U		0.0621	U		0.198	U		0.0652	U		0.0495	U		0.0496	U	
185	183 + 185		C183			C183			C183			C183			C183			C183	
186		0.0498	U		0.0726	U		0.231	U		0.0723	U		0.0495	U		0.0562	U	
187		53.4			83.7			58.6			53.6			60			79.9		
188		0.234			0.204	K	J-EMPC	0.222	U		0.209			0.202	K	J-EMPC	0.297		
189		1.29			1.14	K	J-EMPC	1.31			0.936			1.32			1.65		
190		4.71			7.11			4.3			6.46			4.93			10.7		
191		1.61			0.641	K	J-EMPC	0.46			0.566	K	J-EMPC	0.483			0.857		
192		0.0596	U		0.085	U		0.271	U		0.0847	U		0.0542	U		0.0658	U	
193	180 + 193		C180			C180			C180			C180			C180			C180	
194		2.89			3.96			3.85			2.91			3.44			4.53		
195		3.45			3.94			2.32	K	J-EMPC	3.12			2.36			3.87		
196		3.85			3.26			2.55			2.37			2.27			3.43		
197	197 + 200	0.827	C		0.638	C		0.244	C U		0.284	C		0.214	C		0.448	C	
198	198 + 199	3.19	C		7.24	C		6.09	C		4.47	C		4.59	C		8.19	C	
199	198 + 199		C198			C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197			C197	
201		1.15			2.16			1.27			1.51			1.28			2.01		
202		1.42	K	J-EMPC	2.62			0.961	K	J-EMPC	1.21			1.18			2.22		
203		4.45			5.92			3.04			4.86			4.32			9.69		
204		0.0499	U		0.0661	U		0.238	U		0.0786	U		0.0495	U		0.0648	U	
205		0.139	K	J-EMPC	0.38			0.288	U		0.319	K	J-EMPC	0.242	K	J-EMPC	0.45		
206		1.07			1.83			1.28			1.63			1.35			2.54		
207		0.849			0.892			0.757	K	J-EMPC	0.666			0.499			0.813		
208		0.449	K	J-EMPC	1.06			0.701	U		0.739	K	J-EMPC	0.641			1.19		
209		1.72			2.23			2.02			2.37			1.71	K	J-EMPC	2.67		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL.
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the analyte-specific reporting limit.

1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coelutir congeners, to eliminate possible errors during congener summation.

RIVER OPERABLE UNIT REMEDIAL INVESTIGATION REPORT

QUALITY CONTROL SUMMARY REPORT FOR ANALYTICAL CHEMISTRY

CONGENER RESULTS FOR FOREBAY AND REFRENCE AREA SEDIMENT COLLECTED FROM FEBRUARY THROUGH MARCH 2008

JANUARY 2009

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1.0 Executive Summary

The overall assessment of the sediment Polychlorinated Biphenyl (PCB) results show the quality of the data is acceptable to support project objectives. The contracted laboratory provided results for all requested analyses and laboratory data reports were complete. Some data were qualified as estimated and flagged 'J' or 'J-EMPC'. Some data were qualified as not detected and flagged 'U'. Refer to Section 4.0 of this report for a listing of qualifier definitions. All data qualifiers resulting from this review have been added to both the project database and the data tables within the main body of this report.

2.0 Project Description

A total of 37 sediment samples were submitted to Axys Analytical Services Ltd. of Sidney, British Columbia, Canada (Axys) for PCB congener analysis. These samples were collected from both the forebay and reference areas during the February/March 2008 sampling event in support of the Bradford Island Bonneville Lock and Dam Project, River Operable Unit Remedial Investigation. Table 1 summarizes the identification numbers from URS and the analytical laboratory, the collection dates and the requested analyses for each sample. These samples were previously analyzed for PCB Aroclors, polynuclear aromatic hydrocarbons (PAHs), semivolatile organic compounds (SVOCs) and selected metals by Columbia Analytical Services (CAS) of Kelso, Washington. The analytical results for these analyses were presented in the *River Operable Unit Remedial Investigation Data Summary Report*, July 29, 2008 (URS 2008). This quality control summary report and attached tables only addresses the PCB congener analytical results for the 37 sediment samples. The other CAS-reported analytical results for these tissue samples and the PCB congener results reported for clam and tissue samples are addressed in a separate quality control summary reports.

3.0 Sampling and Analytical Procedures

Samples were analyzed according to the *Bradford Island Bonneville Lock and Dam Project, River Operable Unit Remedial Investigation Quality Assurance Project Plan* (QAPP) (URS 2007). The sediment samples were submitted to Columbia Analytical Services (CAS) of Kelso, Washington in discrete batches throughout the February/March 2008 sampling event. The specifics of the sample receipts are detailed in the quality control summary report attached with the original data report (URS 2008). In summary, all sediment samples arrived intact at CAS and were archived frozen prior to and following homogenization using an industrial blender. Authorization to release the remainder of the homogenized sediment samples to Axys to perform PCB congener analysis by EPA Method 1668A, *Chlorinated Biphenyl Congeners in Water, Soil, Sediment and Tissue by High Resolution Gas Chromatography/High Resolution Mass Spectrometry* was given to CAS on June 25, 2008 by URS. The Axys analytical data reports include a listing of the Axys Method 1668A modifications. The PCB congener results for the

sediment samples are reported in four Axys sample delivery groups; these are outlined in Table 1.

4.0 Data Validation

Analyses were performed in general accordance with the above-referenced method. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, chain of custody (COC), laboratory case narrative, proper sample preservation and handling procedures, holding times, initial and continuing calibrations, reporting limits, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. As appropriate for the analytical method, the following items were reviewed for 20% or greater of the data: primary and secondary column verification, instrument calibration and a verification of the reported electronic data with the hard copy deliverable.

The data review process for this investigation followed the QAPP. Additionally, because the QAPP-referenced *Department of Defense Quality Systems Manual* (DOD 2006) does not discuss PCB congeners, the data review process utilized guidance from EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review (*USEPA 2005a) and *EPA Region 10 Standard Operating Procedure (SOP) for the Validation of Method 1668 Toxic, Dioxin-like, PCB Data* (USEPA 1995) as appropriate for the method performed. In the case of disagreement between the documents listed as guidance and the analytical method, method criteria were utilized for data review. Project-specific QC criteria are listed in the above mentioned QAPP.

A summary of qualifiers assigned to results during this review is provided in Table 2. Samples are listed by their URS sample identification number assigned in the field as well as the laboratory identification number. All qualifiers are included in the database, the data tables, and the main body of this report. Congeners are reported using sample-specific detection limits. Qualifiers that may be assigned to analytical results because of this investigation as part of this QA/QC review include the following:

- U - The analyte was analyzed for but was not detected above the reported sample reporting limit.

- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

- J-EMPC – The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration of the analyte in the sample - used only for PCB congener results.

- UJ - The analyte was not detected above the reported sample reporting limit. However, the reported reporting limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

- DNR - Do Not Report. Another value is available that is more reliable or appropriate.

4.1 Chain-of-Custody, Sample Preservation and Holding Time

As stated above in Section 3.0, all sediment samples arrived intact at CAS and were archived frozen prior to and following homogenization using an industrial blender. As reported previously, the COC forms indicate that samples were maintained under proper chain-of-custody and forms were signed upon release and receipt. All coolers were submitted at temperatures within the EPA-recommended temperature of 6 degrees Celsius (°C) or below. Representativeness was maintained during the sampling effort by completing all sampling using similar sampling procedures and in accordance with an approved QAPP.

The COC forms from CAS to Axys indicate that samples were maintained under chain of custody and forms were signed upon release and receipt. All samples listed on the COC forms were present. The collection date was omitted from the jars for samples L11366-13 and L11366-19; they were logged in according to the date listed on the COC. All sediment samples were received by Axys at 12-13°C. Samples were frozen prior to shipment and packaged on dry ice per Method 1668A. Samples were shipped on June 30th, 2008. Due to complications at customs the samples were received on July 3rd, 2008 by Axys, two days beyond the expected date of arrival. The samples were immediately frozen upon receipt by Axys. PCBs are known for long term stability (USEPA 2005b). Therefore, the sample results were not qualified based on the elevation in temperature during shipment.

All samples were analyzed within the technical and contracted holding times.

4.2 Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and standard compounds as required by the Method 1668A. Initial calibration (ICAL), and continuing calibration (CCV)

standards were analyzed at the proper frequency and at appropriate concentrations as required by EPA Method 1668A. All calibration compounds met the acceptance criteria listed in the method with the following exceptions:

- Samples L11366-13, L11366-31, and L11366-32 were re-injected due to a continuing calibration standard being out of control. The re-injection results were used for all analytes in these samples. They were reported with an 'i' suffix. No data qualification was necessary.

4.3 Review of Blanks

Method blanks are used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank per analysis for each batch, per QAPP requirements. Qualification of samples due to method blank and calibration blank contamination followed guidelines set forth in the EPA NFGs and EPA Region 10 SOP.

PCB congener results that were reported as detected at a concentration less than five times (5x) the associated blank concentration were flagged 'U' or non-detect at the reported concentration. Target compounds reported with concentrations greater than 5x the blank concentration were not qualified. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Method blank results reported as estimated maximum possible concentrations (EMPCs) were not considered appropriate for use in qualifying associated sample results. Method 1668A stipulates using a method blank as similar to the matrix as possible. The method blank was prepared using clean sand to imitate the sediment matrix.

Method blanks associated with the sediment samples had low levels of some PCBs. The results of a few congeners were qualified non-detect based on these method blank concentrations. Samples qualified non-detect and flagged 'U' as a result of method blank detected PCB congeners are indentified in the URS Review Qualifier field of Table 3.

4.4 Labeled Internal Standard Recovery Review

Samples analyzed for PCB congeners are spiked with labeled internal (quantification) standards. These standards are used to quantitate target congeners and the calculations of target compound concentrations are designed to compensate for low extraction and/or cleanup efficiencies. In addition, their recovery is measured against injection standards added after extraction and cleanup to evaluate extraction and/or cleanup efficiency which could affect sensitivity and could also affect accuracy for target compounds not quantitated against a chemically identical, isotopically labeled standard. The percent recovery of the labeled standards was compared with the limits set forth in EPA Method 1668A and those set by Axys detailed in Table 1 of the Axys narratives. All recoveries were acceptable with the following exception:

- The percent recoveries of ^{13}C-labeled PCB 4 for samples L11366-9, L11366-13 and L11366-35 were below the Axys control limits of 30% with 18.8%, 21.2%, and 23.3%, respectively. Given that isotopic dilution calculations produce recovery corrected quantitation results, only the non-chemically identical PCB congeners, quantitated using these labeled standards were qualified as estimated based on these internal standard recoveries. Associated analytical results of PCB 5 through 14 for samples L11366-9, L11366-13, and L11366-35 were qualified as estimated and flagged 'J/UJ' due to the low recovery of ^{13}C-labeled PCB 4.

Cleanup standards 28L, 111L, and 178L typically are added prior to cleanup and quantitated using injection standards added just prior to analysis to evaluate cleanup efficiency. The cleanup standards were within the 30-135% control limits set by EPA Method 1668A.

4.5 Ongoing Precision and Recovery

MS/MSD samples are not required by Method 1668A for PCB congener analysis. For Method 1668A, ongoing precision and recovery (OPR) samples were used in place of LCS to monitor laboratory performance. The OPR was prepared using clean sand to imitate the solid matrix of the samples. OPR recoveries were acceptable for congener analyses with the following exception:

- The recovery of ^{13}C-labeled PCB 4 in the OPR associated with sample delivery group (SDG) DPWG26268 was 28.3%. This is below the minimum control limit of 30%. This labeled standard was only used to calculate the concentration of non-labeled congeners in the OPR. All non labeled congeners were within method required recovery limits. No data qualification was deemed necessary.

4.6 Duplicate Review

Field duplicates were not collected due to the statistical nature of the sampling event (as discussed in detail in the QAPP). Laboratory precision was monitored through laboratory duplicate analysis. Axys performed duplicate analysis on sediment sample L11366-20. There is no guidance on laboratory duplicate precision for individual PCB congeners, in either the NFGs, the EPA Region 10 SOP, or Method 1668A. Axys uses the general rule that: if any one congener has an RPD greater than 40% the data is flagged (at a minimum) and corrective action may be taken (i.e. reextraction or reanalysis). For analytical results greater than 5x the sample specific detection limit and not reported as EMPCs, the RPDs for individual congeners were less than 40%, indicating acceptable analytical precision. The detailed laboratory duplicate evaluation can be found within the Axys analytical reports.

4.7 Compound Quantification

The internal standard method is used to calculate concentrations of PCB congeners that do not have chemically identical labeled standards. The internal standard method is dependent upon consistent detector response over the calibration range. If the detector response varies, concentrations can be biased high or low based on variations in the detector sensitivity. During congener analysis, PFK (perfluorokerosene) is used as a lock mass reference standard to measure changes in detector sensitivity. Each lock mass must not vary more than 20% throughout its respective retention time window as required by Method 1668A. Variations of more than 20% indicate the presence of a co-eluting interference or decreased sensitivity. Lock mass stability and its effect on analyte quantification was acceptable with the following exceptions:

- Samples L11366-6, L11366-8, L11366-9, L11366-14, and L11366-15 had deflections in lock mass which interfered with several analytes. The sample was re-injected and the lock mass was within control in the second analysis. The affected target analytes were reported from the re-injection. The reanalysis results are identified with a 'W' suffix.
- Sample L11366-15 had a lock mass deflection that affected the recovery standard ^{13}C-labeled PCB 194, which is used to quantify hepta- through deca- (PCB 170-209) chlorinated ^{13}C-labeled PCBs. Upon dilution the lock mass was within control limits. However, the laboratory reported PCB 208 and 209 from the initial, non-diluted, analysis due to their low concentrations. The alternative recovery standard ^{13}C-labeled PCB 138 was used to quantify the hepta- through deca- chlorinated ^{13}C-labeled PCBs in the non-diluted analysis. No data qualification was deemed necessary.
- Sample L11366-15 had a lock mass deflection that affected ^{13}C-labeled PCB 188. Isotopic dilution calculations produce recovery corrected quantitation results, therefore only the non-chemically identical PCB congeners using this labeled standard for quantitation were estimated based on the internal standard recovery. Associated analytical results for PCB 170 through 193, excluding 188 and 189 which are calculated by isotope dilution, were qualified as estimated and flagged 'J/UJ' (See Table 2).
- Many samples in SDGs DPWG26478, DPWG26229, and DPWG26565 had lock mass deflections which interfered with the analysis of several PCBs. Results affected by lock mass deflection were qualified as estimated and flagged 'J/UJ'. See the Table 2 for the affected samples and analytes.

4.8 Target Compound Identification

Ion abundance ratios are used to identify PCB congeners. Results that met all other qualitative identification criteria, but deviated from the theoretical ion abundance criterion set by EPA Method 1668A by more than 15%, are flagged in the laboratory report with a 'K' flag. Those results flagged 'K' with ion abundance ratios outside the identified quantitation criteria were

considered estimated maximum possible concentrations (EMPC) and were re-flagged 'J-EMPC' during this review. If the analyte result was previously qualified 'U' by method blank detection, the result retained the 'U' qualifier and was not qualified further because the ion abundance ratio was outside control limits (there is no ion abundance ratio criterion for non-detects). These "J-EMPC" flags are not tabulated in this report but appear within Table 2 and are entered into the database.

Ion abundance ratios outside the control limits are generally a consequence of co-eluting interferences to either one or both quantitation peaks. In these cases, Axys chose to use the quantitation peak areas as recorded; no adjustments were made to force the peaks to match the theoretical ion abundance ratios before reporting EMPC results. EMPC results should be considered by the data users as part of evaluating the data for end-use objectives. Additionally, it is important to note EMPC results were not included in the Axys-reported homologue totals or Toxicity Equivalent Quotient (TEQ) calculations.

Additionally, the flag 'C' was assigned by the laboratory and listed in Table 2 to indicate co-eluting PCB isomers in this analysis. The concentrations of the co-eluting isomers were reported as a group, eliminating the need for any data qualification.

4.9 Comparability

The results from this sampling event are comparable to other sampling events because of the use of standard techniques to collect representative samples, consistent application of analytical method protocols, and reporting analytical results with appropriate units and reporting limits.

4.10 Reporting Limits

All non-detect congener results are reported at sample specific detection limits. All sediment samples were analyzed using approximately 10 grams dry weight as recommended by Method 1668A. Axys performed a dilution on some samples due to matrix interferences. The dilutions appear to have had little impact on the reporting limits.

5.0 Completeness

The laboratory reported all requested analytes and the deliverable data reports were complete. As part of this review, some data were qualified as estimated 'J' or 'J-EMPC' and some as non-detect 'U'. A summary of qualifiers can be found in Table 2 and Table 3. A completeness summary follows; analysis completeness was calculated using 159 congener results, 209 total congeners minus the 50 co-eluting congeners which were reported with the lowest numbered congener in the co-eluting set.

The electronic and portable delivery format (.pdf) versions of the deliverables were cross-checked for accuracy at a frequency of 20% or greater. Any minor discrepancies found between

the deliverables were reported to Axys and corrected by updating the database to reflect the .pdf deliverable.

- *Technical Completeness* = (number of useable results/total reported results) x100

  = (5,883 compliant / 5,883 total results) = 100%

  All samples results are considered useable.

- *Analytical Completeness* = (number of unqualified results/total reported results) x100

  = (5137 compliant / 5,883 total results) = 87%

  Data were qualified as estimated and flagged 'J' or 'J-EMPC' or qualified non-detect and flagged 'U'.

- *Contract Completeness* = (number of contract compliant results/total reported results) x100

  = (5,883 compliant / 5,883 total results) = 100%

  All samples analyzed met laboratory contract requirements.

- *Field Sampling Completeness* =(number samples collected/number of samples required) x100

  = (37 compliant / 37 required) =100%

  Sediment samples were collected from the reference region (18) and the forebay region (19). Sediment was collected in conjunction with collocated clam tissue samples. All samples collected and submitted to the laboratory for analysis had a complete set of results. All samples had sufficient sample volume to analyze the full analyte list as detailed in the QAPP.

6.0 References

DOD 2006. D*epartment of Defense Environmental Data Quality Workgroup. Department of Defense (DOD) Quality Systems Manual (QSM) for Environmental Laboratories*. Final Version 3. January 2006. Retrieved from [http://www.navylabs.navy.mil/Archive/DoDV3.pdf] on 3/3/06

URS 2007. *Quality Assurance Project Plan, River Operable Unit Remedial Investigation*, Bradford Island, Bonneville Lock and Dam Project, Cascade Locks, Oregon. September 2007.

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USEPA 1995. *EPA Region 10 SOP for the Validation of Method 1668 Toxic, Dioxin-like, PCB Data*, Revision 1.0. December 1995.

USEPA 2005a. *National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review*. September 2005.

USEPA 2005b. *Environmental Protection Agency (EPA) Sample Holding Time Reevaluation*, EPA/600/R-05/124, October 2005.

Table 1. Sample ID and Analysis Summary

Bradford Island Remedial Investigation - Sediment Samples

						Anaytes					
Station Number	**URS ID**	**Collection Date**	**CAS ID (non-congeners)**	**Axys ID (congeners)**	**Axys Sample Delivery Group**	**PCB (Aroclors) (CAS)**	**PCB (Congeners) (Axys Analytical)**	**PAHs**	**SVOCs**	**Metals**	**%Solids**
4	08022604SD	02/26/08	K0801328-022	L11366-1	DPWG26229	--	X	--	--	--	--
7	08021507SD	02/15/08	K0801328-007	L11366-2		--	X	--	--	--	--
8	08021508SD	02/15/08	K0801328-009	L11366-3		--	X	--	--	--	--
9	08021409SD	02/14/08	K0801328-004	L11366-4		--	X	--	--	--	--
10	08021410SD	02/14/08	K0801328-005	L11366-5		--	X	--	--	--	--
11	08021411SD	02/14/08	K0801328-006	L11366-6		--	X	--	--	--	--
15	08022115SD	02/21/08	K0801328-012	L11366-7		--	X	--	--	--	--
16	08022116SD	02/21/08	K0801328-013	L11366-8		--	X	--	--	--	--
17	08022117SD	02/21/08	K0801328-011	L11366-9		--	X	--	--	--	--
18	08021118SD	02/11/08	K0801328-003	L11366-10		--	X	--	--	--	--
21	08021221SD	02/12/08	K0801328-002	L11366-11		--	X	--	--	--	--
5	08031905SD	03/19/08	K0802371-005	L11366-12		--	X	--	--	--	--
13	08031713SD	03/17/08	K0802371-001	L11366-14		--	X	--	--	--	--
14	08031814SD	03/14/08	K0802371-004	L11366-15		--	X	--	--	--	--
65	08022965SD	03/29/08	K0802371-009	L11366-16		--	X	--	--	--	--
67	08030367SD	03/03/08	K0802371-010	L11366-17		--	X	--	--	--	--
88	08031788SD	03/17/08	K0802371-003	L11366-18	DPWG26478	--	X	--	--	--	--
89	08031789SD	03/17/08	K0802371-002	L11366-19		--	X	--	--	--	--
22	08030522SD	03/05/08	K0801769-010	L11366-20		--	X	--	--	--	--
24	08030524SD	03/05/08	K0801769-011	L11366-21		--	X	--	--	--	--
26	08030426SD	03/04/08	K0801769-005	L11366-22		--	X	--	--	--	--
27	08030427SD	03/04/08	K0801769-006	L11366-23		--	X	--	--	--	--
28	08030428SD	03/04/08	K0801769-007	L11366-24		--	X	--	--	--	--
29	08022229SD	02/22/08	K0801769-021	L11366-25		--	X	--	--	--	--
34	08022534SD	02/25/08	K0801769-024	L11366-26		--	X	--	--	--	--
35	08022535SD	02/25/08	K0801769-023	L11366-27		--	X	--	--	--	--
36	08022536SD	02/25/08	K0801769-022	L11366-28		--	X	--	--	--	--
38	08022738SD	02/27/08	K0801769-026	L11366-30		--	X	--	--	--	--
37	08022637SD	02/26/08	K0801769-025	L11366-29	DPWG26565	--	X	--	--	--	--
6	08031806SD	03/18/08	K0802371-006	L11366-13	DPWG26268	--	X	--	--	--	--
39	08022739SD	02/27/08	K0801769-027	L11366-31		--	X	--	--	--	--
40	08022740SD	02/27/08	K0801769-028	L11366-32		--	X	--	--	--	--
41	08022741SD	02/27/08	K0801769-029	L11366-33		--	X	--	--	--	--
42	08022742SD	02/27/08	K0801769-030	L11366-34		--	X	--	--	--	--
85	08030685SD	03/06/08	K0801769-017	L11366-35		--	X	--	--	--	--
86	08030686SD	03/06/08	K0801769-009	L11366-36		--	X	--	--	--	--
87	08030687SD	03/06/08	K0801769-018	L11366-37		--	X	--	--	--	--

Notes:

CAS - Columbia Analytical Services
Axys - Axys Analytical Services, Ltd.
ID - Identification
PCB - Polychlorinated Biphenyl
PAH - Polycyclic Aromatic Hydrocarbon
SVOCs - Semivolatile Organic Compounds
-- previously reported, not included in this quality control summary report.

Table 2
PCB Congener Qualifier Summary
Lab Sample ID's L11366-1 through L11366-5
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26229

IUPAC #	COELUTING CONGENERS[1]	08022604SD L11366-1	Lab Qualifier	URS Review Qualifier	08021507SD L11366-2	Lab Qualifier	URS Review Qualifier	08021508SD L11366-3	Lab Qualifier	URS Review Qualifier	08021409SD L11366-4	Lab Qualifier	URS Review Qualifier	08021410SD L11366-5	Lab Qualifier	URS Review Qualifier
1		1.16			0.181			0.168			0.296	K	J-EMPC	0.324	K	J-EMPC
2		2.78			1.28			1.69			6.62			4.86		
3		0.5	K	J-EMPC	0.206			0.252	K	J-EMPC	0.467			0.416	K	J-EMPC
4		7.11			1.46			0.628			0.985			0.566		
5		0.0659	U		0.0521	U		0.0719	U		0.0625	U		0.0504	U	
6		0.897			0.254			0.219	K	J-EMPC	0.352			0.292		
7		0.597			0.163	K	J-EMPC	0.124			0.222	K	J-EMPC	0.172		
8		4.61			1.14			0.958			1.67			1.52		
9		0.758			0.149	K	J-EMPC	0.083	K	J-EMPC	0.161			0.119		
10		0.323			0.067	K	J-EMPC	0.0653	U		0.0569	U		0.0477	U	
11		79.5			42.6			52.6			68.8			84.4		
12	12 + 13	1.52	C		0.503	C K	J-EMPC	0.551	C		0.974	C		0.803	C K	J-EMPC
13	12 + 13		C12			C12			C12			C12			C12	
14		0.0612	U		0.0484	U		0.0668	U		0.0581	U		0.0477	U	
15		6.4			1.67			2.01			2.76			3.26		
16		1.71			0.667			0.457			0.942			0.813		
17		12.1			2.28			1.14			2.44			2.67		
18	18 + 30	12	C		2.74	C		1.55	C		3.07	C		2.33	C	
19		4.73			0.986			0.362			0.878	K	J-EMPC	0.394		
20	20 + 28	52.9	C		5.68	C		5.61	C		10.1	C		13.2	C	
21	21 + 33	12.8	C		2.15	C		1.59	C		3.91	C		2.78	C	
22		7.7			1.29			1.45			2.42			2.37		
23		0.0491	U		0.0473	U		0.0505	U		0.0495	U		0.0477	U	
24		0.135	K	J-EMPC	0.0473	U		0.0478	U		0.059	K	J-EMPC	0.0477	U	
25		20.9			0.608			0.449	K	J-EMPC	0.825			0.937		
26	26 + 29	32.7	C		0.97	C		0.717	C		1.39	C		1.39	C	
27		4.33			0.726			0.374			0.747			0.524		
28	20 + 28		C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18	
31		36.7			4.32			3.62			6.58			5.89		
32		13.5			1.06			0.448			1			0.918		
33	21 + 33		C21			C21			C21			C21			C21	
34		0.463			0.0473	U		0.0485	U		0.079	K	J-EMPC	0.065	K	J-EMPC
35		0.488			0.173	K	J-EMPC	0.305			0.346			0.44		
36		0.132			0.0473	U		0.128	K	J-EMPC	0.106			0.143		
37		8.11			1.63			2.05			3			3.2		
38		0.106	K	J-EMPC	0.0473	U		0.055	K	J-EMPC	0.129	K	J-EMPC	0.096	K	J-EMPC
39		0.451	K	J-EMPC	0.058	K	J-EMPC	0.0478	U		0.078	K	J-EMPC	0.056	K	J-EMPC
40	40 + 41 + 71	97.6	C		7.84	C		3.21	C		7.96	C		4.57	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40	
42		39.8			4.32			1.92			4.65			2.83		
43		4.96	K	J-EMPC	0.653			0.296			0.591	K	J-EMPC	0.459		
44	44 + 47 + 65	403	C		37	C		15.7	C		34.8	C		19	C	
45	45 + 51	21.6	C		1.45	C		0.655	C		0.927	C		0.631	C	
46		7.95			0.607			0.222			0.607			0.343		
47	44 + 47 + 65		C44			C44			C44			C44			C44	
48		14.7			1.79			1.01			2.24			1.46		
49	49 + 69	299	C		23	C		10.2	C		24.2	C		12.1	C	
50	50 + 53	49.8	C		3.87	C		1.49	C		3.5	C		2.18	C	
51	45 + 51		C45			C45			C45			C45			C45	
52		964			87			34.1			70.8			32.2		
53	50 + 53		C50			C50			C50			C50			C50	
54		1.28			0.109	K	J-EMPC	0.0478	U		0.136			0.054	K	J-EMPC
55		4.34			0.597			0.203			0.676	K	J-EMPC	0.307		
56		117			9.68			5.45			10.4			6.92		
57		1.19			0.0895	U		0.0814	U		0.144	U		0.146	U	
58		1.47			0.127	K	J-EMPC	0.13	K	J-EMPC	0.178	K	J-EMPC	0.146	U	
59	59 + 62 + 75	9.53	C		0.9	C		0.549	C		1.43	C		1.02	C	
60		49.7			3.95			2.89			4.71			3.4		
61	61 + 70 + 74 + 76	1250	C		85.8	C		45.7	C		85.7	C		45.6	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59	
63		12.7			0.963			0.711	K	J-EMPC	1.46			0.822		
64		137			13.6			6.7			13.2			6.89		
65	44 + 47 + 65		C44			C44			C44			C44			C44	
66		356			27.3			16.8			33.3			20.5		
67		4.03			0.185			0.164	K	J-EMPC	0.292	K	J-EMPC	0.265		
68		2.56			0.131	K	J-EMPC	0.083	K	J-EMPC	0.451	K	J-EMPC	0.245	K	J-EMPC
69	49 + 69		C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40	
72		3.55			0.236			0.148	K	J-EMPC	0.582			0.277		
73		0.0491	U		0.0473	U		0.0478	U		0.0495	U		0.0477	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
77		7.09			1.1			1.21			1.99			1.98		
78		0.406	U		0.0865	U		0.0786	U		0.139	U		0.141	U	
79		21.7			1.16			0.648			1.44	K	J-EMPC	0.66		
80		0.373	U		0.0795	U		0.0723	U		0.128	U		0.13	U	
81		3.4	K	J-EMPC	0.192	K	J-EMPC	0.103	K	J-EMPC	0.14	U		0.147	K	J-EMPC
82		232			14			7.06			14.7			6.5		
83	83 + 99	1360	C		73.4	C		42.6	C		86	C		40.9	C	
84		493			36.4			15.1			34			15		
85	85 + 116 + 117	426	C		25.2	C		15.2	C		27.6	C		14	C	
86	86 + 87 + 97 + 108 + 119 + 125	1580	C		93.4	C		48.4	C		94.5	C		43.7	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
88	88 + 91	292	C		20	C		9.18	C		19.3	C		9.36	C	
89		13			0.851			0.414			0.905			0.389		
90	90 + 101 + 113	2180	C		125	C		66.3	C		136	C		63	C	
91	88 + 91		C88			C88			C88			C88			C88	
92		368			22.1			11.4			24.4			12.2		
93	93 + 95 + 98 + 100 + 102	1550	C		121	C		51.8	C		105	C		48	C	
94		6.65			0.476			0.202	K	J-EMPC	0.483	K	J-EMPC	0.226		
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
96		6.32			0.653			0.239			0.588			0.268		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
103		8.63			0.599			0.325			0.88			0.428		
104		0.127	K	J-EMPC	0.0473	U		0.0478	U		0.0495	U		0.0477	U	
105		1080			47.5			33.5			57.2			31.1		
106		2.43	U		0.178	U		0.138	U		0.127	U		0.117	U	
107	107 + 124	95.4	C		4	C		2.83	C		5.1	C		2.53	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
109		149			7.04			5.17			10			4.91		
110	110 + 115	2690	C		171	C		90.1	C		171	C		84.3	C	
111		0.216	U		0.0479	U		0.0478	U		0.0675	U		0.0477	U	
112		0.21	U		0.0473	U		0.0478	U		0.0656	U		0.0477	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90	
114		60.3			2.8			1.85			3.27			1.71	K	J-EMPC
115	110 + 115		C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85	

Table 2
PCB Congener Qualifier Summary
Lab Sample ID's L11366-1 through L11366-5
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26229

IUPAC #	COELUTING CONGENERS[1]	08022604SD L11366-1	Lab Qualifier	URS Review Qualifier	08021507SD L11366-2	Lab Qualifier	URS Review Qualifier	08021508SD L11366-3	Lab Qualifier	URS Review Qualifier	08021409SD L11366-4	Lab Qualifier	URS Review Qualifier	08021410SD L11366-5	Lab Qualifier	URS Review Qualifier
117	85 + 116 + 117		C85			C85			C85			C85			C85	
118		2650			131			92.6			145			79.4		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
120		0.78	K	J-EMPC	0.106	K	J-EMPC	0.113	K	J-EMPC	0.317			0.229		
121		0.219	U		0.0486	U		0.0478	U		0.0684	U		0.0477	U	
122		27.2			1.25			0.806	K	J-EMPC	1.61			0.725		
123		36.3			1.9	K	J-EMPC	1.44			2.04			1.19		
124	107 + 124		C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
126		2.69	U		0.203	U		0.177	K	J-EMPC	0.219	K	J-EMPC	0.252	K	J-EMPC
127		2.51	U		0.184	U		0.143	U		0.131	U		0.121	U	
128	128 + 166	445	C		14.7	C		13	C		26.5	C		14.6	C	
129	129 + 138 + 160 + 163	2340	C		85.9	C		74.2	C		138	C		82.5	C	
130		142			5.14			4.29			9.23			5.29		
131		32.4			1.11			0.742			1.68			0.881		
132		725			25.2			18			41.8			21.2		
133		19.8			0.866			0.791			1.68			1.07		
134	134 + 143	105	C		3.84	C		2.73	C		6.51	C		3.33	C	
135	135 + 151 + 154	376	C		18.3	C		13.9	C		31.4	C		19.9	C	
136		152			7.76			4.71			11.5			6.15		
137		178			5.16			4.31			7.92			3.75		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
139	139 + 140	48.2	C		1.68	C		1.26	C		2.77	C		1.42	C	
140	139 + 140		C139			C139			C139			C139			C139	
141		273			7.76			6.16			15			7.6		
142		1.16	U		0.12	U		0.114	U		0.162	U		0.133	U	
143	134 + 143		C134			C134			C134			C134			C134	
144		54.6			2.38			1.89			3.9			2.1		
145		0.838			0.0473	U		0.0478	U		0.074	K	J-EMPC	0.0477	U	
146		269			12.4			10.9			20			12.5		
147	147 + 149	1190	C		49	C		37	C		81.3	C		46.6	C	
148		0.844			0.066	K	J-EMPC	0.0478	U		0.184	K	J-EMPC	0.139		
149	147 + 149		C147			C147			C147			C147			C147	
150		1.54			0.069	K	J-EMPC	0.076	K	J-EMPC	0.181			0.106		
151	135 + 151 + 154		C135			C135			C135			C135			C135	
152		1.8			0.078			0.049	K	J-EMPC	0.104	K	J-EMPC	0.06		
153	153 + 168	1580	C		72.6	C		62	C		101	C		68	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135	
155		0.0491	U		0.0473	U		0.0478	U		0.0495	U		0.0477	U	
156	156 + 157	380	C		12	C		10.4	C		19.5	C		10.6	C	
157	156 + 157		C156			C156			C156			C156			C156	
158		245			7.81			6.61			13			6.91		
159		6.36			0.232	K	J-EMPC	0.266			0.609			0.443		
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
161		0.822	U		0.0849	U		0.0804	U		0.115	U		0.094	U	
162		8.11			0.182	K	J-EMPC	0.211			0.41	K	J-EMPC	0.233		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
164		118			4.42			3.36			7.97			4.4		
165		0.934	U		0.0964	U		0.0913	U		0.13	U		0.107	U	
166	128 + 166		C128			C128			C128			C128			C128	
167		113			4.52			4.3			6.33			3.91		
168	153 + 168		C153			C153			C153			C153			C153	
169		0.879	U		0.0923	U		0.0881	U		0.126	U		0.123	U	
170		190			5.53			6.14			14.4			10.6		
171	171 + 173	59.2	C		1.88	C		2.28	C		5.17	C		4.06	C	
172		30.1			0.852			1.03			2.77			2.17		
173	171 + 173		C171			C171			C171			C171			C171	
174		127			4.02			4.53			12.2			9.72		
175		5.87			0.255			0.284			0.608			0.448		
176		18.1			0.625			0.761			1.82			1.39		
177		81.6			3.74			4.69			9.64			8.49		
178		22.1			1.24			1.68			3.52			3.4		
179		38.9			2.04			2.65			5.88			5.29		
180	180 + 193	316	C		11.2	C		12.7	C		29.1	C		23.7	C	
181		4.54			0.153			0.108	K	J-EMPC	0.281	K	J-EMPC	0.18	K	J-EMPC
182		1.41			0.075			0.049	K	J-EMPC	0.172	K	J-EMPC	0.108	K	J-EMPC
183	183 + 185	102	C		3.96	C		4.58	C		10.2	C		8.38	C	
184		0.168	K	J-EMPC	0.0473	U		0.0478	U		0.06			0.067	K	J-EMPC
185	183 + 185		C183			C183			C183			C183			C183	
186		0.104	K	J-EMPC	0.0473	U		0.0478	U		0.0495	U		0.0477	U	
187		153			8.76			11.1			24.3			22		
188		0.149			0.0473	U		0.0478	U		0.071	K	J-EMPC	0.073		
189		9.01			0.331	K	J-EMPC	0.347	K	J-EMPC	0.787			0.617		
190		34.6			1.45			1.66			3.47			2.87		
191		7.46			0.22			0.242			0.569			0.45		
192		0.0491	U		0.0473	U		0.0478	U		0.0495	U		0.0477	U	
193	180 + 193		C180			C180			C180			C180			C180	
194		40.4			2.08			2.94			6.83			6.09		
195		17.3			1.21			1.71			3.36			3.03		
196		21.7			1.11			1.48			3.79			3.17		
197	197 + 200	9.25	C G	J	0.61	C		0.726	C		1.23	C G	J	1.09	C G	J
198	198 + 199	42.6	C		2.8	C		4.05	C		9.73	C		8.92	C	
199	198 + 199		C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197	
201		5.47			0.371	K	J-EMPC	0.596			1.31			1.08		
202		10.2			1.02			1.57			3.19			2.96		
203		31.2			2.26			3.4			6.95			6.36		
204		0.0491	U		0.0473	U		0.0478	U		0.0495	U		0.0477	U	
205		2.56			0.158	K	J-EMPC	0.235	K	J-EMPC	0.437	K	J-EMPC	0.406		
206		15.5			1.88			2.85			6.96			6.35		
207		2.22			0.254	K	J-EMPC	0.405	K	J-EMPC	0.948			0.888		
208		3.84			0.707			0.988	K	J-EMPC	2.56			2.35		
209		7.48			1.85			2.94			7.14			7.75		

Notes:

All results are in units of pg/g (picograms per gram), dry weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating that a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating that the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the reported sample quantification limit.
1 = When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 2
PCB Congener Qualifier Summary
Lab Sample ID's L11366-6 through L11366-10
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26229

IUPAC #	COELUTING CONGENERS[1]	08021411SD L11366-6	Lab Qualifier	URS Review Qualifier	08022115SD L11366-7	Lab Qualifier	URS Review Qualifier	08022116SD L11366-8	Lab Qualifier	URS Review Qualifier	08022117SD L11366-9	Lab Qualifier	URS Review Qualifier	08021118SD L11366-10	Lab Qualifier	URS Review Qualifier
1		0.257			0.671			0.298	K	J-EMPC	0.337	K	J-EMPC	0.183		
2		4.76			6.34			6.03			4.21			1.54		
3		0.351			0.515			0.387	K	J-EMPC	0.371	K	J-EMPC	0.245	K	J-EMPC
4		2.24			0.965			0.892			0.457			0.466		
5		0.0438	U		0.07	K	J-EMPC	0.0493	U		0.0669	U	UJ	0.048	U	
6		0.736			0.431			0.472			0.294	K	J-EMPC	0.215		
7		0.131	K	J-EMPC	0.133	K	J-EMPC	0.155	K	J-EMPC	0.092		J	0.122		
8		3.83			1.95			2.65			1.27		J	0.978		
9		0.197			0.107	K	J-EMPC	0.147			0.08	K	J-EMPC	0.06		
10		0.067			0.0618	U		0.0478	U		0.0585	U	UJ	0.0478	U	
11		86.8			118			92.2			65.2		J	71.5		
12	12 + 13	1.15	C		1.04	C K	J-EMPC	1.1	C		0.776	C	J	0.74	C	
13	12 + 13		C12			C12			C12			C12			C12	
14		0.066			0.072			0.064	K	J-EMPC	0.0605	U	UJ	0.0478	U	
15		4.26			2.83			4.36			2.33			1.75		
16		5.69			1.99			2.09			0.817	K	J-EMPC	0.759		
17		5.25			2.18			2.47			0.97			0.759		
18	18 + 30	11.2	C		4.79	C		4.66	C		2.04	C		1.96	C	
19		1.56			0.399			0.559	K	J-EMPC	0.255	K	J-EMPC	0.201	K	J-EMPC
20	20 + 28	20.7	C		10.7	C		13.2	C		8.21	C		5.31	C	
21	21 + 33	10.1	C		3.53	C		5.27	C		2.87	C		1.49	C	
22		7.51			3.83			3.99			2.7			1.89		
23		0.0368	U		0.0618	U		0.0478	U		0.0475	U		0.0478	U	
24		0.176			0.066	K	J-EMPC	0.088	K	J-EMPC	0.0475	U		0.0478	U	
25		1.36			0.6			0.861			0.435			0.25		
26	26 + 29	3.07	C		1.28	C		1.73	C		0.922	C		0.498	C	
27		0.864			0.429			0.377			0.14			0.182		
28	20 + 28		C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18	
31		15.5			7.18			8.59			5.58			3.5		
32		3.13			0.82			1.15			0.661			0.321		
33	21 + 33		C21			C21			C21			C21			C21	
34		0.081			0.0618	U		0.063			0.0475	U		0.0478	U	
35		0.617			0.516			0.532			0.344			0.298		
36		0.154			0.163			0.117			0.106	K	J-EMPC	0.091	K	J-EMPC
37		6.47			4			5.01			2.94			2.21		
38		0.131			0.175			0.115	K	J-EMPC	0.092			0.057	K	J-EMPC
39		0.104			0.092	K	J-EMPC	0.056	K	J-EMPC	0.0475	U		0.0478	U	
40	40 + 41 + 71	7.5	C		4.98	C		3.83	C		2.55	C		2.3	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40	
42		4.07			3.66			2.43			1.55			1.75		
43		0.559			0.356			0.23	K	J-EMPC	0.191			0.143		
44	44 + 47 + 65	17.1	C		14.8	C		9.75	C		6.35	C		7.14	C	
45	45 + 51	2.37	C		1.48	C		1.15	C		0.783	C		0.602	C	
46		0.817			0.458			0.399			0.235			0.178	K	J-EMPC
47	44 + 47 + 65		C44			C44			C44			C44			C44	
48		3			2.11			1.63			1.05			1.05		
49	49 + 69	9.54	C		7.72	C		5.59	C		3.86	C		3.62	C	
50	50 + 53	1.89	C		1.46	C		1.05	C		0.666	C		0.62	C	
51	45 + 51		C45			C45			C45			C45			C45	
52		24.7			17			11.8			8.12			8.54		
53	50 + 53		C50			C50			C50			C50			C50	
54		0.042	K	J-EMPC	0.0618	U		0.0478	U		0.0486	U		0.0478	U	
55		0.134	U		0.189	K	J-EMPC	0.171			0.208			0.18		
56		7.6			6.32			5.47			4.29			3.56		
57		0.134	U		0.128	U		0.0742	U		0.0854	U		0.112	U	
58		0.134	U		0.135	U		0.0781	U		0.0898	U		0.118	U	
59	59 + 62 + 75	1.47	C		1.13	C		0.879	C		0.577	C		0.567	C	
60		4.48			3.63			2.95			2.7			2.45		
61	61 + 70 + 74 + 76	33	C		26.9	C		22.2	C		18.5	C		15.4	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59	
63		0.708			0.726			0.534			0.477			0.379		
64		7.1			5.91			4.42			3.35			3.3		
65	44 + 47 + 65		C44			C44			C44			C44			C44	
66		17.1			15.7			13			10.6			9.17		
67		0.483			0.368			0.341			0.225	K	J-EMPC	0.155		
68		0.13	U		0.158	K	J-EMPC	0.14	K	J-EMPC	0.0827	U		0.109	U	
69	49 + 69		C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40	
72		0.175	K	J-EMPC	0.215	K	J-EMPC	0.174	K	J-EMPC	0.103	K	J-EMPC	0.109	U	
73		0.0368	U		0.0618	U		0.0478	U		0.0475	U		0.0478	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
77		2.31			2.4			2.17			1.51			1.32		
78		0.13	U		0.127	U		0.0734	U		0.0845	U		0.111	U	
79		0.389	K	J-EMPC	0.482			0.379			0.227	K	J-EMPC	0.205	K	J-EMPC
80		0.119	U		0.117	U		0.068	U		0.0783	U		0.103	U	
81		0.129	U		0.138	U		0.0754	U		0.0802	U		0.115	U	
82		4.67			2.94			2.97			1.84			1.65		
83	83 + 99	26	C		24.4	C		17.9	C		12.3	C		11.7	C	
84		10.4			5.94			4.88			3.12			2.73		
85	85 + 116 + 117	9.4	C		7.79	C		6.93	C		4.9	C		4.22	C	
86	86 + 87 + 97 + 108 + 119 + 125	31.9	C		23.5	C		18.2	C		12.1	C		11.8	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
88	88 + 91	5.51	C		4.21	C		3.24	C		2.23	C		2.06	C	
89		0.301			0.251	K	J-EMPC	0.182	K	J-EMPC	0.109	K	J-EMPC	0.136		
90	90 + 101 + 113	47.1	C		36.9	C		27.6	C		18.7	C		17.3	C	
91	88 + 91		C88			C88			C88			C88			C88	
92		9.4			7.26			5.52			4.57			3.31		
93	93 + 95 + 98 + 100 + 102	35.6	C		26	C		18.1	C		12.4	C		11.6	C	
94		0.141			0.111			0.059	K	J-EMPC	0.06	K	J-EMPC	0.0478	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
96		0.178			0.14			0.085	K	J-EMPC	0.06	K	J-EMPC	0.051	K	J-EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
103		0.275			0.295	K	J-EMPC	0.183			0.128			0.113	K	J-EMPC
104		0.0368	U		0.0618	U		0.0478	U		0.0475	U		0.0478	U	
105		21.1			18.8			16.8			12			11.3		
106		0.086	U		0.116	U		0.0726	U		0.0494	U		0.0712	U	
107	107 + 124	2.05	C		1.41	C		1.34	C		0.947	C		0.82	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
109		3.9			3.64			3.16			2.27			1.96		
110	110 + 115	59.2	C		43.6	C		39.3	C		26.8	C		22.8	C	
111		0.0378	U		0.0618	U		0.0478	U		0.0475	U		0.0478	U	
112		0.0368	U		0.0618	U		0.0478	U		0.0475	U		0.0478	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90	
114		1.17			0.965	K	J-EMPC	0.813			0.665			0.621		
115	110 + 115		C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85	
118		52.8			51.6			40.8			27.4			29		

Table 2
PCB Congener Qualifier Summary
Lab Sample ID's L11366-6 through L11366-10
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26229

IUPAC #	COELUTING CONGENERS[1]	08021411SD L11366-6	Lab Qualifier	URS Review Qualifier	08022115SD L11366-7	Lab Qualifier	URS Review Qualifier	08022116SD L11366-8	Lab Qualifier	URS Review Qualifier	08022117SD L11366-9	Lab Qualifier	URS Review Qualifier	08021118SD L11366-10	Lab Qualifier	URS Review Qualifier
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
120		0.206			0.249			0.227			0.13			0.11		
121		0.0384	U		0.0618	U		0.0478	U		0.0475	U		0.0478	U	
122		0.557			0.344	K	J-EMPC	0.417			0.291			0.27		
123		0.859			0.796			0.833			0.459			0.582		
124	107 + 124		C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
126		0.212	K	J-EMPC	0.296	K	J-EMPC	0.238			0.173			0.123	K	J-EMPC
127		0.0888	U		0.118	U		0.0736	U		0.0501	U		0.0722	U	
128	128 + 166	12.6	C		9.53	C		9.51	C		6.89	C		5.57	C	
129	129 + 138 + 160 + 163	74.2	C		62.5	C		55.9	C		39.5	C		35.5	C	
130		4.88			3.78			3.62			2.56			2.16		
131		0.775			0.434			0.483	K	J-EMPC	0.277			0.237		
132		18.9			12			12.2			8.41			6.06		
133		1.06			0.956	K	J-EMPC	0.836			0.607			0.559		
134	134 + 143	2.98	C		1.95	C		1.91	C		1.25	C		1.03	C	
135	135 + 151 + 154	20	C		18.9	C		15.3	C		9.93	C		8.92	C	
136		5.68			4.58			3.86			2.19			1.92		
137		3.11			1.65			1.74			1.22			1.24		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
139	139 + 140	1.23	C		0.855	C		0.785	C K	J-EMPC	0.55	C		0.442	C	
140	139 + 140		C139			C139			C139			C139			C139	
141		7.88			4.92			5.21			3.59			2.71		
142		0.106	U		0.0772	U		0.0951	U		0.0728	U		0.0537	U	
143	134 + 143		C134			C134			C134			C134			C134	
144		2.2			1.65			1.51	K	J-EMPC	1.11			0.829		
145		0.0368	U		0.0618	U		0.0478	U		0.0475	U		0.0478	U	
146		11.9			12			10.3			7.86			7.06		
147	147 + 149	44.6	C		37.8	C		32.7	C		23.7	C		18.7	C	
148		0.104			0.114	K	J-EMPC	0.117	K	J-EMPC	0.077	K	J-EMPC	0.151		
149	147 + 149		C147			C147			C147			C147			C147	
150		0.106			0.1	K	J-EMPC	0.073	K	J-EMPC	0.0475	U		0.0478	U	
151	135 + 151 + 154		C135			C135			C135			C135			C135	
152		0.063			0.0618	U		0.0478	U		0.0475	U		0.0478	U	
153	153 + 168	64.4	C		66.7	C		51	C		35.1	C		38.3	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135	
155		0.049	K	J-EMPC	0.069			0.0478	U		0.0475	U		0.0478	U	
156	156 + 157	8.74	C		6.53	C		6.61	C		4.48	C		3.81	C	
157	156 + 157		C156			C156			C156			C156			C156	
158		6.31			4.55			4.49			3.09			2.58		
159		0.485			0.452			0.42			0.34			0.202		
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
161		0.0746	U		0.0618	U		0.0683	U		0.0523	U		0.0478	U	
162		0.226			0.158	K	J-EMPC	0.0727	U		0.13	K	J-EMPC	0.101		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
164		4.03			2.92			2.94			2.08			1.59		
165		0.0848	U		0.0642	U		0.0791	U		0.0605	U		0.0478	U	
166	128 + 166		C128			C128			C128			C128			C128	
167		3.49			3.37			2.87			1.84			1.9		
168	153 + 168		C153			C153			C153			C153			C153	
169		0.111	U		0.161	K	J-EMPC	0.132	U		0.109	U		0.0841	U	
170		10.4			9.65			10.4			8.28			4.95		
171	171 + 173	4.13	C		4.05	C		4.12	C		2.74	C		2.05	C	
172		2.27	D		2.13			2.04	K D	J-EMPC	1.34	D		1.02		
173	171 + 173		C171			C171			C171			C171			C171	
174		9.65			9.67			9.52			6.72			4.68		
175		0.518			0.542			0.524			0.292			0.267		
176		1.56			1.6			1.47			1.09			0.801		
177		8.98			9.85			9.45			6.5			4.72		
178		3.56			4.36			3.57			2.61			2.28		
179		5.73			6.75			6.18			4.18			3.4		
180	180 + 193	24.3	C		27.7	C		26.1	C		20.9	C		14	C	
181		0.165			0.134			0.152	K	J-EMPC	0.058	K	J-EMPC	0.075		
182		0.108			0.185			0.0478	U		0.105	K	J-EMPC	0.09		
183	183 + 185	9.08	C		9.97	C		8.75	C		6.13	C		4.78	C	
184		0.067	K	J-EMPC	0.066			0.068			0.059	K	J-EMPC	0.0478	U	
185	183 + 185		C183			C183			C183			C183			C183	
186		0.0368	U		0.0618	U		0.0478	U		0.0475	U		0.0478	U	
187		23.4			28.3			23.3			17.4			13.9		
188		0.059			0.099			0.057	K	J-EMPC	0.0475	U		0.0478	U	
189		0.589	D		0.534	K	J-EMPC	0.452	D		0.428	K D	J-EMPC	0.217	K	J-EMPC
190		2.98	K D	J-EMPC	3.53			2.68	D		1.91	D		1.73		
191		0.483	D		0.523	K	J-EMPC	0.412	K D	J-EMPC	0.354	D		0.229		
192		0.146	U D		0.0618	U		0.0949	U D		0.106	U D		0.0478	U	
193	180 + 193		C180			C180			C180			C180			C180	
194		5.38			4.82			4.86			4.77			2.4		
195		2.99	D		2.05			3.38	D		2.56	D		1.1		
196		3.05			2.75			2.82			2.4			1.55		
197	197 + 200	1.74	C D		1.15	C G	J	1.35	C D		1.31	C K D	J-EMPC	0.722	C G	J
198	198 + 199	8.23	C		7.79	C		7.77	C		6.68	C		4.97	C	
199	198 + 199		C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197	
201		1.16			1.22			1.15			0.789			0.676		
202		3.06			3.29			2.92			2.17			1.83		
203		6.09			6.28			5.77			4.62			3.85		
204		0.0368	U		0.0618	U		0.0478	U		0.0475	U		0.0478	U	
205		0.404	K	J-EMPC	0.372			0.4			0.331			0.169		
206		5.52			5.36			6.06			4.52			3.91		
207		0.81			0.7			0.763			0.569	K	J-EMPC	0.487		
208		2.11			2.09			2.27			1.72			1.55		
209		7.16			5.44			7.3			4.83			3.2		

Notes:

All results are in units of pg/g (picograms per gram), dry weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating that a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating that the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the reported sample quantification limit.
1 = When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 2
PCB Congener Qualifier Summary
Lab Sample ID's L11366-11, L11366-12, and L11366-14 through L11366-17
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26229

IUPAC #	COELUTING CONGENERS[1]	08021221SD L11366-11	Lab Qualifier	URS Review Qualifier	08031905SD L11366-12	Lab Qualifier	URS Review Qualifier	08031713SD L11366-14	Lab Qualifier	URS Review Qualifier	08031814SD L11366-15	Lab Qualifier	URS Review Qualifier	08022965SD L11366-16	Lab Qualifier	URS Review Qualifier	08030367SD L11366-17	Lab Qualifier	URS Review Qualifier
1		0.212			0.179			0.24			0.11			0.147			0.104		
2		3.61			0.113	K	U	3			0.832			2.07			0.17		U
3		0.294	K	J-EMPC	0.153	K	J-EMPC	0.343	K	J-EMPC	0.123	K	J-EMPC	0.206			0.066	K	J-EMPC
4		0.386			0.777			0.82			0.197	K	J-EMPC	0.291			0.113		
5		0.0488	U		0.0479	U		0.0486	U		0.0509	U		0.0487	U		0.0479	U	
6		0.23			0.182			0.359	G	J	0.079			0.148			0.06	K	J-EMPC
7		0.134			0.153			0.487			0.177	K	J-EMPC	0.074			0.083	K	J-EMPC
8		1.01			0.394		U	1.49	D		0.343		U	0.69		U	0.246		U
9		0.057			0.075	K	J-EMPC	0.093	K	J-EMPC	0.0484	U		0.0487	U		0.0479	U	
10		0.0488	U		0.058			0.0486	U		0.0484	U		0.0487	U		0.0479	U	
11		71.1			11.9			110			20.9			48.5			10.5		
12	12 + 13	0.936	C		0.185	C K	J-EMPC	0.857	C K	J-EMPC	0.456	C		0.684	C		0.156	C K	J-EMPC
13	12 + 13		C12			C12			C12			C12			C12			C12	
14		0.0488	U		0.0479	U		0.0486	U		0.0484	U		0.0487	U		0.0479	U	
15		2.7			0.676			2.75			0.771			1.74			0.346		
16		0.521			0.163	K	J-EMPC	1.19			0.185			0.472			0.125	K	J-EMPC
17		0.646			0.804			1.2			0.168			0.478			0.127	K	J-EMPC
18	18 + 30	1.42	C		1.23	C		3.53	C D		0.402	C		1.1	C		0.273	C	
19		0.161	K	J-EMPC	0.524			0.23			0.063	K	J-EMPC	0.104	K	J-EMPC	0.053	K	J-EMPC
20	20 + 28	5.49	C		1.3	C		7.12	C		1.57	C		4.17	C		0.908	C	
21	21 + 33	1.53	C		0.315	C	U	2.41	C		0.434	C	U	1.13	C		0.333	C	U
22		1.58			0.319			2.53			0.447			1.21			0.392		
23		0.0488	U		0.0479	U		0.0486	U		0.0484	U		0.0487	U		0.0479	U	
24		0.0488	U		0.0479	U		0.0486	U		0.0484	U		0.0487	U		0.0479	U	
25		0.25	K	J-EMPC	0.628			0.401			0.082			0.203			0.0479	U	
26	26 + 29	0.529	C		0.781	C		0.945	C		0.153	C		0.437	C		0.12	C	
27		0.114			0.282			0.28			0.052	K	J-EMPC	0.089			0.0479	U	
28	20 + 28		C20			C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18			C18	
31		3.35			0.971			5			0.927			2.46			0.593	K	U
32		0.221			0.755			0.387			0.086	K	J-EMPC	0.188			0.09		
33	21 + 33		C21			C21			C21			C21			C21			C21	
34		0.0488	U		0.0479	U		0.0486	U		0.0484	U		0.0487	U		0.0479	U	
35		0.347	K	J-EMPC	0.0479	U		0.418			0.091	K	J-EMPC	0.221			0.054	K	J-EMPC
36		0.115	K	J-EMPC	0.0479	U		0.097			0.0484	U		0.064	K	J-EMPC	0.0479	U	
37		2.6			0.396		U	3.96			0.745			1.88			0.439		
38		0.058			0.0479	U		0.097			0.0484	U		0.0487	U		0.0479	U	
39		0.0488	U		0.0479	U		0.063			0.0484	U		0.0487	U		0.0479	U	
40	40 + 41 + 71	1.52	C		1.38	C		3.03	C		0.482	C		1.26	C		0.55	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
42		1.11			0.724			2.68			0.282			0.83			0.277	K	J-EMPC
43		0.119			0.105			0.214			0.0548	U		0.058	K	J-EMPC	0.0582	U	
44	44 + 47 + 65	5.02	C		6.4	C		10.4	C		1.32	C		4.16	C		1.03	C	
45	45 + 51	0.443	C		0.553	C		0.73	C		0.088	C K	J-EMPC	0.317	C		0.104	C	
46		0.142	K	J-EMPC	0.208	K	J-EMPC	0.199			0.0538	U		0.14			0.063	K	J-EMPC
47	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
48		0.68			0.241			1.39			0.18	K	J-EMPC	0.556			0.163		
49	49 + 69	3.08	C		4.07	C		4.45	C		0.733	C		2.28	C		0.515	C	
50	50 + 53	0.408	C		1.38	C		0.848	C		0.118	C		0.31	C		0.102	C K	J-EMPC
51	45 + 51		C45			C45			C45			C45			C45			C45	
52		7.33			13.1			10.9			1.73			6.22			1.07		
53	50 + 53		C50			C50			C50			C50			C50			C50	
54		0.0488	U		0.09	K	J-EMPC	0.0486	U		0.0484	U		0.0487	U		0.0533	U	
55		0.172	K	J-EMPC	0.0802	U		0.197			0.0717	U		0.126	K	J-EMPC	0.0756	U	
56		2.64			1.28			3.87			0.762			1.96			0.714		
57		0.0915	U		0.0768	U		0.09	U		0.0695	U		0.105	U		0.0734	U	
58		0.0963	U		0.0808	U		0.091	U		0.0704	U		0.106	U		0.0742	U	
59	59 + 62 + 75	0.45	C		0.122	C		0.828	C		0.088	C K	J-EMPC	0.346	C K	J-EMPC	0.051	C	
60		1.92			0.701			2.43			0.588			1.38			0.436		
61	61 + 70 + 74 + 76	13.3	C		11.8	C		17.6	C		3.69	C		10.5	C		2.07	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
63		0.347	K	J-EMPC	0.127	K	J-EMPC	0.447			0.069	K	J-EMPC	0.269			0.0712	U	
64		2.45			1.99			3.89			0.656			2			0.478		
65	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
66		8.2			4.2			11.6			2.48			6.88			1.41		
67		0.164			0.0675	U		0.242			0.0622	U		0.139			0.0656	U	
68		0.0886	U		0.0744	U		0.119	K	J-EMPC	0.0674	U		0.101	U		0.0711	U	
69	49 + 69		C49			C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
72		0.0887	U		0.0744	U		0.156			0.0672	U		0.101	U		0.0709	U	
73		0.0488	U		0.0479	U		0.0486	U		0.0484	U		0.0487	U		0.0479	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
77		1.47			0.209			1.63			0.417			1.04			0.289		
78		0.0905	U		0.076	U		0.0867	U		0.067	U		0.101	U		0.0707	U	
79		0.248			0.186	K	J-EMPC	0.343			0.0568	U		0.172			0.0599	U	
80		0.0839	U		0.0704	U		0.079	U		0.0611	U		0.0919	U		0.0644	U	
81		0.0934	U		0.0773	U		0.091	U		0.0694	U		0.102	U		0.0693	U	
82		1.62			1.98			1.61			0.36			1.2			0.27	K	J-EMPC
83	83 + 99	11.6	C		11.1	C		15	C		2.78	C		8.81	C		1.01	C	
84		2.59			3.89			3.22			0.728			2.41			0.368	K	J-EMPC
85	85 + 116 + 117	4.38	C		3.98	C		4.69	C		0.993	C		3.07	C		0.413	C	
86	86 + 87 + 97 + 108 + 119 + 125	11.8	C		13	C		15	C		2.77	C		9	C		1.17	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
88	88 + 91	1.9	C		2.39	C		2.28	C		0.462	C		1.47	C		0.218	C	
89		0.075	K	J-EMPC	0.107			0.114	K	J-EMPC	0.0484	U		0.081	K	J-EMPC	0.0479	U	
90	90 + 101 + 113	18.4	C		16.6	C		24	C		4.27	C		14.4	C		1.59	C	
91	88 + 91		C88			C88			C88			C88			C88			C88	
92		3.49			2.72			4.06			0.802			2.62			0.293		
93	93 + 95 + 98 + 100 + 102	10.5	C		14	C		15.6	C		2.68	C		9.42	C		1.11	C K	J-EMPC
94		0.0488	U		0.067			0.064			0.0484	U		0.0487	U		0.0479	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
96		0.054			0.066	K	J-EMPC	0.063	K	J-EMPC	0.0484	U		0.0487	U		0.0479	U	
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
103		0.121	K	J-EMPC	0.077	K	J-EMPC	0.129	K	J-EMPC	0.0484	U		0.101			0.0479	U	
104		0.0488	U		0.0479	U		0.0486	U		0.0484	U		0.0487	U		0.0479	U	
105		12.5			9.54			12.4			2.87			8.49			1.3		
106		0.0791	U		0.0637	U		0.0828	U		0.0606	U		0.0577	U		0.0479	U	
107	107 + 124	0.966	C		0.718	C		1.07	C		0.239	C		0.684	C		0.089	C K	J-EMPC
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
109		2.52			1.37			2.41			0.58			1.61			0.174		
110	110 + 115	24.8	C		23.9	C		27.4	C		5.56	C		18.8	C		2.32	C	
111		0.0488	U		0.0479	U		0.0486	U		0.0484	U		0.0487	U		0.0479	U	
112		0.0488	U		0.0479	U		0.0486	U		0.0484	U		0.0487	U		0.0479	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
114		0.666			0.631			0.661			0.136	K	J-EMPC	0.429			0.058	K	J-EMPC
115	110 + 115		C110			C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85			C85	

Table 2
PCB Congener Qualifier Summary
Lab Sample ID's L11366-11, L11366-12, and L11366-14 through L11366-17
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26229

IUPAC #	COELUTING CONGENERS[1]	08021221SD L11366-11	Lab Qualifier	URS Review Qualifier	08031905SD L11366-12	Lab Qualifier	URS Review Qualifier	08031713SD L11366-14	Lab Qualifier	URS Review Qualifier	08031814SD L11366-15	Lab Qualifier	URS Review Qualifier	08022965SD L11366-16	Lab Qualifier	URS Review Qualifier	08030367SD L11366-17	Lab Qualifier	URS Review Qualifier
117	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
118		29.9			29.4			38.4			6.9			20.9			2.71		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
120		0.154			0.0479	U		0.165			0.0484	U		0.083	K	J-EMPC	0.0479	U	
121		0.0488	U		0.0479	U		0.0486	U		0.0484	U		0.0487	U		0.0479	U	
122		0.289			0.227	K	J-EMPC	0.249			0.076	K	J-EMPC	0.177			0.0479	U	
123		0.569			0.61	K	J-EMPC	0.661			0.107	K	J-EMPC	0.327	K	J-EMPC	0.064	K	J-EMPC
124	107 + 124		C107			C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
126		0.189			0.0725	U		0.199	K	J-EMPC	0.0662	U		0.135	K	J-EMPC	0.0479	U	
127		0.0802	U		0.0646	U		0.0818	U		0.0599	U		0.057	U		0.0479	U	
128	128 + 166	7.54	C		3.22	C		6.15	C		1.61	C		4.96	C		0.621	C	
129	129 + 138 + 160 + 163	43.3	C		20.9	C		41.1	C		9.69	C		27	C		3.67	C	
130		2.9			1.1			2.17			0.62	K	J-EMPC	1.57			0.189		
131		0.389	K	J-EMPC	0.214	K	J-EMPC	0.281			0.073			0.197	K	J-EMPC	0.0479	U	
132		10.1			4.47			7.21			2			5.46			0.702		
133		0.743			0.177			0.517			0.125			0.406			0.0479	U	
134	134 + 143	1.51	C		0.732	C		1	C		0.342	C		0.913	C		0.087	C	
135	135 + 151 + 154	11.8	C		3.02	C		9.28	C		2.92	C		6.77	C		0.811	C	
136		2.83			1.15			2.32			0.531			1.52			0.198	K	J-EMPC
137		1.49			1.23			1.09			0.257			0.809			0.097	K	J-EMPC
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
139	139 + 140	0.648	C		0.277	C K	J-EMPC	0.461	C		0.125	C K	J-EMPC	0.337	C K	J-EMPC	0.052	C	
140	139 + 140		C139			C139			C139			C139			C139			C139	
141		4.09			1.64			2.96			0.92			2.45			0.386		
142		0.0868	U		0.0479	U		0.0649	U		0.0484	U		0.0626	U		0.0479	U	
143	134 + 143		C134			C134			C134			C134			C134			C134	
144		1.25	K	J-EMPC	0.424			0.931			0.343			0.718			0.084		
145		0.0488	U		0.0479	U		0.0486	U		0.0484	U		0.0487	U		0.0479	U	
146		7.12			2.43			7.03			2	K D	J-EMPC	4.7			0.531		
147	147 + 149	25.3	C		9.13	C		23.7	C		6.2	C		15	C		1.83	C	
148		0.101	K	J-EMPC	0.0479	U		0.057			0.0484	U		0.0487	U		0.0479	U	
149	147 + 149		C147			C147			C147			C147			C147			C147	
150		0.058			0.0479	U		0.0486	U		0.0484	U		0.0487	U		0.0479	U	
151	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
152		0.0488	U		0.0479	U		0.0486	U		0.0484	U		0.0487	U		0.0479	U	
153	153 + 168	38.8	C		20.4	C		45.5	C		9.18	C		23.4	C		2.94	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
155		0.0488	U		0.0479	U		0.0486	U		0.0484	U		0.0487	U		0.0479	U	
156	156 + 157	4.7	C		3.5	C		4.73	C		1.13	C		3.08	C		0.399	C	
157	156 + 157		C156			C156			C156			C156			C156			C156	
158		3.41			1.76			3.04			0.766			2.22			0.293		
159		0.307			0.055			0.26			0.065	K	J-EMPC	0.207	K	J-EMPC	0.0479	U	
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
161		0.0623	U		0.0479	U		0.0486	U		0.0484	U		0.0487	U		0.0479	U	
162		0.123	K	J-EMPC	0.053	K	J-EMPC	0.123	K	J-EMPC	0.0484	U		0.107	K	J-EMPC	0.0479	U	
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
164		2.27			0.931	K	J-EMPC	1.79			0.522			1.3			0.186	K	J-EMPC
165		0.0722	U		0.0479	U		0.0513	U		0.0484	U		0.0495	U		0.0479	U	
166	128 + 166		C128			C128			C128			C128			C128			C128	
167		1.9			1.52			2.46			0.461			1.37			0.173	K	J-EMPC
168	153 + 168		C153			C153			C153			C153			C153			C153	
169		0.103	U		0.0479	U		0.104	U		0.0484	U		0.0931	U		0.0479	U	
170		6.51			1.8			8.9	D		2.71	D		5.17			0.967		
171	171 + 173	2.61	C		0.577	C		3.08	C D		0.969	C D		2.41	C		0.363	C K	J-EMPC
172		1.25			0.212			1.91	D		0.561	K D	J-EMPC	1.01			0.18		
173	171 + 173		C171			C171			C171			C171			C171			C171	
174		6.26			1.01			7.1	D		2.29	K D	J-EMPC	5.86			0.917	K	J-EMPC
175		0.343			0.0479	U		0.305	U D		0.18	U D		0.264			0.0479	U	
176		1.11			0.14	K	J-EMPC	1.15	D		0.386	K D	J-EMPC	0.737			0.125	K	J-EMPC
177		6.26			0.807			6.09	K D	J-EMPC	1.82	D		5.35			0.723		
178		2.52			0.328	K	J-EMPC	3.02	D		0.771	K D	J-EMPC	1.87			0.284		
179		4.92			0.491			4.5	D		1.36	D		2.87			0.406		
180	180 + 193	16.7	C		3.5	C		21.3	C D		5.52	C D		12.5	C		2.21	C	
181		0.107	K	J-EMPC	0.0479	U		0.336	U D		0.199	U D		0.0487	U		0.0479	U	
182		0.0488	U		0.0479	U		0.311	U D		0.183	U D		0.059	K	J-EMPC	0.0479	U	
183	183 + 185	5.39	C		1.04	C		6.82	C D		2.03	C D		4.74	C		0.701	C	
184		0.054			0.0479	U		0.246	U D		0.145	U D		0.0487	U		0.0479	U	
185	183 + 185		C183			C183			C183			C183			C183			C183	
186		0.0488	U		0.0479	U		0.264	U D		0.156	U D		0.0487	U		0.0479	U	
187		15.4			2.31			17.6	D		4.8	D		13.4			1.77		
188		0.052	K	J-EMPC	0.0479	U		0.229	U D		0.0493	U G	UJ	0.0487	U		0.0479	U	
189		0.332			0.127	K	J-EMPC	0.62	K D	J-EMPC	0.814	U		0.242			0.0479	U	
190		2.06			0.447			2.52	D		0.602	K D	J-EMPC	1.59			0.247	K	J-EMPC
191		0.316			0.06	K	J-EMPC	0.332	K D	J-EMPC	0.318	K D	J-EMPC	0.225			0.0479	U	
192		0.0488	U		0.0479	U		0.291	U D		0.172	U D		0.0487	U		0.0479	U	
193	180 + 193		C180			C180			C180			C180			C180			C180	
194		3.67			0.429			6.45	D		1.63	D		2.64			0.51		
195		1.57			0.226			2.59	D		1.04	D		1.21			0.233	K	J-EMPC
196		2.16			0.215			3.02	D		0.691	K D	J-EMPC	1.32			0.224		
197	197 + 200	0.886	C G	J	0.084	C		1.26	C D		0.239	C U D		0.632	C G	J	0.109	C K	J-EMPC
198	198 + 199	6.22	C		0.582	C		8.61	C D		1.64	C D		3.91	C		0.744	C	
199	198 + 199		C198			C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197			C197	
201		0.893			0.081			1.01	K D	J-EMPC	0.333	K D	J-EMPC	0.678			0.111	K	J-EMPC
202		2.12			0.171			2.14	D		0.582			1.42			0.199		
203		4.4			0.542			6.12	D		1.05	D		2.77			0.534		
204		0.0488	U		0.0479	U		0.181	U D		0.239	U D		0.0487	U		0.0479	U	
205		0.281			0.048			0.477	K D	J-EMPC	0.305	U D		0.181			0.0479	U	
206		4.78			0.415			5.28	D		1.14			2.94			0.449		
207		0.621	K	J-EMPC	0.112	U		0.751	U D		0.896	U D		0.508			0.145	U	
208		1.85			0.113	U		1.86	K D	J-EMPC	0.451	K	J-EMPC	1.08			0.143	U	
209		8.55			0.663		U	5.33	D		1.34			3.51			0.366	K	U

Notes:

All results are in units of pg/g (picograms per gram), dry weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating that a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating that the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the reported sample quantification limit.
1 = When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 2
PCB Congener Qualifier Summary
Lab Sample ID's L11366-18 through L11366-23
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26478

IUPAC #	COELUTING CONGENERS[1]	08031788SD L11366-18	Lab Qualifier	URS Review Qualifier	08031789SD L11366-19	Lab Qualifier	URS Review Qualifier	08030522SD L11366-20	Lab Qualifier	URS Review Qualifier	08030524SD L11366-21	Lab Qualifier	URS Review Qualifier	08030426SD L11366-22	Lab Qualifier	URS Review Qualifier	08030427SD L11366-23	Lab Qualifier	URS Review Qualifier
1		0.144			0.1	K	J-EMPC	0.144			0.395			0.129			0.233		
2		0.432			0.636			4.82			3.23			0.937			3.04		
3		0.184	K	J-EMPC	0.238	K	J-EMPC	0.362			0.244			0.162			0.319		
4		0.283			0.269	K	J-EMPC	0.293			0.352			0.301			1.19		
5		0.0571	U		0.0834	U		0.0769	U		0.154	U		0.0682	U		0.107	U	
6		0.125			0.095	K	J-EMPC	0.12	K	J-EMPC	0.204	K	J-EMPC	0.129			0.346		
7		0.086	K	U	0.078	K	U	0.088	K	U	0.139	U		0.0618	U		0.0966	U	
8		0.46			0.404			0.672			0.693			0.464			0.876		
9		0.0525	U		0.0766	U		0.074	K	J-EMPC	0.137	U		0.0606	U		0.0948	U	
10		0.0514	U		0.075	U		0.0692	U		0.138	U		0.0614	U		0.0959	U	
11		35.1			19.9			57			68			57.6			205		
12	12 + 13	0.0565	C U		0.0825	C U		0.0761	C U		0.15	C U		0.53	C		0.104	C U	
13	12 + 13		C12			C12			C12			C12			C12			C12	
14		0.0546	U		0.0796	U		0.0735	U		0.143	U		0.0633	U		0.0989	U	
15		0.876			0.66			1.52			1.59			1.12			2.59		
16		0.402			0.332			0.553			0.616			0.543			2.43		
17		0.389			0.287			0.568			0.604			0.455			1.6		
18	18 + 30	0.87	C		0.619	C		1.31	C		1.39	C		1.1	C		4.7	C	
19		0.136	K	J-EMPC	0.177			0.126			0.159	K	J-EMPC	0.129	K	J-EMPC	0.26	K	J-EMPC
20	20 + 28	1.86	C		1.31	C		4.43	C		4.15	C		2.7	C		5.93	C	
21	21 + 33	0.687	C		0.453	C	U	1.25	C		1.24	C		0.855	C		1.86	C	
22		0.678			0.482			1.37			1.38			0.913			2.94		
23		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.045	U	
24		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.055		
25		0.107			0.087	K	J-EMPC	0.198			0.204			0.135			0.298		
26	26 + 29	0.229	C		0.162	C		0.461	C		0.437	C		0.341	C		0.74	C	
27		0.097			0.1	K	J-EMPC	0.111			0.113	K	J-EMPC	0.126			0.58		
28	20 + 28		C20			C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18			C18	
31		1.16			0.841			2.82			2.65			1.77			3.47		
32		0.178			0.128			0.244			0.222			0.19			0.285		
33	21 + 33		C21			C21			C21			C21			C21			C21	
34		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.045	U	
35		0.118			0.06	K	J-EMPC	0.23			0.279			0.238			0.438		
36		0.0423	U		0.0454	U		0.085			0.063	K	J-EMPC	0.069			0.12		
37		0.811			0.634			1.67			1.57			1.1			2.22		
38		0.0423	U		0.0454	U		0.065	K	J-EMPC	0.071	K	J-EMPC	0.05	K	J-EMPC	0.12		
39		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.079		
40	40 + 41 + 71	0.867	C		0.588	C	U	1.65	C		1.58	C		1.14	C		2.7	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
42		0.605			0.519			1.06			1.15			0.88			3.84		
43		0.051			0.0454	U		0.153			0.118	K	J-EMPC	0.076	K	J-EMPC	0.204		
44	44 + 47 + 65	2.73	C		2.04	C	U	4.57	C		5.29	C		3.94	C		18	C	
45	45 + 51	0.261	C		0.185	C		0.47	C		0.415	C		0.355	C		0.771	C	
46		0.084			0.092	K	J-EMPC	0.15			0.144	K	J-EMPC	0.095			0.166		
47	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
48		0.37			0.231			0.65			0.687			0.484			1.48		
49	49 + 69	1.24	C		0.825	C		2.71	C		2.52	C		1.72	C		3.41	C	
50	50 + 53	0.291	C		0.244	C	U	0.41	C		0.443	C		0.369	C		1.36	C	
51	45 + 51		C45			C45			C45			C45			C45			C45	
52		3.5			2.37			6.24			6.44			4.64			12.6		
53	50 + 53		C50			C50			C50			C50			C50			C50	
54		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.045	U	
55		0.082	K	J-EMPC	0.062	K	J-EMPC	0.3			0.099			0.115			0.207		
56		1.14			0.963			2.37			2.38			1.73			3.74		
57		0.0663	U		0.0492	U		0.0554	U		0.0736	U		0.0362	U		0.0722	U	
58		0.0659	U		0.0489	U		0.0551	U		0.0737	U		0.0362	U		0.0723	U	
59	59 + 62 + 75	0.209	C	U	0.148	C	U	0.397	C	U	0.394	C	U	0.302	C	U	1.01	C	
60		0.709			0.626	K	J-EMPC	1.67			1.58			1.03			1.95		
61	61 + 70 + 74 + 76	4.84	C		3.55	C		11.5	C		10.8	C		7.36	C		14.2	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
63		0.105	K	J-EMPC	0.092			0.304			0.255			0.171			0.375		
64		0.987			0.745			2.21			2.12			1.45			2.85		
65	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
66		3.11			2.51			7.28			6.99			4.81			10		
67		0.057	K	J-EMPC	0.058			0.137			0.125			0.097			0.196		
68		0.0612	U		0.0454	U		0.08			0.076	K	J-EMPC	0.045	K	J-EMPC	0.082		
69	49 + 69		C49			C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
72		0.063	U		0.0467	U		0.091	K	J-EMPC	0.0735	U		0.045			0.099	K	J-EMPC
73		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.045	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
77		0.409			0.341			0.989			0.983			0.699			1.39		
78		0.0671	U		0.0498	U		0.0561	U		0.0768	U		0.0362	U		0.0754	U	
79		0.105	K	J-EMPC	0.081	K	J-EMPC	0.191			0.212			0.183			0.612		
80		0.0599	U		0.0454	U		0.05	U		0.0689	U		0.0362	U		0.0676	U	
81		0.0662	U		0.0486	U		0.063	K	J-EMPC	0.0786	U		0.049	K	J-EMPC	0.1	K	J-EMPC
82		0.572			0.386			1.14			1.01			1.15			1.53		
83	83 + 99	4.73	C		3.33	C		9.91	C		9.78	C		8.11	C		19.2	C	
84		1.09			0.811			2.55			2.43			2.12			3.94		
85	85 + 116 + 117	1.39	C		1.12	C		3.42	C		3.01	C		2.72	C		5.27	C K	J-EMPC
86	86 + 87 + 97 + 108 + 119 + 125	4.48	C		3.57	C	U	9.22	C		9.26	C		8.05	C		21.8	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
88	88 + 91	0.753	C		0.518	C		1.59	C		1.53	C		1.35	C		2.51	C	
89		0.05			0.0454	U		0.102	K	J-EMPC	0.08	K	J-EMPC	0.082			0.099	K	J-EMPC
90	90 + 101 + 113	7.17	C		5.08	C		15.2	C		16.2	C		12	C		31.3	C	
91	88 + 91		C88			C88			C88			C88			C88			C88	
92		1.24			0.891			2.92			2.78			2.18			5.23		
93	93 + 95 + 98 + 100 + 102	5.1	C		3.65	C		9.5	C		9.52	C		8.34	C		27.1	C	
94		0.0423	U		0.0454	U		0.0453	U		0.049	K	J-EMPC	0.049			0.094		
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
96		0.0423	U		0.0454	U		0.048	K	J-EMPC	0.054	K	J-EMPC	0.046	K	J-EMPC	0.069	K	J-EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
103		0.0423	U		0.0454	U		0.094			0.101			0.078	K	J-EMPC	0.128	K	J-EMPC
104		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.045	U	
105		4.02			3.06			8.92			8.01			7.17			13.2		
106		0.0514	U		0.0571	U		0.0852	U		0.0713	U		0.0725	U		0.11	U	
107	107 + 124	0.281	C		0.204	C		0.602	C		0.734	C		0.603	C		1.07	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
109		0.594			0.459			1.41			1.35			1.12			2.09		
110	110 + 115	8.56	C		6.03	C		18.7	C		17.1	C		15.1	C		33.9	C	
111		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.045	U	
112		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.045	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
114		0.267			0.174			0.41			0.485			0.378			0.798		
115	110 + 115		C110			C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85			C85	

Table 2
PCB Congener Qualifier Summary
Lab Sample ID's L11366-18 through L11366-23
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26478

IUPAC #	COELUTING CONGENERS[1]	08031788SD L11366-18	Lab Qualifier	URS Review Qualifier	08031789SD L11366-19	Lab Qualifier	URS Review Qualifier	08030522SD L11366-20	Lab Qualifier	URS Review Qualifier	08030524SD L11366-21	Lab Qualifier	URS Review Qualifier	08030426SD L11366-22	Lab Qualifier	URS Review Qualifier	08030427SD L11366-23	Lab Qualifier	URS Review Qualifier
117	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
118		12.7			10			22.2			22.4			20.9			64.2		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
120		0.055	K	J-EMPC	0.0454	U		0.131			0.108	K	J-EMPC	0.083	K	J-EMPC	0.228		
121		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.045	U	
122		0.102	K	J-EMPC	0.098	K	J-EMPC	0.176			0.196	K	J-EMPC	0.191			0.373		
123		0.201		U	0.158	K	U	0.38		U	0.429		U	0.442		U	1.22		
124	107 + 124		C107			C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
126		0.0635	U		0.0693	U		0.175	K	J-EMPC	0.147	K	J-EMPC	0.117			0.234		
127		0.0524	U		0.0582	U		0.0869	U		0.0745	U		0.0758	U		0.115	U	
128	128 + 166	1.75	C		1.22	C		4.22	C		4.07	C		3.46	C		5.93	C	
129	129 + 138 + 160 + 163	13.8	C		11	C		29.3	C		31.6	C		25.6	C		65.7	C	
130		0.645			0.46			1.7			1.71			1.35			2.39		
131		0.0617	U		0.1			0.163	K	J-EMPC	0.157	K	J-EMPC	0.184			0.303		
132		2.33			1.79			5.63			5.8			5.91			8.28		
133		0.153	K	J-EMPC	0.116	K	J-EMPC	0.463			0.365			0.283			0.493		
134	134 + 143	0.33	C		0.216	C		0.807	C		0.758	C		0.707	C		1.18	C	
135	135 + 151 + 154	2.94	C		2.3	C		6.76	C		7.47	C		5.6	C		11.2	C	
136		0.741			0.581			1.62			1.96			1.47			2.59		
137		0.499			0.359			0.929			0.852			0.788			1.41		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
139	139 + 140	0.147	C K	U	0.114	C K	U	0.381	C		0.324	C		0.327	C		0.545	C	
140	139 + 140		C139			C139			C139			C139			C139			C139	
141		1.07			0.912			2.24			2.71			2.28			3.28		
142		0.0616	U		0.0564	U		0.087	U		0.0614	U		0.066	U		0.0819	U	
143	134 + 143		C134			C134			C134			C134			C134			C134	
144		0.283			0.244			0.646			0.726			0.613			1.03		
145		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.045	U	
146		2.17			1.61			3.92	G	J	3.89	G	J	3.31	G	J	8.46	G	J
147	147 + 149	7.88	C		5.81	C		16.6	C		18.3	C		15.4	C		34.9	C	
148		0.0423	U		0.0454	U		0.059	K	J-EMPC	0.065	K	J-EMPC	0.0362	U		0.072		
149	147 + 149		C147			C147			C147			C147			C147			C147	
150		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.05	K	J-EMPC
151	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
152		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.045	U	
153	153 + 168	15.1	C		12.9	C		26.9	C		31.8	C		27.1	C		100	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
155		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.045	U	
156	156 + 157	1.35	C		0.935	C	U	2.54	C		2.58	C		2.42	C		5.17	C	
157	156 + 157		C156			C156			C156			C156			C156			C156	
158		0.925			0.777			2.11			2.23			1.91			3.67		
159		0.107			0.124			0.154			0.339			0.248			0.286		
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
161		0.0423	U		0.0454	U		0.0598	U		0.0467	U		0.0474	U		0.0588	U	
162		0.0452	U		0.0454	U		0.078			0.084	K	J-EMPC	0.089			0.125	K	J-EMPC
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
164		0.577			0.399			1.3			1.45			1.26			2.06		
165		0.0494	U		0.0454	U		0.0699	U		0.0505	U		0.0543	U		0.0674	U	
166	128 + 166		C128			C128			C128			C128			C128			C128	
167		0.71		U	0.64		U	1.18			1.3			1.25			3.84		
168	153 + 168		C153			C153			C153			C153			C153			C153	
169		0.0485	U		0.0454	U		0.0685	U		0.102	U		0.0571	U		0.0971	U	
170		1.91			2.18			3.76			4.89			3.87			5.51		
171	171 + 173	0.715	C		0.765	C		1.55	C		1.9	C		1.47	C K	J-EMPC	2.39	C	
172		0.351			0.379			0.785			1.01			0.752			1.04		
173	171 + 173		C171			C171			C171			C171			C171			C171	
174		1.82			2.12			3.7			5.63			4.18			5.36		
175		0.1			0.105	K	J-EMPC	0.205	K	J-EMPC	0.27			0.183	K	J-EMPC	0.333		
176		0.228			0.256	K	J-EMPC	0.581			0.78			0.564			0.966		
177		1.68			1.61			3.89			4.43			3.24			5.22		
178		0.657			0.542			1.63			1.92			1.28			2.16		
179		1.05			0.987			2.54			3.41			2.44			3.65		
180	180 + 193	5.16	C		6.03	C		10.1	C		14.1	C		11	C		22.1	C	
181		0.0423	U		0.0454	U		0.047	K	J-EMPC	0.054			0.073	K	J-EMPC	0.112		
182		0.0423	U		0.0454	U		0.065	K	U	0.087	K	U	0.058	K	U	0.096	K	U
183	183 + 185	1.89	C		1.81	C		3.57	C		4.84	C		3.81	C		7.36	C	
184		0.0423	U		0.0454	U		0.0453	U		0.049	K	J-EMPC	0.0362	U		0.055		
185	183 + 185		C183			C183			C183			C183			C183			C183	
186		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.045	U	
187		4.61			4.24			10.5			13			9.68			19.8		
188		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.054		U
189		0.1			0.098			0.225			0.26			0.264	K	J-EMPC	0.351		
190		0.641			0.751			1.31			1.6			1.27			3.12		
191		0.066			0.106			0.193			0.211			0.185			0.312		
192		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.045	U	
193	180 + 193		C180			C180			C180			C180			C180			C180	
194		1.12			1.94			2.87			3.34			2.42			3.24		
195		0.499			0.853			1.25			1.41			0.988			1.5		
196		0.56			0.909			1.38			1.77			1.34			1.9		
197	197 + 200	0.211	C G	U	0.301	C K	U	0.375	C G	J	0.415	C G	J	0.335	C G	J	0.447	C G	J
198	198 + 199	1.49	C		1.89	C		4.52	C		5.38	C		4.09	C		5.79	C	
199	198 + 199		C198			C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197			C197	
201		0.204		U	0.223	K	U	0.636			0.686			0.527			0.765		
202		0.437			0.362			1.53			1.71			1.13			1.92		
203		1.25			1.55			3.29			3.84			3			6.21		
204		0.0423	U		0.0454	U		0.0453	U		0.0467	U		0.0362	U		0.045	U	
205		0.081			0.116			0.231			0.245			0.149			0.192		
206		0.968			0.994			2.9			3.38			2.35			4.29		
207		0.158			0.107	U		0.514			0.432			0.353			0.547		
208		0.386			0.3			1.17			1.31			0.967			1.61		
209		1.14			0.669		U	3.71			3.61			2.46			4.55		

Notes:

All results are in units of pg/g (picograms per gram), dry weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating that a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating that the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the reported sample quantification limit.

1 = When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 2
PCB Congener Qualifier Summary
Lab Sample ID's L11366-24 through L11366-28 and L11366-30
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26478

IUPAC #	COELUTING CONGENERS[1]	08030428SD L11366-24	Lab Qualifier	URS Review Qualifier	08022229SD L11366-25	Lab Qualifier	URS Review Qualifier	08022534SD L11366-26	Lab Qualifier	URS Review Qualifier	08022535SD L11366-27	Lab Qualifier	URS Review Qualifier	08022536SD L11366-28	Lab Qualifier	URS Review Qualifier	08022738SD L11366-30	Lab Qualifier	URS Review Qualifier
1		0.145			0.198			0.375			0.156			0.176	K	J-EMPC	0.178	K	J-EMPC
2		2.16			7.02			7.86			2.01			2.11			1.69		
3		0.242			0.58			0.88			0.253			0.222			0.241		
4		0.278	K	J-EMPC	0.928			1.22			0.4	K	J-EMPC	0.488			1.02		
5		0.135	U		0.13	U		0.085	K	J-EMPC	0.0916	U		0.105	U		0.0987	U	
6		0.18	K	J-EMPC	1.1			0.878			0.218			0.243			0.332		
7		0.123	U		0.258		U	0.215		U	0.098	K	U	0.104		U	0.103	K	U
8		0.716			4.71			3.33			0.88			0.988			0.904		
9		0.12	U		0.364			0.219			0.0814	U		0.0938	U		0.0885	U	
10		0.122	U		0.117	U		0.0761	U		0.0824	U		0.0973	U		0.0919	U	
11		66.4			70.5			83			65			69.4			135		
12	12 + 13	0.132	C U		1.43	C		1.4	C		0.0893	C U G	UJ	0.102	C U		0.0966	C U	
13	12 + 13		C12			C12			C12			C12			C12			C12	
14		0.125	U		0.121	U		0.11	K	J-EMPC	0.085	U		0.098	U		0.0925	U	
15		1.83			5.29			5.42			1.99			2.26			1.98		
16		0.507			2.08			2.19			0.621			0.884			1.64		
17		0.531	K	J-EMPC	2.57			2.64			0.797			0.958			1.29		
18	18 + 30	1.17	C		5.01	C		5.11	C		1.57	C		2.17	C		3.6	C	
19		0.107	K	J-EMPC	0.352			0.464			0.141			0.197	K	J-EMPC	0.189		
20	20 + 28	4.86	C		16.1	C		15.5	C		5.51	C		6.11	C		5.01	C	
21	21 + 33	1.37	C		6.77	C		5.58	C G	J	1.47	C		1.89	C		1.56	C	
22		1.48			5.44			4.93			1.65			2			2.16		
23		0.0443	U		0.0425	U		0.0455	U		0.0466	U		0.049	U		0.044	U	
24		0.0443	U		0.087	K	J-EMPC	0.081			0.0466	U		0.049	U		0.044	U	
25		0.214			0.93			0.883			0.259			0.29			0.269		
26	26 + 29	0.471	C		2.02	C		1.83	C		0.546	C		0.659	C		0.657	C	
27		0.094			0.364			0.466			0.129	G	J	0.195			0.397		
28	20 + 28		C20			C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18			C18	
31		3.01			11.5			10.9	G	J	3.32	G	J	3.87			3.09		
32		0.264			1.07			0.859			0.258			0.316			0.238		
33	21 + 33		C21			C21			C21			C21			C21			C21	
34		0.0443	U		0.058	K	J-EMPC	0.062	K	J-EMPC	0.0466	U		0.049	U		0.044	U	
35		0.326			0.387			0.543			0.319			0.261			0.349		
36		0.133	K	J-EMPC	0.097	K	J-EMPC	0.136			0.101	K	J-EMPC	0.103			0.112	K	J-EMPC
37		1.93			4.09			4.73			2.1			2.15			1.97		
38		0.059			0.053	K	J-EMPC	0.12			0.053			0.049	K	J-EMPC	0.044		
39		0.061			0.068	K	J-EMPC	0.136			0.0466	U		0.049	U		0.058	K	J-EMPC
40	40 + 41 + 71	1.55	C		3.73	C		6.64	C		2.03	C		1.76	C		1.98	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
42		0.939			2.22			4.01			1.14			1.3			2.02		
43		0.148	K	J-EMPC	0.306			0.543			0.132	K	J-EMPC	0.157	K	J-EMPC	0.183	K	J-EMPC
44	44 + 47 + 65	4.46	C		8.76	C		21.4	C		5.03	C		5.26	C		8.45	C	
45	45 + 51	0.475	C		1.13	C		1.8	C		0.527	C		0.523	C		0.47	C	
46		0.183			0.362			0.646			0.167			0.14			0.16		
47	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
48		0.643			1.76			3.03			0.702			0.834			1.03		
49	49 + 69	2.76	C		5.26	C		11.9	C		3.35	C		2.88	C		2.85	C	
50	50 + 53	0.391	C		0.815	C		1.83	C		0.485	C		0.471	C		0.726	C	
51	45 + 51		C45			C45			C45			C45			C45			C45	
52		6.31			10.4			37.5			7.05			6.82			8.74		
53	50 + 53		C50			C50			C50			C50			C50			C50	
54		0.0443	U		0.0425	U		0.0455	U		0.0466	U		0.049	U		0.044	U	
55		0.225			0.293			0.428			0.151			0.233			0.194		
56		2.46			3.18			6.34			2.04			2.41			2.35		
57		0.0774	U		0.0577	U		0.114	U		0.0693	U		0.0858	U		0.0731	U	
58		0.0775	U		0.0578	U		0.114	U		0.0694	U		0.0896	U		0.0763	U	
59	59 + 62 + 75	0.39	C	U	0.822	C		1.23	C		0.396	C	U	0.522	C		0.591	C	
60		1.7			1.95			3.47			1.38			1.63			1.53		
61	61 + 70 + 74 + 76	10.7	C		15	C		40.3	C		10.5	C		11.4	C		11.1	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
63		0.283			0.393			0.777			0.261			0.269			0.248		
64		2.33			4.16			8.72			2.25			2.43			2.26		
65	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
66		6.87			9.65			18			6.49			7.22			7.06		
67		0.133			0.263			0.368			0.159			0.174			0.155		
68		0.0752	U		0.11	K	J-EMPC	0.122			0.0673	U		0.0809	U		0.0689	U	
69	49 + 69		C49			C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
72		0.085	K	J-EMPC	0.128	K	J-EMPC	0.206			0.08			0.0802	U		0.089		
73		0.0443	U		0.0425	U		0.0455	U		0.0466	U		0.049	U		0.044	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
77		1.11			1.4			2.01			1.04			0.965			1.13		
78		0.0808	U		0.0602	U		0.119	U		0.0723	U		0.0871	U		0.0743	U	
79		0.206			0.255			0.605			0.154			0.162	K	J-EMPC	0.295		
80		0.0725	U		0.0541	U		0.107	U		0.0649	U		0.0804	U		0.0685	U	
81		0.0832	U		0.073	K	J-EMPC	0.143			0.075	U		0.0896	U		0.0767	U	
82		1.23			1.43			5.71			0.953			1.01			1.14		
83	83 + 99	9.86	C		11.9	C		33	C		8.5	C		8.11	C		13	C	
84		2.48			2.89			13.2			2.43			2.07			2.51		
85	85 + 116 + 117	3.55	C		3.77	C		10.6	C		2.72	C		2.58	C		3.83	C	
86	86 + 87 + 97 + 108 + 119 + 125	9.4	C		11.2	C		39.1	C		8.07	C		7.7	C		13.3	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
88	88 + 91	1.48	C		1.97	C		6.79	C		1.56	C		1.36	C		1.8	C	
89		0.063	K	J-EMPC	0.1	K	J-EMPC	0.462			0.079	K	J-EMPC	0.069			0.084	K	J-EMPC
90	90 + 101 + 113	14.8	C		18.4	C		58.9	C		13.1	C		13.1	C		20.7	C	
91	88 + 91		C88			C88			C88			C88			C88			C88	
92		2.94			3.28			10.3			2.41			2.46			3.87		
93	93 + 95 + 98 + 100 + 102	9.08	C		10.9	C		43.8	C		8.42	C		8.08	C		13.4	C	
94		0.0614	U		0.065			0.209	K	J-EMPC	0.052	K	J-EMPC	0.067	K	J-EMPC	0.044	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
96		0.053	K	J-EMPC	0.074			0.235			0.055	K	J-EMPC	0.049	U		0.044	K	J-EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
103		0.092			0.138			0.339			0.086			0.106	K	J-EMPC	0.104	K	J-EMPC
104		0.0443	U		0.0425	U		0.0455	U		0.0466	U		0.049	U		0.044	U	
105		9.06			10.9			27.5			8.18			8.03			9.85		
106		0.106	U		0.136	U		0.156	U		0.0664	U		0.111	U		0.111	U	
107	107 + 124	0.716	C		0.794	C		2.36	C		0.623	C		0.477	C		0.792	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
109		1.48			1.79			4.61			1.38			1.27			1.52		
110	110 + 115	19.4	C		22.1	C		68.2	C		16.1	C		15.6	C		25	C	
111		0.0443	U		0.0425	U		0.0455	U		0.0466	U		0.049	U		0.044	U	
112		0.0443	U		0.0425	U		0.0455	U		0.0466	U		0.049	U		0.044	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
114		0.479			0.602			1.63			0.382			0.372			0.422		
115	110 + 115		C110			C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85			C85	

Table 2
PCB Congener Qualifier Summary
Lab Sample ID's L11366-24 through L11366-28 and L11366-30
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26478

IUPAC #	COELUTING CONGENERS[1]	08030428SD L11366-24	Lab Qualifier	URS Review Qualifier	08022229SD L11366-25	Lab Qualifier	URS Review Qualifier	08022534SD L11366-26	Lab Qualifier	URS Review Qualifier	08022535SD L11366-27	Lab Qualifier	URS Review Qualifier	08022536SD L11366-28	Lab Qualifier	URS Review Qualifier	08022738SD L11366-30	Lab Qualifier	URS Review Qualifier
117	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
118		22.1			28.3			70.5			19.9			20.7			35.6		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
120		0.077	K	J-EMPC	0.118	K	J-EMPC	0.177			0.099	K	J-EMPC	0.074			0.144		
121		0.0443	U		0.0425	U		0.0455	U		0.0466	U		0.049	U		0.044	U	
122		0.22			0.27			0.718			0.189	K	J-EMPC	0.16	K	J-EMPC	0.168	K	J-EMPC
123		0.408		U	0.446		U	0.98			0.309		U	0.401		U	0.656		
124	107 + 124		C107			C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
126		0.185	K	J-EMPC	0.205			0.337			0.126			0.139	U		0.184		
127		0.111	U		0.142	U		0.17			0.0694	U		0.115	U		0.114	U	
128	128 + 166	4.61	C		5.17	C		12.7	C		4.08	C		3.88	C		4.37	C	
129	129 + 138 + 160 + 163	32.5	C		36.7	C		81.3	C		25.9	C		26.9	C		38.8	C	
130		2.05			2.12			4.97			1.63			1.66			1.94		
131		0.223			0.244			0.868			0.188			0.185			0.247		
132		6.59			7.24			22.6			5.81			5.23			6.08		
133		0.438			0.508			0.956			0.459			0.34			0.411		
134	134 + 143	0.948	C		1.1	C		3.31	C		0.809	C		0.712	C		0.886	C	
135	135 + 151 + 154	7.66	C		8.3	C		17.9	C		6.04	C		6.18	C		7.89	C	
136		1.83			2.11			6.15			1.73			1.49			1.84		
137		0.88			0.955			3.11			0.768			0.71			0.838		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
139	139 + 140	0.443	C		0.454	C		1.21	C		0.381	C		0.32	C		0.413	C	
140	139 + 140		C139			C139			C139			C139			C139			C139	
141		2.68			2.75			8.66			2.14			1.94			2.04		
142		0.0521	U		0.0742	U		0.123	U		0.0648	U		0.0515	U		0.044	U	
143	134 + 143		C134			C134			C134			C134			C134			C134	
144		0.65			0.821			2.37			0.589			0.552			0.771		
145		0.0443	U		0.0425	U		0.0455	U		0.0466	U		0.049	U		0.044	U	
146		4.23	G	J	4.6	G	J	9.76	G	J	3.44			3.7	G	J	6.01	G	J
147	147 + 149	18.5	C		21.3	C		48.8	C		15.5	C		14.3	C		22	C	
148		0.051	K	J-EMPC	0.086	K	J-EMPC	0.1			0.0466	U		0.071	K	J-EMPC	0.076	K	J-EMPC
149	147 + 149		C147			C147			C147			C147			C147			C147	
150		0.048			0.0425	U		0.097			0.049	K	J-EMPC	0.049	U		0.047		
151	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
152		0.0443	U		0.0425	U		0.0455	U		0.0466	U		0.049	U		0.044	U	
153	153 + 168	27.9	C		32.8	C		63.5	C		22.9	C		25.6	C		47	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
155		0.0443	U		0.0425	U		0.0455	U		0.0466	U		0.049	U		0.044	U	
156	156 + 157	2.82	C		3.19	C		8.5	C		2.42	C		2.4	C		3.12	C	
157	156 + 157		C156			C156			C156			C156			C156			C156	
158		2.35			2.47			6.86			1.99			1.91			2.56		
159		0.288			0.303			0.614			0.184	K	J-EMPC	0.211			0.203		
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
161		0.0443	U		0.0533	U		0.0885	U		0.0466	U		0.049	U		0.044	U	
162		0.139			0.121	K	J-EMPC	0.214			0.072			0.095	K	J-EMPC	0.116		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
164		1.67			1.63			4.32			1.21			1.22			1.32		
165		0.0443	U		0.061	U		0.101	U		0.0533	U		0.049	U		0.044	U	
166	128 + 166		C128			C128			C128			C128			C128			C128	
167		1.18			1.46			3.2			1.1		U	1.01		U	1.86		
168	153 + 168		C153			C153			C153			C153			C153			C153	
169		0.11	U		0.0811	U		0.179	U		0.0711	U		0.0891	U		0.0951	U	
170		5.64			5.72			10.9			4.58			3.68			3.83		
171	171 + 173	2.03	C		2.16	C		4.41	C		1.84	C		1.59	C		1.92	C	
172		1.12			1.13			1.86			0.864			0.733			0.73		
173	171 + 173		C171			C171			C171			C171			C171			C171	
174		5.39			5.45			10.6			4.36			3.72			3.62		
175		0.224			0.284			0.519			0.233			0.204	K	J-EMPC	0.212	K	J-EMPC
176		0.727			0.842			1.54			0.646			0.605			0.718		
177		4.88			5.3			8.81			3.94			3.66			4.73		
178		2.04			2.1			3.48			1.66			1.33			1.93		
179		3.22			3.49			5.98			2.82			2.46			3.12		
180	180 + 193	14	C		14	C		24.5	C		11	C		9.2	C		11.3	C	
181		0.114	K	J-EMPC	0.082			0.191	K	J-EMPC	0.057	K	J-EMPC	0.061	K	J-EMPC	0.091	K	J-EMPC
182		0.054		U	0.058	K	U	0.143		U	0.054	K	U	0.053	K	U	0.071	K	U
183	183 + 185	4.56	C		4.98	C		9.01	C		3.87	C		3.4	C		4.7	C	
184		0.0443	U		0.084	K	J-EMPC	0.065			0.0466	U		0.049	U		0.051	K	J-EMPC
185	183 + 185		C183			C183			C183			C183			C183			C183	
186		0.0443	U		0.0425	U		0.0455	U		0.0466	U		0.049	U		0.044	U	
187		12.8			13.6			22			9.79			9.27			13.2		
188		0.0443	U		0.0425	U		0.066	K	U	0.0466	U		0.049	U		0.044	U	
189		0.416			0.357	K	J-EMPC	0.573			0.248	K	J-EMPC	0.237			0.188		
190		1.74			1.9			3.01			1.48			1.21			1.69		
191		0.224			0.224			0.457			0.223	K	J-EMPC	0.155	K	J-EMPC	0.18		
192		0.0443	U		0.0425	U		0.0455	U		0.0466	U		0.049	U		0.044	U	
193	180 + 193		C180			C180			C180			C180			C180			C180	
194		3.6			3.2			5.11			3.05			2.32			2.33		
195		1.57			1.45			2.3			1.33			1.17			1.24		
196		1.85			1.74			2.87			1.47			1.19			1.28		
197	197 + 200	0.491	C G	J	0.447	C G	J	0.572	C G	J	0.474	C K G	J-EMPC	0.35	C G	J	0.426	C G	J
198	198 + 199	6.38	C		5.26	C		8.78	C		5.19	C		3.27	C		3.25	C	
199	198 + 199		C198			C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197			C197	
201		0.662			0.642			1.2			0.639			0.428			0.568		
202		1.86			1.6			2.59			1.6			1.07			1.39		
203		4.26			3.96			6.34			3.71			2.61			3.19		
204		0.0443	U		0.0425	U		0.0455	U		0.0466	U		0.049	U		0.044	U	
205		0.222			0.242			0.347			0.197			0.172	K	J-EMPC	0.194	K	J-EMPC
206		6.18			4.59			7.21			4.28			2.85			2.71		
207		0.652			0.601			0.938			0.517			0.445			0.416		
208		2.41			1.85			2.5			1.59			1.13			1.04		
209		6.38			6.12			7.86			4.05			3.47			3.33		

Notes:

All results are in units of pg/g (picograms per gram), dry weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating that a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating that the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the reported sample quantification limit.
1 = When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 2
PCB Congener Qualifier Summary
Lab Sample ID's L11366-13 and L11366-31 through L11366-33
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26268

IUPAC #	COELUTING CONGENERS[1]	08031806SD L11366-13	Lab Qualifier	URS Review Qualifier	08022739SD L11366-31	Lab Qualifier	URS Review Qualifier	08022740SD L11366-32	Lab Qualifier	URS Review Qualifier	08022741SD L11366-33	Lab Qualifier	URS Review Qualifier
1		0.368		U	0.144		U	0.233		U	0.276		U
2		0.711	K	J-EMPC	1.13			1.63			1.73		
3		0.467			0.261	K	J-EMPC	0.372	K	J-EMPC	0.238		
4		1.39	K	J-EMPC	0.274	K	J-EMPC	0.629			0.506	K	J-EMPC
5		0.212	U	UJ	0.12	U		0.107	U		0.125	U	
6		0.258	K	J-EMPC	0.154			0.231	K	J-EMPC	0.224		
7		0.202	K	UJ	0.112	U		0.124	K	J-EMPC	0.114	U	
8		1.15	K	J-EMPC	0.543			0.771			1.05		
9		0.189	U	UJ	0.107	U		0.0948	U		0.11	U	
10		0.191	U	UJ	0.109	U		0.0961	U		0.113	U	
11		32.1		J	51.1			100			56.1		
12	12 + 13	0.223	C U	UJ	0.127	C U		0.112	C U		0.118	C U	
13	12 + 13		C12			C12			C12			C12	
14		0.204	U	UJ	0.116	U		0.103	U		0.114	U	
15		1.02			1.55			1.91			1.74		
16		0.408			0.284		U	0.815			0.498		
17		1.25			0.343			0.75			0.466	K	J-EMPC
18	18 + 30	1.52	C		0.727	C	U	1.97	C		1.16	C	
19		0.723			0.072			0.18			0.139		
20	20 + 28	2.94	C		2.9	C		4.11	C		3.23	C	
21	21 + 33	1.23	C		0.811	C		1.18	C		0.955	C	
22		0.698			0.889			1.64			1.16		
23		0.0626	U		0.0474	U		0.0475	U		0.0535	U	
24		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
25		0.405			0.171	K	J-EMPC	0.247			0.16		
26	26 + 29	0.678	C		0.319	C K	J-EMPC	0.466	C		0.385	C	
27		0.395			0.067			0.203	K	J-EMPC	0.124	K	J-EMPC
28	20 + 28		C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18	
31		2.49			1.81			2.42			1.9		
32		0.635			0.131			0.207			0.199		
33	21 + 33		C21			C21			C21			C21	
34		0.0626	U		0.0474	U		0.062	K	J-EMPC	0.0513	U	
35		0.15			0.283			0.352	K	J-EMPC	0.216		
36		0.0626	U		0.125	K	J-EMPC	0.095	K	J-EMPC	0.073	K	J-EMPC
37		0.808			1.35			1.54			1.45		
38		0.0626	U		0.0474	U		0.0475	U		0.0502	U	
39		0.0626	U		0.0474	U		0.0475	U		0.0493	U	
40	40 + 41 + 71	2.88	C		0.791	C		1.32	C		0.867	C	
41	40 + 41 + 71		C40			C40			C40			C40	
42		1.44			0.523			1.44			0.737	K	J-EMPC
43		0.284			0.066	K	J-EMPC	0.086			0.063	K	J-EMPC
44	44 + 47 + 65	13.7	C		2.44	C		5.89	C		3.11	C	
45	45 + 51	0.538	C		0.205	C		0.36	C		0.241	C	
46		0.251			0.072			0.1	K	J-EMPC	0.095		
47	44 + 47 + 65		C44			C44			C44			C44	
48		0.712			0.337			0.728			0.442		
49	49 + 69	8.72	C		1.41	C		2.2	C		1.49	C	
50	50 + 53	1.61	C		0.227	C		0.475	C		0.283	C	
51	45 + 51		C45			C45			C45			C45	
52		32.9			3.71			6.06			3.99		
53	50 + 53		C50			C50			C50			C50	
54		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
55		0.121	U		0.0606	U		0.0558	U		0.0992	U	
56		3.93			1.51			2.3			1.47		
57		0.115	U		0.0577	U		0.0532	U		0.0928	U	
58		0.118	U		0.059	U		0.0544	U		0.0968	U	
59	59 + 62 + 75	0.404	C K	J-EMPC	0.155	C K	J-EMPC	0.426	C K	J-EMPC	0.211	C	
60		2.07			1.1			1.51			1.08		
61	61 + 70 + 74 + 76	37.3	C		7.25	C		9.82	C		6.76	C	
62	59 + 62 + 75		C59			C59			C59			C59	
63		0.489	K	J-EMPC	0.194			0.266	K	J-EMPC	0.164	K	J-EMPC
64		5.19			1.26			1.86			1.3		
65	44 + 47 + 65		C44			C44			C44			C44	
66		13			4.56			6.89			4.44		
67		0.107	K	J-EMPC	0.093			0.158			0.0849	U	
68		0.107	U		0.0536	U		0.08	K	J-EMPC	0.0921	U	
69	49 + 69		C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40	
72		0.109	U		0.0547	U		0.079			0.0906	U	
73		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61	
77		0.596			0.637			0.883			0.709		
78		0.123	U		0.0614	U		0.0565	U		0.0939	U	
79		0.539			0.164			0.29	K	J-EMPC	0.097	K	J-EMPC
80		0.11	U		0.0553	U		0.0509	U		0.087	U	
81		0.106	U		0.0556	U		0.058			0.0927	U	
82		5.79			0.66			0.821			0.584		
83	83 + 99	31	C		5.72	C		9.46	C		5.37	C	
84		11.8			1.31			1.77			1.12		
85	85 + 116 + 117	11.7	C		1.98	C		2.89	C		1.68	C	
86	86 + 87 + 97 + 108 + 119 + 125	35.7	C		5.28	C		9.13	C		5.07	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
88	88 + 91	6.54	C		0.878	C		1.36	C		0.782	C	
89		0.334			0.0474	U		0.0475	U		0.0485	U	
90	90 + 101 + 113	47.4	C		8.77	C		16	C		8.58	C	
91	88 + 91		C88			C88			C88			C88	
92		7.97			1.68			2.51			1.55		
93	93 + 95 + 98 + 100 + 102	37.5	C		5.11	C		9.32	C		5.25	C	
94		0.148			0.0474	U		0.0475	U		0.0485	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
96		0.191	K	J-EMPC	0.0474	U		0.0475	U		0.0485	U	
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93	
103		0.227	K	J-EMPC	0.062	K	J-EMPC	0.078			0.051	K	J-EMPC
104		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
105		24.6			5.34			7.46			4.89		
106		0.282	U		0.0492	U		0.0942	U		0.0487	U	
107	107 + 124	2.04	C		0.448	C		0.641	C		0.424	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
109		3.74			0.984			1.3			0.908		
110	110 + 115	67.9	C		11.1	C		17.3	C		10.5	C	
111		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
112		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
113	90 + 101 + 113		C90			C90			C90			C90	
114		1.6			0.337	K	J-EMPC	0.345			0.284		
115	110 + 115		C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85	
118		68.7			13.1			24.4			13.9		

Table 2
PCB Congener Qualifier Summary
Lab Sample ID's L11366-13 and L11366-31 through L11366-33
Bradford Island - Remedial Investigation
Sample Delivery Group DPWG26268

IUPAC #	COELUTING CONGENERS[1]	08031806SD L11366-13	Lab Qualifier	URS Review Qualifier	08022739SD L11366-31	Lab Qualifier	URS Review Qualifier	08022740SD L11366-32	Lab Qualifier	URS Review Qualifier	08022741SD L11366-33	Lab Qualifier	URS Review Qualifier
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
120		0.0626	U		0.063	K	J-EMPC	0.12	K	J-EMPC	0.087		
121		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
122		0.619			0.153	K	J-EMPC	0.158			0.103		
123		1.11	K	J-EMPC	0.235	K	J-EMPC	0.406			0.272		
124	107 + 124		C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86	
126		0.318	U		0.115	K	J-EMPC	0.147	K	J-EMPC	0.093	K	J-EMPC
127		0.299	U		0.0522	U		0.1	U		0.0508	U	
128	128 + 166	8.59	C		2.89	C		3.29	C		2.72	C	
129	129 + 138 + 160 + 163	52.8	C		19.4	C		29.7	C		18	C	
130		2.98			1.14			1.46			1.06		
131		0.602			0.131	K	J-EMPC	0.162			0.078		
132		13			3.73			4.4			3.06		
133		0.415			0.309			0.334	K	J-EMPC	0.226	K	J-EMPC
134	134 + 143	1.91	C		0.499	C		0.724	C		0.392	C	
135	135 + 151 + 154	7.66	C		4.23	C		5.98	C		4.03	C	
136		3.12			1.05			1.38			0.919		
137		3.5			0.541			0.754			0.454		
138	129 + 138 + 160 + 163		C129			C129			C129			C129	
139	139 + 140	0.911	C		0.267	C		0.303	C K	J-EMPC	0.216	C	
140	139 + 140		C139			C139			C139			C139	
141		4.71			1.56	K	J-EMPC	1.56			1.26	K	J-EMPC
142		0.0814	U		0.0474	U		0.0823	U		0.0558	U	
143	134 + 143		C134			C134			C134			C134	
144		1.11			0.441			0.563			0.399		
145		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
146		6.07			3.13			4.84			3.15		
147	147 + 149	23.8	C		10.7	C		16.7	C		10.1	C	
148		0.0626	U		0.0474	U		0.049	K	J-EMPC	0.0485	U	
149	147 + 149		C147			C147			C147			C147	
150		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
151	135 + 151 + 154		C135			C135			C135			C135	
152		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
153	153 + 168	41.7	C		16.5	C		33.5	C		18.9	C	
154	135 + 151 + 154		C135			C135			C135			C135	
155		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
156	156 + 157	7.65	C		1.8	C		2.46	C		1.65	C	
157	156 + 157		C156			C156			C156			C156	
158		4.38			1.54			1.95			1.26		
159		0.158	K	J-EMPC	0.197			0.152			0.101		
160	129 + 138 + 160 + 163		C129			C129			C129			C129	
161		0.0626	U		0.0474	U		0.0559	U		0.0485	U	
162		0.187			0.058	K	J-EMPC	0.0626	U		0.054	K	J-EMPC
163	129 + 138 + 160 + 163		C129			C129			C129			C129	
164		2.51			0.891			1.09			0.796		
165		0.0637	U		0.0474	U		0.0645	U		0.0485	U	
166	128 + 166		C128			C128			C128			C128	
167		2.55			0.761			1.4			0.87		
168	153 + 168		C153			C153			C153			C153	
169		0.0626	U		0.2	U		0.1	U		0.1	U	
170		4.3			2.79			3.13			2.55		
171	171 + 173	1.16	C		1.21	C		1.42	C		1.06	C	
172		0.526			0.565			0.55			0.446		
173	171 + 173		C171			C171			C171			C171	
174		2.79			2.6			2.94			2.38		
175		0.132			0.168			0.187			0.119		
176		0.351	K	J-EMPC	0.409			0.526			0.458		
177		2.15			2.78			3.38			2.46		
178		0.713			1.09			1.37			0.918		
179		1.18			1.82			2.17			1.59		
180	180 + 193	8.17	C		7.12	C		9.27	C		6.75	C	
181		0.125	K	J-EMPC	0.0474	U		0.062	K	J-EMPC	0.0485	U	
182		0.0626	U		0.048	K	J-EMPC	0.054			0.0485	U	
183	183 + 185	2.54	C		2.58	C		3.61	C		2.48	C	
184		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
185	183 + 185		C183			C183			C183			C183	
186		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
187		5.28			6.87			9.6			6.93		
188		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
189		0.241	K	J-EMPC	0.159	K	J-EMPC	0.181			0.132		
190		0.98			0.97			1.29			0.969		
191		0.17			0.14			0.192			0.137	K	J-EMPC
192		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
193	180 + 193		C180			C180			C180			C180	
194		1.85			1.9			1.82			1.4		
195		0.672			0.904			1.06			0.708		
196		0.812			0.958	K	J-EMPC	0.968			0.788		
197	197 + 200	0.316	C		0.332	C		0.357	C		0.316	C K	J-EMPC
198	198 + 199	2.31	C		2.42	C		2.78	C		2.07	C	
199	198 + 199		C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197	
201		0.263	K	J-EMPC	0.347			0.444			0.286	K	J-EMPC
202		0.653			0.885			1.05			0.686		
203		1.76			1.96			2.7			1.83		
204		0.0626	U		0.0474	U		0.0475	U		0.0485	U	
205		0.127	K	J-EMPC	0.137	K	J-EMPC	0.152			0.119	K	J-EMPC
206		1.87			1.89			2.28			1.7		
207		0.267			0.276			0.376			0.244		
208		0.6			0.751			0.849			0.645		
209		1.83			2.49			3.78			2.4		

Notes:

All results are in units of pg/g (picograms per gram), dry weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating that a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating that the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the reported sample quantification limit.
1 = When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentratic
is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 2
PCB Congener Qualifier Summary
Lab Sample ID's L11366-34 through L11366-37 and L11366-29
Bradford Island - Remedial Investigation
Sample Delivery Groups DPWG26268 and DPWG26565

IUPAC #	COELUTING CONGENERS[1]	08022742SD L11366-34	Lab Qualifier	URS Review Qualifier	08030685SD L11366-35	Lab Qualifier	URS Review Qualifier	08030686SD L11366-36	Lab Qualifier	URS Review Qualifier	08030687SD L11366-37	Lab Qualifier	URS Review Qualifier	08022637SD L11366-29	Lab Qualifier	URS Review Qualifier
1		0.165		U	0.27		U	0.192		U	0.189		U	0.186	U	
2		0.614			3.93			2.99			2.29			1.83		
3		0.193	K	J-EMPC	0.361			0.252			0.246			0.469	K	J-EMPC
4		0.302	K	J-EMPC	0.655			0.336			0.318			0.414		
5		0.113	U		0.107	U	UJ	0.0815	U		0.0791	U		0.115	U	
6		0.123	K	J-EMPC	0.306		J	0.195			0.164	K	J-EMPC	0.285	K	J-EMPC
7		0.103	U		0.0973	U	UJ	0.123			0.134	K	J-EMPC	0.138		
8		0.436			1.14		J	0.747			0.686			1.22		
9		0.0986	U		0.112	K	J-EMPC	0.0714	U		0.0694	U		0.102	U	
10		0.102	U		0.0962	U	UJ	0.0736	U		0.0715	U		0.106	U	
11		32.1			131		J	46.6			49.1			68.3		
12	12 + 13	0.106	C U		0.1	C U	UJ	0.449	C		0.535	C K	J-EMPC	0.29	C	
13	12 + 13		C12			C12			C12			C12			C12	
14		0.102	U		0.0965	U	UJ	0.0738	U		0.0716	U		0.104	U	
15		0.924			1.86			1.41			1.56			2.54		
16		0.356		U	1.04			0.458	K	J-EMPC	0.711			0.69		
17		0.351			0.975			0.505	K	J-EMPC	0.648			0.814		
18	18 + 30	0.655	C	U	2.52	C		1.11	C		1.49	C		1.76	C	
19		0.105	K	J-EMPC	0.225			0.15			0.184	K	J-EMPC	0.196	U	
20	20 + 28	1.97	C		5.85	C		3.52	C		4.13	C		6.4	C	
21	21 + 33	0.644	C		2.05	C		1.07	C		1.28	C		2.07	C	
22		0.67			2.15			1.04			1.32			1.93		
23		0.0487	U		0.0619	U		0.0471	U		0.0534	U		0.123	U	
24		0.0487	U		0.048	K	J-EMPC	0.0471	U		0.0457	U		0.118	U	
25		0.111			0.32			0.181	K	J-EMPC	0.215	K	J-EMPC	0.313	K	J-EMPC
26	26 + 29	0.244	C K	J-EMPC	0.718	C		0.417	C		0.498	C		0.744	C	
27		0.089			0.247			0.107			0.141			0.159	K	J-EMPC
28	20 + 28		C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18	
31		1.17			3.85			2.23			2.76			4.24		
32		0.142	K	J-EMPC	0.364			0.214			0.346			0.321		
33	21 + 33		C21			C21			C21			C21			C21	
34		0.0487	U		0.0594	U		0.0471	U		0.0512	U		0.116	U	
35		0.0487	U		0.453	K	J-EMPC	0.253	K	J-EMPC	0.285			0.387	K	J-EMPC
36		0.0487	U		0.151			0.062	K	J-EMPC	0.085	K	J-EMPC	0.109	U	
37		0.938			2.21			1.35			1.64			2.41		
38		0.0487	U		0.135			0.068			0.074			0.112	U	
39		0.0487	U		0.0571	U		0.0471	U		0.0492	U		0.111	U	
40	40 + 41 + 71	0.656	C		2.03	C		1.08	C		1.53	C		1.96	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40	
42		0.416	K	J-EMPC	1.83			0.822			1.11			1.28		
43		0.0487	U		0.136	K	J-EMPC	0.072	K	J-EMPC	0.12			0.131	K	J-EMPC
44	44 + 47 + 65	2.07	C		8.1	C		3.54	C		4.43	C		4.9	C	
45	45 + 51	0.2	C		0.575	C K	J-EMPC	0.344	C K	J-EMPC	0.443	C		0.588	C	
46		0.068	K	J-EMPC	0.223			0.117	K	J-EMPC	0.189			0.171		
47	44 + 47 + 65		C44			C44			C44			C44			C44	
48		0.28			0.972			0.516			0.634			0.928		
49	49 + 69	0.987	C		3.56	C		2.01	C		2.62	C		3.09	C	
50	50 + 53	0.22	C K	J-EMPC	0.687	C		0.316	C		0.353	C		0.506	C K	J-EMPC
51	45 + 51		C45			C45			C45			C45			C45	
52		2.73			9.07			4.6			5.84			6.4		
53	50 + 53		C50			C50			C50			C50			C50	
54		0.0487	U		0.0437	U		0.0471	U		0.0457	U		0.0532	U	
55		0.0774	U		0.0805	U		0.0714	U		0.107	U		0.0648	U	
56		1.1			3.14			1.74	K	J-EMPC	2.2			2.31		
57		0.0724	U		0.0753	U		0.0667	U		0.1	U		0.061	U	
58		0.0755	U		0.0785	U		0.0696	U		0.105	U		0.0609	U	
59	59 + 62 + 75	0.178	C		0.616	C		0.289	C		0.393	C		0.471	C K	J-EMPC
60		0.734			2.08			1.15			1.41	K	J-EMPC	1.53		
61	61 + 70 + 74 + 76	4.36	C		14	C		8.19	C		10.2	C		11	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59	
63		0.103	K	J-EMPC	0.335			0.181	K	J-EMPC	0.242			0.257		
64		0.805			3.06			1.58			2.14			2.59		
65	44 + 47 + 65		C44			C44			C44			C44			C44	
66		2.96			8.39			4.77			5.64			6.39		
67		0.071	K	J-EMPC	0.221	K	J-EMPC	0.105	K	J-EMPC	0.14	K	J-EMPC	0.16		
68		0.0718	U		0.095	K	J-EMPC	0.0662	U		0.0996	U		0.069		
69	49 + 69		C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40	
72		0.0706	U		0.124			0.0652	U		0.105			0.083		
73		0.0487	U		0.0437	U		0.0471	U		0.0457	U		0.0498	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
77		0.434			1.27			0.734			0.89			1.02		
78		0.0732	U		0.0762	U		0.0675	U		0.102	U		0.0613	U	
79		0.072	K	J-EMPC	0.296	K	J-EMPC	0.156			0.167			0.383	K	J-EMPC
80		0.0678	U		0.0705	U		0.0625	U		0.0941	U		0.0557	U	
81		0.07	U		0.0748	U		0.068	U		0.0988	U		0.0639	U	
82		0.31			1.57			0.852			1.17			0.964		
83	83 + 99	3.47	C		13.2	C		7.01	C		8.82	C		7.44	C	
84		0.625			3.03			1.77			2.27			1.87		
85	85 + 116 + 117	1.09	C		4.67	C		2.41	C		3.08	C		2.6	C	
86	86 + 87 + 97 + 108 + 119 + 125	3.3	C		14.2	C		7.33	C		8.96	C		6.85	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
88	88 + 91	0.525	C		2.08	C		1.23	C		1.51	C		1.3	C	
89		0.0538	U		0.097	K	J-EMPC	0.055	K	J-EMPC	0.058	K	J-EMPC	0.086	K	J-EMPC
90	90 + 101 + 113	5.39	C		20.4	C		11	C		13.4	C		11.8	C	
91	88 + 91		C88			C88			C88			C88			C88	
92		0.903			4.16			2.2			2.59			2.51		
93	93 + 95 + 98 + 100 + 102	3.19	C		14.5	C		6.82	C		8.18	C		7.22	C	
94		0.0561	U		0.0656	U		0.0471	U		0.0457	U		0.0832	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
96		0.0487	U		0.052	K	J-EMPC	0.0471	U		0.0457	U		0.071	U	
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
103		0.0487	U		0.118			0.094	K	J-EMPC	0.106			0.101		
104		0.0487	U		0.0437	U		0.0471	U		0.0457	U		0.071	U	
105		2.96			10.3			5.82			6.91			6.53		
106		0.0522	U		0.109	U		0.0604	U		0.0551	U		0.0988	U	
107	107 + 124	0.24	C		0.955	C		0.492	C		0.637	C		0.594	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
109		0.565			1.86			1.02			1.32			1.17		
110	110 + 115	6.34	C		25.2	C		13.6	C		16.8	C		14.3	C	
111		0.0487	U		0.046	U		0.0471	U		0.0457	U		0.0565	U	
112		0.0487	U		0.0467	U		0.0471	U		0.0457	U		0.0598	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90	
114		0.154			0.542			0.328			0.336			0.352	K	J-EMPC
115	110 + 115		C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85	
118		8.31			29.8			14.1			16.8			15.7		

Table 2
PCB Congener Qualifier Summary
Lab Sample ID's L11366-34 through L11366-37 and L11366-29
Bradford Island - Remedial Investigation
Sample Delivery Groups DPWG26268 and DPWG26565

IUPAC #	COELUTING CONGENERS[1]	08022742SD L11366-34	Lab Qualifier	URS Review Qualifier	08030685SD L11366-35	Lab Qualifier	URS Review Qualifier	08030686SD L11366-36	Lab Qualifier	URS Review Qualifier	08030687SD L11366-37	Lab Qualifier	URS Review Qualifier	08022637SD L11366-29	Lab Qualifier	URS Review Qualifier
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
120		0.0487	U		0.146			0.075	K	J-EMPC	0.106	K	J-EMPC	0.087		
121		0.0487	U		0.0469	U		0.0471	U		0.0457	U		0.058	U	
122		0.063	K	J-EMPC	0.198			0.127			0.163	K	J-EMPC	0.113	K	J-EMPC
123		0.172	K	J-EMPC	0.679			0.309			0.342			0.374		
124	107 + 124		C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
126		0.0583	U		0.184	K	J-EMPC	0.084			0.123			0.175		
127		0.0544	U		0.114	U		0.063	U		0.0574	U		0.0954	U	
128	128 + 166	1.49	C		6.2	C		3.91	C		4.82	C		3.49	C	
129	129 + 138 + 160 + 163	10.7	C		42.3	C		22.6	C		29.8	C		23.6	C	
130		0.62			2.38			1.46			1.88			1.42		
131		0.091	K	J-EMPC	0.279			0.185			0.234			0.159	K	J-EMPC
132		1.74			7.65			4.89			6.15			5.15		
133		0.157			0.525	K	J-EMPC	0.362			0.426	K	J-EMPC	0.388		
134	134 + 143	0.278	C		1.1	C		0.664	C K	J-EMPC	0.732	C K	J-EMPC	0.718	C K	J-EMPC
135	135 + 151 + 154	2.28	C		9.54	C		5.8	C		6.8	C		6.69	C	
136		0.475			2.06			1.49			1.65			1.52		
137		0.313			1.37			0.643			0.892			0.683		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
139	139 + 140	0.136	C		0.516	C		0.274	C K	J-EMPC	0.373	C		0.304	C	
140	139 + 140		C139			C139			C139			C139			C139	
141		0.701			3			1.89			2.58			1.72		
142		0.0744	U		0.107	U		0.0499	U		0.0757	U		0.0682	U	
143	134 + 143		C134			C134			C134			C134			C134	
144		0.251	K	J-EMPC	0.889			0.499			0.685			0.577		
145		0.0487	U		0.0437	U		0.0471	U		0.0457	U		0.0646	U	
146		2.02			6.32			3.86			4.34			3.9		
147	147 + 149	6.06	C		23.9	C		13.7	C		16.5	C		14.1	C	
148		0.0487	U		0.056	K	J-EMPC	0.05	K	J-EMPC	0.052	K	J-EMPC	0.0815	U	
149	147 + 149		C147			C147			C147			C147			C147	
150		0.0487	U		0.0437	U		0.0471	U		0.0457	U		0.0619	U	
151	135 + 151 + 154		C135			C135			C135			C135			C135	
152		0.0487	U		0.0437	U		0.0471	U		0.0457	U		0.0571	U	
153	153 + 168	12.2	C		47.7	C		20.9	C		25.3	C		20.1	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135	
155		0.0487	U		0.0437	U		0.0471	U		0.0457	U		0.0507	U	
156	156 + 157	0.93	C		3.74	C		2.04	C		2.66	C		2.25	C	
157	156 + 157		C156			C156			C156			C156			C156	
158		0.747	K	J-EMPC	2.93			1.72			2.25			1.69		
159		0.0528	U		0.259			0.183			0.228			0.25	K	J-EMPC
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
161		0.0501	U		0.0719	U		0.0471	U		0.051	U		0.0449	U	
162		0.0545	U		0.138			0.064	K	J-EMPC	0.112	K	J-EMPC	0.102		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
164		0.419			1.87			1.24			1.54			1.25		
165		0.0586	U		0.0841	U		0.0471	U		0.0596	U		0.0519	U	
166	128 + 166		C128			C128			C128			C128			C128	
167		0.482	K	J-EMPC	1.97			0.915			1.2			0.918		
168	153 + 168		C153			C153			C153			C153			C153	
169		0.0542	U		0.2	U		0.1	U		0.1	U		0.086	K	J-EMPC
170		1.38			5.22			3.53			5.16			3.58		
171	171 + 173	0.598	C		2.02	C		1.53	C		2.08	C		1.6	C	
172		0.269			1.15			0.816	K	J-EMPC	1.19			0.837		
173	171 + 173		C171			C171			C171			C171			C171	
174		1.31			5.52			3.58			5.3			3.89		
175		0.079	K	J-EMPC	0.283			0.219			0.23	K	J-EMPC	0.17	K	J-EMPC
176		0.248	K	J-EMPC	0.818			0.566			0.732			0.65		
177		1.53			5.1			3.67			4.55			3.94		
178		0.567			2.22			1.52			1.86			1.42		
179		0.931			3.45			2.41			3.01			2.34		
180	180 + 193	3.99	C		15.2	C		9.26	C		13.1	C		9.03	C	
181		0.0487	U		0.082	K	J-EMPC	0.0471	U		0.095			0.0674	U	
182		0.0487	U		0.084	K	J-EMPC	0.0471	U		0.099	K	J-EMPC	0.0634	U	
183	183 + 185	1.5	C		5.44	C		3.37	C		4.71	C		3.36	C	
184		0.0487	U		0.0437	U		0.0471	U		0.0457	U		0.0471	U	
185	183 + 185		C183			C183			C183			C183			C183	
186		0.0487	U		0.0437	U		0.0471	U		0.0457	U		0.0509	U	
187		4			15.5			9.63			12.6			9		
188		0.0487	U		0.0437	U		0.0471	U		0.0457	U		0.0449	U	
189		0.072			0.25			0.158			0.243			0.197		
190		0.545			2.02			1.25			1.6			1.23		
191		0.054	K	J-EMPC	0.285			0.164	K	J-EMPC	0.217			0.158		
192		0.0487	U		0.0437	U		0.0471	U		0.0457	U		0.0578	U	
193	180 + 193		C180			C180			C180			C180			C180	
194		0.778	K	J-EMPC	3.15			2.46			3.66			2.44		
195		0.49	K	J-EMPC	1.45			1.05			1.57			1.2		
196		0.452			1.8			1.29			1.97			1.23		
197	197 + 200	0.209	C K	J-EMPC	0.658	C		0.464	C		0.741	C		0.442	C	
198	198 + 199	1.12	C K	J-EMPC	5.88	C		3.92	C		6.21	C		3.66	C	
199	198 + 199		C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197	
201		0.209	K	J-EMPC	0.731			0.515			0.757			0.559		
202		0.466			1.97			1.36			2			1.1		
203		1.08			4.6			2.78			4.18			2.5		
204		0.0487	U		0.0437	U		0.0471	U		0.0457	U		0.0629	U	
205		0.078	K	J-EMPC	0.233			0.171	K	J-EMPC	0.256			0.156		
206		1.01	K	J-EMPC	4.38			2.98			5.79			3.21		
207		0.141			0.607			0.481			0.799			0.339		
208		0.332	K	J-EMPC	1.83			1.13			2.16			1.16		
209		1.52			4.83			3.58			6.67			3.42		

Notes:

All results are in units of pg/g (picograms per gram), dry weight.

C = Concentration represents coeluting congeners.
D = The reported value is from a diluted analysis.
G = Axys qualifier indicating that a lockmass deflection affected the result.
J = The reported value is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
K = Axys qualifier indicating that the analyte did not meet relative response factor criteria.
Non-detect values reported at the RL
PCBs = Polychlorinated Biphenyls
RL = analyte-specific reporting limit
U = The analyte was not detected above the reported sample quantification limit.
1 = When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

RIVER OPERABLE UNIT REMEDIAL INVESTIGATION REPORT

QUALITY CONTROL SUMMARY REPORT FOR ANALYTICAL CHEMISTRY

SCULPIN COLLECTED FEBRUARY THROUGH OCTOBER 2008

JUNE 2009

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1.0 Executive Summary

The overall assessment of the analytical results for the 35 sculpin samples shows the quality of the data to be acceptable to support project objectives. The contracted laboratories provided results for all requested analyses and laboratory data reports were complete. Some data were qualified as estimated and flagged 'J' or 'J-EMPC'. Some data were qualified as not detected and flagged 'U'. All data qualifiers resulting from this review have been added to both the project database and the data tables within the main body of this report. Refer to Section 4.0 of this report for a listing of qualifier definitions. The end user should be aware of the potential low bias of the mercury and Aroclor results due to hold time exceedances (as discussed in Section 4.1). Additionally, the identification of individual Aroclors may be subjective due to pattern degradation within the sample matrix (Section 4.8).

2.0 Project Description

Sculpin were collected from both the forebay and reference area during 2008 in support of the Bradford Island Bonneville Lock and Dam Project, River Operable Unit Remedial Investigation. The following five sampling events were conducted by URS and United States Army Corp of Engineers (USACE):

- Forebay and Reference Area (URS event) – February 2 through March 20, 2008
- Reference Area (USACE event) – July 21 through July 25, 2008
- Forebay (USACE event) – September 15 through September 19, 2008
- Reference Area (USACE event) – October 6 through October 10, 2008
- Forebay (USACE event) – October 20 through October 24, 2008

Table 1 summarizes the identification numbers assigned to the individual sculpin, the laboratory identification numbers assigned to the sample composites, collection date and requested analyses for sculpin composites. Those samples collected during the URS sampling event were submitted to Columbia Analytical Services (CAS) of Kelso, Washington on March 18, 2008 and were archived frozen (-20 degrees Celsius, °C). Samples collected by USACE were archived frozen at the USACE Juvenile Fish Monitoring Facility near Bonneville Dam. Details of the chain of custody (COC) are included in the USACE memorandum attached to this report. (Note: Not all sculpin submitted to CAS were selected for analysis, those not selected were archived for potential future analysis).

URS retrieved the USACE archived sculpin on February 5, 2009, relabeled and packaged them for delivery to CAS (via courier) on February 6, 2009. CAS combined the previously archived URS sculpin and composited/homogenized these with the USACE sculpin per the URS compositing scheme (Table 1). All sculpin were logged in under the new sample composite identification numbers (as detailed in Table 1).

3.0 Sampling and Analytical Procedures

Composite samples were analyzed according to the Bradford Island Bonneville Lock and Dam Project, River Operable Unit Remedial Investigation Quality Assurance Project Plan (QAPP)

(URS 2007). Whole-body sculpin were homogenized using an industrial blender by CAS. An aliquot of the homogenized tissue was sent to Axys Analytical Services Ltd. of Sidney, British Columbia, Canada (Axys) to perform the PCB congener analysis by EPA Method 1668A, *Chlorinated Biphenyl Congeners in Water, Soil, Sediment and Tissue by High Resolution Gas Chromatography/High Resolution Mass Spectrometry*. The Axys analytical data report includes a listing of the Axys Method 1668A modifications.

The following table lists the parameters analyzed for one or more of the samples. Table 1 summarizes the specific requested analyses for each sample by URS and laboratory identification numbers.

Method	Analytical Parameter
EPA 8082M	Polychlorinated Biphenyls (PCBs) as Aroclors
EPA 1668A	PCBs as congeners
EPA 6000/7000 series	Metals
Puget Sound Estuary Program (PSEP 1996)	Percent Lipids
Freeze Dry	Percent Solids

4.0 Data Validation

Analyses were performed in general accordance with the above-referenced methods. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, COC, laboratory case narrative, proper sample preservation and handling procedures, holding times, quantitation limits, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The following items were reviewed for 15% or greater of the data: primary and secondary column verification, initial and continuing instrument calibrations and a verification of the reported electronic data with the hard copy deliverable.

The data review process for this investigation followed the QAPP. Additionally, because the QAPP-referenced *Department of Defense Quality Systems Manual* does not discuss PCB congeners, the data review process utilized guidance from EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review* (USEPA 2005) and *EPA Region 10 Standard Operating Procedure (SOP) for the Validation of Method 1668 Toxic, Dioxin-like, PCB Data* (USEPA 1995) as appropriate for method performed. In the case of disagreement between the guidance documents and the analytical method, method criteria were utilized for data review. The metals results were reviewed in accordance with the criteria contained in the DoD QSM (DoD 2006), the above listed methods, and EPA's *NFGs for Inorganic Data Review* (USEPA 2004), in that order of precedence. Project-specific QC criteria are listed in the above-mentioned QAPP.

A summary of qualifiers assigned to results in this investigation is included in Table 2 and Table 3. Samples are listed by their URS sample identification assigned in the field as well as the laboratory identification. CAS was requested to report analytical results above the method detection limit (MDL) but below the method reporting limit (MRL). These results were flagged 'J' by CAS, these 'J' qualifiers are not included in Table 2. These 'J' qualifiers are included in the database and are included in the data tables included in the main body of this report. Congeners are reported using sample-specific detection limits. Qualifiers that may have been assigned to the results of this investigation include the following:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J-EMPC – The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration of the analyte in the sample - used only for PCB congener results.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR - Do Not Report. Another value is available that is more reliable or appropriate.

Final sample results and qualifiers are presented in the analytical tables provided in the sampling report.

4.1 Chain-of-Custody, Sample Preservation and Holding Time

Non-congener Results

As noted above, the sculpin were archived frozen by both CAS and the USACE prior to analysis. CAS and the USACE stored all tissues samples frozen at -20°C until homogenization and analysis. The COC forms for the URS to CAS delivery indicate that samples were maintained under proper chain-of-custody and forms were signed upon release and receipt. (*Note*: Data package K0901018, provided from CAS, has an addendum reporting the COC form from the sculpin submitted for the first sampling event.)

All coolers were submitted at temperatures within the EPA-recommended temperature of 6°C or below. The COC documentation for the USACE to URS delivery is included in a USACE memorandum included as an Attachment to the sampling report. Data were not qualified based on sample receipt or COC forms.

All samples were analyzed within technical and contracted holding times with the following exceptions:

- The 28-day EPA recommended hold time (and QAPP identified hold time) for mercury was exceeded for all samples. All samples were analyzed for mercury by CAS on February 25, 2009. Therefore, for those samples collected in February/March 2008, hold time exceedance was 10 months, for samples collected in July 2008 hold time exceedance was approximately 7 months and for samples collected in September/October 2008 hold time exceedance was approximately 5 months. All mercury sample results have been qualified as estimated and flagged 'J' due to hold time exceedance (Table 2). The data were not rejected due to holding time exceedance because mercury was reported as detected in all 35 samples; however, the end user should be aware of the potential low bias of the mercury results due to sample degradation.
- Samples K09010108-012 (F-12) and K09010108-012 (F-13) were analyzed for PCB Aroclors approximately 10 days past the EPA recommend one-year hold time for PCBs. Analytical results for PCB Aroclors were qualified as estimated and flagged 'UJ' due to holding time exceedances (Table 2). It should be noted that these results may be biased low due to sample degradation.

Congener Results

The COC form for CAS to Axys delivery (samples shipped on February 24, 2009 and received on February 25, 2009) indicates that samples were maintained under chain of custody and forms were signed upon release and receipt. The condition and temperature of the samples upon receipt by Axys was appropriate and all samples listed on the COC form were present. Data were not qualified based COC and sample shipment procedures.

All samples were analyzed within technical and contracted holding times with the following exceptions:

- PCB congener samples L12360-1 (F-12), L12360-13 (F-13), L12360-24 (R-7) were analyzed 6 to 15 days past the 1 year hold time. Analytical results for PCB congeners were qualified as estimated and flagged 'J/UJ' due to holding time exceedances (Table 2). It should be noted that these results may be biased low due to sample degradation.

4.2 Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the analytical methods. Initial calibrations (ICALs) and continuing calibrations (CCALs) were analyzed at the proper frequency and at the appropriate concentrations required by the methods.

Non-congener Results

Instrument calibrations were acceptable for the sample analyses performed.

Congener Results

The congener analyses were performed in three analysis batches (WG28046, WG28057 and WG28419) due to some samples requiring dilution. ICALs and continuing calibration verifications (CCVs) were reviewed for PCB congener analyses. The laboratory performed initial multipoint calibrations for target and standard compounds as required by the Method 1668A. ICALs, CCVs and OPR (ongoing precision recovery) standards were analyzed at the proper frequency and at appropriate concentrations as required by EPA Method 1668A. Calibration compounds met the acceptance criteria as listed in the method with the following exception:

- The 25.3% recovery of ^{13}C-labeled PCB 155 (PCB 155L) in the OPR for analysis batch WG28419 was below the method acceptance criteria of 30%. The 154% recovery of PCB 178L (cleanup standard) in the OPR for the same analysis batch was above the method acceptance criteria of 130%. All native (or unlabeled) congeners were within control limits for the OPR, including PCB 155 and PCB 178. Additionally the labeled and non-labeled standards had acceptable recoveries in the method blank (corn oil) and project samples, with the one exception stated below in section 4.5. Sample analytical results were not qualified as estimated based on the low recovery of PCB 155L and high recovery of PCB 187L within the OPR.

4.3 Review of Blanks

Method blanks are used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank per analysis for each batch, per QAPP requirements. Initial calibration and continuing calibration blanks are also analyzed when appropriate per analytical method (i.e 6000/7000 series metal analyses) to check for laboratory contamination and instrument bias. Field blanks were not collected as part of this analytical program. Qualification of samples due to method blank and calibration blank contamination followed guidelines set forth in the EPA NFGs.

Non-congener Results

Non-congener organic sample results less than five times (5x) and inorganic sample results (or common laboratory organic contaminates such as phthalates) less than ten times (10x) the blank concentration and between the method detection limit (MDL) and the MRL were qualified as non-detect and flagged with a ‘U’ at the MRL. When sample results were less than 5x (or 10x for inorganics and phthalates) the blank concentration but above the MRL, the reported result was qualified as non-detect and flagged ‘U’. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Target compounds reported with concentrations greater than 5x (or 10x) the blank concentration were not qualified. For solid matrices reported in both wet and dry weight concentrations, the above-noted guidelines were applied using the wet weight results, and any qualifiers assigned were also assigned to the dry weight results.

All analytical tests indicate non-detects for all method blanks with the following exceptions:

- Lead was detected in the method blanks and in the continuing calibration blanks bracketing samples in CAS delivery group K0901018. All blank concentrations were above the MDL but below the MRL. All detected lead results were greater than 10x the associated blank concentrations with the exception of K0901018-006 and K0901018-029, which were qualified as non-detect and flagged 'U' per the criteria listed above.

Congener Results

PCB congener sample results that were reported as detected at a concentration less than five times (5x) the associated blank concentration were flagged 'U' or non-detect at the reported concentration. Target compounds reported with concentrations greater than 5x the blank concentration were not qualified. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Method blank results reported as EMPCs were not considered appropriate for use in qualifying associated sample results. Method 1668A stipulates using a method blank as similar to the matrix as possible. The method blank was prepared using corn oil to approximate the lipid content of the samples.

The method blank associated with sculpin tissue samples had only low levels of few PCB congeners. PCB 209 for sample F-3 was the only PCB congener result qualified based on method blank concentrations (Table 3).

4.4 Surrogate Recovery Review

Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. Each sample analyzed for PCB Aroclors was spiked with the surrogate decachlorobiphenyl (a system monitoring compound). Surrogate recoveries were acceptable for all analyses.

4.5 Labeled Internal Standard Recovery Review (congener analysis only)

Samples analyzed for PCB congeners are spiked with labeled internal (quantification) standards. These standards are used to quantitate target congeners and the calculations of target compound concentrations are designed to compensate for low extraction and/or cleanup efficiencies. In addition, their recovery is measured against injection standards added after extraction and cleanup to evaluate extraction and/or cleanup efficiency, which could affect sensitivity and could also affect accuracy for target compounds not quantitated against a chemically identical, isotopically labeled standard. The percent recovery of the labeled standards was compared with the limits set forth in EPA Method 1668A and those set by Axys detailed in Table 1 of the Axys narrative. All recoveries were acceptable with the following exception:

- The percent recovery of ^{13}C-labeled PCB 4 in sample L12360-15 (F-15) was 23.1%, which was below the method acceptance criteria of 25%. PCB 4 has a chemically identical isotopic labeled standard. Given that isotopic dilution calculations produce recovery corrected quantitation results, only the non-chemically identical PCB congeners, quantitated using this labeled standard was estimated based on the low ^{13}C-labeled PCB 4 internal standard recovery. As such, analytical results for PCB 5 through 14 for sample L12360-15 were qualified 'J/UJ' to reflect the potential low bias.

Cleanup standards 28L, 111L, and 178L typically are added prior to cleanup and quantitated using injection standards added just prior to analysis to evaluate cleanup efficiency. The cleanup standards were within the 30-135% control limits set by EPA Method 1668A, with the following exception:

- The percent recovery of ^{13}C-labeled PCB 28 (the cleanup standard) within the laboratory duplicate performed on sample L12360-17 (F-17) was below the method acceptance criteria. Analytical results were not qualified since this was a laboratory quality control sample and therefore the analytical results of this sample are not reported with the primary samples.

4.6 Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control/laboratory control duplicate (LCS/LCSD) samples are used to monitor the laboratory's day-to-day performance of routine analytical methods independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the ability of the laboratory to recover the target compounds from the sample matrix. At least one LCS and one MS/MSD were performed for each non-congener analysis and for each batch per method requirements.

Non-congener Results

LCS/LCSD and MS/MSD recoveries were acceptable for all non-congener analytical tests with the following exception:

- MS/MSD analyses were performed on four samples (K0901018-016, K0901018-017, K0901018-018 and K0901018-035). The recovery of mercury was below the DoD QSM criteria of 80% for the MS (69.4%) in sample K0901018-016 and the MSD (61.4%) in sample K0901018-018. Additionally, the RPD (20.2%) calculated on the mercury MS/MSD pair for sample K0901018-018 exceeded the DoD QSM precision control limit of 20%. The LCS samples were in control indicating the analytical batch was in control. Analytical results for mercury in sample K0901018-016 were not qualified because two of the three control criteria (MS, MSD and/or RPD) were within the DoD QSM control limits. However, the mercury result for sample K0901018-018 was qualified as estimated due to the bias low MS recovery and RPD precision.

Congener Results

MS/MSD samples are not required by Method 1668A for PCB congener analysis. For Method 1668A, Ongoing Precision and Recovery (OPR) samples were used in place of LCS to monitor laboratory performance. The OPR was prepared using corn oil to approximate the lipid content of the samples. OPR recoveries were acceptable for congener analyses with the exception previously stated in Section 4.2 above.

4.7 Duplicate Review

Non-congener Results

Field duplicates were not collected during this sampling event. To evaluate laboratory precision, CAS performed duplicate analyses (i.e. LCS/LCSD and MS/MSD) as discussed above. All duplicate analyses were within relative percent difference criteria with the one exception described in Section 4.6 above. No samples were qualified exclusively on duplicate precision exceedances.

Congener Results

Axys performed a laboratory duplicate analyses on samples L12360-14 (F-17) and L12360-27 (R-10). For these analytical results greater than 5x the sample specific detection limit and not reported as Estimated Maximum Potential Concentrations (EMPCs), the relative percent difference for individual congeners on average was less than 10%, indicating good analytical precision. The detailed evaluation can be found within the Axys analytical report. Analytical results were not qualified based on laboratory duplicate precision.

4.8 Compound Quantification

Non-congener Results

All second column confirmations performed by CAS using Method 8082 were acceptable.

CAS reported that samples associated with sample delivery groups K0901018 *"appear to have been subjected to environmental stresses…causing pattern degradation and changing peak ratios. When pattern degradation occurs, correct identification and quantitative analysis of the individual Aroclors can be subjective*." *"Care was taken to report Aroclor with the best pattern match. Aroclor 1254 was reported for the data set."* Aroclor analytical results were not estimated for sample delivery group K0901018, but the data user should consider this when examining Aroclor results from these deliverables.

Congener Results

Samples L12360-2, L12360-6, L12360-16, L12360-20, L12360-30, L12360-32, L12360-33, L12360-34 and L12360-35 were diluted and reanalyzed to bring area responses of some target congeners within the linear calibration range of the instrument. Only the affected target congeners are reported from the reanalysis; consequently, only one result was reported by Axys for each sample congener. Relevant concentrations from both the undiluted and diluted analytical results are reported within the data deliverable and project database. The reanalysis results are identified with a sample ID suffix of 'W' within the report.

Samples L12360-4 and L12360-5 were diluted, and refortified with labeled standards prior to reanalysis. Only the affected target compounds are reported from the reanalysis; consequently, only one result was reported by Axys for each sample congener. Relevant concentrations from both the undiluted and diluted analytical results are reported within the data deliverable. The reanalysis results are identified with a sample ID suffix of 'NK' within the report. Sample data for the NK dilution have been recovery corrected using the original labeled standard recoveries, to account for losses during extraction.

Sample L12360-3 was originally analyzed in extraction batch WG28046 and due to observed levels above the calibration range was reextracted using a smaller sample size (3 grams) and reported in extraction batch WG28419. All sample data are reported from reextracted analysis, results are identified with a sample ID suffix of 'R' within the report.

The internal standard method is used to calculate concentrations of PCB congeners that do not have chemically identical labeled standards. The internal standard method is dependent upon consistent detector response over the calibration range. If the detector response varies, concentrations can be biased high or low based on variations in the detector sensitivity. During congener analysis, PFK (perfluorokerosene) is used as a lock mass reference standard to measure changes in detector sensitivity. Each lock mass must not vary more than 20% throughout its respective retention time window as required by Method 1668A. Variations of more than 20% indicate the presence of a co-eluting interference or decreased sensitivity. Lock mass stability and sensitivity were acceptable for the sculpin sample analyses.

4.9 Target Compound Identification

Non-congener Results

- Two standard reference materials (SRM) were analyzed for metals (N.R.C.C Dorm-3 and N.R.C.C. Tort-2). Both SRMs were extracted twice and all recoveries were within CAS control limits with the exception of lead in N.R.C.C. Dorm-3 which had a recovery of 63%, below the laboratory control limit of 70%. All other QC parameters including MS/MSD, method blank and calibration standards were in control for lead. Therefore, data were not qualified based on the single SRM recovery.

Congener Results

Ion abundance ratios are used to identify PCB congeners. Results that met all other qualitative identification criteria but differ by more than 15% from the theoretical ion abundance criterion set by EPA Method 1668A were flagged in the laboratory report with a 'K' flag. Those results flagged 'K' with ion abundance ratios outside the identified quantitation criteria are considered estimated maximum possible concentrations (EMPC) and were re-flagged 'J-EMPC' during this review. If the analyte result was previously qualified 'U' by method blank detection, the result retained the 'U' qualifier and it was not qualified further because an ion ratio was out of limits (there is no ion ratio criterion for non-detects). These "EMPC" flagged data are listed in Table 3, appear within the data tables in the main body of this deliverable, and have been entered into the database.

Ion ratios outside the control limits are generally a consequence of co-eluting interferences to either one or both quantitation peaks. In these cases, Axys chose to use the quantitation peak areas as recorded; no adjustments were made to force the peaks to match the theoretical ion abundance ratios before reporting EMPC results. EMPC results should be considered by the data users as part of evaluating the data for end-use objectives.

Additionally, the laboratory-assigned flag 'C' was used in Table 3 to indicate co-eluting PCB isomers for this analysis. The concentrations of the co-eluting isomers were reported as a group, eliminating the need for any data qualification as part of this data review.

4.10 Reporting Limits

Non-congener Results

Sample concentrations for non-congener analyses that were detected below the MRL but above the MDL, were qualified as estimated flagged with a 'J' by the laboratory (CAS). All laboratory J-flagged results are considered estimates. As stated above, these flags are recorded within the database and are reported in the data tables included in the main body of this report.

Several Aroclor results have elevated MDL and MRLs due to matrix interferences. These results were not qualified during this review, but should be considered as part of data use by the end users.

Congener Results

All non-detect congener results are reported at sample specific reporting limits. All sculpin samples were analyzed using approximately 10 grams as recommended by Method 1668A, with the below-listed exceptions. Exceptions were typically caused by insufficient sample volume or large sample concentrations requiring smaller extraction size. Based on historical experience, Axys suggested 3 grams as the absolute minimum sample volume for standard Method 1668A analysis. Therefore, if the sample mass provided was below 10 grams, but above 3 grams, or a smaller extraction size was warranted due to sample concentration, URS authorized Axys to analyze the sample using a sample size less than 10 grams.

- Samples L12360-6, L12360-10, L12360-12, L12360-13, L12360-15, L12360-23, L12360-24 and L12360-31 were analyzed using 4 grams.
- Sample L12360-27 was analyzed using 5 grams.
- Samples L12360-3 was initially analyzed using 10 grams, and was re-extracted using 3 grams (as previously stated in Section 4.8 above).

The data user should be aware that the sample-specific detection limits reported for these samples, may be slightly higher than those reported for the other tissue samples. As a result the total congener concentration, summed using non-detect congeners as zero, may have a slightly low bias for these samples; the precise bias can not be determined. The overall data usability is considered sufficient to meet project objectives.

5.0 Completeness

The laboratory reported all requested analytes and the deliverable data reports were complete. Some data were qualified as estimated 'J' or 'J-EMPC' and some as non-detect 'U'. A summary of qualifiers can be found in Tables 2 and 3. A completeness summary follows; analysis completeness was calculated using 159 congener results, 209 total congeners minus the 50 co-eluting congeners which were reported with the lowest numbered congener in the co-eluting set.

The electronic and portable delivery format (.pdf) versions of the deliverables were cross-checked for accuracy at a frequency of 20% or greater. Any minor discrepancies found between the

deliverables were reported to CAS and corrected by updating the database to reflect the .pdf deliverable.

- *Technical Completeness* = (number of useable results/total reported results) x100

  All samples results are considered useable.

  Non-congener = (490 compliant / 490 total results) = 100%

  Congener = (5,565 compliant / 5,565 total results) = 100%

- *Analytical Completeness* = (number of unqualified results/total reported results) x100

  Non-congener = (435 unqualified results/ 490 total results) = 89%

  Data were qualified as estimated 'J' due to hold time exceedances. Non-congener data qualified 'J' due to detections between the MRL and the MRL were not included in this calculation.

  Congener = (5,084 unqualified results/ 5,565 total results) = 91%

  Congener data were qualified as estimated and flagged 'J' or 'J-EMPC'.

- *Contract Completeness* = (number of contract compliant results/total reported results) x100

  Non-congener = *(437 contract compliant results / 490 total results) = 89%*

  Congener = *(5,565 contract compliant results / 5,565 total results) = 100%*

  All samples analyzed met laboratory contract requirements with the exception of the samples analyzed outside of the 28 day hold time for mercury and the 1 year hold time for PCB Aroclors. Due to the nature of the sampling event, samples were not received by CAS or authorized for analysis until after the hold time expired.

- *Field Sampling Completeness* =(number samples collected/number samples planned) x100

  Non-congener = *(35 samples collected / 35 planned samples) =100%*

  Congener = *(35 samples collected / 35 planned samples) =100%*

  All sculpin composite samples submitted to CAS and Axys for analysis had a complete set of results. All samples had sufficient sample volume to analyze the full analyte list as detailed in the QAPP. A set number of sculpin composite samples was not specified in the QAPP; however there are sufficient number of samples from both the forebay and reference area to met minimum statistical requirements detailed in the QAPP.

6.0 References

DOD 2006. Department of Defense Environmental Data Quality Workgroup. Department of Defense (DOD) Quality Systems Manual (QSM) for Environmental Laboratories. Final Version 3. January 2006. Retrieved from [*http://www.navylabs.navy.mil/Archive/DoDV3.pdf*] on 3/3/06

PSEP 1996. Puget Sound Estuary Program *Recommended Protocols for Measuring Selected Environmental Variables in Puget Sound*, January 1996 and subsequent chapter revisions.

URS 2007. Quality Assurance Project Plan, *River Operable Unit Remedial Investigation*, Bradford Island, Bonneville Lock and Dam Project, Cascade Locks, Oregon. September 2007.

USEPA 1995. EPA Region 10 Standard Operating Procedure (SOP) for the Validation of Method 1668 Toxic, Dioxin-like, PCB Data. December 1995.

USEPA 2004. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. October 2004.

USEPA 2005. Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review. September 2005.

USEPA 2008. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review. June 2008.

Table 1
Sample Identification and Analysis Summary
Bradford Island - Remedial Investigation
Sculpin Collected February through October 2008

URS Composite ID	CAS Composite ID (non-congener)	Axys Composite ID (congener)	USACE and URS Individual ID	Collection Date	Analytes: PCB Aroclors (EPA 8082)	PCB Congeners (EPA 1668A)	Metals (EPA 6000/7000 series)	%Lipids / %Solids
FOREBAY (39 individual sculpin, 17 composite samples)								
F-1	K0901018-001	L12360-1	88B10917S4	9/17/2008	X	X	X	X
			881021S1	10/21/2008				
			88B10918S1	9/18/2008				
F-2	K0901018-002	L12360-2	89B10919S1	9/19/2008	X	X	X	X
			89B10917S3	9/17/2008				
			89B10917S2	9/17/2008				
F-3	K0901018-003	L12360-3	05B10917S10	9/17/2008	X	X	X	X
			8B21022S3	10/22/2008				
F-4	K0901018-004	L12360-4	05B20919S1	9/19/2008	X	X	X	X
			5B21021S1	10/21/2008				
			05B10917S11	9/17/2008				
			05B20918S1	9/18/2008				
F-5	K0901018-005	L12360-5	6B21022S1	10/22/2008	X	X	X	X
			6B21022S2	10/22/2008				
F-6	K0901018-006	L12360-6	10B10919S2	9/19/2008	X	X	X	X
F-7	K0901018-007	L12360-7	13B11021S3	10/21/2008	X	X	X	X
			13B11021S5	10/21/2008				
			13B11021S4	10/21/2008				
F-8	K0901018-008	L12360-8	14B10917S6	9/17/2008	X	X	X	X
			14B10917S7	9/17/2008				
			14B11021S2	10/21/2008				
			14B10917S5	9/17/2008				
F-9	K0901018-009	L12360-9	11B10919S3	9/19/2008	X	X	X	X
			15B11021S7	10/21/2008				
			15B11021S6	10/21/2008				
F-10	K0901018-010	L12360-10	16B11021S8	10/21/2008	X	X	X	X
			16B11021S9	10/21/2008				
F-11	K0901018-011	L12360-11	B10916S115	9/16/2008	X	X	X	X
			15B10917S8	9/17/2008				
F-12	K0901018-012	L12360-12	08022217SC	2/22/2008	X	X	X	X
F-13	K0901018-013	L12360-13	08022218SC	2/22/2008	X	X	X	X
F-14	K0901018-014	L12360-14	65B11022S1	10/22/2008	X	X	X	X
			65B11022S2	10/22/2008				
			65B11022S3	10/22/2008				
F-15	K0901018-015	L12360-15	67B21021S1	10/21/2008	X	X	X	X
F-16	K0901018-016	L12360-16	18B11021S10	10/21/2008	X	X	X	X
			18B11021S11	10/21/2008				
F-17	K0901018-017	L12360-17	21B21021S1	10/21/2008	X	X	X	X
			21B21021S2	10/21/2008				
REFERENCE (60 individual sculpin, 18 composite samples)								
R-1	K0901018-018	L12360-18	861008S1	10/8/2008	X	X	X	X
			861010S1	10/10/2008				
			861010S2	10/10/2008				
			861010S3	10/10/2008				
			861010S4	10/10/2008				
			861010S5	10/10/2008				
			861010S6	10/10/2008				
			080723RSC01	7/23/2008				
			871010S7	10/10/2008				
R-2	K0901018-019	L12360-19	080724RSC06	7/24/2008	X	X	X	X
			080724RSC07	7/24/2008				
			080724RSC05	7/24/2008				
R-3	K0901018-020	L12360-20	211008S2	10/8/2008	X	X	X	X
			08031491SC	3/14/2008				
R-4	K0901018-021	L12360-21	401009S11	10/9/2008	X	X	X	X
R-5	K0901018-022	L12360-22	080724RSC08	7/24/2008	X	X	X	X
			080724RSC09	7/24/2008				
R-6	K0901018-023	L12360-23	08022622SC	2/26/2008	X	X	X	X
				2/26/2008				
R-7	K0901018-024	L12360-24	08021935SC	3/10/2008	X	X	X	X
				3/10/2008				
			08031035SC	3/10/2008				
R-8	K0901018-025	L12360-25	341010S19	10/10/2008	X	X	X	X
			341009S15	10/9/2008				
			341009S16	10/9/2008				
R-9	K0901018-026	L12360-26	080724RSC17	7/24/2008	X	X	X	X
			080724RSC18	7/24/2008				
			351009S14	10/9/2008				
			080724RSC16	7/24/2008				
R-10	K0901018-027	L12360-27	080723RSC44	7/23/2008	X	X	X	X
			080724RSC15	7/24/2008				
R-11	K0901018-028	L12360-28	080722RSC02	7/22/2008	X	X	X	X
			371009S13	10/9/2008				
			08030337SC	3/3/2008				
			080722RSC01	7/22/2008				
R-12	K0901018-029	L12360-29	261009S6	10/9/2008	X	X	X	X
			271009S9	10/9/2008				
			281009S10	10/9/2008				
R-13	K0901018-030	L12360-30	261009S5	10/9/2008	X	X	X	X
			261009S7	10/9/2008				
			271009S8	10/9/2008				
			080723RSC27	7/23/2008				
			261009S4	10/9/2008				
R-14	K0901018-031	L12360-31	271010S16	10/10/2008	X	X	X	X
			371010S18	10/10/2008				
R-15	K0901018-032	L12360-32	241009S3	10/9/2008	X	X	X	X
			241010S14	10/10/2008				
			241009S2	10/9/2008				
R-16	K0901018-033	L12360-33	221010S9	10/10/2008	X	X	X	X
			221010S10	10/10/2008				
			241010S11	10/10/2008				
			241010S12	10/10/2008				
			241010S13	10/10/2008				
			241010S15	10/10/2008				
R-17	K0901018-034	L12360-34	221009S1	10/9/2008	X	X	X	X
			221010S8	10/10/2008				
R-18	K0901018-035	L12360-35	401008S4	10/8/2008	X	X	X	X
			080724RSC02	7/25/2008				
			080724RSC10	7/24/2008				
			080724RSC01	7/25/2008				

Notes:
ID = Identification Number
CAS = Columbia Analytical Services
PCB = Polychlorinated Biphenyls
USACE = U.S. Army Corps of Engineers

Table 2
Non-congener Qualifer Summary
Bradford Island - Remedial Investigation
Sculpin Collected February through October 2008

URS Composite ID	CAS Composite ID (non-congener)	Analyte	Qualifer	Rationale
F-1	K0901018-001	Mercury	J	Hold Time
F-2	K0901018-002			
F-3	K0901018-003			
F-4	K0901018-004			
F-5	K0901018-005			
F-6	K0901018-006			
F-7	K0901018-007			
F-8	K0901018-008			
F-9	K0901018-009			
F-10	K0901018-010			
F-11	K0901018-011			
F-12	K0901018-012			
F-13	K0901018-013			
F-14	K0901018-014			
F-15	K0901018-015			
F-16	K0901018-016			
F-17	K0901018-017			
R-1	K0901018-018			
R-2	K0901018-019			
R-3	K0901018-020			
R-4	K0901018-021			
R-5	K0901018-022			
R-6	K0901018-023			
R-7	K0901018-024			
R-8	K0901018-025			
R-9	K0901018-026			
R-10	K0901018-027			
R-11	K0901018-028			
R-12	K0901018-029			
R-13	K0901018-030			
R-14	K0901018-031			
R-15	K0901018-032			
R-16	K0901018-033			
R-17	K0901018-034			
R-18	K0901018-035			
F-12	K0901018-012	PCB Aroclors	UJ	Hold Time
F-13	K0901018-013			
F-6	K0901018-006	Lead	21.4U	Method Blank Detection
R-12	K0901018-029		21.4U	

Notes:
units: ug/kg
ID = Identification Number
CAS = Columbia Analytical Services
Concentrations are reported as wet weight, qualifiers would apply to dry weight concentrations also.
-- = Not applicable
PCBs = Polychlorinated Biphenyls
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
U = The analyte was analyzed for but was not detected above the reported concentration.

Table 3a
PCB Congener Analytical Results
Lab Sample ID's L12360-1 through L12360-6
Bradford Island - Remedial Investigation
Sculpin Collected February through October 2008

IUPAC #	COELUTING CONGENERS[1]	F-1 L12360-1	Lab Qualifier	URS Qualifier	F-2 L12360-2	Lab Qualifier	URS Qualifier	F-3 L12360-3	Lab Qualifier	URS Qualifier	F-4 L12360-4	Lab Qualifier	URS Qualifier	F-5 L12360-5	Lab Qualifier	URS Qualifier	F-6 L12360-6	Lab Qualifier	URS Qualifier
1		0.121	K	J-EMPC	0.161			66.3	U		0.205			0.246			0.382		
2		0.482			0.409			72.3	U		0.561			0.444			1.22		
3		0.22	K	J-EMPC	0.444	K	J-EMPC	77	U		0.496	K	J-EMPC	0.247			0.665	K	J-EMPC
4		1.03	K	J-EMPC	1.22	K	J-EMPC	336	U		1.01			1.78			2.94		
5		0.151	U		0.148	U		251	U		0.184	U		0.132	U		0.216	U	
6		0.681			0.684			226	U		1.21	K	J-EMPC	0.961			1.75		
7		0.267	K	J-EMPC	0.154	K	J-EMPC	229	U		0.191	K	J-EMPC	0.233			0.469	K	J-EMPC
8		3.47			3.4			209	U		2.78			4.36			8.63		
9		0.233	K	J-EMPC	0.268			225	U		0.744			0.304			0.652	K	J-EMPC
10		0.139	U		0.136	U		230	U		0.169	U		0.121	U		0.206	U	
11		211			191			233	U		90.5			124			450		
12	12 + 13	0.146	C U		0.143	C U		233	C U		1.07	C K	J-EMPC	0.127	C U		0.221	C U	
13	12 + 13		C12			C12			C12			C12			C12			C12	
14		0.139	U		0.135	U		228	U		0.168	U		0.12	U		0.208	U	
15		1.16	K	J-EMPC	1.19			278	U		0.62			0.854			2.93	K	J-EMPC
16		3.94			3.64			130	U		2.63			5.38			11.5		
17		6.55			5.96			189			14.6			14.8			36.3		
18	18 + 30	15.6	C		15.1	C		882	C K	J-EMPC	65.2	C		25.9	C		60.1	C	
19		0.437			0.499	K	J-EMPC	111	U		0.492			1.01			1.76		
20	20 + 28	68	C		60.6	C		2330	C		283	C		122	C		280	C	
21	21 + 33	9.9	C		7.6	C		380	C		20.7	C		14.1	C		40.1	C	
22		9.74			8.99			86.1	U		14.6			13.3			48.1		
23		0.074	K	J-EMPC	0.0497	U		80.7	U		0.418			0.196	U		0.33	U	
24		0.314	K	J-EMPC	0.248			79.9	U		0.29			0.376			0.655		
25		1.53			1.32			69.3	U		5.51			2.62			10.5		
26	26 + 29	7.77	C		6.49	C		211	C K	J-EMPC	31.4	C		12.4	C		38.8	C	
27		1			1.02			79	U		2.75			2.39			7.03		
28	20 + 28		C20			C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18			C18	
31		29.8			23			850			243			37.4			170		
32		1.61			1.23			75.3	U		4.21			4.08			13.3		
33	21 + 33		C21			C21			C21			C21			C21			C21	
34		0.234	K	J-EMPC	0.21			79.8	U		0.804			0.397			1.02		
35		0.068	K	J-EMPC	0.141			77.7	U		0.325	U		0.198	U		0.343	U	
36		0.0517	U		0.086			74	U		0.882	K	J-EMPC	0.169	U		0.302	U	
37		2.53			3.54			96.5			28.7			9.62			13.9		
38		0.119	K	J-EMPC	0.108			78.9	U		1.99			0.559			0.972		
39		0.315	K	J-EMPC	0.184			76.6	U		8.92			1.95			3.59		
40	40 + 41 + 71	10.6	C		7.53	C		3320	C		322	C		162	C		227	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
42		7.19			6.24			3610			505			82.5			115		
43		2.21	K	J-EMPC	1.62			2880			54.4			17.3			23.3		
44	44 + 47 + 65	71.3	C		67.5	C		52400	C		5620	C		1120	C		1300	C	
45	45 + 51	2.1	C		1.52	C		313	C K	J-EMPC	5.89	C		11.8	C		20.4	C	
46		0.359			0.385	K	J-EMPC	94.7	U		0.515			2.14			2.66		
47	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
48		8.08			6.12			2690			0.25	U		52.9			93.1		
49	49 + 69	56.3	C		53.1	C		35700	C		8730	C		909	C		1090	C	
50	50 + 53	1.05	C		0.876	C K	J-EMPC	1090	C		18.7	C		18.5	C		15.5	C	
51	45 + 51		C45			C45			C45			C45			C45			C45	
52		142			109			165000			29800			3220			3640		
53	50 + 53		C50			C50			C50			C50			C50			C50	
54		0.062	K	J-EMPC	0.0497	U		59.6	U		0.261			0.214	K	J-EMPC	1.38		
55		0.198	U		0.24	U		258	U		4.22	U		1.64	U		1.7	U	
56		7.85			6.63			5290			1340			18.1			217		
57		0.622			0.608	K	J-EMPC	260	U		7.88			1.68			2.88	K	J-EMPC
58		0.405	K	J-EMPC	0.461			262	U		3.85	U		4.39	K	J-EMPC	4.32	K	J-EMPC
59	59 + 62 + 75	6.14	C		5.8	C		1070	C		97.1	C		25.5	C		44.7	C	
60		41.4			63.5			8840			1950			370			357		
61	61 + 70 + 74 + 76	246	C		360	C		131000	C		41600	C		3970	C		5880	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
63		14.2			31.5			2480			501			199			82.5		
64		29.7			26.5			9120			1710			417			559		
65	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
66		201			396			73300			16800			3060			1970		
67		1.28			1.39			225	U		10.4			2.07			8.86		
68		2.62			3.22			236	U		12.1			7.68			10.6		
69	49 + 69		C49			C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
72		3.46			3.83			237	U		19.2			9.09			15.4		
73		0.0505	U		0.0497	U		58.2	U		0.192	U		0.178	U		0.124	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
77		10.8			19.9			443			111			40			48.7		
78		0.494			0.241	U		251	U		47.1			26.2			6.78	K	J-EMPC
79		1.63			1.9			3020			471			71.4			59.4		
80		0.456			0.486	K	J-EMPC	233	U		9.75	K	J-EMPC	3.83			1.57		
81		0.449	K	J-EMPC	0.807	K	J-EMPC	295	U		9.5	U		5.23	U		3.88	U	
82		2.29	K	J-EMPC	1.23	K	J-EMPC	22200			2230			361			227		
83	83 + 99	708	C		1480	C		315000	C		69000	C		33400	C		8610	C	
84		6.44			4.5			29200			1240			588			420		
85	85 + 116 + 117	198	C		365	C		73900	C		18800	C		8850	C		2650	C	
86	86 + 87 + 97 + 108 + 119 + 125	117	C		129	C		196000	C		33500	C		7090	C		5600	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
88	88 + 91	9.41	C		6.34	C		23900	C		2730	C		566	C		535	C	
89		0.294			0.229	K	J-EMPC	366	U		6.26			31.7			25.4		
90	90 + 101 + 113	302	C		311	C		303000	C		58700	C		12600	C		10000	C	
91	88 + 91		C88			C88			C88			C88			C88			C88	
92		82.8			85.9			49100			9270			1840			1760		
93	93 + 95 + 98 + 100 + 102	96.2	C		75.1	C		113000	C		12100	C		2720	C		2860	C	
94		0.083			0.0908	U		363	U		1.96			4.01			1.48		
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
96		0.507	K	J-EMPC	0.3			234	K	J-EMPC	8.61			19			19.6		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
103		1.35			0.795	K	J-EMPC	954			120			24.4			26.7		
104		0.0505	U		0.0615	U		52.9	U		0.49	U		0.4	U		0.189	U	
105		383			881			269000			38200			21400			5130		
106		1.28	U		2.55	U		325	U		23.9	U		13.5	U		7.53	U	
107	107 + 124	14.5	C		14.6	C		10400	C		2180	C		182	C		465	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
109		100			283			40600			7130			3890			955		
110	110 + 115	197	C		197	C		247000	C		45700	C		12200	C		9350	C	
111		1.83			5.01			256	U		6.01			4.76			3.22		
112		0.0505	U		0.0639	U		235	U		0.657	U		0.441	U		0.194	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
114		44.8			162			19900			3510			2890			356		
115	110 + 115		C110			C110			C110			C110			C110			C110	

Table 3a
PCB Congener Analytical Results
Lab Sample ID's L12360-1 through L12360-6
Bradford Island - Remedial Investigation
Sculpin Collected February through October 2008

IUPAC #	COELUTING CONGENERS[1]	F-1 L12360-1	Lab Qualifier	URS Qualifier	F-2 L12360-2	Lab Qualifier	URS Qualifier	F-3 L12360-3	Lab Qualifier	URS Qualifier	F-4 L12360-4	Lab Qualifier	URS Qualifier	F-5 L12360-5	Lab Qualifier	URS Qualifier	F-6 L12360-6	Lab Qualifier	URS Qualifier
116	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
118		1630			6700			757000			111000			86900			19300		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
120		9.36			26.6			234	U		33.1			32			19.5		
121		0.677			1.11			259	U		1.55			1.54	K	J-EMPC	1.63		
122		1.44	U		2.87	U		4460			257			15.2	U		56		
123		22.9			61			11800			1660			920			268		
124	107 + 124		C107			C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
126		3.21			7.31			405	K	J-EMPC	54			29.1			11.7		
127		4.51			15			1950			283			14	U		31.9		
128	128 + 166	305	C		597	C		60700	C		20800	C		17100	C		2510	C	
129	129 + 138 + 160 + 163	2040	C		4800	C		463000	C		113000	C		91300	C		15100	C	
130		32.6			44.2			23600			3040			774			577		
131		0.63			0.562	U		2350			332			48			38.7		
132		16			9.49			38400			4080			1010			874		
133		37.7			107			4820			912			827			176		
134	134 + 143	5.45	C		3.43	C		10400	C		1330	C		233	C		200	C	
135	135 + 151 + 154	164	C		204	C		31900	C		6240	C		1740	C		1710	C	
136		16.1			12.6			13700			1280			493			453		
137		130			424			57700			12800			14700			979		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
139	139 + 140	34.3	C		70.6	C		6590	C		2040	C		1530	C		306	C	
140	139 + 140		C139			C139			C139			C139			C139			C139	
141		63.5			74.5			37700			7460			2330			1220		
142		0.206	U		0.561	U		233	U		6.08	U		3.32	U		2.18	U	
143	134 + 143		C134			C134			C134			C134			C134			C134	
144		7.37			5.71			7050			1100			195			191		
145		0.0505	U		0.0497	U		55.1	K	J-EMPC	0.343	U		2.17			1.88		
146		304			845			59200			10500			7890			1840		
147	147 + 149	57.5	C		49.8	C		69800	C		8440	C		1360	C		1480	C	
148		1.07	K	J-EMPC	1.15			91.1	K	J-EMPC	17.2			5.27			7.33		
149	147 + 149		C147			C147			C147			C147			C147			C147	
150		0.094			0.0497	U		61.9	K	J-EMPC	8.6			1.37			1.72		
151	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
152		0.377			0.332			49.8	U		10.4			9.62			8.39		
153	153 + 168	2940	C		13600	C		423000	C		105000	C		106000	C		14500	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
155		2.34	K	J-EMPC	5.11			46.1	U		4.5			5.38			4.76		
156	156 + 157	306	C		1220	C		118000	C		21900	C		25400	C		2020	C	
157	156 + 157		C156			C156			C156			C156			C156			C156	
158		169			380			40500			12800			11400			1450		
159		1.03			1.11	K	J-EMPC	375			31.3			7.48			7.47		
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
161		0.136	U		0.371	U		158	U		4.01	U		2.19	U		1.47	U	
162		10.8			36.1			2740			426			475			53.8		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
164		20.8			20.3			15200			2580			618			456		
165		1.73			4.68			177	U		14.5			14.3			1.64	U	
166	128 + 166		C128			C128			C128			C128			C128			C128	
167		97.9			322			30800			5230			3520			766		
168	153 + 168		C153			C153			C153			C153			C153			C153	
169		2.46	U		7.04	U		164	U		23.2	U		28.8	U		5.51	U	
170		285			1120			49200			9460			12900			988		
171	171 + 173	103	C		281	C		6420	C		2160	C		2240	C		379	C	
172		37.6			71.5			5030			851			830			134		
173	171 + 173		C171			C171			C171			C171			C171			C171	
174		12.7			8.59			8400			687			134			152		
175		5.64			11.3			839			125			63.5			27.8		
176		1.55			0.819			566			64.3			10.7			20.8		
177		40.6			58			8900			851			309			311		
178		81.8			246			4160			659			599			300		
179		26.8			21.3			2220			318			121			220		
180	180 + 193	975	C		7050	C		84000	C		16500	C		26600	C		2040	C	
181		6.76			26.4			1410			311			412			28.4		
182		2.35			3.95			266	K	J-EMPC	48			47.7			7.86		
183	183 + 185	234	C		788	C		16100	C		3520	C		3550	C		721	C	
184		2.66			6.37			48.8	U		12			12			5.82		
185	183 + 185		C183			C183			C183			C183			C183			C183	
186		0.0513	U		0.0497	U		53.4	U		0.475	U		0.246	U		0.137	K	J-EMPC
187		451			952			28700			3350			2620			1750		
188		1.06			2.28			53.1	U		6.22			4.29			3.12		
189		12.8			88.1			2480			400			501			43.7		
190		107			421			7060			1640			1990			294		
191		15.9			84.3			2130			337			438			39.8		
192		0.057	U		0.274	K	J-EMPC	56	U		0.528	U		0.273	U		0.124	U	
193	180 + 193		C180			C180			C180			C180			C180			C180	
194		101			422			9210			950			1480			147		
195		60.8			394			3180			371			534			90.2		
196		59.5			445			3890			462			688			86.5		
197	197 + 200	9.52	C		39.6	C		393	C		44.2	C		63.9	C		17.8	C	
198	198 + 199	72.8	C		172	C		7560	C		564	C		449	C		193	C	
199	198 + 199		C198			C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197			C197	
201		11.1			30.4			830	K	J-EMPC	65.7			48.2			29.6		
202		53.2			205			1790			226			309			131		
203		128			409			2960			717			1220			232		
204		0.214	K	J-EMPC	0.765			35.6	U		0.801			1.1			0.363		
205		6.94			27.4			265			50.5			67.1			12.7		
206		54.5			147			1650			321			635			75.8		
207		12			57			405			60.6			92.8			12.3		
208		10.7			26.7			631			54.2			54.7			20		
209		28.5			75			282		U	67			85.5			28.5		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the reported sample quantification limit.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
K = (CAS qualifer) The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
J-EMPC = (URS qualifer) The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
PCBs = Polychlorinated Biphenyls
Non-detect values reported at the analytical reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 3b
PCB Congener Analytical Results
Lab Sample ID's L12360-7 through L12360-12
Bradford Island - Remedial Investigation
Sculpin Collected February through October 2008

IUPAC #	COELUTING CONGENERS[1]	F-7 L12360-7	Lab Qualifier	URS Qualifier	F-8 L12360-8	Lab Qualifier	URS Qualifier	F-9 L12360-9	Lab Qualifier	URS Qualifier	F-10 L12360-10	Lab Qualifier	URS Qualifier	F-11 L12360-11	Lab Qualifier	URS Qualifier	F-12 L12360-12	Lab Qualifier	URS Qualifier
1		0.234			0.178			0.16	K	J-EMPC	0.251	K	J-EMPC	0.175			0.929		J
2		0.446			0.473			0.535			0.479	K	J-EMPC	0.384			1.14		J
3		0.251	K	J-EMPC	0.265	K	J-EMPC	0.368	K	J-EMPC	0.594	K	J-EMPC	0.236	K	J-EMPC	0.702	K	J-EMPC
4		1.27			1.1			1.36			1.84			1.01			5.26		J
5		0.0876	U		0.112	U		0.172	U		0.134	K	J-EMPC	0.112	U		0.347	K	J-EMPC
6		0.687			0.657			0.161	U		0.125	U		0.518			2.55		J
7		0.146	K	J-EMPC	0.176			0.165	U		0.289			0.114	K	J-EMPC	0.477		J
8		3.26			3.58			3.05			5.69			2.44			12.2		J
9		0.241			0.244			0.237			0.391			0.178	K	J-EMPC	0.946	K	J-EMPC
10		0.089	K	J-EMPC	0.106	U		0.163	U		0.125	U		0.106	U		0.257	K	J-EMPC
11		128			213			152			132			179			332		J
12	12 + 13	0.0896	C U		0.114	C U		0.176	C U		0.125	C U		0.114	C U		0.132	C U	UJ
13	12 + 13		C12			C12			C12			C12			C12			C12	
14		0.0845	U		0.108	U		0.166	U		0.125	U		0.108	U		0.125	U	UJ
15		0.784			1.51	K	J-EMPC	0.923	K	J-EMPC	1.19			1.16	K	J-EMPC	1.98	K	J-EMPC
16		4.02			4.16			3.47			5.68			2.7			12.7		J
17		7.31			8.49			5.65			9.32			4.84			21.4		J
18	18 + 30	16.5	C		18.8	C		12.6	C		20.5	C		11.9	C		49.6	C	J
19		0.561			0.461			0.534	K	J-EMPC	0.754			0.423			1.89		J
20	20 + 28	89	C		97.6	C		66.2	C		99.7	C		66.3	C		184	C	J
21	21 + 33	11.8	C		13	C		8.45	C		16.7	C		7.27	C		28.3	C	J
22		11.2			13.1			9.07			14.8			7.21			27.8		J
23		0.126			0.0752	U		0.065	K	J-EMPC	0.125	U		0.0815	U		0.184		J
24		0.319			0.299			0.309			0.419			0.214			0.88	K	J-EMPC
25		1.75			1.9			1.31			2.45			1.13			3.53		J
26	26 + 29	9.6	C		10.5	C		6.89	C		11.5	C		6.6	C		18.2	C	J
27		1.04			1.16			0.877			1.4			0.649			3.56		J
28	20 + 28		C20			C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18			C18	
31		36.8			40.5			26.7			50.6			22.3			93.8		J
32		1.6			1.81			1.2			2.83			1.1			4.38		J
33	21 + 33		C21			C21			C21			C21			C21			C21	
34		0.394			0.394	K	J-EMPC	0.28			0.422			0.273			0.63		J
35		0.088	U		0.105	K	J-EMPC	0.107	K	J-EMPC	0.239			0.0847	U		0.179	U	UJ
36		0.0775	U		0.0689	U		0.051	K	J-EMPC	0.138			0.0746	U		0.157	U	UJ
37		2.29			11.4			2.55			3.23			3.24			3.7		J
38		0.17	K	J-EMPC	0.151			0.125	K	J-EMPC	0.235	K	J-EMPC	0.108	K	J-EMPC	0.407	K	J-EMPC
39		0.464			0.454			0.364			0.653	K	J-EMPC	0.244			1.21		J
40	40 + 41 + 71	17.5	C		16.8	C		10.7	C		24.3	C		7.51	C		43.3	C	J
41	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
42		14.3			12.4			9.84			15.5			5.21			42.9		J
43		3.47			3.43			1.97			4.51			2.04	K	J-EMPC	8.19		J
44	44 + 47 + 65	118	C		119	C		69	C		138	C		65.9	C		307	C	J
45	45 + 51	2.74	C		2.59	C		2	C		4.74	C		1.32	C		8.77	C	J
46		0.55			0.413	K	J-EMPC	0.489			0.836			0.3	K	J-EMPC	1.71		J
47	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
48		15.1			13.7			0.0623	U		0.125	U		6.24			40.9		J
49	49 + 69	105	C		105	C		62.2	C		128	C		57.5	C		208	C	J
50	50 + 53	1.4	C		1.22	C		1.25	C		2.31	C		0.829	C		6.12	C	J
51	45 + 51		C45			C45			C45			C45			C45			C45	
52		231			234			122			310			123			564		J
53	50 + 53		C50			C50			C50			C50			C50			C50	
54		0.087	K	J-EMPC	0.075	K	J-EMPC	0.0527	U		0.125	U		0.057			0.125	U	UJ
55		0.236	U		0.396	U		0.262	U		0.361	U		0.341	U		0.745	U	J
56		11.2			11.6			8.27			15.7			5.84			37.9		J
57		1.12			1.48			0.775	K	J-EMPC	1.39			0.728			2.22		J
58		0.96			0.589			0.45			1.47			0.525			2.0	K	J-EMPC
59	59 + 62 + 75	10.5	C		10.1	C		5.95	C		12.8	C		5.67	C		26.4	C	J
60		68.6			77.2			46			70.9			54.5			154		J
61	61 + 70 + 74 + 76	402	C		505	C		259	C		514	C		307	C		940	C	J
62	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
63		19.2			31			14.4			16.6			22.1			33.5		J
64		58.4			54.8			37.4			73.9			27.7			0.125	U	UJ
65	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
66		330			458			227			318			319			633		J
67		2.17			2.52			1.52			2.71			1.23			4.86		J
68		3.55			4.22			2.92			3.66			3.36			7.33		J
69	49 + 69		C49			C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
72		5.47			5.89			3.24			5.8			3.92			9.79		J
73		0.05	U		0.0501	U		0.0497	U		0.125	U		0.0498	U		0.125	U	UJ
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
77		12.8			29.8			11.4			14.3			14.2			29.2		J
78		0.905	K	J-EMPC	0.831			0.621			0.349	U		0.92			1.44		J
79		2.87			2.68			1.76			3.91			1.59			10.9		J
80		0.315	K	J-EMPC	0.441	K	J-EMPC	0.298	K	J-EMPC	0.306	U		0.385			0.717		J
81		0.553	U		1.45			0.382	K	J-EMPC	0.524	U		0.71	K	J-EMPC	0.818	U	UJ
82		4.11	K	J-EMPC	3.48			3.07			6.08			2.22	K	J-EMPC	16.8		J
83	83 + 99	1020	C		1210	C		524	C		1060	C		877	C		1880	C	J
84		11			9.27			7.46			18.2			4.05			56.4		J
85	85 + 116 + 117	280	C		347	C		154	C		316	C		234	C		608	C	J
86	86 + 87 + 97 + 108 + 119 + 125	241	C		227	C		133	C		342	C		110	C		733	C	J
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	J
88	88 + 91	19.8	C		17.2	C		11.4	C		30.9	C		6.16	C		90.2	C	J
89		0.75			0.638			0.47	K	J-EMPC	1.14			0.208	U		1.93	K	J-EMPC
90	90 + 101 + 113	730	C		661	C		375	C		920	C		291	C		2080	C	J
91	88 + 91		C88			C88			C88			C88			C88			C88	
92		166			169			76.4			203			74.4			469		J
93	93 + 95 + 98 + 100 + 102	180	C		180	C		88.8	C		240	C		76.6	C		520	C	J
94		0.232	U		0.214	U		0.262	U		0.224			0.214	U		0.449		J
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
96		0.928			0.804			0.448	K	J-EMPC	1.25			0.361	K	J-EMPC	2.09		J
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
103		3.09			2.5			1.54			3.67			0.943			7.22		J
104		0.103	U		0.103	U		0.113	U		0.137	U		0.106	U		0.141	U	UJ
105		600			752			325			652			527			1210		J
106		1.73	U		1.97	U		1.18	U		1.6	U		1.74	U		3.09	U	UJ
107	107 + 124	25.9	C		33.6	C		16.7	C		43.3	C		17.7	C		63.8	C	J
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
109		159			187			107			143			171			320		J
110	110 + 115	462	C		430	C		263	C		649	C		172	C		1720	C	J
111		2.87			3.04			1.87			2.16			3.1			4.08		J
112		0.159	U		0.146	U		0.179	U		0.144	U		0.147	U		0.219	U	UJ
113	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
114		55.3			73.4			32.7			47.8			68.2			63.8		J
115	110 + 115		C110			C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85			C85	

Table 3b
PCB Congener Analytical Results
Lab Sample ID's L12360-7 through L12360-12
Bradford Island - Remedial Investigation
Sculpin Collected February through October 2008

IUPAC #	COELUTING CONGENERS[1]	F-7 L12360-7	Lab Qualifier	URS Qualifier	F-8 L12360-8	Lab Qualifier	URS Qualifier	F-9 L12360-9	Lab Qualifier	URS Qualifier	F-10 L12360-10	Lab Qualifier	URS Qualifier	F-11 L12360-11	Lab Qualifier	URS Qualifier	F-12 L12360-12	Lab Qualifier	URS Qualifier
118		2430			3000			1360			2090			2880			3840		J
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
120		14.7			16.2			8.97			11			16.8			22.6		J
121		1.17			1.09			0.633			1.08			0.789			2.38		J
122		1.94	U		2.2	U		1.32	U		1.79	U		1.95	U		3.46	U	UJ
123		32.6			37.6			21.4			24.1			39.4			30.3		J
124	107 + 124		C107			C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
126		4.35			5.97			3.21			4.2			5.5			10.2		J
127		3.82			6			2.78			4.89			5.91			3.17	U	UJ
128	128 + 166	392	C		500	C		207	C		476	C		347	C		834	C	J
129	129 + 138 + 160 + 163	3090	C		3700	C		1550	C		3270	C		2960	C		5390	C	J
130		72.7			65.2			43.8			78.9			37.5			183		J
131		1.67			1.45			1.03			2.26			0.492	U		2.39	U	UJ
132		33.7			31.4			19.6			60.4			8.62			237		J
133		61.3			70.4			34.8			56.5			61.3			117		J
134	134 + 143	14.4	C		11.6	C		7.45	C		20.4	C		3.34	C		59.8	C	J
135	135 + 151 + 154	320	C		307	C		144	C		356	C		138	C		1030	C	J
136		34.9			32.9			16.6			45.3			12.2			129		J
137		138			180			73.3			140			163			59.6		J
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
139	139 + 140	46.3	C		56.8	C		22.3	C		56.3	C		40.1	C		62.6	C	J
140	139 + 140		C139			C139			C139			C139			C139			C139	
141		115			130			53.5			161			65.4			123		J
142		0.37	U		0.424	U		0.33	U		0.52	U		0.501	U		2.44	U	UJ
143	134 + 143		C134			C134			C134			C134			C134			C134	
144		16.8			14.2			8.62			22.3			5.07			31.2		J
145		0.101	U		0.0808	U		0.0954	U		0.125	U		0.0685	U		0.125	U	UJ
146		525			570			310			420			538			935		J
147	147 + 149	109	C		105	C		65.2	C		158	C		40.9	C		808	C	J
148		2.23			1.86			1.11			2.52			0.727			8.49		J
149	147 + 149		C147			C147			C147			C147			C147			C147	
150		0.202			0.152	K	J-EMPC	0.09	U		0.273			0.0647	U		1.14		J
151	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
152		0.598			0.0745	U		0.341			0.808			0.305			1.94		J
153	153 + 168	4650	C		5270	C		2190	C		3950	C		6260	C		5280	C	J
154	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
155		3.62			4.12			1.77			3.97			3.47			6.51		J
156	156 + 157	340	C		428	C		179	C		337	C		414	C		283	C	J
157	156 + 157		C156			C156			C156			C156			C156			C156	
158		233			293			106			284			205			186		J
159		1.63			1.64			0.922			1.93			0.778	K	J-EMPC	3.66		J
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
161		0.25	U		0.286	U		0.223	U		0.351	U		0.338	U		1.65	U	UJ
162		14.7			18.9			8.77			14.1			17.7			18.1		J
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
164		41.5			43.3			20.9			58.6			18.8			160		J
165		2.7			3.12			1.72			2.31			2.83			3.77	K	J-EMPC
166	128 + 166		C128			C128			C128			C128			C128			C128	
167		116			140			71.6			93.5			165			131		J
168	153 + 168		C153			C153			C153			C153			C153			C153	
169		3.65			3.63	U		2.18	U		3.22	U		4.79	U		4.05	U	UJ
170		328			388			175			373			478			218		J
171	171 + 173	152	C		177	C		77.6	C		188	C		159	C		127	C	J
172		49.9			57.4			27.5			52.7			64.3			42.1		J
173	171 + 173		C171			C171			C171			C171			C171			C171	
174		21			19.4			12			32.3			7.51			70.8		J
175		9.72			9.21			5.65			9.54			8.02			10.6		J
176		3.09			2.74			1.73			5.13			0.614	K	J-EMPC	13.6		J
177		85.4			72.4			57.1			91.3			45.5			414		J
178		159			168			87.7			147			133			386		J
179		67.1			53.3			34.3			82.8			17.5			333		J
180	180 + 193	1290	C		1460	C		693	C		1150	C		2270	C		744	C	J
181		8.39			10			4.24			8.19			9.88			6.22		J
182		3			3.49			1.73	K	J-EMPC	3.59			2.68			3.09		J
183	183 + 185	347	C		384	C		172	C		379	C		398	C		309	C	J
184		4.22			4.81			2.2			5.12			4.13			5.36		J
185	183 + 185		C183			C183			C183			C183			C183			C183	
186		0.05	U		0.0574	U		0.0507	U		0.125	U		0.0498	U		0.125	U	UJ
187		705			643			468			526			654			2230		J
188		1.83			1.76			1.34			1.47			1.75			5.34		J
189		13.5			15.7			8.13			13.6			20.9			9.62		J
190		172			202			83			170			242			161		J
191		19.9			24.2			10.3			21.1			33.3			11.1		J
192		0.0542	U		0.0647	U		0.0571	U		0.175	K	J-EMPC	0.101	K	J-EMPC	0.125	U	UJ
193	180 + 193		C180			C180			C180			C180			C180			C180	
194		124			130			69.5			118			190			65.9		J
195		84.9			92			44.6			83			123			67.9		J
196		68.4			77.7			40.9			71.8			120			40.7		J
197	197 + 200	14.1	C		15.1	C		7.56	C		16.7	C		18.3	C		10.3	C	J
198	198 + 199	115	C		108	C		73.7	C		91.8	C		110	C		155	C	J
199	198 + 199		C198			C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197			C197	
201		19.6			17.6			13			15.5			18.5			20.7		J
202		106			113			57.8			104			93.2			199		J
203		213			227			102			217			288			142		J
204		0.407			0.42			0.214			0.374	K	J-EMPC	0.476			0.229		J
205		11.2			11.6			5.74			10.7			14.3			5.73		J
206		73.4			74.9			40.7			66.6			73.4			34.8		J
207		14.5			15.6			8.48			14.6			18.3			7.46		J
208		17.4			16.3			10.9			13.9			14.4			14.8		J
209		37.1			39.3			20.9			29.6			34.9			15.9		J

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the reported sample quantification limit.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
K = (CAS qualifer) The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
J-EMPC = (URS qualifer) The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
PCBs = Polychlorinated Biphenyls
Non-detect values reported at the analytical reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 3c
PCB Congener Analytical Results
Lab Sample ID's L12360-13 through L12360-17
Bradford Island - Remedial Investigation
Sculpin Collected February through October 2008

IUPAC #	COELUTING CONGENERS[1]	F-13 L12360-13	Lab Qualifier	URS Qualifier	F-14 L12360-14	Lab Qualifier	URS Qualifier	F-15 L12360-15	Lab Qualifier	URS Qualifier	F-16 L12360-16	Lab Qualifier	URS Qualifier	F-17 L 12360-17	Lab Qualifier	URS Qualifier
1		0.54	K	J-EMPC	0.16			1.94			0.218	K	J-EMPC	0.266	K	J-EMPC
2		0.664		J	0.376			2.04			0.411			0.454		
3		2.45	K	J-EMPC	0.221	K	J-EMPC	20.9	K	J-EMPC	0.461	K	J-EMPC	0.595	K	J-EMPC
4		2.43		J	1.32			0.989	K	J-EMPC	1.27			1.7		
5		0.157	U	UJ	0.096			0.273	U	UJ	0.087	K	J-EMPC	0.233	U	
6		1.21		J	0.748			0.379	K	J-EMPC	0.637			1.34		
7		0.289	K	J-EMPC	0.202	K	J-EMPC	0.651		J	0.187			0.254		
8		4.86		J	3.44			1.92		J	2.84			6.59		
9		0.547		J	0.286	K	J-EMPC	0.975	K	J-EMPC	0.221	K	J-EMPC	0.435		
10		0.15	U	UJ	0.083	K	J-EMPC	0.241	U	UJ	0.076			0.206	U	
11		114		J	127			138	K	J-EMPC	134			133		
12	12 + 13	0.924	C K	J-EMPC	0.0822	C U		0.269	C U	UJ	0.0759	C U		0.23	C U	
13	12 + 13		C12			C12			C12			C12			C12	
14		0.152	U	UJ	0.0769	U		0.252	U	UJ	0.071	U		0.215	U	
15		0.731		J	0.975	K	J-EMPC	1.41			0.779			1.15		
16		4.24		J	3.92			0.937			3.27			6.22		
17		5.96		J	11.2			1.84			5.58			13.7		
18	18 + 30	15.2	C	J	22.5	C		4.69	C		15.3	C		29.9	C	
19		0.735		J	0.456	K	J-EMPC	0.272	K	J-EMPC	0.475			0.621		
20	20 + 28	66.4	C	J	106	C		44.9	C		78.9	C		226	C	
21	21 + 33	6.95	C	J	13.3	C		3.29	C		7.6	C		26.2	C	
22		6.41		J	14.5			3.51			8.85			23.2		
23		0.141	U	UJ	0.106	K	J-EMPC	0.132	U		0.117	K	J-EMPC	0.203	U	
24		0.263	K	J-EMPC	0.352	K	J-EMPC	0.132	U		0.243			0.529	K	J-EMPC
25		0.866		J	2.06			0.576			1.35			3.63		
26	26 + 29	6.67	C	J	11.7	C		3.79	C		8.35	C		18.8	C	
27		1.03		J	1.33			0.291	K	J-EMPC	0.954			1.91		
28	20 + 28		C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18	
31		35.4		J	44.5			15.2			32.2			88.9		
32		1.79		J	1.85			0.452	K	J-EMPC	1.35			7.15		
33	21 + 33		C21			C21			C21			C21			C21	
34		0.153	K	J-EMPC	0.383			0.132	U		0.256			0.467		
35		0.141	U	UJ	0.114	K	J-EMPC	0.132	U		0.0929	U		0.219	U	
36		0.141	U	UJ	0.0776	U		0.132	U		0.08	U		0.188	U	
37		0.874		J	2.34			0.716			2.51			4.1		
38		0.141	U	UJ	0.223			0.132	U		0.134	K	J-EMPC	0.342	K	J-EMPC
39		0.158	K	J-EMPC	0.663	K	J-EMPC	0.132	U		0.35			0.821		
40	40 + 41 + 71	7.86	C	J	17.2	C		2.61	C		8.07	C		35.9	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40	
42		5.17		J	18			1.72			10.9			25.4		
43		1.55		J	0.245			0.88	K	J-EMPC	2.91			6.71		
44	44 + 47 + 65	66.9	C	J	154	C		57.4	C		102	C		279	C	
45	45 + 51	1.8	C	J	2.51	C		1.21	C		2	C		4.69	C	
46		0.493	K	J-EMPC	0.367	K	J-EMPC	0.132	U		0.395	K	J-EMPC	0.619	K	J-EMPC
47	44 + 47 + 65		C44			C44			C44			C44			C44	
48		6.69		J	19.4			2.37			9.48			24.9		
49	49 + 69	58.7	C	J	136	C		29.1	C		82	C		221	C	
50	50 + 53	1.27	C	J	1.03	C		0.223	C		0.972	C		2.17	C	
51	45 + 51		C45			C45			C45			C45			C45	
52		151		J	277			61.8			165			361		
53	50 + 53		C50			C50			C50			C50			C50	
54		0.141	U	UJ	0.081	K	J-EMPC	0.132	U		0.076	K	J-EMPC	0.108	K	J-EMPC
55		0.24	U	UJ	0.819	U		0.336	U		0.349	U		1.18	U	
56		5.32		J	9.89			1.47			6.5			22.3		
57		0.564		J	1.3			0.409			1.1			2.27		
58		0.285		J	0.734	U		0.301	U		0.509			1.06	U	
59	59 + 62 + 75	6.09	C	J	13	C		3.84	C		8.31	C		22.2	C	
60		43.9		J	108			51.1			59.4			249		
61	61 + 70 + 74 + 76	255	C	J	585	C		257	C		477	C		1090	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59	
63		10.4		J	28.2			12.9			29.4			49.5		
64		0.141	U	UJ	68			14.2			42.5			114		
65	44 + 47 + 65		C44			C44			C44			C44			C44	
66		188		J	517			266			383			982		
67		0.612		J	2.45			0.479			1.44	K	J-EMPC	3.52		
68		2.22		J	4.44			2.11			6.21			5		
69	49 + 69		C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40	
72		3.2		J	6.62			2.81			4.89			8.77		
73		0.141	U	UJ	0.0499	U		0.132	U		0.0501	U		0.1	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61	
77		4.31		J	15.3			4.64			18.7			15.4		
78		0.365		J	1.21			0.505	K	J-EMPC	1.32			1.63	K	J-EMPC
79		1.26		J	3.25			0.664			1.91			4.36		
80		0.238	K	J-EMPC	0.682	U		0.28	U		0.46	K	J-EMPC	1.92	K	J-EMPC
81		0.225	U	UJ	0.756	U		0.278	U		0.846	K	J-EMPC	1.11	U	
82		2.64	K	J-EMPC	2.98			0.629	K	J-EMPC	2.73			11.6		
83	83 + 99	502	C	J	1710	C		913	C		878	C		2490	C	
84		6.5		J	8.94			1.27	K	J-EMPC	6.94			21.6		
85	85 + 116 + 117	157	C	J	454	C		158	C		252	C		708	C	
86	86 + 87 + 97 + 108 + 119 + 125	119	C	J	288	C		58.4	C		151	C		447	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
88	88 + 91	7.34	C	J	18.9	C		2.27	C		11.2	C		33.3	C	
89		0.21	K	J-EMPC	0.642			0.209	U		0.382			0.967		
90	90 + 101 + 113	342	C	J	953	C		161	C		485	C		1020	C	
91	88 + 91		C88			C88			C88			C88			C88	
92		99.1		J	228			55			109			251		
93	93 + 95 + 98 + 100 + 102	100	C	J	207	C		46.7	C		114	C		246	C	
94		0.197	U	UJ	0.0839	U		0.214	U		0.138	U		0.286	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
96		0.342	K	J-EMPC	0.836			0.15	U		0.572			1.19		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93	
103		1.43		J	3.07			0.43	K	J-EMPC	2.05			4.13		
104		0.145	U	UJ	0.0743	U		0.211	U		0.0719	U		0.167	U	
105		303		J	997			549			530			1570		
106		0.9	U	UJ	2.63	U		1.58	U		3.47	U		3.9	U	
107	107 + 124	13	C	J	35.7	C		8.36	C		17.6	C		37.5	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
109		72.4		J	221			98.3			393			270		
110	110 + 115	191	C	J	551	C		97.2	C		289	C		756	C	
111		1.2		J	3.71			3.25			3.81			4.41		
112		0.141	U	UJ	0.0586	U		0.15	U		0.0964	U		0.2	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90	
114		21.2		J	81.8			48.8			239			128		
115	110 + 115		C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85	

Table 3c
PCB Congener Analytical Results
Lab Sample ID's L12360-13 through L12360-17
Bradford Island - Remedial Investigation
Sculpin Collected February through October 2008

IUPAC #	COELUTING CONGENERS[1]	F-13 L12360-13	Lab Qualifier	URS Qualifier	F-14 L12360-14	Lab Qualifier	URS Qualifier	F-15 L12360-15	Lab Qualifier	URS Qualifier	F-16 L12360-16	Lab Qualifier	URS Qualifier	F-17 L 12360-17	Lab Qualifier	URS Qualifier
118		870		J	3750			1860			7340			4800		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
120		6.4	K	J-EMPC	22			8.18			19.8			18.5		
121		0.897		J	1.87			0.669	K	J-EMPC	1.15			2.29		
122		1.01	U	UJ	2.99	U		1.8	U		3.94	U		4.42	U	
123		12.8	K	J-EMPC	48.7			19.6			160			56.6		
124	107 + 124		C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86	
126		2.39		J	6.32			2.9			7.26			5.96		
127		1.62		J	5.7			3.59			20.6			10.7		
128	128 + 166	190	C	J	670	C		401	C		335	C		877	C	
129	129 + 138 + 160 + 163	1380	C	J	5510	C		3010	C		3230	C		5830	C	
130		30.9		J	98.3			19.7			65.4			103		
131		0.754	K	J-EMPC	1.69	K	J-EMPC	0.507	U		0.997			3		
132		16.8		J	32.1			2.82			18.5			66.6		
133		27.1		J	100			60.4			73.6			91.2		
134	134 + 143	5.18	C	J	14.3	C		1.24	C		6.6	C		17.2	C	
135	135 + 151 + 154	180	C	J	488	C		114	C		211	C		407	C	
136		0.141	U	UJ	42.9			5.9			20.7			46.2		
137		47.2		J	180			95			602			366		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
139	139 + 140	22.3	C	J	78.3	C		22.9	C		31.3	C		95.7	C	
140	139 + 140		C139			C139			C139			C139			C139	
141		66.6		J	148			47.9			81.5			266		
142		0.555	U	UJ	0.722	U		0.506	U		0.633	U		1.04	U	
143	134 + 143		C134			C134			C134			C134			C134	
144		8.04		J	21.1			2.3			10.4			25.6		
145		0.141	U	UJ	0.061	K	J-EMPC	0.132	U		0.0703	U		0.161	U	
146		216		J	840			547			977			721		
147	147 + 149	53.4	C	J	128	C		17.8	C		82.6	C		196	C	
148		1.32		J	3.54			0.597			1.89			3.14		
149	147 + 149		C147			C147			C147			C147			C147	
150		0.141	U	UJ	0.126	K	J-EMPC	0.132	U		0.0655	U		0.301	K	J-EMPC
151	135 + 151 + 154		C135			C135			C135			C135			C135	
152		0.141	U	UJ	0.852			0.132	U		0.449			0.651	K	J-EMPC
153	153 + 168	1480	C	J	7790	C		4780	C		8030	C		6930	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135	
155		1.98		J	6.24			1.76			3.29			6.24		
156	156 + 157	123	C	J	485	C		381	C		1550	C		759	C	
157	156 + 157		C156			C156			C156			C156			C156	
158		90.3		J	414			183			150			552		
159		0.799		J	1.34			0.556	K	J-EMPC	1.14	K	J-EMPC	2.38	K	J-EMPC
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
161		0.375	U	UJ	0.504	U		0.353	U		0.442	U		0.724	U	
162		6.02		J	20.6			13.4			37.4			28.5		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129	
164		25.1		J	52.9			12.3			27			73.1		
165		1.3		J	4.53			4.52			3.88			3.85	K	J-EMPC
166	128 + 166		C128			C128			C128			C128			C128	
167		43.2		J	179			87.5			671			193		
168	153 + 168		C153			C153			C153			C153			C153	
169		1.45	U	UJ	5.62	U		3.69	U		4.16	U		3.7	U	
170		148		J	411			526			392			641		
171	171 + 173	67.6	C	J	271	C		130	C		112	C		227	C	
172		27.5		J	64			81.2			44.5			102		
173	171 + 173		C171			C171			C171			C171			C171	
174		12.8		J	17.9			3.01			12.9			32.7		
175		5.47		J	15.2			5.04			11.3			14.8		
176		1.61		J	3.85			0.132	U		1.73			4.77		
177		38.4		J	110			19.2			78.6			93.9		
178		79.7		J	292			128			170			200		
179		35.1		J	91.6			10.2			36.5			61		
180	180 + 193	448	C	J	1650	C		1620	C		2710	C		1860	C	
181		3.13		J	11.3			5.02			20.4			13.8		
182		2.19		J	5.01			2.22	K	J-EMPC	3.02			6.29		
183	183 + 185	175	C	J	595	C		319	C		360	C		520	C	
184		1.86		J	7.7			1.58			3.24			5.89		
185	183 + 185		C183			C183			C183			C183			C183	
186		0.141	U	UJ	0.057	U		0.132	U		0.0592	U		0.109	U	
187		306		J	1100			710			1350			720		
188		0.88	K	J-EMPC	2.9			0.692			2.99			2.25		
189		5.86		J	15.8			20.5			41.3			24.8		
190		67		J	246			169			193			191		
191		8.32		J	28.3			20.2			29.8			32.2		
192		0.141	U	UJ	0.225			0.132	U		0.184	K	J-EMPC	0.141	K	J-EMPC
193	180 + 193		C180			C180			C180			C180			C180	
194		62.3		J	116			179			155			204		
195		31.1		J	109			85.5			98.3			98.1		
196		42.7		J	86.9			68.2			121			109		
197	197 + 200	6.51	C	J	20.7	C		12.1	C		12.8	C		16.2	C	
198	198 + 199	87.9	C	J	136	C		166	C		166	C		169	C	
199	198 + 199		C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197	
201		10.3		J	32.6			9.75			33.9			20.8		
202		49.4		J	193			49.4			100			122		
203		112		J	288			208			185			268		
204		0.225		J	0.483			0.276			0.319	K	J-EMPC	0.696		
205		4.88		J	14.8			12			9.79			13.1		
206		46.3		J	82.3			68.2			58.2			102		
207		13.2		J	18.3			12			24.1			18.4		
208		15.6		J	22.4			12			20.3			20.9		
209		22.4		J	41.9			22.8			34.8			31.6		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the reported sample quantification limit.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
K = (CAS qualifer) The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
J-EMPC = (URS qualifer) The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
PCBs = Polychlorinated Biphenyls
Non-detect values reported at the analytical reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 3d
PCB Congener Analytical Results
Lab Sample ID's L12360-18 through L12360-23
Bradford Island - Remedial Investigation
Sculpin Collected February through October 2008

IUPAC #	COELUTING CONGENERS[1]	R-1 L12360-18	Lab Qualifier	URS Qualifier	R-2 L12360-19	Lab Qualifier	URS Qualifier	R-3 L12360-20	Lab Qualifier	URS Qualifier	R-4 L12360-21	Lab Qualifier	URS Qualifier	R-5 L12360-22	Lab Qualifier	URS Qualifier	R-6 L12360-23	Lab Qualifier	URS Qualifier
1		0.165			0.19	K	J-EMPC	0.179	K	J-EMPC	0.213			0.323	K	J-EMPC	0.433		
2		0.407	K	J-EMPC	0.44	K	J-EMPC	0.235			0.413	K	J-EMPC	0.611			0.656	K	J-EMPC
3		0.275			0.241	K	J-EMPC	0.218	K	J-EMPC	0.212	K	J-EMPC	0.353			0.458	K	J-EMPC
4		1.24			1.41			1.26			2.03	K	J-EMPC	3.18	K	J-EMPC	1.81		
5		0.275	U		0.25	U		0.192	U		0.198	U		0.242	K	J-EMPC	0.423	U	
6		0.641			0.913			0.573			1.03			1.98			1.05		
7		0.253	U		0.231	U		0.177	U		0.233	K	J-EMPC	0.419	K	J-EMPC	0.402	K	J-EMPC
8		3.15			4.41			2.6			0.172	U		8.86			5.25		
9		0.244	U		0.305	K	J-EMPC	0.201	K	J-EMPC	0.334			0.639			0.45	K	J-EMPC
10		0.257	U		0.234	U		0.179	U		0.184	U		0.198	K	J-EMPC	0.393	U	
11		143			149			119			140			215			112		
12	12 + 13	0.257	C U		0.234	C U		0.179	C U		0.19	C U		0.182	C U		0.405	C U	
13	12 + 13		C12			C12			C12			C12			C12			C12	
14		0.246	U		0.224	U		0.171	U		0.185	U		0.177	U		0.395	U	
15		1.03			1.25			0.587	K	J-EMPC	0.903			2.3			0.976		
16		3.55			5.85			2.64			4.06			12			4.91		
17		6.49			9.45			4.21			7.34			21			6.38		
18	18 + 30	14.3	C		21.8	C		9.94	C		17.9	C		44.9	C		16	C	
19		0.429	K	J-EMPC	0.741			0.392	K	J-EMPC	0.633			1.56			0.916		
20	20 + 28	91.5	C		99.4	C		57	C		112	C		166	C		68.5	C	
21	21 + 33	12.5	C		15.2	C		5.84	C		15.1	C		29.9	C		9.51	C	
22		12.6			15.1			6.81			16.2			31.3			7.54		
23		0.133	U		0.0906	U		0.118	U		0.109			0.239			0.246	U	
24		0.239			0.315			0.183	K	J-EMPC	0.277			0.532	K	J-EMPC	0.337		
25		2.01			2.3			1			2.9			3.96			1.03		
26	26 + 29	9.87	C		12.1	C		6.1	C		12.8	C		19.9	C		6.79	C	
27		0.802			1.62			0.658	K	J-EMPC	1.23			3.23			1.09		
28	20 + 28		C20			C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18			C18	
31		46.4			39.6			21			57.7			74.1			33.2		
32		1.36			2.85			1.08			1.89			5.54			2.18		
33	21 + 33		C21			C21			C21			C21			C21			C21	
34		0.314			0.394	K	J-EMPC	0.165	K	J-EMPC	0.407			0.722			0.266	K	J-EMPC
35		0.133	U		0.198	K	J-EMPC	0.118	U		0.137	K	J-EMPC	0.288			0.253	U	
36		0.114	U		0.16	K	J-EMPC	0.102	U		0.0852	U		0.138			0.21	U	
37		2.85			4.47			2.27			2.06			7.28			0.674		
38		0.123	U		0.171	K	J-EMPC	0.109	U		0.0926	U		0.276			0.228	U	
39		0.483			0.606	K	J-EMPC	0.108	U		0.0937	U		1.22	K	J-EMPC	0.245	K	J-EMPC
40	40 + 41 + 71	14.8	C		24.4	C		7.61	C		19.5	C		7.73	C		12.7	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
42		11			19.4			10.9			15.2			40.8			7.92		
43		3.37	K	J-EMPC	5.15			2.22			4.15			7.29			2.78		
44	44 + 47 + 65	112	C		156	C		103	C		126	C		257	C		82.8	C	
45	45 + 51	2.33	C		4.43	C		1.34	C		2.95	C		6.83	C		2.84	C	
46		0.38	K	J-EMPC	0.709			0.124			0.434	K	J-EMPC	1.85			0.792	K	J-EMPC
47	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
48		12.1			18.5			8.93			16			35.7			9.05		
49	49 + 69	103	C		121	C		86.1	C		123	C		183	C		67.3	C	
50	50 + 53	0.952	C		2.48	C		0.784	C		1.88	C		6.32	C		2.41	C	
51	45 + 51		C45			C45			C45			C45			C45			C45	
52		216			284			175			256			424			161		
53	50 + 53		C50			C50			C50			C50			C50			C50	
54		0.0903	U		0.083	K	J-EMPC	0.0588	U		0.0597	U		0.182			0.141	U	
55		0.334	U		0.481	U		0.475	U		0.311	U		0.362	U		0.75	U	
56		12.4			18.8			5.48	K	J-EMPC	18.6			39.5			7.33		
57		1			1.02			0.803	K	J-EMPC	1.08			1.43			0.811		
58		1.06			0.717	K	J-EMPC	0.502	K	J-EMPC	1.12			1.33	K	J-EMPC	0.725	U	
59	59 + 62 + 75	9.92	C		13.2	C		8.7	C		12.1	C		21.4	C		7.98	C	
60		69			82.1			78.7			67.4			130			52.6		
61	61 + 70 + 74 + 76	415	C		420	C		366	C		463	C		680	C		282	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
63		15.1			19.5			22.5			17			28			12		
64		55.3			64			41			70.2			116			38.8		
65	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
66		313			387			409			310			579			215		
67		2.43			2.81			1.73			3.48			4.59			0.972	K	J-EMPC
68		3.3			2.53			2.37			3.89			4.18			2.11		
69	49 + 69		C49			C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
72		5.64			5.95			5.39			6.15			8.38			3.93		
73		0.0823	U		0.0706	U		0.0604	U		0.0582	U		0.0484	U		0.138	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
77		11.4			12.9			10.7			13.8			21.7			5.19		
78		0.318	U		0.458	U		0.452	U		0.3	U		0.349	U		0.724	U	
79		2.03			3.24			2.19			2.74			6.22			1.42		
80		0.39	K	J-EMPC	0.421	U		0.576			0.374	K	J-EMPC	0.542	K	J-EMPC	0.649	U	
81		0.938	K	J-EMPC	1.4	K	J-EMPC	1.36	K	J-EMPC	0.689	K	J-EMPC	1.98	K	J-EMPC	0.711	U	
82		4.1			6.24			1.61			9.57			15.7			4.3		
83	83 + 99	868	C		1200	C		1730	C		817	C		1930	C		632	C	
84		11.2			16.7			4.57			22.4			40.3			11		
85	85 + 116 + 117	266	C		324	C		445	C		239	C		522	C		192	C	
86	86 + 87 + 97 + 108 + 119 + 125	212	C		263	C		233	C		274	C		496	C		145	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
88	88 + 91	18	C		23.3	C		9.67	C		29	C		52.6	C		12.1	C	
89		0.483			0.984	K	J-EMPC	0.203			0.674			1.83			0.461	K	J-EMPC
90	90 + 101 + 113	632	C		758	C		775	C		758	C		1270	C		412	C	
91	88 + 91		C88			C88			C88			C88			C88			C88	
92		161			203			213			188			305			127		
93	93 + 95 + 98 + 100 + 102	172	C		204	C		149	C		204	C		347	C		134	C	
94		0.113	U		0.209	U		0.186	U		0.225	K	J-EMPC	0.42			0.221	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
96		0.734			1.04			0.497			0.758			1.71			0.569		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
103		2.53			2.99			2.07			4.04			4.47			1.49	K	J-EMPC
104		0.0591	U		0.0624	U		0.0757	U		0.0619	U		0.136	K	J-EMPC	0.119	U	
105		505			685			972			455			1040			358		
106		1.27	U		2.1	U		2.11	U		1.27	U		2.23	U		0.903	U	
107	107 + 124	29.4	C		25.9	C		23.7	C		32.9	C		41.6	C		13.6	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
109		123			159			261			104			214			80.7		
110	110 + 115	458	C		498	C		390	C		568	C		1030	C		289	C	
111		1.88			2.7			4.18			1.7	K	J-EMPC	3.81			1.39	K	J-EMPC
112		0.0723	U		0.134	U		0.119	U		0.118	U		0.106	U		0.142	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
114		32			47.1			82.1			27.2			71.6			25		
115	110 + 115		C110			C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85			C85	

Table 3d
PCB Congener Analytical Results
Lab Sample ID's L12360-18 through L12360-23
Bradford Island - Remedial Investigation
Sculpin Collected February through October 2008

IUPAC #	COELUTING CONGENERS[1]	R-1 L12360-18	Lab Qualifier	URS Qualifier	R-2 L12360-19	Lab Qualifier	URS Qualifier	R-3 L12360-20	Lab Qualifier	URS Qualifier	R-4 L12360-21	Lab Qualifier	URS Qualifier	R-5 L12360-22	Lab Qualifier	URS Qualifier	R-6 L12360-23	Lab Qualifier	URS Qualifier
118		1540			2180			3870			1270			3490			1050		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
120		10.2			14.1			24.1			8.82			21.2			7.27		
121		0.984			1.68			0.133	U		0.985			1.95			0.878		
122		2.19	K	J-EMPC	2.24	U		2.25	U		2.92			3.59	K	J-EMPC	0.993	U	
123		20.2			25.8			44.5			21.4			45.3			15.3		
124	107 + 124		C107			C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
126		3.06			3.64			4.62			2.54			5.89			2.72		
127		1.3	U		2.16	U		7.38			2.86			7.33			2.47		
128	128 + 166	361	C		450	C		803	C		319	C		840	C		271	C	
129	129 + 138 + 160 + 163	2440	C		3310	C		6350	C		2110	C		5890	C		1820	C	
130		54.1			56.5			76.2			79.7			124			45.5		
131		1.51			1.33	K	J-EMPC	0.47	U		3.1			3.26	K	J-EMPC	1.08		
132		40			48.5			13.8			72.1			122			25.7		
133		45.1			66.5			123			40.6			97.1			34.4		
134	134 + 143	11.1	C		13.2	C		7.32	C		19.1	C		29.3	C		7.86	C	
135	135 + 151 + 154	310	C		398	C		531	C		354	C		623	C		243	C	
136		32.9			40.7			29.8			43.1			73.6			24		
137		76.5			94.4			179			62.4			172			57.8		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
139	139 + 140	39.1	C		52.4	C		91.9	C		35.6	C		88.2	C		28.3	C	
140	139 + 140		C139			C139			C139			C139			C139			C139	
141		108			124			138			110			197			78.2		
142		0.274	U		0.543	U		0.458	U		0.209	U		2.05	U		0.379	U	
143	134 + 143		C134			C134			C134			C134			C134			C134	
144		15			17.6			15.7			24			32			10.7		
145		0.0554	U		0.092			0.0663	U		0.0653	U		0.097	K	J-EMPC	0.119	U	
146		352			470			922			353			722			280		
147	147 + 149	131	C		149	C		81.2	C		186	C		330	C		76.6	C	
148		2.23			2.72			3.3			2.86			4.08			2		
149	147 + 149		C147			C147			C147			C147			C147			C147	
150		0.251	K	J-EMPC	0.171	K	J-EMPC	0.0639	U		0.469			0.509			0.119	U	
151	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
152		0.597			0.783	K	J-EMPC	0.735	K	J-EMPC	0.555			1.24			0.472	K	J-EMPC
153	153 + 168	2900	C		4190	C		9000	C		2290	C		7430	C		1950	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
155		2.55			3.9			7.09			2.47	K	J-EMPC	6.49			2.12		
156	156 + 157	183	C		239	C		464	C		148	C		438	C		140	C	
157	156 + 157		C156			C156			C156			C156			C156			C156	
158		195			268			504			173			482			148		
159		1.7	K	J-EMPC	1.84			0.324	U		2.21			3.48	K	J-EMPC	1.63	K	J-EMPC
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
161		0.183	U		0.362	U		0.305	U		0.144	U		1.41	U		0.262	U	
162		9.42			12.1			27.8			7.82			19.7			6.76		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
164		41			42.3			35.8			49.1			87.1			31.1		
165		1.64			2.65			4.47			1.58	K	J-EMPC	3.99			1.65		
166	128 + 166		C128			C128			C128			C128			C128			C128	
167		70.8			91.2			175			60.6			149			51.9		
168	153 + 168		C153			C153			C153			C153			C153			C153	
169		3.36	U		4.03	U		7.77	U		2.14	U		7.56	U		2.9	U	
170		212			245			528			186			560			188		
171	171 + 173	110	C		153	C		361	C		100	C		304	C		91.3	C	
172		39.4			43.8			80.5			34.8			78.8			33.8		
173	171 + 173		C171			C171			C171			C171			C171			C171	
174		21.4			21.5			9.27			31.8			50.6			16.3		
175		6.6			8.12			15.1			8.19			13.7			5.72		
176		3.59			3.43			1.58			5.38			8.51			1.97		
177		60.8			62			79.9			84.5			146			47.4		
178		118			164			357			109			257			93.4		
179		57.7			59.1			67.8			72.6			127			44.7		
180	180 + 193	624	C		756	C		1940	C		514	C		1650	C		523	C	
181		4.3			5.84			13.6			3.82			11.5			3.39	K	J-EMPC
182		2.14			3			5.69			2.14	K	J-EMPC	5.39			2.46	K	J-EMPC
183	183 + 185	224	C		321	C		722	C		203	C		550	C		194	C	
184		3.14			4.75			9.57			2.7			7.93			2.38		
185	183 + 185		C183			C183			C183			C183			C183			C183	
186		0.0672	U		0.0495	U		0.0683	U		0.0721	U		0.0777	U		0.192	U	
187		450			520			1060			503			917			381		
188		1.19			1.54			2.85			1.32			2.43			1.12		
189		6.91			8.59			0.318	U		5.2			17.2			5.98		
190		97.8			131			322			78.1			260			78.2		
191		10.1			14.6			36.9			8.48			28.6			9.42		
192		0.075			0.068	K	J-EMPC	0.0719	U		0.087	K	J-EMPC	0.193	K	J-EMPC	0.208	U	
193	180 + 193		C180			C180			C180			C180			C180			C180	
194		65.2			75			158			52.9			162			57.7		
195		45.2			59.2			158			37.3			133			38.8		
196		38			49			117			32.4			97.3			34.2		
197	197 + 200	9.08	C		11.5	C		27.7	C		7.31	C		22.5	C		7.29	C	
198	198 + 199	81.8	C		83.8	C		153	C		73.8	C		132	C		67.1	C	
199	198 + 199		C198			C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197			C197	
201		13.3			14.7			37.4			12.5			25.7			10.7		
202		67.5			91.1			225			55			151			48.2		
203		114			155			420			82.7			296			90.6		
204		0.244			0.259			0.65			0.133	K	J-EMPC	0.378	K	J-EMPC	0.129	U	
205		5.36			6.54			17.8			4.58			13.4			3.91		
206		34.8			36			88.4			25.8			78.8			27.4		
207		7.22			8.85			22			5.72			17			6.57		
208		10.8			10.2			21.8			9.3			17.5			8.42		
209		17.8			15.1			41.1			13.1			32.3			12.9		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the reported sample quantification limit.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
K = (CAS qualifer) The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
J-EMPC = (URS qualifer) The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
PCBs = Polychlorinated Biphenyls
Non-detect values reported at the analytical reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 3e
PCB Congener Analytical Results
Lab Sample ID's L12360-24 through L12360-29
Bradford Island - Remedial Investigation
Sculpin Collected February through October 2008

IUPAC #	COELUTING CONGENERS[1]	R-7 L12360-24	Lab Qualifier	URS Qualifier	R-8 L12360-25	Lab Qualifier	URS Qualifier	R-9 L12360-26	Lab Qualifier	URS Qualifier	R-10 L12360-27	Lab Qualifier	URS Qualifier	R-11 L12360-28	Lab Qualifier	URS Qualifier	R-12 L12360-29	Lab Qualifier	URS Qualifier
1		1.43		J	0.182			0.166	K	J-EMPC	0.36	K	J-EMPC	0.231	K	J-EMPC	0.185	K	J-EMPC
2		0.719		J	0.411	K	J-EMPC	0.672	K	J-EMPC	0.631	K	J-EMPC	0.45			0.483	K	J-EMPC
3		0.424		J	0.236	K	J-EMPC	0.227	K	J-EMPC	0.428	K	J-EMPC	0.235	K	J-EMPC	0.245	K	J-EMPC
4		16.9		J	2.1			2.49			4.05	K	J-EMPC	2.74			1.5		
5		0.513	U	UJ	0.229	U		0.199	U		0.371	U		0.207	U		0.14	U	
6		7.9		J	1.1			1.7			2.18			1.7			0.818		
7		0.726	K	J-EMPC	0.256	K	J-EMPC	0.283	K	J-EMPC	0.523	K	J-EMPC	0.221			0.18		
8		23.9		J	4.49			5.79			8.77			5.86			4.02		
9		2.21		J	0.366	K	J-EMPC	0.486			0.854			0.485	K	J-EMPC	0.286		
10		0.886		J	0.213	U		0.187	U		0.345	U		0.195	U		0.131	U	
11		178		J	135			145			188			153			204		
12	12 + 13	1.65	C K	J-EMPC	0.219	C U		0.865	C K	J-EMPC	1.14	C		1.14	C K	J-EMPC	0.899	C	
13	12 + 13		C12			C12			C12			C12			C12			C12	
14		0.479	U	UJ	0.214	U		0.185	U		0.346	U		0.192	U		0.13	U	
15		1.92		J	1.03			1.48			2.11			1.32			1.2		
16		17.8		J	4.6			7.35			10.4			7.77			4.1		
17		31.3		J	11.3			14.6			16.6			13.9			8.35		
18	18 + 30	68.6	C	J	21	C		31.9	C		35.4	C		32.1	C		18.1	C	
19		3.18		J	0.566			0.918			1.9			1.17			0.552		
20	20 + 28	251	C	J	138	C		132	C		137	C		135	C		120	C	
21	21 + 33	39.8	C	J	17.3	C		20.2	C		23.1	C		16.2	C		15.6	C	
22		28.8		J	18.4			21.4			25.6			19.5			16.6		
23		0.221	K	J-EMPC	0.137	U		0.096			0.179	U		0.161			0.0764	U	
24		1.06		J	0.245			0.421			0.49	K	J-EMPC	0.476	K	J-EMPC	0.306		
25		4.0		J	2.8			2.82			3.63			2.52			2.79		
26	26 + 29	27.3	C	J	14.5	C		14.6	C		16.3	C		15.1	C		14.2	C	
27		4.32		J	1.25			2.25			2.91			2.21			1.17	K	J-EMPC
28	20 + 28		C20			C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18			C18	
31		90.2		J	65.6			60.9			65.1			53.2			56.5		
32		11.6		J	2.65			3.92			5.34			3.61			1.84		
33	21 + 33		C21			C21			C21			C21			C21			C21	
34		0.561		J	0.434			0.514	K	J-EMPC	0.48			0.494			0.527		
35		0.164	U	UJ	0.141	U		0.084	U		0.184	U		0.173	K	J-EMPC	0.148	K	J-EMPC
36		0.136	U	UJ	0.117	U		0.088	K	J-EMPC	0.153	U		0.117	K	J-EMPC	0.0724	U	
37		1.41		J	1.73			3.61			6.08			3.97			2.59		
38		0.149	K	J-EMPC	0.127	U		0.0747	U		0.166	U		0.0917	U		0.129	K	J-EMPC
39		0.911		J	0.651	K	J-EMPC	0.821			0.842			0.763	K	J-EMPC	0.589		
40	40 + 41 + 71	40.5	C	J	20.4	C		27.1	C		39.5	C		23.7	C		18.6	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
42		24.9		J	14.4			24.8			31.6			22.6			0.081	U	
43		7.1		J	4.02			5.23			5.78			5.05			4.49		
44	44 + 47 + 65	204	C	J	140	C		167	C		195	C		184	C		149	C	
45	45 + 51	7.65	C	J	2.69	C		4.45	C		8.79	C		4.06	C		2.35	C K	J-EMPC
46		1.76		J	0.425	K	J-EMPC	0.753	K	J-EMPC	2.14	K	J-EMPC	0.814			0.447	K	J-EMPC
47	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
48		30.3		J	18			23.4			25.8			21			16.4		
49	49 + 69	177	C	J	135	C		132	C		138	C		154	C		141	C	
50	50 + 53	4.5	C	J	0.994	C		2.28	C		7.73	C		3.31	C		1.18	C K	J-EMPC
51	45 + 51		C45			C45			C45			C45			C45			C45	
52		347		J	253			285			333			307			315		
53	50 + 53		C50			C50			C50			C50			C50			C50	
54		0.149	K	J-EMPC	0.074	K	J-EMPC	0.0687	U		0.131	K	J-EMPC	0.0833	U		0.078	K	J-EMPC
55		0.709	U	UJ	0.283	U		0.256	U		0.278	U		0.313	U		0.214	U	
56		14		J	13.4			17.7			34			15.1			15.1		
57		1.59		J	1.37			1.22			1.15			1.46			1.43		
58		0.813		J	1.14	K	J-EMPC	0.941			1.04			0.976			1.03	K	J-EMPC
59	59 + 62 + 75	18.1	C	J	13.1	C		14.7	C		16.7	C		16.4	C		13.9	C	
60		92.3		J	84.7			80.6			84			113			100		
61	61 + 70 + 74 + 76	504	C	J	520	C		466	C		493	C		602	C		575	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
63		23.7		J	20.9			19.2			20			29.3			23.8		
64		0.122	U	UJ	64.5			77.5			89.5			0.0727	U		71		
65	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
66		409		J	393			380			389			536			477		
67		2.48		J	3.37			3.13			3.69			3.16			3.69		
68		3.06		J	3.57			3.39			3.49			4.12			4.16		
69	49 + 69		C49			C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
72		6.59		J	6.68			5.74			6.17			7.9			8.43		
73		0.122	U	UJ	0.056	U		0.0595	U		0.0994	U		0.0732	U		0.0593	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
77		9.81		J	13.9			13.2			17.8			13.8			17.7		
78		0.683	U	UJ	0.272	U		0.246	U		0.269	U		0.302	U		0.206	U	
79		2.65		J	2.53	K	J-EMPC	3.07			5.75	K	J-EMPC	3.47			2.58	K	J-EMPC
80		0.613	U	UJ	0.244	U		0.529			0.241	U		0.446	K	J-EMPC	0.423	K	J-EMPC
81		1.41	K	J-EMPC	1.19	K	J-EMPC	1.04	K	J-EMPC	1.39	K	J-EMPC	1.42	K	J-EMPC	0.998	K	J-EMPC
82		5.96		J	3.6			5.26			17.9			4.65			4.09		
83	83 + 99	1010	C	J	1060	C		940	C		1220	C		1720	C		1490	C	
84		11.3		J	7.56			12.8			43.3			12.4			10.8		
85	85 + 116 + 117	285	C	J	280	C		269	C		335	C		456	C		403	C	
86	86 + 87 + 97 + 108 + 119 + 125	269	C	J	235	C		256	C		366	C		322	C		289	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
88	88 + 91	16.7	C	J	14.9	C		23.7	C		51.1	C		21.8	C		20	C	
89		0.568		J	0.486	K	J-EMPC	0.781	K	J-EMPC	1.92	K	J-EMPC	0.582			0.598	K	J-EMPC
90	90 + 101 + 113	748	C	J	688	C		746	C		925	C		926	C		953	C	
91	88 + 91		C88			C88			C88			C88			C88			C88	
92		197		J	176			181			227			262			254		
93	93 + 95 + 98 + 100 + 102	197	C	J	166	C		198	C		283	C		232	C		240	C	
94		0.351	U	UJ	0.258	U		0.123	U		0.326	U		0.226	U		0.248	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
96		1.19		J	0.85			0.921			1.6			0.883	K	J-EMPC	0.927		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
103		3.21		J	3.11			2.84	K	J-EMPC	4.21			3.12			3.45		
104		0.131	U	UJ	0.11	U		0.0526	U		0.137	U		0.0866	U		0.104	U	
105		591		J	593			531			692			937			828		
106		1.48	U	UJ	1.45	U		1.47	U		1.86	U		1.65	U		1.6	U	
107	107 + 124	22.9	C	J	31.2	C		28.3	C		33.3	C		36.5	C		46.5	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
109		144		J	139			133			138			220			206		
110	110 + 115	460	C	J	425	C		544	C		748	C		585	C		554	C	
111		2.44		J	2.2			1.9			2.61			3.97			2.98		
112		0.225	U	UJ	0.166	U		0.0788	U		0.209	U		0.145	U		0.159	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
114		39.2		J	37.6			34.7			47.8			68.3			54.4		
115	110 + 115		C110			C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85			C85	

Table 3e
PCB Congener Analytical Results
Lab Sample ID's L12360-24 through L12360-29
Bradford Island - Remedial Investigation
Sculpin Collected February through October 2008

IUPAC #	COELUTING CONGENERS[1]	R-7 L12360-24	Lab Qualifier	URS Qualifier	R-8 L12360-25	Lab Qualifier	URS Qualifier	R-9 L12360-26	Lab Qualifier	URS Qualifier	R-10 L12360-27	Lab Qualifier	URS Qualifier	R-11 L12360-28	Lab Qualifier	URS Qualifier	R-12 L12360-29	Lab Qualifier	URS Qualifier
118		1710		J	1790			1720			2190			3130			2800		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
120		11.7		J	11.8			11			13.6			21.6			17.7		
121		1.62		J	0.184	U		1.13			0.232	U		2.16			1.84		
122		1.62	U	UJ	1.59	U		1.7	U		3.66	K	J-EMPC	1.92	U		2.4	K	J-EMPC
123		25.5		J	21.6			23.2			29.8			35.8			33.3		
124	107 + 124		C107			C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
126		3.97		J	3.4			3.35	K	J-EMPC	3.8			5.19			5.93		
127		3.0		J	2.65	K	J-EMPC	3.13			4.57	K	J-EMPC	5.76			4.7		
128	128 + 166	366	C	J	367	C		353	C		465	C		682	C		550	C	
129	129 + 138 + 160 + 163	2740	C	J	2660	C		2550	C		3310	C		4910	C		4120	C	
130		81.1		J	71.4			72.1			93.2			95.1			88		
131		1.94		J	1.41			1.48			4.08			1.37			1.72		
132		32.4		J	26.3			42.4			120			37.8			39.5		
133		53.8		J	50.8			48.8			59.8			96.1			76.3		
134	134 + 143	12.4	C	J	9.89	C		13.3	C		25.8	C		12.3	C		14.5	C	
135	135 + 151 + 154	378	C	J	308	C		359	C		456	C		556	C		484	C	
136		36.2		J	27.3			36.2			58.8			44.2			41.4		
137		64.6		J	73.3			64.1			106			150			132		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
139	139 + 140	40.8	C	J	40.8	C		38.1	C		53.3	C		80.6	C		66.6	C	
140	139 + 140		C139			C139			C139			C139			C139			C139	
141		107		J	91.2			94.5			135			144			155		
142		0.569	U	UJ	0.27	U		0.472	U		0.486	U		0.415	U		0.399	U	
143	134 + 143		C134			C134			C134			C134			C134			C134	
144		19		J	15.6			17.3			26.1			21.4			21.5		
145		0.153	U	UJ	0.0546	U		0.0551	U		0.184	K	J-EMPC	0.0546	U		0.0788	U	
146		447		J	413			421			531			769			645		
147	147 + 149	101	C	J	95.5	C		156	C		322	C		164	C		139	C	
148		2.91		J	2.63			2.67			3.11			3.92			3.39		
149	147 + 149		C147			C147			C147			C147			C147			C147	
150		0.147	U	UJ	0.145	K	J-EMPC	0.269	K	J-EMPC	0.773			0.268	K	J-EMPC	0.226		
151	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
152		0.738		J	0.571			0.691			1.02			0.89			0.904		
153	153 + 168	2930	C	J	2960	C		3130	C		4000	C		6740	C		5350	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
155		3.24		J	3.39			3.1			4.4			6.36			4.76		
156	156 + 157	187	C	J	192	C		178	C		270	C		374	C		322	C	
157	156 + 157		C156			C156			C156			C156			C156			C156	
158		206		J	219			191			265			415			338		
159		2.01	K	J-EMPC	1.39			1.46			2.68	K	J-EMPC	1.83			1.46	K	J-EMPC
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
161		0.393	U	UJ	0.187	U		0.327	U		0.336	U		0.288	U		0.276	U	
162		9.81		J	10.2			8.85			11.6			18.8			15.2		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
164		57.1		J	36.5			49.7			57.7			58			56.3		
165		1.88	K	J-EMPC	1.98			1.89			2.26			3.87			2.85		
166	128 + 166		C128			C128			C128			C128			C128			C128	
167		77		J	73.9			81.1			101			142			136		
168	153 + 168		C153			C153			C153			C153			C153			C153	
169		3.95	U	UJ	2.94	U		3.84	U		4.56	U		5.86	U		3.84	U	
170		188		J	196			181			281			425			340		
171	171 + 173	113	C	J	121	C		112	C		150	C		263	C		190	C	
172		35.2		J	36.5			33.8			49.7			65.1			58.7		
173	171 + 173		C171			C171			C171			C171			C171			C171	
174		21.9		J	15.7			22.8			47.4			21.9			21.9		
175		9.25		J	7.83			7.42			9.47			12.8			10.1		
176		3.13		J	2.4			3.5			8.24			3.44			3.43		
177		75.6		J	65.8			80.4			115			93.7			79.6		
178		150		J	136			131			159			247			189		
179		69.2		J	52.6			68.1			93.6			78.8			74.4		
180	180 + 193	576	C	J	584	C		576	C		841	C		1360	C		1020	C	
181		4.84		J	4.27			3.94			5.73			9.47			7.52		
182		2.91		J	2.14			2.23			3.24	K	J-EMPC	4.87			3.17		
183	183 + 185	279	C	J	242	C		233	C		319	C		508	C		379	C	
184		3.31		J	3.47			3.25			4.93			7.63			5.13		
185	183 + 185		C183			C183			C183			C183			C183			C183	
186		0.133	U	UJ	0.0565	U		0.069	U		0.112	U		0.0644	U		0.0647	U	
187		634		J	509			627			661			844			673		
188		1.67		J	1.4	K	J-EMPC	1.31			1.67			2.45			1.95		
189		6.73		J	6.4			5.93			9.63			14.2			11.5		
190		102		J	98.2			98.7			135			227			172		
191		11.8		J	10.3			10.2			14.7			25.6			17.5		
192		0.144	U	UJ	0.096			0.096			0.121	U		0.199			0.104		
193	180 + 193		C180			C180			C180			C180			C180			C180	
194		57.6		J	53.1			55.1			84.5			130			104		
195		40.3		J	41.6			44.3			66.2			124			83.2		
196		42.3		J	32.4			34.7			54.3			90.8			62.5		
197	197 + 200	8.82	C	J	8.12	C		8.57	C		12.2	C		20.6	C		14.6	C	
198	198 + 199	87	C	J	67.5	C		81	C		96.6	C		130	C		112	C	
199	198 + 199		C198			C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197			C197	
201		16.3		J	12.2			14.6			17.6			26.8			21.6		
202		72.1		J	70.4			71.3			84			161			120		
203		122		J	98.9			113			151			290			193		
204		0.187		J	0.194	K	J-EMPC	0.245			0.212	K	J-EMPC	0.401	K	J-EMPC	0.315		
205		5.26		J	4.93			5.08			7.2			13			8.62		
206		34.1		J	31			31.1			46.3			66			45.8		
207		7.86		J	6.6			6.47			10.3			16.2			11.1		
208		12.4		J	10.1			10.5			13.5			17.9			14		
209		21.6		J	16.8			16.9			23.6			34.6			24		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the reported sample quantification limit.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
K = (CAS qualifer) The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
J-EMPC = (URS qualifer) The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
PCBs = Polychlorinated Biphenyls
Non-detect values reported at the analytical reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

Table 3f
PCB Congener Analytical Results
Lab Sample ID's L12360-30 through L12360-35
Bradford Island - Remedial Investigation
Sculpin Collected February through October 2008

IUPAC #	COELUTING CONGENERS[1]	R-13 L12360-30	Lab Qualifier	URS Qualifier	R-14 L12360-31	Lab Qualifier	URS Qualifier	R-15 L12360-32	Lab Qualifier	URS Qualifier	R-16 L12360-33	Lab Qualifier	URS Qualifier	R-17 L12360-34	Lab Qualifier	URS Qualifier	R-18 L12360-35	Lab Qualifier	URS Qualifier
1		0.231	K	J-EMPC	0.368	K	J-EMPC	0.175			0.163	K	J-EMPC	0.234	K	J-EMPC	0.228		
2		0.44			0.523			0.295	K	J-EMPC	0.396	K	J-EMPC	0.589			0.447	K	J-EMPC
3		0.333	K	J-EMPC	0.471	K	J-EMPC	0.231	K	J-EMPC	0.241			0.274	K	J-EMPC	0.238		
4		2.36			2.46	K	J-EMPC	1.29			1.88			1.8			1.94		
5		0.22	U		0.605	U		0.29	U		0.251	U		0.245	U		0.407	U	
6		1.75			1.36	K	J-EMPC	0.637			1.1			1.08			1.23	K	J-EMPC
7		0.218	K	J-EMPC	0.572	U		0.268	U		0.233			0.298	K	J-EMPC	0.375	U	
8		6.09			5.51			2.81			4.46			5.31			5.02		
9		0.31			0.56	K	J-EMPC	0.259	U		0.272			0.38			0.406	K	J-EMPC
10		0.207	U		0.562	U		0.273	U		0.236	U		0.23	U		0.383	U	
11		177			183			109			177			264			139		
12	12 + 13	0.868	C K	J-EMPC	0.58	C U		0.694	C		0.239	C U		0.233	C U		0.388	C U	
13	12 + 13		C12			C12			C12			C12			C12			C12	
14		0.205	U		0.565	U		0.27	U		0.233	U		0.227	U		0.378	U	
15		1.46			1.1	K	J-EMPC	0.932			1.15	K	J-EMPC	1.88	K	J-EMPC	1.41		
16		13.9			7.31			2.89			6.85			5.43			6.97		
17		23.8			12.9			5.33			9.92			12.2			11.4		
18	18 + 30	53.1	C		28.1	C		13.2	C		23.7	C		27.9	C		26.3	C	
19		0.986			1.03	K	J-EMPC	0.573			0.674			0.444			1.05	K	J-EMPC
20	20 + 28	122	C		142	C		67.2	C		76.9	C		155	C		117	C	
21	21 + 33	21.2	C		21.3	C		8.28	C		12.8	C		23.4	C		17.2	C	
22		31.9			23.5			8.69			15.4			21.2			16.8		
23		0.165	U		0.21	U		0.171	U		0.233	U		0.152	K	J-EMPC	0.142	K	J-EMPC
24		0.505	K	J-EMPC	0.398			0.201			0.262	K	J-EMPC	0.357	K	J-EMPC	0.36		
25		3.72			3.39			1.33			2.14			3.37			2.69		
26	26 + 29	15.5	C		16.4	C		7.57	C		9.32	C		17.9	C		13.9	C	
27		4.4			2.01			0.839			1.73			1.7			1.9		
28	20 + 28		C20			C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18			C18	
31		57.6			70.6			27.5			38.7			80.1			55.9		
32		3.38			3.64			1.12			1.7	K	J-EMPC	3.3			3.4		
33	21 + 33		C21			C21			C21			C21			C21			C21	
34		0.367			0.201	U		0.225	K	J-EMPC	0.349	K	J-EMPC	0.612			0.527		
35		0.194	K	J-EMPC	0.215	U		0.183	U		0.248	U		0.199	K	J-EMPC	0.142	U	
36		0.157	U		0.179	U		0.162	U		0.221	U		0.146	K	J-EMPC	0.126	U	
37		2.41			2.13			2.5			2.79	K	J-EMPC	3.33			2.64		
38		0.217	K	J-EMPC	0.194	U		0.162	U		1.25	U		0.268	K	J-EMPC	0.126	U	
39		1.32			0.948			0.279	K	J-EMPC	0.496			0.948	K	J-EMPC	0.739		
40	40 + 41 + 71	29.1	C		33.4	C		8.8	C		12.8	C		22.3	C		22.5	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
42		54.5			31.5			6.15			14.3			11.7			18.2		
43		4.26			5.61			2.25			2.41			5.71			4.45		
44	44 + 47 + 65	218	C		196	C		70.2	C		87.6	C		156	C		142	C	
45	45 + 51	3.76	C		5.36	C		1.39	C K	J-EMPC	2.41	C		2.93	C		4.54	C	
46		0.788			1.09			0.248	K	J-EMPC	0.225			0.394	K	J-EMPC	0.963	K	J-EMPC
47	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
48		29.1			26.3			7.8			11.5			18.9			18.6		
49	49 + 69	134	C		148	C		61.2	C		65	C		146	C		117	C	
50	50 + 53	4.64	C		2.89	C		0.79	C		1.7	C		0.234	C K	J-EMPC	3.02	C K	J-EMPC
51	45 + 51		C45			C45			C45			C45			C45			C45	
52		312			356			143			157			374			296		
53	50 + 53		C50			C50			C50			C50			C50			C50	
54		0.102	K	J-EMPC	0.152	U		0.0919	U		0.0958	U		0.166	K	J-EMPC	0.132	K	J-EMPC
55		0.381	U		0.618	U		0.358	U		0.328	U		0.409	U		0.401	U	
56		26.5			25.7			7.88			11.5			17.8			23		
57		1.07	K	J-EMPC	1.6	K	J-EMPC	0.745			0.639			1.7			1.23		
58		0.607	K	J-EMPC	1.55	K	J-EMPC	0.517	K	J-EMPC	0.567	K	J-EMPC	1.23	K	J-EMPC	0.762	K	J-EMPC
59	59 + 62 + 75	15.5	C		17.7	C		6.41	C		4.9	C		14.7	C		12.8	C	
60		96.9			91.3			68.7			48.3			123			95.7		
61	61 + 70 + 74 + 76	574	C		575	C		332	C		293	C		660	C		490	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
63		20.8			21.3			20.9			12.8			24.6			20.4		
64		77.5			94.3			31.3			36.4			80.3			65.3		
65	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
66		481			432			342			244			524			381		
67		4.39			4.19			1.52			2.28			4.26			2.86		
68		3.46			5.28			3.06			2.3	K	J-EMPC	5.2			3.34		
69	49 + 69		C49			C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
72		5.17			7.11			4.59			3.79			8.47			6.59		
73		0.0525	U		0.135	U		0.082	U		0.0832	U		0.0585	U		0.094	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
77		21.3			19.4			16			14			25.9			13.2		
78		0.367	U		0.596	U		0.344	U		0.316	U		0.394	U		0.386	U	
79		7.86			4.54			2.03	K	J-EMPC	2.89			3.58			5.94		
80		0.474			0.785	K	J-EMPC	0.428	K	J-EMPC	0.287	U		0.662			0.567	K	J-EMPC
81		1.56	K	J-EMPC	1.57	K	J-EMPC	1.49	K	J-EMPC	0.829	K	J-EMPC	2.21	K	J-EMPC	1.22	K	J-EMPC
82		11.8	K	J-EMPC	10.4			2.35			3.81			2.79	K	J-EMPC	10.2	K	J-EMPC
83	83 + 99	1290	C		1040	C		1160	C		664	C		1670	C		1080	C	
84		22.4			27			5.05			8.1			8.84			18.7		
85	85 + 116 + 117	368	C		300	C		290	C		213	C		450	C		308	C	
86	86 + 87 + 97 + 108 + 119 + 125	411	C		403	C		148	C		170	C		279	C		300	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
88	88 + 91	33.8	C		45.1	C		7.63	C		12.8	C		22.4	C		25	C	
89		1.29	U		1.75	K	J-EMPC	0.306	U		0.497			1.23	K	J-EMPC	1.27	U	
90	90 + 101 + 113	1050	C		1150	C		397	C		445	C		1050	C		823	C	
91	88 + 91		C88			C88			C88			C88			C88			C88	
92		207			253			115			104			281			215		
93	93 + 95 + 98 + 100 + 102	238	C		268	C		90.3	C		124	C		261	C		230	C	
94		1.33	U		0.607	U		0.318	U		0.198	U		0.265	U		1.3	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
96		1.08			1.5			0.35			0.39	U		1.22			1.16		
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
103		3.55			5.31			1.1	K	J-EMPC	1.46	K	J-EMPC	3.56			3.61	K	J-EMPC
104		0.155	U		0.15	U		0.144	U		0.171	U		0.111	U		0.262	U	
105		885			614			694			442			908			717		
106		2.45	U		2.16	U		2.76	U		1.67	U		2.37	U		2.21	U	
107	107 + 124	41.7	C		41.1	C		18.9	C		26.1	C		58.2	C		30.9	C	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
109		178			151			201			125			210			160		
110	110 + 115	768	C		889	C		216	C		363	C		693	C		566	C	
111		2.97			2.36			3.56			1.92			3.11			2.04	K	J-EMPC
112		0.886	U		0.389	U		0.204	U		0.127	U		0.17	U		0.87	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
114		60.5			40.3			64.4			33.7			57.8			43.9		
115	110 + 115		C110			C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85			C85	

Table 3f
PCB Congener Analytical Results
Lab Sample ID's L12360-30 through L12360-35
Bradford Island - Remedial Investigation
Sculpin Collected February through October 2008

IUPAC #	COELUTING CONGENERS[1]	R-13 L12360-30	Lab Qualifier	URS Qualifier	R-14 L12360-31	Lab Qualifier	URS Qualifier	R-15 L12360-32	Lab Qualifier	URS Qualifier	R-16 L12360-33	Lab Qualifier	URS Qualifier	R-17 L12360-34	Lab Qualifier	URS Qualifier	R-18 L12360-35	Lab Qualifier	URS Qualifier
118		2790			1920			3110			1610			2850			1930		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
120		12.1			12.6			18.3			10			17.9			11.8		
121		1.28			1.28	K	J-EMPC	1.24	K	J-EMPC	0.795			1.8			1.22		
122		2.83	U		2.38	U		3.21	U		1.94	U		2.75	U		10.3	K	J-EMPC
123		47			32	K	J-EMPC	42.3			21.9			40.2			31.3		
124	107 + 124		C107			C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
126		4.83			5.2			4.93			3.13			5.52			3.91		
127		7.05			2.2	U		7.99	K	J-EMPC	3.94			7.91			4.02	K	J-EMPC
128	128 + 166	614	C		391	C		570	C		344	C		653	C		519	C	
129	129 + 138 + 160 + 163	5200	C		2960	C		4940	C		2800	C		5620	C		4110	C	
130		101			127			48.8			56.5			102			102		
131		3.67	K	J-EMPC	3.25			0.829	K	J-EMPC	1.82	K	J-EMPC	2.13			2.35	K	J-EMPC
132		68.6			101			18			32.1			47.5			66.9		
133		62.4			54.9			78.8			46.1			79.4			70.2		
134	134 + 143	24.7	C		1.62	C U		5.99	C		0.467	C U		17.9	C		19.5	C	
135	135 + 151 + 154	386	C		479	C		219	C		235	C		460	C		438	C	
136		44.5			62.9			15.6			20.2			47.6			44.5		
137		168			76			163			80			146			105		
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
139	139 + 140	65.5	C		42.9	C		60.8	C		35.4	C		71.5	C		57	C	
140	139 + 140		C139			C139			C139			C139			C139			C139	
141		155			138			90.1			81.9			188			1.55	U	
142		1.45	U		1.61	U		0.524	U		0.465	U		0.557	U		1.75	U	
143	134 + 143		C134			C134			C134			C134			C134			C134	
144		23.7			35.6			7.52			11.6			21.3			21.1		
145		0.112			0.16	U		0.0861	U		0.0872	U		0.0896	U		0.132	U	
146		642			517			627			410			661			617		
147	147 + 149	243	C		315	C		64.2	C		119	C		158	C		225	C	
148		2.59			4.41			1.17			1.65			3.16			3.46		
149	147 + 149		C147			C147			C147			C147			C147			C147	
150		0.302	K	J-EMPC	0.524	K	J-EMPC	0.126			0.106			0.242			0.258		
151	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
152		1.07			1			0.427	K	J-EMPC	0.225	K	J-EMPC	1.16	K	J-EMPC	0.828	K	J-EMPC
153	153 + 168	7400	C		3230	C		6360	C		4080	C		5380	C		4970	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
155		3.29			3.71			4.95			2.35	K	J-EMPC	5.48			4.1		
156	156 + 157	402	C		203	C		402	C		193	C		350	C		257	C	
157	156 + 157		C156			C156			C156			C156			C156			C156	
158		383			215			356			194			395			314		
159		1.26			3.35			1.54	K	J-EMPC	1.07	K	J-EMPC	2.56			2.4		
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
161		1	U		1.12	U		0.363	U		0.323	U		0.386	U		1.21	U	
162		14.1			10.1			19.4			9.38			17.2			13.7		
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
164		55.8			71.6			21.2			34.3			68.2			66		
165		2.15			1.91			3.33	K	J-EMPC	1.75			3.18	K	J-EMPC	2.26		
166	128 + 166		C128			C128			C128			C128			C128			C128	
167		170			96.8			146			91			139			99.2		
168	153 + 168		C153			C153			C153			C153			C153			C153	
169		5.05	U		3.66	U		9.29	U		4.88	U		7.12	U		4.67	U	
170		297			205			398			186			342			252		
171	171 + 173	177	C		120	C		221	C		108	C		194	C		150	C	
172		46			41.6			56			31.3	K	J-EMPC	60			48.7		
173	171 + 173		C171			C171			C171			C171			C171			C171	
174		24.7			49.3			15.4			14.2			31.4			30.5		
175		12.6			12.1			9.08			6.65			11.8			11.5		
176		6.51			8.71			1.82	K	J-EMPC	2.9	K	J-EMPC	4.44			4.85	K	J-EMPC
177		127			155			50.7			63.3			94			88.8		
178		193			159			195			115			196			173		
179		99.4			123			31.6			48.6			96.2			79		
180	180 + 193	998	C		630	C		1510	C		670	C		1020	C		756	C	
181		9.42	K	J-EMPC	4.38	K	J-EMPC	10.8	K	J-EMPC	5.26	K	J-EMPC	6.52			7.05		
182		6.3			2.74			5.63			4.19	K	J-EMPC	3.01	K	J-EMPC	7.02	K	J-EMPC
183	183 + 185	362	C		273	C		445	C		239	C		396	C		316	C	
184		3.8			3.62			6.29			3.05	K	J-EMPC	6.34			4.22		
185	183 + 185		C183			C183			C183			C183			C183			C183	
186		0.384	U		0.154	U		0.417	U		0.352	U		0.402	U		0.332	U	
187		818			889			668			515			700			723		
188		2.45			2.32			2.02			1.51			1.92			2.28		
189		9.74			6.9			15.4			8.2			11	K	J-EMPC	9.2		
190		146			102			229			101			158			120		
191		19.2			11			32.9			14.5			19.3			16.5		
192		0.427	U		0.167	U		0.464	U		0.392	U		0.447	U		0.369	U	
193	180 + 193		C180			C180			C180			C180			C180			C180	
194		71.4			56.8			144			67.3			107			74.8		
195		70.8			43.5			127			56.8			77			59.6		
196		50.3			38			95.7			40.4			60.8			46.6		
197	197 + 200	13.5	C		10.8	C		18.6	C		9.27	C		15.7	C		11.2	C	
198	198 + 199	93.6	C		99.5	C		107	C		70.8	C		109	C		99	C	
199	198 + 199		C198			C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197			C197	
201		27.6			20.1			21.6			16.9			20.7			18.8		
202		118			74.1			129			72.3			115			86.6		
203		188			111			274			141			184			137		
204		0.392	K	J-EMPC	0.174			0.367	U		0.364	U		0.368	U		0.482	K	J-EMPC
205		8.12			5			12.3			5.91			8.02			6.69		
206		42.1			30.8			63.1			35.6			49.3			37.6		
207		9.85			6.81			15.9			8.05			9.45			8.4		
208		13.7			12.4			13.5			9.81			13.4			11.9		
209		20.9			15.8			30.6			17.2			24.2			20.4		

Notes:

All results are in units of pg/g (picograms/gram), wet weight.

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the reported sample quantification limit.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
K = (CAS qualifer) The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
J-EMPC = (URS qualifer) The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
PCBs = Polychlorinated Biphenyls
Non-detect values reported at the analytical reporting limit.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.

QUALITY CONTROL SUMMARY REPORT FOR ANALYTICAL CHEMISTRY

GOOSE ISLAND SAMPLES COLLECTED APRIL/MAY 2008

SEPTEMBER 2009

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1.0 Executive Summary

The overall assessment of the analytical results for the two sediment, one clam, one crayfish, and one sculpin sample collected from the Goose Island Slough, shows the quality of the data to be acceptable to support project objectives. The contracted laboratories provided results for all requested analyses and laboratory data reports were complete. Some data were qualified as estimated and flagged 'J' or 'J-EMPC', and some data were qualified as not detected and flagged 'U'. All data qualifiers resulting from this review have been added to both the project database and the data tables within the main body of this report. Refer to Section 4.0 of this report for a listing of qualifier definitions.

2.0 Project Description

Sediment and tissue were collected from the Goose Island Slough on April 27, 29 and May 1, 2009, in support of the Bradford Island Bonneville Lock and Dam Project, River Operable Unit Remedial Investigation. Table D-1 summarizes the identification numbers assigned to the samples, the laboratory identification numbers, collection date, and requested analyses.

3.0 Sampling and Analytical Procedures

Samples were collected and analyzed according to the Bradford Island Bonneville Lock and Dam Project, River Operable Unit Remedial Investigation Quality Assurance Project Plan (QAPP) (URS 2007) and QAPP Addendum (URS 2009). Deviations from the proposed sample collection (i.e. number and volume per each pre-determined sample location) are addressed in the Goose Island Slough Data Gap Sampling Report (URS 2009). The sculpin sample (090429110SC) had insufficient sample volume to analyze the full suite of analytes listed in the QAPP Addendum, as indicated in Table D-1. The remaining two tissue samples (clams and crayfish) and the two sediment samples had sufficient sample volume to analyze all the COIs identified in the QAPP Addendum.

All samples were submitted to Columbia Analytical Services (CAS) of Kelso, Washington and logged in under two CAS sample delivery group numbers (K0903809 and K0904119), see Table D-1. (Note: SVOCs and PAHs were analyzed separately for tissue matrices and are therefore discussed separately in this report). Samples were archived frozen by CAS (-20 degrees Celsius, °C) prior to analysis.

Whole-body clam, crayfish, and sediment samples were homogenized using an industrial blender by CAS. An aliquot of the homogenized tissue (clam and crayfish) and sediment sample were sent to Axys Analytical Services Ltd. of Sidney, British Columbia, Canada (Axys) to perform the PCB congener analysis by EPA Method 1668A, *Chlorinated Biphenyl Congeners in Water, Soil, Sediment and Tissue by High Resolution Gas Chromatography/High Resolution Mass Spectrometry*. Due to limited sample volume, the single sculpin collected was submitted directly to Axys for sample homogenization and PCB congener analysis,.

The Axys analytical data report includes a listing of the Axys Method 1668A modifications. Samples were logged in by Axys under two Axys sample delivery group numbers (DPWG29244 and DPWG29402), see Table D-1.

The following table lists the parameters analyzed for one or more of the samples. Table D-1 summarizes the specific requested analyses for each sample by URS and laboratory identification numbers.

Method	Analytical Parameter
EPA 8082M	Polychlorinated Biphenyls (PCBs) as Aroclors
EPA 1668A	PCBs as congeners
EPA 6000/7000 series	Metals[1]
EPA 8270C-SIM	Semi-Volatile Organic Compounds (SVOCs)
EPA 8270C-SIM	Polynuclear Aromatic Hydrocarbons (PAHs)
NWTPH-Dx (Ecology 1997)	Northwest Total Petroleum Hydrocarbon – Diesel and Residual Range (NWTPH-Dx)
Puget Sound Estuary Program (PSEP 1996)	Percent Lipids
Puget Sound Estuary Program (PSEP 1996)	Total Organic Carbon (TOC)
Gravimetric Freeze Dry	Percent Solids – Sediment Matrix Percent Solids – Tissue Matrices
Puget Sound Estuary Program (PSEP 1996)	Grain Size

[1] = Aluminum, Antimony, Arsenic, Barium, Berylium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, thallium, vanadium, zinc

4.0 Data Validation

Analyses were performed in general accordance with the above-referenced methods. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, COC, laboratory case narrative, proper sample preservation and handling procedures, holding times, quantitation limits, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The following items were reviewed for 20% or greater of the data: primary and secondary column verification, initial and continuing instrument calibrations and a verification of the reported electronic data with the hard copy deliverable.

The data review process for this investigation followed the QAPP. Additionally, because the QAPP-referenced *Department of Defense Quality Systems Manual* does not discuss PCB congeners, the data review process utilized guidance from EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review* (USEPA 2005) and *EPA Region 10 Standard Operating Procedure (SOP) for the Validation of Method 1668 Toxic, Dioxin-like, PCB Data*

(USEPA 1995) as appropriate for method performed. In the case of disagreement between the guidance documents and the analytical method, method criteria were utilized for data review.

The non-congener organic and metals results were reviewed in accordance with the criteria contained in the DoD QSM (DoD 2006), the above listed methods and EPA's *NFGs for Organic Data Review* (USEPA 2008) or EPA's *NFGs for Inorganic Data Review* (USEPA 2004), in that order of precedence.

A summary of qualifiers assigned to results in this investigation is included in Table D-2 and Table D-3. Samples are listed by their URS sample identification assigned in the field as well as the laboratory identification. CAS was requested to report analytical results above the method detection limit (MDL) but below the method reporting limit (MRL). These results were flagged 'J' by CAS. These 'J' qualifiers are included in the database and in the data tables included in the main body of this report, but are not tabulated in Table D-2. Congeners are reported using sample-specific detection limits. Qualifiers that may have been assigned to the results of this investigation include the following:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J-EMPC – The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration of the analyte in the sample - used only for PCB congener results.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR - Do Not Report. Another value is available that is more reliable or appropriate.

Final sample results and qualifiers are presented in the analytical tables provided in the sampling report.

4.1 Chain-of-Custody, Sample Preservation and Holding Time

Non-congener Results

The two sediment samples and the composited bait (dry dog food) sample were received by CAS via courier on May 1, 2009. The tissue samples were received by CAS on May 8, 2009. URS shucked the clam tissue prior to submitting the sample to CAS. As noted above, all samples were archived frozen by CAS prior to analysis. The COC forms for the URS to CAS deliveries indicate that samples were maintained under proper custody and the forms were signed upon release and receipt. All coolers were submitted at temperatures within the EPA-recommended temperature range of 6°C or below. All samples were analyzed within technical and contracted holding times.

Congener Results

The COC forms for the CAS to Axys delivery of the sediment samples (shipped on May 5, 2009 and received on May 8, 2009) and the tissue samples (shipped on May 26, 2009 and received on May 27, 2009) indicate that samples were maintained under proper custody and the forms were signed upon release and receipt. The condition and temperature of the samples upon receipt by Axys was appropriate and all samples listed on the COC form were present with the following exceptions:

- Sediment samples arrived at Axys at 14 degrees Celsius (°C) above the EPA-recommended temperature of 6 °C or below. The samples were delayed passing through international customs during shipment and therefore spent four days in transit. PCBs are known for long term stability (USEPA 2005b). Therefore, the sample results were not qualified based on the elevation in temperature during shipment.
- The glass sample container for sediment sample 090429111SD was received by Axys broken, the sample was still intact and usable. Samples results were not qualified based on the broken sample container.

All samples were analyzed within technical and contracted holding times.

4.2 Instrument Calibration

The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by the analytical methods. Initial calibrations (ICALs) and continuing calibrations (CCALs) were analyzed at the proper frequency and at the appropriate concentrations required by the methods.

Non-congener Results

Instrument calibrations were acceptable for the sample analyses performed, with the following exception:

- EPA Method 8082 requires a secondary column confirmation. The initial calibration verification criteria for the confirmation column for Aroclors 1016 and 1260, associated with the tissue analytical batch KWG0904914, exceeded the laboratory criterion, but was within the DOD QSM criterion of ± 20% of the expected values. Second source values

were -16.8% and -17.2% for Aroclors 1016 and 1260, respectively. Analytical results for Aroclors 1016 and 1260 were reported from the primary column and results were not qualified.

Congener Results

The laboratory performed initial multipoint calibrations for target and standard compounds as required by the Method 1668A. ICALs, continuing calibration verifications (CCVs) and OPR (ongoing precision recovery) standards were analyzed at the proper frequency and at appropriate concentrations as required by EPA Method 1668A. Calibration compounds met the acceptance criteria as listed in the method with the following exception:

- The 25.3% recoveries of ^{13}C-labeled PCB 4 (PCB 4L) and ^{13}C-labeled PCB 19 (19L) in the OPR for analysis batch WG28904-102 were below the method acceptance criteria of 30%. All native (or unlabeled) congeners were within control limits for the OPR, including PCB 4 and PCB 19. Additionally the labeled and non-labeled standards had acceptable recoveries in the method blank (canola oil) and project samples, with the one exception stated below in section 4.5. Sample analytical results were not qualified based on the low recovery of PCB 4L and 19L in the OPR.

4.3 Review of Blanks

Method blanks are used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank per analysis for each batch, per QAPP requirements. Initial calibration and continuing calibration blanks are also analyzed when appropriate per analytical method to check for laboratory contamination and instrument bias. Field blanks were not collected as part of this analytical program. Qualification of samples due to method blank and calibration blank contamination followed guidelines set forth in the EPA NFGs.

Non-congener Results

Non-congener organic sample results less than five times (5x) and inorganic sample results less than ten times (10x) the blank concentration and between the method detection limit (MDL) and the MRL were qualified as non-detect and flagged with a ‘U’ at the MRL. When sample results were less than 5x (or 10x for inorganics) the blank concentration but above the MRL, the reported result was qualified as non-detect and flagged ‘U’. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Target compounds reported with concentrations greater than 5x (or 10x) the blank concentration were not qualified. For solid matrices reported in both wet and dry weight concentrations, the above-noted guidelines were applied using the wet weight results, and any qualifiers assigned were also assigned to the dry weight results.

All analytical tests indicate non-detects for method blanks with the following exceptions:

- Cobalt and nickel were above the MDL and below the MRL and mercury was detected at the MDL in the method blank in CAS delivery group K0903809. Antimony, barium, copper, and thallium were detected in the continuing calibration blanks bracketing the samples in the same sample delivery group. All detected cobalt, nickel, mercury,

antimony barium, copper and thallium results were greater than 10x the associated blank concentrations, therefore data were not qualified.

- Antimony and barium were detected above the MDL and below the MRL in the continuing calibration blanks bracketing the samples in the sample delivery group K0904119. All detected antimony and barium results were greater than 10x the associated blank concentrations, therefore data were not qualified.
- Diesel Range Organics (DRO) and Residual Range Organics (RRO) were both detected above the MDL and below the MRL in the method blank associated with delivery group K0903809. All detected DRO and RRO results were greater than 5x the associated method blank concentrations, therefore data were not qualified based on DRO and RRO method blank detections.
- Acenaphthene, benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, fluorene, fluoranthene and pyrene were detected above the MDL and below the MRL in the method blank associated with the PAHs in sample delivery group K0904119. Acenaphthene, benzo(a)anthracene, fluoranthene, and pyrene results for associated sample K0904119-001 were less than 5x the detected blank concentrations and therefore, qualified as non-detect at the reported concentration (Table D-2).

Congener Results

PCB congener sample results that were reported as detected at a concentration less than five times (5x) the associated blank concentration were flagged 'U' or non-detect at the reported concentration. Target compounds reported with concentrations greater than 5x the blank concentration were not qualified. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Method blank results reported as EMPCs were not considered appropriate for use in qualifying associated sample results. Method 1668A stipulates using a method blank as similar to the matrix as possible. The method blank for sediment was prepared using sand. For the tissues matrices and the dog food canola oil was used to approximate the lipid content of the samples.

PCB congener result qualified based on method blank concentrations are included in Table D-3.

4.4 Surrogate Recovery Review

Surrogate recoveries are a measure of accuracy for the overall analysis of each individual sample. Each sample analyzed for organic compounds (PCB Aroclors and SVOCs) was spiked with surrogate(s) (system monitoring compounds). Surrogate recoveries were acceptable for all analyses, with the following exceptions:

- The SVOC analysis of the bait sample (K0903809-003) required a large dilution (100 fold) to overcome the sample matrix interferences. Due to the large dilution, the surrogate recoveries could not be calculated and therefore the recoveries were reported as 0%. The LCS/LCSD associated with this sample were within control limits, indicating the analytical batch was in control. Analytical results for this sample were not qualified due to the surrogate recoveries.

- The recovery of the surrogate decachlorobiphenyl (56%) associated with PCB Aroclor analysis was below the DoD QSM control limit of 60% for sample K0904119-003. NO PCB Aroclors were detected in this sample. All PCB Aroclors were qualified as estimated and flagged 'UJ' due to the bias low surrogate recovery.

4.5 Labeled Internal Standard Recovery Review (congener analysis only)

Samples analyzed for PCB congeners are spiked with labeled internal (quantification) standards. These standards are used to quantitate target congeners and the calculations of target compound concentrations are designed to compensate for low extraction and/or cleanup efficiencies. In addition, their recovery is measured against injection standards added after extraction and cleanup to evaluate extraction and/or cleanup efficiency, which could affect sensitivity and could also affect accuracy for target compounds not quantitated against a chemically identical, isotopically labeled standard. The percent recovery of the labeled standards was compared with the limits set forth in EPA Method 1668A and those set by Axys detailed in Table D-1 of the Axys narrative. All recoveries were acceptable with the following exception:

- The percent recoveries of ^{13}C-labeled PCB 4 (19.2%) and ^{13}C-labeled PCB 19 (20.9) in sample L12725-1 were below the method acceptance criteria of 25%. PCB 4 and 19 have chemically identical isotopic labeled standards. The isotopic dilution calculations produce recovery corrected quantitation results; therefore, only the non-chemically identical PCB congeners quantitated using these labeled standards were estimated based on the low internal standard recoveries. Analytical results for PCB 5 through 14, 16 through 18, 20 through 36, 38 and 39 for sample L12725-1 were qualified 'J/UJ' to reflect the potential low bias.

Cleanup standards 28L, 111L, and 178L are added prior to cleanup and quantitated using injection standards added just prior to analysis to evaluate cleanup efficiency. The cleanup standards were within the 30-135% control limits set by EPA Method 1668A.

4.6 Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicate Review

Laboratory control/laboratory control duplicate (LCS/LCSD) samples are used to monitor the laboratory's day-to-day performance of routine analytical methods independent of matrix effects and to assess accuracy for the target compounds. Matrix spike/matrix spike duplicate (MS/MSD) samples are analyzed to assess the laboratory's ability to recover the target compounds from the sample matrix. At least one LCS and one MS/MSD were performed for each non-congener analysis and for each batch per method requirements.

Non-congener Results

LCS/LCSD and MS/MSD recoveries were acceptable for all non-congener analytical tests with the following exception:

- The recovery of aluminum was below the DoD QSM criteria of 80% for the MS (-392.7%) and the MSD (-186.5%) performed on sample K0903809-001. The sample result

for aluminum was greater than four time (4x) the spike concentration, therefore samples results were not qualified based on MS/MSD recoveries.

- The recovery of mercury was below the DoD QSM criteria of 80% for the MS (67.8%) performed on sample K0903809-003 and the RPD (37.9%) for the MS/MSD pair exceeded the exceeded the DoD QSM precision control limit of 20%. The LCS samples were in control indicating the analytical batch was in control. Mercury results for sample K0903809-003 were qualified as estimated and flagged 'UJ' due to bias low MS recovery and RPD precision.
- The recovery of mercury was below the DoD QSM criteria of 80% for the MSD (61.6%) in sample K0904119-003 and the RPD (34.2%) for the MS/MSD pair exceeded the exceeded the DoD QSM precision control limit of 20%. The LCS samples were in control indicating the analytical batch was in control. Mercury results for sample K0904119-003 were qualified as estimated and flagged 'J' due to bias low MS recovery and RPD precision.
- Only two Aroclors are required by EPA Method 8082 to monitor LCS recoveries (Aroclors 1016 and 1260). The recovery of Aroclor 1260 in the LCS associated with sample delivery group K0903809 was 59% (below the DoD QSM lower limit of 60%). Aroclor 1016 was with the DoD QSM control limits. Aroclor 1260 in the associated samples (K0903809-001, K0903809-002, and K0903809-003) were qualified as estimated and flagged 'UJ' due to bias low LCS recovery.
- Aroclor 1260 recovery in the LCSD (59%) was below the DoD QSM lower limit of 60% for sample delivery group K0904119. The LCS and RPD for the LCS/LCSD pair were in control. Because two of the three parameters were in control, the analytical results were not qualified.
- The MS/MSD recoveries and RPD for Aroclor 1260 associated with sample delivery group K0903809 was outside the DoD QSM control limits. However, the sample chosen for the matrix spike was not a project sample and, therefore, results of the MS/MSD are not applicable for qualification of the project specific sample matrix.

Congener Results

MS/MSD samples are not required by Method 1668A for PCB congener analysis. For Method 1668A, Ongoing Precision and Recovery (OPR) samples were used in place of LCS to monitor laboratory performance. The OPR was prepared using canola oil to approximate the lipid content of the samples. OPR recoveries were acceptable for congener analyses with the exception previously stated in Section 4.2 above.

4.7 Duplicate Review

Field duplicates were not collected during this sampling event.

Non-congener Results

To evaluate laboratory precision, CAS performed duplicate analyses (i.e. LCS/LCSD and MS/MSD) as discussed above. All duplicate analyses were within relative percent difference

criteria with the one exception described in Section 4.6 above. No samples were qualified exclusively due to duplicate precision exceedances.

Congener Results

Laboratory duplicates were not performed by Axys on the congener samples.

4.8 Compound Quantification

Non-congener Results

All second column confirmations performed by CAS using Method 8082 were acceptable, with the exception previously mentioned in Section 4.2.

Congener Results

The internal standard method is used to calculate concentrations of PCB congeners that do not have chemically identical labeled standards. The internal standard method is dependent upon consistent detector response over the calibration range. If the detector response varies, concentrations can be biased high or low based on variations in the detector sensitivity. During congener analysis, PFK (perfluorokerosene) is used as a lock mass reference standard to measure changes in detector sensitivity. The lock mass must not vary more than 20% throughout its respective retention time window as required by Method 1668A. Variations of more than 20% indicate the presence of a co-eluting interference or decreased sensitivity. Lock mass stability and sensitivity were acceptable for the all sample analyses with the following exceptions:

- Sample L12657-1 had lock mass deflections for PCBs 92, 146 and 187 and sample L12657-2 had lock mass deflections for PCBs 92, 146, 187 and 197. These congeners were qualified as estimated and flagged 'J/UJ' due to the lock mass deflection (Table D-3). The overall concentration of the analytes affected by lock mass represents less than 4 percent of the total PCB concentration for each sediment sample.

4.9 Target Compound Identification

Non-congener Results

- CAS applied a 'Z' flag, indicating the chromatographic pattern did not resemble and petroleum product, to the residual range organics (RRO) for samples K0903809-001, K0903809-002 and to both the diesel range organics (DRO) and RRO for sample K0903809-003. Theses results were reported unqualified.

Congener Results

Ion abundance ratios are used to identify PCB congeners. Results that met all other qualitative identification criteria, but differ by more than 15% from the theoretical ion abundance criterion set by EPA Method 1668A were flagged in the laboratory report with a 'K' flag. Those results flagged 'K' with ion abundance ratios outside the identified quantitation criteria are considered estimated maximum possible concentrations (EMPC) and were re-flagged 'J-EMPC' during this review. If the analyte result was previously qualified 'U' by method blank detection, the result retained the 'U' qualifier and was not qualified further (there is no ion ratio criterion for non-

detects). These "J-EMPC" flagged data are listed in Table D-3, appear within the data tables in the main body of this deliverable, and have been entered into the database.

Ion ratios outside the control limits are generally a consequence of co-eluting interferences to either one or both quantitation peaks. In these cases, Axys chose to use the quantitation peak areas as recorded; no adjustments were made to force the peaks to match the theoretical ion abundance ratios before reporting EMPC results. EMPC results should be considered by the data users as part of evaluating the data for end-use objectives.

Additionally, the laboratory-assigned flag 'C' is used in Table D-3 to indicate co-eluting PCB isomers for this analysis. The concentrations of the co-eluting isomers were reported as a group, eliminating the need for any data qualification as part of this data review.

4.10 Reporting Limits

Non-congener Results

Sample concentrations for non-congener analyses that were detected below the MRL but above the MDL, were qualified as estimated flagged with a 'J' by the laboratory (CAS). All laboratory J-flagged results are considered estimates. As stated above, these flags are recorded within the database and are reported in the data tables included in the main body of this report.

The SVOC extract for the bait sample (K0903809-003) was highly viscous and colored. Following a semi-quantitative analysis, a 100 fold dilution was performed. Due to the nature of the sample matrix and the dilution the SVOC analytical results have elevated MDL and MRLs. These results were not qualified during this review, but should be considered as part of data use by the end users.

Congener Results

All non-detect congener results are reported at sample specific reporting limits. All samples were analyzed using approximately 10 grams as recommended by Method 1668A, with the below-listed exceptions:

- Inadequate sculpin tissue was received by the laboratory (Axys). Therefore, only 5.91 grams were extracted for the analysis of sample 090429110SC. The end user of the data should be aware that this small sample size may have elevated the reporting limits for some PCB congeners.

5.0 Completeness

The laboratory reported all requested analytes and the deliverable data reports were complete. Some data were qualified as estimated 'J' or 'J-EMPC' and some as non-detect 'U'. A summary of qualifiers can be found in Tables D-2 and D-3. A completeness summary follows; analysis completeness was calculated using 159 congener results, 209 total congeners minus the 50 co-eluting congeners which were reported with the lowest numbered congener in the co-eluting set.

The electronic and portable delivery format (.pdf) versions of the deliverables were cross-checked for accuracy at a frequency of 20% or greater. Any minor discrepancies found between the

deliverables were reported to CAS and corrected by updating the database to reflect the .pdf deliverable.

- *Technical Completeness* = (number of useable results/total reported results) x100

  Non-congener = (168 compliant / 168 total results) = 100%
  Congener = (954 compliant / 954 total results) = 100%

  All samples results are considered useable.

- *Analytical Completeness* = (number of unqualified results/total reported results) x100

  Non-congener = (154 unqualified results/ 168 total results) = 92%

  Non-congener data qualified 'J' due to detections between the MDL and the MRL were not included in this calculation.

  Congener = (792 unqualified results/ 954 total results) = 83%

  Congener data qualified as estimated and flagged 'J', 'UJ' or 'J-EMPC' were included in this evaluation.

- *Contract Completeness* = (number of contract compliant results/total reported results) x100

  Non-congener = (168 compliant / 168 total results) = 100%

  Congener = (954 compliant / 954 total results) = 100%

  All samples analyzed met laboratory contract requirements.

- *Field Sampling Completeness* =(number samples collected/number samples planned) x100

  Total Samples = *(5 samples collected / 8 planned samples) =63%*

  The target number of samples outlined in the QAP Addendum (URS 2009) was eight; sediment, clam, crayfish and sculpin at two sample stations. Only 5 samples were collected due to insufficient sample volume at one of the sample stations. The bait sample was not included in the field sampling completeness calculations as this sample was not a primary sample, but a QC sample.

6.0 References

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PSEP 1996. Puget Sound Estuary Program *Recommended Protocols for Measuring Selected Environmental Variables in Puget Sound*, January 1996 and subsequent chapter revisions.

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USEPA 2004. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. October 2004.

USEPA 2005. Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review. September 2005.

USEPA 2005b. U.S. Environmental Protection Agency (USEPA) Sample Holding Time Reevaluation, EPA/600/R-05/124, October 2005.

USEPA 2008. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review. June 2008.

TABLES

Table D-1
Sample Identification and Analysis Summary
Bradford Island - Remedial Investigation
Goose Island Slough Sampling

URS ID	Sample Station	Matrix	Collection Date	CAS ID (non-congener)	Axys ID (congener)	Axys Sample Delivery Group	Analytes									
							PCB Aroclors (EPA 8082)	PCB Congeners (EPA 1668A)	Metals	SVOCs	PAHs	TPH-Dx (NWTPH-Dx)	TOC	Grain Size	%Solids	%Lipids
090427110SD	110	Sediment	4/27/2009	K0903809-001	L12657-1	DPWG29244	X	X	X	X		X	X	X	X	
090429111SD	111	Sediment	4/29/2009	K0903809-002	L12657-2		X	X	X	X		X	X	X	X	
090427110TC	110	Clam	4/27/2009	K0904119-003	L12725-3	DPWG29402	X	X	X	X	X[1]				X	X
090429110CF	110	Crayfish	4/29/2009	K0904119-001	L12725-1		X	X	X	X	X[1]				X	X
090429110SC	110	Sculpin	4/29/2009	K0904119-002	L12725-2			X								X
090430BaitDF	110/111	Bait (Dog Food)	4/30/2009	K0903809-003	L12658-1	DPWG29244	X	X	X	X		X			X	X

Notes:
ID = Identification Number
CAS = Columbia Analytical Services
PAHs = Polyaromatic Hydrocarbons
PCB = Polychlorinated Biphenyl
NWTPH = Northwest Total Petroluem Hydrocarbons
Dx = Diesel Range Hydrocarbons
SVOCs = Semi-volatile Organic Compound
1 = Selected SVOCs and PAHs were analyzed separately for tissue matrices and are therefore discussed separately in this report. SVOCs and PAHs were analyzed in a single analysis for the sediment matrix.

Table D-2
Non-congener Qualifier Summary
Bradford Island - Remedial Investigation

Goose Island Slough Sampling

URS ID	CAS ID (non-congener)	Analyte	Qualifier	Rationale
090429110CF	K0904119-001	acenaphthene	0.50U	method blank detection
		benz(a)anthracene	0.50U	
		fluoranthene	0.50U	
		pyrene	0.50U	
090427110SD	K0903809-001	Aroclor 1260	UJ	LCS recovery
090429111SD	K0903809-002			
090430BaitDF	K0903809-003			
090429110TC	K0904119-003	All Aroclors	UJ	surrogate recovery
090429110TC	K0904119-003	mercury	J	MS recovery/ RPD precision
090430BaitDF	K0903809-003	mercury	UJ	

Notes:

units: micrograms per kilograms (ug/kg)

CAS = Columbia Analytical Services

Concentrations are reported as wet weight, qualifiers would apply to dry weight concentrations also.

ID = Identification Number

LCS = Laboratory Control Sample

MS = Matrix Spike

PCBs = Polychlorinated Biphenyls

Table D-3
PCB Congener Qualifer Summary
Bradford Island - Remedial Investigation
Goose Island Slough Sampling

IUPAC #	COELUTING CONGENERS[1]	090427110SD L12657-1	Lab Qualifier	URS Review Qualifier	090429111SD L12657-2	Lab Qualifier	URS Review Qualifier	090429110CF L12725-1	Lab Qualifier	URS Review Qualifier	090429110SC L12725-2	Lab Qualifier	URS Review Qualifier	090429110TC L12725-3	Lab Qualifier	URS Review Qualifier	090430BAIT DF L12658-1	Lab Qualifier	URS Review Qualifier
1		0.309	K	J-EMPC	0.339			0.201	U		0.437	K	J-EMPC	1.62			2.19		U
2		22.8			27.2			0.209	U		0.294			3.65			0.493		
3		1.02			1.06			0.258	U		0.388	K	J-EMPC	0.805	K	J-EMPC	1.13		U
4		0.856	K	J-EMPC	0.862			1.29	U		3.87	K	J-EMPC	36.8			2.46		
5		0.289	U		0.232	U		0.703	U	UJ	0.519	U		0.700			0.193	U	
6		0.565			0.564	K	J-EMPC	0.639	U	UJ	2.16			7.82			1.34		
7		0.252	U		0.202	U		0.657	U	UJ	0.485	U		0.480			0.290		
8		2.41			2.79			0.600	U	UJ	7.58			22.6			5.41		
9		0.257	U		0.206	U		0.634	U	UJ	0.540	K	J-EMPC	0.597			0.563	K	J-EMPC
10		0.250	U		0.201	U		0.626	U	UJ	0.462	U		0.501	K	J-EMPC	0.175	U	
11		91.8			101			19.8		UJ	34.1			4,480			6.55		
12	12 + 13	1.51	C		1.42	C K	J-EMPC	0.724	C U	UJ	0.534	C U		0.385	C U		0.350	C K	J-EMPC
13	12 + 13		C12			C12			C12			C12			C12			C12	
14		0.251	U		0.202	U		0.687	U	UJ	0.507	U		0.366	U		0.184	U	
15		5.52	K	J-EMPC	7.13			0.914	U		1.05	K	J-EMPC	36.9			1.57		
16		1.85			1.77			0.292		UJ	8.56			53.7			1.38	K	J-EMPC
17		1.93			2.00			0.295	K	J-EMPC	17.8			49.7			1.78		
18	18 + 30	4.40	C		4.40	C		0.655	C K	UJ	37.6	C		116	C		3.63	C	
19		0.395			0.385			0.214	U		1.26			9.19			0.472		
20	20 + 28	15.2	C		17.1	C		2.23	C	J	155	C		110	C		4.96	C	
21	21 + 33	4.83	C		5.60	C		0.460	C K	J-EMPC	29.7	C		56.2	C		2.08	C	
22		4.60			5.08			0.566	K	J-EMPC	23.1			102			1.21		
23		0.104	U		0.0716	U		0.115	U	UJ	0.143	K	J-EMPC	0.127	K	J-EMPC	0.150	K	J-EMPC
24		0.0760	K	J-EMPC	0.0474	U		0.104	U	UJ	0.644	K	J-EMPC	1.35			0.0798	U	
25		0.807			0.939			0.117		J	2.42			10.1			0.246		
26	26 + 29	1.70	C		1.88	C		0.348	C		14.2	C		21.0	C		0.812	C	
27		0.382			0.419			0.0930	U	UJ	3.15			13.0			0.242	K	J-EMPC
28	20 + 28		C20			C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18			C18	
31		9.39			10.5			1.09		J	38.0			76.2			3.36		
32		0.937			0.929			0.132		J	9.17			9.78			0.947		
33	21 + 33		C21			C21			C21			C21			C21			C21	
34		0.102	U		0.103	K	J-EMPC	0.116	U	UJ	0.537			0.325			0.0803	U	
35		0.533	K	J-EMPC	0.594			0.136	U	UJ	0.123	U		11.0			0.129	K	J-EMPC
36		0.152			0.183	K	J-EMPC	0.119	U	UJ	0.107	U		2.49			0.0825	U	
37		5.85			7.23			2.59			2.36			47.7			0.525		U
38		0.0946	U		0.0910			0.120	U	UJ	0.108	U		0.867			0.0837	U	
39		0.0939	U		0.117	K	J-EMPC	0.117	U	UJ	0.556			2.04			0.0856	U	
40	40 + 41 + 71	5.92	C		6.31	C		0.647	C K	J-EMPC	35.1	C		102	C		0.760	C	
41	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
42		3.75			3.67			0.512			15.6			107			0.0849	U	
43		0.301			0.474			0.103	U		5.01			6.41			0.0912	U	
44	44 + 47 + 65	16.9	C		16.1	C		2.15	C		104	C		399	C		2.37	C	
45	45 + 51	1.67	C		1.83	C		0.138	C K	J-EMPC	4.24	C		22.4	C		0.508	C K	J-EMPC
46		0.637	K	J-EMPC	0.698			0.104	U		0.608	K	J-EMPC	5.07	K	J-EMPC	0.0970	K	J-EMPC
47	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
48		2.40			2.42			0.321			15.2			57.7			0.269		
49	49 + 69	9.67	C		10.7	C		0.907	C		92.5	C		120	C		1.09	C K	J-EMPC
50	50 + 53	1.67	C		1.50	C		0.150	C		1.99	C K	J-EMPC	33.3	C		0.257	C K	J-EMPC
51	45 + 51		C45			C45			C45			C45			C45			C45	
52		21.6			22.5			1.89			161			322			3.88		
53	50 + 53		C50			C50			C50			C50			C50			C50	
54		0.0677	U		0.0661	U		0.130	U		0.130	U		0.131			0.0620	U	
55		0.124	U		0.117	U		0.187	K	J-EMPC	6.82			8.48			0.0715	U	
56		6.87			8.25			0.802			17.1			109			0.364	K	J-EMPC
57		0.120	U		0.113	U		0.125	U		0.714			1.01			0.0648	U	
58		0.120	U		0.113	U		0.133	U		0.752	U		1.12			0.0674	U	
59	59 + 62 + 75	1.61	C		1.50	C		0.207	C		10.4	C		29.6	C		0.179	C K	J-EMPC
60		4.46			4.83			0.875			62.1			60.1			0.380		
61	61 + 70 + 74 + 76	34.6	C		39.7	C		6.60	C		249	C		394	C		3.90	C	
62	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
63		0.997			1.18			0.777			12.2			10.5			0.0654	U	
64		7.06			7.58			0.650			51.4			94.4			0.787	K	J-EMPC
65	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
66		21.0			24.8			7.41			236			295			1.80		
67		0.469	K	J-EMPC	0.519			0.112	U		1.60			9.20			0.0589	U	
68		0.243	K	J-EMPC	0.361			0.128			0.811			2.75			0.0603	U	
69	49 + 69		C49			C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
72		0.327			0.406			0.121	U		3.30			2.59			0.0585	U	
73		0.0731	U		0.0643	U		0.0568	U		0.103	U		0.0585	U		0.0619	U	
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
77		2.85			3.53			2.26			7.99			33.7			0.121	K	J-EMPC
78		0.117	U		0.111	U		0.137	U		0.772	U		0.714	U		0.0707	U	
79		0.538			0.481			0.146			0.997			15.8			0.0576	U	
80		0.109	U		0.103	U		0.120	U		0.675	U		0.624	U		0.0633	U	
81		0.135			0.150	K	J-EMPC	0.145	U		0.882	K	J-EMPC	2.17	K	J-EMPC	0.0831	U	
82		3.66			4.45			0.168	U		4.24	K	J-EMPC	29.3			0.350	K	J-EMPC
83	83 + 99	30.0	C		33.8	C		7.64	C		398	C		529	C		5.57	C	
84		8.13			9.95			0.560			4.60			64.7			0.546		
85	85 + 116 + 117	9.25	C		10.4	C		2.58	C		132	C		134	C		1.33	C	
86	86 + 87 + 97 + 108 + 119 + 125	28.6	C		32.4	C		3.47	C		103	C		489	C		2.11	C	
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
88	88 + 91	5.27	C		6.11	C		0.404	C		5.64	C		59.6	C		0.329	C	
89		0.309			0.359	K	J-EMPC	0.161	U		0.343	U		2.82			0.111	U	
90	90 + 101 + 113	44.2	C		51.9	C		5.26	C K	J-EMPC	176	C		845	C		2.62	C	
91	88 + 91		C88			C88			C88			C88			C88			C88	
92		8.33	G	J	9.58	G	J	0.850			56.4			110			0.616	K	J-EMPC
93	93 + 95 + 98 + 100 + 102	29.7	C		31.7	C		2.43	C		73.0	C		500	C		2.45	C	
94		0.111	U		0.125	U		0.162	U		0.345	U		1.25	K	J-EMPC	0.110	U	
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
96		0.133	K	J-EMPC	0.198	K	J-EMPC	0.0644	U		0.509	K	J-EMPC	0.989			0.0612	U	
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
103		0.397			0.469	K	J-EMPC	0.137	U		0.749	K	J-EMPC	2.35			0.0903	U	
104		0.0612	U		0.0557	U		0.106	U		0.119	U		0.0970			0.0723	U	
105		24.9			27.7			6.24			362			352			2.67		
106		0.200	U		0.270	U		0.190	U		0.851	U		0.935	U		0.104	U	
107	107 + 124	1.72	C		2.27	C K	J-EMPC	0.399	C		12.9	C		28.9	C		0.110	C U	
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
109		4.60			5.25			4.75			53.1			60.4			0.181	K	J-EMPC
110	110 + 115	52.8	C		63.5	C		3.99	C		186	C		786	C		3.11	C	
111		0.0723	U		0.0816	U		0.120	U		1.00			0.344	K	J-EMPC	0.0844	U	
112		0.0716	U		0.0807	U		0.108	U		0.231	U		0.173	U		0.0807	U	
113	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
114		1.29			1.37			2.35			22.0			22.8			0.254	K	J-EMPC
115	110 + 115		C110			C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85			C85	

Table D-3
PCB Congener Qualifer Summary
Bradford Island - Remedial Investigation
Goose Island Slough Sampling

IUPAC #	COELUTING CONGENERS[1]	090427110SD L12657-1	Lab Qualifier	URS Review Qualifier	090429111SD L12657-2	Lab Qualifier	URS Review Qualifier	090429110CF L12725-1	Lab Qualifier	URS Review Qualifier	090429110SC L12725-2	Lab Qualifier	URS Review Qualifier	090429110TC L12725-3	Lab Qualifier	URS Review Qualifier	090430BAIT DF L12658-1	Lab Qualifier	URS Review Qualifier
118		65.7			69.5			87.0			872			1,590			11.0		
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
120		0.319	K	J-EMPC	0.291			0.398			3.45			5.09			0.0815	U	
121		0.0774	U		0.0872	U		0.118	U		0.455			0.287	K	J-EMPC	0.0816	U	
122		0.604			0.576			0.232	U		1.04	U		8.27			0.118	U	
123		0.963			0.970	K	J-EMPC	2.56			16.3			28.0			0.166	K	J-EMPC
124	107 + 124		C107			C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
126		0.255	K	J-EMPC	0.419	K	J-EMPC	0.261	K	J-EMPC	3.15			3.07			0.139	U	
127		0.204	U		0.275	U		0.223	U		1.51	K	J-EMPC	1.64			0.115	U	
128	128 + 166	14.2	C		17.3	C		1.48	C K	J-EMPC	194	C		141	C		1.49	C	
129	129 + 138 + 160 + 163	91.4	C		97.5	C		44.5	C		1,130	C		1,640	C		13.3	C	
130		5.75			6.51			1.77			18.2			61.3			0.243		
131		0.721	K	J-EMPC	0.761			0.195	U		0.798	U		7.67			0.116	U	
132		20.9			25.3			1.42			10.7			162			0.989	K	J-EMPC
133		1.28			1.54			0.924			16.8			16.7			0.169		
134	134 + 143	3.04	C		3.76	C		0.689	C K	J-EMPC	2.28	C		31.9	C		0.151	C K	J-EMPC
135	135 + 151 + 154	20.8	C		23.5	C		3.04	C		94.7	C		270	C		1.12	C	
136		6.12			7.28			0.636			9.96			48.9			0.292		
137		2.52	K	J-EMPC	3.22	K	J-EMPC	4.13			33.1			32.7			0.474	K	J-EMPC
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
139	139 + 140	1.31	C K	J-EMPC	1.33	C		0.178	C U		15.6	C		14.8	C		0.158	C	
140	139 + 140		C139			C139			C139			C139			C139			C139	
141		7.80			10.7			0.177	U		49.7			45.1			0.535		
142		0.168	U		0.307	U		0.198	U		0.812	U		0.913	U		0.119	U	
143	134 + 143		C134			C134			C134			C134			C134			C134	
144		1.98			2.66			0.290	K	J-EMPC	4.25			26.2			0.0893	U	
145		0.0739	U		0.0643	U		0.0866	U		0.113	U		0.256			0.0695	U	
146		9.23	G	J	8.91	G	J	15.0			114			270			1.02		
147	147 + 149	54.9	C		60.2	C		6.32	C		38.4	C		930	C		2.15	C	
148		0.132			0.0796	U		0.111	U		0.473	K	J-EMPC	1.49			0.0882	U	
149	147 + 149		C147			C147			C147			C147			C147			C147	
150		0.100			0.122	K	J-EMPC	0.0823	U		0.107	U		1.12			0.0656	U	
151	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
152		0.0676	U		0.0589	U		0.0787	U		0.254	K	J-EMPC	0.447			0.0615	U	
153	153 + 168	87.6	C		78.8	C		136	C		1,050	C		2,540	C		14.5	C	
154	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
155		0.0591	U		0.0523	U		0.118	U		1.20	K	J-EMPC	0.907			0.0668	U	
156	156 + 157	8.50	C		10.4	C		13.3	C		106	C		96.9	C		1.55	C	
157	156 + 157		C156			C156			C156			C156			C156			C156	
158		6.63			7.51			1.04			86.7			103			1.40		
159		0.753			0.871			0.138	U		0.567	U		2.45			0.0929	U	
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
161		0.113	U		0.207	U		0.139	U		0.570	U		0.641	U		0.0877	U	
162		0.284	K	J-EMPC	0.250	K	J-EMPC	0.400	K	J-EMPC	4.48			2.92			0.0956	U	
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
164		5.10			6.01			0.579	K	J-EMPC	23.4			37.4			0.157	K	J-EMPC
165		0.130	U		0.238	U		0.159	U		0.718			0.733	U		0.0952	U	
166	128 + 166		C128			C128			C128			C128			C128			C128	
167		4.02			3.81			11.2			34.8			92.5			0.607		
168	153 + 168		C153			C153			C153			C153			C153			C153	
169		0.241	U		0.250	U		0.164	U		1.31	U		1.08	U		0.0994	U	
170		13.8			17.1			8.66			113			38.7			3.10		
171	171 + 173	5.36	C		5.94	C		0.960	C		47.8	C		52.7	C		0.729	C K	J-EMPC
172		2.43			3.08			0.676	K	J-EMPC	17.4			6.10			0.371	K	J-EMPC
173	171 + 173		C171			C171			C171			C171			C171			C171	
174		13.9			18.8			1.55			8.12			39.6			0.524	K	J-EMPC
175		0.706			0.698	K	J-EMPC	0.290			2.37			7.22			0.0891	U	
176		1.99			2.20			0.285	K	J-EMPC	0.687			22.0			0.0654	U	
177		11.9			13.8			4.80			19.3			139			0.720		
178		5.05			5.66			2.42			41.6			65.3			0.0898	U	
179		8.08			9.39			1.07			11.5			87.2			0.284	K	J-EMPC
180	180 + 193	32.2	C		37.6	C		57.3	C		264	C		295	C		8.13	C	
181		0.164	K	J-EMPC	0.139	K	J-EMPC	0.267	K	J-EMPC	1.52			1.72			0.0965	U	
182		0.117	U		0.178			0.142	K	J-EMPC	1.28	K	J-EMPC	0.144	U		0.0883	U	
183	183 + 185	11.5	C		13.1	C		5.11	C		89.0	C		153	C		2.36	C	
184		0.0990	K	J-EMPC	0.0741	U		0.0568	U		0.886			1.06			0.0638	U	
185	183 + 185		C183			C183			C183			C183			C183			C183	
186		0.0974	U		0.0791	U		0.0589	U		0.149	U		0.122	U		0.0693	U	
187		31.1	G	J	29.8	G	J	52.2			200			477			1.69	K	J-EMPC
188		0.0892	U		0.0733	U		0.155	K	J-EMPC	0.414	K	J-EMPC	1.09			0.0703	U	
189		0.615			0.869			0.662			3.83			1.57			0.0917	U	
190		4.02			4.11	K	J-EMPC	4.73			44.0			52.6			0.665		
191		0.534	K	J-EMPC	0.630			0.841			5.34			5.48			0.0793	U	
192		0.104	U		0.0844	U		0.0623	U		0.157	U		0.129	U		0.0864	U	
193	180 + 193		C180			C180			C180			C180			C180			C180	
194		9.07			12.0			3.76			35.7			8.03			1.69		
195		4.07			4.76			2.48			23.6			17.8			0.566		
196		4.27			5.18			3.05			19.6			11.4			0.966	K	J-EMPC
197	197 + 200	0.815	C		1.01	C G	J	0.297	C K	J-EMPC	3.63	C		6.84	C		0.216	C K	J-EMPC
198	198 + 199	13.4	C		17.1	C		5.37	C K	J-EMPC	45.2	C		28.2	C		0.911	C	
199	198 + 199		C198			C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197			C197	
201		1.64	K	J-EMPC	1.80			1.20			3.32			13.5			0.0830	K	J-EMPC
202		4.07			4.81			1.63			26.9			44.5			0.233	K	J-EMPC
203		9.76			10.9			5.47			60.7			74.5			1.56		
204		0.0942	U		0.0818	U		0.0637	U		0.132			0.0634	U		0.0666	U	
205		0.499			0.631	K	J-EMPC	0.315	K	J-EMPC	3.29			2.87			0.107	U	
206		7.73			11.1			1.53	K	J-EMPC	21.3			10.9			0.915		
207		1.25			1.62			0.425			3.24			2.25			0.260	K	J-EMPC
208		2.71			3.88			0.758			6.62			5.71			0.151		
209		6.79			11.0			1.80			11.0			7.10			0.612		
	Total PCBs[2] (pg/g)	1,195			1,335			578			8,134			21,432			146		
	Total PCBs[2] (ug/kg or ppb)	**1.19**	**J**		**1.34**	**J**		**0.578**	**J**		**8.13**	**J**		**21.4**	**J**		**0.146**	**J**	

Notes:

All results are in units of pg/g (picograms/gram), dry weight, except where noted.

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the reported sample quantification limit.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported sample quanitification limit is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
PCBs = Polychlorinated Biphenyls
ug/kg = micrograms per kilogram
pg/g = picograms per gram
ppb = parts per billion
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.
2= Total PCBs are calculated by summing all 209 congeners, excluding results flagged as U, UJ, or J-EMPC.

RIVER OPERABLE UNIT REMEDIAL INVESTIGATION REPORT

QUALITY CONTROL SUMMARY REPORT FOR ANALYTICAL CHEMISTRY

CONGENER RESULTS FOR DOWNSTREAM SEDIMENT COLLECTED MARCH 2008

JUNE 2009

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1.0 Executive Summary

The overall assessment of the analytical results for the six downstream sediment samples shows the quality of the data to be acceptable to support project objectives. The contracted laboratories provided results for all requested analyses and laboratory data reports were complete. Some data were qualified as estimated, and flagged 'J' or 'J-EMPC'. Some data were qualified as not detected, and flagged 'U'. All data qualifiers resulting from this review have been added to both the project database and the data tables within the main body of this report. Refer to Section 4.0 of this report for a listing of qualifier definitions. The end user should be aware of the potential low bias of the PCB congener results due to hold time exceedance (as discussed in Section 4.1). Additionally, the mono- and dichlorbiphenyls (PCBs 1 through PCB 14) could not be validated against method blank concentrations due to inadequate method blank results for these congeners (Section 4.4).

2.0 Project Description

Downstream sediment samples were collected by URS on March 10 and 11, 2008 in support of the Bradford Island Bonneville Lock and Dam Project, River Operable Unit Remedial Investigation. Table 1 summarizes the URS identification number, the laboratory identification number, collection date and requested analyses for each of the sediment samples. The samples were previously analyzed for PCB Aroclors, selected semivolatile organic compounds (SVOCs), selected metals, diesel range total petroleum hydrocarbons (TPH-Dx), total organic carbon (TOC), percent solids and grain size. The analytical results and data quality review for the above-listed analytes were presented in the River Operable Unit Remedial Investigation Data Summary Report dated July 28, 2008 (URS 2008a). This quality control summary data report and attached tables only addresses the PCB congener analytical results for the six sediments.

3.0 Sampling and Analytical Procedures

Samples were collected according to the Bradford Island Bonneville Lock and Dam Project, River Operable Unit Remedial Investigation Quality Assurance Project Plan (QAPP) (URS 2007). Deviations from the QAPP (i.e. change in sample locations) are addressed in the Post-Removal Sample Collection Memorandum (URS 2008b). Samples were submitted to Columbia Analytical Services (CAS) of Kelso, Washington and were archived frozen (-20 degrees Celsius, °C). The specifics of the sample receipt are detailed in the quality control summary report attached with the original data report (URS 2008a). In summary, all sediment sample arrived intact at CAS as were archived frozen prior to and following homogenization using an industrial blender. Authorization to release the remainder of the homogenized sediment sample to Axys of Sidney, British Columbia, Canada to perform PCB congener analysis by EPA Method 1668A, *Chlorinated Biphenyl Congeners in Water, Soil, Sediment and Tissue by High Resolution Gas Chromatography/High Resolution Mass Spectrometry*, was given to CAS on March 25, 2009, by URS. The Axys analytical data report includes a listing of the Axys Method 1668A modifications. Table 1 lists the Axys samples identification numbers.

4.0 Data Validation

Analyses were performed in general accordance with the above-referenced methods. The analytical results for all samples were subjected to a quality assurance/quality control (QA/QC) review. This QA/QC review includes evaluation of representativeness (sample collection/handling), accuracy (spike and/or standard recoveries), analytical precision (duplicate relative percent difference), comparability (use of standard methods) and completeness (percent of usable data). Specifically, the following items were reviewed when appropriate: compliance with the QAPP, chain-of-custody (COC), laboratory case narrative, proper sample preservation and handling procedures, holding times, quantitation limits, field/method/trip blank analyses, matrix/matrix spike duplicate recoveries, laboratory duplicate results, field duplicate results, blank spike recoveries (laboratory control samples), data completeness and format, data qualifiers assigned by the laboratory, and analyte identification. The following items were reviewed for 20% or greater of the data: primary and secondary column verification, initial and continuing instrument calibrations and a verification of the reported electronic data with the hard copy deliverable. In the case of identified inconsistencies in the above-listed items a complete review would be have been performed.

The data review process for this investigation followed the QAPP. Additionally, because the QAPP-referenced *Department of Defense Quality Systems Manual* does not discuss PCB congeners, the data review process utilized guidance from EPA's *Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review* (USEPA 2005) and *EPA Region 10 Standard Operating Procedure (SOP) for the Validation of Method 1668 Toxic, Dioxin-like, PCB Data* (USEPA 1995) as appropriate for method performed. In the case of disagreement between the guidance documents and the analytical method, method criteria were utilized for data review. Project-specific QC criteria are listed in the above mentioned QAPP.

A summary of qualifiers assigned to results in this investigation is included in Table 2. Samples are listed by their URS sample identification assigned in the field as well as the laboratory identification. Congeners are reported using sample-specific detection limits. Qualifiers that may be assigned to the results of this investigation include the following:

- U - The analyte was analyzed for but was not detected.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J-EMPC – The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration of the analyte in the sample - used only for PCB congener results.
- UJ - The analyte was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR - Do Not Report. Another value is available that is more reliable or appropriate.

Final sample results and qualifiers are presented in the analytical tables provided in the sampling report.

4.1 Chain-of-Custody, Sample Preservation and Holding Time

As noted above in Section 3.0, all sediment samples arrived intact at CAS and were archived frozen prior to and following homogenization using an industrial blender. As reported previously, the COC forms indicated that the samples were maintained under proper chain-of-custody and forms were signed upon release and receipt. All coolers were submitted at temperatures within the EPA-recommended temperature of 6 degrees Celsius (°C) or below. Representativeness was maintained during the sampling effort by completing all sampling using similar sampling procedures and in accordance with the approved QAPP.

The COC form for the CAS to Axys delivery (samples shipped on March 24, 2009 and were received on March 25, 2009) indicates that samples were maintained under chain-of-custody and the form was signed upon release and receipt. The condition and temperature of the samples upon receipt by Axys was appropriate and all samples listed on the COC form were present. Data were not qualified based COC and sample shipment procedures.

All samples were analyzed on April 15, 2009, 35 to 36 days past the technical and contracted holding time of one year.

- Analytical results for PCB congeners for all six samples were qualified as estimated and flagged 'J/UJ' due to holding time exceedances (Table 2). It should be noted that these results may be biased low due to sample degradation.

4.2 Instrument Calibration

The congener analyses were performed within one analysis batch, WG28339. The laboratory performed initial multipoint calibrations for all target and surrogate compounds as required by Method 1668A. The laboratory performed initial multipoint calibrations for all target and standard compounds as required by the ICALs, CCVs and OPR (ongoing precision recovery) standards were analyzed at the proper frequency and at appropriate concentrations as required by EPA Method 1668A. Calibration compounds met the acceptance criteria as listed in the method.

4.3 Review of Blanks

Method blanks are used to check for laboratory contamination and instrument bias. The laboratory analyzed at least one method blank per analysis for each batch, per QAPP requirements. Qualification of samples due to method blank and calibration blank contamination followed guidelines set forth in the EPA NFGs and EPA Region 10 SOP.

PCB congener results that were reported as detected at a concentration less than five times (5x) the associated blank concentration were flagged 'U' or non-detect at the reported concentration. Target compounds reported with concentrations greater than 5x the blank concentration were not qualified. Target compounds detected in the method blank but reported as not detected in the associated samples were not qualified. Method blank results reported as estimated maximum possible concentrations (EMPCs) were not considered appropriate for use in qualifying associated sample results. Method 1668A stipulates using a method blank as similar to the matrix as possible. The method blank was prepared using clean sand to imitate the sediment matrix.

Method blanks associated with the sediment samples had low levels of some PCBs. The results of a few congeners were qualified non-detect based on these method blank concentrations. Samples qualified non-detect and flagged 'U' as a result of method blank detected PCB congeners are indentified in the URS Review Qualifier field of Table 2.

Recoveries of some of the labeled standards in the method blank were below the acceptance criteria, as a result analytical results for the mono- and di-chlorobiphenyls (PCB 1 through 14) were not available, see Section 4.4 below for details.

4.4 Labeled Internal Standard Recovery Review

Samples analyzed for PCB congeners are spiked with labeled internal (quantification) standards. These standards are used to quantitate target congeners and the calculations of target compound concentrations are designed to compensate for low extraction and/or cleanup efficiencies. In addition, their recovery is measured against injection standards added after extraction and cleanup to evaluate extraction and/or cleanup efficiency which could affect sensitivity and could also affect accuracy for target compounds not quantitated against a chemically identical, isotopically labeled standard. The percent recovery of the labeled standards was compared with the limits set forth in EPA Method 1668A and those set by Axys detailed in Table 1 of the Axys narratives. All recoveries were acceptable with the following exception:

- The percent recoveries of ^{13}C-labeled PCB 1 (14.9%) and ^{13}C-labeled PCB 4 (21.0%) for sample 08031046SD (L12476-1) were below the Axys control limits of 15% and 25%, respectively. Data were not qualified based on ^{13}C-labeled PCB 1 recovery, the recovery was close enough to round to the control limit of 15%. Given that isotopic dilution calculations produce recovery corrected quantitation results, only the non-chemically identical PCB congeners, quantitated using the labeled standard PCB 4 were qualified as estimated based on the internal standard recoveries for PCB 4. Associated analytical results for PCB 5 through 14 were qualified as estimated and flagged 'J/UJ' due to the low recovery of ^{13}C-labeled standard PCB 4.
- The percent recoveries of the following labeled standards in the method blank sample (WG28339-101) were below the Axys control limits:

Labeled Standard	% Recovery	Control Limits (%)

^{13}C-labeled PCB 1	Not Quantifiable (NQ)	
^{13}C-labeled PCB 3	NQ	
^{13}C-labeled PCB 4	NQ	
^{13}C-labeled PCB 15	17.3	25-150
^{13}C-labeled PCB 19	12.4	25-150
^{13}C-labeled PCB 54	22.6	25-150

Associated analytical results for mono- and dichlorbiphenyls (PCBs 1 through 14) could not be quantified in the method blank due to the non-quantifiable analytical results for labeled standard PCBs 1 through 4. All other analytes were reported in the method blank sample. The labeled standards in the OPR and the primary samples were acceptable (with the above noted exception). Therefore, the bias low recoveries of the low molecule weight labeled standards appears to be isolated to the method blank sample. When contacted, the laboratory suggested the low recovery is likely attributed to evaporation during the blow-down process.

As a result of not having method blank results for the PCBs 1 through 14, the associated project samples could not be validated against method blank concentrations. Not having the ability to potentially qualify the PCB congeners 1 through 14 non-detect, is deemed to have minimal effect on the overall data usage. All congener results were previously qualified 'J/UJ' due to hold time exceedance, further qualification of the data was not necessary.

Cleanup standards 28L, 111L, and 178L typically are added prior to cleanup and quantitated using injection standards added just prior to analysis to evaluate cleanup efficiency. The cleanup standards were within the 30-135% control limits set by EPA Method 1668A.

4.5 Ongoing Precision and Recovery

MS/MSD samples are not required by Method 1668A for PCB congener analysis. For Method 1668A, ongoing precision and recovery (OPR) samples were used in place of LCS to monitor laboratory performance. The OPR was prepared using clean sand to imitate the solid matrix of the samples. OPR recoveries were acceptable for congener analyses.

4.6 Duplicate Review

Field duplicates were not collected due to the statistical nature of the sampling event (as discussed in detail in the QAPP). Project-specific laboratory duplicates were not performed. There is no guidance on laboratory duplicate precision for individual PCB congeners, in either the NFGs, the EPA Region 10 SOP, or Method 1668A.

4.7 Compound Quantification

Sample 08031151SD (L2476-6) was diluted and reanalyzed to bring area responses of some target congeners within the linear calibration range of the instrument. Only the affected target compounds are reported from the reanalysis. Relevant concentrations from both the undiluted and

diluted analytical results are reported within the data deliverable and project database. The reanalysis results are identified with a sample ID suffix of 'W' within the report.

The internal standard method is used to calculate concentrations of PCB congeners that do not have chemically identical labeled standards. The internal standard method is dependent upon consistent detector response over the calibration range. If the detector response varies, concentrations can be biased high or low based on variations in the detector sensitivity. During congener analysis, PFK (perfluorokerosene) is used as a lock mass reference standard to measure changes in detector sensitivity. Each lock mass must not vary more than 20% throughout its respective retention time window as required by Method 1668A. Variations of more than 20% indicate the presence of a co-eluting interference or decreased sensitivity. Lock mass stability and sensitivity were acceptable for the sediment sample analysis.

4.8 Target Compound Identification

Ion abundance ratios are used to identify PCB congeners. Results that met all other qualitative identification criteria but differ by more than 15% from the theoretical ion abundance criterion set by EPA Method 1668A were flagged in the laboratory report with a 'K' flag. Those results flagged 'K' with ion abundance ratios outside the identified quantitation criteria are considered estimated maximum possible concentrations (EMPC) and were re-flagged 'J-EMPC' during this review. If the analyte result was previously qualified 'U' by method blank detection, the result retained the 'U' qualifier and it was not qualified further because an ion ratio was out of limits (there is no ion ratio criterion for non-detects). These "EMPC" flagged data are listed in Table 2, appear within the data tables in the main body of this deliverable, and have been entered into the database.

Ion ratios outside the control limits are generally a consequence of co-eluting interferences to either one or both quantitation peaks. In these cases, Axys chose to use the quantitation peak areas as recorded; no adjustments were made to force the peaks to match the theoretical ion abundance ratios before reporting EMPC results. EMPC results should be considered by the data users as part of evaluating the data for end-use objectives.

Additionally, the laboratory-assigned flag 'C' was used in Table 2 to indicate co-eluting PCB isomers for this analysis. The concentrations of the co-eluting isomers were reported as a group, eliminating the need for any data qualification as part of this data review.

4.10 Reporting Limits

All non-detect congener results are reported at sample specific reporting limits. All samples were analyzed using approximately 10 grams as recommended by Method 1668A. Axys performed a dilution on sample 080311251SD. The dilution appears to have had little impact on the reporting limits. All reporting limits are considered sufficient to meet project objectives.

5.0 Completeness

The laboratory reported all requested analytes and the deliverable data reports were complete. Some data were qualified as estimated 'J' or 'J-EMPC' and some as non-detect 'U'. A summary of qualifiers can be found in Tables 2. A completeness summary follows; analysis completeness was calculated using 159 congener results, 209 total congeners minus the 50 co-eluting congeners which were reported with the lowest numbered congener in the co-eluting set.

The electronic and portable delivery format (.pdf) versions of the deliverables were cross-checked for accuracy at a frequency of 20% or greater. Any minor discrepancies found between the deliverables were reported to CAS and corrected by updating the database to reflect the .pdf deliverable.

- *Technical Completeness* = (useable results/total reported results) x100
  = (954 compliant / 954 total results) = 100%
  All samples results are considered useable.

- *Analytical Completeness* = (unqualified results/total reported results) x100
  = (0 compliant / 954 total results) = 0%

  Congener data were qualified as estimated and flagged 'J-EMPC' or qualified non-detect and flagged 'U'. Additionally, all analytical results were qualified as estimated 'J/UJ' due to hold time exceedances.. Samples were analyzed 35 to 36 days past the 1 year hold time for PCB congeners. Samples were authorized for PCB congener analysis by URS per request the USACE (client) after the hold time of 1 year was exceeded. The slight hold time exceedance is not deemed to appreciably effect the data usability.

- *Contract Completeness* = (contract compliant results/total reported results) x100
  = (954 compliant / 954 total results) = 100%

  All samples met laboratory contract requirements.

- *Field Sampling Completeness* =(samples collected/number samples planned) x100
  = (6 samples collected / 6 planned samples) =100%

  All samples submitted to Axys for analysis had a complete set of results. All samples had sufficient sample volume to perform the PCB congener anlaysis as detailed in the QAPP.

6.0 References

DOD 2006. Department of Defense Environmental Data Quality Workgroup. Department of Defense (DOD) Quality Systems Manual (QSM) for Environmental Laboratories. Final Version 3. January 2006. Retrieved from [*http://www.navylabs.navy.mil/Archive/DoDV3.pdf*] on 3/3/06

URS 2007. Quality Assurance Project Plan, *River Operable Unit Remedial Investigation*, Bradford Island, Bonneville Lock and Dam Project, Cascade Locks, Oregon. September 2007.

URS 2008a. River Operable Unit Remedial Investigation Data Summary Report, Bradford Island, Bonneville Dam Forebay, Cascade Locks, Oregon. July 28, 2008.

URS 2008b. Memorandum: Post-Removal Sample Collection, Bradford Island Disposal Site, Bonneville Dam Forebay, Cascade Locks, Oregon. May 12, 2008.

USEPA 1995. EPA Region 10 Standard Operating Procedure (SOP) for the Validation of Method 1668 Toxic, Dioxin-like, PCB Data. December 1995.

USEPA 2008. U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines (NFGs) for Organic Data Review. June 2008.

USEPA 2005. Contract Laboratory Program National Functional Guidelines (EPA NFGs) for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review. September 2005.

Table 1
Sample Identification and Analysis Summary
Bradford Island - Remedial Investigation
Sediment Samples Collected March 2008

						Anaytes						
Station Number	**URS ID**	**Collection Date**	**CAS ID (non-congeners)**	**Axys ID (congeners)**	**Axys Sample Delivery Group**	**PCB (Aroclors) (CAS)**	**PCB (Congeners) (Axys Analytical)**	**PAHs**	**SVOCs**	**Metals**	**TOC**	**%Solids**
46	08031046SD	03/10/08	K0802371-011	L12476-1	DPWG28676	--	X	--	--	--	--	--
47	08031047SD	03/10/08	K0802371-012	L12476-2		--	X	--	--	--	--	--
48	08031048SD	03/10/08	K0802371-013	L12476-3		--	X	--	--	--	--	--
49	08031049SD	03/10/08	K0802371-014	L12476-4		--	X	--	--	--	--	--
50	08031150SD	03/11/08	K0802371-015	L12476-5		--	X	--	--	--	--	--
51	08031151SD	03/11/08	K0802371-016	L12476-6		--	X	--	--	--	--	--

Notes:
CAS - Columbia Analytical Services
Axys - Axys Analytical Services, Ltd.
ID - Identification
PCB - Polychlorinated Biphenyl
PAHs - Polycyclic Aromatic Hydrocarbons
SVOCs - Semivolatile Organic Compounds
-- previously reported; not included in this quality control summary report.

Table 2
Downstream Sediment PCB Congener Analysis Results
Lab Sample ID's L12476-1 through L11366-6
Bradford Island - Remedial Investigation
Sediment Collected March 2008

IUPAC #	COELUTING CONGENERS[1]	08031046SD L12476-1	Lab Qualifier	URS Review Qualifier	08031047SD L12476-2	Lab Qualifier	URS Review Qualifier	08031048SD L12476-3	Lab Qualifier	URS Review Qualifier	08031049SD L12476-4	Lab Qualifier	URS Review Qualifier	08031150SD L12476-5	Lab Qualifier	URS Review Qualifier	08031151SD L12476-6	Lab Qualifier	URS Review Qualifier
1		0.155	K	J-EMPC	0.187		J	0.226		J	1.130		J	0.276		J	0.118	K	J-EMPC
2		0.263		J	0.406		J	0.439		J	0.411		J	5.390		J	0.335	K	J-EMPC
3		0.186		J	0.186		J	0.155		J	2.670		J	0.319		J	0.148	K	J-EMPC
4		0.531	U	UJ	0.429		J	0.497		J	2.310		J	0.737		J	0.344	U	UJ
5		0.268	U	UJ	0.155	U	UJ	0.205	U	UJ	0.257	U	UJ	0.147	U	UJ	0.201	U	UJ
6		0.247	U	UJ	0.210		J	0.188	U	UJ	0.237	U	UJ	0.436		J	0.185	U	UJ
7		0.255	U	UJ	0.148	U	UJ	0.195	U	UJ	0.245	U	UJ	0.140	U	UJ	0.191	U	UJ
8		0.321		J	0.938		J	0.738		J	1.010		J	2.250		J	0.493		J
9		0.246	U	UJ	0.142	U	UJ	0.187	U	UJ	0.236	U	UJ	0.135	U	UJ	0.184	U	UJ
10		0.254	U	UJ	0.147	U	UJ	0.194	U	UJ	0.244	U	UJ	0.139	U	UJ	0.190	U	UJ
11		18.1		J	27.2		J	27.7		J	25.9		J	52.4		J	32.9		J
12	12 + 13	0.259	C U	UJ	0.150	C U	UJ	0.198	C U	UJ	0.249	C U	UJ	0.478	C	J	0.194	C U	J
13	12 + 13		C12			C12			C12			C12			C12			C12	
14		0.246	U	UJ	0.142	U	UJ	0.188	U	UJ	0.236	U	UJ	0.135	U	UJ	0.184	U	UJ
15		0.286	U	UJ	1.150		J	1.510		J	4.980		J	3.360		J	0.685		J
16		0.201	K	J-EMPC	0.496		J	0.347	K	J-EMPC	0.995		J	1.910		J	0.399		J
17		0.202		UJ	0.605		UJ	0.361		UJ	1.250		J	1.910		J	0.390		UJ
18	18 + 30	0.415	C K	J-EMPC	1.080	C	J	0.981	C	J	2.510	C	J	4.340	C	J	0.832	C	J
19		0.107	U	UJ	0.182	K	J-EMPC	0.212		J	2.660		J	0.443		J	0.121	U	J
20	20 + 28	1.01	C K	UJ	2.43	C	UJ	2.80	C	UJ	9.28	C	J	11.40	C	J	1.80	C	UJ
21	21 + 33	0.360	C	UJ	1.070	C	UJ	0.751	C	UJ	3.810	C	J	3.640	C	J	0.523	C	UJ
22		0.366	K	UJ	0.802		UJ	1.020		UJ	3.070		J	3.570		J	0.604		UJ
23		0.0516	U	UJ	0.0501	U	UJ	0.0492	U	UJ	2.1700		J	0.0751	U	UJ	0.0691	U	UJ
24		0.0563	U	UJ	0.0503	U	UJ	0.0571	U	UJ	0.0912	U	UJ	0.0800		J	0.0801	U	UJ
25		0.0790		J	0.1460		J	0.1350		J	0.5650		J	0.6520		J	0.1080		J
26	26 + 29	0.152	C		0.331	C	J	0.372	C	J	1.300	C	J	1.390	C	J	0.224	C	J
27		0.0527	U	UJ	0.0840		J	0.0870		J	0.1560		J	0.3750		J	0.0750	U	UJ
28	20 + 28		C20			C20			C20			C20			C20			C20	
29	26 + 29		C26			C26			C26			C26			C26			C26	
30	18 + 30		C18			C18			C18			C18			C18			C18	
31		0.679		UJ	1.720		UJ	1.770		UJ	7.670		J	7.660		J	1.250		UJ
32		0.0730		J	0.3290		J	0.2900		J	0.7940		J	0.9640		J	0.1390		J
33	21 + 33		C21			C21			C21			C21			C21			C21	
34		0.0495	U	UJ	0.0501	U	UJ	0.0492	U	UJ	1.9100		J	0.0721	U	UJ	0.0663	U	UJ
35		0.0890		J	0.1130	K	J-EMPC	0.1620		J	0.1670	K	J-EMPC	0.2590	K	J-EMPC	0.1180	K	J-EMPC
36		0.0493	U	UJ	0.0501	U	UJ	0.0492	U	UJ	0.1010	U	UJ	0.0690	K	J-EMPC	0.0628	U	UJ
37		0.504		UJ	1.040		U	1.230		J	4.290		J	3.960		J	0.819		UJ
38		0.0493	U	UJ	0.0501	U	UJ	0.0492	U	UJ	0.1040	U	UJ	0.0705	U	UJ	0.0649	U	UJ
39		0.0493	U	UJ	0.0501	U	UJ	0.0492	U	UJ	0.1020	U	UJ	0.0693	U	UJ	0.0638	U	UJ
40	40 + 41 + 71	0.285	C K	J-EMPC	0.659	C		0.665	C	J	3.770	C	J	4.640	C	J	0.901	C	J
41	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
42		0.200	K	J-EMPC	0.514	K	J-EMPC	0.378		J	1.940		J	2.820		J	0.522	K	J-EMPC
43		0.0683	U	UJ	0.0507	U	UJ	0.0547	U	UJ	0.3160	K	J-EMPC	0.3790		J	0.0890	U	UJ
44	44 + 47 + 65	1.14	C	U	2.20	C	U	1.80	C	UJ	7.04	C	J	12.20	C	J	2.59	C	U
45	45 + 51	0.130	C	J	0.260	C K	J-EMPC	0.272	C	J	1.220	C	J	1.510	C	J	0.282	C	
46		0.0660	U	UJ	0.0800	K	J-EMPC	0.0990		J	0.3860		J	0.5150		J	0.0860	U	UJ
47	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
48		0.132	K	J-EMPC	0.313		J	0.299		J	1.740	K	J-EMPC	1.650		J	0.314	K	J-EMPC
49	49 + 69	0.617	C	U	1.310	C	J	1.150	C	UJ	5.270	C	J	8.710	C	J	1.430	C	J
50	50 + 53	0.143	C K	J-EMPC	0.253	C	J	0.194	C	J	1.100	C K	J-EMPC	1.500	C	J	0.215	C K	J-EMPC
51	45 + 51		C45			C45	J		C45			C45			C45			C45	
52		1.48		UJ	4.19		J	2.84		J	11.10		J	20.30		J	3.57		J
53	50 + 53		C50			C50	J		C50			C50			C50			C50	
54		0.0508	U	UJ	0.0501	U	UJ	0.0492	U	UJ	2.2800		J	0.0473	U	UJ	0.0563	U	UJ
55		0.0774	U	UJ	0.0643	U	UJ	0.0492	U	UJ	0.1920	K	J-EMPC	0.1920	K	J-EMPC	0.0808	U	UJ
56		0.479		UJ	1.020		J	0.944		J	4.570		J	5.850		J	1.140		J
57		0.0723	U	UJ	0.0600	U	UJ	0.0492	U	UJ	0.0635	U	UJ	0.0762	U	UJ	0.0754	U	UJ
58		0.0733	U	UJ	0.0609	U	UJ	0.0492	U	UJ	0.0644	U	UJ	0.0810	K	J-EMPC	0.0765	U	UJ
59	59 + 62 + 75	0.118	C K	J-EMPC	0.187	C	J	0.179	C K	J-EMPC	0.831	C	J	1.060	C	J	0.203	C	J
60		0.359			0.847		J	0.714		J	2.730		J	3.100		J	0.782		J
61	61 + 70 + 74 + 76	2.42	C	UJ	6.30	C	J	4.78	C	J	17.10	C	J	30.30	C	J	5.62	C	J
62	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
63		0.0681	U	UJ	0.1140		J	0.1020		J	0.4920		J	0.7270		J	0.1540		J
64		0.504		UJ	1.220		J	0.956		J	3.990		J	5.840		J	1.120		J
65	44 + 47 + 65		C44			C44			C44			C44			C44			C44	
66		1.40			3.46		J	2.73		J	10.10		J	17.80		J	3.33		J
67		0.0633	U		0.0830		J	0.0600		J	0.2500		J	0.3460	K	J-EMPC	0.0661	U	UJ
68		0.0695	U		0.0577	U	UJ	0.0492	U	UJ	0.0930	K	J-EMPC	0.2110	K	J-EMPC	0.0725	U	UJ
69	49 + 69		C49			C49			C49			C49			C49			C49	
70	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
71	40 + 41 + 71		C40			C40			C40			C40			C40			C40	
72		0.0692	U	UJ	0.0575	U	UJ	0.0492	U	UJ	0.0870		J	0.2990	K	J-EMPC	0.0722	U	UJ
73		0.0493	U	UJ	0.0610	K	J-EMPC	0.0492	U	UJ	0.0699	U	UJ	0.0473	U	UJ	0.0567	U	UJ
74	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
75	59 + 62 + 75		C59			C59			C59			C59			C59			C59	
76	61 + 70 + 74 + 76		C61			C61			C61			C61			C61			C61	
77		0.259	K	J-EMPC	0.531	K	J-EMPC	0.478		J	1.600		J	2.010		J	0.573		J
78		0.0763	U	UJ	0.0633	U	UJ	0.0492	U	UJ	0.0670	U	UJ	0.0805	U	UJ	0.0796	U	UJ
79		0.0602	U	UJ	0.1140	K	J-EMPC	0.0880	K	J-EMPC	0.2180		J	0.5340		J	0.1500		J
80		0.0684	U	UJ	0.0568	U		0.0492	U	UJ	0.0601	U	UJ	0.0722	U	UJ	0.0714	U	UJ
81		0.0831	U	UJ	0.0707	U	UJ	0.0492	U	UJ	0.2600		J	0.1000	U	UJ	0.0981	U	UJ
82		0.157		J	0.610		J	0.464		J	1.240		J	2.340		J	0.552	K	J-EMPC
83	83 + 99	1.65	C		4.91	C	J	3.50	C	J	11.20	C	J	22.00	C	J	4.90	C	J
84		0.376		J	1.170		J	0.826		J	2.410		J	6.290		J	0.926		J
85	85 + 116 + 117	0.712	C K	J-EMPC	2.020	C	J	1.330	C	J	3.400	C	J	5.730	C	J	1.790	C	J
86	86 + 87 + 97 + 108 + 119 + 125	1.57	C	J	4.59	C	J	3.55	C	J	10.10	C	J	19.70	C	J	4.51	C	J
87	86 + 87 + 97 + 108 + 119 + 125		C86			C86	J		C86			C86			C86			C86	
88	88 + 91	0.334	C K	J-EMPC	0.831	C	J	0.568	C	J	1.590	C	J	4.170	C	J	0.775	C	J
89		0.0753	U	UJ	0.0590	K	J-EMPC	0.0691	U	UJ	0.1300	K	J-EMPC	0.2680		J	0.2650	U	UJ
90	90 + 101 + 113	2.61	C	J	7.75	C	J	5.61	C	J	16.60	C	J	30.90	C	J	7.14	C	J
91	88 + 91		C88			C88			C88			C88			C88			C88	
92		0.493		J	1.410		J	1.150	K	J-EMPC	2.900		J	9.030		J	1.200		J
93	93 + 95 + 98 + 100 + 102	1.41	C	UJ	4.85	C	J	3.38	C	J	8.51	C	J	32.30	C	J	4.49	C	J
94		0.0774	U	UJ	0.0529	U	UJ	0.0710	U	UJ	0.1120	U	UJ	0.1420	K	J-EMPC	0.2750	U	UJ
95	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
96		0.0493	U	UJ	0.0501	U	UJ	0.0492	U	UJ	0.0760		J	0.1040		J	0.1450	U	UJ
97	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
98	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
99	83 + 99		C83			C83			C83			C83			C83			C83	
100	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
101	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
102	93 + 95 + 98 + 100 + 102		C93			C93			C93			C93			C93			C93	
103		0.0625	U	UJ	0.0700	K	J-EMPC	0.0573	U	UJ	0.0903	U	UJ	0.2220		J	0.2230	U	UJ
104		0.0493	U	UJ	0.0501	U	UJ	0.0492	U	UJ	0.8900		J	0.0473	U	UJ	0.0652	U	UJ
105		1.79		J	6.26		J	4.26		J	9.43		J	19.70		J	3.98		J
106		0.0784	U	UJ	0.0576	U	UJ	0.0587	U	UJ	0.1200	U	UJ	0.0733	U	UJ	0.3280	U	UJ
107	107 + 124	0.159	C K	J-EMPC	0.398	C	J	0.254	C K	J-EMPC	0.438	C	J	1.170	C K	J-EMPC	0.414	C	J
108	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
109		0.272	K	J-EMPC	0.762		J	0.549	K	J-EMPC	1.390		J	2.450		J	0.906		J
110	110 + 115	2.85	C	J	10.60	C	J	7.15	C	J	17.20	C	J	35.90	C		8.71	C	J
111		0.0533	U	UJ	0.0501	U	UJ	0.0492	U	UJ	0.0771	U	UJ	0.0535	U	UJ	0.1940	U	UJ
112		0.0529	U	UJ	0.0501	U	UJ	0.0492	U	UJ	0.0765	U	UJ	0.0531	U	UJ	0.1840	U	UJ
113	90 + 101 + 113		C90			C90			C90			C90			C90			C90	
114		0.0976	U	UJ	0.3830		J	0.2390		J	0.6500		J	0.9570		J	0.3150		J
115	110 + 115		C110			C110			C110			C110			C110			C110	
116	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
117	85 + 116 + 117		C85			C85			C85			C85			C85			C85	
118		4.09		J	13.20		J	9.18		J	16.70		J	45.60		J	10.90		J
119	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
120		0.0495	U	UJ	0.0501	U	UJ	0.0590	K	J-EMPC	0.0715	U	UJ	0.2260	K	J-EMPC	0.1830	U	UJ
121		0.0546	U	UJ	0.0501	U	UJ	0.0500	U	UJ	0.0788	U	UJ	0.0547	U	UJ	0.1970	U	UJ
122		0.0913	U	UJ	0.0910	K	J-EMPC	0.0800		J	0.1440	K	J-EMPC	0.3600		J	0.3540	U	UJ
123		0.168	K	J-EMPC	0.271		J	0.130		J	0.497			0.874		J	0.226		J
124	107 + 124		C107			C107			C107			C107			C107			C107	
125	86 + 87 + 97 + 108 + 119 + 125		C86			C86			C86			C86			C86			C86	
126		0.113	U	UJ	0.081	U	UJ	0.079	U	UJ	0.171	U	UJ	0.211		J	0.096	U	UJ
127		0.0869	U	UJ	0.0638	U	UJ	0.0650	U	UJ	0.1330	U	UJ	0.0812	U	UJ	0.3440	U	UJ
128	128 + 166	0.767	C	J	2.550	C	J	1.900	C	J	3.230	C	J	8.950	C	J	2.120	C	J

Table 2
Downstream Sediment PCB Congener Analysis Results
Lab Sample ID's L12476-1 through L11366-6
Bradford Island - Remedial Investigation
Sediment Collected March 2008

IUPAC #	COELUTING CONGENERS[1]	08031046SD L12476-1	Lab Qualifier	URS Review Qualifier	08031047SD L12476-2	Lab Qualifier	URS Review Qualifier	08031048SD L12476-3	Lab Qualifier	URS Review Qualifier	08031049SD L12476-4	Lab Qualifier	URS Review Qualifier	08031150SD L12476-5	Lab Qualifier	URS Review Qualifier	08031151SD L12476-6	Lab Qualifier	URS Review Qualifier
129	129 + 138 + 160 + 163	5.95	C	J	15.80	C	J	12.00	C	J	21.90	C	J	69.10	C	J	16.10	C	J
130		0.312		J	0.928	K	J-EMPC	0.708		J	1.120		J	4.020		J	0.750	K	J-EMPC
131		0.0845	U	UJ	0.1150	U	UJ	0.0800	K	J-EMPC	0.2720	K	J-EMPC	0.4610		J	0.1110	U	UJ
132		0.943			2.600		J	2.420		J	5.880		J	14.500		J	2.060	K	J-EMPC
133		0.0815	U	UJ	0.2120		J	0.1650	K	J-EMPC	0.2980		J	0.8180		J	0.1610	K	J-EMPC
134	134 + 143	0.117	C K	J-EMPC	0.433	C K	J-EMPC	0.289	C	J	0.738	C K	J-EMPC	2.140	C	J	0.310	C K	J-EMPC
135	135 + 151 + 154	1.34	C	J	3.00	C	J	2.63	C	J	6.34	C	J	17.00	C	J	2.48	C	J
136		0.267	K	J-EMPC	0.815		J	0.637		J	1.720		J	4.840		J	0.664		J
137		0.158		J	0.667	K	J-EMPC	0.481		J	1.040	K	J-EMPC	1.960		J	0.454		J
138	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
139	139 + 140	0.0850	C	J	0.2370	C K	J-EMPC	0.1140	C K	J-EMPC	0.3300	C	J	0.7210	C	J	0.1160	C K	J-EMPC
140	139 + 140		C139			C139			C139			C139			C139			C139	
141		0.642		J	1.460		J	1.220		J	2.430		J	7.300		J	1.260		J
142		0.0839	U	UJ	0.1150	U	UJ	0.0793	U	UJ	0.1120	U	UJ	0.1140	U	UJ	0.1100	U	UJ
143	134 + 143		C134			C134			C134			C134			C134			C134	
144		0.114	K	J-EMPC	0.331		J	0.332	K	J-EMPC	0.746		J	1.640		J	0.254		J
145		0.0493	U	UJ	0.0501	U	UJ	0.0492	U	J	0.0482	U	UJ	0.0495	U	UJ	0.0563	U	UJ
146		1.26	K	J-EMPC	2.82		J	2.39		J	5.31		J	13.30		J	3.80		J
147	147 + 149	3.01	C		7.67	C	J	6.04	C	J	13.40	C	J	39.20	C	J	6.15	C	J
148		0.0621	U	UJ	0.0501	U	UJ	0.0529	U	UJ	0.0618	U	UJ	0.0730		J	0.0669	U	UJ
149	147 + 149		C147			C147			C147			C147			C147			C147	
150		0.0493	U	UJ	0.0501	U	J	0.0492	U	UJ	0.0482	U	UJ	0.0482	U	UJ	0.0563	U	UJ
151	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
152		0.0493	U	UJ	0.0501	U	UJ	0.0492	U	UJ	0.0482	U	UJ	0.0473	U	UJ	0.0563	U	UJ
153	153 + 168	5.46	C	J	13.20	C	J	9.74	C	J	18.30	C	J	56.80	C	J	12.00	C	J
154	135 + 151 + 154		C135			C135			C135			C135			C135			C135	
155		0.0493	U	UJ	0.0501	U	UJ	0.0492	U	UJ	0.3500		J	0.0473	U	UJ	0.0563	U	UJ
156	156 + 157	0.604	C K	J-EMPC	1.820	C	J	1.390	C K	J-EMPC	2.890	C	J	6.250	C	J	1.740	C	J
157	156 + 157		C156			C156			C156			C156			C156			C156	
158		0.446		J	1.320		J	1.010		J	2.050		J	5.590		J	1.100		J
159		0.0790	K	J-EMPC	0.0817	U	UJ	0.1440		J	0.3190		J	0.9870	K	J-EMPC	0.1180	K	J-EMPC
160	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
161		0.0578	U	UJ	0.0790	U	UJ	0.0547	U	UJ	0.0769	U	UJ	0.0788	U	UJ	0.0760	U	UJ
162		0.0613	U	UJ	0.0838	U	UJ	0.0580	U	UJ	0.0816	U	UJ	0.2260	K	J-EMPC	0.0806	U	UJ
163	129 + 138 + 160 + 163		C129			C129			C129			C129			C129			C129	
164		0.286		J	0.714		J	0.636		J	1.210	K	J-EMPC	3.730		J	0.688		J
165		0.0651	U	UJ	0.0889	U	UJ	0.0615	U	UJ	0.0865	U	UJ	0.0887	U	UJ	0.0855	U	UJ
166	128 + 166		C128			C128			C128			C128			C128			C128	
167		0.320		J	0.697		J	0.554		J	1.030		J	2.610		J	0.765		J
168	153 + 168		C153			C153			C153			C153			C153			C153	
169		0.0697	U	UJ	0.0894	U	UJ	0.0630	U	UJ	0.0900	U	UJ	0.1540	U	UJ	0.0837	U	UJ
170		1.03		J	1.86		J	2.04		J	5.34		J	12.40		J	2.73		J
171	171 + 173	0.410	C K	J-EMPC	0.715	C	J	0.627	C K	J-EMPC	1.670	C	J	4.570	C	J	0.806	C	J
172		0.329	K	J-EMPC	0.524		J	0.481	K	J-EMPC	1.160		J	2.650		J	0.705		J
173	171 + 173		C171			C171			C171			C171			C171			C171	
174		1.12		J	1.82		J	1.69		J	4.75		J	13.10		J	2.21		J
175		0.0600	K	J-EMPC	0.0870	K	J-EMPC	0.1250	K	J-EMPC	0.1750		J	0.6120		J	0.1220	K	J-EMPC
176		0.0930	K	J-EMPC	0.3060	K	J-EMPC	0.2490		J	0.5730		J	1.8000		J	0.2070	K	J-EMPC
177		0.830		J	1.860		J	1.690		J	4.390		J	10.300		J	2.130		J
178		0.449		J	0.667	K	J-EMPC	0.601		J	1.330	K	J-EMPC	4.160		J	0.998		J
179		0.523		J	1.130		J	1.020		J	2.510		J	6.560		J	1.010		J
180	180 + 193	2.87	C	J	4.66	C	J	4.94	C	J	12.60	C	J	31.40	C	J	7.15	C	J
181		0.0521	U	UJ	0.0501	U	UJ	0.0566	U	UJ	0.1220	K	J-EMPC	0.1600	K	J-EMPC	0.0563	U	UJ
182		0.0493	U	UJ	0.0501	U	UJ	0.0522	U	UJ	0.0980	K	J-EMPC	0.1170	K	J-EMPC	0.0920	K	J-EMPC
183	183 + 185	0.947	C	J	1.670	C	J	1.530	C	J	3.860	C	J	10.900	C	J	1.900	C	J
184		0.0493	U	UJ	0.0501	U	UJ	0.0492	U	UJ	0.0482	U	UJ	0.0473	U	UJ	0.0563	U	UJ
185	183 + 185		C183			C183			C183			C183			C183			C183	
186		0.0493	U	UJ	0.0501	U	UJ	0.0492	U	UJ	0.0515	U	UJ	0.0473	U	J	0.0563	U	UJ
187		2.94		J	4.81		J	4.34			10.90		J	29.70		J	7.70		J
188		0.0493	U	UJ	0.0501	U	UJ	0.0492	U	UJ	0.0940		J	0.0473	U	UJ	0.0563	U	UJ
189		0.0733	U	UJ	0.1150	K	J-EMPC	0.0970		J	0.2540		J	0.5960		J	0.1400		J
190		0.301	K	J-EMPC	0.572		J	0.431		J	1.290		J	3.280		J	0.731		J
191		0.0493	U	UJ	0.0690	K	J-EMPC	0.0930		J	0.1730	K	J-EMPC	0.5220		J	0.1040	K	J-EMPC
192		0.0493	U	UJ	0.0501	U	UJ	0.0492	U	UJ	0.0603	U	UJ	0.0540	U	UJ	0.0563	U	UJ
193	180 + 193		C180			C180			C180			C180			C180			C180	
194		0.928		J	1.110		J	1.170	K	J-EMPC	3.010		J	7.520		J	2.040		J
195		0.326		J	0.564		J	0.578	K	J-EMPC	1.360		J	3.410		J	1.010		J
196		0.361	K	J-EMPC	0.646	K	J-EMPC	0.558	K	J-EMPC	1.450		J	3.730		J	0.932	K	J-EMPC
197	197 + 200	0.238	C	J	0.339	C	J	0.418	C	J	0.670	C K	J-EMPC	1.460	C	J	0.328	C U	UJ
198	198 + 199	1.49	C	J	2.04	C	J	1.68	C	J	3.57	C K	J-EMPC	9.72	C	J	2.94	C	J
199	198 + 199		C198			C198			C198			C198			C198			C198	
200	197 + 200		C197			C197			C197			C197			C197			C197	
201		0.114	K	J-EMPC	0.321		J	0.216	K	J-EMPC	0.482		J	1.280		J	0.293	K	J-EMPC
202		0.589	K	J-EMPC	0.738		J	0.515		J	1.140		J	3.040		J	1.150		J
203		0.917		J	1.200	K	J-EMPC	1.320		J	2.390		J	6.990		J	2.280		J
204		0.0493	U	UJ	0.0501	U	UJ	0.0492	U	UJ	0.0487	U	UJ	0.0473	U	UJ	0.0563	U	UJ
205		0.0565	U	UJ	0.0950	K	J-EMPC	0.0650	K	J-EMPC	0.1170		J	0.3980		J	0.1150	K	J-EMPC
206		0.784		J	2.920		J	1.050		J	1.590		J	6.160		J	2.160		J
207		0.128	U	UJ	0.413		J	0.118	U	UJ	0.231		J	0.789	K	J-EMPC	0.287	K	J-EMPC
208		0.412		J	1.400		J	0.437		J	0.574		J	2.260		J	0.876		J
209		0.825	K	J-EMPC	2.400		J	1.250		J	1.490		J	7.100		J	3.450		J
	Total PCBs[2] (pg/g)	82.1			210			168			412			915			208		
	Total PCBs[2] (ug/kg or ppb)	**0.0821**	**J**		**0.210**	**J**		**0.168**	**J**		**0.412**	**J**		**0.915**	**J**		**0.208**	**J**	

Notes:

All results are in units of pg/g (picograms/gram), dry weight.

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the reported sample quantification limit.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported sample quanitification limit is an estimate.
J-EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
PCBs = Polychlorinated Biphenyls
ug/kg = micrograms per kilogram
pg/g = picograms per gram
ppb = parts per billion
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners, to eliminate possible errors during congener summation.
2= Total PCBs are calculated by summing all 209 congeners, excluding results flagged as U, UJ, or J-EMPC.

APPENDIX G

HISTORICAL DATA NOT USED IN RI

Table G-1a
Data Not Used in the RI - 1998 Landfill Site Inspection Soil Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Herbicides, and Pesticides
(Page 1 of 2)

Site ID	BK1-01	BK2-01	BK3-01	MW-01	PW1-01	TP1-01	TP2-01	TP4-01	TP5-01	TP5-01 DUP	TP6-01	TP6-02	TP7-01	TP8-01
Sample ID	BK1-SS-01	BK2-SS-01	BK3-SS-01	SB1-SS-01	PW1-SS-01	TP1-SS-01	TP2-SS-01	TP4-SS-01	TP5-SS-01	TP9-SS-01	TP6-SS-01	TP6-SS-02	TP7-SS-01	TP8-SS-01
Sample Date	8/18/1998	8/18/1998	8/18/1998	8/17/1998	8/19/1998	8/19/1998	8/19/1998	8/19/1998	8/20/1998	8/20/1998	8/20/1998	8/20/1998	8/20/1998	8/20/1998
Sample Depth (Feet bgs)	0.5	0.5	0.5	20	1	10	2	3.7	5	5	4	6.5	4.5	4
PCB Aroclors (µg/kg)														
Aroclor 1016	-	-	-	50.0 UJ	50.0 UJ	1,050 UJ	550 UJ	50.0 UJ	1,050 UJ	1,050 UJ	1,050 UJ	50.0 UJ	2,550 UJ	50.0 UJ
Aroclor 1221	-	-	-	50.0 UJ	50.0 UJ	1,050 UJ	550 UJ	50.0 UJ	1,050 UJ	1,050 UJ	1,050 UJ	50.0 UJ	2,550 UJ	50.0 UJ
Aroclor 1232	-	-	-	50.0 UJ	50.0 UJ	1,050 UJ	550 UJ	50.0 UJ	1,050 UJ	1,050 UJ	1,050 UJ	50.0 UJ	2,550 UJ	50.0 UJ
Aroclor 1242	-	-	-	50.0 UJ	50.0 UJ	1,050 UJ	550 UJ	50.0 UJ	1,050 UJ	1,050 UJ	1,050 UJ	50.0 UJ	2,550 UJ	50.0 UJ
Aroclor 1248	-	-	-	50.0 UJ	50.0 UJ	1,050 UJ	550 UJ	50.0 UJ	1,050 UJ	1,050 UJ	1,050 UJ	50.0 UJ	2,550 UJ	50.0 UJ
Aroclor 1254	-	-	-	50.0 UJ	50.0 UJ	1,050 UJ	550 UJ	50.0 UJ	1,050 UJ	1,050 UJ	1,050 UJ	50.0 UJ	2,550 UJ	50.0 UJ
Aroclor 1260	-	-	-	50.0 UJ	50.0 UJ	**2,250**	550 UJ	50.0 UJ	1,050 UJ	1,050 UJ	1,050 UJ	50.0 UJ	2,550 UJ	50.0 UJ
Aroclor 1262	-	-	-	50.0 UJ	50.0 UJ	1,050 UJ	550 UJ	50.0 UJ	1,050 UJ	1,050 UJ	1,050 UJ	50.0 UJ	2,550 UJ	50.0 UJ
Aroclor 1268	-	-	-	50.0 UJ	50.0 UJ	1,050 UJ	550 UJ	50.0 UJ	1,050 UJ	1,050 UJ	1,050 UJ	50.0 UJ	2,550 UJ	50.0 UJ
Total PCBs as Aroclors	-	-	-	50.0 UJ	50.0 UJ	**2,250**	550 UJ	50.0 UJ	1,050 UJ	1,050 UJ	1,050 UJ	50.0 UJ	2,550 UJ	50.0 UJ
Metals (mg/kg)														
Aluminum	**12,000**	**19,500**	**20,200**	-	-	**16,600**	-	**11,200**	**12,600**	**13,200**	**16,000**	-	-	**9,020**
Antimony	0.500 U	0.500 U	0.500 U	-	-	**4.49**	-	0.500 U	**0.874**	**1.16**	0.500 U	-	-	**3.05**
Arsenic	**2.77 J**	**3.24 J**	**2.92 J**	-	-	**9.73 J**	-	**2.18 J**	**3.04 J**	**2.11 J**	**1.75 J**	-	-	**5.35 J**
Barium	**77.0**	**95.5**	**139**	-	-	**567**	-	**84.6**	**136**	**98.3**	**87.6**	-	-	**156**
Beryllium	0.500 U	**0.554**	**0.622**	-	-	0.500 U	-	0.500 U	0.500 U	0.500 U	0.500 U	-	-	0.500 U
Cadmium	0.500 U	**0.575**	0.500 U	-	-	**195**	-	0.500 U	**4.54**	**3.55**	**7.92**	-	-	**5.03**
Calcium	**6,180**	**8,030**	**7,890**	-	-	**9,740**	-	**6,610**	**5,050**	**5,420**	**8,870**	-	-	**6,830**
Chromium	**11.9**	**19.2**	**21.3**	-	-	**60.1**	-	**9.12**	**14.0**	**12.6**	**9.34**	-	-	**13.5**
Cobalt	**11.4**	**18.9**	**17.5**	-	-	**17.2**	-	**8.28**	**9.02**	**7.93**	**7.92**	-	-	**10.7**
Copper	**45.0**	**49.9**	**53.6**	-	-	**1,620**	-	**28.5**	**55.1**	**44.7**	**53.0**	-	-	**204**
Iron	**18,900**	**25,600**	**28,300**	-	-	**52,700**	-	**21,500**	**18,100**	**22,300**	**22,400**	-	-	**16,900**
Lead	**14.2**	**18.7**	**8.67**	-	-	**7,140**	-	**189**	**193**	**151**	**1,120**	-	-	**403**
Magnesium	**7,090**	**11,700**	**15,900**	-	-	**5,180**	-	**7,070**	**5,860**	**5,660**	**7,840**	-	-	**5,840**
Manganese	**368**	**610**	**460**	-	-	**1,830**	-	**273**	**362**	**290**	**211**	-	-	**381**
Mercury	**0.101**	0.100 U	0.500 U	-	-	**1.61**	-	0.100 U	**1.66**	**3.52**	0.100 U	-	-	**3.50**
Nickel	**16.3**	**24.2**	**19.2**	-	-	**84.0**	-	**14.0**	**17.7**	**15.3**	**20.4**	-	-	**21.3**
Potassium	**204**	**962**	**764**	-	-	**1,180**	-	**865**	**1,100**	**1,020**	**1,020**	-	-	**826**
Selenium	**0.801**	0.500 U	0.500 U	-	-	0.500 U	-	0.500 U	0.500 U	0.500 U	0.500 U	-	-	0.500 U
Silver	0.500 U	0.500 U	0.500 U	-	-	**46.0**	-	0.500 U	0.500 U	0.500 U	0.500 U	-	-	**12.0**
Sodium	**295 J**	**393 J**	**239 J**	-	-	**471 J**	-	**585 J**	**404 J**	**344 J**	**570 J**	-	-	**433 J**
Thallium	0.500 U	0.500 U	0.500 U	-	-	0.500 U	-	0.500 U	0.500 U	0.500 U	0.500 U	-	-	0.500 U
Vanadium	**42.2**	**73.0**	**73.0**	-	-	**26.9**	-	**34.3**	**40.9**	**38.3**	**31.5**	-	-	**37.1**
Zinc	**53.6**	**60.4**	**60.4**	-	-	**8,650**	-	**57.9**	**114**	**85.7**	**130**	-	-	**381**
Petroleum Hydrocarbons (mg/kg)														
Diesel Range Organics	-	-	-	-	-	**920**	**132**	**27.4**	**9,780**	**8,700**	**1,880**	**81.9**	**1,900**	**202**
Residual Range Organics	-	-	-	-	-	**2,360**	**342**	**136**	**20,200**	**31,400**	**4,040**	**533**	**2,790**	**951**
Gasoline Range Organics	-	-	-	20.0 UJ	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U
Herbicides (µg/kg)														
2,4,5-T	-	-	-	20.0 UJ	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U
2,4,5-TP (Silvex)	-	-	-	20.0 UJ	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U
2,4-D	-	-	-	5.00 UJ	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
2,4-DB	-	-	-	20.0 UJ	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U
Dalapon	-	-	-	80.0 UJ	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U	80.0 U
Dicamba	-	-	-	5.00 UJ	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Dichloroprop	-	-	-	15.0 UJ	15.0 U	15.0 U	15.0 U	15.0 U	15.0 U	15.0 U	15.0 U	15.0 U	15.0 U	15.0 U

Table G-1a
Data Not Used in the RI - 1998 Landfill Site Inspection Soil Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Herbicides, and Pesticides
(Page 2 of 2)

Site ID	BK1-01	BK2-01	BK3-01	MW-01	PW1-01	TP1-01	TP2-01	TP4-01	TP5-01	TP5-01 DUP	TP6-01	TP6-02	TP7-01	TP8-01
Sample ID	BK1-SS-01	BK2-SS-01	BK3-SS-01	SB1-SS-01	PW1-SS-01	TP1-SS-01	TP2-SS-01	TP4-SS-01	TP5-SS-01	TP9-SS-01	TP6-SS-01	TP6-SS-02	TP7-SS-01	TP8-SS-01
Sample Date	8/18/1998	8/18/1998	8/18/1998	8/17/1998	8/19/1998	8/19/1998	8/19/1998	8/19/1998	8/20/1998	8/20/1998	8/20/1998	8/20/1998	8/20/1998	8/20/1998
Sample Depth (Feet bgs)	0.5	0.5	0.5	20	1	10	2	3.7	5	5	4	6.5	4.5	4
Dinoseb	-	-	-	45.0 UJ	45.0 U	45.0 U	45.0 U	**51.2**	10.0 U	10.0 U	10.0 U	45.0 U	10.0 U	10.0 U
MCPA	-	-	-	750 UJ	750 U	750 U	750 U	750 U	750 U	750 U	750 U	750 U	750 U	750 U
MCPP	-	-	-	750 UJ	750 U	750 U	750 U	750 U	750 U	750 U	750 U	750 U	750 U	750 U
Pesticides (µg/kg)														
4,4'-DDD	-	-	-	1.00 UJ	2.29 UJ	**3,060**	11.0 UJ	1.00 UJ	21.0 UJ	21.0 UJ	21.0 UJ	1.00 UJ	51.0 UJ	1.00 UJ
4,4'-DDE	-	-	-	1.00 UJ	3.05 UJ	**1,830**	11.0 UJ	1.00 UJ	21.0 UJ	21.0 UJ	21.0 UJ	1.00 UJ	51.0 UJ	1.00 UJ
4,4'-DDT	-	-	-	1.00 UJ	**4.36 J**	**9,520 J**	11.0 UJ	1.00 UJ	21.0 UJ	21.0 UJ	21.0 UJ	1.00 UJ	51.0 UJ	1.00 UJ
Aldrin	-	-	-	1.00 UJ	1.00 UJ	21.0 UJ	11.0 UJ	1.00 UJ	21.0 UJ	21.0 UJ	21.0 UJ	1.00 UJ	51.0 UJ	1.00 UJ
BHC (alpha)	-	-	-	0.500 UJ	0.500 UJ	10.5 UJ	5.50 UJ	0.500 UJ	10.5 UJ	10.5 UJ	10.5 UJ	0.500 UJ	25.5 UJ	0.500 UJ
BHC (beta)	-	-	-	0.900 UJ	0.900 UJ	18.9 UJ	9.90 UJ	0.900 UJ	18.9 UJ	18.9 UJ	18.9 UJ	0.900 UJ	45.9 UJ	0.900 UJ
BHC (delta)	-	-	-	0.600 UJ	0.600 UJ	12.6 UJ	6.60 UJ	0.600 UJ	12.6 UJ	12.6 UJ	12.6 UJ	0.600 UJ	30.6 UJ	0.600 UJ
BHC (gamma) Lindane	-	-	-	1.00 UJ	1.00 UJ	21.0 UJ	11.0 UJ	1.00 UJ	21.0 UJ	21.0 UJ	21.0 UJ	1.00 UJ	51.0 UJ	1.00 UJ
Chlordane (alpha)	-	-	-	0.800 UJ	0.800 UJ	16.8 UJ	8.80 UJ	0.800 UJ	16.8 UJ	16.8 UJ	16.8 UJ	0.800 UJ	40.8 UJ	0.800 UJ
Chlordane (gamma)	-	-	-	0.700 UJ	0.700 UJ	14.7 UJ	7.70 UJ	0.700 UJ	14.7 UJ	14.7 UJ	14.7 UJ	0.700 UJ	35.7 UJ	0.700 UJ
Chlordane (technical)	-	-	-	1.00 UJ	1.00 UJ	21.0 UJ	11.0 UJ	1.00 UJ	21.0 UJ	21.0 UJ	21.0 UJ	1.00 UJ	51.0 UJ	1.00 UJ
Dieldrin	-	-	-	2.00 UJ	2.00 UJ	42.0 UJ	22.0 UJ	2.00 UJ	42.0 UJ	42.0 UJ	42.0 UJ	2.00 UJ	102 UJ	2.00 UJ
Endosulfan I	-	-	-	1.00 UJ	1.00 UJ	21.0 UJ	11.0 UJ	1.00 UJ	21.0 UJ	21.0 UJ	21.0 UJ	1.00 UJ	51.0 UJ	1.00 UJ
Endosulfan II	-	-	-	2.00 UJ	2.00 UJ	42.0 UJ	22.0 UJ	2.00 UJ	42.0 UJ	42.0 UJ	42.0 UJ	2.00 UJ	102 UJ	2.00 UJ
Endosulfan Sulfate	-	-	-	1.00 UJ	1.00 UJ	21.0 UJ	11.0 UJ	1.00 UJ	21.0 UJ	21.0 UJ	21.0 UJ	1.00 UJ	51.0 UJ	1.00 UJ
Endrin	-	-	-	2.00 UJ	2.00 UJ	42.0 UJ	22.0 UJ	2.00 UJ	42.0 UJ	42.0 UJ	42.0 UJ	2.00 UJ	102 UJ	2.00 UJ
Endrin Aldehyde	-	-	-	2.00 UJ	2.00 UJ	42.0 UJ	22.0 UJ	2.00 UJ	42.0 UJ	42.0 UJ	42.0 UJ	2.00 UJ	102 UJ	2.00 UJ
Heptachlor	-	-	-	1.00 UJ	1.00 UJ	21.0 UJ	11.0 UJ	1.00 UJ	21.0 UJ	21.0 UJ	21.0 UJ	1.00 UJ	51.0 UJ	1.00 UJ
Heptachlor Epoxide	-	-	-	1.00 UJ	1.00 UJ	21.0 UJ	11.0 UJ	1.00 UJ	21.0 UJ	21.0 UJ	21.0 UJ	1.00 UJ	**85.1 J**	1.00 UJ
Methoxychlor	-	-	-	4.00 UJ	4.00 UJ	84.0 UJ	44.0 UJ	4.00 UJ	84.0 UJ	84.0 UJ	84.0 UJ	4.00 UJ	204 UJ	4.00 UJ
Toxaphene	-	-	-	50.0 UJ	50.0 UJ	1,050 UJ	550 UJ	50.0 UJ	1,050 UJ	1,050 UJ	1,050 UJ	50.0 UJ	2,550 UJ	50.0 UJ

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-1b
Data Not Used in the RI - 1998 Landfill Site Inspection Soil Analytical Results
Volatile Organic Compounds
(Page 1 of 2)

Site ID	MW-01	PW1-01	TP1-01	TP2-01	TP4-01
Sample ID	SB1-SS-01	PW1-SS-01	TP1-SS-01	TP2-SS-01	TP4-SS-01
Sample Date	8/17/1998	8/19/1998	8/19/1998	8/19/1998	8/19/1998
Sample Depth (Feet bgs)	20	1	10	2	3.7
Volatile Organic Compounds (µg/kg)					
1,1,1,2-Tetrachloroethane	100 UJ	100 U	100 UJ	100 U	100 U
1,1,1-Trichloroethane (TCA)	100 UJ	100 U	100 UJ	100 U	100 U
1,1,2,2-Tetrachloroethane	100 UJ	100 U	100 UJ	100 U	100 U
1,1,2-Trichloroethane	100 UJ	100 U	100 UJ	100 U	100 U
1,1-Dichloroethane	100 UJ	100 U	100 UJ	100 U	100 U
1,1-Dichloroethene	100 UJ	100 U	100 UJ	100 U	100 U
1,1-Dichloropropene	100 UJ	100 U	100 UJ	100 U	100 U
1,2,3-Trichlorobenzene	100 UJ	100 U	100 UJ	100 U	100 U
1,2,3-Trichloropropane	100 UJ	100 U	100 UJ	100 U	100 U
1,2,4-Trichlorobenzene	100 UJ	100 U	100 UJ	100 U	100 U
1,2,4-Trimethylbenzene	100 UJ	100 U	100 UJ	100 U	100 U
1,2-Dibromo-3-chloropropane	1,000 UJ	1,000 U	1,000 UJ	1,000 U	1,000 U
1,2-Dibromoethane (EDB)	100 UJ	100 U	100 UJ	100 U	100 U
1,2-Dichlorobenzene	100 UJ	100 U	100 UJ	100 U	100 U
1,2-Dichloroethane (EDC)	100 UJ	100 U	100 UJ	100 U	100 U
1,2-Dichloropropane	100 UJ	100 U	100 UJ	100 U	100 U
1,3,5-Trimethylbenzene	100 UJ	100 U	100 UJ	100 U	100 U
1,3-Dichlorobenzene	100 UJ	100 U	100 UJ	100 U	100 U
1,3-Dichloropropane	100 UJ	100 U	100 UJ	100 U	100 U
1,4-Dichlorobenzene	100 UJ	100 U	100 UJ	100 U	100 U
2,2-Dichloropropane	100 UJ	100 U	100 UJ	100 U	100 U
2-Butanone (MEK)	2,000 UJ	2,000 U	2,000 UJ	2,000 U	2,000 U
2-Chlorotoluene	100 UJ	100 U	100 UJ	100 U	100 U
2-Hexanone	2,000 UJ	2,000 U	2,000 UJ	2,000 U	2,000 U
4-Chlorotoluene	100 UJ	100 U	100 UJ	100 U	100 U
4-Isopropyltoluene	100 UJ	100 U	100 UJ	100 U	100 U
4-Methyl-2-pentanone (MIBK)	2,000 UJ	2,000 U	2,000 UJ	2,000 U	2,000 U
Acetone	2,000 UJ	2,000 U	2,000 UJ	2,000 U	2,000 U
Benzene	100 UJ	100 U	100 UJ	100 U	100 U
Bromobenzene	100 UJ	100 U	100 UJ	100 U	100 U
Bromochloromethane	100 UJ	100 U	100 UJ	100 U	100 U
Bromodichloromethane	100 UJ	100 U	100 UJ	100 U	100 U
Bromoform	100 UJ	100 U	100 UJ	100 U	100 U
Bromomethane	100 UJ	100 U	100 UJ	100 U	100 U
Carbon Disulfide	100 UJ	100 U	100 UJ	100 U	100 U
Carbon Tetrachloride	100 UJ	100 U	100 UJ	100 U	100 U
Chlorobenzene	100 UJ	100 U	100 UJ	100 U	100 U
Chloroethane	100 UJ	100 U	100 UJ	100 U	100 U
Chloroform	100 UJ	100 U	100 UJ	100 U	100 U
Chloromethane	500 UJ	500 U	500 UJ	500 U	500 U
cis-1,2-Dichloroethene	100 UJ	100 U	100 UJ	100 U	100 U
cis-1,3-Dichloropropene	100 UJ	100 U	100 UJ	100 U	100 U
Dibromochloromethane	100 UJ	100 U	100 UJ	100 U	100 U
Dibromomethane	100 UJ	100 U	100 UJ	100 U	100 U
Dichlorodifluoromethane	100 UJ	100 U	100 UJ	100 U	100 U
Dichloromethane (Methylene Chloride)	100 UJ	100 U	1,000 UJ	100 U	100 U
Ethylbenzene	100 UJ	100 U	100 UJ	100 U	100 U
Hexachlorobutadiene	100 UJ	100 U	100 UJ	100 U	100 U
Isopropylbenzene	100 UJ	100 U	100 UJ	100 U	100 U
m,p-Xylenes	200 UJ	200 U	200 UJ	200 U	200 U
Naphthalene	100 UJ	100 U	100 UJ	100 U	100 U
n-Butylbenzene	100 UJ	100 U	100 UJ	100 U	100 U
n-Propylbenzene	100 UJ	100 U	100 UJ	100 U	100 U
o-Xylene	100 UJ	100 U	100 UJ	100 U	100 U
sec-Butylbenzene	100 UJ	100 U	100 UJ	100 U	100 U
Styrene	100 UJ	100 U	100 UJ	100 U	100 U
tert-Butylbenzene	100 UJ	100 U	100 UJ	100 U	100 U
Tetrachloroethene (PCE)	100 UJ	100 U	100 UJ	100 U	100 U
Toluene	100 UJ	100 U	100 UJ	100 U	100 U
trans-1,2-Dichloroethene	100 UJ	100 U	100 UJ	100 U	100 U
trans-1,3-Dichloropropene	100 UJ	100 U	100 UJ	100 U	100 U
Trichloroethene (TCE)	100 UJ	100 U	100 UJ	100 U	100 U
Trichlorofluoromethane	100 UJ	100 U	100 UJ	100 U	100 U
Vinyl Chloride	100 UJ	100 U	100 UJ	100 U	100 U

Notes:
µg/kg = microgram per kilogram
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-1b
Data Not Used in the RI - 1998 Landfill Site Inspection Soil Analytical Results
Volatile Organic Compounds

Site ID	TP5-01	TP5-01 DUP	TP6-01	TP6-02	TP7-01	TP8-01
Sample ID	TP5-SS-01	TP9-SS-01	TP6-SS-01	TP6-SS-02	TP7-SS-01	TP8-SS-01
Sample Date	8/20/1998	8/20/1998	8/20/1998	8/20/1998	8/20/1998	8/20/1998
Sample Depth (Feet bgs)	5	5	4	6.5	4.5	4
Volatile Organic Compounds (µg/kg)						
1,1,1,2-Tetrachloroethane	100 U	100 U	100 U	100 U	100 U	100 U
1,1,1-Trichloroethane (TCA)	100 U	100 U	100 U	100 U	100 U	100 U
1,1,2,2-Tetrachloroethane	100 U	100 U	100 U	100 U	100 U	100 U
1,1,2-Trichloroethane	100 U	100 U	100 U	100 U	100 U	100 U
1,1-Dichloroethane	**112**	100 U	100 U	100 U	100 U	100 U
1,1-Dichloroethene	100 U	100 U	100 U	100 U	100 U	100 U
1,1-Dichloropropene	100 U	100 U	100 U	100 U	100 U	100 U
1,2,3-Trichlorobenzene	100 U	100 U	100 U	100 U	100 U	100 U
1,2,3-Trichloropropane	100 U	100 U	100 U	100 U	100 U	100 U
1,2,4-Trichlorobenzene	100 U	100 U	100 U	100 U	100 U	100 U
1,2,4-Trimethylbenzene	**1,460**	**448**	100 U	100 U	100 U	100 U
1,2-Dibromo-3-chloropropane	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
1,2-Dibromoethane (EDB)	100 U	100 U	100 U	100 U	100 U	100 U
1,2-Dichlorobenzene	100 U	100 U	100 U	100 U	100 U	100 U
1,2-Dichloroethane (EDC)	100 U	100 U	100 U	100 U	100 U	100 U
1,2-Dichloropropane	100 U	100 U	100 U	100 U	100 U	100 U
1,3,5-Trimethylbenzene	**570**	**189**	100 U	100 U	100 U	100 U
1,3-Dichlorobenzene	100 U	100 U	100 U	100 U	100 U	100 U
1,3-Dichloropropane	100 U	100 U	100 U	100 U	100 U	100 U
1,4-Dichlorobenzene	100 U	100 U	100 U	100 U	100 U	100 U
2,2-Dichloropropane	100 U	100 U	100 U	100 U	100 U	100 U
2-Butanone (MEK)	2,000 U	2,000 U	2,000 U	2,000 U	2,000 U	2,000 U
2-Chlorotoluene	100 U	100 U	100 U	100 U	100 U	100 U
2-Hexanone	2,000 U	2,000 U	2,000 U	2,000 U	2,000 U	2,000 U
4-Chlorotoluene	100 U	100 U	100 U	100 U	100 U	100 U
4-Isopropyltoluene	**314**	100 U	100 U	100 U	100 U	100 U
4-Methyl-2-pentanone (MIBK)	2,000 U	2,000 U	2,000 U	2,000 U	2,000 U	2,000 U
Acetone	2,000 U	2,000 U	2,000 U	2,000 U	2,000 U	2,000 U
Benzene	100 U	100 U	100 U	100 U	100 U	100 U
Bromobenzene	100 U	100 U	100 U	100 U	100 U	100 U
Bromochloromethane	100 U	100 U	100 U	100 U	100 U	100 U
Bromodichloromethane	100 U	100 U	100 U	100 U	100 U	100 U
Bromoform	100 U	100 U	100 U	100 U	100 U	100 U
Bromomethane	100 U	100 U	100 U	100 U	100 U	100 U
Carbon Disulfide	100 U	100 U	100 U	100 U	100 U	100 U
Carbon Tetrachloride	100 U	100 U	100 U	100 U	100 U	100 U
Chlorobenzene	100 U	100 U	100 U	100 U	100 U	100 U
Chloroethane	100 U	100 U	100 U	100 U	100 U	100 U
Chloroform	100 U	100 U	100 U	100 U	100 U	100 U
Chloromethane	500 U	500 U	500 U	500 U	500 U	500 U
cis-1,2-Dichloroethene	100 U	100 U	100 U	100 U	100 U	100 U
cis-1,3-Dichloropropene	100 U	100 U	100 U	100 U	100 U	100 U
Dibromochloromethane	100 U	100 U	100 U	100 U	100 U	100 U
Dibromomethane	100 U	100 U	100 U	100 U	100 U	100 U
Dichlorodifluoromethane	100 U	100 U	100 U	100 U	100 U	100 U
Dichloromethane (Methylene Chloride)	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Ethylbenzene	**228**	100 U	100 U	100 U	100 U	100 U
Hexachlorobutadiene	100 U	100 U	100 U	100 U	100 U	100 U
Isopropylbenzene	100 U	100 U	100 U	100 U	100 U	100 U
m,p-Xylenes	**631**	200 U	200 U	200 U	200 U	200 U
Naphthalene	**333**	**135**	**139**	100 U	100 U	100 U
n-Butylbenzene	**422**	**146**	100 U	100 U	100 U	100 U
n-Propylbenzene	**172**	100 U	100 U	100 U	100 U	100 U
o-Xylene	**269**	100 U	100 U	100 U	100 U	100 U
sec-Butylbenzene	**142**	100 U	100 U	100 U	100 U	100 U
Styrene	100 U	100 U	100 U	100 U	100 U	100 U
tert-Butylbenzene	100 U	100 U	100 U	100 U	100 U	100 U
Tetrachloroethene (PCE)	100 U	100 U	100 U	100 U	**2,120**	**1,340**
Toluene	**1,360**	**1,120**	100 U	100 U	100 U	100 U
trans-1,2-Dichloroethene	100 U	100 U	100 U	100 U	100 U	100 U
trans-1,3-Dichloropropene	100 U	100 U	100 U	100 U	100 U	100 U
Trichloroethene (TCE)	100 U	100 U	100 U	100 U	100 U	100 U
Trichlorofluoromethane	100 U	100 U	100 U	100 U	100 U	100 U
Vinyl Chloride	100 U	100 U	100 U	100 U	100 U	100 U

Notes:
µg/kg = microgram per kilogram
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-1c
Data Not Used in the RI - 1998 Landfill Site Inspection Soil Analytical Results
Semivolatile Organic Compounds

Site ID	MW-01	PW1-01	TP1-01	TP2-01	TP4-01
Sample ID	SB1-SS-01	PW1-SS-01	TP1-SS-01	TP2-SS-01	TP4-SS-01
Sample Date	8/17/1998	8/19/1998	8/19/1998	8/19/1998	8/19/1998
Sample Depth (Feet bgs)	20	1	10	2	3.7
Semivolatile Organic Compounds (µg/kg)					
1,2,4-Trichlorobenzene	100 UJ	100 U	500 U	500 U	100 U
1,2-Dichlorobenzene	100 UJ	100 U	500 U	500 U	100 U
1,3-Dichlorobenzene	100 UJ	100 U	500 U	500 U	100 U
1,4-Dichlorobenzene	100 UJ	100 U	500 U	500 U	100 U
2,4,5-Trichlorophenol	500 UJ	500 U	2,500 U	2,500 U	500 U
2,4,6-Trichlorophenol	100 UJ	100 U	500 U	500 U	100 U
2,4-Dichlorophenol	100 UJ	100 U	500 U	500 U	100 U
2,4-Dimethylphenol	100 UJ	100 U	500 U	500 U	100 U
2,4-Dinitrophenol	500 UJ	500 U	2,500 U	2,500 U	500 U
2,4-Dinitrotoluene	100 UJ	100 U	500 U	500 U	100 U
2,6-Dinitrotoluene	100 UJ	100 U	500 U	500 U	100 U
2-Chloronaphthalene	100 UJ	100 U	500 U	500 U	100 U
2-Chlorophenol	100 UJ	100 U	500 U	500 U	100 U
2-Methylnaphthalene	100 UJ	100 U	500 U	500 U	100 U
2-Methylphenol	100 UJ	100 U	500 U	500 U	100 U
2-Nitroaniline	500 UJ	500 U	2,500 U	2,500 U	500 U
2-Nitrophenol	100 UJ	100 U	500 U	500 U	100 U
3-&4-Methylphenol	100 UJ	100 U	500 U	500 U	100 U
3,3'-Dichlorobenzidine	5,000 UJ	5,000 U	500 U	25,000 U	5,000 U
3-Nitroaniline	500 UJ	500 U	2,500 U	500 U	500 U
4,6-Dinitro-2-methylphenol	500 UJ	500 U	2,500 U	2,500 U	500 U
4-Bromophenyl Phenyl Ether	100 UJ	100 U	500 U	2,500 U	100 U
4-Chloro-3-methylphenol	100 UJ	100 U	500 U	500 U	100 U
4-Chloroaniline	100 UJ	100 U	500 U	500 U	100 U
4-Chlorophenyl Phenyl Ether	100 UJ	100 U	500 U	500 U	100 U
4-Nitroaniline	500 UJ	500 U	2,500 U	2,500 U	500 U
4-Nitrophenol	500 UJ	500 U	2,500 U	2,500 U	500 U
Acenaphthene	100 UJ	100 U	500 U	500 U	100 U
Acenaphthylene	100 UJ	100 U	500 U	500 U	100 U
Aniline	100 UJ	100 U	500 U	500 U	100 U
Anthracene	100 UJ	100 U	500 U	500 U	100 U
Benzo(a)anthracene	100 UJ	100 U	500 U	**1,720**	**111**
Benzo(a)pyrene	100 UJ	100 U	500 U	**2,050**	100 U
Benzo(b)fluoranthene	100 UJ	100 U	500 U	**2,880**	**132**
Benzo(g,h,i)perylene	100 UJ	100 U	500 U	**1,400**	100 U
Benzo(k)fluoranthene	100 UJ	100 U	500 U	**890**	100 U
Benzoic Acid	500 UJ	500 U	**2,500**	2,500 U	100 U
Benzyl Alcohol	100 UJ	100 U	500 U	500 U	100 U
Bis(2-chloroethoxy)methane	100 UJ	100 U	500 U	500 U	100 U
Bis(2-chloroethyl) Ether	100 UJ	100 U	500 U	500 U	100 U
Bis(2-chloroisopropyl) Ether	100 UJ	100 U	500 U	500 U	100 U
Bis(2-ethylhexyl) Phthalate	500 UJ	500 U	2,500 U	2,500 U	500 U
Butyl Benzyl Phthalate	100 UJ	100 U	500 U	500 U	100 U
Carbazole	500 UJ	500 U	2,500 U	2,500 U	500 U
Chrysene	100 UJ	100 U	500 U	**1,790**	**130**
Dibenz(a,h)anthracene	100 UJ	100 U	500 U	500 U	100 U
Dibenzofuran	100 UJ	100 U	500 U	500 U	100 U
Diethyl Phthalate	100 UJ	100 U	500 U	500 U	100 U
Dimethyl Phthalate	100 UJ	100 U	500 U	500 U	100 U
Di-n-butyl Phthalate	500 UJ	500 U	2,500 U	2,500 U	500 U
Di-n-octyl Phthalate	500 UJ	500 U	2,500 U	2,500 U	500 U
Fluoranthene	100 UJ	100 U	500 U	**2,480**	**164**
Fluorene	100 UJ	100 U	500 U	500 U	100 U
Hexachlorobenzene	100 UJ	100 U	500 U	500 U	100 U
Hexachlorobutadiene	100 UJ	100 U	500 U	500 U	100 U
Hexachlorocyclopentadiene	100 UJ	100 U	500 U	500 U	100 U
Hexachloroethane	100 UJ	100 U	500 U	500 U	100 U
Indeno(1,2,3-cd)pyrene	100 UJ	100 U	500 U	**1,560**	100 U
Isophorone	100 UJ	100 U	500 U	500 U	100 U
Naphthalene	100 UJ	100 U	500 U	500 U	100 U
Nitrobenzene	100 UJ	100 U	500 U	500 U	100 U
N-Nitrosodi-n-propylamine	100 UJ	100 U	500 U	500 U	100 U
N-Nitrosodiphenylamine	200 UJ	200 U	1,000 U	1,000 U	200 U
Pentachlorophenol	500 UJ	500 U	2,500 U	2,500 U	500 U
Phenanthrene	100 UJ	100 U	500 U	**709**	100 U
Phenol	100 UJ	100 U	500 U	500 U	100 U
Pyrene	100 UJ	100 U	500 U	**4,050**	**222**

Notes:
µg/kg = microgram per kilogram
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-1c
Data Not Used in the RI - 1998 Landfill Site Inspection Soil Analytical Results
Semivolatile Organic Compounds

Site ID	TP5-01	TP5-01 DUP	TP6-01	TP6-02	TP7-01	TP8-01
Sample ID	TP5-SS-01	TP9-SS-01	TP6-SS-01	TP6-SS-02	TP7-SS-01	TP8-SS-01
Sample Date	8/20/1998	8/20/1998	8/20/1998	8/20/1998	8/20/1998	8/20/1998
Sample Depth (Feet bgs)	5	5	4	6.5	4.5	4
Semivolatile Organic Compounds (µg/kg)						
1,2,4-Trichlorobenzene	2,500 UJ	2,500 UJ	500 UJ	500 U	10,000 UJ	2,500 U
1,2-Dichlorobenzene	2,500 UJ	2,500 UJ	500 UJ	500 U	10,000 UJ	2,500 U
1,3-Dichlorobenzene	2,500 UJ	2,500 UJ	500 UJ	500 U	10,000 UJ	2,500 U
1,4-Dichlorobenzene	2,500 UJ	2,500 UJ	500 UJ	500 U	10,000 UJ	2,500 U
2,4,5-Trichlorophenol	12,500 UJ	12,500 UJ	25,000 UJ	2,500 U	50,000 UJ	12,500 U
2,4,6-Trichlorophenol	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
2,4-Dichlorophenol	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
2,4-Dimethylphenol	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
2,4-Dinitrophenol	12,500 UJ	12,500 UJ	25,000 UJ	2,500 U	50,000 UJ	12,500 U
2,4-Dinitrotoluene	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
2,6-Dinitrotoluene	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
2-Chloronaphthalene	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
2-Chlorophenol	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
2-Methylnaphthalene	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
2-Methylphenol	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
2-Nitroaniline	12,500 UJ	12,500 UJ	25,000 UJ	2,500 U	50,000 UJ	12,500 U
2-Nitrophenol	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
3-&4-Methylphenol	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
3,3'-Dichlorobenzidine	125,000 UJ	125,000 UJ	250,000 UJ	25,000 U	500,000 UJ	125,000 U
3-Nitroaniline	12,500 UJ	12,500 UJ	25,000 UJ	500 U	50,000 UJ	12,500 U
4,6-Dinitro-2-methylphenol	12,500 UJ	12,500 UJ	25,000 UJ	2,500 U	50,000 UJ	12,500 U
4-Bromophenyl Phenyl Ether	2,500 UJ	2,500 UJ	5,000 UJ	2,500 U	10,000 UJ	2,500 U
4-Chloro-3-methylphenol	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
4-Chloroaniline	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
4-Chlorophenyl Phenyl Ether	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
4-Nitroaniline	12,500 UJ	12,500 UJ	25,000 UJ	2,500 U	50,000 UJ	12,500 U
4-Nitrophenol	12,500 UJ	12,500 UJ	25,000 UJ	2,500 U	50,000 UJ	12,500 U
Acenaphthene	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Acenaphthylene	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Aniline	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Anthracene	2,500 UJ	2,500 UJ	5,000 UJ	500 U	**11,000 J**	2,500 U
Benzo(a)anthracene	2,500 UJ	2,500 UJ	**6,310 J**	500 U	**84,300 J**	2,500 U
Benzo(a)pyrene	2,500 UJ	2,500 UJ	**6,030 J**	500 U	**103,000 J**	2,500 U
Benzo(b)fluoranthene	2,500 UJ	2,500 UJ	**7,610 J**	500 U	**134,000 J**	2,500 U
Benzo(g,h,i)perylene	2,500 UJ	2,500 UJ	**5,790 J**	500 U	**70,400 J**	2,500 U
Benzo(k)fluoranthene	2,500 UJ	2,500 UJ	5,000 UJ	500 U	**53,400 J**	2,500 U
Benzoic Acid	12,500 UJ	12,500 UJ	25,000 UJ	2,500 U	50,000 UJ	12,500 U
Benzyl Alcohol	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Bis(2-chloroethoxy)methane	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Bis(2-chloroethyl) Ether	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Bis(2-chloroisopropyl) Ether	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Bis(2-ethylhexyl) Phthalate	12,500 UJ	12,500 UJ	25,000 UJ	2,500 U	**73,400 J**	12,500 U
Butyl Benzyl Phthalate	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Carbazole	12,500 UJ	12,500 UJ	25,000 UJ	2,500 U	50,000 UJ	12,500 U
Chrysene	2,500 UJ	2,500 UJ	**6,540 J**	500 U	**89,800 J**	2,500 U
Dibenz(a,h)anthracene	2,500 UJ	2,500 UJ	5,000 UJ	500 U	**19,300 J**	2,500 U
Dibenzofuran	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Diethyl Phthalate	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Dimethyl Phthalate	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Di-n-butyl Phthalate	12,500 UJ	12,500 UJ	25,000 UJ	2,500 U	50,000 UJ	12,500 U
Di-n-octyl Phthalate	12,500 UJ	12,500 UJ	25,000 UJ	2,500 U	50,000 UJ	12,500 U
Fluoranthene	2,500 UJ	2,500 UJ	**10,500 J**	500 U	**136,000 J**	2,500 U
Fluorene	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Hexachlorobenzene	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Hexachlorobutadiene	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Hexachlorocyclopentadiene	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Hexachloroethane	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Indeno(1,2,3-cd)pyrene	2,500 UJ	2,500 UJ	**5,190 J**	500 U	**72,900 J**	2,500 U
Isophorone	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Naphthalene	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Nitrobenzene	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
N-Nitrosodi-n-propylamine	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
N-Nitrosodiphenylamine	5,000 UJ	5,000 UJ	10,000 UJ	1,000 U	20,000 UJ	5,000 U
Pentachlorophenol	12,500 UJ	12,500 UJ	25,000 UJ	2,500 U	50,000 UJ	12,500 U
Phenanthrene	2,500 UJ	2,500 UJ	**12,800 J**	500 U	**37,500 J**	2,500 U
Phenol	2,500 UJ	2,500 UJ	5,000 UJ	500 U	10,000 UJ	2,500 U
Pyrene	2,500 UJ	2,500 UJ	**15,800 J**	500 U	**268,000 J**	2,500 U

Notes:
µg/kg = microgram per kilogram
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-1d
Data Not Used in the RI - 1998 Landfill Site Inspection Groundwater Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Herbicides, and Pesticides

Site ID	MW-02	MW-03	MW-04	MW-04 DUP
Sample ID	MW2-GW-01	MW3-GW-01	MW4-GW-01	MW5-GW-01
Sample Date	9/2/1998	9/1/1998	9/1/1998	9/1/1998
Sample Depth (Feet btc)	29.56	18.21	20.29	20.29
Total PCB Aroclors (µg/L)				
Aroclor 1016	0.100 U	0.100 U	0.100 U	0.100 U
Aroclor 1221	0.100 U	0.100 U	0.100 U	0.100 U
Aroclor 1232	0.100 U	0.100 U	0.100 U	0.100 U
Aroclor 1242	0.100 U	0.100 U	0.100 U	0.100 U
Aroclor 1248	0.100 U	0.100 U	0.100 U	0.100 U
Aroclor 1254	0.100 U	0.100 U	0.100 U	0.100 U
Aroclor 1260	0.100 U	0.100 U	0.100 U	0.100 U
Aroclor 1262	0.100 U	0.100 U	0.100 U	0.100 U
Aroclor 1268	0.100 U	0.100 U	0.100 U	0.100 U
Total PCBs as Aroclors	0.100 U	0.100 U	0.100 U	0.100 U
Total Metals (mg/L)				
Aluminum	**3.48**	**0.107**	**1.46**	**1.63**
Antimony	**0.00108**	0.00100 U	0.00100 U	0.00100 U
Arsenic	**0.00808**	0.00100 U	**0.00228**	**0.00261**
Barium	**0.128**	**0.0233**	**0.264**	**0.249**
Beryllium	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Cadmium	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Calcium	**4.51 J**	**20.7 J**	**72.6 J**	**72.9 J**
Chromium	**0.00351**	**0.00111**	**0.00350**	**0.00345**
Cobalt	**0.00163**	0.00100 U	**0.00553**	**0.00562**
Copper	**0.00567**	**0.00185**	**0.00760**	**0.00730**
Cyanide	0.0100 U	0.0100 U	0.0100 U	0.0100 U
Iron	**4.34**	0.150 U	**11.0**	**8.88**
Lead	**0.00771**	0.00100 U	**0.0123**	**0.0108**
Magnesium	**1.17**	**6.49**	**16.4**	**16.7**
Manganese	**0.0987**	**0.348**	**2.49**	**2.68**
Mercury	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Nickel	**0.00246**	**0.00247**	**0.00939**	**0.00902**
Potassium	**5.15**	**1.54**	**4.70**	**4.91**
Selenium	**0.00148**	0.00100 U	0.00100 U	0.00100 U
Silver	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Sodium	**49.2**	**0.589**	**9.26**	**10.3**
Thallium	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Vanadium	**0.0119**	0.00100 U	**0.00691**	**0.00663**
Zinc	**0.0268**	0.0100 U	**0.0237**	**0.0238**
Total Petroleum Hydrocarbons (mg/L)				
Diesel Range Organics	**0.502**	0.250 U	**0.332**	**0.340**
Residual Range Organics	0.500 U	0.500 U	0.500 U	0.500 U
Gasoline Range Organics	50.0 U	50.0 U	50.0 U	50.0 U
Total Herbicides (µgL)				
2,4,5-T	1.00 U	1.00 U	1.00 U	1.00 U
2,4,5-TP (Silvex)	1.00 U	1.00 U	1.00 U	1.00 U
2,4-D	0.500 U	0.500 U	0.500 U	0.500 U
2,4-DB	1.00 U	1.00 U	1.00 U	1.00 U
Dalapon	1.50 U	1.50 U	1.50 U	1.50 U
Dicamba	0.500 U	0.500 U	0.500 U	0.500 U
Dichloroprop	1.00 U	1.00 U	1.00 U	1.00 U
Dinoseb	1.00 U	1.00 U	1.00 U	1.00 U
MCPA	50.0 U	50.0 U	50.0 U	50.0 U
MCPP	50.0 U	50.0 U	50.0 U	50.0 U
Total Pesticides (µg/L)				
4,4'-DDD	0.0400 U	0.0400 U	0.0400 U	0.0400 U
4,4'-DDE	0.0300 U	0.0300 U	0.0300 U	0.0300 U
4,4'-DDT	0.270 U	0.270 U	0.270 U	0.270 U
Aldrin	0.0400 U	0.0400 U	0.0400 U	0.0400 U
BHC (alpha)	0.0200 U	0.0200 U	0.0200 U	0.0200 U
BHC (beta)	0.0300 U	0.0300 U	0.0300 U	0.0300 U
BHC (delta)	0.0200 U	0.0200 U	0.0200 U	0.0200 U
BHC (gamma) Lindane	0.0300 U	0.0300 U	0.0300 U	0.0300 U
Chlordane (alpha)	0.0200 U	0.0200 U	0.0200 U	0.0200 U
Chlordane (gamma)	0.0200 U	0.0200 U	0.0200 U	0.0200 U
Chlordane (technical)	0.150 U	0.150 U	0.150 U	0.150 U
Dieldrin	0.0700 U	0.0700 U	0.0700 U	0.0700 U
Endosulfan I	0.0300 U	0.0300 U	0.0300 U	0.0300 U
Endosulfan II	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Endosulfan Sulfate	0.0700 U	0.0700 U	0.0700 U	0.0700 U
Endrin	0.0800 U	0.0800 U	0.0800 U	0.0800 U
Endrin Aldehyde	0.0800 U	0.0800 U	0.0800 U	0.0800 U
Heptachlor	0.0300 U	0.0300 U	0.0300 U	0.0300 U
Heptachlor Epoxide	0.0300 U	0.0300 U	0.0300 U	0.0300 U
Methoxychlor	0.500 U	0.500 U	0.500 U	0.500 U
Toxaphene	1.50 U	1.50 U	1.50 U	1.50 U

Notes:
btc = below top of well casing
µg/L = microgram per liter
mg/L = milligram per liter
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-1e
Data Not Used in the RI - 1998 Landfill Site Inspection Groundwater Analytical Results
Volatile Organic Compounds

Site ID	MW-02	MW-03	MW-04	MW-04 DUP
Sample ID	MW2-GW-01	MW3-GW-01	MW4-GW-01	MW5-GW-01
Sample Date	9/2/1998	9/1/1998	9/1/1998	9/1/1998
Sample Depth (Feet btc)	29.56	18.21	20.29	20.29
Total Volatile Organic Compounds (µg/L)				
1,1,1,2-Tetrachloroethane	1.00 U	1.00 U	1.00 U	1.00 U
1,1,1-Trichloroethane (TCA)	1.00 U	1.00 U	1.00 U	1.00 U
1,1,2,2-Tetrachloroethane	1.00 U	1.00 U	1.00 U	1.00 U
1,1,2-Trichloroethane	1.00 U	1.00 U	1.00 U	1.00 U
1,1-Dichloroethane	1.00 U	1.00 U	1.00 U	1.00 U
1,1-Dichloroethene	1.00 U	1.00 U	1.00 U	1.00 U
1,1-Dichloropropene	1.00 U	1.00 U	1.00 U	1.00 U
1,2,3-Trichlorobenzene	1.00 U	1.00 U	1.00 U	1.00 U
1,2,3-Trichloropropane	1.00 U	1.00 U	1.00 U	1.00 U
1,2,4-Trichlorobenzene	1.00 U	1.00 U	1.00 U	1.00 U
1,2,4-Trimethylbenzene	1.00 U	1.00 U	1.00 U	1.00 U
1,2-Dibromo-3-chloropropane	5.00 U	5.00 U	5.00 U	5.00 U
1,2-Dibromoethane (EDB)	1.00 U	1.00 U	1.00 U	1.00 U
1,2-Dichlorobenzene	1.00 U	1.00 U	1.00 U	1.00 U
1,2-Dichloroethane (EDC)	1.00 U	1.00 U	1.00 U	1.00 U
1,2-Dichloropropane	1.00 U	1.00 U	1.00 U	1.00 U
1,3,5-Trimethylbenzene	1.00 U	1.00 U	1.00 U	1.00 U
1,3-Dichlorobenzene	1.00 U	1.00 U	1.00 U	1.00 U
1,3-Dichloropropane	1.00 U	1.00 U	1.00 U	1.00 U
1,4-Dichlorobenzene	1.00 U	1.00 U	1.00 U	1.00 U
2,2-Dichloropropane	1.00 U	1.00 U	1.00 U	1.00 U
2-Butanone (MEK)	10.0 U	10.0 U	10.0 U	10.0 U
2-Chlorotoluene	1.00 U	1.00 U	1.00 U	1.00 U
2-Hexanone	10.0 U	10.0 U	10.0 U	10.0 U
4-Chlorotoluene	1.00 U	1.00 U	1.00 U	1.00 U
4-Isopropyltoluene	1.00 U	1.00 U	1.00 U	1.00 U
4-Methyl-2-pentanone (MIBK)	10.0 U	10.0 U	10.0 U	10.0 U
Acetone	10.0 U	10.0 U	10.0 U	10.0 U
Benzene	1.00 U	1.00 U	1.00 U	1.00 U
Bromobenzene	1.00 U	1.00 U	1.00 U	1.00 U
Bromochloromethane	1.00 U	1.00 U	1.00 U	1.00 U
Bromodichloromethane	1.00 U	1.00 U	1.00 U	1.00 U
Bromoform	1.00 U	1.00 U	1.00 U	1.00 U
Bromomethane	1.00 U	1.00 U	1.00 U	1.00 U
Carbon Disulfide	1.00 U	1.00 U	1.00 U	1.00 U
Carbon Tetrachloride	1.00 U	1.00 U	1.00 U	1.00 U
Chlorobenzene	1.00 U	1.00 U	1.00 U	1.00 U
Chloroethane	1.00 U	1.00 U	1.00 U	1.00 U
Chloroform	1.00 U	1.00 U	1.00 U	1.00 U
Chloromethane	5.00 U	5.00 U	5.00 U	5.00 U
cis-1,2-Dichloroethene	1.00 U	1.00 U	1.00 U	1.00 U
cis-1,3-Dichloropropene	1.00 U	1.00 U	1.00 U	1.00 U
Dibromochloromethane	1.00 U	1.00 U	1.00 U	1.00 U
Dibromomethane	1.00 U	1.00 U	1.00 U	1.00 U
Dichlorodifluoromethane	1.00 U	1.00 U	1.00 U	1.00 U
Dichloromethane (Methylene Chloride)	5.00 U	5.00 U	5.00 U	5.00 U
Ethylbenzene	1.00 U	1.00 U	1.00 U	1.00 U
Hexachlorobutadiene	1.00 U	1.00 U	1.00 U	1.00 U
Isopropylbenzene	1.00 U	1.00 U	1.00 U	1.00 U
m,p-Xylenes	2.00 U	2.00 U	2.00 U	2.00 U
Naphthalene	1.00 U	1.00 U	1.00 U	1.00 U
n-Butylbenzene	1.00 U	1.00 U	1.00 U	1.00 U
n-Propylbenzene	1.00 U	1.00 U	1.00 U	1.00 U
o-Xylene	1.00 U	1.00 U	1.00 U	1.00 U
sec-Butylbenzene	1.00 U	1.00 U	1.00 U	1.00 U
Styrene	1.00 U	1.00 U	1.00 U	1.00 U
tert-Butylbenzene	1.00 U	1.00 U	1.00 U	1.00 U
Tetrachloroethene (PCE)	1.00 U	**6.62**	1.00 U	1.00 U
Toluene	1.00 U	1.00 U	**1.11**	1.00 U
trans-1,2-Dichloroethene	1.00 U	1.00 U	1.00 U	1.00 U
trans-1,3-Dichloropropene	1.00 U	1.00 U	1.00 U	1.00 U
Trichloroethene (TCE)	1.00 U	1.00 U	1.00 U	1.00 U
Trichlorofluoromethane	1.00 U	1.00 U	1.00 U	1.00 U
Vinyl Chloride	1.00 U	1.00 U	1.00 U	1.00 U

Notes:
btc = below top of well casing
µg/L = microgram per liter
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-1f
Data Not Used in the RI - 1998 Landfill Site Inspection Groundwater Analytical Results
Semivolatile Organic Compounds

Site ID	MW-02	MW-03	MW-04	MW-04 DUP
Sample ID	MW2-GW-01	MW3-GW-01	MW4-GW-01	MW5-GW-01
Sample Date	9/2/1998	9/1/1998	9/1/1998	9/1/1998
Sample Depth (Feet btc)	29.56	18.21	20.29	20.29
Semivolatile Organic Compounds (µg/L)				
1,2,4-Trichlorobenzene	5.00 U	5.00 U	5.00 U	5.00 U
1,2-Dichlorobenzene	5.00 U	5.00 U	5.00 U	5.00 U
1,3-Dichlorobenzene	5.00 U	5.00 U	5.00 U	5.00 U
1,4-Dichlorobenzene	5.00 U	5.00 U	5.00 U	5.00 U
2,4,5-Trichlorophenol	10.0 U	10.0 U	10.0 U	10.0 U
2,4,6-Trichlorophenol	10.0 U	10.0 U	10.0 U	10.0 U
2,4-Dichlorophenol	10.0 U	10.0 U	10.0 U	10.0 U
2,4-Dimethylphenol	10.0 U	10.0 U	10.0 U	10.0 U
2,4-Dinitrophenol	10.0 U	10.0 U	10.0 U	10.0 U
2,4-Dinitrotoluene	10.0 U	10.0 U	10.0 U	10.0 U
2,6-Dinitrotoluene	10.0 U	10.0 U	10.0 U	10.0 U
2-Chloronaphthalene	10.0 U	10.0 U	10.0 U	10.0 U
2-Chlorophenol	10.0 U	10.0 U	10.0 U	10.0 U
2-Methylnaphthalene	10.0 U	10.0 U	10.0 U	10.0 U
2-Methylphenol	10.0 U	10.0 U	10.0 U	10.0 U
2-Nitroaniline	20.0 U	20.0 U	20.0 U	20.0 U
2-Nitrophenol	5.00 U	5.00 U	5.00 U	5.00 U
3-&4-Methylphenol	10.0 U	10.0 U	10.0 U	10.0 U
3,3'-Dichlorobenzidine	20.0 U	20.0 U	20.0 U	20.0 U
3-Nitroaniline	10.0 U	10.0 U	10.0 U	10.0 U
4,6-Dinitro-2-methylphenol	10.0 U	10.0 U	10.0 U	10.0 U
4-Bromophenyl Phenyl Ether	10.0 U	10.0 U	10.0 U	10.0 U
4-Chloro-3-methylphenol	10.0 U	10.0 U	10.0 U	10.0 U
4-Chloroaniline	5.00 U	5.00 U	5.00 U	5.00 U
4-Chlorophenyl Phenyl Ether	10.0 U	10.0 U	10.0 U	10.0 U
4-Nitroaniline	10.0 U	10.0 U	10.0 U	10.0 U
4-Nitrophenol	10.0 U	10.0 U	10.0 U	10.0 U
Acenaphthene	10.0 U	10.0 U	10.0 U	10.0 U
Acenaphthylene	10.0 U	10.0 U	10.0 U	10.0 U
Aniline	10.0 U	10.0 U	10.0 U	10.0 U
Anthracene	10.0 U	10.0 U	10.0 U	10.0 U
Benzo(a)anthracene	5.00 U	5.00 U	5.00 U	5.00 U
Benzo(a)pyrene	5.00 U	5.00 U	5.00 U	5.00 U
Benzo(b)fluoranthene	5.00 U	5.00 U	5.00 U	5.00 U
Benzo(g,h,i)perylene	5.00 U	5.00 U	5.00 U	5.00 U
Benzo(k)fluoranthene	5.00 U	5.00 U	5.00 U	5.00 U
Benzoic Acid	20.0 U	20.0 U	20.0 U	20.0 U
Benzyl Alcohol	10.0 U	10.0 U	10.0 U	10.0 U
Bis(2-chloroethoxy)methane	10.0 U	10.0 U	10.0 U	10.0 U
Bis(2-chloroethyl) Ether	10.0 U	10.0 U	10.0 U	10.0 U
Bis(2-chloroisopropyl) Ether	10.0 U	10.0 U	10.0 U	10.0 U
Bis(2-ethylhexyl) Phthalate	20.0 U	20.0 U	20.0 U	20.0 U
Butyl Benzyl Phthalate	5.00 U	5.00 U	5.00 U	5.00 U
Carbazole	10.0 U	10.0 U	10.0 U	10.0 U
Chrysene	5.00 U	5.00 U	5.00 U	5.00 U
Dibenz(a,h)anthracene	5.00 U	5.00 U	5.00 U	5.00 U
Dibenzofuran	10.0 U	10.0 U	10.0 U	10.0 U
Diethyl Phthalate	10.0 U	10.0 U	10.0 U	10.0 U
Dimethyl Phthalate	10.0 U	10.0 U	10.0 U	10.0 U
Di-n-butyl Phthalate	5.00 U	5.00 U	5.00 U	5.00 U
Di-n-octyl Phthalate	5.00 U	5.00 U	5.00 U	5.00 U
Fluoranthene	5.00 U	5.00 U	5.00 U	5.00 U
Fluorene	10.0 U	10.0 U	10.0 U	10.0 U
Hexachlorobenzene	10.0 U	10.0 U	10.0 U	10.0 U
Hexachlorobutadiene	5.00 U	5.00 U	5.00 U	5.00 U
Hexachlorocyclopentadiene	5.00 U	5.00 U	5.00 U	5.00 U
Hexachloroethane	10.0 U	10.0 U	10.0 U	10.0 U
Indeno(1,2,3-cd)pyrene	5.00 U	5.00 U	5.00 U	5.00 U
Isophorone	10.0 U	10.0 U	10.0 U	10.0 U
Naphthalene	10.0 U	10.0 U	10.0 U	10.0 U
Nitrobenzene	10.0 U	10.0 U	10.0 U	10.0 U
N-Nitrosodi-n-propylamine	10.0 U	10.0 U	10.0 U	10.0 U
N-Nitrosodiphenylamine	10.0 U	10.0 U	10.0 U	10.0 U
Pentachlorophenol	10.0 U	10.0 U	10.0 U	10.0 U
Phenanthrene	10.0 U	10.0 U	10.0 U	10.0 U
Phenol	10.0 U	10.0 U	10.0 U	10.0 U
Pyrene	5.00 U	5.00 U	5.00 U	5.00 U

Notes:
btc = below top of well casing
µg/L = microgram per liter
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-2a
Data Not Used in the RI - 2001 In-Water Investigation
Sediment Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Herbicides, Pesticides, and General Chemistry Parameters
(Page 1 of 2)

Area	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal
Site ID	IW01	IW02	IW07	IW08	IW13
Sample ID	010502IW01SS	010502IW02SS	010502IW07SS	010502IW08SS	010503IW13SS
Sample Date	5/2/2001	5/2/2001	5/2/2001	5/2/2001	5/3/2001
PCB Aroclors (µg/kg dry)					
Aroclor 1016	10.0 U	12.0 U	10.0 U	14.0 U	13.0 U
Aroclor 1221	21.0 U	12.0 U	21.0 U	14.0 U	13.0 U
Aroclor 1232	10.0 U	12.0 U	10.0 U	14.0 U	13.0 U
Aroclor 1242	10.0 U	12.0 U	10.0 U	14.0 U	13.0 U
Aroclor 1248	10.0 U	12.0 U	10.0 U	14.0 U	13.0 U
Aroclor 1254	10.0 U	**200**	10.0 U	14.0 U	**350**
Aroclor 1260	10.0 U	12.0 U	10.0 U	14.0 U	13.0 U
Metals (mg/kg dry)					
Aluminum	**12,000**	-	**12,000**	-	-
Antimony	0.620 U	-	0.720 U	-	-
Arsenic	**4.30**	-	**2.40**	-	-
Barium	**95.0**	-	**74.0**	-	-
Beryllium	**0.230**	-	**0.240**	-	-
Cadmium	**0.730**	-	**0.620**	-	-
Calcium	**4,400**	-	**7,000**	-	-
Chromium	**17.0**	-	**18.0**	-	-
Cobalt	**9.60**	-	**17.0**	-	-
Copper	**27.0**	-	**50.0**	-	-
Iron	**21,000**	-	**30,000**	-	-
Lead	**7.90**	-	**6.20**	-	-
Magnesium	**6,000**	-	**12,000**	-	-
Manganese	**340**	-	**380**	-	-
Mercury	**0.0650 J**	-	**0.0510 J**	-	-
Nickel	**8.50**	-	**22.0**	-	-
Potassium	**950**	-	**500**	-	-
Selenium	**0.260 J**	-	**0.310 J**	-	-
Silver	**0.140**	-	**0.110 J**	-	-
Thallium	**0.150**	-	**0.170**	-	-
Vanadium	**45.0**	-	**49.0**	-	-
Zinc	**78.0**	-	**92.0**	-	-
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	63.0 U	-	62.0 U	-	-
Residual Range Organics	130 U	-	120 U	-	-
Gasoline Range Organics	25.0 U	-	25.0 U	-	-
Butyltins (µg/kg dry)					
Dibutyltin	-	-	-	-	-
Monobutyltin	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin	-	-	-	-	-
Herbicides (µg/kg dry)					
2,4,5-T	8.30 U	-	8.70 U	-	-
2,4,5-TP (Silvex)	8.30 U	-	8.70 U	-	-
2,4-D	8.30 U	-	8.70 U	-	-
2,4-DB	8.30 U	-	8.70 U	-	-
4-Nitrophenol	8.30 U	-	8.70 U	-	-
Dalapon	8.30 U	-	8.70 U	-	-
Dicamba	8.30 U	-	8.70 U	-	-
Dichloroprop	8.30 U	-	8.70 U	-	-
Dinoseb	8.30 U	-	8.70 U	-	-
MCPA	8.30 U	-	8.70 U	-	-
MCPP	8.30 U	-	8.70 U	-	-
Pentachlorophenol	8.30 U	-	8.70 U	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	2.00 U	-	2.10 U	-	-
4,4'-DDE	2.00 U	-	2.10 U	-	-
4,4'-DDT	**1.70 J**	-	2.10 U	-	-
Aldrin	1.00 U	-	1.00 U	-	-
BHC (alpha)	1.00 U	-	1.00 U	-	-
BHC (beta)	1.00 U	-	1.00 U	-	-
BHC (delta)	1.00 U	-	1.00 U	-	-
BHC (gamma) Lindane	1.00 U	-	1.00 U	-	-
Chlordane (technical)	10.0 U	-	10.0 U	-	-
Dieldrin	2.00 U	-	2.10 U	-	-
Endosulfan I	1.00 U	-	1.00 U	-	-
Endosulfan II	2.00 U	-	2.10 U	-	-
Endosulfan Sulfate	2.00 U	-	2.10 U	-	-
Endrin	2.00 U	-	2.10 U	-	-
Endrin Aldehyde	2.00 U	-	2.10 U	-	-
Endrin Ketone	2.00 U	-	2.10 U	-	-
Heptachlor	1.00 U	-	1.00 U	-	-
Heptachlor Epoxide	1.00 U	-	1.00 U	-	-
Methoxychlor	10.0 U	-	10.0 U	-	-
Toxaphene	100 U	-	100 U	-	-
General Chemistry Parameters and Grain Size(%)					
Carbon, Total Organic	**0.190**	**0.130**	**0.150**	**0.0390**	**0.130**
Gravel (12.5-4.75mm)	-	**38.3**	-	**54.2**	**44.6**
Sand (4.74-03063mm)	-	**61.4**	-	**44.4**	**52.8**
Clay/Silt (<0.063mm)	-	**0.290**	-	**1.37**	**2.60**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-2a
Data Not Used in the RI - 2001 In-Water Investigation
Sediment Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, Herbicides, Pesticides, and General Chemistry Parameters
(Page 2 of 2)

Area	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal
Site ID	IW14	IW14 DUP	IW16	IW17
Sample ID	010502IW14SS	010502IW15SS	010502IW16SS	010503IW17SS
Sample Date	5/3/2001	5/3/2001	5/3/2001	5/3/2001
PCB Aroclors (µg/kg dry)				
Aroclor 1016	10.0 U	10.0 U	10.0 U	12.0 U
Aroclor 1221	21.0 U	21.0 U	21.0 U	12.0 U
Aroclor 1232	10.0 U	10.0 U	10.0 U	12.0 U
Aroclor 1242	10.0 U	10.0 U	10.0 U	12.0 U
Aroclor 1248	10.0 U	10.0 U	10.0 U	12.0 U
Aroclor 1254	**510**	**570**	**44.0**	**1,100**
Aroclor 1260	10.0 U	10.0 U	10.0 U	12.0 U
Metals (mg/kg dry)				
Aluminum	**11,000**	**13,000**	**9,500**	-
Antimony	0.700 U	0.730 U	0.700 U	-
Arsenic	**2.40**	**2.70**	**4.30**	-
Barium	**88.0**	**95.0**	**83.0**	-
Beryllium	**0.270**	**0.300**	**0.210**	-
Cadmium	**1.00**	**1.00**	**0.700**	-
Calcium	**4,200**	**6,000**	**5,100**	-
Chromium	**16.0**	**22.0**	**20.0**	-
Cobalt	**8.60**	**13.0**	**12.0**	-
Copper	**27.0**	**37.0**	**32.0**	-
Iron	**18,000**	**24,000**	**25,000**	-
Lead	**9.30**	**9.00**	**12.0**	-
Magnesium	**4,600**	**8,200**	**6,500**	-
Manganese	**380**	**600**	**470**	-
Mercury	**0.0350 J**	0.0250 UJ	**0.0170 J**	-
Nickel	**7.60**	**11.0**	**11.0**	-
Potassium	**1,100**	**1,100**	**750**	-
Selenium	0.700 U	0.730 U	**0.200 J**	-
Silver	**0.160**	**0.180**	**0.130**	-
Thallium	**0.160**	**0.170**	**0.210**	-
Vanadium	**44.0**	**58.0**	**56.0**	-
Zinc	**73.0**	**89.0**	**91.0**	-
Petroleum Hydrocarbons (mg/kg dry)				
Diesel Range Organics	61.0 U	62.0 U	57.0 U	-
Residual Range Organics	120 U	120 U	110 U	-
Gasoline Range Organics	24.0 U	25.0 U	23.0 U	-
Butyltins (µg/kg dry)				
Dibutyltin	-	-	-	-
Monobutyltin	-	-	-	-
Tetrabutyltin	-	-	-	-
Tributyltin	-	-	-	-
Herbicides (µg/kg dry)				
2,4,5-T	8.60 UJ	8.90 UJ	7.70 U	-
2,4,5-TP (Silvex)	8.60 UJ	8.90 UJ	7.70 U	-
2,4-D	8.60 UJ	8.90 UJ	7.70 U	-
2,4-DB	8.60 UJ	8.90 UJ	7.70 U	-
4-Nitrophenol	8.60 UJ	8.90 UJ	7.70 U	-
Dalapon	8.60 UJ	8.90 UJ	7.70 U	-
Dicamba	8.60 UJ	8.90 UJ	7.70 U	-
Dichloroprop	8.60 UJ	8.90 UJ	7.70 U	-
Dinoseb	8.60 UJ	8.90 UJ	7.70 U	-
MCPA	8.60 UJ	8.90 UJ	7.70 U	-
MCPP	8.60 UJ	8.90 UJ	7.70 U	-
Pentachlorophenol	8.60 UJ	8.90 UJ	7.70 U	-
Pesticides (µg/kg dry)				
4,4'-DDD	2.10 U	2.20 U	**0.840 J**	-
4,4'-DDE	2.10 U	2.20 U	**0.500 J**	-
4,4'-DDT	2.10 U	2.20 U	1.80 U	-
Aldrin	1.00 U	1.10 U	0.910 U	-
BHC (alpha)	1.00 U	1.10 U	0.910 U	-
BHC (beta)	1.00 U	1.10 U	0.910 U	-
BHC (delta)	1.00 U	1.10 U	0.910 U	-
BHC (gamma) Lindane	1.00 U	1.10 U	0.910 U	-
Chlordane (technical)	10.0 U	11.0 U	9.10 U	-
Dieldrin	2.10 U	2.20 U	1.80 U	-
Endosulfan I	1.00 U	1.10 U	0.910 U	-
Endosulfan II	2.10 U	2.20 U	1.80 U	-
Endosulfan Sulfate	2.10 U	2.20 U	1.80 U	-
Endrin	2.10 U	2.20 U	1.80 U	-
Endrin Aldehyde	2.10 U	2.20 U	1.80 U	-
Endrin Ketone	2.10 U	2.20 U	1.80 U	-
Heptachlor	1.00 U	1.10 U	0.910 U	-
Heptachlor Epoxide	1.00 U	1.10 U	0.910 U	-
Methoxychlor	10.0 U	11.0 U	9.10 U	-
Toxaphene	100 U	110 U	91.0 U	-
General Chemistry Parameters and Gra				
Carbon, Total Organic	**0.380**	**0.290**	**0.150**	**0.240**
Gravel (12.5-4.75mm)	-	-	-	-
Sand (4.74-03063mm)	-	-	-	-
Clay/Silt (<0.063mm)	-	-	-	-

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-2b
Data Not Used in the RI - 2001 In-Water Investigation
Sediment Analytical Results
Semivolatile Organic Compounds

Area	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal
Site ID	IW01	IW07	IW14	IW14 DUP	IW16
Sample ID	010502IW01SS	010502IW07SS	010502IW14SS	010502IW15SS	010502IW16SS
Sample Date	5/2/2001	5/2/2001	5/3/2001	5/3/2001	5/3/2001
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
1,2-Dichlorobenzene	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
1,3-Dichlorobenzene	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
1,4-Dichlorobenzene	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
2,4,5-Trichlorophenol	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
2,4,6-Trichlorophenol	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
2,4-Dichlorophenol	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
2,4-Dimethylphenol	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
2,4-Dinitrophenol	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
2,4-Dinitrotoluene	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
2,6-Dinitrotoluene	**9.50 J**	**9.50 J**	**12.0 J**	**8.70 J**	**10.0 J**
2-Chloronaphthalene	1.60 U	1.70 U	1.70 U	1.70 U	1.60 U
2-Chlorophenol	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
2-Methylnaphthalene	8.00 U	8.50 U	8.40 U	8.70 U	**2.30 J**
2-Methylphenol	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
2-Nitroaniline	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
2-Nitrophenol	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
3,3'-Dichlorobenzidine	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
3-Nitroaniline	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
4,6-Dinitro-2-methylphenol	40.0 U	43.0 U	42.0 U	43.0 U	39.0 U
4-Bromophenyl Phenyl Ether	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
4-Chloro-3-methylphenol	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
4-Chloroaniline	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
4-Chlorophenyl Phenyl Ether	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
4-Nitroaniline	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
4-Nitrophenol	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
Acenaphthene	1.60 U	1.70 U	1.70 U	1.70 U	**4.20**
Acenaphthylene	1.60 U	1.70 U	1.70 U	1.70 U	1.60 U
Anthracene	1.60 U	1.70 U	1.70 U	**2.40**	**12.0**
Benzidine	**15.0 J**	17.0 U	17.0 U	**68.0**	16.0 U
Benzo(a)anthracene	16.0 U	17.0 U	17.0 U	**7.30 J**	**59.0**
Benzo(a)pyrene	8.00 U	8.50 U	8.40 U	**5.40 J**	**78.0**
Benzo(b)fluoranthene	8.00 U	8.50 U	**2.90 J**	**12.0**	**87.0**
Benzo(g,h,i)perylene	8.00 U	8.50 U	8.40 U	**2.80 J**	**30.0**
Benzo(k)fluoranthene	1.60 U	1.70 U	1.70 U	1.70 U	**4.40**
Benzoic Acid	40.0 UJ	43.0 UJ	42.0 UJ	43.0 UJ	39.0 UJ
Benzyl Alcohol	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
Bis(2-chloroethoxy)methane	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
Bis(2-chloroethyl) Ether	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
Bis(2-chloroisopropyl) Ether	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
Bis(2-ethylhexyl) Phthalate	42.0 U	190 U	140 U	43.0 U	57.0 U
Butyl Benzyl Phthalate	17.0 U	17.0 U	17.0 U	17.0 U	20.0 U
Carbazole	40.0 U	43.0 U	42.0 U	43.0 U	39.0 U
Chrysene	8.00 U	8.50 U	**2.30 J**	**7.10 J**	**58.0**
Dibenz(a,h)anthracene	8.00 U	8.50 U	8.40 U	8.70 U	7.80 U
Dibenzofuran	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
Diethyl Phthalate	16.0 U	17.0 U	17.0 U	14.0 U	16.0 U
Dimethyl Phthalate	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
Di-n-butyl Phthalate	30.0 U	85.0 U	84.0 U	87.0 U	78.0 U
Di-n-octyl Phthalate	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
Fluoranthene	8.00 U	8.50 U	**4.70 J**	**18.0**	**98.0**
Fluorene	1.60 U	1.70 U	1.70 U	1.70 U	**3.30**
Hexachlorobenzene	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
Hexachlorobutadiene	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
Hexachlorocyclopentadiene	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
Hexachloroethane	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
Indeno(1,2,3-cd)pyrene	8.00 U	8.50 U	8.40 U	8.70 U	**29.0**
Isophorone	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
Naphthalene	8.00 U	8.50 U	8.40 U	8.70 U	7.80 U
Nitrobenzene	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
N-Nitrosodimethylamine	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
N-Nitrosodi-n-propylamine	16.0 U	17.0 U	**42.0**	17.0 U	16.0 U
N-Nitrosodiphenylamine	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
p-cresol (4-Methylphenol)	16.0 U	**3.40 J**	**5.50 J**	**3.50 J**	16.0 U
Pentachlorophenol	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
Phenanthrene	8.00 U	8.50 U	8.40 U	**7.00 J**	**35.0**
Phenol	16.0 U	17.0 U	17.0 U	17.0 U	16.0 U
Pyrene	8.00 U	8.50 U	**5.20 J**	**19.0**	**100**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
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- = Not Analyzed
bold = analyte detected above MDL.

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-2c
Data Not Used in the RI - 2001 In-Water Investigation
Co-located Surface Water and Sediment Analytical Results

Area	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Goose Island Reference area	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal
Site ID	IW03	IW04	IW04 DUP	IW06	IW10	IW11	IW11 DUP
Sample ID	010502IW03WCS/SD	010502IW04WCS/SD	010502IW05WCS	010502IW06WCS/SD	010503IW10WCS/SD	010503IW11WCS/SD	010503IW12WSD
Sample Date	5/2/2001	5/2/2001	5/2/2001	5/2/2001	5/3/2001	5/3/2001	5/3/2001
Water - Dissolved Phase (µg/L)							
Aroclor 1242	0.0326 U	0.0321 U	0.0311 U	0.0320 U	0.0310 U	0.0299 U	-
Aroclor 1248	0.0326 U	0.0321 U	0.0311 U	0.0320 U	0.0310 U	0.0299 U	-
Aroclor 1254	**0.265**	**0.0380 J**	**0.0399**	0.0320 U	0.0310 U	**0.0300**	-
Aroclor 1260	0.0326 U	0.0321 U	0.0311 U	0.0320 U	0.0310 U	0.0299 U	-
Water - Particulate Phase (µg/L)							
Aroclor 1242	0.316 U	0.0316 U	0.0316 U	0.0316 U	0.0316 U	0.0316 U	-
Aroclor 1248	0.316 U	0.0316 U	0.0316 U	0.0316 U	0.0316 U	0.0316 U	-
Aroclor 1254	**7.28**	**0.624**	0.0320 U	**0.132**	0.0320 U	**0.240**	-
Aroclor 1260	0.316 U	0.0316 U	0.0316 U	0.0316 U	0.0316 U	0.0316 U	-
Sediment (µg/kg dry)							
Aroclor 1242	2.08 U	1.97 U	-	1.88 U	2.55 U	2.13 U	2.13 U
Aroclor 1248	2.08 U	1.97 U	-	1.88 U	2.55 U	2.13 U	2.13 U
Aroclor 1254	**23,900 J**	**77.1**	-	**92.0**	**17.5**	**1,240**	**417**
Aroclor 1260	2.08 U	1.97 U	-	1.88 U	2.55 U	2.13 U	2.13 U
Sediment General Chemistry Parameters (%)							
Carbon, Total Organic	**0.150**	**0.0800**	-	**0.190**	**0.470**	**0.420**	**0.230**

Notes:

µg/L = microgram per liter
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-2d
Data Not Used in the RI - 2001 In-Water Investigation
Tissue Analytical Results

Area	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Goose Island Reference area	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Goose Island Reference area	Forebay Pre-Equipment Removal
Site ID	IW02	IW08	IW10	IW13	IW13 DUP	IW02	IW02 DUP	IW08	IW10	IW13
Sample ID	010509IW27TS	010509IW28TS	010509IW29TS	010509IW26TS	010509IE30TS	010502IW23TS	010502IW24TS	010502IW09TS	010502IW21TS	010502IW22TS
Sample Date	5/3/2001	5/2/2001	5/3/2001	5/3/2001	5/3/2001	5/3/2001	5/3/2001	5/2/2001	5/3/2001	5/3/2001
Tissue Type	Crayfish	Crayfish	Crayfish	Crayfish	Crayfish	Clam	Clam	Clam	Clam	Clam
Percent Lipids	5.61	5.74	5.74	6.06	5.54	3.91	4.92	3.33	3.05	3.16
PCB Aroclors (µg/kg wet)										
Aroclor 1242	14.3 U	15.4 U	14.3 U	13.5 U	15.4 U	14.1 U	13.9 U	14.2 U	14.2 U	14.3 U
Aroclor 1248	14.3 U	15.4 U	14.3 U	13.5 U	15.4 U	14.1 U	13.9 U	14.2 U	14.2 U	14.3 U
Aroclor 1254	**11,900**	**75,600 J**	**268**	**2,670**	**3,970**	**345**	**451**	**604**	**23.8**	**344**
Aroclor 1260	14.3 U	15.4 U	14.3 U	13.5 U	15.4 U	14.1 U	13.9 U	14.2 U	14.2 U	14.3 U

Notes:

µg/kg = microgram per kilogram
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-2e
Data Not Used in the RI - 2001 In-Water Investigation
Sandblast Area Storm Drain System Analytical Results
PCB Aroclors, Metals, Petroleum Hydrocarbons, and Butyltins

Area	Sandblast	Sandblast	Sandblast	Sandblast	Sandblast	Sandblast	Sandblast	Sandblast
Site ID	SBDS-18	SBDS-19	SBDS-24	SBMS-1	SBMS-1 DUP	SBDS-18	SBDS-19	SBDS-19 DUP
Sample ID	010503SBDS18SD	010503SBDS19SD	010504SBDS24SD	010501SBMS1SD	010501SBMS2SD	010503SBDS18PW	010503SBDS19PW	010503SBDS20PW
Sample Date	5/3/2001	5/3/2001	5/4/2001	5/1/2001	5/1/2001	5/3/2001	5/3/2001	5/3/2001
Sample Medium	River Sediment at Outfall	River Sediment at Outfall	Catchbasin Solids	Catchbasin Solids	Catchbasin Solids	Sediment Pore Water	Sediment Pore Water	Sediment Pore Water
PCB Aroclors (µg/kg dry)								
Aroclor 1016	13.0 U	13.0 U	26.0 U	14.0 U	12.0 U	-	-	-
Aroclor 1221	13.0 U	13.0 U	26.0 U	14.0 U	12.0 U	-	-	-
Aroclor 1232	13.0 U	13.0 U	26.0 U	14.0 U	12.0 U	-	-	-
Aroclor 1242	13.0 U	13.0 U	26.0 U	14.0 U	12.0 U	-	-	-
Aroclor 1248	13.0 U	13.0 U	26.0 U	14.0 U	12.0 U	-	-	-
Aroclor 1254	13.0 U	13.0 U	26.0 U	14.0 U	12.0 U	-	-	-
Aroclor 1260	**17.0**	**95.0**	**18.0 J**	14.0 U	**57.0**	-	-	-
Metals (mg/kg dry)								
Aluminum	**11,000**	**6,200**	**16,000**	**9,500**	**7,000**	-	-	-
Antimony	0.920 U	0.970 U	1.50 U	**1.20**	**2.20**	-	-	-
Arsenic	**7.40**	**7.00**	**6.10**	**3.60**	**11.0**	-	-	-
Barium	**89.0**	**50.0**	**100**	**76.0**	**32.0**	-	-	-
Beryllium	**0.240**	**0.0860 J**	**0.380**	**0.140**	**0.110 J**	-	-	-
Cadmium	**1.10**	**1.30**	**1.40**	**1.60**	**1.10**	-	-	-
Calcium	**6,100**	**4,200**	**7,500**	**4,000**	**3,400**	-	-	-
Chromium	**74.0 J**	**980 J**	**130**	**87.0 J**	**310 J**	-	-	-
Cobalt	**12.0**	**25.0**	**18.0**	**11.0**	**10.0**	-	-	-
Copper	**110**	**40.0**	**200**	**43.0**	**36.0**	-	-	-
Iron	**26,000**	**32,000**	**37,000**	**28,000**	**24,000**	-	-	-
Lead	**230 J**	**130 J**	**250**	**630 J**	**240 J**	-	-	-
Magnesium	**6,300**	**33,000**	**9,000**	**6,000**	**11,000**	-	-	-
Manganese	**460 J**	**770 J**	**540**	**510 J**	**380**	-	-	-
Mercury	0.0220 U	**0.0210 J**	**0.0340 J**	**0.0630**	**0.170**	-	-	-
Nickel	**26.0**	**630**	**53.0**	**33.0**	**94.0**	-	-	-
Potassium	**1,000**	**340 J**	**1,100**	**450 J**	**300 J**	-	-	-
Selenium	0.770 U	**0.190 J**	1.50 U	0.720 U	**0.390 J**	-	-	-
Silver	**0.580**	**0.0990 J**	**0.420**	**0.260**	**0.110 J**	-	-	-
Thallium	**0.150**	**0.0720 J**	**0.540**	**0.0320 J**	**0.0470 J**	-	-	-
Vanadium	**51.0**	**21.0**	**94.0**	**50.0**	**30.0**	-	-	-
Zinc	**180**	**310**	**220**	**180**	**150**	-	-	-
Petroleum Hydrocarbons (mg/kg dry)								
Diesel Range Organics	**40**	**40**	**180**	**130**	**95**	-	-	-
Residual Range Organics	**410**	**170**	**1400**	**600**	**410**	-	-	-
Butyltins (µg/kg dry)						**Total Butyltins (µg/L)**		
Dibutyltin	**2.00 J**	**9.60**	**310**	2.70 U	2.60 U	**0.0820**	0.0200 U	0.0200 U
Monobutyltin	3.40 U	**6.10**	**110**	3.60 U	3.50 U	**0.570**	0.0200 U	0.0200 U
Tetrabutyltin	1.70 U	3.00 U	30.0 U	1.80 U	1.70 U	0.0400 U	0.0200 U	0.0200 U
Tributyltin	**12.0**	**15.0**	**680**	3.60 U	3.50 U	0.0400 U	0.0200 U	0.0200 U

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-2f
Data Not Used in the RI - 2001 In-Water Investigation
Sandblast Area Storm Drain System Analytical Results
Semivolatile Organic Compounds

Area	Sandblast	Sandblast	Sandblast	Sandblast	Sandblast
Site ID	SBDS-18	SBDS-19	SBDS-24	SBMS-1	SBMS-1 DUP
Sample ID	010501SBDS18SD	010501SBDS19SD	010501SBDS24SD	010501SBMS1SD	010501SBMS2SD
Sample Date	5/1/2001	5/1/2001	5/1/2001	5/1/2001	5/1/2001
Sample Date	River Sediment at Outfall	River Sediment at Outfall	Catchbasin Solids	Catchbasin Solids	Catchbasin Solids
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	170 U	17.0 U	340 U	180 U	170 U
1,2-Dichlorobenzene	170 U	17.0 U	340 U	180 U	170 U
1,3-Dichlorobenzene	170 U	17.0 U	340 U	180 U	170 U
1,4-Dichlorobenzene	170 U	17.0 U	340 U	180 U	170 U
2,4,5-Trichlorophenol	170 U	17.0 U	340 U	180 U	170 U
2,4,6-Trichlorophenol	170 U	17.0 U	340 U	180 U	170 U
2,4-Dichlorophenol	170 U	17.0 U	340 U	180 U	170 U
2,4-Dimethylphenol	170 U	17.0 U	340 U	180 U	170 U
2,4-Dinitrophenol	170 U	17.0 U	340 U	180 U	170 U
2,4-Dinitrotoluene	170 U	17.0 U	340 UJ	180 U	170 U
2,6-Dinitrotoluene	170 U	17.0 U	340 U	180 U	170 U
2-Chloronaphthalene	170 U	17.0 U	340 U	180 U	170 U
2-Chlorophenol	170 U	17.0 U	340 U	180 U	170 U
2-Methylnaphthalene	170 U	9.00 U	170 U	180 U	170 U
2-Methylphenol	170 U	17.0 U	340 U	180 U	170 U
2-Nitroaniline	170 U	17.0 U	340 U	180 U	170 U
2-Nitrophenol	170 U	17.0 U	340 U	180 U	170 U
3,3'-Dichlorobenzidine	170 U	17.0 U	340 U	180 U	170 U
3-Nitroaniline	170 U	17.0 U	340 U	180 U	170 U
4,6-Dinitro-2-methylphenol	420 U	44.0 U	850 UJ	450 U	420 U
4-Chloroaniline	170 U	17.0 U	340 UJ	180 U	170 U
4-Nitroaniline	170 U	17.0 U	340 U	180 U	170 U
4-Nitrophenol	170 U	17.0 U	340 U	180 U	170 U
Acenaphthene	**40.0 J**	**36.0**	170 U	**250**	**100**
Acenaphthylene	170 U	17.0 U	170 U	**31.0 J**	170 U
Anthracene	**110**	**66.0**	170 U	**290**	**96.0**
Benzidine	170 U	34.0 U	340 U	360 U	340 U
Benzo(a)anthracene	**240**	**250**	**140 J**	**1,000**	**390**
Benzo(a)pyrene	**290**	**400**	**170 J**	**1,400**	**610**
Benzo(b)fluoranthene	**330**	**490**	**190**	**1,700**	**670**
Benzo(g,h,i)perylene	**150**	**160**	**78.0 J**	**700**	**260**
Benzo(k)fluoranthene	170 U	**65.0**	**51.0 J**	**370**	**140**
Benzoic Acid	420 U	44.0 UJ	850 U	450 UJ	420 U
Benzyl Alcohol	170 U	17.0 U	340 U	180 U	170 U
Bis(2-chloroethoxy)methane	170 U	17.0 U	340 U	180 U	170 U
Bis(2-chloroethyl) Ether	170 U	17.0 U	340 U	180 U	170 U
Bis(2-chloroisopropyl) Ether	170 U	17.0 U	340 U	180 U	170 U
Bis(2-ethylhexyl) Phthalate	2,300 U	**440**	**9,500**	**3,800**	2,900 U
Butyl Benzyl Phthalate	170 U	27.0 U	340 U	180 U	170 U
Carbazole	**71.0 J**	**27.0 J**	850 U	**190 J**	**79.0 J**
Chrysene	**300**	**270**	**170**	**1,000**	**410**
Dibenz(a,h)anthracene	170 U	9.00 U	170 U	**180**	84.0 U
Dibenzofuran	83.0 U	**9.00 J**	340 U	**62.0 J**	**27.0 J**
Diethyl Phthalate	170 U	17.0 U	340 U	180 U	170 U
Dimethyl Phthalate	170 U	17.0 U	340 U	180 U	170 U
Di-n-butyl Phthalate	830 U	87.0 U	1,700 U	910 U	840 U
Di-n-octyl Phthalate	170 U	17.0 U	340 U	180 U	170 U
Fluoranthene	**530**	**490**	**290**	**2,100**	**860**
Fluorene	**56.0 J**	**24.0**	170 U	**160**	**51.0 J**
Hexachlorobenzene	170 U	17.0 U	340 UJ	180 U	170 U
Hexachlorobutadiene	170 U	17.0 U	340 U	180 U	170 U
Hexachlorocyclopentadiene	170 U	17.0 U	340 U	180 U	170 U
Hexachloroethane	170 U	17.0 U	340 U	180 U	170 U
Indeno(1,2,3-cd)pyrene	**80.0 J**	**150**	**34.0 J**	**640**	**200**
Isophorone	170 U	17.0 U	340 U	180 U	170 U
Naphthalene	170 U	**6.00 J**	170 U	**27.0 J**	84.0 U
Nitrobenzene	170 U	17.0 U	340 U	180 U	170 U
N-Nitrosodimethylamine	170 U	17.0 U	340 UJ	180 U	170 U
N-Nitrosodi-n-propylamine	170 U	40.0 U	340 U	180 U	170 U
N-Nitrosodiphenylamine	170 U	17.0 U	340 U	180 U	170 U
p-cresol (4-Methylphenol)	**58.0 J**	**72.0**	**370**	**85.0 J**	**69.0 J**
Pentachlorophenol	170 U	17.0 U	340 U	180 U	170 U
Phenanthrene	**480**	**190**	**110 J**	**1,100**	**480**
Phenol	170 U	17.0 U	340 U	180 U	170 U
Pyrene	**520**	**470**	**300**	**1,900**	**760**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-2g
Data Not Used in the RI - 2001 In-Water Investigation
Semi-Permeable Membrane Device (SPMD) Analytical Results

Area	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Goose Island Reference area
Site ID	RQ01	RQ02	RQ02 DUP	RQ05	IW10
Sample ID	010619RQ01	010619RQ02	010619RQ03	010619RQ05	010619RQ06
Sample Date	9/20/2001	9/20/2001	9/20/2001	9/20/2001	9/20/2001
PCB Aroclors (ng/SPMD)					
Aroclor 1242	32.6 U	32.6 U	32.6 U	32.6 U	32.6 U
Aroclor 1248	32.6 U	32.6 U	32.6 U	32.6 U	32.6 U
Aroclor 1254	32.6 U	32.6 U	32.6 U	32.6 U	32.6 U
Aroclor 1260	32.6 U	32.6 U	32.6 U	32.6 U	32.6 U

Notes:

ng/SPMD = nanograms per SPMD
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-3
Data Not Used in the RI - 2002 Trashboom Anchor Sediment Investigation
Analytical Results
(Page 1 of 2)

Area	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal
Site ID	TAF-05	TAF-06	TAF-07	TAF-08	TAF-09	TAF-10	TAF-11
Sample ID	020115TAF05SD	020115TAF06SD	020115TAF07SD	020115TAF08SD	020115TAF09SD	020115TAF010SD	020115TAF011SD
Sample Date	1/15/2002	1/15/2002	1/15/2002	1/15/2002	1/15/2002	1/15/2002	1/15/2002
PCB Aroclors (µg/kg dry)							
Aroclor 1016	1.3 U	1.6 U	2.2 U	1.3 U	1.2 U	1.4 U	1.4 U
Aroclor 1221	5.6 U	6.7 U	9.5 U	5.6 U	5.1 U	5.9 U	6.1 U
Aroclor 1232	4.5 U	5.4 U	7.6 U	4.5 U	4.0 U	4.7 U	4.9 U
Aroclor 1242	2.4 U	2.9 U	4.1 U	2.4 U	2.2 U	2.5 U	2.6 U
Aroclor 1248	5.9 U	7.1 U	10.1 U	6.0 U	5.4 U	6.3 U	6.5 U
Aroclor 1254	1.9 U	2.2 U	3.2 U	1.9 U	1.7 U	2.0 U	2.0 U
Aroclor 1260	1.9 U	2.2 U	3.2 U	1.9 U	1.7 U	2.0 U	2.0 U
Metals (mg/kg dry)							
Lead	**7.9**	**8.0**	**15.5**	**7.0**	**6.2**	**8.7**	**10.2**
Mercury	**0.0 J**	**0.0**	**0.2**	**0.1**	**0.1**	**0.0**	**0.4**
Petroleum Hydrocarbons (mg/kg dry)							
Diesel Range Organics	16.7 U	16.9 U	26.8 U	15.5 U	13.8 U	15.2 U	17.5 U
Residual Range Organics	33.5 U	33.9 U	53.6 U	31.0 U	27.5 U	30.5 U	**41.4 J**
Gasoline Range Organics	2.6 U	2.9 U	4.4 UJ	2.7 UJ	2.3 U	2.7 U	2.8 U
General Chemistry Parameters (mg/kg) and Grain Size (%)							
Carbon, Total Organic	**1580.0**	**4120.0**	**13300.0**	**8590.0**	**5300.0**	**7720.0**	**6290.0**
Gravel (>2.00 mm)	**3.4**	**15.0**	**12.1**	**18.9**	**18.6**	**44.1**	0.0 U
Sand (2.0 - 0.075mm)	**87.8**	**76.0**	**27.4**	**68.4**	**68.2**	**53.4**	**75.2**
Silt/Clay (< 0.075mm)	**8.3**	**9.1**	**57.6**	**12.4**	**12.8**	**2.4**	**24.9**

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
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J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-3
Data Not Used in the RI - 2002 Trashboom Anchor Sediment Investigation
Analytical Results
(Page 2 of 2)

Area	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal	Forebay Pre-Equipment Removal
Site ID	TAF-12	TAF-13	TSF-01	TSF-02	TSF-03	TSF-03 DUP
Sample ID	020115TAF012SD	020115TAF013SD	020112TSF01SD	020112TSF02SD	020112TSF03SD	020112TSF04SD
Sample Date	1/15/2002	1/15/2002	1/14/2002	1/14/2002	1/14/2002	1/14/2002
PCB Aroclors (µg/kg dry)						
Aroclor 1016	1.5 U	1.5 U	1.7 U	1.6 U	1.5 U	1.6 U
Aroclor 1221	6.5 U	6.4 U	7.4 U	6.9 U	6.4 U	6.9 U
Aroclor 1232	5.2 U	5.1 U	5.9 U	5.5 U	5.1 U	5.5 U
Aroclor 1242	2.8 U	2.7 U	3.2 U	2.9 U	2.7 U	3.0 U
Aroclor 1248	6.9 U	6.8 U	7.8 U	7.3 U	6.8 U	7.4 U
Aroclor 1254	2.1 U	2.1 U	2.5 U	2.3 U	2.1 U	2.3 U
Aroclor 1260	2.1 U	2.1 U	2.5 U	2.3 U	2.1 U	2.3 U
Metals (mg/kg dry)						
Lead	**11.3**	**16.0**	**13.6**	**14.1**	**16.6**	**11.7**
Mercury	**0.4**	**0.0**	**0.1 J**	**0.1 J**	**0.1 J**	**0.1 J**
Petroleum Hydrocarbons (mg/kg dry)						
Diesel Range Organics	16.8 U	17.5 U	20.0 U	18.1 U	18.1 U	18.2 U
Residual Range Organics	**39.4 J**	**60.4 J**	**72.3 J**	**38.2 J**	**43.6 J**	**195.0 X2**
Gasoline Range Organics	2.8 UJ	2.7 UJ	3.2 UJ	2.8 U	3.0 U	3.1 U
General Chemistry Parameters (mg/kg)						
Carbon, Total Organic	**12500.0**	**11300.0**	**12600.0**	**6110.0**	**13900.0**	**13700.0**
Gravel (>2.00 mm)	0.0 U	0.0 U	0.0 U	**0.6**	0.0 U	0.0 U
Sand (2.0 - 0.075mm)	**79.1**	**8.9**	**56.4**	**46.4**	**74.0**	**56.7**
Silt/Clay (< 0.075mm)	**20.8**	**90.5**	**43.6**	**52.5**	**25.4**	**42.7**

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-4
Data Not Used in the RI - 2002 In-Water Equipment Removal
Water Quality Analytical Results

Site ID	Debris Pile 01	Debris Pile 01	Debris Pile 01	Debris Pile 01 DUP	Debris Pile 02	Debris Pile 02	Debris Pile 03
Sample ID	020227IW04WC	020228IW05WC	020304IW07WC	020228IW06WC	020223IW02WC	020226IW03WC	020220IW01WC
Sample Date	2/27/2002	2/28/2002	3/4/2002	2/28/2002	2/22/2002	2/26/2002	2/20/2002
Dissolved PCB Aroclors (µg/L)							
Aroclor 1016	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 UJ
Aroclor 1221	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00300 U	0.00200 U	0.00300 UJ
Aroclor 1232	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 UJ
Aroclor 1242	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 UJ
Aroclor 1248	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 UJ
Aroclor 1254	0.00100 U	0.00100 U	**0.0308**	0.00100 U	0.00100 U	0.00100 U	0.00100 UJ
Aroclor 1260	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 UJ
Particulate PCB Aroclors (µg/L)							
Aroclor 1016	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Aroclor 1221	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00300 U	0.00200 U	0.00300 U
Aroclor 1232	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Aroclor 1242	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Aroclor 1248	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Aroclor 1254	0.00100 U	**0.0186 J**	**0.0218**	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Aroclor 1260	0.00100 U	0.00100 U	0.00100 U	**0.0347 J**	0.00100 U	0.00100 U	0.00100 U
General Chemistry Parameters (mg/L)							
Carbon, Total Organic	**2.44 J**	**1.70 J**	**1.90 J**	**2.40 J**	**2.05 J**	**1.91 J**	-
Carbon, Dissolved Organic	**4.20 J**	**1.89 J**	**2.84 J**	**1.83 J**	**2.48 J**	**3.52 J**	**8.19 J**

Notes:

µg/L = microgram per liter
mg/L = milligram per liter
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-5
Data Not Used in the RI - 2002 U.S. Army Corp of Engineers Sediment Investigation
Analytical Results
(Page 1 of 2)

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Reference Area at River Mile 147
Site ID	BF-03	BF-04	BF-07	BF-14
Sample ID	BF-BC-03	BF-BC-04	BF-BC-07	BF-BC-14
Sample Date	7/18/2002	7/18/2002	7/18/2002	7/18/2002
PCB Aroclors (µg/kg dry)				
Aroclor 1016	3.37 U	3.43 U	3.13 U	3.04 U
Aroclor 1221	14.4 U	14.7 U	13.4 U	13.0 U
Aroclor 1232	11.5 U	11.7 U	10.7 U	10.4 U
Aroclor 1242	6.16 U	6.27 U	5.71 U	5.55 U
Aroclor 1248	15.3 U	15.6 U	14.2 U	13.8 U
Aroclor 1254	4.78 U	4.87 U	**19.2 J**	4.30 U
Aroclor 1260	4.78 U	4.87 U	4.43 U	4.30 U
Metals (mg/kg dry)				
Aluminum	**11,400**	-	**9,870**	-
Antimony	**0.407 J**	-	**0.400 J**	-
Arsenic	**4.57**	-	**2.42**	-
Barium	**152**	-	**118**	-
Beryllium	**0.396 J**	-	**0.372 J**	-
Cadmium	**0.207 J**	-	**0.0605 J**	-
Calcium	**7,150**	-	**5,560**	-
Chromium	**20.3**	-	**17.0**	-
Cobalt	**11.6**	-	**9.87**	-
Copper	**37.2**	-	**25.5**	-
Iron	**23,800**	-	**20,700**	-
Lead	**12.0**	**13.1**	**8.31**	**13.0**
Magnesium	**5,960**	-	**5,100**	-
Manganese	**510**	-	**399**	-
Mercury	**0.0674**	**0.136**	**0.0451**	**0.0739**
Nickel	**18.5**	-	**15.4**	-
Potassium	**1,000**	-	**845**	-
Selenium	0.518 U	-	0.554 U	-
Silver	**0.162 J**	-	**0.115 J**	-
Sodium	**345**	-	**263 J**	-
Thallium	**0.334 J**	-	**0.187 J**	-
Vanadium	**59.9**	-	**51.3**	-
Zinc	**111**	-	**84.4**	-
Semivolatile Organic Compounds (µg/kg dry)				
1,2,4-Trichlorobenzene	9.83 U	-	8.87 U	-
1,2-Dichlorobenzene	9.83 U	-	8.87 U	-
1,3-Dichlorobenzene	9.83 U	-	8.87 U	-
1,4-Dichlorobenzene	9.83 U	-	8.87 U	-
2,4-Dimethylphenol	9.83 U	-	8.87 U	-
2-Methylnaphthalene	2.46 U	-	2.22 U	-
2-Methylphenol	9.83 U	-	8.87 U	-
Acenaphthene	0.983 U	-	**0.923**	-
Acenaphthylene	0.983 U	-	0.887 U	-
Anthracene	0.983 U	-	**1.02**	-
Benzo(a)anthracene	**1.12**	-	**7.99**	-
Benzo(a)pyrene	0.983 U	-	**5.81**	-
Benzo(g,h,i)perylene	0.983 U	-	**4.42**	-
Benzofluoranthenes, Total	**3.47**	-	**9.27**	-
Benzoic Acid	49.1 U	-	44.4 U	-
Benzyl Alcohol	9.83 U	-	8.87 U	-
Bis(2-ethylhexyl) Phthalate	**28.0**	-	**20.2**	-
Butyl Benzyl Phthalate	9.83 U	-	8.87 U	-
Chrysene	**1.19**	-	**9.64**	-
Dibenz(a,h)anthracene	0.983 U	-	0.887 U	-
Dibenzofuran	9.83 U	-	8.87 U	-
Diethyl Phthalate	9.83 U	-	8.87 U	-
Dimethyl Phthalate	9.83 U	-	8.87 U	-
Di-n-butyl Phthalate	9.83 U	-	8.87 U	-
Di-n-octyl Phthalate	9.83 U	-	8.87 U	-
Fluoranthene	**2.08**	-	**13.6**	-
Fluorene	**1.38**	-	0.887 U	-
Hexachlorobenzene	9.83 U	-	8.87 U	-
Hexachlorobutadiene	9.83 U	-	8.87 U	-
Hexachloroethane	9.83 U	-	8.87 U	-
Indeno(1,2,3-cd)pyrene	0.983 U	-	**4.09**	-
Naphthalene	2.46 U	-	2.22 U	-
N-Nitrosodiphenylamine	9.83 U	-	8.87 U	-
p-cresol (4-Methylphenol)	19.7 U	-	17.7 U	-
Pentachlorophenol	9.83 U	-	8.87 U	-
Phenanthrene	0.983 U	-	**4.57**	-
Phenol	**11.9**	-	8.87 U	-
Pyrene	**1.77**	-	**15.4**	-
General Chemistry Parameters (mg/kg dry)				
Carbon, Total Organic	**6,270**	**7,120**	**3,660**	**5,200**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-5
Data Not Used in the RI - 2002 U.S. Army Corp of Engineers Sediment Investigation
Analytical Results
(Page 2 of 2)

Area	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147
Site ID	BF-15	BF-16	BF-17	BF-26
Sample ID	BF-BC-15	BF-BC-16	BF-BC-17	BF-BC-26
Sample Date	7/18/2002	7/18/2002	7/18/2002	7/18/2002
PCB Aroclors (µg/kg dry)				
Aroclor 1016	4.52 U	4.31 U	4.16 U	2.72 U
Aroclor 1221	19.3 U	18.4 U	17.8 U	11.6 U
Aroclor 1232	15.4 U	14.7 U	14.2 U	9.30 U
Aroclor 1242	8.25 U	7.87 U	7.60 U	4.97 U
Aroclor 1248	20.5 U	19.6 U	18.9 U	12.4 U
Aroclor 1254	6.41 U	6.11 U	5.90 U	3.86 U
Aroclor 1260	6.41 U	6.11 U	5.90 U	3.86 U
Metals (mg/kg dry)				
Aluminum	-	-	**11,900**	**9,500**
Antimony	-	-	**0.806 J**	**0.342 J**
Arsenic	-	-	**5.51**	**5.77**
Barium	-	-	**153**	**199**
Beryllium	-	-	**0.482 J**	**0.373 J**
Cadmium	-	-	**0.520 J**	**0.0649 J**
Calcium	-	-	**5,510**	**6,500**
Chromium	-	-	**21.5**	**15.7**
Cobalt	-	-	**12.4**	**14.5**
Copper	-	-	**28.3**	**33.7**
Iron	-	-	**26,100**	**25,200**
Lead	**17.0**	**14.9**	**16.3**	**8.85**
Magnesium	-	-	**5,170**	**6,980**
Manganese	-	-	**716**	**499**
Mercury	**0.197**	**0.117**	**0.188**	**0.0498**
Nickel	-	-	**19.1**	**18.7**
Potassium	-	-	**1,550**	**878**
Selenium	-	-	0.727 U	0.462 U
Silver	-	-	**0.221 J**	**0.109 J**
Sodium	-	-	**366 J**	**275**
Thallium	-	-	**0.270 J**	**0.220 J**
Vanadium	-	-	**68.9**	**49.2**
Zinc	-	-	**147**	**103**
Semivolatile Organic Compounds (µg/kg dry)				
1,2,4-Trichlorobenzene	-	-	12.1 U	7.49 U
1,2-Dichlorobenzene	-	-	12.1 U	7.49 U
1,3-Dichlorobenzene	-	-	12.1 U	7.49 U
1,4-Dichlorobenzene	-	-	12.1 U	7.49 U
2,4-Dimethylphenol	-	-	12.1 U	7.49 U
2-Methylnaphthalene	-	-	3.03 U	1.87 U
2-Methylphenol	-	-	12.1 U	7.49 U
Acenaphthene	-	-	1.21 U	0.749 U
Acenaphthylene	-	-	1.21 U	0.749 U
Anthracene	-	-	**1.23**	0.749 U
Benzo(a)anthracene	-	-	**6.82**	0.749 U
Benzo(a)pyrene	-	-	**7.29**	0.749 U
Benzo(g,h,i)perylene	-	-	**6.63**	0.749 U
Benzofluoranthenes, Total	-	-	**14.3**	1.50 U
Benzoic Acid	-	-	60.6 U	37.5 U
Benzyl Alcohol	-	-	12.1 U	7.49 U
Bis(2-ethylhexyl) Phthalate	-	-	**24.2**	**8.70**
Butyl Benzyl Phthalate	-	-	**37.0**	**9.90**
Chrysene	-	-	**8.57**	0.749 U
Dibenz(a,h)anthracene	-	-	1.21 U	0.749 U
Dibenzofuran	-	-	12.1 U	7.49 U
Diethyl Phthalate	-	-	12.1 U	7.49 U
Dimethyl Phthalate	-	-	12.1 U	7.49 U
Di-n-butyl Phthalate	-	-	12.1 U	7.49 U
Di-n-octyl Phthalate	-	-	12.1 U	7.49 U
Fluoranthene	-	-	**13.9**	**1.21**
Fluorene	-	-	**1.27**	0.749 U
Hexachlorobenzene	-	-	12.1 U	7.49 U
Hexachlorobutadiene	-	-	12.1 U	7.49 U
Hexachloroethane	-	-	12.1 U	7.49 U
Indeno(1,2,3-cd)pyrene	-	-	**4.77**	0.749 U
Naphthalene	-	-	3.03 U	1.87 U
N-Nitrosodiphenylamine	-	-	12.1 U	7.49 U
p-cresol (4-Methylphenol)	-	-	24.2 U	15.0 U
Pentachlorophenol	-	-	12.1 U	7.49 U
Phenanthrene	-	-	**5.36**	0.749 U
Phenol	-	-	12.1 U	7.49 U
Pyrene	-	-	**9.76**	**3.75**
General Chemistry Parameters (mg/kg dry)				
Carbon, Total Organic	**16,000**	**13,600**	**12,900**	**2,210**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	DP-118	DP-120	DP-121	DP-122	DP-123
Sample ID	030402DP118SD	030402DP120SD	030403DP121SD	030304DP122SD	030304DP123SD
Sample Date	4/3/2003	4/3/2003	4/3/2003	3/4/2003	3/4/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
Aroclor 1221	0.200 U	0.200 U	0.200 U	0.210 U	0.200 U
Aroclor 1232	0.510 U	0.510 U	0.510 U	0.520 U	0.520 U
Aroclor 1242	0.630 U	0.630 U	0.630 U	0.640 U	0.630 U
Aroclor 1248	0.550 U	0.550 U	0.550 U	0.560 U	0.560 U
Aroclor 1254	0.530 U	0.530 U	**1.50**	0.530 U	0.530 U
Aroclor 1260	0.340 U	0.340 U	0.340 U	0.340 U	0.340 U
Metals (mg/kg dry)					
Aluminum	**11,800**	**16,800**	**25,500**	**13,400**	**14,700**
Antimony	-	-	-	-	-
Arsenic	-	-	-	-	-
Barium	**126**	**131**	**230**	**129**	**111**
Beryllium	**0.200**	**0.300**	**0.400**	**0.300**	**0.200**
Cadmium	**0.600**	**0.600**	**0.700**	**0.700**	0.300 U
Calcium	-	-	-	-	-
Chromium	**14.8**	**15.1**	**27.0**	**16.2**	**14.5**
Cobalt	-	-	-	-	-
Copper	**18.5**	**28.0**	**42.2**	**22.9**	**20.2**
Iron	-	-	-	-	-
Lead	**11.6**	**10.3**	**11.0**	**13.0**	**6.80**
Magnesium	-	-	-	-	-
Manganese	-	-	-	-	-
Mercury	-	-	-	-	-
Nickel	**15.0**	**15.0**	**23.0**	**18.0**	**28.0**
Potassium	-	-	-	-	-
Selenium	0.300 U	0.300 U	0.400 U	0.400 U	0.300 U
Silver	-	-	-	-	-
Sodium	-	-	-	-	-
Thallium	**0.300**	0.200 U	**0.300**	0.200 U	0.100 U
Vanadium	-	-	-	-	-
Zinc	**119**	**110**	**156**	**125**	**77.3**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	-	-
Residual Range Organics	-	-	-	-	-
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	-	-
Monobutyltin trichloride	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin chloride	-	-	-	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	-	-
4,4'-DDE	-	-	-	-	-
4,4'-DDT	-	-	-	-	-
Aldrin	-	-	-	-	-
BHC (alpha)	-	-	-	-	-
BHC (beta)	-	-	-	-	-
BHC (delta)	-	-	-	-	-
BHC (gamma) Lindane	-	-	-	-	-
Chlordane (alpha)	-	-	-	-	-
Chlordane (gamma)	-	-	-	-	-
Dieldrin	-	-	-	-	-
Endosulfan I	-	-	-	-	-
Endosulfan II	-	-	-	-	-
Endosulfan Sulfate	-	-	-	-	-
Endrin	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	-	-	-	-	-
Heptachlor Epoxide	-	-	-	-	-
Methoxychlor	-	-	-	-	-
Toxaphene	-	-	-	-	-
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-
2-Methylnaphthalene	1.70 U	1.50 U	1.70 U	1.90 U	1.50 U
2-Methylphenol	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	DP-118	DP-120	DP-121	DP-122	DP-123
Sample ID	030402DP118SD	030402DP120SD	030403DP121SD	030304DP122SD	030304DP123SD
Sample Date	4/3/2003	4/3/2003	4/3/2003	3/4/2003	3/4/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-
4-Bromophenyl Phenyl Ether	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-
Acenaphthene	2.80 U	2.50 U	2.80 U	3.20 U	2.50 U
Acenaphthylene	1.90 U	1.70 U	1.90 U	2.20 U	1.70 U
Aniline	-	-	-	-	-
Anthracene	1.90 U	1.60 U	1.90 U	2.10 U	1.70 U
Benzo(a)anthracene	**43.0**	2.40 U	2.70 U	3.10 U	2.40 U
Benzo(a)pyrene	**51.0**	2.30 U	2.70 U	3.10 U	2.40 U
Benzo(b)fluoranthene	**52.0**	2.50 U	2.80 U	3.20 U	2.50 U
Benzo(g,h,i)perylene	**26.0**	1.90 U	2.20 U	2.50 U	2.00 U
Benzo(k)fluoranthene	**35.0**	3.20 U	3.70 U	4.20 U	3.30 U
Benzoic Acid	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-
Bis(2-chloroethoxy)methane	-	-	-	-	-
Bis(2-chloroethyl) Ether	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	10.0 U	12.0 U	11.0 U	22.0 U	9.10 U
Butyl Benzyl Phthalate	-	-	-	-	-
Carbazole	-	-	-	-	-
Chrysene	**52.0**	2.70 U	3.00 U	3.50 U	2.70 U
Dibenz(a,h)anthracene	**13.0**	2.50 U	2.90 U	3.30 U	2.60 U
Dibenzofuran	2.40 U	2.10 U	2.40 U	2.80 U	2.20 U
Diethyl Phthalate	-	-	-	-	-
Dimethyl Phthalate	-	-	-	-	-
Di-n-butyl Phthalate	-	-	-	-	-
Di-n-octyl Phthalate	-	-	-	-	-
Fluoranthene	**71.0**	2.10 U	2.30 U	2.70 U	2.10 U
Fluorene	1.90 U	1.60 U	1.90 U	2.20 U	1.70 U
Hexachlorobenzene	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-
Hexachloroethane	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	**22.0**	2.10 U	2.40 U	2.80 U	2.20 U
Isophorone	-	-	-	-	-
Naphthalene	1.80 U	1.60 U	1.80 U	2.10 U	1.60 U
Nitrobenzene	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-
p-cresol (4-Methylphenol)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-
Phenanthrene	**14.0**	1.90 U	2.20 U	2.50 U	2.00 U
Phenol	-	-	-	-	-
Pyrene	**56.0**	1.90 U	2.20 U	**13.0**	2.00 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.830**	**0.710**	**1.40**	**1.00**	**0.960**
Solids, Total	**58.0**	**71.9**	**53.0**	**55.4**	**68.1**
Gravel	**8.65 J**	**0.000 J**	**24.1 J**	**0.126 J**	**0.371 J**
Sand, Coarse	**4.33 J**	**4.85 J**	**6.41 J**	**0.0900 J**	**2.32 J**
Sand, Medium	**1.18 J**	**23.9 J**	**13.3 J**	**1.31 J**	**40.2 J**
Sand, Fine	**30.6 J**	**41.2 J**	**36.0 J**	**43.8 J**	**51.9 J**
Sand	**36.1 J**	**69.9 J**	**55.6 J**	**45.2 J**	**94.4 J**
Silt	**50.7 J**	**26.3 J**	**15.1 J**	**48.4 J**	**4.15 J**
Clay	**4.47 J**	**3.72 J**	**5.17 J**	**6.30 J**	**1.09 J**
Fines	**55.2 J**	**30.1 J**	**20.3 J**	**54.7 J**	**5.25 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	DP-124	DP-125	DP-127	DP-127	DP-128
Sample ID	030304DP124SD	030401DP125SD	030304DP127SD	030304DP132SD	030304DP128SD
Sample Date	3/4/2003	4/1/2003	3/4/2003	3/4/2003	3/4/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
Aroclor 1221	0.210 U	0.210 U	0.200 U	0.200 U	0.200 U
Aroclor 1232	0.520 U	0.520 U	0.520 U	0.510 U	0.500 U
Aroclor 1242	0.640 U	0.640 U	0.630 U	0.620 U	0.620 U
Aroclor 1248	0.560 U	0.560 U	0.560 U	0.550 U	0.550 U
Aroclor 1254	**7.30**	0.530 U	0.530 U	0.530 U	0.490 U
Aroclor 1260	0.340 U	0.340 U	0.340 U	0.340 U	0.340 U
Metals (mg/kg dry)					
Aluminum	**14,500**	**20,800**	**14,500**	**13,500**	**10,400**
Antimony	-	-	-	-	-
Arsenic	-	-	-	-	-
Barium	**128**	**159**	**135**	**135**	**117**
Beryllium	**0.300**	**0.300**	**0.400**	**0.300**	**0.200**
Cadmium	**0.900**	0.300 U	**0.900**	**0.500**	0.300 U
Calcium	-	-	-	-	-
Chromium	**17.4**	**23.0**	**17.0**	**15.6**	**14.2**
Cobalt	-	-	-	-	-
Copper	**24.0**	**47.3**	**25.9**	**21.8**	**15.9**
Iron	-	-	-	-	-
Lead	**16.4**	**5.90**	**15.0**	**11.8**	**11.0**
Magnesium	-	-	-	-	-
Manganese	-	-	-	-	-
Mercury	-	-	-	-	-
Nickel	**15.0**	**20.0**	**18.0**	**18.0**	**16.0**
Potassium	-	-	-	-	-
Selenium	0.400 U	0.300 U	0.400 U	0.300 U	0.300 U
Silver	-	-	-	-	-
Sodium	-	-	-	-	-
Thallium	**0.200**	**0.300**	**0.400**	**0.400**	**0.300**
Vanadium	-	-	-	-	-
Zinc	**126**	**76.6**	**145**	**126**	**123**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	-	-
Residual Range Organics	-	-	-	-	-
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	-	-
Monobutyltin trichloride	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin chloride	-	-	-	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	-	-
4,4'-DDE	-	-	-	-	-
4,4'-DDT	-	-	-	-	-
Aldrin	-	-	-	-	-
BHC (alpha)	-	-	-	-	-
BHC (beta)	-	-	-	-	-
BHC (delta)	-	-	-	-	-
BHC (gamma) Lindane	-	-	-	-	-
Chlordane (alpha)	-	-	-	-	-
Chlordane (gamma)	-	-	-	-	-
Dieldrin	-	-	-	-	-
Endosulfan I	-	-	-	-	-
Endosulfan II	-	-	-	-	-
Endosulfan Sulfate	-	-	-	-	-
Endrin	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	-	-	-	-	-
Heptachlor Epoxide	-	-	-	-	-
Methoxychlor	-	-	-	-	-
Toxaphene	-	-	-	-	-
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-
2-Methylnaphthalene	1.90 U	1.50 U	2.20 U	1.70 U	1.60 U
2-Methylphenol	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	DP-124	DP-125	DP-127	DP-127	DP-128
Sample ID	030304DP124SD	030401DP125SD	030304DP127SD	030304DP132SD	030304DP128SD
Sample Date	3/4/2003	4/1/2003	3/4/2003	3/4/2003	3/4/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-
4-Bromophenyl Phenyl Ether	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-
Acenaphthene	3.20 U	2.60 U	3.70 U	2.80 U	2.70 U
Acenaphthylene	2.10 U	1.70 U	2.50 U	1.90 U	1.80 U
Aniline	-	-	-	-	-
Anthracene	2.10 U	1.70 U	2.40 U	1.80 U	1.80 U
Benzo(a)anthracene	**18.0**	2.50 U	3.50 U	2.70 U	2.60 U
Benzo(a)pyrene	**22.0**	2.40 U	3.50 U	**19.0**	2.60 U
Benzo(b)fluoranthene	**27.0**	2.60 U	3.70 U	**21.0**	2.70 U
Benzo(g,h,i)perylene	**15.0**	2.00 U	2.80 U	**12.0**	2.10 U
Benzo(k)fluoranthene	**19.0**	3.40 U	4.80 U	**20.0**	3.60 U
Benzoic Acid	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-
Bis(2-chloroethoxy)methane	-	-	-	-	-
Bis(2-chloroethyl) Ether	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	17.0 U	19.0 U	18.0 U	16.0 U	22.0 U
Butyl Benzyl Phthalate	-	-	-	-	-
Carbazole	-	-	-	-	-
Chrysene	**33.0**	2.80 U	4.00 U	**14.0**	2.90 U
Dibenz(a,h)anthracene	3.20 U	2.60 U	3.80 U	2.80 U	2.80 U
Dibenzofuran	2.70 U	2.20 U	3.20 U	2.40 U	2.40 U
Diethyl Phthalate	-	-	-	-	-
Dimethyl Phthalate	-	-	-	-	-
Di-n-butyl Phthalate	-	-	-	-	-
Di-n-octyl Phthalate	-	-	-	-	-
Fluoranthene	**32.0**	2.10 U	3.10 U	2.30 U	2.30 U
Fluorene	2.10 U	1.70 U	2.50 U	1.80 U	1.80 U
Hexachlorobenzene	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-
Hexachloroethane	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	**14.0**	2.20 U	3.10 U	**12.0**	2.30 U
Isophorone	-	-	-	-	-
Naphthalene	2.00 U	1.70 U	2.40 U	1.80 U	1.80 U
Nitrobenzene	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-
p-cresol (4-Methylphenol)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-
Phenanthrene	**18.0**	2.00 U	2.80 U	2.10 U	2.10 U
Phenol	-	-	-	-	-
Pyrene	**30.0**	2.00 U	2.80 U	2.10 U	2.10 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**1.20**	**1.00**	**1.20**	**0.690**	**0.340**
Solids, Total	**48.1**	**58.8**	**47.9**	**68.6**	**71.1**
Gravel	**2.04 J**	**41.7 J**	**0.000 J**	**0.000 J**	**0.219 J**
Sand, Coarse	**1.79 J**	**23.7 J**	**0.000 J**	**0.000 J**	**0.843 J**
Sand, Medium	**9.36 J**	**14.1 J**	**0.812 J**	**1.26 J**	**4.80 J**
Sand, Fine	**52.6 J**	**15.6 J**	**26.8 J**	**82.3 J**	**89.7 J**
Sand	**63.7 J**	**53.5 J**	**27.6 J**	**83.6 J**	**95.3 J**
Silt	**27.5 J**	**4.08 J**	**59.7 J**	**13.1 J**	**2.42 J**
Clay	**6.74 J**	**0.761 J**	**12.7 J**	**3.35 J**	**2.03 J**
Fines	**34.2 J**	**4.84 J**	**72.4 J**	**16.4 J**	**4.45 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	DP-128 DUP	DP-129	DP-130	DP-130	GI-111
Sample ID	030304DP131SD	030321DP129SD	030305DP130SD	030305DP135SD	030304GI111SD
Sample Date	3/4/2003	3/21/2003	3/5/2003	3/5/2003	3/4/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	1.00 U	0.200 U	0.220 U	0.200 U	0.200 U
Aroclor 1221	1.20 U	0.200 U	0.210 U	0.200 U	0.200 U
Aroclor 1232	0.540 U	0.520 U	0.530 U	0.520 U	0.520 U
Aroclor 1242	0.630 U	0.640 U	0.650 U	0.630 U	0.630 U
Aroclor 1248	0.420 U	0.560 U	0.580 U	0.560 U	0.560 U
Aroclor 1254	1.20 U	**2.90**	0.530 U	0.530 U	**1.00 J**
Aroclor 1260	1.00 U	0.340 U	0.340 U	0.340 U	0.340 U
Metals (mg/kg dry)					
Aluminum	**11,000**	**21,500**	**15,100**	**11,600**	**16,600**
Antimony	-	-	-	-	-
Arsenic	-	-	-	-	-
Barium	**127**	**185**	**142**	**122**	**153**
Beryllium	**0.200**	0.500 U	**0.400**	**0.200**	**0.400**
Cadmium	**0.400**	**1.00**	**1.10**	**0.300**	**0.900**
Calcium	-	-	-	-	-
Chromium	**14.4**	**24.0**	**18.0**	**13.6**	**19.0**
Cobalt	-	-	-	-	-
Copper	**18.4**	**38.0**	**27.7**	**18.5**	**30.1**
Iron	-	-	-	-	-
Lead	**11.0**	**21.0**	**16.0**	**11.7**	**14.0**
Magnesium	-	-	-	-	-
Manganese	-	-	-	-	-
Mercury	-	-	-	-	-
Nickel	**16.0**	**24.0**	**18.0**	**17.0**	**18.0**
Potassium	-	-	-	-	-
Selenium	0.300 U	1.00 U	0.400 U	0.300 U	0.400 U
Silver	-	-	-	-	-
Sodium	-	-	-	-	-
Thallium	**0.300**	**0.500 Z**	**0.400**	**0.300**	**0.200**
Vanadium	-	-	-	-	-
Zinc	**120**	**167**	**148**	**122**	**139**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	-	-
Residual Range Organics	-	-	-	-	-
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	-	-
Monobutyltin trichloride	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin chloride	-	-	-	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	-	-
4,4'-DDE	-	-	-	-	-
4,4'-DDT	-	-	-	-	-
Aldrin	-	-	-	-	-
BHC (alpha)	-	-	-	-	-
BHC (beta)	-	-	-	-	-
BHC (delta)	-	-	-	-	-
BHC (gamma) Lindane	-	-	-	-	-
Chlordane (alpha)	-	-	-	-	-
Chlordane (gamma)	-	-	-	-	-
Dieldrin	-	-	-	-	-
Endosulfan I	-	-	-	-	-
Endosulfan II	-	-	-	-	-
Endosulfan Sulfate	-	-	-	-	-
Endrin	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	-	-	-	-	-
Heptachlor Epoxide	-	-	-	-	-
Methoxychlor	-	-	-	-	-
Toxaphene	-	-	-	-	-
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-
2-Methylnaphthalene	1.70 U	2.50 U	2.30 U	1.80 U	2.10 U
2-Methylphenol	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	DP-128 DUP	DP-129	DP-130	DP-130	GI-111
Sample ID	030304DP131SD	030321DP129SD	030305DP130SD	030305DP135SD	030304GI111SD
Sample Date	3/4/2003	3/21/2003	3/5/2003	3/5/2003	3/4/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-
4-Bromophenyl Phenyl Ether	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-
Acenaphthene	2.80 U	4.10 U	3.90 U	3.00 U	3.50 U
Acenaphthylene	1.90 U	2.80 U	2.60 U	2.00 U	2.40 U
Aniline	-	-	-	-	-
Anthracene	1.90 U	2.70 U	2.50 U	2.00 U	2.30 U
Benzo(a)anthracene	2.70 U	4.00 U	3.70 U	**24.0**	3.40 U
Benzo(a)pyrene	2.70 U	3.90 U	3.70 U	**29.0**	3.30 U
Benzo(b)fluoranthene	2.80 U	4.10 U	3.90 U	**29.0**	15.0 U
Benzo(g,h,i)perylene	2.20 U	3.20 U	3.00 U	**22.0**	2.70 U
Benzo(k)fluoranthene	3.70 U	5.40 U	5.00 U	**25.0**	4.60 U
Benzoic Acid	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-
Bis(2-chloroethoxy)methane	-	-	-	-	-
Bis(2-chloroethyl) Ether	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	16.0 U	45.0 U	37.0 U	18.0 U	18.0 U
Butyl Benzyl Phthalate	-	-	-	-	-
Carbazole	-	-	-	-	-
Chrysene	3.10 U	4.50 U	4.20 U	**35.0**	3.80 U
Dibenz(a,h)anthracene	2.90 U	4.30 U	4.00 U	3.10 U	3.60 U
Dibenzofuran	2.50 U	3.60 U	3.30 U	2.60 U	3.00 U
Diethyl Phthalate	-	-	-	-	-
Dimethyl Phthalate	-	-	-	-	-
Di-n-butyl Phthalate	-	-	-	-	-
Di-n-octyl Phthalate	-	-	-	-	-
Fluoranthene	2.40 U	3.50 U	3.20 U	**42.0**	2.90 U
Fluorene	1.90 U	2.80 U	2.60 U	2.00 U	2.40 U
Hexachlorobenzene	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-
Hexachloroethane	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	2.40 U	3.60 U	3.30 U	**20.0**	3.00 U
Isophorone	-	-	-	-	-
Naphthalene	1.80 U	2.70 U	2.50 U	1.90 U	2.30 U
Nitrobenzene	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-
p-cresol (4-Methylphenol)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-
Phenanthrene	2.20 U	3.20 U	3.00 U	**17.0**	2.70 U
Phenol	-	-	-	-	-
Pyrene	2.20 U	3.20 U	3.00 U	**31.0**	2.70 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.560**	**1.10**	**1.40**	**2.10**	**1.60**
Solids, Total	**68.2**	**30.8**	**45.6**	**62.2**	**36.9**
Gravel	**0.000 J**	**1.63 J**	**0.000 J**	**0.000 J**	**0.000 J**
Sand, Coarse	**0.0377 J**	**2.15 J**	**0.000 J**	**0.000 J**	**0.408 J**
Sand, Medium	**0.962 J**	**2.64 J**	**0.872 J**	**0.872 J**	**1.46 J**
Sand, Fine	**73.5 J**	**10.4 J**	**11.1 J**	**11.1 J**	**20.1 J**
Sand	**74.5 J**	**15.2 J**	**12.0 J**	**12.0 J**	**21.9 J**
Silt	**19.8 J**	**71.8 J**	**72.9 J**	**72.9 J**	**67.2 J**
Clay	**5.66 J**	**11.4 J**	**15.1 J**	**15.1 J**	**10.8 J**
Fines	**25.5 J**	**83.2 J**	**88.0 J**	**88.0 J**	**78.1 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	GI-111	GI-112	GI-115	S1-29	S1-30
Sample ID	030304GI133SD	030402GI112SD	030304GI115SD	030325S129SD	030321S130SD
Sample Date	3/4/2003	4/3/2003	3/4/2003	3/25/2003	3/21/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
Aroclor 1221	0.200 U	0.200 U	0.210 U	0.200 U	0.200 U
Aroclor 1232	0.520 U	0.510 U	0.520 U	0.500 U	0.480 U
Aroclor 1242	0.630 U	0.620 U	0.640 U	0.620 U	0.600 U
Aroclor 1248	0.560 U	0.550 U	0.560 U	0.550 U	0.540 U
Aroclor 1254	**0.900 J**	0.530 U	0.530 U	**110**	**12.0**
Aroclor 1260	0.340 U	0.340 U	0.340 U	0.340 U	**8.10**
Metals (mg/kg dry)					
Aluminum	**13,700**	**18,600**	**17,200**	**11,400**	**19,600**
Antimony	-	-	-	R	**0.900 J**
Arsenic	-	-	-	**5.50**	**5.30**
Barium	**137**	**197**	**154**	**99.0**	**163**
Beryllium	**0.300**	**0.300**	**0.400**	**0.200**	**0.500**
Cadmium	**0.800**	**0.600**	**1.10**	0.300 U	0.700 U
Calcium	-	-	-	**5,660**	**6,500**
Chromium	**16.7**	**17.0**	**20.0**	**17.6**	**36.0**
Cobalt	-	-	-	**8.50**	**12.0**
Copper	**23.7**	**33.3**	**30.6**	**24.4**	**30.4**
Iron	-	-	-	**28,400**	**28,300**
Lead	**13.9**	**10.0**	**16.0**	**35.0**	**19.0**
Magnesium	-	-	-	**3,540**	**5,910**
Manganese	-	-	-	**293**	**773**
Mercury	-	-	-	0.0300 U	**0.120**
Nickel	**16.0**	**26.0**	**19.0**	**14.0**	**23.0**
Potassium	-	-	-	**570**	**2,060**
Selenium	0.300 U	0.400 U	0.500 U	0.300 U	0.700 U
Silver	-	-	-	0.400 U	1.00 U
Sodium	-	-	-	**650**	**680**
Thallium	**0.300**	0.200 U	0.300 U	**0.200**	**0.900**
Vanadium	-	-	-	**53.6**	**66.0**
Zinc	**133**	**103**	**156**	**69.1**	**168**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	2.00 U	**9.60**
Residual Range Organics	-	-	-	**11.0 L**	**38.0 O**
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	5.80 U	5.90 U
Monobutyltin trichloride	-	-	-	5.80 U	5.90 U
Tetrabutyltin	-	-	-	5.80 U	5.90 U
Tributyltin chloride	-	-	-	5.80 U	5.90 U
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	0.0860 U	0.115 U
4,4'-DDE	-	-	-	14.0 U	2.00 U
4,4'-DDT	-	-	-	0.132 U	0.191 U
Aldrin	-	-	-	0.0340 U	0.103 U
BHC (alpha)	-	-	-	0.0520 U	0.0470 U
BHC (beta)	-	-	-	0.0570 U	0.0430 U
BHC (delta)	-	-	-	0.0420 U	0.0490 U
BHC (gamma) Lindane	-	-	-	0.0400 U	0.0430 U
Chlordane (alpha)	-	-	-	1.50 U	0.0590 U
Chlordane (gamma)	-	-	-	0.0360 U	0.980 U
Dieldrin	-	-	-	11.0 U	0.0820 U
Endosulfan I	-	-	-	0.0520 U	0.0470 U
Endosulfan II	-	-	-	0.118 U	0.119 U
Endosulfan Sulfate	-	-	-	5.30 U	0.0980 U
Endrin	-	-	-	0.0570 U	0.0900 U
Endrin Aldehyde	-	-	-	9.10 U	0.197 U
Endrin Ketone	-	-	-	0.195 U	0.137 U
Heptachlor	-	-	-	0.0420 U	0.0820 U
Heptachlor Epoxide	-	-	-	0.0420 U	0.0490 U
Methoxychlor	-	-	-	0.573 U	0.644 U
Toxaphene	-	-	-	4.29 U	4.88 U
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	4.80 U	4.90 U
1,2-Dichlorobenzene	-	-	-	5.00 U	5.10 U
1,3-Dichlorobenzene	-	-	-	4.60 U	4.70 U
1,4-Dichlorobenzene	-	-	-	5.00 U	5.10 U
2,4,5-Trichlorophenol	-	-	-	7.70 U	7.90 U
2,4,6-Trichlorophenol	-	-	-	6.60 U	6.70 U
2,4-Dichlorophenol	-	-	-	9.60 U	9.80 U
2,4-Dimethylphenol	-	-	-	9.30 U	9.40 U
2,4-Dinitrophenol	-	-	-	98.0 U	100 U
2,4-Dinitrotoluene	-	-	-	5.20 U	5.30 U
2,6-Dinitrotoluene	-	-	-	4.80 U	4.90 U
2-Chloronaphthalene	-	-	-	5.60 U	5.70 U
2-Chlorophenol	-	-	-	6.40 U	6.50 U
2-Methylnaphthalene	1.80 U	1.50 U	2.10 U	4.80 U	4.90 U
2-Methylphenol	-	-	-	6.60 U	6.70 U
2-Nitroaniline	-	-	-	13.0 U	13.0 U
2-Nitrophenol	-	-	-	9.40 U	9.60 U

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	GI-111	GI-112	GI-115	S1-29	S1-30
Sample ID	030304GI133SD	030402GI112SD	030304GI115SD	030325S129SD	030321S130SD
Sample Date	3/4/2003	4/3/2003	3/4/2003	3/25/2003	3/21/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	-	-	-	33.0 U	34.0 U
3-Nitroaniline	-	-	-	11.0 U	11.0 U
4,6-Dinitro-2-methylphenol	-	-	-	160 U	170 U
4-Bromophenyl Phenyl Ether	-	-	-	6.20 U	6.30 U
4-Chloro-3-methylphenol	-	-	-	9.10 U	9.20 U
4-Chloroaniline	-	-	-	14.0 U	14.0 U
4-Chlorophenyl Phenyl Ether	-	-	-	9.60 U	9.80 U
4-Nitroaniline	-	-	-	13.0 U	13.0 U
4-Nitrophenol	-	-	-	18.0 U	18.0 U
Acenaphthene	3.10 U	2.50 U	3.50 U	5.00 U	5.10 U
Acenaphthylene	2.10 U	1.70 U	2.40 U	4.40 U	4.50 U
Aniline	-	-	-	6.00 U	6.10 U
Anthracene	2.00 U	1.70 U	2.30 U	4.60 U	4.70 U
Benzo(a)anthracene	2.90 U	2.40 U	3.40 U	**9.80 J**	**13.0 J**
Benzo(a)pyrene	2.90 U	2.40 U	3.30 U	**12.0 J**	3.90 U
Benzo(b)fluoranthene	3.10 U	2.50 U	3.50 U	**12.0 J**	8.10 U
Benzo(g,h,i)perylene	2.40 U	2.00 U	2.70 U	**13.0 J**	5.30 U
Benzo(k)fluoranthene	4.00 U	3.30 U	4.60 U	**13.0 J**	11.0 U
Benzoic Acid	-	-	-	160 U	160 U
Benzyl Alcohol	-	-	-	19.0 U	20.0 U
Bis(2-chloroethoxy)methane	-	-	-	4.60 U	4.70 U
Bis(2-chloroethyl) Ether	-	-	-	6.60 U	6.70 U
Bis(2-chloroisopropyl) Ether	-	-	-	5.60 U	5.70 U
Bis(2-ethylhexyl) Phthalate	18.0 U	26.0 U	13.0 U	18.0 U	**330**
Butyl Benzyl Phthalate	-	-	-	4.80 U	4.90 U
Carbazole	-	-	-	4.60 U	4.70 U
Chrysene	3.30 U	2.70 U	3.80 U	**15.0 J**	**16.0 J**
Dibenz(a,h)anthracene	3.10 U	2.60 U	3.60 U	5.60 U	5.70 U
Dibenzofuran	2.60 U	2.20 U	3.00 U	4.80 U	4.90 U
Diethyl Phthalate	-	-	-	**21.0**	8.70 U
Dimethyl Phthalate	-	-	-	5.00 U	5.10 U
Di-n-butyl Phthalate	-	-	-	**15.0 J**	5.70 U
Di-n-octyl Phthalate	-	-	-	7.90 U	8.10 U
Fluoranthene	2.60 U	2.10 U	2.90 U	**15.0 J**	**19.0 J**
Fluorene	2.00 U	1.70 U	2.30 U	6.60 U	6.70 U
Hexachlorobenzene	-	-	-	5.40 U	5.50 U
Hexachlorobutadiene	-	-	-	6.60 U	6.70 U
Hexachlorocyclopentadiene	-	-	-	29.0 U	29.0 U
Hexachloroethane	-	-	-	7.30 U	7.50 U
Indeno(1,2,3-cd)pyrene	2.60 U	2.20 U	3.00 U	**10.0 J**	5.90 U
Isophorone	-	-	-	6.20 U	6.30 U
Naphthalene	2.00 U	1.60 U	2.30 U	5.00 U	5.10 U
Nitrobenzene	-	-	-	5.80 U	5.90 U
N-Nitrosodimethylamine	-	-	-	39.0 U	40.0 U
N-Nitrosodi-n-propylamine	-	-	-	6.90 U	7.10 U
N-Nitrosodiphenylamine	-	-	-	6.70 U	6.90 U
p-cresol (4-Methylphenol)	-	-	-	6.60 U	6.70 U
Pentachlorophenol	-	-	-	42.0 U	43.0 U
Phenanthrene	2.40 U	1.90 U	2.70 U	4.40 U	4.50 U
Phenol	-	-	-	6.40 U	6.50 U
Pyrene	2.40 U	2.00 U	2.70 U	**14.0 J**	**17.0 J**
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.940**	**0.840**	**1.40**	**0.240**	**2.10**
Solids, Total	**62.9**	**69.5**	**46.1**	**71.7**	**26.7**
Gravel	**0.000 J**	**30.0 J**	**0.000 J**	**5.00**	**0.000**
Sand, Coarse	**0.000 J**	**29.9 J**	**0.0656 J**	**7.00**	**0.100**
Sand, Medium	**1.20 J**	**9.97 J**	**1.53 J**	**63.3**	**1.00**
Sand, Fine	**39.0 J**	**10.8 J**	**56.9 J**	**14.3**	**14.2**
Sand	**40.2 J**	**50.8 J**	**58.4 J**	**84.6**	**15.3**
Silt	**52.9 J**	**16.6 J**	**35.0 J**	**10.0**	**59.7**
Clay	**6.82 J**	**2.71 J**	**6.56 J**	**0.400**	**25.0**
Fines	**59.8 J**	**19.3 J**	**41.6 J**	**10.4**	**84.7**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S1-31	S1-32	S1-33	S1-34	S1-35
Sample ID	030319S131SD	030321S132SD	030314S133SD	030328S134SD	030313S135SD
Sample Date	3/19/2003	3/21/2003	3/14/2003	3/28/2003	3/13/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	1.00 U	0.200 U	0.200 U	51.1 U	0.0200 U
Aroclor 1221	1.02 U	0.210 U	0.200 U	50.9 U	0.0200 U
Aroclor 1232	2.61 U	0.480 U	0.520 U	135 U	0.0500 U
Aroclor 1242	3.10 U	0.600 U	0.630 U	160 U	0.0600 U
Aroclor 1248	**140**	0.540 U	0.560 U	134 U	0.700 U
Aroclor 1254	**140**	**21.0**	**99.0**	**36,000**	**1.70**
Aroclor 1260	19.0 U	**35.0**	4.13 U	1,102 U	0.280 U
Metals (mg/kg dry)					
Aluminum	**15,600**	**10,500**	**17,200**	**9,190**	**19,900**
Antimony	R	R	R	R	R
Arsenic	**5.80**	**2.00**	**4.20**	**1.70**	**3.00**
Barium	**108**	**98.2**	**136**	**75.8**	**181**
Beryllium	0.400 U	0.300 U	**0.400**	0.100 U	**0.300**
Cadmium	0.900 U	0.500 U	0.400 U	**0.200**	0.300 U
Calcium	**6,310**	**5,100**	**6,440**	**5,230**	**7,900**
Chromium	**26.0**	**117**	**19.0**	**11.7**	**24.7**
Cobalt	**11.0**	**11.0**	**9.40**	**7.80**	**11.8**
Copper	**44.7**	**21.1**	**27.4**	**24.7**	**38.5**
Iron	**94,900**	**18,900**	**25,100**	**21,400**	**31,300**
Lead	**19.9**	**31.0**	**12.0**	**3.10**	**8.70**
Magnesium	**8,640**	**6,580**	**5,760**	**8,000**	**9,140**
Manganese	**626**	**278**	**508**	**384**	**423**
Mercury	**0.0600**	**0.0700**	**0.0900**	0.0300 U	**0.0700**
Nickel	**26.0**	**47.0**	**16.0**	**13.0**	**20.0**
Potassium	**750**	**930**	**1,460**	**480**	**1,250**
Selenium	**0.400**	0.500 U	0.300 U	0.200 U	0.300 U
Silver	1.00 U	0.800 U	0.500 U	0.400 U	0.500 U
Sodium	**620**	**640**	**650**	**540**	**810**
Thallium	**0.200**	**0.300**	**0.300**	**0.200**	0.200 U
Vanadium	**56.0**	**41.6**	**60.5**	**41.7**	**76.9**
Zinc	**100**	**129**	**116**	**70.1**	**92.0**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	**9.30**	**28.0**	2.20 U	**47.0**	2.40 U
Residual Range Organics	**31.0 L**	**60.0 L**	**11.0 O**	5.00 U	**19.0 O**
Butyltins (µg/kg dry)					
Dibutyltin dichloride	5.80 U	5.80 U	5.80 U	5.80 U	5.80 U
Monobutyltin trichloride	5.80 U	5.80 U	5.80 U	5.80 U	5.80 U
Tetrabutyltin	5.80 U	5.80 U	5.80 U	5.80 U	5.80 U
Tributyltin chloride	5.80 U	5.80 U	5.80 U	5.80 U	5.80 U
Pesticides (µg/kg dry)					
4,4'-DDD	0.568 U	0.116 U	0.0880 U	1.75 U	0.0880 U
4,4'-DDE	1.05 U	0.215 U	24.0 U	410 U	**1.20 J**
4,4'-DDT	0.943 U	0.193 U	0.135 U	2.68 U	0.134 U
Aldrin	0.510 U	0.104 U	0.0350 U	0.700 U	0.0350 U
BHC (alpha)	0.231 U	0.0470 U	0.0530 U	1.05 U	0.0530 U
BHC (beta)	0.212 U	0.0430 U	0.0590 U	1.17 U	0.0580 U
BHC (delta)	0.240 U	0.0490 U	0.0430 U	0.855 U	0.0430 U
BHC (gamma) Lindane	9.50 U	0.0430 U	0.0410 U	0.816 U	0.0410 U
Chlordane (alpha)	0.289 U	0.0590 U	2.20 U	45.0 U	0.0290 U
Chlordane (gamma)	0.548 U	0.112 U	0.0370 U	0.738 U	0.0370 U
Dieldrin	0.404 U	0.0830 U	18.0 U	330 U	0.0580 U
Endosulfan I	0.231 U	0.0470 U	0.0530 U	1.05 U	0.0530 U
Endosulfan II	0.587 U	0.120 U	0.122 U	2.41 U	0.121 U
Endosulfan Sulfate	0.481 U	0.0990 U	0.165 U	3.26 U	0.164 U
Endrin	0.442 U	0.0910 U	0.0590 U	1.17 U	0.0580 U
Endrin Aldehyde	0.972 U	0.199 U	13.0 U	250 U	0.111 U
Endrin Ketone	0.673 U	0.138 U	0.200 U	3.96 U	0.199 U
Heptachlor	0.404 U	0.0830 U	0.0430 U	0.855 U	0.0430 U
Heptachlor Epoxide	4.80 U	0.0490 U	0.0430 U	0.855 U	0.0430 U
Methoxychlor	3.17 U	0.651 U	0.588 U	11.7 U	0.584 U
Toxaphene	24.0 U	4.93 U	4.41 U	87.4 U	4.38 U
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	4.80 U	4.90 U	4.80 U	4.80 U	4.90 U
1,2-Dichlorobenzene	5.00 U	5.10 U	5.00 U	5.00 U	5.10 U
1,3-Dichlorobenzene	4.60 U	4.70 U	4.60 U	4.60 U	4.70 U
1,4-Dichlorobenzene	5.00 U	5.10 U	5.00 U	5.00 U	5.10 U
2,4,5-Trichlorophenol	7.70 U	7.90 U	7.70 U	7.70 U	7.80 U
2,4,6-Trichlorophenol	6.50 U	6.70 U	6.60 U	6.60 U	6.70 U
2,4-Dichlorophenol	9.60 U	9.80 U	9.70 U	9.70 U	9.80 U
2,4-Dimethylphenol	9.20 U	9.40 U	9.30 U	9.30 U	9.40 U
2,4-Dinitrophenol	97.0 U	99.0 U	98.0 U	98.0 U	99.0 U
2,4-Dinitrotoluene	5.20 U	5.30 U	5.20 U	5.20 U	5.30 U
2,6-Dinitrotoluene	4.80 U	4.90 U	4.80 U	4.80 U	4.90 U
2-Chloronaphthalene	5.60 U	5.70 U	5.60 U	5.60 U	5.70 U
2-Chlorophenol	6.30 U	6.50 U	6.40 U	6.40 U	6.50 U
2-Methylnaphthalene	4.80 U	4.90 U	4.80 U	4.80 U	4.90 U
2-Methylphenol	6.50 U	6.70 U	6.60 U	6.60 U	6.70 U
2-Nitroaniline	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U
2-Nitrophenol	9.40 U	9.60 U	9.50 U	9.50 U	9.60 U

Table G-6a
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Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S1-31	S1-32	S1-33	S1-34	S1-35
Sample ID	030319S131SD	030321S132SD	030314S133SD	030328S134SD	030313S135SD
Sample Date	3/19/2003	3/21/2003	3/14/2003	3/28/2003	3/13/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	33.0 U	34.0 U	33.0 U	33.0 U	34.0 U
3-Nitroaniline	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
4,6-Dinitro-2-methylphenol	160 U	170 U	160 U	160 U	170 U
4-Bromophenyl Phenyl Ether	6.10 U	6.30 U	6.20 U	6.20 U	6.30 U
4-Chloro-3-methylphenol	9.00 U	9.20 U	9.10 U	9.10 U	9.20 U
4-Chloroaniline	14.0 U	14.0 U	14.0 U	14.0 U	14.0 U
4-Chlorophenyl Phenyl Ether	9.60 U	9.80 U	9.70 U	9.70 U	9.80 U
4-Nitroaniline	12.0 U	13.0 U	13.0 U	13.0 U	13.0 U
4-Nitrophenol	17.0 U	18.0 U	18.0 U	18.0 U	18.0 U
Acenaphthene	5.00 U	5.10 U	5.00 U	5.00 U	5.10 U
Acenaphthylene	4.40 U	4.50 U	4.40 U	4.50 U	4.50 U
Aniline	6.00 U	6.10 U	6.00 U	6.00 U	6.10 U
Anthracene	4.60 U	4.70 U	4.60 U	4.60 U	4.70 U
Benzo(a)anthracene	**21.0**	**57.0**	5.00 U	5.00 U	5.10 U
Benzo(a)pyrene	**17.0 J**	**38.0**	3.90 U	3.90 U	3.90 U
Benzo(b)fluoranthene	**20.0**	**48.0**	7.90 U	7.90 U	8.00 U
Benzo(g,h,i)perylene	5.20 U	**22.0**	5.20 U	5.20 U	5.30 U
Benzo(k)fluoranthene	**18.0 J**	**46.0**	11.0 U	11.0 U	11.0 U
Benzoic Acid	160 U	160 U	160 U	160 U	160 U
Benzyl Alcohol	19.0 U	20.0 U	19.0 U	19.0 U	20.0 U
Bis(2-chloroethoxy)methane	4.60 U	4.70 U	4.60 U	4.60 U	4.70 U
Bis(2-chloroethyl) Ether	6.50 U	6.70 U	6.60 U	6.60 U	6.70 U
Bis(2-chloroisopropyl) Ether	5.60 U	5.70 U	5.60 U	5.60 U	5.70 U
Bis(2-ethylhexyl) Phthalate	**48.0**	**3,600**	18.0 U	18.0 U	**35.0**
Butyl Benzyl Phthalate	4.80 U	4.90 U	4.80 U	4.80 U	4.90 U
Carbazole	4.60 U	4.70 U	4.60 U	4.60 U	4.70 U
Chrysene	**28.0**	**82.0**	6.00 U	6.00 U	6.10 U
Dibenz(a,h)anthracene	5.60 U	5.70 U	5.60 U	5.60 U	5.70 U
Dibenzofuran	4.80 U	4.90 U	4.80 U	4.80 U	4.90 U
Diethyl Phthalate	8.40 U	8.60 U	8.50 U	8.50 U	8.60 U
Dimethyl Phthalate	5.00 U	5.10 U	5.00 U	5.00 U	5.10 U
Di-n-butyl Phthalate	5.60 U	5.70 U	5.60 U	5.60 U	5.70 U
Di-n-octyl Phthalate	7.90 U	8.10 U	7.90 U	7.90 U	8.00 U
Fluoranthene	**37.0**	**90.0**	5.80 U	5.80 U	5.90 U
Fluorene	6.50 U	6.70 U	6.60 U	6.60 U	6.70 U
Hexachlorobenzene	5.40 U	5.50 U	5.40 U	5.40 U	5.50 U
Hexachlorobutadiene	6.50 U	6.70 U	6.60 U	6.60 U	6.70 U
Hexachlorocyclopentadiene	28.0 U	29.0 U	29.0 U	29.0 U	29.0 U
Hexachloroethane	7.30 U	7.50 U	7.30 U	7.40 U	7.40 U
Indeno(1,2,3-cd)pyrene	5.80 U	**24.0**	5.80 U	5.80 U	5.90 U
Isophorone	6.10 U	6.30 U	6.20 U	6.20 U	6.30 U
Naphthalene	5.00 U	5.10 U	5.00 U	5.00 U	5.10 U
Nitrobenzene	5.80 U	5.90 U	5.80 U	5.80 U	5.90 U
N-Nitrosodimethylamine	39.0 U	40.0 U	39.0 U	39.0 U	40.0 U
N-Nitrosodi-n-propylamine	6.90 U	7.10 U	7.00 U	7.00 U	7.00 U
N-Nitrosodiphenylamine	6.70 U	6.90 U	6.80 U	6.80 U	6.80 U
p-cresol (4-Methylphenol)	6.50 U	**18.0 J**	6.60 U	6.60 U	6.70 U
Pentachlorophenol	42.0 U	43.0 U	42.0 U	42.0 U	43.0 U
Phenanthrene	**26.0**	**37.0**	4.40 U	4.50 U	4.50 U
Phenol	6.30 U	6.50 U	6.40 U	6.40 U	6.50 U
Pyrene	**37.0**	**89.0**	10.0 U	10.0 U	10.0 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.400**	**1.40**	**1.40**	**0.200**	**0.220**
Solids, Total	**67.8**	**29.7**	**55.0**	**76.6**	**65.7**
Gravel	**86.5**	**0.500**	**6.70**	**50.1**	**1.50**
Sand, Coarse	**10.3**	**1.80**	**9.20**	**31.3**	**4.40**
Sand, Medium	**2.10**	**6.90**	**16.0**	**16.1**	**36.2**
Sand, Fine	**0.600**	**25.8**	**41.8**	**1.50**	**36.4**
Sand	**13.0**	**34.5**	**67.0**	**48.9**	**77.0**
Silt	**0.400**	**57.6**	**24.7**	**0.700**	**19.4**
Clay	**0.100**	**7.40**	**1.50**	**0.300**	**2.20**
Fines	**0.500**	**65.0**	**26.2**	**1.00**	**21.6**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S1-36	S1-37	S1-38	S1-39	S1-40
Sample ID	030328S136SD	030326S137SD	030320S138SD	030314S139SD	030314S140SD
Sample Date	3/28/2003	3/26/2003	3/20/2003	3/14/2003	3/14/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	41.3 U	0.220 U	0.200 U	1.02 U	0.200 U
Aroclor 1221	41.0 U	0.210 U	0.210 U	1.03 U	0.200 U
Aroclor 1232	106 U	0.530 U	0.480 U	2.61 U	0.510 U
Aroclor 1242	130 U	0.640 U	0.600 U	3.20 U	0.630 U
Aroclor 1248	114 U	0.560 U	0.540 U	2.82 U	0.550 U
Aroclor 1254	**22,000**	**31.0**	**22.0**	**420**	**94.0**
Aroclor 1260	758 U	0.340 U	5.70 U	13.8 U	3.44 U
Metals (mg/kg dry)					
Aluminum	**10,200**	**8,460**	**20,600**	**19,000**	**23,200**
Antimony	**0.300 J**	R	R	R	R
Arsenic	**2.00**	**1.10**	**5.70**	**4.10**	**3.70**
Barium	**75.2**	**39.8**	**187**	**166**	**189**
Beryllium	0.100 U	0.100 U	**0.400**	**0.400**	**0.400**
Cadmium	0.300 U	0.300 U	**0.700**	0.400 U	0.300 U
Calcium	**5,710**	**5,150**	**8,080**	**7,060**	**8,470**
Chromium	**17.6**	**12.7**	**29.0**	**22.0**	**23.5**
Cobalt	**11.7**	**6.70**	**13.9**	**11.3**	**11.6**
Copper	**41.9**	**26.7**	**32.2**	**41.5**	**39.2**
Iron	**27,900**	**18,300**	**32,100**	**29,500**	**32,600**
Lead	**23.0**	**2.90**	**18.0**	**15.0**	**9.90**
Magnesium	**8,860**	**8,120**	**6,720**	**6,750**	**9,620**
Manganese	**455**	**248**	**589**	**668**	**495**
Mercury	0.0300 U	0.0300 U	**0.160**	**0.120**	**0.0800**
Nickel	**20.0**	**12.0**	**23.0**	**28.0**	**19.0**
Potassium	**410**	**400**	**2,080**	**1,630**	**1,530**
Selenium	0.300 U	0.300 U	0.600 U	0.400 U	0.300 U
Silver	0.400 U	0.400 U	0.800 U	0.600 U	0.500 U
Sodium	**540**	**610**	**990**	**730**	**900**
Thallium	**0.200**	**0.100**	**0.600**	**0.300**	**0.200**
Vanadium	**55.1**	**31.4**	**83.7**	**72.1**	**73.3**
Zinc	**76.0**	**75.5**	**196**	**143**	**105**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	**9.80**	1.80 U	2.80 U	2.60 U	2.30 U
Residual Range Organics	**13.0 L**	5.00 U	**18.0 O**	**16.0 O**	5.00 U
Butyltins (µg/kg dry)					
Dibutyltin dichloride	5.90 U	5.90 U	5.90 U	5.90 U	5.80 U
Monobutyltin trichloride	5.90 U	5.90 U	5.90 U	5.90 U	5.80 U
Tetrabutyltin	5.90 U	5.90 U	5.90 U	5.90 U	5.80 U
Tributyltin chloride	5.90 U	5.90 U	5.90 U	5.90 U	5.80 U
Pesticides (µg/kg dry)					
4,4'-DDD	1.76 U	0.0870 U	0.116 U	0.886 U	0.0880 U
4,4'-DDE	510 U	0.0760 U	0.214 U	54.0 U	0.0760 U
4,4'-DDT	2.70 U	0.134 U	0.192 U	1.36 U	0.134 U
Aldrin	0.706 U	0.0350 U	0.104 U	0.354 U	0.0350 U
BHC (alpha)	1.06 U	0.0520 U	0.0470 U	0.531 U	0.0530 U
BHC (beta)	1.18 U	0.0580 U	0.0430 U	0.591 U	0.0580 U
BHC (delta)	0.862 U	0.0430 U	0.0490 U	0.433 U	0.0430 U
BHC (gamma) Lindane	0.823 U	0.0410 U	0.0430 U	0.413 U	0.0410 U
Chlordane (alpha)	54.0 U	0.0290 U	0.0590 U	0.295 U	0.0290 U
Chlordane (gamma)	0.745 U	0.0370 U	0.112 U	0.374 U	0.0370 U
Dieldrin	420 U	0.0580 U	0.0820 U	0.591 U	0.0580 U
Endosulfan I	1.06 U	0.0520 U	0.0470 U	0.531 U	0.0530 U
Endosulfan II	2.43 U	0.121 U	0.120 U	1.22 U	0.121 U
Endosulfan Sulfate	3.29 U	0.163 U	0.0980 U	23.0 U	0.164 U
Endrin	1.18 U	0.0580 U	0.0900 U	0.591 U	0.0580 U
Endrin Aldehyde	320 U	0.111 U	0.198 U	30.0 U	0.111 U
Endrin Ketone	4.00 U	0.198 U	0.137 U	2.01 U	0.199 U
Heptachlor	0.862 U	0.0430 U	0.0820 U	0.433 U	0.0430 U
Heptachlor Epoxide	0.862 U	0.0430 U	0.0490 U	0.433 U	0.0430 U
Methoxychlor	11.8 U	0.583 U	0.647 U	5.91 U	0.584 U
Toxaphene	88.2 U	4.37 U	4.90 U	44.3 U	4.38 U
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	4.90 U	4.90 U	4.90 U	4.90 U	4.90 U
1,2-Dichlorobenzene	5.10 U	5.10 U	5.10 U	5.10 U	5.10 U
1,3-Dichlorobenzene	4.70 U	4.70 U	4.70 U	4.70 U	4.70 U
1,4-Dichlorobenzene	5.10 U	5.10 U	5.10 U	5.10 U	5.10 U
2,4,5-Trichlorophenol	7.90 U	7.80 U	7.90 U	7.90 U	7.80 U
2,4,6-Trichlorophenol	6.70 U	6.60 U	6.70 U	6.70 U	6.60 U
2,4-Dichlorophenol	9.90 U	9.70 U	9.80 U	9.90 U	9.70 U
2,4-Dimethylphenol	9.50 U	9.30 U	9.40 U	9.50 U	9.30 U
2,4-Dinitrophenol	100 U	98.0 U	99.0 U	100 U	98.0 U
2,4-Dinitrotoluene	5.30 U	5.20 U	5.30 U	5.30 U	5.20 U
2,6-Dinitrotoluene	4.90 U	4.90 U	4.90 U	4.90 U	4.90 U
2-Chloronaphthalene	5.70 U	5.60 U	5.70 U	5.70 U	5.60 U
2-Chlorophenol	6.50 U	6.40 U	6.50 U	6.50 U	6.40 U
2-Methylnaphthalene	4.90 U	4.90 U	4.90 U	4.90 U	4.90 U
2-Methylphenol	6.70 U	6.60 U	6.70 U	6.70 U	6.60 U
2-Nitroaniline	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U
2-Nitrophenol	9.70 U	9.50 U	9.60 U	9.70 U	9.50 U

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S1-36	S1-37	S1-38	S1-39	S1-40
Sample ID	030328S136SD	030326S137SD	030320S138SD	030314S139SD	030314S140SD
Sample Date	3/28/2003	3/26/2003	3/20/2003	3/14/2003	3/14/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	34.0 U	34.0 U	34.0 U	34.0 U	34.0 U
3-Nitroaniline	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
4,6-Dinitro-2-methylphenol	170 U	160 U	170 U	170 U	170 U
4-Bromophenyl Phenyl Ether	6.30 U	6.20 U	6.30 U	6.30 U	6.20 U
4-Chloro-3-methylphenol	9.30 U	9.10 U	9.20 U	9.30 U	9.10 U
4-Chloroaniline	14.0 U	14.0 U	14.0 U	14.0 U	14.0 U
4-Chlorophenyl Phenyl Ether	9.90 U	9.70 U	9.80 U	9.90 U	9.70 U
4-Nitroaniline	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U
4-Nitrophenol	18.0 U	18.0 U	18.0 U	18.0 U	18.0 U
Acenaphthene	**36.0**	5.10 U	5.10 U	5.10 U	5.10 U
Acenaphthylene	4.50 U	4.50 U	4.50 U	4.50 U	4.50 U
Aniline	6.10 U	6.00 U	6.10 U	6.10 U	6.00 U
Anthracene	**25.0**	4.70 U	4.70 U	4.70 U	4.70 U
Benzo(a)anthracene	**95.0**	5.10 U	5.10 U	5.10 U	5.10 U
Benzo(a)pyrene	**88.0**	3.90 U	3.90 U	3.90 U	3.90 U
Benzo(b)fluoranthene	**91.0**	8.00 U	8.10 U	8.10 U	8.00 U
Benzo(g,h,i)perylene	**76.0**	5.20 U	5.30 U	5.30 U	5.20 U
Benzo(k)fluoranthene	**100 J**	11.0 U	11.0 U	**22.0**	11.0 U
Benzoic Acid	160 U	160 U	160 U	160 U	160 U
Benzyl Alcohol	20.0 U	19.0 U	20.0 U	20.0 U	19.0 U
Bis(2-chloroethoxy)methane	4.70 U	4.70 U	4.70 U	4.70 U	4.70 U
Bis(2-chloroethyl) Ether	6.70 U	6.60 U	6.70 U	6.70 U	6.60 U
Bis(2-chloroisopropyl) Ether	5.70 U	5.60 U	5.70 U	5.70 U	5.60 U
Bis(2-ethylhexyl) Phthalate	19.0 U	18.0 U	**220**	**29.0**	18.0 U
Butyl Benzyl Phthalate	4.90 U	4.90 U	4.90 U	4.90 U	4.90 U
Carbazole	**18.0 J**	4.70 U	4.70 U	4.70 U	4.70 U
Chrysene	**110**	6.00 U	6.10 U	**20.0**	6.00 U
Dibenz(a,h)anthracene	**25.0**	5.60 U	5.70 U	5.70 U	5.60 U
Dibenzofuran	4.90 U	4.90 U	4.90 U	4.90 U	4.90 U
Diethyl Phthalate	8.70 U	8.50 U	8.60 U	8.70 U	8.60 U
Dimethyl Phthalate	5.10 U	5.10 U	5.10 U	5.10 U	5.10 U
Di-n-butyl Phthalate	5.70 U	5.60 U	5.70 U	5.70 U	5.60 U
Di-n-octyl Phthalate	8.10 U	8.00 U	8.10 U	8.10 U	8.00 U
Fluoranthene	**190**	5.80 U	5.90 U	5.90 U	5.80 U
Fluorene	**14.0 J**	6.60 U	6.70 U	6.70 U	6.60 U
Hexachlorobenzene	5.50 U	5.40 U	5.50 U	5.50 U	5.40 U
Hexachlorobutadiene	6.70 U	6.60 U	6.70 U	6.70 U	6.60 U
Hexachlorocyclopentadiene	29.0 U	29.0 U	29.0 U	29.0 U	29.0 U
Hexachloroethane	7.50 U	7.40 U	7.50 U	7.50 U	7.40 U
Indeno(1,2,3-cd)pyrene	**76.0**	5.80 U	5.90 U	5.90 U	5.80 U
Isophorone	6.30 U	6.20 U	6.30 U	6.30 U	6.20 U
Naphthalene	5.10 U	5.10 U	5.10 U	5.10 U	5.10 U
Nitrobenzene	5.90 U	5.80 U	5.90 U	5.90 U	5.80 U
N-Nitrosodimethylamine	40.0 U	39.0 U	40.0 U	40.0 U	39.0 U
N-Nitrosodi-n-propylamine	7.10 U	7.00 U	7.10 U	7.10 U	7.00 U
N-Nitrosodiphenylamine	6.90 U	6.80 U	6.90 U	6.90 U	6.80 U
p-cresol (4-Methylphenol)	6.70 U	6.60 U	6.70 U	6.70 U	6.60 U
Pentachlorophenol	43.0 U	42.0 U	43.0 U	43.0 U	42.0 U
Phenanthrene	**140**	4.50 U	4.50 U	4.50 U	4.50 U
Phenol	6.50 U	6.40 U	6.50 U	6.50 U	6.40 U
Pyrene	**170**	10.0 U	10.0 U	10.0 U	10.0 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.170**	**0.0940**	**1.40**	**1.20**	**0.500**
Solids, Total	**77.8**	**73.6**	**46.6**	**56.9**	**64.3**
Gravel	**45.0**	**60.3**	**0.000**	**12.6**	**10.2**
Sand, Coarse	**13.9**	**29.1**	**0.300**	**7.00**	**4.10**
Sand, Medium	**32.9**	**10.0**	**2.00**	**22.1**	**27.8**
Sand, Fine	**6.90**	**0.300**	**54.5**	**34.3**	**30.9**
Sand	**53.7**	**39.4**	**56.8**	**63.4**	**62.8**
Silt	**0.700**	**0.200**	**31.4**	**22.8**	**24.8**
Clay	**0.700**	**0.000**	**11.9**	**1.10**	**2.10**
Fines	**1.40**	**0.200**	**43.3**	**23.9**	**26.9**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S1-41	S1-41 DUP	S1-42	S1-43	S1-44
Sample ID	030313S141SD	030313S1139SD	030313S142SD	030321S143SD	030321S144SD
Sample Date	3/13/2003	3/13/2003	3/13/2003	3/21/2003	3/21/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	1.04 U	0.200 U	0.200 U	1.02 U	1.04 U
Aroclor 1221	1.03 U	0.200 U	0.200 U	1.03 U	1.03 U
Aroclor 1232	2.61 U	0.520 U	0.520 U	2.61 U	2.61 U
Aroclor 1242	3.20 U	0.180 U	0.630 U	3.20 U	3.20 U
Aroclor 1248	2.82 U	0.560 U	0.560 U	2.82 U	2.82 U
Aroclor 1254	**410**	**33.0 J**	**9.50**	8.90 U	**35.0**
Aroclor 1260	19.6 U	2.27 U	0.340 U	**140**	**380**
Metals (mg/kg dry)					
Aluminum	**18,300**	**16,300**	**25,800**	**5,360**	**16,200**
Antimony	R	R	R	**0.600 J**	R
Arsenic	**2.90**	**3.40**	**3.10**	**32.0**	**4.40**
Barium	**156**	**147**	**134**	**49.2**	**144**
Beryllium	**0.400**	0.400 U	**0.400**	0.100 U	**0.300**
Cadmium	**0.400**	0.900 U	0.300 U	0.300 U	0.500 U
Calcium	**6,930**	**6,240**	**8,410**	**4,260**	**6,310**
Chromium	**19.7**	**18.0**	**25.0**	**620**	**25.0**
Cobalt	**10.9**	**10.0**	**15.7**	**14.8**	**10.7**
Copper	**54.9**	**13,100**	**51.5**	**47.9**	**24.6**
Iron	**28,300**	**25,600**	**33,800**	**21,500**	**23,700**
Lead	**50.0**	**20.3**	**19.4**	**121**	**16.0**
Magnesium	**6,390**	**5,580**	**10,400**	**21,100**	**5,160**
Manganese	**464**	**486**	**537**	**432**	**429**
Mercury	**0.160**	**0.110**	**0.0700**	0.0200 U	**0.170**
Nickel	**25.0**	**20.0**	**23.0**	**520**	**19.0**
Potassium	**1,370**	**1,530**	**1,110**	**280**	**1,630**
Selenium	0.400 U	0.300 U	0.300 U	0.300 U	0.500 U
Silver	0.500 U	**2.00**	0.500 U	0.400 U	0.700 U
Sodium	**690**	**710**	**790**	**410**	**750**
Thallium	**0.300**	**0.400**	0.200 U	**0.300**	**0.400**
Vanadium	**67.3**	**61.0**	**85.8**	**19.3**	**60.2**
Zinc	**154**	**1,420**	**83.0**	**187**	**146**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	2.60 U	**5.10**	2.40 U	**23.0**	3.90 U
Residual Range Organics	**25.0 O**	**32.0**	**38.0 A**	**74.0 L**	**14.0 O**
Butyltins (µg/kg dry)					
Dibutyltin dichloride	5.90 U	5.90 U	5.80 U	**4.60 J**	5.90 U
Monobutyltin trichloride	5.90 U	5.90 U	5.80 U	5.80 U	5.90 U
Tetrabutyltin	5.90 U	5.90 U	5.80 U	5.80 U	5.90 U
Tributyltin chloride	5.90 U	5.90 U	5.80 U	**13.0**	5.90 U
Pesticides (µg/kg dry)					
4,4'-DDD	0.0900 U	0.0880 U	0.0870 U	0.115 U	0.117 U
4,4'-DDE	9.20 U	5.20 U	0.0760 U	0.212 U	0.216 U
4,4'-DDT	0.137 U	0.135 U	0.134 U	0.191 U	0.194 U
Aldrin	0.0360 U	0.0350 U	0.0350 U	0.103 U	0.105 U
BHC (alpha)	0.0540 U	0.0530 U	0.0520 U	0.0470 U	0.0480 U
BHC (beta)	0.0600 U	0.0590 U	0.0580 U	0.0430 U	0.0440 U
BHC (delta)	0.0440 U	0.0430 U	0.0430 U	0.0490 U	0.0500 U
BHC (gamma) Lindane	0.0420 U	0.0410 U	0.0410 U	0.0430 U	0.0440 U
Chlordane (alpha)	0.0300 U	0.0290 U	0.0290 U	0.0580 U	0.0590 U
Chlordane (gamma)	0.0380 U	0.0370 U	0.0370 U	0.111 U	0.113 U
Dieldrin	6.20 U	3.50 U	0.0580 U	0.0820 U	0.0830 U
Endosulfan I	0.0540 U	0.0530 U	0.0520 U	0.0470 U	0.0480 U
Endosulfan II	0.123 U	0.121 U	0.120 U	0.119 U	0.121 U
Endosulfan Sulfate	4.50 U	0.164 U	0.163 U	0.0970 U	0.0990 U
Endrin	0.0600 U	0.0590 U	0.0580 U	0.0890 U	0.0910 U
Endrin Aldehyde	5.10 U	2.60 U	0.111 U	0.196 U	0.200 U
Endrin Ketone	0.203 U	0.200 U	0.198 U	0.136 U	0.139 U
Heptachlor	0.0440 U	0.0430 U	0.0430 U	0.0820 U	0.0830 U
Heptachlor Epoxide	0.0440 U	0.0430 U	0.0430 U	0.0490 U	0.0500 U
Methoxychlor	0.597 U	0.587 U	0.582 U	0.642 U	0.653 U
Toxaphene	4.48 U	4.40 U	4.37 U	4.86 U	4.95 U
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	5.00 U	4.90 U	4.90 U	4.80 U	4.90 U
1,2-Dichlorobenzene	5.20 U	5.00 U	5.10 U	5.00 U	5.10 U
1,3-Dichlorobenzene	4.80 U	4.70 U	4.70 U	4.70 U	4.70 U
1,4-Dichlorobenzene	5.20 U	5.00 U	5.10 U	5.00 U	5.10 U
2,4,5-Trichlorophenol	7.90 U	7.80 U	7.80 U	7.80 U	7.90 U
2,4,6-Trichlorophenol	6.70 U	6.60 U	6.60 U	6.60 U	6.70 U
2,4-Dichlorophenol	9.90 U	9.70 U	9.80 U	9.70 U	9.90 U
2,4-Dimethylphenol	9.50 U	9.30 U	9.40 U	9.30 U	9.50 U
2,4-Dinitrophenol	100 U	98.0 U	99.0 U	98.0 U	100 U
2,4-Dinitrotoluene	5.40 U	5.20 U	5.30 U	5.20 U	5.30 U
2,6-Dinitrotoluene	5.00 U	4.90 U	4.90 U	4.80 U	4.90 U
2-Chloronaphthalene	5.80 U	5.60 U	5.70 U	5.60 U	5.70 U
2-Chlorophenol	6.50 U	6.40 U	6.40 U	6.40 U	6.50 U
2-Methylnaphthalene	5.00 U	4.90 U	4.90 U	4.80 U	4.90 U
2-Methylphenol	6.70 U	6.60 U	6.60 U	6.60 U	6.70 U
2-Nitroaniline	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U
2-Nitrophenol	9.70 U	9.50 U	9.60 U	9.50 U	9.70 U

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S1-41	S1-41 DUP	S1-42	S1-43	S1-44
Sample ID	030313S141SD	030313S1139SD	030313S142SD	030321S143SD	030321S144SD
Sample Date	3/13/2003	3/13/2003	3/13/2003	3/21/2003	3/21/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	34.0 U	34.0 U	34.0 U	34.0 U	34.0 U
3-Nitroaniline	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
4,6-Dinitro-2-methylphenol	170 U	160 U	170 U	160 U	170 U
4-Bromophenyl Phenyl Ether	6.30 U	6.20 U	6.20 U	6.20 U	6.30 U
4-Chloro-3-methylphenol	9.30 U	9.10 U	9.20 U	9.10 U	9.30 U
4-Chloroaniline	14.0 U	14.0 U	14.0 U	14.0 U	14.0 U
4-Chlorophenyl Phenyl Ether	9.90 U	9.70 U	9.80 U	9.70 U	9.90 U
4-Nitroaniline	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U
4-Nitrophenol	18.0 U	18.0 U	18.0 U	18.0 U	18.0 U
Acenaphthene	5.20 U	5.00 U	5.10 U	**20.0**	5.10 U
Acenaphthylene	4.60 U	4.50 U	4.50 U	4.50 U	4.50 U
Aniline	6.20 U	6.00 U	20.0 U	6.00 U	6.10 U
Anthracene	4.80 U	4.70 U	4.70 U	**140**	4.70 U
Benzo(a)anthracene	**15.0 J**	**34.0**	**22.0**	**890**	**13.0 J**
Benzo(a)pyrene	**36.0**	**30.0**	**20.0**	**420**	3.90 U
Benzo(b)fluoranthene	**15.0 J**	**34.0**	**29.0**	**510**	8.10 U
Benzo(g,h,i)perylene	5.40 U	5.20 U	5.30 U	**100**	5.30 U
Benzo(k)fluoranthene	**16.0 J**	**40.0**	**130 J**	**420**	11.0 U
Benzoic Acid	160 U	160 U	160 U	160 U	160 U
Benzyl Alcohol	20.0 U	19.0 U	20.0 U	19.0 U	20.0 U
Bis(2-chloroethoxy)methane	4.80 U	4.70 U	4.70 U	4.70 U	4.70 U
Bis(2-chloroethyl) Ether	6.70 U	6.60 U	6.60 U	6.60 U	6.70 U
Bis(2-chloroisopropyl) Ether	5.80 U	5.60 U	5.70 U	5.60 U	5.70 U
Bis(2-ethylhexyl) Phthalate	**44.0**	**36.0**	**86.0**	**3,800**	**570**
Butyl Benzyl Phthalate	5.00 U	4.90 U	4.90 U	4.80 U	4.90 U
Carbazole	4.80 U	4.70 U	4.70 U	**120**	4.70 U
Chrysene	**41.0**	**36.0**	**27.0**	**1,200**	**15.0 J**
Dibenz(a,h)anthracene	5.80 U	5.60 U	5.70 U	**42.0**	5.70 U
Dibenzofuran	5.00 U	4.90 U	4.90 U	4.80 U	4.90 U
Diethyl Phthalate	8.70 U	8.50 U	8.60 U	8.50 U	8.70 U
Dimethyl Phthalate	5.20 U	5.00 U	5.10 U	5.00 U	5.10 U
Di-n-butyl Phthalate	5.80 U	5.60 U	5.70 U	**87.0**	5.70 U
Di-n-octyl Phthalate	8.10 U	8.00 U	8.00 U	7.90 U	8.10 U
Fluoranthene	**51.0**	**40.0**	**36.0**	**1,700**	**18.0 J**
Fluorene	6.70 U	6.60 U	6.60 U	6.60 U	6.70 U
Hexachlorobenzene	5.60 U	5.40 U	5.50 U	5.40 U	5.50 U
Hexachlorobutadiene	6.70 U	6.60 U	6.60 U	6.60 U	6.70 U
Hexachlorocyclopentadiene	29.0 U	29.0 U	29.0 U	29.0 U	29.0 U
Hexachloroethane	7.50 U	7.40 U	7.40 U	7.40 U	7.50 U
Indeno(1,2,3-cd)pyrene	6.00 U	5.80 U	5.90 U	**140**	5.90 U
Isophorone	6.30 U	6.20 U	6.20 U	6.20 U	6.30 U
Naphthalene	5.20 U	5.00 U	5.10 U	5.00 U	5.10 U
Nitrobenzene	6.00 U	5.80 U	5.90 U	5.80 U	5.90 U
N-Nitrosodimethylamine	40.0 U	39.0 U	40.0 U	39.0 U	40.0 U
N-Nitrosodi-n-propylamine	7.10 U	7.00 U	7.00 U	7.00 U	7.10 U
N-Nitrosodiphenylamine	6.90 U	6.80 U	6.80 U	6.80 U	6.90 U
p-cresol (4-Methylphenol)	6.70 U	6.60 U	**36.0**	6.60 U	6.70 U
Pentachlorophenol	43.0 U	42.0 U	43.0 U	42.0 U	43.0 U
Phenanthrene	4.60 U	4.50 U	4.50 U	**510**	4.50 U
Phenol	6.50 U	6.40 U	6.40 U	6.40 U	6.50 U
Pyrene	**44.0**	**38.0**	**32.0**	**2,000**	**19.0 J**
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.800**	**1.30**	**0.280**	**0.400**	**1.20**
Solids, Total	**61.5**	**57.6**	**70.8**	**75.2**	**42.3**
Gravel	**2.60**	**3.20**	**4.90**	**1.50**	**0.400**
Sand, Coarse	**5.00**	**6.80**	**14.6**	**3.60**	**0.300**
Sand, Medium	**3.50**	**2.90**	**29.6**	**63.3**	**2.30**
Sand, Fine	**35.0**	**38.9**	**21.0**	**17.2**	**32.4**
Sand	**43.5**	**48.6**	**65.2**	**84.1**	**35.0**
Silt	**49.7**	**43.0**	**28.2**	**13.1**	**49.7**
Clay	**4.10**	**5.10**	**1.70**	**1.30**	**14.8**
Fines	**53.8**	**48.1**	**29.9**	**14.4**	**64.5**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S1-44 DUP	S1-45	S1-46	S1-47	S1-48
Sample ID	030321S1141SD	030325S145SD	030325S146SD	030319S147SD	030319S148SD
Sample Date	3/21/2003	3/25/2003	3/25/2003	3/19/2003	3/19/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.200 U	0.200 U	1.02 U	1.02 U	1.02 U
Aroclor 1221	0.210 U	0.200 U	1.02 U	1.02 U	1.03 U
Aroclor 1232	0.480 U	0.510 U	2.61 U	2.61 U	2.61 U
Aroclor 1242	0.170 U	0.620 U	3.20 U	3.20 U	3.20 U
Aroclor 1248	0.540 U	0.550 U	2.82 U	2.82 U	2.82 U
Aroclor 1254	**24.0**	**150**	**22,000**	**2,400**	**2,900**
Aroclor 1260	**9.20**	0.340 U	379 U	65.5 U	62.0 U
Metals (mg/kg dry)					
Aluminum	**17,000**	**24,400**	**14,600**	**16,300**	**13,800**
Antimony	R	R	R	R	R
Arsenic	**4.00**	**3.10**	**5.50**	**6.80**	**3.30**
Barium	**152**	**75.8**	**121**	**130**	**126**
Beryllium	**0.400**	**0.400**	**0.300**	**0.300**	**0.200**
Cadmium	0.600 U	0.400 U	**0.600**	0.300 U	0.300 U
Calcium	**6,420**	**11,800**	**6,430**	**6,940**	**5,620**
Chromium	**26.0**	**31.7**	**18.9**	**22.8**	**25.9**
Cobalt	**10.9**	**22.9**	**9.80**	**10.4**	**9.70**
Copper	**27.6**	**46.1**	**35.9**	**31.5**	**28.0**
Iron	**25,800**	**38,900**	**30,100**	**32,000**	**23,800**
Lead	**14.0**	**8.10**	**16.5**	**35.0**	**10.4**
Magnesium	**5,350**	**16,600**	**7,670**	**6,830**	**5,900**
Manganese	**624**	**630**	**370**	**501**	**344**
Mercury	**0.160**	0.0400 U	**0.0300**	**0.100**	0.0300 U
Nickel	**20.0**	**47.0**	**17.0**	**18.0**	**16.0**
Potassium	**1,730**	**640**	**870**	**1,130**	**770**
Selenium	0.600 U	0.400 U	0.300 U	0.300 U	0.300 U
Silver	0.900 U	0.600 U	0.400 U	0.500 U	0.400 U
Sodium	**690**	**1,700**	**690**	**770**	**530**
Thallium	**0.400**	**0.300**	**0.400**	**0.300**	**0.200**
Vanadium	**63.5**	**89.9**	**51.8**	**65.5**	**62.5**
Zinc	**157**	**83.0**	**98.6**	**123**	**75.4**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	**6.20**	2.30 U	**6.50**	2.30 U	**9.60**
Residual Range Organics	**19.0**	5.00 U	**14.0 L**	**11.0 O**	**14.0 O**
Butyltins (µg/kg dry)					
Dibutyltin dichloride	5.90 U	5.80 U	5.80 U	5.90 U	5.80 U
Monobutyltin trichloride	5.90 U	5.80 U	5.80 U	5.90 U	5.80 U
Tetrabutyltin	5.90 U	5.80 U	5.80 U	5.90 U	5.80 U
Tributyltin chloride	5.90 U	5.80 U	5.80 U	5.90 U	5.80 U
Pesticides (µg/kg dry)					
4,4'-DDD	0.116 U	0.0870 U	43.6 U	0.114 U	0.465 U
4,4'-DDE	2.00 U	0.0750 U	7,100 U	1.90 U	7.90 U
4,4'-DDT	0.192 U	0.133 U	66.8 U	0.190 U	0.772 U
Aldrin	0.104 U	0.0350 U	17.4 U	0.103 U	0.417 U
BHC (alpha)	0.0470 U	0.0520 U	26.2 U	0.0470 U	0.189 U
BHC (beta)	0.0430 U	0.0580 U	29.1 U	0.0430 U	0.173 U
BHC (delta)	0.0490 U	0.0420 U	21.3 U	0.0480 U	0.197 U
BHC (gamma) Lindane	0.0430 U	0.0400 U	20.3 U	0.0430 U	0.173 U
Chlordane (alpha)	0.0590 U	0.0290 U	740 U	0.970 U	3.90 U
Chlordane (gamma)	0.112 U	0.0370 U	18.4 U	0.110 U	0.449 U
Dieldrin	0.0820 U	0.0580 U	5,800 U	1.90 U	7.90 U
Endosulfan I	0.0470 U	0.0520 U	26.2 U	0.0470 U	0.189 U
Endosulfan II	0.120 U	0.119 U	60.1 U	0.118 U	0.481 U
Endosulfan Sulfate	0.0980 U	0.162 U	2,300 U	0.0970 U	7.90 U
Endrin	0.0900 U	0.0580 U	29.1 U	0.0890 U	9.90 U
Endrin Aldehyde	0.198 U	0.110 U	4,000 U	1.90 U	7.90 U
Endrin Ketone	0.137 U	0.196 U	98.8 U	0.136 U	0.551 U
Heptachlor	0.0820 U	0.0420 U	21.3 U	0.0810 U	0.331 U
Heptachlor Epoxide	0.0490 U	0.0420 U	21.3 U	0.0480 U	0.197 U
Methoxychlor	0.648 U	0.578 U	291 U	0.640 U	2.60 U
Toxaphene	4.91 U	4.33 U	2,180 U	4.84 U	19.7 U
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	4.90 U	4.80 U	4.90 U	4.80 U	4.80 U
1,2-Dichlorobenzene	5.10 U	5.00 U	5.10 U	5.00 U	5.00 U
1,3-Dichlorobenzene	4.70 U	4.60 U	4.70 U	4.70 U	4.60 U
1,4-Dichlorobenzene	5.10 U	5.00 U	5.10 U	5.00 U	5.00 U
2,4,5-Trichlorophenol	7.80 U	7.70 U	7.80 U	7.80 U	7.70 U
2,4,6-Trichlorophenol	6.60 U	6.60 U	6.70 U	6.60 U	6.60 U
2,4-Dichlorophenol	9.70 U	9.70 U	9.80 U	9.70 U	9.70 U
2,4-Dimethylphenol	9.30 U	9.30 U	9.40 U	9.30 U	9.30 U
2,4-Dinitrophenol	99.0 U	98.0 U	99.0 U	98.0 U	98.0 U
2,4-Dinitrotoluene	5.30 U	5.20 U	5.30 U	5.20 U	5.20 U
2,6-Dinitrotoluene	4.90 U	4.80 U	4.90 U	4.80 U	4.80 U
2-Chloronaphthalene	5.60 U	5.60 U	5.70 U	5.60 U	5.60 U
2-Chlorophenol	6.40 U	6.40 U	6.50 U	6.40 U	6.40 U
2-Methylnaphthalene	4.90 U	4.80 U	4.90 U	4.80 U	4.80 U
2-Methylphenol	6.60 U	6.60 U	6.70 U	6.60 U	6.60 U
2-Nitroaniline	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U
2-Nitrophenol	9.50 U	9.50 U	9.60 U	9.50 U	9.50 U

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S1-44 DUP	S1-45	S1-46	S1-47	S1-48
Sample ID	030321S1141SD	030325S145SD	030325S146SD	030319S147SD	030319S148SD
Sample Date	3/21/2003	3/25/2003	3/25/2003	3/19/2003	3/19/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	34.0 U	33.0 U	34.0 U	34.0 U	34.0 U
3-Nitroaniline	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
4,6-Dinitro-2-methylphenol	170 U	160 U	170 U	160 U	160 U
4-Bromophenyl Phenyl Ether	6.20 U	6.20 U	6.30 U	6.20 U	6.20 U
4-Chloro-3-methylphenol	9.20 U	9.10 U	9.20 U	9.10 U	9.10 U
4-Chloroaniline	14.0 U	14.0 U	14.0 U	14.0 U	14.0 U
4-Chlorophenyl Phenyl Ether	9.70 U	9.70 U	9.80 U	9.70 U	9.70 U
4-Nitroaniline	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U
4-Nitrophenol	18.0 U	18.0 U	18.0 U	18.0 U	18.0 U
Acenaphthene	5.10 U	5.00 U	5.10 U	5.00 U	5.00 U
Acenaphthylene	4.50 U	4.40 U	4.50 U	4.50 U	4.50 U
Aniline	6.00 U	6.00 U	6.10 U	6.00 U	6.00 U
Anthracene	4.70 U	4.60 U	4.70 U	4.70 U	4.60 U
Benzo(a)anthracene	**15.0 J**	**26.0**	**28.0**	**13.0 J**	**23.0**
Benzo(a)pyrene	3.90 U	**25.0**	**26.0**	**12.0 J**	**25.0**
Benzo(b)fluoranthene	**15.0 J**	**31.0**	**26.0**	**14.0 J**	**26.0**
Benzo(g,h,i)perylene	5.30 U	**18.0 J**	**17.0 J**	5.20 U	5.20 U
Benzo(k)fluoranthene	**16.0 J**	**30.0**	**24.0**	**14.0 J**	**26.0**
Benzoic Acid	160 U	160 U	160 U	160 U	**300**
Benzyl Alcohol	19.0 U	19.0 U	20.0 U	**22.0**	19.0 U
Bis(2-chloroethoxy)methane	4.70 U	4.60 U	4.70 U	4.70 U	4.60 U
Bis(2-chloroethyl) Ether	6.60 U	6.60 U	6.70 U	6.60 U	6.60 U
Bis(2-chloroisopropyl) Ether	5.60 U	5.60 U	5.70 U	5.60 U	5.60 U
Bis(2-ethylhexyl) Phthalate	**920**	18.0 U	**68.0**	**27.0**	**58.0**
Butyl Benzyl Phthalate	4.90 U	4.80 U	4.90 U	4.80 U	4.80 U
Carbazole	4.70 U	4.60 U	4.70 U	4.70 U	4.60 U
Chrysene	**23.0**	**35.0**	**34.0**	**18.0 J**	**33.0**
Dibenz(a,h)anthracene	5.60 U	5.60 U	5.70 U	5.60 U	5.60 U
Dibenzofuran	4.90 U	4.80 U	4.90 U	4.80 U	4.80 U
Diethyl Phthalate	8.60 U	8.50 U	8.60 U	8.50 U	8.50 U
Dimethyl Phthalate	5.10 U	5.00 U	5.10 U	5.00 U	5.00 U
Di-n-butyl Phthalate	5.60 U	5.60 U	**76.0**	**45.0**	5.60 U
Di-n-octyl Phthalate	8.00 U	7.90 U	8.00 U	8.00 U	7.90 U
Fluoranthene	**39.0**	**52.0**	**54.0**	**23.0**	**47.0**
Fluorene	6.60 U	6.60 U	6.70 U	6.60 U	6.60 U
Hexachlorobenzene	5.50 U	5.40 U	5.50 U	5.40 U	5.40 U
Hexachlorobutadiene	6.60 U	6.60 U	6.70 U	6.60 U	6.60 U
Hexachlorocyclopentadiene	29.0 U	29.0 U	29.0 U	29.0 U	29.0 U
Hexachloroethane	7.40 U	7.30 U	7.50 U	7.40 U	7.40 U
Indeno(1,2,3-cd)pyrene	5.80 U	**17.0 J**	**18.0 J**	5.80 U	5.80 U
Isophorone	6.20 U	6.20 U	6.30 U	6.20 U	6.20 U
Naphthalene	5.10 U	5.00 U	5.10 U	5.00 U	5.00 U
Nitrobenzene	5.80 U	5.80 U	5.90 U	5.80 U	5.80 U
N-Nitrosodimethylamine	40.0 U	39.0 U	40.0 U	97.0 U	39.0 U
N-Nitrosodi-n-propylamine	7.00 U	7.00 U	7.10 U	7.00 U	7.00 U
N-Nitrosodiphenylamine	6.80 U	6.80 U	6.90 U	6.80 U	6.80 U
p-cresol (4-Methylphenol)	6.60 U	6.60 U	6.70 U	6.60 U	6.60 U
Pentachlorophenol	42.0 U	42.0 U	43.0 U	42.0 U	42.0 U
Phenanthrene	**24.0**	**21.0**	**31.0**	**14.0 J**	**38.0**
Phenol	6.40 U	6.40 U	6.50 U	6.40 U	6.40 U
Pyrene	**31.0**	**49.0**	**57.0**	**22.0**	**44.0**
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**2.00**	**0.280**	**1.50**	**1.30**	**1.00**
Solids, Total	**29.6**	**69.3**	**57.0**	**63.5**	**46.5**
Gravel	**0.000**	**68.6**	**48.8**	**21.7**	**6.60**
Sand, Coarse	**0.300**	**10.1**	**27.0**	**2.50**	**7.00**
Sand, Medium	**1.50**	**15.4**	**14.9**	**15.3**	**53.3**
Sand, Fine	**27.3**	**5.20**	**5.00**	**30.3**	**26.9**
Sand	**29.1**	**30.7**	**46.9**	**48.1**	**87.2**
Silt	**52.2**	**0.500**	**3.50**	**26.1**	**4.40**
Clay	**18.7**	**0.200**	**0.700**	**4.20**	**1.70**
Fines	**70.9**	**0.700**	**4.20**	**30.3**	**6.10**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S1-49	S1-50	S1-50 DUP	S1-51	S1-52
Sample ID	030328S149SD	030328S150SD	030328S1142SD	030326S151SD	030324S152SD
Sample Date	3/28/2003	3/28/2003	3/28/2003	3/26/2003	3/24/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	1.00 U	1,120 U	1,101 U	0.200 U	0.200 U
Aroclor 1221	1.00 U	1,115 U	1,099 U	0.200 U	0.200 U
Aroclor 1232	2.52 U	2,902 U	2,805 U	0.520 U	0.510 U
Aroclor 1242	3.10 U	3,500 U	967 U	0.630 U	0.630 U
Aroclor 1248	2.69 U	3,090 U	2,956 U	0.560 U	0.550 U
Aroclor 1254	**25.0**	**690,000**	**520,000**	**24.0**	**15.0**
Aroclor 1260	1.72 U	24,457 U	17,568 U	0.340 U	**5.80**
Metals (mg/kg dry)					
Aluminum	**12,100**	**11,100**	**12,000**	**9,620**	**15,400**
Antimony	R	**0.400 J**	R	R	R
Arsenic	**5.00**	**11.4**	**8.00**	**0.700**	**2.60**
Barium	**113**	**166**	**163**	**50.0**	**144**
Beryllium	**0.200**	**0.300**	**0.300**	0.100 U	**0.300**
Cadmium	0.300 U	0.300 U	0.300 U	0.300 U	0.400 U
Calcium	**5,070**	**5,310**	**6,470**	**5,650**	**7,570**
Chromium	**20.0**	**25.1**	**20.4**	**13.5**	**22.0**
Cobalt	**11.1**	**13.6**	**13.3**	**8.30**	**12.2**
Copper	**34.9**	**53.9**	**62.4**	**30.6**	**22.5**
Iron	**28,600**	**33,300**	**30,500**	**22,000**	**22,500**
Lead	**9.90**	**98.0**	**25.0**	**3.70**	**12.0**
Magnesium	**6,680**	**4,590**	**5,500**	**8,990**	**6,570**
Manganese	**202**	**240**	**234**	**262**	**322**
Mercury	0.0300 U	0.0300 U	0.0300 U	0.0300 U	**0.100**
Nickel	**17.0**	**27.0**	**26.0**	**12.0**	**21.0**
Potassium	**750**	**740**	**750**	**570**	**1,200**
Selenium	0.300 U	0.300 U	0.300 U	0.300 U	0.400 U
Silver	0.500 U	0.400 U	0.400 U	0.400 U	0.600 U
Sodium	**530**	**480**	**620**	**630**	**1,090**
Thallium	**0.200**	**0.400**	**0.200**	0.100 U	**0.500**
Vanadium	**48.8**	**49.8**	**51.7**	**43.1**	**53.9**
Zinc	**66.0**	**158**	**153**	**57.5**	**134**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	**12.0**	**810**	**220**	2.00 U	**14.0**
Residual Range Organics	**43.0 L**	**240 A**	**110**	5.00 U	**42.0 O**
Butyltins (µg/kg dry)					
Dibutyltin dichloride	5.80 U	14.0 U	26.0 U	5.80 U	5.90 U
Monobutyltin trichloride	5.80 U	14.0 U	26.0 U	5.80 U	5.90 U
Tetrabutyltin	5.80 U	14.0 U	26.0 U	5.80 U	5.90 U
Tributyltin chloride	5.80 U	14.0 U	26.0 U	5.80 U	5.90 U
Pesticides (µg/kg dry)					
4,4'-DDD	0.0870 U	87.4 U	177 U	0.0870 U	0.0870 U
4,4'-DDE	16.0 U	9,400 U	9,300 U	0.0750 U	0.0760 U
4,4'-DDT	0.134 U	134 U	272 U	0.133 U	0.134 U
Aldrin	0.0350 U	35.0 U	70.9 U	0.0350 U	0.0350 U
BHC (alpha)	0.0520 U	52.4 U	106 U	0.0520 U	0.0520 U
BHC (beta)	0.0580 U	58.3 U	118 U	0.0580 U	0.0580 U
BHC (delta)	0.0430 U	42.7 U	86.6 U	0.0420 U	0.0430 U
BHC (gamma) Lindane	0.0410 U	40.8 U	82.7 U	0.0400 U	0.0410 U
Chlordane (alpha)	1.60 U	1,100 U	59.1 U	0.0290 U	0.0290 U
Chlordane (gamma)	0.0370 U	36.9 U	74.8 U	0.0370 U	0.0370 U
Dieldrin	13.0 U	58.3 U	118 U	0.0580 U	0.0580 U
Endosulfan I	0.0520 U	52.4 U	106 U	0.0520 U	0.0520 U
Endosulfan II	0.120 U	120 U	244 U	0.119 U	0.120 U
Endosulfan Sulfate	0.163 U	163 U	331 U	0.162 U	0.163 U
Endrin	0.0580 U	58.3 U	118 U	0.0580 U	0.0580 U
Endrin Aldehyde	9.00 U	5,800 U	5,600 U	0.110 U	0.111 U
Endrin Ketone	0.197 U	198 U	402 U	0.196 U	0.198 U
Heptachlor	0.0430 U	42.7 U	86.6 U	0.0420 U	0.0430 U
Heptachlor Epoxide	0.0430 U	42.7 U	86.6 U	0.0420 U	0.0430 U
Methoxychlor	0.581 U	583 U	1,180 U	0.577 U	0.582 U
Toxaphene	4.36 U	4,370 U	8,860 U	4.33 U	4.36 U
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	4.80 U	11.0 U	22.0 U	4.80 U	4.80 U
1,2-Dichlorobenzene	5.00 U	12.0 U	23.0 U	5.00 U	5.00 U
1,3-Dichlorobenzene	4.60 U	11.0 U	21.0 U	4.60 U	4.60 U
1,4-Dichlorobenzene	5.00 U	12.0 U	23.0 U	5.00 U	5.00 U
2,4,5-Trichlorophenol	7.60 U	18.0 U	36.0 U	7.60 U	7.70 U
2,4,6-Trichlorophenol	6.50 U	15.0 U	30.0 U	6.50 U	6.60 U
2,4-Dichlorophenol	9.50 U	23.0 U	45.0 U	9.50 U	9.70 U
2,4-Dimethylphenol	9.20 U	22.0 U	43.0 U	9.20 U	9.30 U
2,4-Dinitrophenol	97.0 U	230 U	450 U	97.0 U	98.0 U
2,4-Dinitrotoluene	5.20 U	12.0 U	24.0 U	5.20 U	5.20 U
2,6-Dinitrotoluene	4.80 U	11.0 U	22.0 U	4.80 U	4.80 U
2-Chloronaphthalene	5.50 U	13.0 U	26.0 U	5.50 U	5.60 U
2-Chlorophenol	6.30 U	15.0 U	29.0 U	6.30 U	6.40 U
2-Methylnaphthalene	4.80 U	11.0 U	22.0 U	4.80 U	4.80 U
2-Methylphenol	6.50 U	15.0 U	30.0 U	6.50 U	6.60 U
2-Nitroaniline	13.0 U	31.0 U	61.0 U	13.0 U	13.0 U
2-Nitrophenol	9.40 U	22.0 U	44.0 U	9.40 U	9.50 U

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S1-49	S1-50	S1-50 DUP	S1-51	S1-52
Sample ID	030328S149SD	030328S150SD	030328S1142SD	030326S151SD	030324S152SD
Sample Date	3/28/2003	3/28/2003	3/28/2003	3/26/2003	3/24/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	33.0 U	78.0 U	150 U	33.0 U	33.0 U
3-Nitroaniline	10.0 U	25.0 U	49.0 U	11.0 U	11.0 U
4,6-Dinitro-2-methylphenol	160 U	380 U	760 U	160 U	160 U
4-Bromophenyl Phenyl Ether	6.10 U	14.0 U	29.0 U	6.10 U	6.20 U
4-Chloro-3-methylphenol	9.00 U	21.0 U	42.0 U	9.00 U	9.10 U
4-Chloroaniline	14.0 U	32.0 U	63.0 U	14.0 U	14.0 U
4-Chlorophenyl Phenyl Ether	9.50 U	23.0 U	45.0 U	9.50 U	9.70 U
4-Nitroaniline	12.0 U	29.0 U	58.0 U	12.0 U	13.0 U
4-Nitrophenol	17.0 U	41.0 U	81.0 U	17.0 U	18.0 U
Acenaphthene	5.00 U	**53.0**	23.0 U	5.00 U	5.00 U
Acenaphthylene	4.40 U	10.0 U	21.0 U	4.40 U	4.40 U
Aniline	5.90 U	14.0 U	28.0 U	5.90 U	6.00 U
Anthracene	4.60 U	**96.0**	21.0 U	4.60 U	4.60 U
Benzo(a)anthracene	**11.0 J**	**1,200**	**110**	5.00 U	**28.0**
Benzo(a)pyrene	**12.0 J**	**1,300**	18.0 U	3.80 U	**24.0**
Benzo(b)fluoranthene	**11.0 J**	**1,400**	**100**	7.80 U	**26.0**
Benzo(g,h,i)perylene	5.20 U	**870**	24.0 U	5.20 U	**13.0 J**
Benzo(k)fluoranthene	11.0 U	**1,300 J**	**130**	11.0 U	**26.0**
Benzoic Acid	160 U	370 U	740 U	160 U	160 U
Benzyl Alcohol	19.0 U	45.0 U	89.0 U	19.0 U	19.0 U
Bis(2-chloroethoxy)methane	4.60 U	11.0 U	21.0 U	4.60 U	4.60 U
Bis(2-chloroethyl) Ether	6.50 U	15.0 U	30.0 U	6.50 U	6.60 U
Bis(2-chloroisopropyl) Ether	5.50 U	13.0 U	26.0 U	5.50 U	5.60 U
Bis(2-ethylhexyl) Phthalate	18.0 U	**180**	85.0 U	18.0 U	**420**
Butyl Benzyl Phthalate	4.80 U	11.0 U	22.0 U	4.80 U	4.80 U
Carbazole	4.60 U	**76.0 J**	21.0 U	4.60 U	4.60 U
Chrysene	**13.0 J**	**1,400**	**140**	5.90 U	**38.0**
Dibenz(a,h)anthracene	5.50 U	**320**	26.0 U	5.50 U	5.60 U
Dibenzofuran	4.80 U	11.0 U	22.0 U	4.80 U	4.80 U
Diethyl Phthalate	8.40 U	20.0 U	39.0 U	8.40 U	8.50 U
Dimethyl Phthalate	5.00 U	12.0 U	23.0 U	5.00 U	5.00 U
Di-n-butyl Phthalate	5.50 U	13.0 U	26.0 U	5.50 U	5.60 U
Di-n-octyl Phthalate	7.80 U	19.0 U	37.0 U	7.80 U	7.90 U
Fluoranthene	**22.0**	**920**	120 U	5.70 U	**60.0**
Fluorene	6.50 U	**29.0 J**	30.0 U	6.50 U	6.60 U
Hexachlorobenzene	5.30 U	13.0 U	25.0 U	5.30 U	5.40 U
Hexachlorobutadiene	6.50 U	15.0 U	30.0 U	6.50 U	6.60 U
Hexachlorocyclopentadiene	28.0 U	67.0 U	130 U	28.0 U	29.0 U
Hexachloroethane	7.30 U	17.0 U	34.0 U	7.30 U	7.30 U
Indeno(1,2,3-cd)pyrene	5.70 U	**960**	27.0 U	5.70 U	**16.0 J**
Isophorone	6.10 U	14.0 U	29.0 U	6.10 U	6.20 U
Naphthalene	5.00 U	12.0 U	23.0 U	5.00 U	5.00 U
Nitrobenzene	5.70 U	14.0 U	27.0 U	5.70 U	5.80 U
N-Nitrosodimethylamine	39.0 U	92.0 U	180 U	39.0 U	39.0 U
N-Nitrosodi-n-propylamine	6.90 U	16.0 U	32.0 U	6.90 U	6.90 U
N-Nitrosodiphenylamine	6.70 U	16.0 U	31.0 U	6.70 U	6.80 U
p-cresol (4-Methylphenol)	**180**	15.0 U	30.0 U	6.50 U	6.60 U
Pentachlorophenol	42.0 U	99.0 U	190 U	42.0 U	42.0 U
Phenanthrene	**15.0 J**	**450**	**120**	4.40 U	**29.0**
Phenol	**24.0**	15.0 U	29.0 U	6.30 U	6.40 U
Pyrene	**19.0**	**940**	120 U	9.90 U	**56.0**
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.300**	**0.370**	**0.490**	**0.130**	**2.30**
Solids, Total	**70.4**	**71.0**	**73.1**	**71.4**	**41.9**
Gravel	**68.2**	**27.7**	**36.1**	**37.0**	**0.400**
Sand, Coarse	**14.8**	**16.5**	**19.2**	**27.6**	**0.600**
Sand, Medium	**13.9**	**43.8**	**34.9**	**29.9**	**2.00**
Sand, Fine	**2.40**	**9.40**	**8.50**	**4.60**	**37.0**
Sand	**31.1**	**69.7**	**62.6**	**62.1**	**39.6**
Silt	**0.300**	**1.60**	**1.00**	**0.600**	**52.7**
Clay	**0.300**	**0.900**	**0.300**	**0.500**	**7.20**
Fines	**0.600**	**2.50**	**1.30**	**1.10**	**59.9**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S2-53	S2-54	S2-55	S2-56	S2-56 DUP
Sample ID	030318S253SD	030318S254SD	030319S255SD	030401S256SD	030401S2144SD
Sample Date	3/18/2003	3/18/2003	3/19/2003	4/1/2003	4/1/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	1.02 U	0.200 U	57.0 U	59.0 U	14.4 U
Aroclor 1221	1.03 U	0.200 U	57.4 U	57.4 U	14.3 U
Aroclor 1232	2.61 U	0.510 U	145 U	145 U	36.8 U
Aroclor 1242	3.20 U	0.630 U	180 U	180 U	12.6 U
Aroclor 1248	2.82 U	0.550 U	161 U	161 U	39.0 U
Aroclor 1254	**1,500**	**65.0**	**3,200**	**3,000 J**	**26,000 J**
Aroclor 1260	1.76 U	0.340 U	96.5 U	99.9 U	24.5 U
Metals (mg/kg dry)					
Aluminum	**16,300**	**16,100**	**12,200**	**13,400**	**13,300**
Antimony	-	-	-	-	-
Arsenic	-	-	-	-	-
Barium	**155**	**86.8**	**128**	**96.7**	**104**
Beryllium	**0.300**	**0.200**	**0.200**	**0.200**	**0.200**
Cadmium	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U
Calcium	-	-	-	-	-
Chromium	**23.6**	**19.7**	**23.0**	**31.6 J**	**18.9 J**
Cobalt	-	-	-	-	-
Copper	**41.5**	**31.9**	**28.4**	**34.7**	**37.4**
Iron	-	-	-	-	-
Lead	**6.10**	**21.0**	**31.0**	**7.30**	**7.10**
Magnesium	-	-	-	-	-
Manganese	-	-	-	-	-
Mercury	-	-	-	-	-
Nickel	**20.0**	**20.0**	**18.0**	**21.0**	**20.0**
Potassium	-	-	-	-	-
Selenium	0.300 U	0.200 U	0.300 U	0.300 U	0.300 U
Silver	-	-	-	-	-
Sodium	-	-	-	-	-
Thallium	0.100 U	**0.300**	**0.300**	**0.200**	**0.300**
Vanadium	-	-	-	-	-
Zinc	**81.5**	**92.2**	**81.5**	**80.3**	**72.9**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	-	-
Residual Range Organics	-	-	-	-	-
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	-	-
Monobutyltin trichloride	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin chloride	-	-	-	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	-	-
4,4'-DDE	-	-	-	-	-
4,4'-DDT	-	-	-	-	-
Aldrin	-	-	-	-	-
BHC (alpha)	-	-	-	-	-
BHC (beta)	-	-	-	-	-
BHC (delta)	-	-	-	-	-
BHC (gamma) Lindane	-	-	-	-	-
Chlordane (alpha)	-	-	-	-	-
Chlordane (gamma)	-	-	-	-	-
Dieldrin	-	-	-	-	-
Endosulfan I	-	-	-	-	-
Endosulfan II	-	-	-	-	-
Endosulfan Sulfate	-	-	-	-	-
Endrin	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	-	-	-	-	-
Heptachlor Epoxide	-	-	-	-	-
Methoxychlor	-	-	-	-	-
Toxaphene	-	-	-	-	-
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-
2-Methylnaphthalene	1.50 U	1.30 U	1.50 U	1.50 U	1.50 U
2-Methylphenol	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S2-53	S2-54	S2-55	S2-56	S2-56 DUP
Sample ID	030318S253SD	030318S254SD	030319S255SD	030401S256SD	030401S2144SD
Sample Date	3/18/2003	3/18/2003	3/19/2003	4/1/2003	4/1/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-
4-Bromophenyl Phenyl Ether	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-
Acenaphthene	2.50 U	2.20 U	2.50 U	2.60 U	2.50 U
Acenaphthylene	1.70 U	1.50 U	1.70 U	1.70 U	1.70 U
Aniline	-	-	-	-	-
Anthracene	1.70 U	1.50 U	1.70 U	1.70 U	1.70 U
Benzo(a)anthracene	2.40 U	2.20 U	**15.0**	2.50 U	2.40 U
Benzo(a)pyrene	2.40 U	2.10 U	**16.0**	2.40 U	2.40 U
Benzo(b)fluoranthene	2.50 U	2.20 U	**14.0**	2.60 U	2.50 U
Benzo(g,h,i)perylene	1.90 U	1.70 U	**13.0**	2.00 U	2.00 U
Benzo(k)fluoranthene	3.30 U	2.90 U	**14.0**	3.40 U	3.30 U
Benzoic Acid	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-
Bis(2-chloroethoxy)methane	-	-	-	-	-
Bis(2-chloroethyl) Ether	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	-	-	-	-	-
Butyl Benzyl Phthalate	-	-	-	-	-
Carbazole	-	-	-	-	-
Chrysene	2.70 U	2.40 U	**18.0**	2.80 U	2.70 U
Dibenz(a,h)anthracene	2.60 U	2.30 U	2.60 U	2.70 U	2.60 U
Dibenzofuran	2.20 U	1.90 U	2.20 U	2.20 U	2.20 U
Diethyl Phthalate	-	-	-	-	-
Dimethyl Phthalate	-	-	-	-	-
Di-n-butyl Phthalate	-	-	-	-	-
Di-n-octyl Phthalate	-	-	-	-	-
Fluoranthene	2.10 U	1.90 U	**31.0**	**15.0**	2.10 U
Fluorene	1.70 U	1.50 U	1.70 U	1.70 U	1.70 U
Hexachlorobenzene	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-
Hexachloroethane	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	2.10 U	1.90 U	**11.0**	2.20 U	2.20 U
Isophorone	-	-	-	-	-
Naphthalene	1.60 U	1.50 U	1.60 U	1.70 U	1.60 U
Nitrobenzene	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-
p-cresol (4-Methylphenol)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-
Phenanthrene	1.90 U	1.70 U	**14.0**	**10.0**	1.90 U
Phenol	-	-	-	-	-
Pyrene	1.90 U	1.70 U	**27.0**	**13.0**	2.00 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.920**	**0.570**	**0.160**	**0.320**	**0.290**
Solids, Total	**71.6**	**74.9**	**75.8**	**73.5**	**71.9**
Gravel	**4.90 J**	**33.9 J**	**12.0 J**	**2.91 J**	**9.77 J**
Sand, Coarse	**9.44 J**	**21.5 J**	**9.38 J**	**10.2 J**	**0.000 J**
Sand, Medium	**44.8 J**	**22.3 J**	**35.8 J**	**69.5 J**	**59.8 J**
Sand, Fine	**26.5 J**	**18.0 J**	**19.9 J**	**15.1 J**	**24.5 J**
Sand	**80.8 J**	**61.8 J**	**65.1 J**	**94.9 J**	**84.3 J**
Silt	**11.7 J**	**3.16 J**	**20.6 J**	**1.25 J**	**4.10 J**
Clay	**2.59 J**	**1.10 J**	**2.35 J**	**0.977 J**	**1.83 J**
Fines	**14.3 J**	**4.26 J**	**22.9 J**	**2.23 J**	**5.93 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S2-57	S2-58	S2-59	S2-60	S2-61
Sample ID	030401S257SD	030324S258SD	030314S259SD	030318S260SD	030318S261SD
Sample Date	4/1/2003	3/24/2003	3/14/2003	3/18/2003	3/18/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.200 U	0.200 U	0.200 U	0.200 U	0.220 U
Aroclor 1221	0.200 U	0.210 U	0.200 U	0.210 U	0.210 U
Aroclor 1232	0.500 U	0.520 U	0.520 U	0.520 U	0.530 U
Aroclor 1242	0.610 U	0.640 U	0.630 U	0.640 U	0.650 U
Aroclor 1248	0.540 U	0.560 U	0.560 U	0.560 U	0.560 U
Aroclor 1254	**150**	**16.0**	**380**	**240**	**120**
Aroclor 1260	0.340 U	0.340 U	0.340 U	0.340 U	0.340 U
Metals (mg/kg dry)					
Aluminum	**13,100**	**18,700**	**23,700**	**21,500**	**19,900**
Antimony	-	-	-	-	-
Arsenic	-	-	-	-	-
Barium	**96.8**	**162**	**204**	**173**	**159**
Beryllium	**0.300**	**0.400**	**0.400**	0.700 U	**0.300**
Cadmium	0.200 U	**0.900**	0.300 U	1.00 U	0.300 U
Calcium	-	-	-	-	-
Chromium	**21.6**	**22.0**	**26.4**	**37.0**	**27.0**
Cobalt	-	-	-	-	-
Copper	**30.1**	**28.6**	**47.8**	**99.0**	**40.1**
Iron	-	-	-	-	-
Lead	**5.80**	**17.0**	**14.1**	**9.40**	**8.60**
Magnesium	-	-	-	-	-
Manganese	-	-	-	-	-
Mercury	-	-	-	-	-
Nickel	**17.0**	**22.0**	**23.0**	**31.0**	**21.0**
Potassium	-	-	-	-	-
Selenium	0.200 U	0.500 U	0.300 U	0.300 U	0.300 U
Silver	-	-	-	-	-
Sodium	-	-	-	-	-
Thallium	**0.200**	0.300 U	0.100 U	0.100 U	**0.300**
Vanadium	-	-	-	-	-
Zinc	**83.4**	**177**	**97.4**	**88.0**	**79.5**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	-	-
Residual Range Organics	-	-	-	-	-
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	-	-
Monobutyltin trichloride	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin chloride	-	-	-	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	-	-
4,4'-DDE	-	-	-	-	-
4,4'-DDT	-	-	-	-	-
Aldrin	-	-	-	-	-
BHC (alpha)	-	-	-	-	-
BHC (beta)	-	-	-	-	-
BHC (delta)	-	-	-	-	-
BHC (gamma) Lindane	-	-	-	-	-
Chlordane (alpha)	-	-	-	-	-
Chlordane (gamma)	-	-	-	-	-
Dieldrin	-	-	-	-	-
Endosulfan I	-	-	-	-	-
Endosulfan II	-	-	-	-	-
Endosulfan Sulfate	-	-	-	-	-
Endrin	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	-	-	-	-	-
Heptachlor Epoxide	-	-	-	-	-
Methoxychlor	-	-	-	-	-
Toxaphene	-	-	-	-	-
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-
2-Methylnaphthalene	1.40 U	2.40 U	1.60 U	1.70 U	1.40 U
2-Methylphenol	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S2-57	S2-58	S2-59	S2-60	S2-61
Sample ID	030401S257SD	030324S258SD	030314S259SD	030318S260SD	030318S261SD
Sample Date	4/1/2003	3/24/2003	3/14/2003	3/18/2003	3/18/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-
4-Bromophenyl Phenyl Ether	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-
Acenaphthene	2.40 U	3.90 U	2.70 U	2.90 U	2.40 U
Acenaphthylene	1.60 U	2.70 U	1.80 U	1.90 U	1.60 U
Aniline	-	-	-	-	-
Anthracene	1.60 U	2.60 U	1.80 U	1.90 U	1.60 U
Benzo(a)anthracene	2.30 U	3.80 U	2.60 U	2.70 U	2.30 U
Benzo(a)pyrene	2.20 U	3.70 U	2.60 U	2.70 U	2.30 U
Benzo(b)fluoranthene	2.40 U	3.90 U	2.70 U	2.90 U	2.40 U
Benzo(g,h,i)perylene	1.80 U	3.10 U	2.10 U	2.20 U	1.90 U
Benzo(k)fluoranthene	3.10 U	5.20 U	3.50 U	3.70 U	3.20 U
Benzoic Acid	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-
Bis(2-chloroethoxy)methane	-	-	-	-	-
Bis(2-chloroethyl) Ether	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	-	14.0 U	-	-	-
Butyl Benzyl Phthalate	-	-	-	-	-
Carbazole	-	-	-	-	-
Chrysene	2.50 U	4.20 U	2.90 U	3.10 U	2.60 U
Dibenz(a,h)anthracene	2.40 U	4.10 U	2.80 U	2.90 U	2.50 U
Dibenzofuran	2.00 U	3.40 U	2.30 U	2.50 U	2.10 U
Diethyl Phthalate	-	-	-	-	-
Dimethyl Phthalate	-	-	-	-	-
Di-n-butyl Phthalate	-	-	-	-	-
Di-n-octyl Phthalate	-	-	-	-	-
Fluoranthene	2.00 U	3.30 U	2.20 U	2.40 U	2.00 U
Fluorene	1.60 U	2.60 U	1.80 U	1.90 U	1.60 U
Hexachlorobenzene	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-
Hexachloroethane	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	2.00 U	3.40 U	2.30 U	2.40 U	2.10 U
Isophorone	-	-	-	-	-
Naphthalene	1.50 U	2.50 U	1.70 U	1.90 U	1.60 U
Nitrobenzene	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-
p-cresol (4-Methylphenol)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-
Phenanthrene	1.80 U	3.00 U	2.10 U	2.20 U	1.90 U
Phenol	-	-	-	-	-
Pyrene	1.80 U	3.10 U	2.10 U	2.20 U	1.90 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.470**	**2.20**	**0.670**	**0.850**	**0.440**
Solids, Total	**77.9**	**31.9**	**72.5**	**65.3**	**74.3**
Gravel	**17.9 J**	**44.7 J**	**12.3 J**	**0.000 J**	**27.5 J**
Sand, Coarse	**34.7 J**	**4.65 J**	**12.3 J**	**3.12 J**	**21.6 J**
Sand, Medium	**26.5 J**	**7.10 J**	**29.9 J**	**29.6 J**	**16.0 J**
Sand, Fine	**13.5 J**	**21.2 J**	**28.0 J**	**49.1 J**	**25.0 J**
Sand	**74.7 J**	**32.9 J**	**70.2 J**	**81.7 J**	**62.5 J**
Silt	**5.70 J**	**16.7 J**	**12.7 J**	**14.6 J**	**7.82 J**
Clay	**1.71 J**	**5.75 J**	**4.81 J**	**3.61 J**	**2.12 J**
Fines	**7.41 J**	**22.4 J**	**17.5 J**	**18.3 J**	**9.94 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S2-62	S2-63	S2-64	S2-65	S2-66
Sample ID	030319S262SD	030403S263SD	030401S264SD	030306S265SD	030324S266SD
Sample Date	3/19/2003	4/3/2003	4/1/2003	3/6/2003	3/24/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.200 U	1.02 U	0.200 U	0.200 U	0.220 U
Aroclor 1221	0.210 U	1.02 U	0.200 U	0.210 U	0.210 U
Aroclor 1232	0.520 U	2.61 U	0.510 U	0.520 U	0.520 U
Aroclor 1242	0.640 U	3.20 U	0.620 U	0.640 U	0.640 U
Aroclor 1248	0.560 U	2.82 U	0.550 U	0.560 U	0.560 U
Aroclor 1254	**2.20**	**3,500**	**3,000**	**77.0**	**86.0**
Aroclor 1260	0.340 U	1.76 U	0.340 U	0.340 U	0.340 U
Metals (mg/kg dry)					
Aluminum	**20,200**	**17,000**	**17,800**	**19,200**	**14,900**
Antimony	-	-	-	-	-
Arsenic	-	-	-	-	-
Barium	**179**	**183**	**156**	**157**	**121**
Beryllium	**0.400**	**0.300**	0.400 U	**0.500**	**0.300**
Cadmium	0.300 U	0.300 U	0.700 U	**0.900**	**0.400**
Calcium	-	-	-	-	-
Chromium	**27.0**	**22.6**	**28.0**	**21.0**	**16.9**
Cobalt	-	-	-	-	-
Copper	**50.5**	**52.3**	**52.5**	**30.5**	**21.4**
Iron	-	-	-	-	-
Lead	**39.0**	**11.5**	**5.10**	**18.0**	**10.8**
Magnesium	-	-	-	-	-
Manganese	-	-	-	-	-
Mercury	-	-	-	-	-
Nickel	**24.0**	**19.0**	**20.0**	**20.0**	**21.0**
Potassium	-	-	-	-	-
Selenium	0.300 U	0.300 U	0.300 U	0.600 U	0.400 U
Silver	-	-	-	-	-
Sodium	-	-	-	-	-
Thallium	0.200 U	**0.400**	**0.300**	0.300 U	0.200 U
Vanadium	-	-	-	-	-
Zinc	**69.1**	**106**	**58.0**	**160**	**136**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	-	-
Residual Range Organics	-	-	-	-	-
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	-	-
Monobutyltin trichloride	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin chloride	-	-	-	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	-	-
4,4'-DDE	-	-	-	-	-
4,4'-DDT	-	-	-	-	-
Aldrin	-	-	-	-	-
BHC (alpha)	-	-	-	-	-
BHC (beta)	-	-	-	-	-
BHC (delta)	-	-	-	-	-
BHC (gamma) Lindane	-	-	-	-	-
Chlordane (alpha)	-	-	-	-	-
Chlordane (gamma)	-	-	-	-	-
Dieldrin	-	-	-	-	-
Endosulfan I	-	-	-	-	-
Endosulfan II	-	-	-	-	-
Endosulfan Sulfate	-	-	-	-	-
Endrin	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	-	-	-	-	-
Heptachlor Epoxide	-	-	-	-	-
Methoxychlor	-	-	-	-	-
Toxaphene	-	-	-	-	-
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-
2-Methylnaphthalene	1.40 U	1.70 U	1.60 U	2.10 U	2.00 U
2-Methylphenol	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S2-62	S2-63	S2-64	S2-65	S2-66
Sample ID	030319S262SD	030403S263SD	030401S264SD	030306S265SD	030324S266SD
Sample Date	3/19/2003	4/3/2003	4/1/2003	3/6/2003	3/24/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-
4-Bromophenyl Phenyl Ether	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-
Acenaphthene	2.40 U	2.80 U	2.60 U	3.60 U	3.40 U
Acenaphthylene	1.60 U	1.90 U	1.80 U	2.40 U	2.30 U
Aniline	-	-	-	-	-
Anthracene	1.60 U	1.80 U	1.70 U	**26.0**	2.20 U
Benzo(a)anthracene	2.30 U	**35.0**	2.50 U	**92.0**	3.20 U
Benzo(a)pyrene	**9.50**	**37.0**	2.50 U	**77.0**	3.20 U
Benzo(b)fluoranthene	2.40 U	**33.0**	2.60 U	**74.0**	3.40 U
Benzo(g,h,i)perylene	1.90 U	**26.0**	2.00 U	**37.0**	2.60 U
Benzo(k)fluoranthene	3.10 U	**32.0**	3.40 U	**77.0**	4.40 U
Benzoic Acid	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-
Bis(2-chloroethoxy)methane	-	-	-	-	-
Bis(2-chloroethyl) Ether	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	-	-	-	**51.0**	-
Butyl Benzyl Phthalate	-	-	-	-	-
Carbazole	-	-	-	-	-
Chrysene	2.60 U	**38.0**	2.80 U	**96.0**	3.60 U
Dibenz(a,h)anthracene	2.50 U	2.80 U	2.70 U	**20.0**	3.50 U
Dibenzofuran	2.10 U	2.40 U	2.20 U	3.10 U	2.90 U
Diethyl Phthalate	-	-	-	-	-
Dimethyl Phthalate	-	-	-	-	-
Di-n-butyl Phthalate	-	-	-	-	-
Di-n-octyl Phthalate	-	-	-	-	-
Fluoranthene	**11.0**	**75.0**	2.20 U	**230**	2.80 U
Fluorene	1.60 U	1.90 U	1.70 U	2.40 U	2.30 U
Hexachlorobenzene	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-
Hexachloroethane	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	2.10 U	**23.0**	2.20 U	**38.0**	2.90 U
Isophorone	-	-	-	-	-
Naphthalene	1.60 U	1.80 U	1.70 U	2.30 U	2.20 U
Nitrobenzene	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-
p-cresol (4-Methylphenol)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-
Phenanthrene	1.80 U	**42.0**	2.00 U	**100**	2.60 U
Phenol	-	-	-	-	-
Pyrene	**10.0**	**60.0**	2.00 U	**140**	2.60 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**1.00**	**1.10**	**0.320**	**1.90**	**1.10**
Solids, Total	**62.7**	**63.0**	**67.8**	**34.8**	**64.9**
Gravel	**21.4 J**	**16.7 J**	**27.8 J**	**3.97 J**	**1.66 J**
Sand, Coarse	**5.99 J**	**7.83 J**	**19.0 J**	**4.73 J**	**2.53 J**
Sand, Medium	**36.6 J**	**37.5 J**	**22.6 J**	**8.67 J**	**2.36 J**
Sand, Fine	**24.8 J**	**29.1 J**	**20.1 J**	**46.9 J**	**73.6 J**
Sand	**67.4 J**	**74.5 J**	**61.7 J**	**60.3 J**	**78.5 J**
Silt	**7.99 J**	**6.15 J**	**8.79 J**	**26.5 J**	**15.6 J**
Clay	**3.20 J**	**2.64 J**	**1.71 J**	**9.22 J**	**4.29 J**
Fines	**11.2 J**	**8.79 J**	**10.5 J**	**35.8 J**	**19.9 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S2-67	S2-67 DUP	S2-68	S2-69	S2-70
Sample ID	030305S267SD	030305S2136SD	030305S268SD	030317S269SD	030314S270SD
Sample Date	3/5/2003	3/5/2003	3/5/2003	3/17/2003	3/14/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	1.02 U	0.200 U	0.200 U	0.200 U	0.200 U
Aroclor 1221	1.02 U	0.200 U	0.200 U	0.200 U	0.200 U
Aroclor 1232	2.61 U	0.510 U	0.520 U	0.510 U	0.510 U
Aroclor 1242	3.20 U	0.180 U	0.630 U	0.620 U	0.620 U
Aroclor 1248	2.82 U	0.550 U	0.560 U	0.550 U	0.550 U
Aroclor 1254	**100**	**120**	**99.0**	**5,800**	**75.0**
Aroclor 1260	1.76 U	0.340 U	0.340 U	0.340 U	0.340 U
Metals (mg/kg dry)					
Aluminum	**12,800**	**12,300**	**18,900**	**18,700**	**23,800**
Antimony	-	-	-	-	-
Arsenic	-	-	-	-	-
Barium	**130**	**119**	**152**	**122**	**218**
Beryllium	**0.300**	**0.300**	**0.400**	**0.500**	0.300 U
Cadmium	**0.400**	**0.400**	**0.900**	**0.300**	0.700 U
Calcium	-	-	-	-	-
Chromium	**16.3**	**16.0**	**21.0**	**17.5**	**29.0**
Cobalt	-	-	-	-	-
Copper	**19.4**	**18.4**	**28.8**	**44.0**	**45.8**
Iron	-	-	-	-	-
Lead	**13.4**	**13.0**	**17.0**	**13.6**	**8.80**
Magnesium	-	-	-	-	-
Manganese	-	-	-	-	-
Mercury	-	-	-	-	-
Nickel	**16.0**	**16.0**	**20.0**	**17.0**	**24.0**
Potassium	-	-	-	-	-
Selenium	0.300 U	0.300 U	0.500 U	0.300 U	0.300 U
Silver	-	-	-	-	-
Sodium	-	-	-	-	-
Thallium	0.100 U	0.200 U	0.300 U	0.200 U	**0.300**
Vanadium	-	-	-	-	-
Zinc	**132**	**126**	**154**	**105**	**87.0**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	-	-
Residual Range Organics	-	-	-	-	-
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	-	-
Monobutyltin trichloride	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin chloride	-	-	-	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	-	-
4,4'-DDE	-	-	-	-	-
4,4'-DDT	-	-	-	-	-
Aldrin	-	-	-	-	-
BHC (alpha)	-	-	-	-	-
BHC (beta)	-	-	-	-	-
BHC (delta)	-	-	-	-	-
BHC (gamma) Lindane	-	-	-	-	-
Chlordane (alpha)	-	-	-	-	-
Chlordane (gamma)	-	-	-	-	-
Dieldrin	-	-	-	-	-
Endosulfan I	-	-	-	-	-
Endosulfan II	-	-	-	-	-
Endosulfan Sulfate	-	-	-	-	-
Endrin	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	-	-	-	-	-
Heptachlor Epoxide	-	-	-	-	-
Methoxychlor	-	-	-	-	-
Toxaphene	-	-	-	-	-
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-
2-Methylnaphthalene	1.70 U	1.70 U	2.10 U	1.70 U	1.60 U
2-Methylphenol	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S2-67	S2-67 DUP	S2-68	S2-69	S2-70
Sample ID	030305S267SD	030305S2136SD	030305S268SD	030317S269SD	030314S270SD
Sample Date	3/5/2003	3/5/2003	3/5/2003	3/17/2003	3/14/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-
4-Bromophenyl Phenyl Ether	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-
Acenaphthene	**18.0**	2.90 U	3.50 U	2.70 U	2.60 U
Acenaphthylene	1.90 U	2.00 U	2.40 U	1.90 U	1.80 U
Aniline	-	-	-	-	-
Anthracene	**20.0**	1.90 U	2.30 U	1.80 U	1.70 U
Benzo(a)anthracene	**140 J**	2.80 UJ	3.30 U	2.60 U	2.50 U
Benzo(a)pyrene	**120 J**	2.80 UJ	3.30 U	2.60 U	2.50 U
Benzo(b)fluoranthene	**100 J**	12.0 UJ	14.0 U	2.70 U	2.60 U
Benzo(g,h,i)perylene	**62.0 J**	2.30 UJ	2.70 U	2.10 U	2.00 U
Benzo(k)fluoranthene	**100 J**	3.80 UJ	4.60 U	3.60 U	3.40 U
Benzoic Acid	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-
Bis(2-chloroethoxy)methane	-	-	-	-	-
Bis(2-chloroethyl) Ether	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	-	-	-	-	-
Butyl Benzyl Phthalate	-	-	-	-	-
Carbazole	-	-	-	-	-
Chrysene	**130 J**	3.10 UJ	3.80 U	3.00 U	2.80 U
Dibenz(a,h)anthracene	25.0 U Z	3.00 UJ	3.60 U	2.80 U	2.70 U
Dibenzofuran	2.40 U	2.50 U	3.00 U	2.40 U	2.20 U
Diethyl Phthalate	-	-	-	-	-
Dimethyl Phthalate	-	-	-	-	-
Di-n-butyl Phthalate	-	-	-	-	-
Di-n-octyl Phthalate	-	-	-	-	-
Fluoranthene	**210 J**	2.40 UJ	2.90 U	2.30 U	2.20 U
Fluorene	**9.00 J Z**	1.90 U	2.30 U	1.80 U	1.70 U
Hexachlorobenzene	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-
Hexachloroethane	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	**60.0 J**	2.50 UJ	3.00 U	2.40 U	2.20 U
Isophorone	-	-	-	-	-
Naphthalene	1.80 U	1.90 U	2.20 U	1.80 U	1.70 U
Nitrobenzene	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-
p-cresol (4-Methylphenol)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-
Phenanthrene	**86.0**	2.20 U	2.70 U	2.10 U	2.00 U
Phenol	-	-	-	-	-
Pyrene	**180 J Z**	2.30 U	2.70 U	2.10 U	2.00 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**1.10**	**0.900**	**0.970**	**0.860**	**0.420**
Solids, Total	**62.5**	**63.4**	**50.2**	**66.5**	**68.7**
Gravel	**0.000 J**	**0.000 J**	**0.000 J**	-	**3.82 J**
Sand, Coarse	**1.11 J**	**0.416 J**	**1.10 J**	-	**6.94 J**
Sand, Medium	**1.71 J**	**0.744 J**	**1.55 J**	-	**16.5 J**
Sand, Fine	**57.3 J**	**62.0 J**	**15.1 J**	-	**48.1 J**
Sand	**60.1 J**	**63.2 J**	**17.8 J**	-	**71.6 J**
Silt	**33.9 J**	**31.3 J**	**69.9 J**	-	**18.3 J**
Clay	**5.99 J**	**5.51 J**	**12.3 J**	-	**6.24 J**
Fines	**39.9 J**	**36.8 J**	**82.2 J**	-	**24.6 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S2-71	S2-72	S2-73	S2-74	S2-75
Sample ID	030314S271SD	030324S272SD	030306S273SD	030305S274SD	030325S275SD
Sample Date	3/14/2003	3/24/2003	3/6/2003	3/5/2003	3/25/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.200 U	0.220 U	0.220 U	0.220 U	0.200 U
Aroclor 1221	0.200 U	0.210 U	0.210 U	0.210 U	0.200 U
Aroclor 1232	0.520 U	0.530 U	0.520 U	0.520 U	0.510 U
Aroclor 1242	0.630 U	0.650 U	0.640 U	0.640 U	0.630 U
Aroclor 1248	0.560 U	0.560 U	0.560 U	0.560 U	0.550 U
Aroclor 1254	**110**	**400**	**320**	**230**	**100**
Aroclor 1260	0.340 U	0.340 U	0.340 U	0.340 U	0.340 U
Metals (mg/kg dry)					
Aluminum	**16,100**	**15,000**	**14,000**	**12,600**	**14,400**
Antimony	-	-	-	-	-
Arsenic	-	-	-	-	-
Barium	**151**	**137**	**132**	**133**	**133**
Beryllium	**0.300**	**0.300**	**0.300**	**0.300**	**0.300**
Cadmium	**0.300**	**0.900**	**0.700**	**0.400**	**0.500**
Calcium	-	-	-	-	-
Chromium	**18.9**	**17.0**	**16.9**	**16.5**	**17.0**
Cobalt	-	-	-	-	-
Copper	**31.8**	**24.9**	**22.8**	**18.9**	**22.2**
Iron	-	-	-	-	-
Lead	**12.1**	**14.0**	**13.4**	**12.9**	**13.5**
Magnesium	-	-	-	-	-
Manganese	-	-	-	-	-
Mercury	-	-	-	-	-
Nickel	**16.0**	**18.0**	**17.0**	**16.0**	**16.0**
Potassium	-	-	-	-	-
Selenium	0.300 U	0.400 U	0.300 U	0.300 U	0.400 U
Silver	-	-	-	-	-
Sodium	-	-	-	-	-
Thallium	**0.200**	0.200 U	**0.200**	0.100 U	0.200 U
Vanadium	-	-	-	-	-
Zinc	**106**	**147**	**143**	**126**	**130**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	-	-
Residual Range Organics	-	-	-	-	-
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	-	-
Monobutyltin trichloride	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin chloride	-	-	-	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	-	-
4,4'-DDE	-	-	-	-	-
4,4'-DDT	-	-	-	-	-
Aldrin	-	-	-	-	-
BHC (alpha)	-	-	-	-	-
BHC (beta)	-	-	-	-	-
BHC (delta)	-	-	-	-	-
BHC (gamma) Lindane	-	-	-	-	-
Chlordane (alpha)	-	-	-	-	-
Chlordane (gamma)	-	-	-	-	-
Dieldrin	-	-	-	-	-
Endosulfan I	-	-	-	-	-
Endosulfan II	-	-	-	-	-
Endosulfan Sulfate	-	-	-	-	-
Endrin	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	-	-	-	-	-
Heptachlor Epoxide	-	-	-	-	-
Methoxychlor	-	-	-	-	-
Toxaphene	-	-	-	-	-
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-
2-Methylnaphthalene	1.40 U	2.60 U	1.70 U	1.60 U	2.00 U
2-Methylphenol	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S2-71	S2-72	S2-73	S2-74	S2-75
Sample ID	030314S271SD	030324S272SD	030306S273SD	030305S274SD	030325S275SD
Sample Date	3/14/2003	3/24/2003	3/6/2003	3/5/2003	3/25/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-
4-Bromophenyl Phenyl Ether	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-
Acenaphthene	2.40 U	4.30 U	2.80 U	2.70 U	3.30 U
Acenaphthylene	1.60 U	2.90 U	1.90 U	1.80 U	2.30 U
Aniline	-	-	-	-	-
Anthracene	1.60 U	2.80 U	1.80 U	1.80 U	2.20 U
Benzo(a)anthracene	**9.50**	4.10 U	2.70 U	2.60 U	3.20 U
Benzo(a)pyrene	**28.0**	4.00 U	2.60 U	2.50 U	3.20 U
Benzo(b)fluoranthene	**37.0**	4.30 U	2.80 U	2.70 U	3.30 U
Benzo(g,h,i)perylene	**24.0**	3.30 U	2.20 U	2.10 U	2.60 U
Benzo(k)fluoranthene	**17.0**	5.60 U	3.60 U	3.50 U	4.40 U
Benzoic Acid	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-
Bis(2-chloroethoxy)methane	-	-	-	-	-
Bis(2-chloroethyl) Ether	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	-	**24.0**	-	-	-
Butyl Benzyl Phthalate	-	-	-	-	-
Carbazole	-	-	-	-	-
Chrysene	**11.0**	4.60 U	3.00 U	2.90 U	3.60 U
Dibenz(a,h)anthracene	**16.0**	4.40 U	2.90 U	2.70 U	3.40 U
Dibenzofuran	2.10 U	3.70 U	2.40 U	2.30 U	2.90 U
Diethyl Phthalate	-	-	-	-	-
Dimethyl Phthalate	-	-	-	-	-
Di-n-butyl Phthalate	-	-	-	-	-
Di-n-octyl Phthalate	-	-	-	-	-
Fluoranthene	**15.0**	3.60 U	**11.0**	2.20 U	2.80 U
Fluorene	1.60 U	2.90 U	1.90 U	1.80 U	2.20 U
Hexachlorobenzene	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-
Hexachloroethane	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	**27.0**	3.70 U	2.40 U	2.30 U	2.90 U
Isophorone	-	-	-	-	-
Naphthalene	1.60 U	2.80 U	1.80 U	1.70 U	2.20 U
Nitrobenzene	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-
p-cresol (4-Methylphenol)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-
Phenanthrene	**9.50**	3.30 U	2.10 U	2.00 U	2.60 U
Phenol	-	-	-	-	-
Pyrene	**11.0**	3.30 U	2.20 U	**10.0**	2.60 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.840**	**1.80**	**1.00**	**0.910**	**1.80**
Solids, Total	**73.2**	**33.8**	**61.6**	**68.1**	**34.3**
Gravel	**19.2 J**	-	**0.000 J**	**0.000 J**	**0.000 J**
Sand, Coarse	**24.2 J**	-	**0.000 J**	**0.313 J**	**0.194 J**
Sand, Medium	**14.2 J**	-	**0.964 J**	**1.21 J**	**1.84 J**
Sand, Fine	**30.0 J**	-	**30.3 J**	**52.3 J**	**48.8 J**
Sand	**68.4 J**	-	**31.3 J**	**53.8 J**	**50.8 J**
Silt	**10.8 J**	-	**62.7 J**	**42.7 J**	**42.7 J**
Clay	**1.58 J**	-	**6.03 J**	**3.48 J**	**6.46 J**
Fines	**12.3 J**	-	**68.7 J**	**46.2 J**	**49.2 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S2-76	S2-77	S2-78	SE-117	TR-1
Sample ID	030313S276SD	030314S277SD	030327S278SD	030305SE117SD	030317TR1SD
Sample Date	3/13/2003	3/14/2003	3/27/2003	3/5/2003	3/17/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.220 U	0.200 U	0.200 U	0.200 U	0.200 U
Aroclor 1221	0.210 U	0.210 U	0.200 U	0.200 U	0.200 U
Aroclor 1232	0.530 U	0.520 U	0.520 U	0.510 U	0.510 U
Aroclor 1242	0.650 U	0.640 U	0.640 U	0.630 U	0.630 U
Aroclor 1248	0.580 U	0.560 U	0.560 U	0.550 U	0.550 U
Aroclor 1254	**41.0**	**50.0**	**1,100**	**540**	**56.0**
Aroclor 1260	0.340 U	0.340 U	0.340 U	0.340 U	0.340 U
Metals (mg/kg dry)					
Aluminum	**17,800**	**17,000**	**14,400**	**15,600**	**22,600**
Antimony	-	-	-	-	-
Arsenic	-	-	-	-	-
Barium	**91.5**	**148**	**162**	**143**	**180**
Beryllium	**0.500**	**0.300**	**0.200**	**0.300**	**0.400**
Cadmium	0.300 U	**0.500**	0.300 U	**0.400**	0.700 U
Calcium	-	-	-	-	-
Chromium	**16.4**	**19.6**	**21.5**	**15.2**	**26.0**
Cobalt	-	-	-	-	-
Copper	**50.6**	**25.7**	**38.0**	**25.9**	**45.7**
Iron	-	-	-	-	-
Lead	**8.40**	**16.9**	**7.00**	**9.60**	**12.0**
Magnesium	-	-	-	-	-
Manganese	-	-	-	-	-
Mercury	-	-	-	-	-
Nickel	**17.0**	**16.0**	**22.0**	**16.0**	**22.0**
Potassium	-	-	-	-	-
Selenium	0.300 U	0.400 U	0.300 U	0.300 U	0.300 U
Silver	-	-	-	-	-
Sodium	-	-	-	-	-
Thallium	**0.300**	**0.400**	**0.200**	0.200 U	**0.300**
Vanadium	-	-	-	-	-
Zinc	**70.7**	**114**	**92.2**	**105**	**117**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	-	-
Residual Range Organics	-	-	-	-	-
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	-	-
Monobutyltin trichloride	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin chloride	-	-	-	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	-	-
4,4'-DDE	-	-	-	-	-
4,4'-DDT	-	-	-	-	-
Aldrin	-	-	-	-	-
BHC (alpha)	-	-	-	-	-
BHC (beta)	-	-	-	-	-
BHC (delta)	-	-	-	-	-
BHC (gamma) Lindane	-	-	-	-	-
Chlordane (alpha)	-	-	-	-	-
Chlordane (gamma)	-	-	-	-	-
Dieldrin	-	-	-	-	-
Endosulfan I	-	-	-	-	-
Endosulfan II	-	-	-	-	-
Endosulfan Sulfate	-	-	-	-	-
Endrin	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	-	-	-	-	-
Heptachlor Epoxide	-	-	-	-	-
Methoxychlor	-	-	-	-	-
Toxaphene	-	-	-	-	-
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-
2-Methylnaphthalene	1.60 U	2.00 U	1.50 U	1.70 U	1.70 U
2-Methylphenol	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	S2-76	S2-77	S2-78	SE-117	TR-1
Sample ID	030313S276SD	030314S277SD	030327S278SD	030305SE117SD	030317TR1SD
Sample Date	3/13/2003	3/14/2003	3/27/2003	3/5/2003	3/17/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-
4-Bromophenyl Phenyl Ether	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-
Acenaphthene	2.70 U	3.30 U	2.50 U	**2.80**	2.80 U
Acenaphthylene	1.80 U	2.20 U	1.70 U	1.90 U	1.90 U
Aniline	-	-	-	-	-
Anthracene	1.80 U	2.20 U	1.60 U	1.90 U	1.80 U
Benzo(a)anthracene	2.60 U	3.20 U	2.40 U	**24.0**	2.70 U
Benzo(a)pyrene	2.60 U	3.10 U	2.30 U	**32.0**	2.60 U
Benzo(b)fluoranthene	2.70 U	3.30 U	2.50 U	**30.0**	2.80 U
Benzo(g,h,i)perylene	2.10 U	2.60 U	1.90 U	**17.0**	2.20 U
Benzo(k)fluoranthene	3.60 U	4.30 U	3.20 U	**22.0**	3.60 U
Benzoic Acid	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-
Bis(2-chloroethoxy)methane	-	-	-	-	-
Bis(2-chloroethyl) Ether	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	-	-	-	10.0 U Z	-
Butyl Benzyl Phthalate	-	-	-	-	-
Carbazole	-	-	-	-	-
Chrysene	2.90 U	3.60 U	2.70 U	**29.0**	3.00 U
Dibenz(a,h)anthracene	2.80 U	3.40 U	2.50 U	2.90 U	2.90 U
Dibenzofuran	2.30 U	2.90 U	2.10 U	2.50 U	2.40 U
Diethyl Phthalate	-	-	-	-	-
Dimethyl Phthalate	-	-	-	-	-
Di-n-butyl Phthalate	-	-	-	-	-
Di-n-octyl Phthalate	-	-	-	-	-
Fluoranthene	2.30 U	2.80 U	2.00 U	**47.0**	2.30 U
Fluorene	1.80 U	2.20 U	1.60 U	1.90 U	1.90 U
Hexachlorobenzene	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-
Hexachloroethane	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	2.30 U	2.80 U	2.10 U	**17.0**	2.40 U
Isophorone	-	-	-	-	-
Naphthalene	1.80 U	2.10 U	1.60 U	1.80 U	1.80 U
Nitrobenzene	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-
p-cresol (4-Methylphenol)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-
Phenanthrene	2.10 U	2.50 U	1.90 U	**36.0**	2.10 U
Phenol	-	-	-	-	-
Pyrene	2.10 U	2.60 U	1.90 U	**45.0**	2.20 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.340**	**0.940**	**0.540**	**1.20**	**1.00**
Solids, Total	**72.5**	**65.6**	**71.0**	**63.5**	**73.5**
Gravel	**2.36 J**	**33.3 J**	**24.7 J**	**1.78 J**	**70.8 J**
Sand, Coarse	**8.48 J**	**19.3 J**	**16.5 J**	**0.889 J**	**3.30 J**
Sand, Medium	**47.0 J**	**1.86 J**	**19.0 J**	**3.40 J**	**6.60 J**
Sand, Fine	**26.5 J**	**3.97 J**	**28.8 J**	**60.4 J**	**8.52 J**
Sand	**82.0 J**	**25.1 J**	**64.4 J**	**64.7 J**	**18.4 J**
Silt	**13.0 J**	**39.3 J**	**9.55 J**	**27.7 J**	**9.56 J**
Clay	**2.61 J**	**2.30 J**	**1.34 J**	**5.89 J**	**1.19 J**
Fines	**15.6 J**	**41.6 J**	**10.9 J**	**33.6 J**	**10.8 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	TR-10	TR-11	TR-12	TR-13	TR-13 DUP
Sample ID	030331TR10SD	030327TR11SD	030404TR12SD	030331TR13SD	030331TR143SD
Sample Date	3/31/2003	3/27/2003	4/4/2003	3/31/2003	3/31/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.200 U	1.00 U	0.200 U	0.200 U	0.200 U
Aroclor 1221	0.200 U	1.02 U	0.210 U	0.200 U	0.200 U
Aroclor 1232	0.510 U	2.61 U	0.520 U	0.520 U	0.520 U
Aroclor 1242	0.630 U	3.10 U	0.640 U	0.630 U	0.180 U
Aroclor 1248	0.550 U	2.82 U	0.560 U	0.560 U	0.560 U
Aroclor 1254	**3.10**	**430**	**6.80**	**2.70**	**0.900 J**
Aroclor 1260	0.340 U	1.72 U	0.340 U	0.340 U	0.340 U
Metals (mg/kg dry)					
Aluminum	**11,300**	**14,100**	**13,800**	**8,100**	**9,570**
Antimony	-	-	-	-	-
Arsenic	-	-	-	-	-
Barium	**52.1**	**117**	**100**	**25.3**	**26.2**
Beryllium	0.100 U	**0.200**	**0.200**	0.100 U	0.100 U
Cadmium	0.200 U	0.300 U	0.300 U	0.200 U	0.200 U
Calcium	-	-	-	-	-
Chromium	**14.7**	**22.4**	**17.5**	**11.6**	**12.5**
Cobalt	-	-	-	-	-
Copper	**28.8**	**25.8**	**29.0**	**34.2**	**40.8**
Iron	-	-	-	-	-
Lead	**4.80 J**	**6.90 J**	**6.00 J**	**3.70 J**	**4.80 J**
Magnesium	-	-	-	-	-
Manganese	-	-	-	-	-
Mercury	-	-	-	-	-
Nickel	**15.0**	**17.0**	**16.0**	**12.0**	**14.0**
Potassium	-	-	-	-	-
Selenium	**0.800**	0.300 U	**0.600**	0.200 U	0.300 U
Silver	-	-	-	-	-
Sodium	-	-	-	-	-
Thallium	0.100 U	0.100 U	**0.100**	0.100 U	**0.200**
Vanadium	-	-	-	-	-
Zinc	**77.9**	**81.8**	**80.7**	**57.0**	**62.5**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	-	-
Residual Range Organics	-	-	-	-	-
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	-	-
Monobutyltin trichloride	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin chloride	-	-	-	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	-	-
4,4'-DDE	-	-	-	-	-
4,4'-DDT	-	-	-	-	-
Aldrin	-	-	-	-	-
BHC (alpha)	-	-	-	-	-
BHC (beta)	-	-	-	-	-
BHC (delta)	-	-	-	-	-
BHC (gamma) Lindane	-	-	-	-	-
Chlordane (alpha)	-	-	-	-	-
Chlordane (gamma)	-	-	-	-	-
Dieldrin	-	-	-	-	-
Endosulfan I	-	-	-	-	-
Endosulfan II	-	-	-	-	-
Endosulfan Sulfate	-	-	-	-	-
Endrin	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	-	-	-	-	-
Heptachlor Epoxide	-	-	-	-	-
Methoxychlor	-	-	-	-	-
Toxaphene	-	-	-	-	-
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-
2-Methylnaphthalene	1.40 U	1.40 U	1.40 U	1.30 U	1.30 U
2-Methylphenol	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	TR-10	TR-11	TR-12	TR-13	TR-13 DUP
Sample ID	030331TR10SD	030327TR11SD	030404TR12SD	030331TR13SD	030331TR143SD
Sample Date	3/31/2003	3/27/2003	4/4/2003	3/31/2003	3/31/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-
4-Bromophenyl Phenyl Ether	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-
Acenaphthene	2.40 U	2.30 U	2.30 U	2.20 U	2.10 U
Acenaphthylene	1.60 U	1.60 U	1.60 U	1.50 U	1.40 U
Aniline	-	-	-	-	-
Anthracene	1.60 U	1.50 U	1.50 U	1.50 U	1.40 U
Benzo(a)anthracene	2.30 U	2.20 U	2.20 U	2.10 U	2.00 U
Benzo(a)pyrene	2.30 U	2.20 U	2.20 U	2.10 U	2.00 U
Benzo(b)fluoranthene	2.40 U	2.30 U	2.30 U	2.20 U	2.10 U
Benzo(g,h,i)perylene	1.90 U	1.80 U	1.80 U	1.70 U	1.60 U
Benzo(k)fluoranthene	3.10 U	3.00 U	3.00 U	2.90 U	2.80 U
Benzoic Acid	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-
Bis(2-chloroethoxy)methane	-	-	-	-	-
Bis(2-chloroethyl) Ether	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	-	-	-	-	-
Butyl Benzyl Phthalate	-	-	-	-	-
Carbazole	-	-	-	-	-
Chrysene	2.60 U	2.50 U	2.50 U	2.40 U	2.30 U
Dibenz(a,h)anthracene	2.50 U	2.40 U	2.40 U	2.30 U	2.20 U
Dibenzofuran	2.10 U	2.00 U	2.00 U	1.90 U	1.80 U
Diethyl Phthalate	-	-	-	-	-
Dimethyl Phthalate	-	-	-	-	-
Di-n-butyl Phthalate	-	-	-	-	-
Di-n-octyl Phthalate	-	-	-	-	-
Fluoranthene	2.00 U	1.90 U	1.90 U	1.80 U	1.80 U
Fluorene	1.60 U	1.60 U	1.60 U	1.50 U	1.40 U
Hexachlorobenzene	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-
Hexachloroethane	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	2.00 U	2.00 U	2.00 U	1.90 U	1.80 U
Isophorone	-	-	-	-	-
Naphthalene	1.50 U	1.50 U	1.50 U	1.40 U	1.40 U
Nitrobenzene	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-
p-cresol (4-Methylphenol)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-
Phenanthrene	1.80 U	1.80 U	1.80 U	1.70 U	1.60 U
Phenol	-	-	-	-	-
Pyrene	1.90 U	1.80 U	1.80 U	1.70 U	1.60 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.160**	**0.480**	**0.360**	**0.140**	**0.150**
Solids, Total	**83.4**	**73.0**	**72.9**	**75.8**	**80.1**
Gravel	**55.2 J**	**42.3 J**	**24.0 J**	**36.1 J**	**40.5 J**
Sand, Coarse	**25.8 J**	**9.79 J**	**11.9 J**	**10.5 J**	**12.4 J**
Sand, Medium	**16.9 J**	**25.2 J**	**31.6 J**	**30.6 J**	**32.4 J**
Sand, Fine	**1.34 J**	**14.1 J**	**27.5 J**	**11.1 J**	**11.7 J**
Sand	**44.0 J**	**49.1 J**	**71.0 J**	**52.3 J**	**56.6 J**
Silt	**0.793 J**	**8.62 J**	**4.65 J**	**9.94 J**	**1.85 J**
Clay	**0.000 J**	**0.000 J**	**0.423 J**	**1.63 J**	**1.11 J**
Fines	**0.793 J**	**8.62 J**	**5.07 J**	**11.6 J**	**2.96 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	TR-14	TR-15	TR-16	TR-17	TR-18
Sample ID	030331TR14SD	030320TR15SD	030320TR16SD	030306TR17SD	030306TR18SD
Sample Date	3/31/2003	3/20/2003	3/20/2003	3/20/2003	3/6/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.220 U	0.200 U	0.200 U	0.200 U	0.220 U
Aroclor 1221	0.210 U	0.200 U	0.210 U	0.210 U	0.210 U
Aroclor 1232	0.520 U	0.520 U	0.520 U	0.520 U	0.530 U
Aroclor 1242	0.640 U	0.630 U	0.640 U	0.640 U	0.650 U
Aroclor 1248	0.560 U	0.560 U	0.560 U	0.560 U	0.560 U
Aroclor 1254	**1.80**	**17.0**	**18.0**	**960**	**1,900**
Aroclor 1260	0.340 U	0.340 U	0.340 U	0.340 U	0.340 U
Metals (mg/kg dry)					
Aluminum	**9,670**	**12,700**	**25,800**	**15,200**	**15,100**
Antimony	-	-	-	-	-
Arsenic	-	-	-	-	-
Barium	**283**	**130**	**224**	**118**	**140**
Beryllium	0.100 U	**0.200**	**0.600**	**0.300**	**0.300**
Cadmium	0.300 U	**0.600**	**1.20**	**0.700**	**0.600**
Calcium	-	-	-	-	-
Chromium	**14.4**	**30.1**	**29.0**	**15.0**	**17.0**
Cobalt	-	-	-	-	-
Copper	**27.6**	**38.5**	**38.4**	**24.1**	**21.4**
Iron	-	-	-	-	-
Lead	**3.70 J**	**21.5**	**23.0 J**	**15.0 J**	**17.6 J**
Magnesium	-	-	-	-	-
Manganese	-	-	-	-	-
Mercury	-	-	-	-	-
Nickel	**13.0**	**19.0**	**28.0**	**15.0**	**17.0**
Potassium	-	-	-	-	-
Selenium	0.300 U	0.300 U	0.900 U	0.500 U	0.400 U
Silver	-	-	-	-	-
Sodium	-	-	-	-	-
Thallium	0.100 U	0.200 U	0.400 U	0.200 U	0.200 U
Vanadium	-	-	-	-	-
Zinc	**50.6**	**152**	**226**	**116**	**140**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	-	-
Residual Range Organics	-	-	-	-	-
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	-	-
Monobutyltin trichloride	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin chloride	-	-	-	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	-	-
4,4'-DDE	-	-	-	-	-
4,4'-DDT	-	-	-	-	-
Aldrin	-	-	-	-	-
BHC (alpha)	-	-	-	-	-
BHC (beta)	-	-	-	-	-
BHC (delta)	-	-	-	-	-
BHC (gamma) Lindane	-	-	-	-	-
Chlordane (alpha)	-	-	-	-	-
Chlordane (gamma)	-	-	-	-	-
Dieldrin	-	-	-	-	-
Endosulfan I	-	-	-	-	-
Endosulfan II	-	-	-	-	-
Endosulfan Sulfate	-	-	-	-	-
Endrin	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	-	-	-	-	-
Heptachlor Epoxide	-	-	-	-	-
Methoxychlor	-	-	-	-	-
Toxaphene	-	-	-	-	-
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-
2-Methylnaphthalene	1.80 U	1.70 U	2.00 U	2.10 U	2.20 U
2-Methylphenol	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	TR-14	TR-15	TR-16	TR-17	TR-18
Sample ID	030331TR14SD	030320TR15SD	030320TR16SD	030306TR17SD	030306TR18SD
Sample Date	3/31/2003	3/20/2003	3/20/2003	3/20/2003	3/6/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-
4-Bromophenyl Phenyl Ether	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-
Acenaphthene	2.90 U	2.80 U	3.30 U	3.50 U	3.70 U
Acenaphthylene	2.00 U	1.90 U	2.20 U	2.40 U	2.50 U
Aniline	-	-	-	-	-
Anthracene	1.90 U	1.80 U	2.20 U	2.30 U	2.40 U
Benzo(a)anthracene	2.80 U	**23.0**	3.20 U	**21.0**	3.50 U
Benzo(a)pyrene	2.80 U	**23.0**	3.10 U	**19.0**	3.50 U
Benzo(b)fluoranthene	2.90 U	**24.0**	3.30 U	**25.0**	13.0 U
Benzo(g,h,i)perylene	2.30 U	**15.0**	2.60 U	2.70 U	2.90 U
Benzo(k)fluoranthene	3.90 U	**12.0**	4.30 U	**16.0**	4.80 U
Benzoic Acid	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-
Bis(2-chloroethoxy)methane	-	-	-	-	-
Bis(2-chloroethyl) Ether	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	-	**170**	**40.0**	**170**	**380**
Butyl Benzyl Phthalate	-	-	-	-	-
Carbazole	-	-	-	-	-
Chrysene	3.20 U	**24.0**	3.60 U	**23.0**	**16.0**
Dibenz(a,h)anthracene	3.00 U	2.90 U	3.40 U	3.60 U	3.80 U
Dibenzofuran	2.50 U	2.40 U	2.80 U	3.00 U	3.20 U
Diethyl Phthalate	-	-	-	-	-
Dimethyl Phthalate	-	-	-	-	-
Di-n-butyl Phthalate	-	-	-	-	-
Di-n-octyl Phthalate	-	-	-	-	-
Fluoranthene	2.50 U	**19.0**	2.70 U	**40.0**	3.10 U
Fluorene	2.00 U	1.90 U	2.20 U	2.30 U	2.50 U
Hexachlorobenzene	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-
Hexachloroethane	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	2.50 U	**12.0**	2.80 U	3.00 U	3.10 U
Isophorone	-	-	-	-	-
Naphthalene	1.90 U	1.80 U	2.10 U	2.30 U	2.40 U
Nitrobenzene	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-
p-cresol (4-Methylphenol)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-
Phenanthrene	2.30 U	**13.0**	2.50 U	**21.0**	2.80 U
Phenol	-	-	-	-	-
Pyrene	2.30 U	**18.0**	2.60 U	**34.0**	2.90 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.130**	**0.840**	**1.80**	**1.60**	**1.00**
Solids, Total	**74.8**	**61.9**	**42.4**	**47.4**	**55.8**
Gravel	**48.7 J**	**0.587 J**	**0.000 J**	**0.000 J**	**0.000 J**
Sand, Coarse	**13.8 J**	**0.695 J**	**0.103 J**	**0.235 J**	**0.0699 J**
Sand, Medium	**22.3 J**	**2.73 J**	**2.84 J**	**1.99 J**	**1.84 J**
Sand, Fine	**10.4 J**	**68.6 J**	**45.3 J**	**46.8 J**	**62.2 J**
Sand	**46.5 J**	**72.0 J**	**48.3 J**	**49.0 J**	**64.1 J**
Silt	**3.49 J**	**25.1 J**	**49.7 J**	**46.5 J**	**32.4 J**
Clay	**1.27 J**	**2.29 J**	**2.06 J**	**4.52 J**	**3.49 J**
Fines	**4.76 J**	**27.4 J**	**51.7 J**	**51.0 J**	**35.9 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	TR-19	TR-2	TR-20	TR-21	TR-22
Sample ID	030306TR19SD	030317TR2SD	030306TR20SD	030306TR21SD	030306TR22SD
Sample Date	3/6/2003	3/17/2003	3/6/2003	3/6/2003	3/6/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.200 U	0.200 U	0.220 U	0.200 U	0.200 U
Aroclor 1221	0.200 U	0.200 U	0.210 U	0.200 U	0.200 U
Aroclor 1232	0.510 U	0.510 U	0.530 U	0.510 U	0.510 U
Aroclor 1242	0.620 U	0.630 U	0.640 U	0.620 U	0.620 U
Aroclor 1248	0.550 U	0.550 U	0.560 U	0.550 U	0.550 U
Aroclor 1254	**630**	**410**	**17.0**	**1,300**	**14.0**
Aroclor 1260	0.340 U	0.340 U	0.340 U	0.340 U	0.340 U
Metals (mg/kg dry)					
Aluminum	**13,100**	**16,700**	**21,300**	**15,000**	**16,900**
Antimony	-	-	-	-	-
Arsenic	-	-	-	-	-
Barium	**120**	**127**	**173**	**135**	**151**
Beryllium	**0.300**	0.300 U	**0.500**	**0.300**	**0.400**
Cadmium	**0.500**	0.700 U	**0.700**	**0.500**	**0.600**
Calcium	-	-	-	-	-
Chromium	**18.2**	**23.0**	**21.0**	**17.3**	**20.0**
Cobalt	-	-	-	-	-
Copper	**19.6**	**28.9**	**33.9**	**21.9**	**26.4**
Iron	-	-	-	-	-
Lead	**13.9 J**	**9.70**	**17.7 J**	**13.3 J**	**14.7 J**
Magnesium	-	-	-	-	-
Manganese	-	-	-	-	-
Mercury	-	-	-	-	-
Nickel	**16.0**	**19.0**	**20.0**	**18.0**	**18.0**
Potassium	-	-	-	-	-
Selenium	0.300 U	0.300 U	0.500 U	0.300 U	0.400 U
Silver	-	-	-	-	-
Sodium	-	-	-	-	-
Thallium	0.200 U	**0.300**	0.300 U	0.200 U	0.200 U
Vanadium	-	-	-	-	-
Zinc	**135**	**105**	**152**	**130**	**140**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	-	-
Residual Range Organics	-	-	-	-	-
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	-	-
Monobutyltin trichloride	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin chloride	-	-	-	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	-	-
4,4'-DDE	-	-	-	-	-
4,4'-DDT	-	-	-	-	-
Aldrin	-	-	-	-	-
BHC (alpha)	-	-	-	-	-
BHC (beta)	-	-	-	-	-
BHC (delta)	-	-	-	-	-
BHC (gamma) Lindane	-	-	-	-	-
Chlordane (alpha)	-	-	-	-	-
Chlordane (gamma)	-	-	-	-	-
Dieldrin	-	-	-	-	-
Endosulfan I	-	-	-	-	-
Endosulfan II	-	-	-	-	-
Endosulfan Sulfate	-	-	-	-	-
Endrin	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	-	-	-	-	-
Heptachlor Epoxide	-	-	-	-	-
Methoxychlor	-	-	-	-	-
Toxaphene	-	-	-	-	-
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-
2-Methylnaphthalene	1.60 U	1.40 U	1.60 U	1.60 U	1.90 U
2-Methylphenol	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	TR-19	TR-2	TR-20	TR-21	TR-22
Sample ID	030306TR19SD	030317TR2SD	030306TR20SD	030306TR21SD	030306TR22SD
Sample Date	3/6/2003	3/17/2003	3/6/2003	3/6/2003	3/6/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-
4-Bromophenyl Phenyl Ether	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-
Acenaphthene	2.60 U	2.40 U	2.70 U	2.70 U	3.10 U
Acenaphthylene	1.80 U	1.60 U	1.80 U	1.90 U	2.10 U
Aniline	-	-	-	-	-
Anthracene	1.70 U	1.60 U	1.80 U	1.80 U	2.10 U
Benzo(a)anthracene	2.50 U	2.30 U	2.60 U	2.60 U	3.00 U
Benzo(a)pyrene	2.50 U	2.30 U	2.60 U	2.60 U	3.00 U
Benzo(b)fluoranthene	2.60 U	2.40 U	2.70 U	2.70 U	3.10 U
Benzo(g,h,i)perylene	2.00 U	1.80 U	2.10 U	2.10 U	2.40 U
Benzo(k)fluoranthene	3.40 U	3.10 U	3.60 U	3.60 U	4.10 U
Benzoic Acid	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-
Bis(2-chloroethoxy)methane	-	-	-	-	-
Bis(2-chloroethyl) Ether	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	**320**	-	**22.0**	**11.0**	**14.0**
Butyl Benzyl Phthalate	-	-	-	-	-
Carbazole	-	-	-	-	-
Chrysene	2.80 U	2.60 U	2.90 U	3.00 U	3.40 U
Dibenz(a,h)anthracene	2.70 U	2.40 U	2.80 U	2.80 U	3.20 U
Dibenzofuran	2.20 U	2.10 U	2.30 U	2.40 U	2.70 U
Diethyl Phthalate	-	-	-	-	-
Dimethyl Phthalate	-	-	-	-	-
Di-n-butyl Phthalate	-	-	-	-	-
Di-n-octyl Phthalate	-	-	-	-	-
Fluoranthene	2.20 U	2.00 U	2.30 U	2.30 U	2.60 U
Fluorene	1.70 U	1.60 U	1.80 U	1.80 U	2.10 U
Hexachlorobenzene	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-
Hexachloroethane	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	2.20 U	2.00 U	2.30 U	2.30 U	2.70 U
Isophorone	-	-	-	-	-
Naphthalene	1.70 U	1.50 U	1.80 U	1.80 U	2.00 U
Nitrobenzene	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-
p-cresol (4-Methylphenol)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-
Phenanthrene	2.00 U	1.80 U	2.10 U	2.10 U	2.40 U
Phenol	-	-	-	-	-
Pyrene	2.00 U	1.80 U	2.10 U	2.10 U	2.40 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.750**	**0.720**	**1.80**	**0.580**	**1.60**
Solids, Total	**64.5**	**79.0**	**43.5**	**65.5**	**50.5**
Gravel	**0.000 J**	**6.63 J**	**0.000 J**	**0.000 J**	**0.000 J**
Sand, Coarse	**0.0345 J**	**16.2 J**	**0.300 J**	**0.0344 J**	**0.116 J**
Sand, Medium	**1.50 J**	**40.6 J**	**1.68 J**	**1.89 J**	**2.00 J**
Sand, Fine	**77.1 J**	**23.0 J**	**67.7 J**	**63.0 J**	**64.3 J**
Sand	**78.6 J**	**79.7 J**	**69.7 J**	**64.9 J**	**66.4 J**
Silt	**18.5 J**	**12.8 J**	**27.3 J**	**30.8 J**	**24.9 J**
Clay	**2.87 J**	**0.945 J**	**2.99 J**	**4.30 J**	**8.66 J**
Fines	**21.4 J**	**13.7 J**	**30.3 J**	**35.1 J**	**33.6 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	TR-23	TR-24	TR-25	TR-26	TR-27
Sample ID	030318TR23SD	030318TR24SD	030326TR25SD	030326TR26SD	030319TR27SD
Sample Date	3/18/2003	3/18/2003	3/26/2003	3/26/2003	3/19/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
Aroclor 1221	0.200 U	0.200 U	0.210 U	0.200 U	0.200 U
Aroclor 1232	0.520 U	0.520 U	0.520 U	0.520 U	0.510 U
Aroclor 1242	0.630 U	0.630 U	0.640 U	0.630 U	0.630 U
Aroclor 1248	0.560 U	0.560 U	0.560 U	0.560 U	0.550 U
Aroclor 1254	**660**	**160**	**34.0**	**120**	**39.0**
Aroclor 1260	0.340 U	0.340 U	0.340 U	0.340 U	0.340 U
Metals (mg/kg dry)					
Aluminum	**17,200**	**18,200**	**14,300**	**12,600**	**11,100**
Antimony	-	-	-	-	-
Arsenic	-	-	-	-	-
Barium	**82.8**	**130**	**118**	**107**	**94.9**
Beryllium	**0.200**	0.300 U	0.300 U	**0.200**	**0.200**
Cadmium	0.300 U	0.600 U	**4.10**	0.300 U	0.300 U
Calcium	-	-	-	-	-
Chromium	**24.1**	**25.0**	**32.0**	**17.8**	**19.0**
Cobalt	-	-	-	-	-
Copper	**31.9**	**36.7**	**89.2**	**23.4**	**28.5**
Iron	-	-	-	-	-
Lead	**24.0 J**	**15.8 J**	**15.8 J**	**7.90**	**13.3**
Magnesium	-	-	-	-	-
Manganese	-	-	-	-	-
Mercury	-	-	-	-	-
Nickel	**21.0**	**21.0**	**36.0**	**18.0**	**15.0**
Potassium	-	-	-	-	-
Selenium	0.300 U	0.300 U	0.200 U	0.300 U	0.200 U
Silver	-	-	-	-	-
Sodium	-	-	-	-	-
Thallium	0.100 U	0.100 U	**0.300**	**0.200**	**0.200**
Vanadium	-	-	-	-	-
Zinc	**90.3**	**110**	**108**	**90.5**	**74.9**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	-	-
Residual Range Organics	-	-	-	-	-
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	-	-
Monobutyltin trichloride	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin chloride	-	-	-	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	-	-
4,4'-DDE	-	-	-	-	-
4,4'-DDT	-	-	-	-	-
Aldrin	-	-	-	-	-
BHC (alpha)	-	-	-	-	-
BHC (beta)	-	-	-	-	-
BHC (delta)	-	-	-	-	-
BHC (gamma) Lindane	-	-	-	-	-
Chlordane (alpha)	-	-	-	-	-
Chlordane (gamma)	-	-	-	-	-
Dieldrin	-	-	-	-	-
Endosulfan I	-	-	-	-	-
Endosulfan II	-	-	-	-	-
Endosulfan Sulfate	-	-	-	-	-
Endrin	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	-	-	-	-	-
Heptachlor Epoxide	-	-	-	-	-
Methoxychlor	-	-	-	-	-
Toxaphene	-	-	-	-	-
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-
2-Methylnaphthalene	1.30 U	1.40 U	1.30 U	1.50 U	1.40 U
2-Methylphenol	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	TR-23	TR-24	TR-25	TR-26	TR-27
Sample ID	030318TR23SD	030318TR24SD	030326TR25SD	030326TR26SD	030319TR27SD
Sample Date	3/18/2003	3/18/2003	3/26/2003	3/26/2003	3/19/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-
4-Bromophenyl Phenyl Ether	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-
Acenaphthene	2.20 U	2.40 U	2.20 U	2.40 U	2.30 U
Acenaphthylene	1.50 U	1.60 U	1.50 U	1.60 U	1.60 U
Aniline	-	-	-	-	-
Anthracene	1.50 U	1.60 U	1.50 U	1.60 U	1.50 U
Benzo(a)anthracene	2.20 U	**48.0**	2.10 U	2.30 U	2.20 U
Benzo(a)pyrene	2.10 U	**39.0**	2.10 U	2.30 U	2.20 U
Benzo(b)fluoranthene	**8.90**	**36.0**	2.20 U	2.40 U	2.30 U
Benzo(g,h,i)perylene	1.70 U	**22.0**	1.70 U	1.90 U	1.80 U
Benzo(k)fluoranthene	2.90 U	**30.0**	2.90 U	3.20 U	3.10 U
Benzoic Acid	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-
Bis(2-chloroethoxy)methane	-	-	-	-	-
Bis(2-chloroethyl) Ether	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	-	-	-	-	-
Butyl Benzyl Phthalate	-	-	-	-	-
Carbazole	-	-	-	-	-
Chrysene	2.40 U	**53.0**	2.40 U	2.60 U	2.50 U
Dibenz(a,h)anthracene	2.30 U	2.50 U	2.30 U	2.50 U	2.40 U
Dibenzofuran	1.90 U	2.10 U	1.90 U	2.10 U	2.00 U
Diethyl Phthalate	-	-	-	-	-
Dimethyl Phthalate	-	-	-	-	-
Di-n-butyl Phthalate	-	-	-	-	-
Di-n-octyl Phthalate	-	-	-	-	-
Fluoranthene	1.90 U	**60.0**	1.80 U	2.00 U	1.90 U
Fluorene	1.50 U	1.60 U	1.50 U	1.60 U	1.60 U
Hexachlorobenzene	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-
Hexachloroethane	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	1.90 U	**18.0**	1.90 U	2.10 U	2.00 U
Isophorone	-	-	-	-	-
Naphthalene	1.50 U	1.60 U	1.40 U	1.60 U	1.50 U
Nitrobenzene	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-
p-cresol (4-Methylphenol)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-
Phenanthrene	1.70 U	**27.0**	1.70 U	1.90 U	1.80 U
Phenol	-	-	-	-	-
Pyrene	1.70 U	**80.0**	1.70 U	1.90 U	1.80 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.200**	**0.290**	**0.160**	**0.530**	**0.240**
Solids, Total	**77.2**	**77.3**	**78.8**	**73.6**	**79.6**
Gravel	**16.4 J**	**0.807 J**	**42.9 J**	**47.8 J**	**33.5 J**
Sand, Coarse	**18.1 J**	**30.6 J**	**19.2 J**	**12.7 J**	**40.0 J**
Sand, Medium	**40.7 J**	**47.5 J**	**30.3 J**	**7.15 J**	**16.2 J**
Sand, Fine	**22.2 J**	**16.7 J**	**7.00 J**	**21.8 J**	**9.31 J**
Sand	**81.0 J**	**94.8 J**	**56.5 J**	**41.6 J**	**65.5 J**
Silt	**1.75 J**	**3.41 J**	**0.627 J**	**6.96 J**	**0.152 J**
Clay	**0.874 J**	**0.938 J**	**0.000 J**	**3.64 J**	**0.800 J**
Fines	**2.62 J**	**4.35 J**	**0.627 J**	**10.6 J**	**0.952 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	TR-28	TR-3	TR-4	TR-5	TR-5 DUP
Sample ID	030319TR28SD	030317TR3SD	030317TR4SD	030317TR5SD	030317TR140SD
Sample Date	3/19/2003	3/17/2003	3/17/2003	3/17/2003	3/17/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.200 U	0.200 U	0.200 U	0.200 U	0.220 U
Aroclor 1221	0.200 U	0.200 U	0.200 U	0.210 U	0.210 U
Aroclor 1232	0.510 U	0.510 U	0.520 U	0.520 U	0.520 U
Aroclor 1242	0.630 U	0.630 U	0.630 U	0.640 U	0.180 U
Aroclor 1248	0.550 U	0.550 U	0.560 U	0.560 U	0.560 U
Aroclor 1254	**180**	**120**	**160**	**180**	**120**
Aroclor 1260	0.340 U	0.340 U	0.340 U	0.340 U	0.340 U
Metals (mg/kg dry)					
Aluminum	**12,600**	**17,700**	**21,000**	**17,300**	**18,900**
Antimony	-	-	-	-	-
Arsenic	-	-	-	-	-
Barium	**145**	**149**	**227**	**164**	**158**
Beryllium	**0.100**	0.400 U	**0.400**	**0.300**	**0.400**
Cadmium	0.300 U	0.700 U	**0.500**	**0.300**	**0.400**
Calcium	-	-	-	-	-
Chromium	**12.5**	**17.0**	**26.0**	**19.4**	**20.1**
Cobalt	-	-	-	-	-
Copper	**25.6**	**37.1**	**37.8**	**38.4**	**35.6**
Iron	-	-	-	-	-
Lead	**16.9**	**26.0**	**14.7**	**11.5**	**14.1**
Magnesium	-	-	-	-	-
Manganese	-	-	-	-	-
Mercury	-	-	-	-	-
Nickel	**18.0**	**16.0**	**19.0**	**16.0**	**18.0**
Potassium	-	-	-	-	-
Selenium	0.200 U	0.300 U	0.400 U	0.300 U	0.300 U
Silver	-	-	-	-	-
Sodium	-	-	-	-	-
Thallium	**0.200**	**0.300**	**0.400**	**0.300**	**0.300**
Vanadium	-	-	-	-	-
Zinc	**76.8**	**104**	**122**	**102**	**112**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	-	-
Residual Range Organics	-	-	-	-	-
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	-	-
Monobutyltin trichloride	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin chloride	-	-	-	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	-	-
4,4'-DDE	-	-	-	-	-
4,4'-DDT	-	-	-	-	-
Aldrin	-	-	-	-	-
BHC (alpha)	-	-	-	-	-
BHC (beta)	-	-	-	-	-
BHC (delta)	-	-	-	-	-
BHC (gamma) Lindane	-	-	-	-	-
Chlordane (alpha)	-	-	-	-	-
Chlordane (gamma)	-	-	-	-	-
Dieldrin	-	-	-	-	-
Endosulfan I	-	-	-	-	-
Endosulfan II	-	-	-	-	-
Endosulfan Sulfate	-	-	-	-	-
Endrin	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	-	-	-	-	-
Heptachlor Epoxide	-	-	-	-	-
Methoxychlor	-	-	-	-	-
Toxaphene	-	-	-	-	-
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-
2-Methylnaphthalene	1.40 U	1.50 U	2.20 U	1.70 U	1.80 U
2-Methylphenol	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	TR-28	TR-3	TR-4	TR-5	TR-5 DUP
Sample ID	030319TR28SD	030317TR3SD	030317TR4SD	030317TR5SD	030317TR140SD
Sample Date	3/19/2003	3/17/2003	3/17/2003	3/17/2003	3/17/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3,3'-Dichlorobenzidine	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-
4-Bromophenyl Phenyl Ether	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-
Acenaphthene	2.30 U	2.50 U	3.70 U	2.80 U	2.90 U
Acenaphthylene	1.60 U	1.70 U	2.50 U	1.90 U	2.00 U
Aniline	-	-	-	-	-
Anthracene	1.50 U	1.70 U	2.50 U	1.80 U	1.90 U
Benzo(a)anthracene	2.20 U	2.40 U	3.60 U	2.70 UJ	**73.0 J**
Benzo(a)pyrene	2.20 U	2.40 U	3.50 U	2.60 UJ	**82.0 J**
Benzo(b)fluoranthene	2.30 U	2.50 U	3.70 U	2.80 UJ	**72.0 J**
Benzo(g,h,i)perylene	1.80 U	1.90 U	2.90 U	2.20 UJ	**59.0 J**
Benzo(k)fluoranthene	3.10 U	3.30 U	4.90 U	3.60 UJ	**73.0 J**
Benzoic Acid	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-
Bis(2-chloroethoxy)methane	-	-	-	-	-
Bis(2-chloroethyl) Ether	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	-	-	-	-	-
Butyl Benzyl Phthalate	-	-	-	-	-
Carbazole	-	-	-	-	-
Chrysene	2.50 U	2.70 U	4.00 U	**19.0 J**	**100 J**
Dibenz(a,h)anthracene	2.40 U	2.60 U	3.80 U	2.80 U	**20.0 J Z**
Dibenzofuran	2.00 U	2.20 U	3.20 U	2.40 U	**11.0 J Z**
Diethyl Phthalate	-	-	-	-	-
Dimethyl Phthalate	-	-	-	-	-
Di-n-butyl Phthalate	-	-	-	-	-
Di-n-octyl Phthalate	-	-	-	-	-
Fluoranthene	1.90 U	2.10 U	3.10 U	2.30 UJ	**110 J**
Fluorene	1.60 U	1.70 U	2.50 U	1.90 U	2.00 U
Hexachlorobenzene	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-
Hexachloroethane	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	2.00 U	2.10 U	3.20 U	2.40 UJ	**59.0 J**
Isophorone	-	-	-	-	-
Naphthalene	1.50 U	1.60 U	2.40 U	1.80 U	1.90 U
Nitrobenzene	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-
p-cresol (4-Methylphenol)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-
Phenanthrene	1.80 U	1.90 U	2.90 U	2.10 U	**23.0**
Phenol	-	-	-	-	-
Pyrene	1.80 U	1.90 U	2.90 U	2.20 U	**100**
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.420**	**0.560**	**1.80**	**1.20**	**0.980**
Solids, Total	**81.4**	**73.0**	**51.6**	**70.4**	**77.8**
Gravel	**16.0 J**	**48.2 J**	**49.5 J**	**21.6 J**	**68.7 J**
Sand, Coarse	**48.7 J**	**6.59 J**	**9.84 J**	**4.94 J**	**3.92 J**
Sand, Medium	**21.9 J**	**20.2 J**	**8.00 J**	**29.1 J**	**11.9 J**
Sand, Fine	**10.5 J**	**16.4 J**	**13.4 J**	**29.4 J**	**9.09 J**
Sand	**81.1 J**	**43.2 J**	**31.2 J**	**63.5 J**	**24.9 J**
Silt	**2.93 J**	**8.59 J**	**16.8 J**	**12.9 J**	**5.66 J**
Clay	**0.000 J**	**0.000 J**	**2.44 J**	**2.02 J**	**0.769 J**
Fines	**2.93 J**	**8.59 J**	**19.3 J**	**14.9 J**	**6.43 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Goose Island
Site ID	TR-6	TR-7	TR-8	TR-9	GI-113
Sample ID	030317TR6SD	030401TR7SD	030401TR8SD	030331TR9SD	030307GI113SD
Sample Date	3/17/2003	4/1/2003	4/1/2003	3/31/2003	3/7/2003
Medium	Sediment	Sediment	Sediment	Sediment	Soil
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.220 U	0.200 U	0.200 U	0.200 U	0.200 U
Aroclor 1221	0.210 U	0.200 U	0.200 U	0.210 U	0.200 U
Aroclor 1232	0.520 U	0.510 U	0.510 U	0.520 U	0.520 U
Aroclor 1242	0.640 U	0.630 U	0.620 U	0.640 U	0.640 U
Aroclor 1248	0.560 U	0.550 U	0.550 U	0.560 U	0.560 U
Aroclor 1254	**120**	**2.30**	**1.00 J**	**12.0**	0.530 U
Aroclor 1260	0.340 U	0.340 U	0.340 U	0.340 U	0.340 U
Metals (mg/kg dry)					
Aluminum	**23,200**	**15,700**	**15,500**	**11,000**	**42,500**
Antimony	-	-	-	-	-
Arsenic	-	-	-	-	-
Barium	**185**	**90.3**	**77.4**	**69.0**	**195**
Beryllium	**0.500**	**0.200**	**0.200**	**0.100**	**0.600**
Cadmium	**0.800**	0.200 U	0.300 U	0.200 U	0.700 U
Calcium	-	-	-	-	-
Chromium	**22.0**	**26.5**	**24.0**	**17.1**	**40.0**
Cobalt	-	-	-	-	-
Copper	**37.1**	**31.5**	**26.9**	**27.2**	**77.9**
Iron	-	-	-	-	-
Lead	**18.0**	**5.50 J**	**8.60 J**	**4.90 J**	**6.40**
Magnesium	-	-	-	-	-
Manganese	-	-	-	-	-
Mercury	-	-	-	-	-
Nickel	**21.0**	**22.0**	**17.0**	**14.0**	**28.0**
Potassium	-	-	-	-	-
Selenium	0.400 U	0.300 U	0.300 U	0.300 U	0.300 U
Silver	-	-	-	-	-
Sodium	-	-	-	-	-
Thallium	**0.400**	0.100 U	0.100 U	0.100 U	0.100 U
Vanadium	-	-	-	-	-
Zinc	**142**	**77.5**	**90.0**	**76.5**	**70.0**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	-	-	-	-
Residual Range Organics	-	-	-	-	-
Butyltins (µg/kg dry)					
Dibutyltin dichloride	-	-	-	-	-
Monobutyltin trichloride	-	-	-	-	-
Tetrabutyltin	-	-	-	-	-
Tributyltin chloride	-	-	-	-	-
Pesticides (µg/kg dry)					
4,4'-DDD	-	-	-	-	-
4,4'-DDE	-	-	-	-	-
4,4'-DDT	-	-	-	-	-
Aldrin	-	-	-	-	-
BHC (alpha)	-	-	-	-	-
BHC (beta)	-	-	-	-	-
BHC (delta)	-	-	-	-	-
BHC (gamma) Lindane	-	-	-	-	-
Chlordane (alpha)	-	-	-	-	-
Chlordane (gamma)	-	-	-	-	-
Dieldrin	-	-	-	-	-
Endosulfan I	-	-	-	-	-
Endosulfan II	-	-	-	-	-
Endosulfan Sulfate	-	-	-	-	-
Endrin	-	-	-	-	-
Endrin Aldehyde	-	-	-	-	-
Endrin Ketone	-	-	-	-	-
Heptachlor	-	-	-	-	-
Heptachlor Epoxide	-	-	-	-	-
Methoxychlor	-	-	-	-	-
Toxaphene	-	-	-	-	-
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-
2-Methylnaphthalene	2.30 U	1.50 U	1.40 U	1.30 U	1.40 U
2-Methylphenol	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Goose Island
Site ID	TR-6	TR-7	TR-8	TR-9	GI-113
Sample ID	030317TR6SD	030401TR7SD	030401TR8SD	030331TR9SD	030307GI113SD
Sample Date	3/17/2003	4/1/2003	4/1/2003	3/31/2003	3/7/2003
Medium	Sediment	Sediment	Sediment	Sediment	Soil
3,3'-Dichlorobenzidine	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-
4-Bromophenyl Phenyl Ether	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-
4-Chlorophenyl Phenyl Ether	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-
Acenaphthene	3.90 U	2.50 U	2.40 U	2.10 U	2.40 U
Acenaphthylene	2.60 U	1.70 U	1.60 U	1.40 U	1.60 U
Aniline	-	-	-	-	-
Anthracene	2.60 U	1.60 U	1.60 U	1.40 U	1.60 U
Benzo(a)anthracene	3.70 U	2.40 U	2.30 U	2.00 U	2.30 U
Benzo(a)pyrene	3.70 U	2.30 U	2.20 U	2.00 U	2.30 U
Benzo(b)fluoranthene	3.90 U	2.50 U	2.40 U	2.10 U	2.40 U
Benzo(g,h,i)perylene	3.00 U	1.90 U	1.80 U	1.60 U	1.90 U
Benzo(k)fluoranthene	5.10 U	3.20 U	3.10 U	2.80 U	3.10 U
Benzoic Acid	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-
Bis(2-chloroethoxy)methane	-	-	-	-	-
Bis(2-chloroethyl) Ether	-	-	-	-	-
Bis(2-chloroisopropyl) Ether	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	-	-	-	-	-
Butyl Benzyl Phthalate	-	-	-	-	-
Carbazole	-	-	-	-	-
Chrysene	4.20 U	2.70 U	**14.0**	2.30 U	2.60 U
Dibenz(a,h)anthracene	4.00 U	2.50 U	2.40 U	2.20 U	2.50 U
Dibenzofuran	3.30 U	2.10 U	2.00 U	1.80 U	2.10 U
Diethyl Phthalate	-	-	-	-	-
Dimethyl Phthalate	-	-	-	-	-
Di-n-butyl Phthalate	-	-	-	-	-
Di-n-octyl Phthalate	-	-	-	-	-
Fluoranthene	3.20 U	2.10 U	2.00 U	1.80 U	2.00 U
Fluorene	2.60 U	1.60 U	1.60 U	1.40 U	1.60 U
Hexachlorobenzene	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-
Hexachloroethane	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	3.30 U	2.10 U	2.00 U	1.80 U	2.10 U
Isophorone	-	-	-	-	-
Naphthalene	2.50 U	1.60 U	1.50 U	1.40 U	1.60 U
Nitrobenzene	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-
p-cresol (4-Methylphenol)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-
Phenanthrene	3.00 U	1.90 U	1.80 U	1.60 U	1.90 U
Phenol	-	-	-	-	-
Pyrene	3.00 U	1.90 U	1.80 U	1.60 U	1.90 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**2.10**	**0.370**	**0.520**	**0.100**	**0.500**
Solids, Total	**50.6**	**75.5**	**73.9**	**80.0**	**76.8**
Gravel	**28.6 J**	**23.4 J**	**73.4 J**	**43.4 J**	**0.000 J**
Sand, Coarse	**0.862 J**	**13.8 J**	**8.36 J**	**12.9 J**	**6.81 J**
Sand, Medium	**4.02 J**	**42.2 J**	**6.19 J**	**31.4 J**	**24.1 J**
Sand, Fine	**16.2 J**	**17.3 J**	**6.43 J**	**9.49 J**	**32.4 J**
Sand	**21.1 J**	**73.3 J**	**21.0 J**	**53.9 J**	**63.3 J**
Silt	**43.1 J**	**2.91 J**	**4.60 J**	**2.44 J**	**30.5 J**
Clay	**7.18 J**	**0.364 J**	**1.00 J**	**0.305 J**	**6.15 J**
Fines	**50.3 J**	**3.27 J**	**5.60 J**	**2.75 J**	**36.7 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results
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Area	Goose Island	Goose Island
Site ID	GI-113 DUP	GI-114
Sample ID	030307GI137SD	030307GI114SD
Sample Date	3/7/2003	3/7/2003
Medium	Soil	Soil
PCB Aroclors (µg/kg dry)		
Aroclor 1016	1.00 U	0.200 U
Aroclor 1221	1.30 U	0.200 U
Aroclor 1232	0.540 U	0.510 U
Aroclor 1242	0.640 U	0.630 U
Aroclor 1248	0.420 U	0.550 U
Aroclor 1254	1.20 U	0.530 U
Aroclor 1260	1.00 U	0.340 U
Metals (mg/kg dry)		
Aluminum	**37,000**	**51,900**
Antimony	-	-
Arsenic	-	-
Barium	**158**	**127**
Beryllium	**0.400**	**0.800**
Cadmium	0.600 U	0.700 U
Calcium	-	-
Chromium	**30.0**	**36.0**
Cobalt	-	-
Copper	**60.4**	**92.4**
Iron	-	-
Lead	**6.10**	**9.10**
Magnesium	-	-
Manganese	-	-
Mercury	-	-
Nickel	**26.0**	**32.0**
Potassium	-	-
Selenium	0.200 U	0.300 U
Silver	-	-
Sodium	-	-
Thallium	0.100 U	0.200 U
Vanadium	-	-
Zinc	**67.0**	**72.0**
Petroleum Hydrocarbons (mg/kg dry)		
Diesel Range Organics	-	-
Residual Range Organics	-	-
Butyltins (µg/kg dry)		
Dibutyltin dichloride	-	-
Monobutyltin trichloride	-	-
Tetrabutyltin	-	-
Tributyltin chloride	-	-
Pesticides (µg/kg dry)		
4,4'-DDD	-	-
4,4'-DDE	-	-
4,4'-DDT	-	-
Aldrin	-	-
BHC (alpha)	-	-
BHC (beta)	-	-
BHC (delta)	-	-
BHC (gamma) Lindane	-	-
Chlordane (alpha)	-	-
Chlordane (gamma)	-	-
Dieldrin	-	-
Endosulfan I	-	-
Endosulfan II	-	-
Endosulfan Sulfate	-	-
Endrin	-	-
Endrin Aldehyde	-	-
Endrin Ketone	-	-
Heptachlor	-	-
Heptachlor Epoxide	-	-
Methoxychlor	-	-
Toxaphene	-	-
Semivolatile Organic Compounds (µg/kg dry)		
1,2,4-Trichlorobenzene	-	-
1,2-Dichlorobenzene	-	-
1,3-Dichlorobenzene	-	-
1,4-Dichlorobenzene	-	-
2,4,5-Trichlorophenol	-	-
2,4,6-Trichlorophenol	-	-
2,4-Dichlorophenol	-	-
2,4-Dimethylphenol	-	-
2,4-Dinitrophenol	-	-
2,4-Dinitrotoluene	-	-
2,6-Dinitrotoluene	-	-
2-Chloronaphthalene	-	-
2-Chlorophenol	-	-
2-Methylnaphthalene	1.50 U	1.70 U
2-Methylphenol	-	-
2-Nitroaniline	-	-
2-Nitrophenol	-	-

Table G-6a
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Forebay Area Sediment and Goose Island Soil Analytical Results
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Area	Goose Island	Goose Island
Site ID	GI-113 DUP	GI-114
Sample ID	030307GI137SD	030307GI114SD
Sample Date	3/7/2003	3/7/2003
Medium	Soil	Soil
3,3'-Dichlorobenzidine	-	-
3-Nitroaniline	-	-
4,6-Dinitro-2-methylphenol	-	-
4-Bromophenyl Phenyl Ether	-	-
4-Chloro-3-methylphenol	-	-
4-Chloroaniline	-	-
4-Chlorophenyl Phenyl Ether	-	-
4-Nitroaniline	-	-
4-Nitrophenol	-	-
Acenaphthene	2.50 U	2.80 U
Acenaphthylene	1.70 U	1.90 U
Aniline	-	-
Anthracene	1.60 U	**19.0**
Benzo(a)anthracene	2.40 U	**12.0**
Benzo(a)pyrene	2.30 U	2.60 U
Benzo(b)fluoranthene	2.50 U	2.80 U
Benzo(g,h,i)perylene	1.90 U	2.10 U
Benzo(k)fluoranthene	3.20 U	3.60 U
Benzoic Acid	-	-
Benzyl Alcohol	-	-
Bis(2-chloroethoxy)methane	-	-
Bis(2-chloroethyl) Ether	-	-
Bis(2-chloroisopropyl) Ether	-	-
Bis(2-ethylhexyl) Phthalate	-	-
Butyl Benzyl Phthalate	-	-
Carbazole	-	-
Chrysene	2.70 U	**13.0**
Dibenz(a,h)anthracene	2.50 U	2.80 U
Dibenzofuran	2.10 U	2.40 U
Diethyl Phthalate	-	-
Dimethyl Phthalate	-	-
Di-n-butyl Phthalate	-	-
Di-n-octyl Phthalate	-	-
Fluoranthene	2.10 U	**78.0**
Fluorene	1.70 U	1.80 U
Hexachlorobenzene	-	-
Hexachlorobutadiene	-	-
Hexachlorocyclopentadiene	-	-
Hexachloroethane	-	-
Indeno(1,2,3-cd)pyrene	2.10 U	2.40 U
Isophorone	-	-
Naphthalene	1.60 U	1.80 U
Nitrobenzene	-	-
N-Nitrosodimethylamine	-	-
N-Nitrosodi-n-propylamine	-	-
N-Nitrosodiphenylamine	-	-
p-cresol (4-Methylphenol)	-	-
Pentachlorophenol	-	-
Phenanthrene	1.90 U	**83.0**
Phenol	-	-
Pyrene	1.90 U	**57.0**
General Chemistry Parameters and Grain Size (%)		
Carbon, Total Organic	**0.940**	**1.30**
Solids, Total	**73.2**	**65.9**
Gravel	**1.81 J**	**18.3 J**
Sand, Coarse	**5.20 J**	**18.6 J**
Sand, Medium	**24.2 J**	**17.1 J**
Sand, Fine	**37.6 J**	**26.4 J**
Sand	**67.0 J**	**62.1 J**
Silt	**21.6 J**	**13.3 J**
Clay	**9.63 J**	**6.25 J**
Fines	**31.2 J**	**19.6 J**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6b
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Reference Area Analytical Results

Area	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147
Site ID	RF-100	RF-100 DUP	RF-101	RF-102	RF-103
Sample ID	030407RF100SD	030407RF146SD	030312RF101SD	030312RF102SD	030312RF103SD
Sample Date	4/7/2003	4/7/2003	3/12/2003	3/12/2003	3/12/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U
Aroclor 1221	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U
Aroclor 1232	0.0500 U	0.0500 U	0.0500 U	0.580 U	0.970 U
Aroclor 1242	0.0600 U	0.0200 U	0.500 U	0.0600 U	0.0600 U
Aroclor 1248	0.800 U	1.30 U	0.0500 U	0.0500 U	0.0500 U
Aroclor 1254	0.490 U	1.40 U	0.310 U	0.0600 U	0.0600 U
Aroclor 1260	0.210 U	0.280 U	0.0300 U	0.0300 U	0.0300 U
Metals (mg/kg dry)					
Aluminum	**18,900**	**17,300**	**18,700**	**17,500**	**10,600**
Antimony	R	R	R	R	R
Arsenic	**4.30**	**4.10**	**3.60**	**6.60**	**3.70**
Barium	**160**	**147**	**153**	**140**	**109**
Beryllium	**0.400**	**0.300**	**0.300**	0.400 U	**0.200**
Cadmium	**0.600**	**0.900**	**0.400**	0.700 U	**0.400**
Calcium	**6,540**	**6,450**	**7,030**	**7,190**	**5,070**
Chromium	**20.0**	**19.0**	**25.6**	**27.0**	**22.9**
Cobalt	**10.8**	**9.80**	**15.0**	**12.0**	**11.5**
Copper	**28.0**	**24.3**	**39.4**	**48.2**	**16.5**
Iron	**26,700**	**25,200**	**32,000**	**44,200**	**28,900**
Lead	**15.0**	**15.0**	**6.30**	**8.50**	**7.40**
Magnesium	**5,360**	**5,140**	**8,360**	**6,550**	**6,570**
Manganese	**607**	**547**	**575**	**480**	**468**
Mercury	**0.170**	**0.160**	0.0600 U	0.0500 U	0.0500 U
Nickel	**18.0**	**17.0**	**22.0**	**23.0**	**28.0**
Potassium	**1,780**	**1,630**	**1,020**	**890**	**690**
Selenium	0.400 U	0.400 U	0.700 U	0.300 U	0.300 U
Silver	0.600 U	0.600 U	0.400 U	1.00 U	0.400 U
Sodium	**760**	**730**	**630**	**760**	**470**
Thallium	**0.300**	**0.200**	**0.200**	**0.300**	**0.200**
Vanadium	**63.8**	**58.6**	**80.9**	**76.0**	**88.2**
Zinc	**144**	**142**	**92.9**	**119**	**94.4**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	3.20 U	**13.0**	2.90 U	2.00 U	2.10 U
Residual Range Organics	5.00 U	**22.0**	5.00 U	5.00 U	5.00 U
Butyltins (µg/kg dry)					
Dibutyltin dichloride	5.80 U	6.00 U	5.90 U	5.70 U	5.80 U
Monobutyltin trichloride	5.80 U	6.00 U	5.90 U	5.70 U	5.80 U
Tetrabutyltin	5.80 U	6.00 U	5.90 U	5.70 U	5.80 U
Tributyltin chloride	5.80 U	6.00 U	5.90 U	5.70 U	5.80 U
Pesticides (µg/kg dry)					
4,4'-DDD	0.0880 U	0.0890 U	0.0890 U	0.0870 U	0.0880 U
4,4'-DDE	0.0760 U	0.0770 U	0.0770 U	0.0750 U	0.0770 U
4,4'-DDT	0.134 U	0.136 U	0.137 U	0.133 U	0.136 U
Aldrin	0.0350 U	0.0360 U	0.0360 U	0.0350 U	0.0350 U
BHC (alpha)	0.0530 U	0.0530 U	0.0530 U	0.0520 U	0.0530 U
BHC (beta)	0.0580 U	0.0590 U	0.0590 U	0.0580 U	0.0590 U
BHC (delta)	0.0430 U	0.0430 U	0.0440 U	0.0420 U	0.0430 U
BHC (gamma) Lindane	0.0410 U	0.0410 U	0.0420 U	0.0400 U	0.0410 U
Chlordane (alpha)	0.0290 U	0.0300 U	0.0300 U	0.0290 U	0.0290 U
Chlordane (gamma)	0.0370 U	0.0380 U	0.0380 U	0.0370 U	0.0370 U
Dieldrin	0.0580 U	0.0590 U	0.0590 U	0.0580 U	0.0590 U
Endosulfan I	0.0530 U	0.0530 U	0.0530 U	0.0520 U	0.0530 U
Endosulfan II	0.121 U	0.122 U	0.123 U	0.120 U	0.122 U
Endosulfan Sulfate	0.164 U	0.166 U	0.166 U	0.162 U	0.165 U
Endrin	0.0580 U	0.0590 U	0.0590 U	0.0580 U	0.0590 U
Endrin Aldehyde	0.111 U	0.113 U	0.113 U	0.110 U	0.112 U
Endrin Ketone	0.199 U	0.202 U	0.202 U	0.197 U	0.200 U
Heptachlor	0.0430 U	0.0430 U	0.0440 U	0.0420 U	0.0430 U
Heptachlor Epoxide	0.0430 U	0.0430 U	0.0440 U	0.0420 U	0.0430 U
Methoxychlor	0.584 U	0.593 U	0.594 U	0.578 U	0.589 U
Toxaphene	4.38 U	4.44 U	4.45 U	4.34 U	4.42 U
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	4.90 U	5.00 U	4.90 U	4.80 U	4.90 U
1,2-Dichlorobenzene	5.10 U	5.20 U	5.10 U	5.00 U	5.10 U
1,3-Dichlorobenzene	4.70 U	4.80 U	4.70 U	4.60 U	4.70 U
1,4-Dichlorobenzene	5.10 U	5.20 U	5.10 U	5.00 U	5.10 U
2,4,5-Trichlorophenol	7.90 U	7.90 U	7.80 U	7.70 U	7.90 U
2,4,6-Trichlorophenol	6.70 U	6.70 U	6.60 U	6.50 U	6.70 U
2,4-Dichlorophenol	9.80 U	9.90 U	9.70 U	9.60 U	9.90 U
2,4-Dimethylphenol	9.40 U	9.50 U	9.30 U	9.20 U	9.50 U
2,4-Dinitrophenol	100 U	100 U	99.0 U	97.0 U	100 U
2,4-Dinitrotoluene	5.30 U	5.40 U	5.30 U	5.20 U	5.30 U
2,6-Dinitrotoluene	4.90 U	5.00 U	4.90 U	4.80 U	4.90 U
2-Chloronaphthalene	5.70 U	5.70 U	5.60 U	5.60 U	5.70 U
2-Chlorophenol	6.50 U	6.50 U	6.40 U	6.30 U	6.50 U
2-Methylnaphthalene	4.90 U	5.00 U	4.90 U	4.80 U	4.90 U
2-Methylphenol	6.70 U	6.70 U	6.60 U	6.50 U	6.70 U
2-Nitroaniline	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U
2-Nitrophenol	9.60 U	9.70 U	9.50 U	9.40 U	9.70 U
3,3'-Dichlorobenzidine	34.0 U	34.0 U	34.0 U	33.0 U	34.0 U

Table G-6b
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Reference Area Analytical Results
(Page 2 of 10)

Area	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147
Site ID	RF-100	RF-100 DUP	RF-101	RF-102	RF-103
Sample ID	030407RF100SD	030407RF146SD	030312RF101SD	030312RF102SD	030312RF103SD
Sample Date	4/7/2003	4/7/2003	3/12/2003	3/12/2003	3/12/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3-Nitroaniline	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
4,6-Dinitro-2-methylphenol	170 U	170 U	170 U	160 U	170 U
4-Bromophenyl Phenyl Ether	6.30 U	6.30 U	6.20 U	6.10 U	6.30 U
4-Chloro-3-methylphenol	9.20 U	9.30 U	9.20 U	9.00 U	9.30 U
4-Chloroaniline	14.0 U	14.0 U	14.0 U	14.0 U	14.0 U
4-Chlorophenyl Phenyl Ether	9.80 U	9.90 U	9.70 U	9.60 U	9.90 U
4-Nitroaniline	13.0 U	13.0 U	13.0 U	12.0 U	13.0 U
4-Nitrophenol	18.0 U	18.0 U	18.0 U	17.0 U	18.0 U
Acenaphthene	5.10 U	5.20 U	5.10 U	5.00 U	5.10 U
Acenaphthylene	4.50 U	4.60 U	4.50 U	4.40 U	4.50 U
Aniline	6.10 U	6.10 U	6.00 U	5.90 U	6.10 U
Anthracene	4.70 U	4.80 U	4.70 U	4.60 U	4.70 U
Benzo(a)anthracene	5.10 U	5.20 U	5.10 U	5.00 U	5.10 U
Benzo(a)pyrene	**11.0 J**	4.00 U	3.90 U	3.80 U	3.90 U
Benzo(b)fluoranthene	**10.0 J**	**11.0 J**	8.00 U	7.90 U	8.10 U
Benzo(g,h,i)perylene	5.30 U	5.40 U	5.30 U	5.20 U	5.30 U
Benzo(k)fluoranthene	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
Benzoic Acid	160 U	160 U	160 U	160 U	160 U
Benzyl Alcohol	20.0 U	20.0 U	19.0 U	19.0 U	20.0 U
Bis(2-chloroethoxy)methane	4.70 U	4.80 U	4.70 U	4.60 U	4.70 U
Bis(2-chloroethyl) Ether	6.70 U	6.70 U	6.60 U	6.50 U	6.70 U
Bis(2-chloroisopropyl) Ether	5.70 U	5.70 U	5.60 U	5.60 U	5.70 U
Bis(2-ethylhexyl) Phthalate	19.0 U	19.0 U	19.0 U	18.0 U	19.0 U
Butyl Benzyl Phthalate	4.90 U	5.00 U	4.90 U	4.80 U	4.90 U
Carbazole	4.70 U	4.80 U	4.70 U	4.60 U	4.70 U
Chrysene	**15.0 J**	**12.0 J**	6.00 U	5.90 U	6.10 U
Dibenz(a,h)anthracene	5.70 U	5.70 U	5.60 U	5.60 U	5.70 U
Dibenzofuran	4.90 U	5.00 U	4.90 U	4.80 U	4.90 U
Diethyl Phthalate	8.70 U	8.70 U	8.60 U	8.40 U	8.70 U
Dimethyl Phthalate	5.10 U	5.20 U	5.10 U	5.00 U	5.10 U
Di-n-butyl Phthalate	5.70 U	5.70 U	5.60 U	5.60 U	5.70 U
Di-n-octyl Phthalate	8.10 U	8.10 U	8.00 U	7.90 U	8.10 U
Fluoranthene	**18.0 J**	**15.0 J**	5.80 U	5.70 U	5.90 U
Fluorene	6.70 U	6.70 U	6.60 U	6.50 U	6.70 U
Hexachlorobenzene	5.50 U	5.60 U	5.50 U	5.40 U	5.50 U
Hexachlorobutadiene	6.70 U	6.70 U	6.60 U	6.50 U	6.70 U
Hexachlorocyclopentadiene	29.0 U	29.0 U	29.0 U	28.0 U	29.0 U
Hexachloroethane	7.50 U	7.50 U	7.40 U	7.30 U	7.50 U
Indeno(1,2,3-cd)pyrene	5.90 U	5.90 U	5.80 U	5.70 U	5.90 U
Isophorone	6.30 U	6.30 U	6.20 U	6.10 U	6.30 U
Naphthalene	5.10 U	5.20 U	5.10 U	5.00 U	5.10 U
Nitrobenzene	5.90 U	5.90 U	5.80 U	5.70 U	5.90 U
N-Nitrosodimethylamine	40.0 U	40.0 U	40.0 U	39.0 U	40.0 U
N-Nitrosodi-n-propylamine	7.10 U	7.10 U	7.00 U	6.90 U	7.10 U
N-Nitrosodiphenylamine	6.90 U	6.90 U	6.80 U	6.70 U	6.90 U
p-cresol (4-Methylphenol)	6.70 U	6.70 U	6.60 U	6.50 U	**100**
Pentachlorophenol	43.0 U	43.0 U	42.0 U	42.0 U	43.0 U
Phenanthrene	**21.0**	4.60 U	4.50 U	4.40 U	4.50 U
Phenol	6.50 U	6.50 U	6.40 U	6.30 U	6.50 U
Pyrene	**17.0 J**	**12.0 J**	10.0 U	10.0 U	10.0 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**1.20**	**1.20**	**0.380**	**0.480**	**0.520**
Solids, Total	**52.9**	**41.4**	**73.0**	**74.5**	**74.2**
Gravel	**0.000**	**0.100**	**3.00**	**6.00**	**2.00**
Sand, Coarse	**0.000**	**0.000**	**7.00**	**4.10**	**2.60**
Sand, Medium	**1.60**	**2.00**	**37.4**	**42.4**	**45.0**
Sand, Fine	**43.5**	**45.3**	**35.8**	**29.8**	**41.6**
Sand	**45.1**	**47.3**	**80.2**	**76.3**	**89.2**
Silt	**46.0**	**44.4**	**14.6**	**16.0**	**6.20**
Clay	**8.80**	**8.20**	**2.10**	**1.80**	**2.50**
Fines	**54.8**	**52.6**	**16.7**	**17.8**	**8.70**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-6b
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Reference Area Analytical Results

Area	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147
Site ID	RF-104	RF-105	RF-106	RF-107	RF-107 DUP
Sample ID	030312RF104SD	030312RF105SD	030312RF106SD	030311RF107SD	030311RF138SD
Sample Date	3/12/2003	3/12/2003	3/12/2003	3/11/2003	3/11/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U
Aroclor 1221	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U
Aroclor 1232	0.390 U	0.770 U	0.580 U	0.0500 U	0.480 U
Aroclor 1242	0.0600 U	0.0600 U	0.0600 U	0.0600 U	0.0200 U
Aroclor 1248	0.0500 U	0.700 U	0.0500 U	0.0500 U	0.0500 U
Aroclor 1254	0.0500 U	0.580 U	0.310 U	0.0600 U	0.360 U
Aroclor 1260	0.0300 U	0.0300 U	0.0300 U	0.0300 U	0.0300 U
Metals (mg/kg dry)					
Aluminum	**13,100**	**12,200**	**15,400**	**16,300**	**17,200**
Antimony	R	R	R	R	R
Arsenic	**2.10**	**4.80**	**4.70**	**3.20**	**3.40**
Barium	**97.3**	**167**	**98.1**	**175**	**127**
Beryllium	**0.200**	**0.200**	**0.100**	**0.200**	**0.200**
Cadmium	0.300 U	**0.400**	**0.400**	0.300 U	**0.500**
Calcium	**5,840**	**6,810**	**8,800**	**8,930**	**10,000**
Chromium	**16.3**	**15.4**	**15.4**	**18.3**	**18.8**
Cobalt	**10.5**	**11.2**	**12.7**	**13.1**	**16.4**
Copper	**18.6**	**16.8**	**16.1**	**23.2**	**23.9**
Iron	**29,600**	**23,100**	**28,600**	**29,500**	**30,700**
Lead	**4.70**	**7.90**	**5.90**	**7.50**	**7.20**
Magnesium	**6,590**	**8,100**	**9,700**	**10,400**	**13,000**
Manganese	**382**	**467**	**424**	**415**	**526**
Mercury	0.0600 U	0.0600 U	0.0500 U	0.0700 U	0.0500 U
Nickel	**21.0**	**24.0**	**31.0**	**32.0**	**46.0**
Potassium	**510**	**670**	**510**	**700**	**590**
Selenium	0.300 U	0.700 U	0.700 U	0.700 U	0.300 U
Silver	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U
Sodium	**700**	**1,000**	**1,500**	**1,250**	**1,640**
Thallium	**0.200**	**0.300**	**0.200**	**0.500**	0.100 U
Vanadium	**82.0**	**54.9**	**65.8**	**66.7**	**69.0**
Zinc	**76.6**	**101**	**94.7**	**104**	**105**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	2.10 U	2.20 U	2.10 U	2.00 U	1.70 U
Residual Range Organics	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Butyltins (µg/kg dry)					
Dibutyltin dichloride	5.80 U	5.90 U	5.80 U	5.90 U	5.90 U
Monobutyltin trichloride	5.80 U	5.90 U	5.80 U	5.90 U	5.90 U
Tetrabutyltin	5.80 U	5.90 U	5.80 U	5.90 U	5.90 U
Tributyltin chloride	5.80 U	5.90 U	5.80 U	5.90 U	5.90 U
Pesticides (µg/kg dry)					
4,4'-DDD	0.0870 U	0.0880 U	0.0880 U	0.0890 U	0.0960 U
4,4'-DDE	0.0750 U	0.0770 U	0.0760 U	0.0770 U	0.0830 U
4,4'-DDT	0.133 U	0.135 U	0.134 U	0.136 U	0.147 U
Aldrin	0.0350 U	0.0350 U	0.0350 U	0.0350 U	0.0380 U
BHC (alpha)	0.0520 U	0.0530 U	0.0530 U	0.0530 U	0.0580 U
BHC (beta)	0.0580 U	0.0590 U	0.0580 U	0.0590 U	0.0640 U
BHC (delta)	0.0430 U	0.0430 U	0.0430 U	0.0430 U	0.0470 U
BHC (gamma) Lindane	0.0410 U	0.0410 U	0.0410 U	0.0410 U	0.0450 U
Chlordane (alpha)	0.0290 U	0.0290 U	0.0290 U	0.0300 U	0.0320 U
Chlordane (gamma)	0.0370 U	0.0370 U	0.0370 U	0.0370 U	0.0410 U
Dieldrin	0.0580 U	0.0590 U	0.0580 U	0.0590 U	0.0640 U
Endosulfan I	0.0520 U	0.0530 U	0.0530 U	0.0530 U	0.0580 U
Endosulfan II	0.120 U	0.122 U	0.121 U	0.122 U	0.132 U
Endosulfan Sulfate	0.162 U	0.165 U	0.164 U	0.165 U	0.179 U
Endrin	0.0580 U	0.0590 U	0.0580 U	0.0590 U	0.0640 U
Endrin Aldehyde	0.110 U	0.112 U	0.111 U	0.112 U	0.122 U
Endrin Ketone	0.197 U	0.200 U	0.199 U	0.201 U	0.218 U
Heptachlor	0.0430 U	0.0430 U	0.0430 U	0.0430 U	0.0470 U
Heptachlor Epoxide	0.0430 U	0.0430 U	0.0430 U	0.0430 U	0.0470 U
Methoxychlor	0.580 U	0.589 U	0.585 U	0.590 U	0.640 U
Toxaphene	4.35 U	4.42 U	4.38 U	4.43 U	4.80 U
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	4.80 U	4.90 U	4.80 U	4.80 U	5.20 U
1,2-Dichlorobenzene	5.00 U	5.10 U	5.00 U	5.00 U	5.40 U
1,3-Dichlorobenzene	4.60 U	4.70 U	4.60 U	4.60 U	5.00 U
1,4-Dichlorobenzene	5.00 U	5.10 U	5.00 U	5.00 U	5.40 U
2,4,5-Trichlorophenol	7.70 U	7.80 U	7.70 U	7.70 U	8.30 U
2,4,6-Trichlorophenol	6.60 U	6.70 U	6.60 U	6.60 U	7.10 U
2,4-Dichlorophenol	9.60 U	9.80 U	9.70 U	9.70 U	10.0 U
2,4-Dimethylphenol	9.30 U	9.40 U	9.30 U	9.30 U	10.0 U
2,4-Dinitrophenol	98.0 U	99.0 U	98.0 U	98.0 U	110 U
2,4-Dinitrotoluene	5.20 U	5.30 U	5.20 U	5.20 U	5.60 U
2,6-Dinitrotoluene	4.80 U	4.90 U	4.80 U	4.80 U	5.20 U
2-Chloronaphthalene	5.60 U	5.70 U	5.60 U	5.60 U	6.00 U
2-Chlorophenol	6.40 U	6.50 U	6.40 U	6.40 U	6.90 U
2-Methylnaphthalene	4.80 U	4.90 U	4.80 U	4.80 U	5.20 U
2-Methylphenol	6.60 U	6.70 U	6.60 U	6.60 U	7.10 U
2-Nitroaniline	13.0 U	13.0 U	13.0 U	13.0 U	14.0 U
2-Nitrophenol	9.40 U	9.60 U	9.50 U	9.50 U	10.0 U
3,3'-Dichlorobenzidine	33.0 U	34.0 U	33.0 U	33.0 U	36.0 U

Table G-6b
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Reference Area Analytical Results
(Page 4 of 10)

Area	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147
Site ID	RF-104	RF-105	RF-106	RF-107	RF-107 DUP
Sample ID	030312RF104SD	030312RF105SD	030312RF106SD	030311RF107SD	030311RF138SD
Sample Date	3/12/2003	3/12/2003	3/12/2003	3/11/2003	3/11/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3-Nitroaniline	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
4,6-Dinitro-2-methylphenol	160 U	170 U	160 U	160 U	180 U
4-Bromophenyl Phenyl Ether	6.20 U	6.30 U	6.20 U	6.20 U	6.70 U
4-Chloro-3-methylphenol	9.10 U	9.20 U	9.10 U	9.10 U	9.80 U
4-Chloroaniline	14.0 U	14.0 U	14.0 U	14.0 U	15.0 U
4-Chlorophenyl Phenyl Ether	9.60 U	9.80 U	9.70 U	9.70 U	10.0 U
4-Nitroaniline	13.0 U	13.0 U	13.0 U	13.0 U	14.0 U
4-Nitrophenol	18.0 U	18.0 U	18.0 U	18.0 U	19.0 U
Acenaphthene	5.00 U	5.10 U	5.00 U	5.00 U	5.40 U
Acenaphthylene	4.40 U	4.50 U	4.40 U	4.50 U	4.80 U
Aniline	6.00 U	6.10 U	6.00 U	6.00 U	6.50 U
Anthracene	4.60 U	4.70 U	4.60 U	4.60 U	5.00 U
Benzo(a)anthracene	5.00 U	5.10 U	5.00 U	5.00 U	5.40 U
Benzo(a)pyrene	3.90 U	3.90 U	3.90 U	3.90 U	4.20 U
Benzo(b)fluoranthene	7.90 U	8.00 U	7.90 U	7.90 U	8.50 U
Benzo(g,h,i)perylene	5.20 U	5.30 U	5.20 U	5.20 U	5.60 U
Benzo(k)fluoranthene	11.0 U	11.0 U	11.0 U	11.0 U	12.0 U
Benzoic Acid	160 U	160 U	160 U	160 U	170 U
Benzyl Alcohol	19.0 U	20.0 U	19.0 U	19.0 U	21.0 U
Bis(2-chloroethoxy)methane	4.60 U	4.70 U	4.60 U	4.60 U	5.00 U
Bis(2-chloroethyl) Ether	6.60 U	6.70 U	6.60 U	6.60 U	7.10 U
Bis(2-chloroisopropyl) Ether	5.60 U	5.70 U	5.60 U	5.60 U	6.00 U
Bis(2-ethylhexyl) Phthalate	18.0 U	**64.0**	18.0 U	18.0 U	20.0 U
Butyl Benzyl Phthalate	4.80 U	**28.0**	4.80 U	4.80 U	5.20 U
Carbazole	4.60 U	4.70 U	4.60 U	4.60 U	5.00 U
Chrysene	6.00 U	6.10 U	6.00 U	6.00 U	6.50 U
Dibenz(a,h)anthracene	5.60 U	5.70 U	5.60 U	5.60 U	6.00 U
Dibenzofuran	4.80 U	4.90 U	4.80 U	4.80 U	5.20 U
Diethyl Phthalate	8.50 U	8.60 U	8.50 U	8.50 U	9.20 U
Dimethyl Phthalate	5.00 U	5.10 U	5.00 U	5.00 U	5.40 U
Di-n-butyl Phthalate	5.60 U	5.70 U	5.60 U	5.60 U	6.00 U
Di-n-octyl Phthalate	7.90 U	**25.0**	7.90 U	7.90 U	8.50 U
Fluoranthene	5.80 U	5.90 U	5.80 U	5.80 U	6.20 U
Fluorene	6.60 U	6.70 U	6.60 U	6.60 U	7.10 U
Hexachlorobenzene	5.40 U	5.50 U	5.40 U	5.40 U	5.80 U
Hexachlorobutadiene	6.60 U	6.70 U	6.60 U	6.60 U	7.10 U
Hexachlorocyclopentadiene	29.0 U	29.0 U	29.0 U	29.0 U	31.0 U
Hexachloroethane	7.30 U	7.40 U	7.40 U	7.40 U	7.90 U
Indeno(1,2,3-cd)pyrene	5.80 U	5.90 U	5.80 U	5.80 U	6.20 U
Isophorone	6.20 U	6.30 U	6.20 U	6.20 U	6.70 U
Naphthalene	5.00 U	5.10 U	5.00 U	5.00 U	5.40 U
Nitrobenzene	5.80 U	5.90 U	5.80 U	5.80 U	6.20 U
N-Nitrosodimethylamine	39.0 U	40.0 U	39.0 U	39.0 U	42.0 U
N-Nitrosodi-n-propylamine	6.90 U	7.00 U	7.00 U	7.00 U	7.50 U
N-Nitrosodiphenylamine	6.70 U	6.90 U	6.80 U	6.80 U	7.30 U
p-cresol (4-Methylphenol)	6.60 U	6.70 U	6.60 U	6.60 U	7.10 U
Pentachlorophenol	42.0 U	43.0 U	42.0 U	42.0 U	45.0 U
Phenanthrene	4.40 U	4.50 U	4.40 U	4.50 U	4.80 U
Phenol	6.40 U	6.50 U	6.40 U	6.40 U	6.90 U
Pyrene	**19.0**	10.0 U	10.0 U	10.0 U	11.0 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.320**	**0.810**	**0.210**	**0.170**	**0.180**
Solids, Total	**75.0**	**72.1**	**75.4**	**74.6**	**74.4**
Gravel	**0.600**	**7.70**	**3.40**	**1.40**	**7.50**
Sand, Coarse	**3.90**	**1.40**	**4.00**	**5.90**	**2.60**
Sand, Medium	**64.9**	**24.2**	**40.2**	**40.9**	**46.4**
Sand, Fine	**22.8**	**36.7**	**39.7**	**40.3**	**32.2**
Sand	**91.6**	**62.3**	**83.9**	**87.1**	**81.2**
Silt	**5.20**	**28.3**	**10.7**	**9.10**	**9.80**
Clay	**2.60**	**1.80**	**2.00**	**2.40**	**1.50**
Fines	**7.80**	**30.1**	**12.7**	**11.5**	**11.3**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6b
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Reference Area Analytical Results
(Page 5 of 10)

Area	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147
Site ID	RF-108	RF-109	RF-110	RF-91	RF-92
Sample ID	030404RF108SD	030404RF109SD	030404RF110SD	030408RF91SD	030408RF92SD
Sample Date	4/4/2003	4/4/2003	4/4/2003	4/8/2003	4/8/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U
Aroclor 1221	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U
Aroclor 1232	0.100 U	0.400 U	0.100 U	0.0500 U	0.0500 U
Aroclor 1242	0.100 U	0.100 U	0.100 U	0.0600 U	0.0600 U
Aroclor 1248	1.30 U	0.130 U	1.00 U	0.0500 U	0.900 U
Aroclor 1254	1.70 U	0.400 U	0.670 U	0.0500 U	0.310 U
Aroclor 1260	0.240 U	0.170 U	0.240 U	0.0300 U	0.0300 U
Metals (mg/kg dry)					
Aluminum	**17,700**	**17,100**	**15,400**	**9,320**	**16,600**
Antimony	R	R	R	R	R
Arsenic	**5.00**	**3.70**	**3.90**	**3.60**	**4.50**
Barium	**135**	**163**	**131**	**64.2**	**159**
Beryllium	**0.300**	**0.200**	**0.300**	0.100 U	**0.300**
Cadmium	**0.700**	**0.600**	**0.700**	0.300 U	0.300 U
Calcium	**7,660**	**9,400**	**6,390**	**4,710**	**6,900**
Chromium	**18.0**	**19.1**	**18.0**	**15.9**	**18.4**
Cobalt	**10.9**	**13.0**	**10.3**	**7.30**	**10.3**
Copper	**23.9**	**21.9**	**22.4**	**12.1**	**23.3**
Iron	**26,400**	**29,200**	**25,000**	**19,000**	**26,000**
Lead	**11.0**	**10.7**	**12.0**	**7.40**	**11.7**
Magnesium	**6,430**	**9,130**	**5,490**	**4,250**	**6,000**
Manganese	**635**	**469**	**513**	**317**	**510**
Mercury	**0.130**	**0.0700**	**0.140**	0.0300 U	**0.0800**
Nickel	**20.0**	**30.0**	**18.0**	**14.0**	**16.0**
Potassium	**1,520**	**1,110**	**1,490**	**550**	**1,280**
Selenium	0.500 U	0.300 U	0.400 U	0.300 U	0.300 U
Silver	0.700 U	0.500 U	0.600 U	0.400 U	0.500 U
Sodium	**1,040**	**1,430**	**790**	**550**	**760**
Thallium	0.300 U	**0.200**	**0.200**	0.100 U	0.200 U
Vanadium	**61.3**	**65.1**	**61.2**	**57.9**	**66.7**
Zinc	**131**	**139**	**141**	**80.4**	**123**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	**14.0**	**9.40**	2.40 U	2.10 U	2.30 U
Residual Range Organics	**26.0 O**	5.00 U	5.00 U	5.00 U	5.00 U
Butyltins (µg/kg dry)					
Dibutyltin dichloride	5.90 U	5.80 U	5.80 U	5.70 U	5.80 U
Monobutyltin trichloride	5.90 U	5.80 U	5.80 U	5.70 U	5.80 U
Tetrabutyltin	5.90 U	5.80 U	5.80 U	5.70 U	5.80 U
Tributyltin chloride	5.90 U	5.80 U	5.80 U	5.70 U	5.80 U
Pesticides (µg/kg dry)					
4,4'-DDD	0.115 U	0.115 U	0.114 U	0.0870 U	0.0870 U
4,4'-DDE	0.213 U	0.213 U	0.211 U	0.0750 U	0.0750 U
4,4'-DDT	0.192 U	0.191 U	0.189 U	0.133 U	0.134 U
Aldrin	0.104 U	0.103 U	0.102 U	0.0350 U	0.0350 U
BHC (alpha)	0.0470 U	0.0470 U	0.0460 U	0.0520 U	0.0520 U
BHC (beta)	0.0430 U	0.0430 U	0.0430 U	0.0580 U	0.0580 U
BHC (delta)	0.0490 U	0.0490 U	0.0480 U	0.0420 U	0.0430 U
BHC (gamma) Lindane	0.0430 U	0.0430 U	0.0430 U	0.0400 U	0.0410 U
Chlordane (alpha)	0.0590 U	0.0590 U	0.0580 U	0.0290 U	0.0290 U
Chlordane (gamma)	0.112 U	0.111 U	0.110 U	0.0370 U	0.0370 U
Dieldrin	0.0820 U	0.0820 U	0.0810 U	0.0580 U	0.0580 U
Endosulfan I	0.0470 U	0.0470 U	0.0460 U	0.0520 U	0.0520 U
Endosulfan II	0.119 U	0.119 U	0.118 U	0.119 U	0.120 U
Endosulfan Sulfate	0.0980 U	0.0980 U	0.0970 U	0.162 U	0.163 U
Endrin	0.0900 U	0.0900 U	0.0890 U	0.0580 U	0.0580 U
Endrin Aldehyde	0.198 U	0.197 U	0.195 U	0.110 U	0.110 U
Endrin Ketone	0.137 U	0.137 U	0.135 U	0.197 U	0.197 U
Heptachlor	0.0820 U	0.0820 U	0.0810 U	0.0420 U	0.0430 U
Heptachlor Epoxide	0.0490 U	0.0490 U	0.0480 U	0.0420 U	0.0430 U
Methoxychlor	0.646 U	0.644 U	0.638 U	0.578 U	0.580 U
Toxaphene	4.89 U	4.88 U	4.83 U	4.34 U	4.35 U
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	4.90 U	4.80 U	4.80 U	4.80 U	4.90 U
1,2-Dichlorobenzene	5.10 U	5.00 U	5.00 U	5.00 U	5.10 U
1,3-Dichlorobenzene	4.70 U	4.60 U	4.60 U	4.60 U	4.70 U
1,4-Dichlorobenzene	5.10 U	5.00 U	5.00 U	5.00 U	5.10 U
2,4,5-Trichlorophenol	7.80 U	7.70 U	7.70 U	7.70 U	7.80 U
2,4,6-Trichlorophenol	6.60 U	6.50 U	6.60 U	6.50 U	6.60 U
2,4-Dichlorophenol	9.80 U	9.60 U	9.70 U	9.60 U	9.80 U
2,4-Dimethylphenol	9.40 U	9.20 U	9.30 U	9.20 U	9.40 U
2,4-Dinitrophenol	99.0 U	97.0 U	98.0 U	97.0 U	99.0 U
2,4-Dinitrotoluene	5.30 U	5.20 U	5.20 U	5.20 U	5.30 U
2,6-Dinitrotoluene	4.90 U	4.80 U	4.80 U	4.80 U	4.90 U
2-Chloronaphthalene	5.70 U	5.60 U	5.60 U	5.60 U	5.70 U
2-Chlorophenol	6.40 U	6.40 U	6.40 U	6.30 U	6.40 U
2-Methylnaphthalene	4.90 U	4.80 U	4.80 U	4.80 U	4.90 U
2-Methylphenol	6.60 U	6.50 U	6.60 U	6.50 U	6.60 U
2-Nitroaniline	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U
2-Nitrophenol	9.60 U	9.40 U	9.50 U	9.40 U	9.60 U
3,3'-Dichlorobenzidine	34.0 U	33.0 U	34.0 U	33.0 U	34.0 U

Table G-6b
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Reference Area Analytical Results
(Page 6 of 10)

Area	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147
Site ID	RF-108	RF-109	RF-110	RF-91	RF-92
Sample ID	030404RF108SD	030404RF109SD	030404RF110SD	030408RF91SD	030408RF92SD
Sample Date	4/4/2003	4/4/2003	4/4/2003	4/8/2003	4/8/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3-Nitroaniline	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
4,6-Dinitro-2-methylphenol	170 U	160 U	160 U	160 U	170 U
4-Bromophenyl Phenyl Ether	6.30 U	6.20 U	6.20 U	6.10 U	6.20 U
4-Chloro-3-methylphenol	9.20 U	9.00 U	9.10 U	9.00 U	9.20 U
4-Chloroaniline	14.0 U	14.0 U	14.0 U	14.0 U	14.0 U
4-Chlorophenyl Phenyl Ether	9.80 U	9.60 U	9.70 U	9.60 U	9.80 U
4-Nitroaniline	13.0 U	13.0 U	13.0 U	12.0 U	13.0 U
4-Nitrophenol	18.0 U	18.0 U	18.0 U	17.0 U	18.0 U
Acenaphthene	5.10 U	5.00 U	5.00 U	5.00 U	5.10 U
Acenaphthylene	4.50 U	4.40 U	4.50 U	4.40 U	4.50 U
Aniline	6.10 U	6.00 U	6.00 U	5.90 U	6.10 U
Anthracene	4.70 U	4.60 U	4.60 U	4.60 U	4.70 U
Benzo(a)anthracene	**14.0 J**	**10.0 J**	5.00 U	5.00 U	5.10 U
Benzo(a)pyrene	**15.0 J**	3.90 U	3.90 U	3.80 U	3.90 U
Benzo(b)fluoranthene	**16.0 J**	7.90 U	**11.0 J**	7.90 U	8.00 U
Benzo(g,h,i)perylene	5.30 U	5.20 U	5.20 U	5.20 U	5.30 U
Benzo(k)fluoranthene	**12.0 J**	11.0 U	11.0 U	11.0 U	11.0 U
Benzoic Acid	160 U	160 U	160 U	160 U	160 U
Benzyl Alcohol	20.0 U	19.0 U	19.0 U	19.0 U	20.0 U
Bis(2-chloroethoxy)methane	4.70 U	4.60 U	4.60 U	4.60 U	4.70 U
Bis(2-chloroethyl) Ether	6.60 U	6.50 U	6.60 U	6.50 U	6.60 U
Bis(2-chloroisopropyl) Ether	5.70 U	5.60 U	5.60 U	5.60 U	5.70 U
Bis(2-ethylhexyl) Phthalate	19.0 U	18.0 U	**36.0**	18.0 U	19.0 U
Butyl Benzyl Phthalate	4.90 U	4.80 U	4.80 U	4.80 U	4.90 U
Carbazole	4.70 U	4.60 U	4.60 U	4.60 U	4.70 U
Chrysene	**18.0 J**	**13.0 J**	**14.0 J**	5.90 U	6.10 U
Dibenz(a,h)anthracene	5.70 U	5.60 U	5.60 U	5.60 U	5.70 U
Dibenzofuran	4.90 U	4.80 U	4.80 U	4.80 U	4.90 U
Diethyl Phthalate	8.60 U	8.50 U	8.50 U	8.40 U	8.60 U
Dimethyl Phthalate	5.10 U	5.00 U	5.00 U	5.00 U	5.10 U
Di-n-butyl Phthalate	5.70 U	**200**	5.60 U	5.60 U	5.70 U
Di-n-octyl Phthalate	8.00 U	7.90 U	7.90 U	7.90 U	8.00 U
Fluoranthene	**33.0**	**19.0 J**	**13.0 J**	5.80 U	**26.0**
Fluorene	6.60 U	6.50 U	6.60 U	6.50 U	6.60 U
Hexachlorobenzene	5.50 U	5.40 U	5.40 U	5.40 U	5.50 U
Hexachlorobutadiene	6.60 U	6.50 U	6.60 U	6.50 U	6.60 U
Hexachlorocyclopentadiene	29.0 U	28.0 U	29.0 U	28.0 U	29.0 U
Hexachloroethane	7.40 U	7.30 U	7.40 U	7.30 U	7.40 U
Indeno(1,2,3-cd)pyrene	5.90 U	5.80 U	5.80 U	5.80 U	5.90 U
Isophorone	6.30 U	6.20 U	6.20 U	6.10 U	6.20 U
Naphthalene	5.10 U	5.00 U	5.00 U	5.00 U	5.10 U
Nitrobenzene	5.90 U	5.80 U	5.80 U	5.80 U	5.90 U
N-Nitrosodimethylamine	40.0 U	39.0 U	39.0 U	39.0 U	40.0 U
N-Nitrosodi-n-propylamine	7.00 U	6.90 U	7.00 U	6.90 U	7.00 U
N-Nitrosodiphenylamine	6.80 U	6.70 U	6.80 U	6.70 U	6.80 U
p-cresol (4-Methylphenol)	6.60 U	6.50 U	6.60 U	6.50 U	6.60 U
Pentachlorophenol	43.0 U	42.0 U	42.0 U	42.0 U	43.0 U
Phenanthrene	**16.0 J**	**14.0 J**	4.50 U	4.40 U	4.50 U
Phenol	6.40 U	6.40 U	6.40 U	6.30 U	6.40 U
Pyrene	**24.0**	**18.0 J**	**11.0 J**	10.0 U	**15.0 J**
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.900**	**0.860**	**0.620**	**0.470**	**0.610**
Solids, Total	**54.6**	**46.0**	**67.4**	**67.9**	**61.3**
Gravel	**16.1**	**2.40**	**6.70**	**2.00**	**3.40**
Sand, Coarse	**7.60**	**6.40**	**9.30**	**2.30**	**0.800**
Sand, Medium	**18.5**	**7.40**	**6.30**	**16.5**	**4.00**
Sand, Fine	**25.6**	**45.6**	**40.2**	**69.9**	**68.4**
Sand	**51.7**	**59.4**	**55.8**	**88.7**	**73.2**
Silt	**23.8**	**33.8**	**33.5**	**8.80**	**20.4**
Clay	**8.50**	**4.40**	**4.00**	**0.500**	**3.00**
Fines	**32.3**	**38.2**	**37.5**	**9.30**	**23.4**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6b
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Reference Area Analytical Results

Area	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147
Site ID	RF-93	RF-94	RF-95	RF-96	RF-96 DUP
Sample ID	030408RF93SD	030408RF94SD	030408RF95SD	030408RF96SD	030408RF147SD
Sample Date	4/8/2003	4/8/2003	4/8/2003	4/8/2003	4/8/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)					
Aroclor 1016	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U
Aroclor 1221	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U
Aroclor 1232	0.580 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Aroclor 1242	0.0600 U	0.0600 U	0.0600 U	0.0600 U	0.0200 U
Aroclor 1248	0.0500 U	0.900 U	1.20 U	1.20 U	0.500 U
Aroclor 1254	0.0500 U	0.580 U	0.980 U	1.40 U	0.710 U
Aroclor 1260	0.0300 U	0.0300 U	0.170 U	0.280 U	0.240 U
Metals (mg/kg dry)					
Aluminum	**23,100**	**18,000**	**16,800**	**18,200**	**19,000**
Antimony	R	R	R	R	R
Arsenic	**8.80**	**4.40**	**4.80**	**4.70**	**4.50**
Barium	**117**	**146**	**142**	**159**	**167**
Beryllium	**0.500**	**0.300**	**0.300**	**0.300**	**0.400**
Cadmium	0.300 U	**0.500**	**0.800**	**0.800**	**0.800**
Calcium	**8,090**	**7,380**	**6,590**	**6,970**	**7,190**
Chromium	**22.3**	**18.2**	**18.0**	**20.0**	**20.0**
Cobalt	**15.1**	**11.5**	**10.0**	**11.0**	**11.3**
Copper	**51.4**	**26.3**	**23.9**	**27.2**	**27.0**
Iron	**33,400**	**28,800**	**25,700**	**27,900**	**28,300**
Lead	**5.50**	**9.70**	**13.0**	**15.0**	**15.0**
Magnesium	**10,100**	**6,880**	**5,540**	**5,670**	**5,750**
Manganese	**345**	**620**	**566**	**656**	**691**
Mercury	**0.0400**	**0.130**	**0.0900**	**0.150**	**0.130**
Nickel	**21.0**	**17.0**	**16.0**	**20.0**	**19.0**
Potassium	**960**	**1,310**	**1,530**	**1,620**	**1,640**
Selenium	0.300 U	0.300 U	0.400 U	0.400 U	0.400 U
Silver	0.400 U	0.500 U	0.600 U	0.700 U	0.600 U
Sodium	**790**	**820**	**710**	**770**	**780**
Thallium	0.100 U	0.200 U	**0.200**	0.200 U	0.200 U
Vanadium	**74.8**	**67.9**	**64.2**	**67.7**	**67.9**
Zinc	**72.0**	**125**	**125**	**137**	**143**
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	2.10 U	2.30 U	2.60 U	**6.90**	**7.00**
Residual Range Organics	5.00 U	5.00 U	5.00 U	**14.0 O**	**16.0**
Butyltins (µg/kg dry)					
Dibutyltin dichloride	5.80 U	5.80 U	5.90 U	5.90 U	5.90 U
Monobutyltin trichloride	5.80 U	5.80 U	5.90 U	5.90 U	5.90 U
Tetrabutyltin	5.80 U	5.80 U	5.90 U	5.90 U	5.90 U
Tributyltin chloride	5.80 U	5.80 U	5.90 U	5.90 U	5.90 U
Pesticides (µg/kg dry)					
4,4'-DDD	0.0860 U	0.0870 U	0.0880 U	0.0880 U	0.0880 U
4,4'-DDE	0.0740 U	0.0750 U	0.0760 U	0.0760 U	0.0760 U
4,4'-DDT	0.132 U	0.133 U	0.135 U	0.135 U	0.134 U
Aldrin	0.0340 U	0.0350 U	0.0350 U	0.0350 U	0.0350 U
BHC (alpha)	0.0520 U	0.0520 U	0.0530 U	0.0530 U	0.0530 U
BHC (beta)	0.0570 U	0.0580 U	0.0590 U	0.0590 U	0.0580 U
BHC (delta)	0.0420 U	0.0420 U	0.0430 U	0.0430 U	0.0430 U
BHC (gamma) Lindane	0.0400 U	0.0400 U	0.0410 U	0.0410 U	0.0410 U
Chlordane (alpha)	0.0290 U	0.0290 U	0.0290 U	0.0290 U	0.0290 U
Chlordane (gamma)	0.0360 U	0.0370 U	0.0370 U	0.0370 U	0.0370 U
Dieldrin	0.0570 U	0.0580 U	0.0590 U	0.0590 U	0.0580 U
Endosulfan I	0.0520 U	0.0520 U	0.0530 U	0.0530 U	0.0530 U
Endosulfan II	0.118 U	0.119 U	0.121 U	0.121 U	0.121 U
Endosulfan Sulfate	0.160 U	0.162 U	0.164 U	0.165 U	0.164 U
Endrin	0.0570 U	0.0580 U	0.0590 U	0.0590 U	0.0580 U
Endrin Aldehyde	0.109 U	0.110 U	0.111 U	0.112 U	0.111 U
Endrin Ketone	0.195 U	0.196 U	0.199 U	0.200 U	0.199 U
Heptachlor	0.0420 U	0.0420 U	0.0430 U	0.0430 U	0.0430 U
Heptachlor Epoxide	0.0420 U	0.0420 U	0.0430 U	0.0430 U	0.0430 U
Methoxychlor	0.573 U	0.578 U	0.585 U	0.588 U	0.584 U
Toxaphene	4.30 U	4.33 U	4.39 U	4.41 U	4.38 U
Semivolatile Organic Compounds (µg/kg dry)					
1,2,4-Trichlorobenzene	4.80 U	4.80 U	4.90 U	4.90 U	4.90 U
1,2-Dichlorobenzene	5.00 U	5.00 U	5.10 U	5.10 U	5.10 U
1,3-Dichlorobenzene	4.60 U	4.60 U	4.70 U	4.70 U	4.70 U
1,4-Dichlorobenzene	5.00 U	5.00 U	5.10 U	5.10 U	5.10 U
2,4,5-Trichlorophenol	7.70 U	7.70 U	7.90 U	7.80 U	7.80 U
2,4,6-Trichlorophenol	6.50 U	6.50 U	6.70 U	6.60 U	6.60 U
2,4-Dichlorophenol	9.60 U	9.60 U	9.80 U	9.80 U	9.70 U
2,4-Dimethylphenol	9.20 U	9.20 U	9.40 U	9.40 U	9.40 U
2,4-Dinitrophenol	97.0 U	97.0 U	99.0 U	99.0 U	99.0 U
2,4-Dinitrotoluene	5.20 U	5.20 U	5.30 U	5.30 U	5.30 U
2,6-Dinitrotoluene	4.80 U	4.80 U	4.90 U	4.90 U	4.90 U
2-Chloronaphthalene	5.50 U	5.60 U	5.70 U	5.70 U	5.70 U
2-Chlorophenol	6.30 U	6.30 U	6.50 U	6.40 U	6.40 U
2-Methylnaphthalene	4.80 U	4.80 U	4.90 U	4.90 U	4.90 U
2-Methylphenol	6.50 U	6.50 U	6.70 U	6.60 U	6.60 U
2-Nitroaniline	13.0 U	13.0 U	13.0 U	13.0 U	13.0 U
2-Nitrophenol	9.40 U	9.40 U	9.60 U	9.60 U	9.50 U
3,3'-Dichlorobenzidine	33.0 U	33.0 U	34.0 U	34.0 U	34.0 U

Table G-6b
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Reference Area Analytical Results
(Page 8 of 10)

Area	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147
Site ID	RF-93	RF-94	RF-95	RF-96	RF-96 DUP
Sample ID	030408RF93SD	030408RF94SD	030408RF95SD	030408RF96SD	030408RF147SD
Sample Date	4/8/2003	4/8/2003	4/8/2003	4/8/2003	4/8/2003
Medium	Sediment	Sediment	Sediment	Sediment	Sediment
3-Nitroaniline	11.0 U	11.0 U	11.0 U	11.0 U	11.0 U
4,6-Dinitro-2-methylphenol	160 U	160 U	170 U	170 U	170 U
4-Bromophenyl Phenyl Ether	6.10 U	6.10 U	6.30 U	6.20 U	6.20 U
4-Chloro-3-methylphenol	9.00 U	9.00 U	9.20 U	9.20 U	9.20 U
4-Chloroaniline	14.0 U	14.0 U	14.0 U	14.0 U	14.0 U
4-Chlorophenyl Phenyl Ether	9.60 U	9.60 U	9.80 U	9.80 U	9.70 U
4-Nitroaniline	12.0 U	12.0 U	13.0 U	13.0 U	13.0 U
4-Nitrophenol	17.0 U	17.0 U	18.0 U	18.0 U	18.0 U
Acenaphthene	5.00 U	5.00 U	5.10 U	5.10 U	5.10 U
Acenaphthylene	4.40 U	4.40 U	4.50 U	4.50 U	4.50 U
Aniline	5.90 U	6.00 U	6.10 U	6.00 U	6.00 U
Anthracene	4.60 U	4.60 U	4.70 U	4.70 U	4.70 U
Benzo(a)anthracene	5.00 U	5.00 U	5.10 U	5.10 U	5.10 U
Benzo(a)pyrene	3.80 U	3.80 U	3.90 U	**10.0 J**	3.90 U
Benzo(b)fluoranthene	7.80 U	7.90 U	8.10 U	**10.0 J**	8.00 U
Benzo(g,h,i)perylene	5.20 U	5.20 U	5.30 U	5.30 U	5.30 U
Benzo(k)fluoranthene	11.0 U	11.0 U	11.0 U	**12.0 J**	11.0 U
Benzoic Acid	160 U	160 U	160 U	160 U	160 U
Benzyl Alcohol	19.0 U	19.0 U	20.0 U	20.0 U	19.0 U
Bis(2-chloroethoxy)methane	4.60 U	4.60 U	4.70 U	4.70 U	4.70 U
Bis(2-chloroethyl) Ether	6.50 U	6.50 U	6.70 U	6.60 U	6.60 U
Bis(2-chloroisopropyl) Ether	5.50 U	5.60 U	5.70 U	5.70 U	5.70 U
Bis(2-ethylhexyl) Phthalate	**30.0**	18.0 U	**42.0**	19.0 U	19.0 U
Butyl Benzyl Phthalate	4.80 U	4.80 U	4.90 U	4.90 U	4.90 U
Carbazole	4.60 U	4.60 U	4.70 U	4.70 U	4.70 U
Chrysene	5.90 U	6.00 U	6.10 U	**13.0 J**	6.00 U
Dibenz(a,h)anthracene	5.50 U	5.60 U	5.70 U	5.70 U	5.70 U
Dibenzofuran	4.80 U	4.80 U	4.90 U	4.90 U	4.90 U
Diethyl Phthalate	8.40 U	8.40 U	8.60 U	8.60 U	8.60 U
Dimethyl Phthalate	5.00 U	5.00 U	5.10 U	5.10 U	5.10 U
Di-n-butyl Phthalate	5.50 U	5.60 U	5.70 U	5.70 U	**17.0 J**
Di-n-octyl Phthalate	7.80 U	7.90 U	8.10 U	8.00 U	8.00 U
Fluoranthene	5.70 U	5.80 U	**14.0 J**	**18.0 J**	**12.0 J**
Fluorene	6.50 U	6.50 U	6.70 U	6.60 U	6.60 U
Hexachlorobenzene	5.40 U	5.40 U	5.50 U	5.50 U	5.50 U
Hexachlorobutadiene	6.50 U	6.50 U	6.70 U	6.60 U	6.60 U
Hexachlorocyclopentadiene	28.0 U	28.0 U	29.0 U	29.0 U	29.0 U
Hexachloroethane	7.30 U	7.30 U	7.50 U	7.40 U	7.40 U
Indeno(1,2,3-cd)pyrene	5.70 U	5.80 U	5.90 U	5.90 U	5.80 U
Isophorone	6.10 U	6.10 U	6.30 U	6.20 U	6.20 U
Naphthalene	5.00 U	5.00 U	5.10 U	5.10 U	5.10 U
Nitrobenzene	5.70 U	5.80 U	5.90 U	5.90 U	5.80 U
N-Nitrosodimethylamine	39.0 U	39.0 U	40.0 U	40.0 U	40.0 U
N-Nitrosodi-n-propylamine	6.90 U	6.90 U	7.10 U	7.00 U	7.00 U
N-Nitrosodiphenylamine	6.70 U	6.70 U	6.90 U	6.80 U	6.80 U
p-cresol (4-Methylphenol)	6.50 U	6.50 U	6.70 U	6.60 U	6.60 U
Pentachlorophenol	42.0 U	42.0 U	43.0 U	43.0 U	42.0 U
Phenanthrene	4.40 U	4.40 U	4.50 U	4.50 U	4.50 U
Phenol	6.30 U	6.30 U	6.50 U	6.40 U	6.40 U
Pyrene	9.90 U	10.0 U	**11.0 J**	**14.0 J**	10.0 U
General Chemistry Parameters and Grain Size (%)					
Carbon, Total Organic	**0.240**	**0.700**	**1.00**	**1.10**	**0.650**
Solids, Total	**56.8**	**64.9**	**55.7**	**49.6**	**56.1**
Gravel	**5.50**	**16.1**	**0.700**	**0.400**	**2.30**
Sand, Coarse	**28.5**	**4.90**	**0.500**	**0.500**	**0.100**
Sand, Medium	**20.7**	**3.60**	**2.20**	**1.30**	**1.50**
Sand, Fine	**12.7**	**32.1**	**71.8**	**51.4**	**46.7**
Sand	**61.9**	**40.6**	**74.5**	**53.2**	**48.3**
Silt	**30.9**	**41.5**	**20.2**	**40.8**	**43.8**
Clay	**1.60**	**1.80**	**4.60**	**5.60**	**5.60**
Fines	**32.5**	**43.3**	**24.8**	**46.4**	**49.4**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6b
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Reference Area Analytical Results

Area	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147
Site ID	RF-97	RF-98	RF-99
Sample ID	030407RF97SD	030407RF98SD	030407RF99SD
Sample Date	4/7/2003	4/7/2003	4/7/2003
Medium	Sediment	Sediment	Sediment
PCB Aroclors (µg/kg dry)			
Aroclor 1016	0.0200 U	0.0200 U	0.0200 U
Aroclor 1221	0.0200 U	0.0200 U	0.0200 U
Aroclor 1232	0.0500 U	0.0500 U	0.0500 U
Aroclor 1242	0.0600 U	0.0600 U	0.0600 U
Aroclor 1248	1.00 U	0.600 U	1.10 U
Aroclor 1254	1.00 U	0.900 U	1.60 U
Aroclor 1260	0.170 U	0.280 U	0.340 U
Metals (mg/kg dry)			
Aluminum	**15,400**	**22,000**	**16,600**
Antimony	**0.400 J**	R	R
Arsenic	**3.90**	**5.60**	**4.60**
Barium	**141**	**177**	**152**
Beryllium	**0.300**	**0.400**	**0.300**
Cadmium	**0.700**	**0.900**	**0.500**
Calcium	**6,410**	**7,840**	**6,700**
Chromium	**18.0**	**23.0**	**18.3**
Cobalt	**9.90**	**13.0**	**10.6**
Copper	**21.9**	**33.4**	**24.9**
Iron	**24,800**	**32,000**	**26,000**
Lead	**13.0**	**16.0**	**13.8**
Magnesium	**5,030**	**6,300**	**5,590**
Manganese	**560**	**815**	**665**
Mercury	**0.0800**	**0.210**	**0.130**
Nickel	**16.0**	**20.0**	**17.0**
Potassium	**1,420**	**2,000**	**1,500**
Selenium	0.400 U	0.700 U	0.300 U
Silver	0.600 U	1.00 U	0.500 U
Sodium	**710**	**830**	**690**
Thallium	**0.400**	0.300 U	**0.200**
Vanadium	**66.0**	**76.0**	**62.9**
Zinc	**132**	**154**	**129**
Petroleum Hydrocarbons (mg/kg dry)			
Diesel Range Organics	**5.90**	3.10 U	**5.60**
Residual Range Organics	**13.0 O**	5.00 U	**11.0 O**
Butyltins (µg/kg dry)			
Dibutyltin dichloride	5.90 U	5.80 U	5.90 U
Monobutyltin trichloride	5.90 U	5.80 U	5.90 U
Tetrabutyltin	5.90 U	5.80 U	5.90 U
Tributyltin chloride	5.90 U	5.80 U	5.90 U
Pesticides (µg/kg dry)			
4,4'-DDD	0.0880 U	0.0870 U	0.0880 U
4,4'-DDE	0.0760 U	0.0760 U	0.0760 U
4,4'-DDT	0.135 U	0.134 U	0.134 U
Aldrin	0.0350 U	0.0350 U	0.0350 U
BHC (alpha)	0.0530 U	0.0520 U	0.0530 U
BHC (beta)	0.0590 U	0.0580 U	0.0580 U
BHC (delta)	0.0430 U	0.0430 U	0.0430 U
BHC (gamma) Lindane	0.0410 U	0.0410 U	0.0410 U
Chlordane (alpha)	0.0290 U	0.0290 U	0.0290 U
Chlordane (gamma)	0.0370 U	0.0370 U	0.0370 U
Dieldrin	0.0590 U	0.0580 U	0.0580 U
Endosulfan I	0.0530 U	0.0520 U	0.0530 U
Endosulfan II	0.121 U	0.120 U	0.121 U
Endosulfan Sulfate	0.164 U	0.163 U	0.163 U
Endrin	0.0590 U	0.0580 U	0.0580 U
Endrin Aldehyde	0.112 U	0.111 U	0.111 U
Endrin Ketone	0.200 U	0.198 U	0.198 U
Heptachlor	0.0430 U	0.0430 U	0.0430 U
Heptachlor Epoxide	0.0430 U	0.0430 U	0.0430 U
Methoxychlor	0.587 U	0.582 U	0.584 U
Toxaphene	4.40 U	4.37 U	4.38 U
Semivolatile Organic Compounds (µg/kg dry)			
1,2,4-Trichlorobenzene	4.90 U	4.90 U	4.90 U
1,2-Dichlorobenzene	5.10 U	5.00 U	5.10 U
1,3-Dichlorobenzene	4.70 U	4.70 U	4.70 U
1,4-Dichlorobenzene	5.10 U	5.00 U	5.10 U
2,4,5-Trichlorophenol	7.90 U	7.80 U	7.80 U
2,4,6-Trichlorophenol	6.70 U	6.60 U	6.60 U
2,4-Dichlorophenol	9.80 U	9.70 U	9.70 U
2,4-Dimethylphenol	9.40 U	9.30 U	9.30 U
2,4-Dinitrophenol	99.0 U	98.0 U	98.0 U
2,4-Dinitrotoluene	5.30 U	5.20 U	5.30 U
2,6-Dinitrotoluene	4.90 U	4.90 U	4.90 U
2-Chloronaphthalene	5.70 U	5.60 U	5.60 U
2-Chlorophenol	6.50 U	6.40 U	6.40 U
2-Methylnaphthalene	4.90 U	4.90 U	4.90 U
2-Methylphenol	6.70 U	6.60 U	6.60 U
2-Nitroaniline	13.0 U	13.0 U	13.0 U
2-Nitrophenol	9.60 U	9.50 U	9.50 U
3,3'-Dichlorobenzidine	34.0 U	34.0 U	34.0 U

Table G-6b
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Reference Area Analytical Results
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Area	Reference Area at River Mile 147	Reference Area at River Mile 147	Reference Area at River Mile 147
Site ID	RF-97	RF-98	RF-99
Sample ID	030407RF97SD	030407RF98SD	030407RF99SD
Sample Date	4/7/2003	4/7/2003	4/7/2003
Medium	Sediment	Sediment	Sediment
3-Nitroaniline	11.0 U	11.0 U	11.0 U
4,6-Dinitro-2-methylphenol	170 U	160 U	170 U
4-Bromophenyl Phenyl Ether	6.30 U	6.20 U	6.20 U
4-Chloro-3-methylphenol	9.20 U	9.10 U	9.10 U
4-Chloroaniline	14.0 U	14.0 U	14.0 U
4-Chlorophenyl Phenyl Ether	9.80 U	9.70 U	9.70 U
4-Nitroaniline	13.0 U	13.0 U	13.0 U
4-Nitrophenol	18.0 U	18.0 U	18.0 U
Acenaphthene	5.10 U	5.00 U	5.10 U
Acenaphthylene	4.50 U	4.50 U	4.50 U
Aniline	6.10 U	6.00 U	6.00 U
Anthracene	4.70 U	4.70 U	4.70 U
Benzo(a)anthracene	**12.0 J**	**13.0 J**	5.10 U
Benzo(a)pyrene	**13.0 J**	**15.0 J**	3.90 U
Benzo(b)fluoranthene	**15.0 J**	**13.0 J**	8.00 U
Benzo(g,h,i)perylene	5.30 U	**9.70 J**	5.30 U
Benzo(k)fluoranthene	11.0 U	11.0 U	11.0 U
Benzoic Acid	160 U	160 U	160 U
Benzyl Alcohol	20.0 U	19.0 U	19.0 U
Bis(2-chloroethoxy)methane	4.70 U	4.70 U	4.70 U
Bis(2-chloroethyl) Ether	6.70 U	6.60 U	6.60 U
Bis(2-chloroisopropyl) Ether	5.70 U	5.60 U	5.60 U
Bis(2-ethylhexyl) Phthalate	19.0 U	18.0 U	18.0 U
Butyl Benzyl Phthalate	4.90 U	4.90 U	4.90 U
Carbazole	4.70 U	4.70 U	4.70 U
Chrysene	**17.0 J**	**16.0 J**	6.00 U
Dibenz(a,h)anthracene	5.70 U	5.60 U	5.60 U
Dibenzofuran	4.90 U	4.90 U	4.90 U
Diethyl Phthalate	8.70 U	8.50 U	8.60 U
Dimethyl Phthalate	5.10 U	5.00 U	5.10 U
Di-n-butyl Phthalate	5.70 U	5.60 U	5.60 U
Di-n-octyl Phthalate	8.10 U	8.00 U	8.00 U
Fluoranthene	**26.0**	**28.0**	5.80 U
Fluorene	6.70 U	6.60 U	6.60 U
Hexachlorobenzene	5.50 U	5.40 U	5.40 U
Hexachlorobutadiene	6.70 U	6.60 U	6.60 U
Hexachlorocyclopentadiene	29.0 U	29.0 U	29.0 U
Hexachloroethane	7.50 U	7.40 U	7.40 U
Indeno(1,2,3-cd)pyrene	5.90 U	19.0 U	5.80 U
Isophorone	6.30 U	6.20 U	6.20 U
Naphthalene	5.10 U	5.00 U	5.10 U
Nitrobenzene	5.90 U	5.80 U	5.80 U
N-Nitrosodimethylamine	40.0 U	39.0 U	39.0 U
N-Nitrosodi-n-propylamine	7.10 U	7.00 U	7.00 U
N-Nitrosodiphenylamine	6.90 U	6.80 U	6.80 U
p-cresol (4-Methylphenol)	6.70 U	6.60 U	6.60 U
Pentachlorophenol	43.0 U	42.0 U	42.0 U
Phenanthrene	**18.0 J**	**12.0 J**	4.50 U
Phenol	6.50 U	6.40 U	6.40 U
Pyrene	**20.0 J**	**22.0**	10.0 U
General Chemistry Parameters and Grain Size (%)			
Carbon, Total Organic	**1.30**	**1.10**	**1.60**
Solids, Total	**50.5**	**44.8**	**42.4**
Gravel	**1.40**	**0.000**	**0.000**
Sand, Coarse	**0.500**	**0.300**	**0.600**
Sand, Medium	**1.30**	**1.70**	**2.80**
Sand, Fine	**61.3**	**33.4**	**57.1**
Sand	**63.1**	**35.4**	**60.5**
Silt	**28.4**	**52.7**	**31.8**
Clay	**7.20**	**11.9**	**7.70**
Fines	**35.6**	**64.6**	**39.5**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-6c
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Surface Water Analytical Results
(Page 1 of 2)

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	DP-122	DP-124	DP-124 DUP	DP-125	DP-127	GI-115
Sample ID	030409DP122WC	030409DP124WC	030409DP148WC	030409DP125WC	030409DP127WC	030409GI115WC
Sample Date	4/9/2003	4/9/2003	4/9/2003	4/9/2003	4/9/2003	4/9/2003
Metals (mg/L)						
Calcium	**14.6**	**16.1**	**15.7**	**16.3**	**16.8**	**16.3**
Magnesium	**4.66**	**5.11**	**5.00**	**5.17**	**5.34**	**5.17**
General Chemistry Parameters (mg/L)						
Carbon, Dissolved Organic	**5.30**	**2.60**	**2.50**	**2.80**	**2.30**	**3.70**
Total Suspended Solids	**7.10**	**6.70**	**6.80**	**7.40**	**7.30**	**7.90**
Hardness (by Calculation)	**56.0**	**61.0**	**60.0**	**62.0**	**64.0**	**62.0**
Biological Oxygen Demand	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
Chemical Oxygen Demand	**5.10**	**8.70**	**8.00**	**9.30**	5.00 U	**9.70**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-6c
Data Not Used in the RI - 2003 Stage 1 and 2 Sediment Investigation
Surface Water Analytical Results
(Page 2 of 2)

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Reference Area at River Mile 147	Reference Area at River Mile 147
Site ID	S1-38	S1-41	S1-50	RF-104	RF-96
Sample ID	030409S138WC	030409S141WC	030409S150WC	030409RF104WC	030409RF96WC
Sample Date	4/9/2003	4/9/2003	4/9/2003	4/9/2003	4/9/2003
Metals (mg/L)					
Calcium	**15.6**	**15.9**	**15.8**	**16.6**	**15.8**
Magnesium	**4.97**	**5.04**	**5.00**	**5.29**	**5.02**
General Chemistry Parameters (mg/L)					
Carbon, Dissolved Organic	**4.00**	**2.90**	**2.60**	**2.90**	**3.50**
Total Suspended Solids	**6.20**	**4.90**	**6.80**	**8.00**	**5.90**
Hardness (by Calculation)	**59.0**	**60.0**	**60.0**	**63.0**	**60.0**
Biological Oxygen Demand	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
Chemical Oxygen Demand	5.00 U	**9.00**	**8.70**	**12.0**	**12.0**

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

Table G-7
Data Not Used in the RI - 2004 Sandblast Supplemental Site Investigation
Catchbasin Solids Analytical Results
(Page 1 of 3)

Area	Sandblast	Sandblast
Site ID	CB1	CB1-FS
Sample ID	041122SGA19SS	041122SGA18SS
Sample Date	11/22/2004	11/22/2004
Location	Catchbasin	Catchbasin Filter Sock
PCB Aroclors (µg/kg dry)		
Aroclor 1016	3.79 U	4.49 U
Aroclor 1221	3.79 U	4.49 U
Aroclor 1232	3.79 U	4.49 U
Aroclor 1242	3.79 U	4.49 U
Aroclor 1248	3.79 U	4.49 U
Aroclor 1254	2.08 U	**207**
Aroclor 1260	**172**	**144**
Metals (mg/kg dry)		
Aluminum	**4,410**	**3,020**
Antimony	**1.32**	**1.39**
Arsenic	**3.95**	**3.65**
Barium	**61.7**	**38.6**
Beryllium	**0.107 J**	**0.0964 J**
Cadmium	**1.35**	**1.31**
Calcium	**4,210**	**4,350**
Chromium	**374**	**394**
Cobalt	**12.0**	**10.5**
Copper	**89.2**	**89.6**
Iron	**30,800**	**29,100**
Lead	**577**	**447**
Magnesium	**9,190**	**11,600**
Manganese	**471**	**432**
Mercury	**0.0128 J**	**0.0442**
Nickel	**100**	**146**
Potassium	**258**	**249**
Selenium	**0.190 J**	**0.127 J**
Silver	**0.0880**	**0.158**
Sodium	13.6 U	16.9 U
Thallium	**0.0423 J**	**0.0317 J**
Vanadium	**40.7**	**27.6**
Zinc	**248**	**223**
Petroleum Hydrocarbons (mg/kg dry)		
Diesel Range Organics	-	**107**
Residual Range Organics	-	**855**
Gasoline Range Organics	-	6.08 U
Butyltins (µg/kg dry)		
Dibutyltin	**6.96 J**	**6.13 J**
Monobutyltin	**15.3 J**	**9.70 J**
Tetrabutyltin	1.00 U	1.17 U
Tributyltin	**12.6 J**	**3.80 J**
Pesticides (µg/kg dry)		
4,4'-DDD	-	0.311 U
4,4'-DDE	-	**1.54 J**
4,4'-DDT	-	**19.1**
Aldrin	-	**0.980 J**
BHC (alpha)	-	0.152 U
BHC (beta)	-	**12.5 J**
BHC (delta)	-	0.152 U
BHC (gamma) Lindane	-	0.183 U
Chlordane (alpha)	-	0.165 U
Chlordane (gamma)	-	**3.37 J**
Dieldrin	-	**9.41 J**
Endosulfan I	-	0.171 U
Endosulfan II	-	**10.8 J**
Endosulfan Sulfate	-	**1.61 J**
Endrin	-	**8.45**
Endrin Aldehyde	-	0.884 U
Endrin Ketone	-	0.171 U
Heptachlor	-	0.152 U
Heptachlor Epoxide	-	0.209 U
Methoxychlor	-	0.219 U
Toxaphene	-	15.2 U
General Chemistry Parameters and Grain Size (%)		
Carbon, Total Organic	-	**2.94**
Gravel, Unspecified sieve size	-	**6.90**
Coarse Sand, Unspecified sieve size	-	**21.4**
Medium Sand, Unspecified sieve size	-	**47.4**
Fine Sand, Unspecified sieve size	-	**12.8**
Fines, Unspecified sieve size	-	**11.5**
Volatile Organic Compounds (µg/kg dry)		
1,1,1,2-Tetrachloroethane	-	0.0740 U
1,1,1-Trichloroethane (TCA)	-	0.109 U
1,1,2,2-Tetrachloroethane	-	0.107 U
1,1,2-Trichloroethane	-	0.150 U
1,1-Dichloroethane	-	0.0956 U
1,1-Dichloroethene	-	0.738 U
1,1-Dichloropropene	-	1.51 U
1,2,3-Trichlorobenzene	-	0.180 U
1,2,3-Trichloropropane	-	0.126 U
1,2,4-Trichlorobenzene	-	0.184 U

Table G-7
Data Not Used in the RI - 2004 Sandblast Supplemental Site Investigation
Catchbasin Solids Analytical Results

Area	Sandblast	Sandblast
Site ID	CB1	CB1-FS
Sample ID	041122SGA19SS	041122SGA18SS
Sample Date	11/22/2004	11/22/2004
Location	Catchbasin	Catchbasin Filter Sock
1,2,4-Trimethylbenzene	-	0.0799 U
1,2-Dibromo-3-chloropropane	-	0.225 UJ
1,2-Dibromoethane (EDB)	-	0.0962 U
1,2-Dichlorobenzene	-	0.0962 U
1,2-Dichloroethane (EDC)	-	0.147 U
1,2-Dichloropropane	-	0.0716 U
1,3,5-Trimethylbenzene	-	0.0721 U
1,3-Dichlorobenzene	-	0.0653 U
1,3-Dichloropropane	-	0.101 U
1,4-Dichlorobenzene	-	0.0922 U
2,2-Dichloropropane	-	0.128 U
2-Butanone (MEK)	-	14.5 U
2-Chlorotoluene	-	0.0820 U
2-Hexanone	-	2.06 U
4-Chlorotoluene	-	0.157 U
4-Isopropyltoluene	-	**4.36**
4-Methyl-2-pentanone (MIBK)	-	**2.14 J**
Acetone	-	129 U
Benzene	-	**0.372 J**
Bromobenzene	-	0.0752 U
Bromochloromethane	-	0.0867 U
Bromodichloromethane	-	0.117 U
Bromoform	-	0.117 UJ
Bromomethane	-	0.665 U
Carbon Disulfide	-	1.89 U
Carbon Tetrachloride	-	0.159 U
Chlorobenzene	-	0.0841 U
Chloroethane	-	1.09 U
Chloroform	-	0.101 U
Chloromethane	-	0.663 U
cis-1,2-Dichloroethene	-	0.170 U
cis-1,3-Dichloropropene	-	0.0691 U
Dibromochloromethane	-	0.122 U
Dibromomethane	-	0.123 U
Dichlorodifluoromethane	-	0.0774 U
Dichloromethane (Methylene Chloride)	-	2.35 U
Ethylbenzene	-	1.89 U
Hexachlorobutadiene	-	0.111 U
Isopropylbenzene	-	0.0706 U
m,p-Xylenes	-	3.79 U
Naphthalene	-	0.780 U
n-Butylbenzene	-	0.175 U
n-Propylbenzene	-	0.0888 U
o-Xylene	-	1.89 U
sec-Butylbenzene	-	0.0738 U
Styrene	-	1.89 U
tert-Butylbenzene	-	0.0456 U
Tetrachloroethene (PCE)	-	0.191 U
Toluene	-	1.89 U
trans-1,2-Dichloroethene	-	0.473 U
trans-1,3-Dichloropropene	-	0.0858 U
Trichloroethene (TCE)	-	0.0608 U
Trichlorofluoromethane	-	0.663 U
Vinyl Acetate	-	1.91 U
Vinyl Chloride	-	0.352 U
Semivolatile Organic Compounds (µg/kg dry)		
1,2,4-Trichlorobenzene	11.3 U	13.4 U
1,2-Dichlorobenzene	9.05 U	10.7 U
1,3-Dichlorobenzene	11.4 U	13.5 U
1,4-Dichlorobenzene	11.2 U	13.3 U
2,4,5-Trichlorophenol	10.3 U	12.3 U
2,4,6-Trichlorophenol	10.5 U	12.5 U
2,4-Dichlorophenol	11.8 U	14.0 U
2,4-Dimethylphenol	10.2 UJ	12.1 UJ
2,4-Dinitrophenol	93.2 U	110 U
2,4-Dinitrotoluene	22.7 U	26.9 U
2,6-Dinitrotoluene	14.3 U	16.9 U
2-Chloronaphthalene	9.00 U	10.7 U
2-Chlorophenol	8.97 U	10.6 U
2-Methylnaphthalene	6.93 U	8.22 U
2-Methylphenol	12.6 U	14.9 U
2-Nitroaniline	7.24 U	8.58 U
2-Nitrophenol	15.2 U	18.0 U
3-&4-Methylphenol	15.7 U	18.7 U
3,3'-Dichlorobenzidine	57.9 U	68.6 U
3-Nitroaniline	39.1 U	46.3 U
4,6-Dinitro-2-methylphenol	24.0 U	28.5 U
4-Bromophenyl Phenyl Ether	24.5 U	29.1 U
4-Chloro-3-methylphenol	11.9 U	14.1 U
4-Chloroaniline	12.4 U	**411 J**
4-Chlorophenyl Phenyl Ether	28.7 U	34.0 UJ

Table G-7
Data Not Used in the RI - 2004 Sandblast Supplemental Site Investigation
Catchbasin Solids Analytical Results
(Page 3 of 3)

Area	Sandblast	Sandblast
Site ID	CB1	CB1-FS
Sample ID	041122SGA19SS	041122SGA18SS
Sample Date	11/22/2004	11/22/2004
Location	Catchbasin	Catchbasin Filter Sock
4-Nitroaniline	54.7 U	64.8 U
4-Nitrophenol	109 U	129 U
Acenaphthene	**265 J**	**128**
Acenaphthylene	**31.4 J**	**68.2**
Aniline	24.5 U	29.1 U
Anthracene	**538 J**	**204**
Benzidine	37.6 U	44.6 U
Benzo(a)anthracene	**2,300 J**	**716 J**
Benzo(a)pyrene	**1,390 J**	**652**
Benzo(g,h,i)perylene	**648 J**	**478 J**
Benzofluoranthenes, Total	**2,390 J**	**1,250**
Benzoic Acid	213 U	**377 J**
Benzyl Alcohol	26.5 U	31.5 U
Bis(2-chloroethoxy)methane	25.6 UJ	30.3 UJ
Bis(2-chloroethyl) Ether	20.9 U	24.8 U
Bis(2-chloroisopropyl) Ether	107 U	126 U
Bis(2-ethylhexyl) Phthalate	**43,500 J**	**20,300**
Butyl Benzyl Phthalate	28.5 U	33.8 U
Carbazole	**324 J**	**255**
Chrysene	**3,230 J**	**921**
Dibenz(a,h)anthracene	**273 J**	**130 J**
Dibenzofuran	**56.2 J**	**77.7 J**
Diethyl Phthalate	48.1 U	57.1 U
Dimethyl Phthalate	26.1 U	31.0 U
Di-n-butyl Phthalate	**251 J**	**247 J**
Di-n-octyl Phthalate	24.5 U	**425**
Fluoranthene	**6,380 J**	**1,990**
Fluorene	**134 J**	**121**
Hexachlorobenzene	7.05 U	8.36 U
Hexachlorobutadiene	9.75 U	11.6 U
Hexachlorocyclopentadiene	10.6 U	12.5 U
Hexachloroethane	22.5 U	26.7 U
Indeno(1,2,3-cd)pyrene	**557 J**	**367 J**
Isophorone	6.72 U	7.97 U
Naphthalene	11.8 U	14.0 U
Nitrobenzene	40.1 U	47.6 U
N-Nitrosodimethylamine	40.7 U	48.2 U
N-Nitrosodi-n-propylamine	17.9 U	21.2 U
N-Nitrosodiphenylamine	7.63 U	9.04 U
Pentachlorophenol	25.9 U	30.7 U
Phenanthrene	**1,940 J**	**1,630**
Phenol	9.64 U	11.4 U
Pyrene	**7,190 J**	**1,600**

Notes:

µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-8a
Data Not Used in the RI - 2006 Sediment Removal Design Data Gaps Report
Sediment Analytical Results
(Page 1 of 1)

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	Debris Pile 01	Debris Pile 02	Debris Pile 02 DUP
Sample ID	060409-SED-3	060405-SED-1	060405-SED-2
Sample Date	4/9/2006	4/5/2006	4/5/2006
PCB Aroclors (µg/kg dry)			
Aroclor 1016	23.0 U	12.0 U	0.390 U
Aroclor 1221	23.0 U	12.0 U	0.390 U
Aroclor 1232	23.0 U	12.0 U	0.390 U
Aroclor 1242	17.0 U	8.80 U	0.390 U
Aroclor 1248	23.0 U	12.0 U	0.390 U
Aroclor 1254	**440**	**160**	**2,100 J**
Aroclor 1260	23.0 U	12.0 U	0.390 U
Aroclor 1262	23.0 U	12.0 U	0.390 U
Aroclor 1268	23.0 U	12.0 U	0.390 U
Metals (mg/kg dry)			
Copper	**29.7**	**31.6 J**	**536 J**
Lead	**3.00**	**17.0 J**	**47.0 J**
Dioxins/Furans (µg/kg dry)			
1,2,3,4,6,7,8-HpCDD	0.000770 U	0.00220 U	0.00170 U
1,2,3,4,6,7,8-HpCDF	0.000550 U	0.00130 U	0.000700 U
1,2,3,4,7,8,9-HpCDF	0.000610 U	0.000540 U	0.000580 U
1,2,3,4,7,8-HxCDD	0.000630 U	0.000670 U	0.000800 U
1,2,3,4,7,8-HxCDF	0.000490 U	0.00180 U	0.000630 U
1,2,3,6,7,8-HxCDD	0.000650 U	0.000690 U	0.000800 U
1,2,3,6,7,8-HxCDF	0.000430 U	0.000970 U	0.000530 U
1,2,3,7,8,9-HxCDD	0.000600 U	0.000640 U	0.000750 U
1,2,3,7,8,9-HxCDF	0.000400 U	0.000440 U	0.000510 U
1,2,3,7,8-PeCDD	0.00100 U	0.00130 U	0.00140 U
1,2,3,7,8-PeCDF	0.000600 U	0.000690 U	0.000810 U
2,3,4,6,7,8-HxCDF	0.000380 U	0.000430 U	0.000480 U
2,3,4,7,8-PeCDF	0.000580 U	0.000690 U	0.000770 U
2,3,7,8-TCDD	0.000450 U	0.000540 U	0.000640 U
2,3,7,8-TCDF	0.000440 U	0.000570 U	0.000700 U
OCDD	0.00440 U	**0.0140 J**	0.0140 UJ
OCDF	0.00100 U	0.00150 U	0.000980 U
Total HpCDD	0.00110 U	**0.00360**	0.00270 U
Total HpCDF	0.000610 U	0.00130 U	0.000870 U
Total HxCDD	0.000650 U	0.000850 U	0.000800 U
Total HxCDF	0.000490 U	0.00180 U	0.000630 U
Total PeCDD	0.00100 U	0.00130 U	0.00160 U
Total PeCDF	0.000630 U	0.000900 U	0.000810 U
Total TCDD	0.000450 U	0.000540 U	0.000640 U
Total TCDF	0.000440 U	0.000570 U	0.000700 U
Semivolatile Organic Compounds (µg/kg dry)			
1-Methylnaphthalene	1.70 U	1.70 U	1.70 U
2-Methylnaphthalene	2.30 U	2.30 U	2.20 U
Acenaphthene	2.40 U	2.40 U	2.40 U
Acenaphthylene	3.00 UJ	2.90 UJ	2.90 UJ
Anthracene	0.900 U	**11.0**	**7.00**
Benzo(a)anthracene	3.10 U	**100**	**130**
Benzo(a)pyrene	3.60 U	**100**	**130**
Benzo(b)fluoranthene	2.70 U	**88.0**	**110**
Benzo(g,h,i)perylene	1.90 U	**61.0**	**89.0**
Benzo(k)fluoranthene	2.30 U	**92.0**	**120**
Bis(2-ethylhexyl) Phthalate	66.0 U	**72.0**	64.0 U
Chrysene	2.70 U	**120**	**150**
Dibenz(a,h)anthracene	2.80 U	**19.0**	**32.0**
Dibenzofuran	2.10 U	2.10 U	2.00 U
Fluoranthene	3.30 U	**170**	**180**
Fluorene	3.30 U	3.30 U	3.20 U
Indeno(1,2,3-cd)pyrene	2.30 U	**56.0**	**80.0**
Naphthalene	1.70 U	1.60 U	1.60 U
Phenanthrene	2.30 U	**47.0**	**22.0**
Pyrene	3.80 U	**150**	**160**
General Chemistry Parameters and Grain Size (%)			
Carbon, Total Organic	**0.406**	**0.514**	**0.559**
Solids, Total	**77.6**	**74.6**	**73.5**
Gravel (>2.00 mm)	**60.2**	**15.8**	-
Sand, Very Coarse (1.00 - 2.00 mm)	**14.7**	**17.8**	-
Sand, Coarse (0.50 - 1.00 mm)	**8.50**	**28.5**	-
Sand, Medium (0.25 - 0.50 mm)	**6.20**	**17.7**	-
Sand, Fine (0.125 - 0.25 mm)	**3.00**	**10.4**	-
Sand, Very Fine (0.0625 - 0.125 mm)	**1.50**	**3.70**	-
Silt, Coarse (0.031 - 0.0625 mm)	**2.50**	**1.60**	-
Silt, Medium (0.0156 - 0.031 mm)	**0.900**	**1.20**	-
Silt, Fine (0.0078 - 0.0156 mm)	**0.700**	**0.900**	-
Silt, Very Fine (0.0039 - 0.0078 mm)	**0.400**	**0.500**	-
Clay, Coarse (0.002 - 0.0039 mm)	**0.300**	**0.500**	-
Clay, Medium (0.001 - 0.002 mm)	**0.200**	**0.500**	-
Clay, Fine (<0.001 mm)	**0.800**	**0.800**	-

Notes:
Results of PCB congener analysis for these samples are shown in Table F-6d.
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed

bold = analyte detected above MDL.
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-8b
Data Not Used in the RI - 2006 Sediment Removal Design Data Gaps Report
High-Volume Sampling Surface Water Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	Debris Pile 01	Debris Pile 01	Goose Island	Goose Island
Sample ID	060403-FIL-1	060403-XAD-1	060404-FIL-2	060404-XAD-2
Sample Date	4/3/2006	4/3/2006	4/4/2006	4/4/2006
Preparation Fraction	Particulate	Dissolved	Particulate	Dissolved
PCB Aroclors (estimated from PCB congener analysis - µg/L)				
Aroclor 1016	0.0000000802 U	0.000000140 U	0.0000000813 U	0.000000172 U
Aroclor 1221	0.0000000416 U	0.0000000725 U	0.0000000421 U	0.0000000893 U
Aroclor 1232	0.0000000133 U	0.0000000143 U	0.0000000112 U	0.0000000211 U
Aroclor 1242	**0.00000204**	**0.00000728**	**0.00000192**	**0.00000671**
Aroclor 1248	0.0000000439 U	0.0000000354 U	0.0000000512 U	0.0000000628 U
Aroclor 1254	**0.0000165**	**0.0000114**	**0.00000922**	**0.00000780**
Aroclor 1260	**0.00000503**	**0.000000945**	**0.00000457**	**0.00000104**
Polycyclic Aromatic Hydrocarbons (µg/L)				
Anthracene	0.0000350 U	0.0000610 EMPC	0.0000380 U	0.0000660 EMPC
Benzo(a)anthracene	0.0000570 EMPC	0.0000110 EMPC	0.0000570 EMPC	0.0000260 EMPC
Benzo(a)pyrene	**0.0000600**	0.00000400 EMPC	**0.0000600**	0.0000150 U
Benzo(b)fluoranthene	**0.0000800**	0.00000400 U	**0.0000820**	0.0000220 U
Benzo(g,h,i)perylene	**0.0000630**	0.0000106 U	**0.0000710**	0.0000140 U
Benzo(k)fluoranthene	**0.0000490**	0.00000500 EMPC	**0.0000520**	0.0000200 U
Bis(2-ethylhexyl) Phthalate	0.00635 U	0.00730 U	0.00422 U	0.00445 U
Chrysene	**0.000152**	**0.0000550**	**0.000130**	**0.0000760**
Dibenz(a,h)anthracene	0.0000120 EMPC	0.00000520 U	0.0000161 U	0.00000890 U
Fluoranthene	**0.000227**	**0.000462**	**0.000215**	**0.000529**
Indeno(1,2,3-cd)pyrene	0.0000500 EMPC	0.0000103 U	0.0000550 EMPC	0.0000140 EMPC
Phenanthrene	**0.000457**	**0.000788**	**0.000320**	**0.000839**
Pyrene	**0.000171**	**0.000171**	**0.000149**	**0.000175**

Notes:
Results of PCB congener analysis for these samples are shown in Table F-6e.
µg/L = microgram per liter
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-8c
Data Not Used in the RI - 2006 Sediment Removal Design Data Gaps Report
Surface Water Grab Sample Analytical Results

Area	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal	Forebay Pre-Sediment Removal
Site ID	Debris Pile 01	Debris Pile 01 DUP	Goose Island
Sample ID	060403-SW-1	060403-SW-2	060403-SW-3
Sample Date	4/3/2006	4/3/2006	4/3/2006
PCB Aroclors (µg/L)			
Aroclor 1016	0.00600 U	0.00600 U	0.00600 U
Aroclor 1221	0.00600 U	0.00600 U	0.00600 U
Aroclor 1232	0.00600 U	0.00600 U	0.00600 U
Aroclor 1242	0.00600 U	0.00600 U	0.00600 U
Aroclor 1248	0.00600 U	0.00600 U	0.00600 U
Aroclor 1254	0.00600 U	0.00600 U	0.00600 U
Aroclor 1260	0.00600 U	0.00600 U	0.00600 U
Aroclor 1262	0.00600 U	0.00600 U	0.00600 U
Aroclor 1268	0.00600 U	0.00600 U	0.00600 U
Metals (mg/L)			
Total Copper	**0.00160**	**0.00120**	**0.00120**
Total Lead	0.000400 U	0.00100 U	0.000400 U
Dissolved Copper	**0.00240**	-	**0.000800**
Dissolved Lead	0.000400 U	-	0.000400 U
General Chemistry Parameters			
Carbon, Total Organic (mg/L)	**2.25**	-	**2.80**
Carbon, Dissolved Organic (mg/L)	**9.28**	-	**3.14**
Total Suspended Solids (mg/L)	**6.10**	-	**7.10**
Turbidity (NTU)	**3.20**	-	**3.00**

Notes:

µg/L = microgram per liter
mg/L = milligram per liter
MDL = method detection limit
MRL = method reporting limit
NTU = Nephelometric Turbidity Units
- = Not Analyzed
bold = analyte detected above MDL.

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

Table G-8d
Data Not Used in the RI - 2006 Sediment Removal Design Data Gaps Report
Sediment PCB Congener Analytical Results (ug/kg)
(Page 1 of 2)

		Forebay Pre-Sediment Removal		
IUPAC Number	**Coeluting Congeners[1]**	Debris Pile 01 060409-SED-3 4/9/2006	Debris Pile 02 060405-SED-1 4/5/2006	Debris Pile 02 DUP 060405-SED-2 4/5/2006
1		0.0240 U	0.0280 U	0.0280 U
2		0.0240 U	0.0280 U	0.0280 U
3		0.0240 U	0.0280 U	0.0280 U
4	4 + 10	0.0240 C U	**0.0470 C**	**0.0330 C**
5	5 + 8	**0.0430 C**	**0.130 C**	**0.0920 C**
6		0.0240 U	0.0280 U	0.0280 U
7	7 + 9	0.0240 C U	0.0280 C U	0.0280 C U
8	5 + 8	C 5	C 5	C 5
9	7 + 9	C 7	C 7	C 7
10	4 + 10	C 4	C 4	C 4
11		0.0240 U	**0.0340**	0.0280 U
12	12 + 13	0.0240 C U	0.0280 C U	0.0280 C U
13	12 + 13	C 12	C 12	C 12
14		0.0240 U	0.0280 U	0.0280 U
15		**0.0260**	**0.0810**	**0.0580**
16	16 + 32	**0.0330 C**	**0.260 C**	**0.130 C**
17		**0.0400**	**0.190**	**0.110**
18		**0.0490**	**0.190**	**0.110**
19		0.0240 U	**0.0470**	**0.0300**
20	20 + 21 + 33	**0.0340 C**	**0.390 C**	**0.260 C**
21	20 + 21 + 33	C 20	C 20	C 20
22		0.0240 U	**0.150**	**0.0880**
23		0.0240 U	0.0280 U	0.0280 U
24	24 + 27	0.0240 C U	**0.0520 C**	**0.0340 C**
25		**0.0310**	**0.0920**	**0.0440**
26		**0.0550**	**0.130**	**0.0760**
27	24 + 27	C 24	C 24	C 24
28		**0.0740**	**0.500**	**0.320**
29		0.0240 U	0.0280 U	0.0280 U
30		0.0240 U	0.0280 U	0.0280 U
31		**0.0650**	**0.900 J**	**0.320 J**
32	16 + 32	C 16	C 16	C 16
33	20 + 21 + 33	C 20	C 20	C 20
34		0.0240 U	0.0280 U	0.0280 U
35		0.0240 U	0.0280 U	0.0280 U
36		0.0240 U	0.0280 U	0.0280 U
37		**0.0340**	**0.210**	**0.120**
38		0.0240 U	**0.0540**	0.0280 U
39		0.0240 U	0.0280 U	0.0280 U
40		**0.0300**	**0.780 J**	**0.190 J**
41	41 + 64 + 68	**0.330 C**	**5.60 C J**	**1.60 C J**
42		**0.0670**	**0.990 J**	**0.360 J**
43	43 + 49	**0.530 C**	**9.80 C J**	**3.00 C J**
44		**0.590**	**12.0 J**	**3.20 J**
45		0.0240 U	**0.150**	**0.0620**
46		0.0240 U	**0.120**	**0.0430**
47	47 + 48 + 75	**0.0780 C**	**1.20 C J**	**0.430 C J**
48	47 + 48 + 75	C 47	C 47	C 47
49	43 + 49	C 43	C 43	C 43
50		0.0240 U	0.0280 U	0.0280 U
51		0.0240 U	**0.120**	**0.0450**
52	52 + 73	**1.60 C**	**27.0 C J**	**8.00 C J**
53		**0.0790**	**0.820 J**	**0.280 J**
54		0.0240 U	0.0280 U	0.0280 U
55		0.0240 U	**0.160**	0.0280 U
56	56 + 60	**0.140 C**	**4.90 C J**	**1.30 C J**
57		0.0240 U	0.0280 U	**0.120**
58		0.0240 U	0.0280 U	0.0280 U
59		**0.0520**	**0.100**	**0.280**
60	56 + 60	C 56	C 56	C 56
61	61 + 74	**0.230 C**	**7.80 C J**	**2.10 C J**
62		0.0240 U	0.0280 U	0.0280 U
63		0.0240 U	**0.330**	**0.0990**
64	41 + 64 + 68	C 41	C 41	C 41
65		0.0240 U	0.0280 U	0.0280 U
66	66 + 80	**0.270 C**	**7.20 C J**	**2.20 C J**
67		0.0240 U	0.0280 U	0.0280 U
68	41 + 64 + 68	C 41	C 41	C 41
69		0.0240 U	0.0280 U	0.0280 U
70		**0.820**	**27.0 J**	**7.40 J**
71		**0.320**	**1.10 J**	**0.320 J**
72		0.0240 U	0.0280 U	0.0280 U
73	52 + 73	C 52	C 52	C 52
74	61 + 74	C 61	C 61	C 61
75	47 + 48 + 75	C 47	C 47	C 47
76		**0.270 C**	**7.20 C J**	**2.20 C J**
77		0.0260 U	0.530 U	0.190 U
78		0.0240 U	**0.0850**	0.0280 U
79		0.0240 U	**0.360**	**0.110**
80	66 + 80	C 66	C 66	C 66
81		0.0130 U	0.560 U	0.140 U
82		**0.140**	**8.10 J**	**1.90 J**
83	83 + 108	**0.0530 C**	**2.70 C J**	**0.680 C J**
84		**0.390**	**15.0 J**	**3.90 J**
85	85 + 120	**0.180 C**	**10.0 C J**	**2.70 C J**
86	86 + 97 + 125 + 111	**0.990 C**	**54.0 C J**	**14.0 C J**
87	87 + 117	**0.990 C**	**54.0 C J**	**14.0 C J**
88	88 + 121	0.0240 C U	0.560 C U	0.0280 C U
89	89 + 90 + 101	**0.900 C**	**44.0 C J**	**12.0 C J**
90	89 + 90 + 101	C 89	C 89	C 89
91		**0.200**	**7.90 J**	**2.20 J**
92		**0.220**	**10.0 J**	**2.80 J**
93	93 + 95	**1.30 C**	**46.0 C J**	**12.0 C J**
94		0.0240 U	0.560 U	**0.0430**
95	93 + 95	C 93	C 93	C 93
96		0.0240 U	0.560 U	**0.0700**
97	86 + 97 + 125 + 111	C 86	C 86	C 86
98	98 + 102	**0.0270 C**	**1.10 C**	**0.280 C**
99		**0.570**	**29.0 J**	**8.20 J**
100		0.0240 U	0.560 U	0.0280 U
101	89 + 90 + 101	C 89	C 89	C 89
102	98 + 102	C 98	C 98	C 98
103		0.0240 U	0.560 U	**0.0640**
104		0.0240 U	0.560 U	0.0280 U
105	105 + 127	**0.380 C**	**24.0 C J**	**6.10 C J**
106	106 + 118	**0.900 C**	**44.0 C J**	**14.0 C J**
107	107 + 109	**0.0650 C**	**4.00 C J**	**1.00 C J**
108	83 + 108	C 83	C 83	C 83
109	107 + 109	C 107	C 107	C 107
110		**1.40**	**71.0 J**	**19.0 J**
111	86 + 97 + 125 + 111	C 86	C 86	C 86
112		0.0240 U	0.560 U	0.0280 U
113		0.0240 U	0.560 U	0.0280 U
114		**0.0170**	**1.20**	**0.310**
115	115 + 116	0.0240 C U	0.560 C U	0.0280 C U

Table G-8d
Data Not Used in the RI - 2006 Sediment Removal Design Data Gaps Report
Sediment PCB Congener Analytical Results (ug/kg)
(Page 2 of 2)

		Forebay Pre-Sediment Removal		
IUPAC Number	**Coeluting Congeners[1]**	Debris Pile 01 060409-SED-3 4/9/2006	Debris Pile 02 060405-SED-1 4/5/2006	Debris Pile 02 DUP 060405-SED-2 4/5/2006
116	115 + 116	C 115	C 115	C 115
117	87 + 117	C 87	C 87	C 87
118	106 + 118	C 106	C 106	C 106
119		0.0240 U	**0.950 J**	**0.270 J**
120	85 + 120	C 85	C 85	C 85
121	88 + 121	C 88	C 88	C 88
122		0.0240 U	**0.660 J**	**0.150 J**
123		0.0170 U	1.40 U	0.290 U
124		**0.0390**	**2.50 J**	**0.640 J**
125	86 + 97 + 125 + 111	C 86	C 86	C 86
126		0.00240 U	0.0560 U	0.00280 U
127	105 + 127	C 105	C 105	C 105
128		**0.140**	**11.0 J**	**2.80 J**
129		**0.0390**	**3.50 J**	**0.820 J**
130		**0.0470**	**3.70 J**	**0.920 J**
131	131 + 142 + 165	0.0240 C U	**0.850 C J**	**0.200 C J**
132	132 + 168	**0.190 C**	**17.0 C J**	**3.80 C J**
133		0.0240 U	**0.550 J**	**0.140 J**
134		**0.0350**	**2.40 J**	**0.620 J**
135	135 + 144	**0.0840 C**	**6.30 C J**	**1.60 C J**
136		**0.0750**	**4.90 J**	**1.20 J**
137		**0.0300**	**2.80 J**	**0.690 J**
138	138 + 163 + 164	**0.490 C**	**38.0 C J**	**10.0 C J**
139	139 + 149	**0.400 C**	**30.0 C J**	**7.70 C J**
140		0.0240 U	**0.250**	**0.0620**
141		**0.0780**	**7.10 J**	**1.70 J**
142	131 + 142 + 165	C 131	C 131	C 131
143		**0.0400**	**0.230**	**0.0440**
144	135 + 144	C 135	C 135	C 135
145		0.0240 U	0.0280 U	0.0280 U
146		**0.0650**	**5.00 J**	**1.30 J**
147		0.0240 U	**1.20 J**	**0.320 J**
148		0.0240 U	0.0280 U	0.0280 U
149	139 + 149	C 139	C 139	C 139
150		0.0240 U	0.0280 U	0.0280 U
151		**0.0730**	**5.00 J**	**1.30 J**
152		0.0240 U	0.0280 U	0.0280 U
153		**0.310**	**24.0 J**	**6.60 J**
154		0.0240 U	**0.440**	**0.110**
155		0.0240 U	0.0280 U	0.0280 U
156		**0.0560**	**5.10 J**	**1.20 J**
157		**0.0130**	**1.20 J**	**0.280 J**
158	158 + 160	**0.0760 C**	**7.00 C J**	**1.70 C J**
159		0.0240 U	0.0280 U	0.0280 U
160	158 + 160	C 158	C 158	C 158
161		0.0240 U	0.0280 U	0.0280 U
162		0.0240 U	**0.210**	**0.0560**
163	138 + 163 + 164	C 138	C 138	C 138
164	138 + 163 + 164	C 138	C 138	C 138
165	131 + 142 + 165	C 131	C 131	C 131
166		0.0240 U	**0.310**	**0.0810**
167		**0.0960**	**7.90 J**	**2.00 J**
168	132 + 168	C 132	C 132	C 132
169		0.00240 U	0.00280 U	0.00280 U
170		**0.0310 C**	**2.80 C J**	**0.730 C J**
171		0.0240 U	**0.990 J**	**0.250 J**
172	172 + 192	0.0240 C U	**0.400 C**	**0.110 C**
173		0.0240 U	**0.100**	0.0280 U
174		**0.0270**	**2.10 J**	**0.620 J**
175		0.0240 U	**0.120**	**0.0340**
176		0.0240 U	**0.330**	**0.0960**
177		0.0240 U	**1.40 J**	**0.400 J**
178		0.0240 U	**0.340**	**0.120**
179		0.0240 U	**0.710 J**	**0.260 J**
180		**0.0430**	**3.40**	**1.10 J**
181		0.0240 U	0.0280 U	0.0280 U
182	182 + 187	0.0240 C U	**1.00 C J**	**0.400 C J**
183		0.0240 U	**1.30**	**0.420 J**
184		0.0240 U	0.0280 U	0.0280 U
185		0.0240 U	**0.170**	**0.0640**
186		0.0240 U	0.0280 U	0.0280 U
187	182 + 187	C 182	C 182	C 182
188		0.0240 U	0.0280 U	0.0280 U
189		0.00240 U	**0.140**	**0.0350**
190		**0.0310 C**	**2.80 C J**	**0.730 C J**
191		0.0240 U	**0.130**	**0.0340**
192	172 + 192	C 172	C 172	C 172
193		0.0240 U	**0.170**	**0.0520**
194		0.0240 U	**0.290 J**	**0.160 J**
195		0.0240 U	**0.0830**	**0.0420**
196	196 + 203	0.0240 C U	**0.400 C**	**0.300 C**
197		0.0240 U	0.0280 U	0.0280 U
198		0.0240 U	0.0280 U	0.0280 U
199		0.0240 U	**0.290**	**0.260**
200		0.0240 U	**0.0400**	**0.0340**
201		0.0240 U	**0.0360**	**0.0320**
202		0.0240 U	**0.0460**	**0.0480**
203	196 + 203	C 196	C 196	C 196
204		0.0240 U	0.0280 U	0.0280 U
205		0.0240 U	0.0280 U	0.0280 U
206		0.0240 U	**0.100**	**0.130**
207		0.0240 U	0.0280 U	0.0280 U
208		0.0240 U	0.0280 U	0.0280 U
209		0.0240 U	**0.0290**	0.0280 U

Notes:
µg/kg = microgram per kilogram
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.
C = concentration represents coeluting congeners.

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

[1] = When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.

Table G-8e
Data Not Used in the RI - 2006 Sediment Removal Design Data Gaps Report
High-Volume Sampling Surface Water PCB Congener Analytical Results (µg/L)
(Page 1 of 2)

		Forebay Pre-Sediment Removal			
		Debris Pile 01 060403-FIL-1 4/3/2006	Debris Pile 01 060403-XAD-1 4/3/2006	Goose Island 060404-FIL-2 4/4/2006	Goose Island 060404-XAD-2 4/4/2006
IUPAC Number	**Coeluting Congeners[1]**	Particulate	Dissolved	Particulate	Dissolved
1		0.0000000350 U	**0.000000210**	0.0000000430 U	**0.000000176**
2		0.0000000610 U	**0.000000182**	**0.0000000910**	**0.000000203**
3		0.0000000720 U	**0.000000210**	**0.000000128**	**0.000000247**
4		0.0000000520 U	0.000000421 U	0.0000000543 U	0.000000383 U
5		0.0000000341 U	0.0000000596 U	0.0000000347 U	0.0000000735 U
6		0.0000000314 U	0.000000101 U	0.0000000319 U	0.0000000890 U
7		0.0000000322 U	0.0000000563 U	0.0000000328 U	0.0000000694 U
8		0.0000000670 U	**0.000000423**	0.0000000670 U	**0.000000387**
9		0.0000000311 U	0.0000000542 U	0.0000000316 U	0.0000000668 U
10		0.0000000321 U	0.0000000560 U	0.0000000326 U	0.0000000691 U
11		**0.00000342**	**0.0000460**	**0.00000419**	**0.0000482**
12	12 + 13	0.0000000341 C U	0.0000000595 C U	0.0000000346 C U	0.0000000734 C U
13	12 + 13	C12	C12	C12	C12
14		0.0000000325 U	0.0000000568 U	0.0000000331 U	0.0000000700 U
15		0.000000108 U	**0.000000317**	0.000000116 U	0.000000247 U
16		**0.0000000510**	**0.000000298**	**0.0000000490**	**0.000000245**
17		0.0000000600 U	**0.000000261**	0.0000000480 U	**0.000000223**
18	18 + 30	0.000000111 U	**0.000000679 C**	0.000000107 U	**0.000000573 C**
19		0.0000000190 U	**0.000000125**	0.0000000110 U	**0.000000105**
20	20 + 28	**0.000000293 C**	**0.000000740 C**	**0.000000277 C**	**0.000000696 C**
21	21 + 33	**0.000000101 C**	**0.000000268 C**	0.0000000940 U	**0.000000251 C**
22		**0.0000000800**	**0.000000282**	**0.0000000820**	**0.000000259**
23		0.00000000300 U	0.00000000540 U	0.00000000340 U	0.00000000700 U
24		0.00000000300 U	0.0000000110 U	0.00000000230 U	0.0000000110 U
25		**0.0000000240**	**0.0000000680**	0.0000000170 U	**0.0000000460**
26	26 + 29	**0.0000000480 C**	**0.000000139 C**	**0.0000000480 C**	**0.000000120 C**
27		**0.0000000140**	**0.0000000650**	0.00000000900 U	**0.0000000510**
28	20 + 28	C20	C20	C20	C20
29	26 + 29	C26	C26	C26	C26
30	18 + 30	C18	C18	C18	C18
31		**0.000000209**	**0.000000585**	**0.000000190**	**0.000000582**
32		**0.0000000350**	**0.000000159**	**0.0000000250**	0.000000100 EMPC
33	21 + 33	C21	C21	C21	C21
34		0.00000000290 U	0.00000000530 U	0.00000000330 U	0.00000000680 U
35		0.0000000230 EMPC	**0.0000000700**	0.0000000230 EMPC	**0.0000000630**
36		0.00000000800 U	0.0000000220 U	0.00000000330 U	0.0000000180 U
37		**0.0000000980**	**0.000000136**	**0.000000102**	**0.000000145**
38		0.00000000290 U	0.00000000530 U	0.00000000330 U	0.00000000680 U
39		0.00000000290 U	0.00000000510 U	0.00000000320 U	0.00000000670 U
40	40 + 41 + 71	**0.000000158 C**	**0.000000297 C**	**0.000000109 C**	**0.000000254 C**
41	40 + 41 + 71	C40	C40	C40	C40
42		**0.0000000870**	**0.000000180**	**0.0000000660**	**0.000000152**
43		0.0000000120 U	**0.0000000240**	0.00000000700 U	0.0000000200 EMPC
44	44 + 47 + 65	**0.000000483 C**	**0.00000109 C**	**0.000000330 C**	**0.000000811 C**
45	45 + 51	**0.0000000510 C**	**0.000000129 C**	**0.0000000380 C**	**0.000000111 C**
46		0.0000000200 U	**0.0000000510**	0.0000000130 U	0.0000000400 EMPC
47	44 + 47 + 65	C44	C44	C44	C44
48		**0.0000000550**	**0.000000111**	**0.0000000520**	**0.000000102**
49	49 + 69	**0.000000309 C**	**0.000000518 C**	**0.000000188 C**	**0.000000348 C**
50	50 + 53	**0.0000000590 C**	**0.000000156 C**	**0.0000000370 C**	**0.0000000970 C**
51	45 + 51	C45	C45	C45	C45
52		**0.000000824**	**0.00000158**	**0.000000486**	**0.00000104**
53	50 + 53	C50	C50	C50	C50
54		0.00000000300 U	0.00000000700 U	0.00000000210 U	0.00000000400 U
55		0.00000000790 U	0.00000000640 U	0.00000000920 U	0.0000000113 U
56		**0.000000172**	**0.000000212**	**0.000000131**	**0.000000185**
57		0.00000000720 U	0.00000000580 U	0.00000000840 U	0.0000000103 U
58		0.00000000740 U	0.00000000600 U	0.00000000870 U	0.0000000107 U
59	59 + 62 + 75	**0.0000000310 C**	0.0000000570 C EMPC	**0.0000000270 C**	**0.0000000630 C**
60		**0.0000000900**	**0.000000106**	**0.0000000840**	**0.000000104**
61	61 + 70 + 74 + 76	**0.00000103 C**	**0.00000121 C**	**0.000000652 C**	**0.000000959 C**
62	59 + 62 + 75	C59	C59	C59	C59
63		0.0000000210 U	0.0000000270 EMPC	0.0000000180 U	**0.0000000270**
64		**0.000000169**	**0.000000322**	**0.000000133**	**0.000000274**
65	44 + 47 + 65	C44	C44	C44	C44
66		**0.000000458**	**0.000000510**	**0.000000359**	**0.000000447**
67		0.0000000140 U	0.0000000170 U	0.0000000140 U	0.0000000180 U
68		0.0000000100 U	**0.0000000300**	0.0000000100 U	**0.0000000240**
69	49 + 69	C49	C49	C49	C49
70	61 + 70 + 74 + 76	C61	C61	C61	C61
71	40 + 41 + 71	C40	C40	C40	C40
72		0.00000000700 U	0.0000000100 U	0.00000000790 U	0.00000000980 U
73		0.00000000150 U	0.00000000240 U	0.00000000190 U	0.00000000300 U
74	61 + 70 + 74 + 76	C61	C61	C61	C61
75	59 + 62 + 75	C59	C59	C59	C59
76	61 + 70 + 74 + 76	C61	C61	C61	C61
77		**0.0000000480**	**0.0000000400**	**0.0000000550**	**0.0000000400**
78		0.00000000760 U	0.00000000620 U	0.00000000890 U	0.0000000110 U
79		0.0000000140 U	0.0000000120 U	0.0000000100 U	0.0000000130 U
80		0.00000000680 U	0.00000000550 U	0.00000000790 U	0.00000000980 U
81		0.00000000710 U	0.00000000560 U	0.00000000810 U	0.00000000940 U
82		**0.000000168**	**0.0000000920**	**0.0000000820**	**0.0000000670**
83	83 + 99	**0.000000978 C**	**0.000000644 C**	**0.000000560 C**	**0.000000444 C**
84		**0.000000343**	**0.000000327**	**0.000000144**	**0.000000194**
85	85 + 116 + 117	**0.000000306 C**	**0.000000173 C**	**0.000000177 C**	**0.000000124 C**
86	86 + 87 + 97 + 108 + 119 + 125	**0.00000109 C**	**0.000000787 C**	**0.000000593 C**	**0.000000531 C**
87	86 + 87 + 97 + 108 + 119 + 125	C86	C86	C86	C86
88	88 + 91	**0.000000183 C**	**0.000000155 C**	**0.000000102 C**	**0.0000000980 C**
89		0.00000000510 U	0.0000000167 U	0.00000000280 U	0.00000000600 U
90	90 + 101 + 113	**0.00000158 C**	**0.00000118 C**	**0.000000941 C**	**0.000000800 C**
91	88 + 91	C88	C88	C88	C88
92		**0.000000301**	**0.000000229**	**0.000000183**	**0.000000162**
93	93 + 95 + 98 + 100 + 102	**0.00000111 C**	**0.00000117 C**	**0.000000609 C**	**0.000000764 C**
94		0.00000000520 U	0.0000000170 U	0.00000000500 U	0.00000000610 U
95	93 + 95 + 98 + 100 + 102	C93	C93	C93	C93
96		0.00000000800 U	0.00000000600 U	0.00000000400 U	0.00000000500 U
97	86 + 87 + 97 + 108 + 119 + 125	C86	C86	C86	C86
98	93 + 95 + 98 + 100 + 102	C93	C93	C93	C93
99	83 + 99	C83	C83	C83	C83
100	93 + 95 + 98 + 100 + 102	C93	C93	C93	C93
101	90 + 101 + 113	C90	C90	C90	C90
102	93 + 95 + 98 + 100 + 102	C93	C93	C93	C93
103		0.0000000110 U	0.0000000142 U	0.00000000600 U	0.00000000510 U
104		0.00000000200 U	0.00000000220 U	0.00000000200 U	0.00000000380 U
105		**0.000000651**	**0.000000276**	**0.000000358**	**0.000000187**
106		0.00000000990 U	0.00000000940 U	0.00000000650 U	0.00000000510 U
107	107 + 124	**0.0000000680 C**	**0.0000000330 C**	**0.0000000410 C**	**0.0000000260 C**
108	86 + 87 + 97 + 108 + 119 + 125	C86	C86	C86	C86
109		**0.000000129**	0.0000000640 EMPC	**0.0000000800**	0.0000000530 EMPC
110	110 + 115	**0.00000176 C**	**0.00000129 C**	**0.00000102 C**	**0.000000893 C**
111		0.00000000360 U	0.0000000117 U	0.00000000200 U	0.00000000420 U
112		0.00000000350 U	0.0000000113 U	0.00000000190 U	0.00000000410 U
113	90 + 101 + 113	C90	C90	C90	C90
114		**0.0000000380**	**0.0000000230**	**0.0000000190**	0.0000000130 U
115	110 + 115	C110	C110	C110	C110
116	85 + 116 + 117	C85	C85	C85	C85

Table G-8e
Data Not Used in the RI - 2006 Sediment Removal Design Data Gaps Report
High-Volume Sampling Surface Water PCB Congener Analytical Results (µg/L)
(Page 2 of 2)

		Forebay Pre-Sediment Removal			
		Debris Pile 01 060403-FIL-1 4/3/2006	Debris Pile 01 060403-XAD-1 4/3/2006	Goose Island 060404-FIL-2 4/4/2006	Goose Island 060404-XAD-2 4/4/2006
IUPAC Number	**Coeluting Congeners[1]**	Particulate	Dissolved	Particulate	Dissolved
117	85 + 116 + 117	C85	C85	C85	C85
118		**0.00000167**	**0.000000847**	**0.000000933**	**0.000000569**
119	86 + 87 + 97 + 108 + 119 + 125	C86	C86	C86	C86
120		0.00000000340 U	0.0000000110 U	0.00000000600 U	0.00000000500 U
121		0.00000000370 U	0.0000000120 U	0.00000000200 U	0.00000000430 U
122		0.0000000210 U	0.0000000102 U	0.0000000120 U	0.00000000700 U
123		**0.0000000240**	0.0000000160 U	0.0000000210 EMPC	0.0000000100 U
124	107 + 124	C107	C107	C107	C107
125	86 + 87 + 97 + 108 + 119 + 125	C86	C86	C86	C86
126		0.0000000101 U	0.00000000940 U	0.00000000700 U	0.00000000520 U
127		0.0000000102 U	0.00000000960 U	0.00000000660 U	0.00000000530 U
128	128 + 166	**0.000000347 C**	**0.0000000790 C**	**0.000000194 C**	**0.0000000580 C**
129	129 + 138 + 160 + 163	**0.00000202 C**	**0.000000653 C**	**0.00000139 C**	**0.000000531 C**
130		**0.000000123**	**0.0000000390**	**0.0000000880**	0.0000000320 EMPC
131		0.0000000210 EMPC	0.00000000600 U	0.0000000130 U	0.00000000600 U
132		**0.000000517**	**0.000000183**	**0.000000317**	**0.000000145**
133		**0.0000000260**	0.0000000120 U	0.0000000150 EMPC	0.0000000100 U
134	134 + 143	**0.0000000830 C**	0.0000000340 C EMPC	**0.0000000460 C**	0.0000000260 C EMPC
135	135 + 151 + 154	**0.000000459 C**	**0.000000198 C**	**0.000000359 C**	**0.000000192 C**
136		**0.000000153**	**0.0000000700**	**0.000000102**	**0.0000000570**
137		0.000000111 EMPC	**0.0000000300**	0.0000000550 EMPC	0.0000000180 U
138	129 + 138 + 160 + 163	C129	C129	C129	C129
139	139 + 140	**0.0000000370 C**	0.00000000800 U	0.0000000230 C EMPC	0.00000000900 U
140	139 + 140	C139	C139	C139	C139
141		**0.000000216**	**0.0000000670**	**0.000000158**	**0.0000000560**
142		0.00000000640 U	0.00000000530 U	0.00000000540 U	0.00000000490 U
143	134 + 143	C134	C134	C134	C134
144		**0.0000000540**	**0.0000000260**	**0.0000000440**	0.0000000160 U
145		0.00000000180 U	0.00000000280 U	0.00000000160 U	0.00000000300 U
146		**0.000000298**	**0.000000106**	**0.000000252**	**0.000000100**
147	147 + 149	**0.00000119 C**	**0.000000512 C**	**0.000000912 C**	**0.000000445 C**
148		0.00000000220 U	0.00000000350 U	0.00000000190 U	0.00000000360 U
149	147 + 149	C147	C147	C147	C147
150		0.00000000300 U	0.00000000270 U	0.00000000200 U	0.00000000280 U
151	135 + 151 + 154	C135	C135	C135	C135
152		0.00000000200 U	0.00000000260 U	0.00000000140 U	0.00000000270 U
153	153 + 168	**0.00000179 C**	**0.000000656 C**	**0.00000146 C**	**0.000000573 C**
154	135 + 151 + 154	C135	C135	C135	C135
155		0.00000000130 U	0.00000000230 U	0.00000000120 U	0.00000000250 U
156	156 + 157	**0.000000232 C**	**0.0000000510 C**	**0.000000133 C**	**0.0000000390 C**
157	156 + 157	C156	C156	C156	C156
158		**0.000000183**	**0.0000000550**	**0.000000108**	**0.0000000410**
159		0.00000000700 U	0.00000000360 U	0.00000000900 U	0.00000000340 U
160	129 + 138 + 160 + 163	C129	C129	C129	C129
161		0.00000000440 U	0.00000000360 U	0.00000000370 U	0.00000000330 U
162		0.00000000450 U	0.00000000370 U	0.00000000400 U	0.00000000340 U
163	129 + 138 + 160 + 163	C129	C129	C129	C129
164		**0.000000105**	**0.0000000340**	**0.0000000700**	**0.0000000300**
165		0.00000000510 U	0.00000000420 U	0.00000000430 U	0.00000000390 U
166	128 + 166	C128	C128	C128	C128
167		**0.0000000930**	**0.0000000260**	**0.0000000660**	**0.0000000210**
168	153 + 168	C153	C153	C153	C153
169		0.00000000500 U	0.00000000360 U	0.00000000500 U	0.00000000330 U
170		**0.000000251**	**0.0000000350**	**0.000000208**	**0.0000000380**
171	171 + 173	**0.0000000850 C**	**0.0000000160 C**	**0.0000000770 C**	0.0000000170 C EMPC
172		**0.0000000490**	0.00000000900 U	**0.0000000420**	0.0000000100 U
173	171 + 173	C171	C171	C171	C171
174		**0.000000233**	**0.0000000610**	**0.000000200**	**0.0000000580**
175		0.0000000130 U	0.00000000400 U	0.0000000110 U	0.00000000310 U
176		**0.0000000320**	0.0000000100 U	**0.0000000350**	0.00000000600 U
177		**0.000000159**	**0.0000000350**	**0.000000176**	**0.0000000350**
178		**0.0000000650**	**0.0000000170**	**0.0000000690**	0.0000000240 EMPC
179		**0.000000117**	0.0000000320 EMPC	**0.000000130**	**0.0000000350**
180	180 + 193	**0.000000552 C**	**0.000000108 C**	**0.000000519 C**	**0.000000124 C**
181		0.00000000300 U	0.00000000230 U	0.00000000180 U	0.00000000320 U
182		0.00000000200 U	0.00000000230 U	0.00000000500 U	0.00000000310 U
183	183 + 185	**0.000000203 C**	**0.0000000460 C**	**0.000000186 C**	**0.0000000460 C**
184		0.00000000150 U	0.00000000180 U	0.00000000300 U	0.00000000240 U
185	183 + 185	C183	C183	C183	C183
186		0.00000000160 U	0.00000000190 U	0.00000000150 U	0.00000000260 U
187		**0.000000413**	**0.000000116**	**0.000000431**	**0.000000120**
188		0.00000000200 U	0.00000000160 U	0.00000000130 U	0.00000000220 U
189		0.0000000100 U	0.00000000300 U	0.0000000100 U	0.00000000330 U
190		**0.0000000650**	0.0000000110 U	0.0000000610 EMPC	**0.0000000130**
191		**0.0000000120**	0.00000000180 U	0.00000000900 U	0.00000000250 U
192		0.00000000180 U	0.00000000200 U	0.00000000200 U	0.00000000270 U
193	180 + 193	C180	C180	C180	C180
194		**0.000000109**	0.0000000170 U	**0.000000108**	0.0000000190 U
195		**0.0000000520**	0.00000000900 U	**0.0000000490**	0.0000000110 U
196		**0.0000000730**	0.0000000200 U	**0.0000000680**	0.0000000180 U
197	197 + 200	**0.0000000220 C**	0.00000000600 U	**0.0000000260 C**	0.00000000700 U
198	198 + 199	**0.000000199 C**	0.0000000580 U	**0.000000178 C**	0.0000000540 U
199	198 + 199	C198	C198	C198	C198
200	197 + 200	C197	C197	C197	C197
201		**0.0000000270**	0.00000000700 U	**0.0000000250**	0.00000000800 U
202		**0.0000000490**	0.0000000120 U	**0.0000000420**	0.0000000170 EMPC
203		**0.000000146**	0.0000000360 U	**0.000000132**	0.0000000430 EMPC
204		0.00000000200 U	0.00000000240 U	0.00000000210 U	0.00000000310 U
205		0.00000000700 U	0.00000000200 U	0.0000000100 U	0.00000000210 U
206		**0.0000000940**	0.0000000200 U	**0.0000000930**	0.0000000210 U
207		**0.0000000200**	0.00000000600 U	0.0000000140 U	0.00000000900 U
208		**0.0000000530**	0.0000000180 U	**0.0000000390**	0.0000000170 U
209		**0.0000000760**	0.00000000900 U	**0.000000113**	0.0000000140 U

Notes:
µg/L = microgram per liter
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.
C = concentration represents coeluting congeners.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.

[1] = When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.

Table G-9a
Data Not Used in the RI - 2007 Sediment Removal Monitoring
PCB Aroclor Results in Dredge Effluent Samples

Time Period of Removal	Week 1		Week 2		Week 3		Week 4		Week 4 (duplicate)		Week 5	
Sample Date	10/4/2007	10/4/2007	10/11/2007	10/11/2007	10/18/2007	10/18/2007	10/25/2007	10/25/2007	10/25/2007	10/25/2007	10/29/2007	10/29/2007
Sample ID	071004-DE	071004-DE	071011-DE	071011-DE	071018-DE	071018-DE	071025-DE-1	071025-DE-1	071025-DE-2	071025-DE-2	071029-DE	071029-DE
Preparation Fraction	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
PCB Aroclors (µg/L)												
Aroclor 1016	0.00100 U	0.00250 U	0.00120 U	0.00120 U	0.00100 U	0.00100 U	0.00100 U	0.00110 U	0.00100 U	0.00100 U	0.00110 U	0.00100 U
Aroclor 1221	0.00100 U	0.00260 U	0.00120 U	0.00120 U	0.00100 U	0.00100 U	0.0100 U	0.00830 U	0.00830 U	0.00630 U	0.00110 U	0.00100 U
Aroclor 1232	0.00100 U	0.00930 U	0.00120 U	0.00120 U	0.00100 U	0.00100 U	0.00100 U	0.00530 U	0.00100 U	0.00100 U	0.00110 U	0.00100 U
Aroclor 1242	0.00100 U	0.00300 U	0.00120 U	0.00120 U	0.00100 U	0.00100 U	0.00120 U	0.00110 U	0.00100 U	0.00100 U	0.00110 U	0.00100 U
Aroclor 1248	0.00100 U	0.00100 U	0.00120 U	0.00120 U	0.00100 U	0.00100 U	0.00100 U	0.00110 U	0.00100 U	0.00100 U	0.00110 U	0.00100 U
Aroclor 1254	0.00100 U	0.00100 U	0.00120 U	0.00120 U	0.00100 U	0.00100 U	0.00100 U	0.00110 U	0.00120 U	0.00100 U	0.00110 U	0.00100 U
Aroclor 1260	0.00100 U	0.00100 U	0.00120 U	0.00120 U	0.00100 U	0.00100 U	0.00100 U	0.00110 U	0.00100 U	0.00100 U	0.00110 U	0.00100 U
Aroclor 1268	0.00100 U	0.00100 U	0.00120 U	0.00120 U	0.00100 U	0.00100 U	0.00100 U	0.00110 U	0.00100 U	0.00100 U	0.00110 U	0.00100 U
General Chemistry Parameters (mg/L)												
Carbon, Organic	-	-	-	-	**1.50**	**1.30**	**1.10**	**1.00**	**1.00**	**1.00**	**0.900**	**0.900**
Total Suspended Solids	-	-	-	-	5.00 U	-	5.00 U	-	5.00 U	-	5.00 U	-

Notes:

µg/L = microgram per liter
mg/L = milligram per liter
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.
J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historical data, the MDLs were not available. In these cases, MRLs were used.
Some dredge effluent samples were also analyzed by Test America Laboratories.
Only results from Cascade Analytical Services are presented here.

Table G-9b
Data Not Used in the RI - 2007 Sediment Removal Monitoring
Analytical Results for Surface Water at Semi-Permeable Membrane Device (SPMD) Locations

Time Period of Removal	Week 1			Week 2			Week 3			Week 4			Week 5		
Sample Date	8/20/2007			9/10/2007			10/1/2007			10/22/2007			11/2/2007		
Site ID	SPMD1	SPMD2	SPMD3	SPMD1	SPMD2	SPMD3	SPMD1	SPMD2	SPMD3	SPMD1	SPMD2	SPMD3	SPMD1	SPMD2	SPMD3
Sample ID	070820-SW-1	070820-SW-2	070820-SW-3	070910-SW-1	070910-SW-2	070910-SW-3	071001-SW-1	071001-SW-2	071001-SW-3	071022-SW-1	071022-SW-2	071022-SW-3	071102-SW-1	071102-SW-2	071102-SW-3
General Chemistry Parameters (mg/L)															
Carbon, Total Organic	**1.48**	**1.55**	**1.50**	**1.80**	**1.90**	**1.40**	**1.30**	**1.30**	**1.30**	**2.20**	**1.90**	**2.00**	**1.40**	**1.40**	**1.30**
Total Suspended Solids	10.0 U	10.0 U	**5.00 J**	**2.40**	**2.60**	**3.00**	4.00 U	**2.40**	**2.00**	**2.40**	**3.40**	**3.20**	**3.30**	**4.30**	**3.30**

Notes:

µg/L = microgram per liter
mg/L = milligram per liter
MDL = method detection limit
MRL = method reporting limit
- = Not Analyzed
bold = analyte detected above MDL.

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported sample quantification limit is an estimate.
For some (older) historical data, the MDLs were not available. In these cases, MRLs were used.

Table G-9c
Data Not Used in the RI - 2007 Sediment Removal Monitoring
Semi-Permeable Membrane Device (SPMD) PCB Congener Analysis Results
9/10/07 Retrievals
(Page 1 of 3)

IUPAC #	COELUTING CONGENERS[1]	070910-SPMD1A L10715-2		070910-SPMD1B L10715-3		070910-SPMD2A L10715-4		070910-SPMD2B L10715-5		070910-SPMD3A L10715-6		070910-SPMD3B L10715-7	
1		0.149	U	0.218	U	0.248	U	0.255	U	0.330	U	0.240	U
2		0.070	U	0.135	U	0.141	U	0.129	U	0.144	U	0.125	U
3		0.109	U	0.151	U	0.166	U	0.173	U	0.207	U	0.160	U
4		0.497	U	0.669	U	0.767	U	0.793	U	0.991	U	0.786	U
5		0.055	U	0.085	UJ	0.071	UJ	0.067	U	0.076	U	0.052	U
6		0.233	U	0.357	UJ	0.299	UJ	0.319	U	0.395	U	0.281	U
7		0.057	U	0.086	UJ	0.075	UJ	0.075	U	0.090	U	0.067	U
8		1.066	U	1.571	UJ	1.423	UJ	1.585	U	1.916	U	1.335	U
9		0.085	U	0.132	UJ	0.110	UJ	0.120	U	0.134	U	0.107	U
10		0.016	U	0.026	UJ	0.027	UJ	0.026	U	0.030	U	0.028	U
11		18.180		34.340	J	46.699	J	37.791		44.500		35.270	
12	12 + 13	0.246	C U	0.520	C UJ	0.344	C UJ	0.276	C U	0.267	C U	0.244	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.003	EMPC	0.005	UJ	0.003	UJ	0.002	U	0.002	U	0.002	U
15		0.644	U	0.930	U	0.764	U	0.787	U	0.783	U	0.628	U
16		0.688	U	0.971	U	0.742	UJ	0.913	U	1.017	U	0.793	U
17		0.656	U	0.967	U	0.762	UJ	0.929	U	0.981	U	0.767	U
18	18 + 30	1.171	C U	1.775	C U	1.310	C UJ	1.703	C U	1.844	C U	1.412	C U
19		0.172	U	0.225	U	0.250	U	0.243	U	0.286	U	0.227	U
20	20 + 28	2.237	C U	3.158	C U	2.466	C UJ	2.842	C U	2.962	C U	2.127	C U
21	21 + 33	1.235	C U	1.773	C U	1.294	C UJ	1.480	C U	1.579	C U	1.127	C U
22		0.873	U	1.234	U	0.882	UJ	0.976	U	1.032	U	0.745	U
23		0.002	U	0.005	U	0.004	UJ	0.005	U	0.005	U	0.004	U
24		0.026	U	0.040	U	0.027	UJ	0.034	U	0.041	U	0.027	U
25		0.157	U	0.229	U	0.181	UJ	0.211	U	0.216	U	0.154	U
26	26 + 29	0.381	C U	0.535	C U	0.419	C UJ	0.499	C U	0.526	C U	0.367	C U
27		0.105	U	0.160	U	0.123	UJ	0.146	U	0.146	U	0.114	U
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		1.796	U	2.535	U	1.964	UJ	2.345	U	2.442	U	1.730	U
32		0.408	U	0.587	U	0.445	UJ	0.549	U	0.592	U	0.427	U
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.008	U	0.011	U	0.008	UJ	0.011	U	0.011	U	0.008	U
35		0.063	U	0.086	U	0.090	UJ	0.082	U	0.092	U	0.068	U
36		0.010		0.016		0.021	J	0.021		0.025		0.019	
37		0.412	U	0.546	U	0.456	U	0.500	U	0.514	U	0.381	U
38		0.003	U	0.004	U	0.005	EMPC	0.005	U	0.006	EMPC	0.003	U
39		0.012	U	0.015	U	0.012	UJ	0.013	U	0.014	U	0.010	U
40	40 + 41 + 71	0.753	C U	0.928	C U	0.780	C U	0.911	C U	0.887	C U	0.655	C U
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		0.321	U	0.414	U	0.384	U	0.451	U	0.442	U	0.324	U
43		0.083	U	0.113	U	0.073	U	0.093	U	0.092	U	0.067	U
44	44 + 47 + 65	1.281	C U	1.631	C U	1.518	C U	1.844	C U	1.680	C U	1.221	C U
45	45 + 51	0.282	C U	0.361	C U	0.292	C U	0.380	C U	0.395	C U	0.287	C U
46		0.094	U	0.121	U	0.101	U	0.126	U	0.129	U	0.094	U
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		0.344	U	0.447	U	0.346	U	0.438	U	0.441	U	0.317	U
49	49 + 69	0.772	C U	0.995	C U	0.971	C U	1.191	C U	1.089	C U	0.781	C U
50	50 + 53	0.203	C U	0.253	C U	0.245	C U	0.297	C U	0.287	C U	0.210	C U
51	45 + 51		C45		C45		C45		C45		C45		C45
52		1.433	U	1.884	U	2.009	U	2.543	U	2.093	U	1.507	U
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.005	U	0.007	U	0.010	U	0.008	U	0.008	U	0.007	U
55		0.036	U	0.069	U	0.029	U	0.035	U	0.034	U	0.025	U
56		0.385	U	0.479	U	0.434	U	0.445	U	0.427	U	0.323	U
57		0.006	U	0.014	U	0.007	U	0.008	U	0.010	U	0.006	U
58		0.005	U	0.014	U	0.005	U	0.004		0.004		0.004	U
59	59 + 62 + 75	0.151	C U	0.205	C U	0.153	C U	0.186	C U	0.187	C U	0.138	C U
60		0.244	U	0.325	U	0.323	U	0.322	U	0.326	U	0.246	U
61	61 + 70 + 74 + 76	1.664	C U	2.228	C U	2.435	C U	2.628	C U	2.332	C U	1.716	C U
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		0.047	U	0.063	U	0.064	U	0.066	U	0.065	U	0.048	U
64		0.545	U	0.707	U	0.691	U	0.819	U	0.783	U	0.576	U
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		0.901	U	1.196	U	1.206	U	1.251	U	1.199	U	0.889	U
67		0.039	U	0.049	U	0.046	U	0.049	U	0.050	U	0.036	U
68		0.011	U	0.020	U	0.017	U	0.019	U	0.018	U	0.012	U
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		0.007	U	0.014	U	0.013		0.014		0.014		0.010	
73		0.000	U	0.001	U	0.000	U	0.000	U	0.000	U	0.000	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		0.052	U	0.067	U	0.081	U	0.077	U	0.083	U	0.065	U
78		0.005	U	0.015	U	0.008	U	0.004	U	0.006	U	0.004	U
79		0.009	U	0.013	U	0.019		0.020		0.013		0.012	
80		0.005	U	0.014	U	0.005	U	0.002	U	0.004	U	0.004	U
81		0.005	U	0.014	U	0.005	U	0.005	U	0.005	U	0.004	U
82		0.077	U	0.120	U	0.146	U	0.146	U	0.096	U	0.076	U
83	83 + 99	0.503	C U	0.720	C U	1.045	C	1.159	C	0.798	C U	0.615	C U
84		0.230	U	0.304	U	0.399	U	0.463	U	0.318	U	0.245	U
85	85 + 116 + 117	0.166	C U	0.238	C U	0.355	C	0.385	C	0.283	C U	0.221	C U
86	86 + 87 + 97 + 108 + 119 + 125	0.590	C U	0.821	C U	1.152	C U	1.250	C U	0.841	C U	0.656	C U
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	0.135	C U	0.173	C U	0.237	C U	0.276	C U	0.198	C U	0.152	C U
89		0.012	U	0.015	U	0.017	U	0.019	U	0.016	U	0.012	U

Table G-9c
Data Not Used in the RI - 2007 Sediment Removal Monitoring
Semi-Permeable Membrane Device (SPMD) PCB Congener Analysis Results
9/10/07 Retrievals

IUPAC #	COELUTING CONGENERS[1]	070910-SPMD1A L10715-2		070910-SPMD1B L10715-3		070910-SPMD2A L10715-4		070910-SPMD2B L10715-5		070910-SPMD3A L10715-6		070910-SPMD3B L10715-7	
90	90 + 101 + 113	1.056	C U	1.454	C U	1.904	C U	2.177	C U	1.592	C U	1.205	C U
91	88 + 91		C88		C88		C88		C88		C88		C88
92		0.192	U	0.263	U	0.355	U	0.405	U	0.309	U	0.237	U
93	93 + 95 + 98 + 100 + 102	0.922	C U	1.228	C U	1.495	C U	1.838	C U	1.320	C U	1.002	C U
94		0.006	U	0.006	U	0.008	U	0.011	U	0.008	U	0.007	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.009	U	0.011	U	0.011	U	0.015	U	0.012	U	0.009	U
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		0.007	U	0.009	U	0.014	U	0.015	U	0.014	U	0.010	U
104		0.002	U	0.001	U	0.001	U	0.002	U	0.002	U	0.002	U
105		0.274	U	0.416	U	0.688		0.705		0.484		0.375	
106		0.004	U	0.007	U	0.004	U	0.003	U	0.003	U	0.004	U
107	107 + 124	0.027	C U	0.042	C U	0.066	C	0.070	C	0.052	C	0.039	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		0.058		0.087		0.124		0.121		0.098		0.079	
110	110 + 115	0.904	C U	1.329	C U	2.079	C	2.102	C	1.542	C U	1.205	C U
111		0.002	U	0.004	U	0.001	EMPC	0.001	U	0.001	EMPC	0.001	U
112		0.002	U	0.003	U	0.001	U	0.001	U	0.001	U	0.001	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		0.017	U	0.028	U	0.039		0.049		0.029	U	0.021	U
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		0.675	U	1.031	U	1.684		1.788		1.144		0.862	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		0.002	EMPC	0.003	U	0.005	EMPC	0.005		0.006		0.005	
121		0.002	U	0.003	U	0.001		0.002		0.001	U	0.001	U
122		0.007	U	0.011	U	0.015		0.020		0.010		0.008	U
123		0.013	U	0.021	U	0.031	U	0.040	U	0.030	U	0.019	U
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		0.005	U	0.009	U	0.006		0.005	U	0.007		0.005	
127		0.005	U	0.009	U	0.005	U	0.004	U	0.004	EMPC	0.004	U
128	128 + 166	0.119	C	0.178	C	0.273	C	0.263	C	0.206	C	0.162	C
129	129 + 138 + 160 + 163	0.917	C U	1.313	C U	1.891	C	1.953	C	1.527	C	1.172	C U
130		0.061		0.079	U	0.118		0.120		0.099		0.076	
131		0.010	U	0.013	U	0.020		0.020		0.016		0.011	
132		0.286	U	0.383	U	0.475	U	0.518	U	0.391	U	0.304	U
133		0.017	U	0.026	U	0.032		0.034		0.032		0.024	
134	134 + 143	0.064	C U	0.086	C U	0.096	C U	0.104	C U	0.079	C U	0.062	C U
135	135 + 151 + 154	0.518	C U	0.694	C U	0.741	C U	0.858	C U	0.746	C U	0.571	C U
136		0.157	U	0.193	U	0.204	U	0.256	U	0.196	U	0.155	U
137		0.026	U	0.030	U	0.058		0.071		0.034	U	0.029	U
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	0.014	C	0.017	C EMPC	0.028	C	0.031	C	0.021	C	0.017	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		0.175	U	0.243	U	0.245	U	0.287	U	0.219	U	0.161	U
142		0.003	U	0.011	U	0.004	U	0.003	U	0.003	U	0.003	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		0.069	U	0.087	U	0.093	U	0.105	U	0.088	U	0.065	U
145		0.000	U	0.001	EMPC	0.000	U	0.001	EMPC	0.001		0.000	
146		0.174	U	0.241	U	0.283	U	0.304	U	0.261	U	0.204	U
147	147 + 149	0.985	C U	1.302	C U	1.531	C U	1.704	C U	1.431	C U	1.073	C U
148		0.001	U	0.002	U	0.003	EMPC	0.003		0.003	EMPC	0.003	
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.002	U	0.002	U	0.003	EMPC	0.003		0.003	EMPC	0.002	
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.002	U	0.001	U	0.001	U	0.002	U	0.002	U	0.002	U
153	153 + 168	1.040	C U	1.421	C U	1.712	C U	1.867	C U	1.487	C U	1.101	C U
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.001	U	0.001	U	0.001	U	0.002	U	0.002	U	0.001	U
156	156 + 157	0.069	C U	0.104	C U	0.175	C	0.192	C	0.114	C	0.085	C U
157	156 + 157		C156		C156		C156		C156		C156		C156
158		0.086	U	0.124	U	0.175		0.185		0.138	U	0.105	U
159		0.011	U	0.011	U	0.014	U	0.016	U	0.013	U	0.011	U
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.003	U	0.010	U	0.004	U	0.003	U	0.003	U	0.002	U
162		0.003	U	0.012	U	0.006	EMPC	0.006		0.004		0.004	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		0.063	U	0.087	U	0.126		0.130		0.104	U	0.076	U
165		0.003	U	0.011	U	0.004	U	0.003	U	0.003	U	0.003	U
166	128 + 166		C128		C128		C128		C128		C128		C128
167		0.029	U	0.046	U	0.067		0.073		0.048		0.037	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		0.004	U	0.012	U	0.005	U	0.004	U	0.004	U	0.003	U
170		0.100	U	0.145	U	0.179	U	0.178	U	0.158	U	0.123	U
171	171 + 173	0.056	C U	0.077	C U	0.090	C U	0.081	C U	0.081	C U	0.061	C U
172		0.026	U	0.037	U	0.043	U	0.041	U	0.041	U	0.032	U
173	171 + 173		C171		C171		C171		C171		C171		C171
174		0.194	U	0.268	U	0.256	U	0.256	U	0.259	U	0.191	U
175		0.013	U	0.018	U	0.017	U	0.017	U	0.018	U	0.013	U
176		0.045	U	0.060	U	0.057	U	0.060	U	0.060	U	0.044	U
177		0.129	U	0.189	U	0.204	U	0.192	U	0.203	U	0.155	U
178		0.074	U	0.105	U	0.100	U	0.115	U	0.111	U	0.082	U

Table G-9c
Data Not Used in the RI - 2007 Sediment Removal Monitoring
Semi-Permeable Membrane Device (SPMD) PCB Congener Analysis Results
9/10/07 Retrievals
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IUPAC #	COELUTING CONGENERS[1]	070910-SPMD1A L10715-2		070910-SPMD1B L10715-3		070910-SPMD2A L10715-4		070910-SPMD2B L10715-5		070910-SPMD3A L10715-6		070910-SPMD3B L10715-7	
179		0.147	U	0.199	U	0.181	U	0.205	U	0.202	U	0.145	U
180	180 + 193	0.336	C U	0.482	C U	0.505	C U	0.505	C U	0.476	C U	0.356	C U
181		0.002	U	0.003	U	0.004	U	0.003	U	0.003	U	0.002	U
182		0.001	U	0.001	U	0.000	U	0.002		0.001	EMPC	0.002	
183	183 + 185	0.178	C U	0.236	C U	0.248	C U	0.242	C U	0.239	C U	0.180	C U
184		0.001	U	0.001	U	0.002	U	0.002	U	0.002	U	0.001	U
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.000	U	0.001	U	0.007	U	0.005	U	0.006	U	0.003	U
187		0.388	U	0.535	U	0.546	U	0.576	U	0.573	U	0.429	U
188		0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
189		0.006	U	0.006	U	0.009	U	0.008	U	0.007	U	0.006	U
190		0.033	U	0.048	U	0.058	U	0.053	U	0.055	U	0.041	U
191		0.008	U	0.010	U	0.012	U	0.012	U	0.010	U	0.009	U
192		0.001	U	0.001	U	0.001	U	0.000	U	0.001	U	0.000	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		0.039	U	0.057	U	0.073	U	0.063	U	0.065	U	0.053	U
195		0.022	U	0.032	U	0.039	U	0.034	U	0.035	U	0.027	U
196		0.032	U	0.045	U	0.050	U	0.047	U	0.048	U	0.037	U
197	197 + 200	0.016	C U	0.021	C U	0.020	C U	0.021	C U	0.022	C U	0.017	C U
198	198 + 199	0.074	C U	0.102	C U	0.107	C U	0.111	C U	0.113	C U	0.086	C U
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		0.020	U	0.027	U	0.025	U	0.026	U	0.029	U	0.021	U
202		0.035	U	0.048	U	0.045	U	0.048	U	0.053	U	0.038	U
203		0.055	U	0.076	U	0.080	U	0.081	U	0.085	U	0.064	U
204		0.001	EMPC	0.001	U	0.001	EMPC	0.000	U	0.001	EMPC	0.001	
205		0.004	U	0.007	U	0.008	U	0.006	U	0.006	U	0.005	U
206		0.027	U	0.039	U	0.047	U	0.037	U	0.046	U	0.031	U
207		0.005	U	0.006	U	0.006	U	0.006	U	0.008	U	0.004	U
208		0.013	U	0.016	U	0.015	U	0.015	U	0.016	U	0.012	U
209		0.037	U	0.046	U	0.035	U	0.039	U	0.041	U	0.030	U

Notes:

All results are in units of pg/L (picograms/Liter)

C = concentration represents coeluting congeners
U = The analyte was not detected above the reported sample specific detection limit.
J = The reported value is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
PCBs = Polychlorinated Biphenyls
[1] = When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.

Table G-9d
Data Not Used in the RI - 2007 Sediment Removal Monitoring
Semi-Permeable Membrane Device (SPMD) PCB Congener Analysis Results
10/22/07 Retrievals

IUPAC #	COELUTING CONGENERS[1]	071022-SPMD1A L10715-9		071022-SPMD1B L10715-10		071022-SPMD2A L10715-11		071022-SPMD2B L10715-12		071022-SPMD3A L10715-13		071022-SPMD3B L10715-14	
1		0.411	U	0.442	U	0.210	U	0.198	U	0.261	U	0.278	U
2		0.161	U	0.196	U	0.103	UJ	0.095	UJ	0.125	U	0.117	U
3		0.309	U	0.314	U	0.159	U	0.143	U	0.184	U	0.178	U
4		1.459	U	1.506	U	0.683	U	0.636	U	0.830	U	0.794	U
5		0.149	U	0.118	UJ	0.052	UJ	0.050	UJ	0.060	U	0.062	UJ
6		0.759	U	0.632	UJ	0.257	UJ	0.241	UJ	0.323	U	0.331	UJ
7		0.179	U	0.142	UJ	0.058	UJ	0.058	UJ	0.075	U	0.076	UJ
8		3.536	U	3.004	UJ	1.207	UJ	1.136	UJ	1.498	U	1.542	UJ
9		0.275	U	0.214	UJ	0.093	UJ	0.089	UJ	0.115	U	0.116	UJ
10		0.060	U	0.045	UJ	0.020	UJ	0.018	UJ	0.025	U	0.025	UJ
11		23.309		27.169	J	15.290	J	16.057	J	27.703		24.432	J
12	12 + 13	0.439	C U	0.462	C UJ	0.204	C UJ	0.192	C UJ	0.246	C U	0.244	C UJ
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.011		0.010	EMPC	0.004	UJ	0.004	UJ	0.006	EMPC	0.003	J
15		1.557	U	1.384	U	0.613	U	0.615	U	0.766	U	0.738	U
16		1.932	U	1.624	U	0.622	UJ	0.623	U	0.801	U	0.765	U
17		1.987	U	1.506	U	0.615	UJ	0.633	U	0.816	U	0.793	U
18	18 + 30	3.754	C U	2.794	C U	1.099	C UJ	1.118	C U	1.514	C U	1.448	C U
19		0.501	U	0.493	U	0.224	U	0.216	U	0.244	U	0.238	U
20	20 + 28	5.509	C U	4.468	C U	1.820	C UJ	1.882	C U	2.339	C U	2.269	C U
21	21 + 33	3.211	C U	2.587	C U	1.015	C UJ	1.017	C U	1.222	C U	1.229	C U
22		1.960	U	1.651	U	0.665	UJ	0.684	U	0.818	U	0.817	U
23		0.009	U	0.008	U	0.003	UJ	0.003	U	0.004	U	0.004	U
24		0.073	U	0.059	U	0.022	UJ	0.025	U	0.028	U	0.033	U
25		0.428	U	0.337	U	0.142	UJ	0.152	U	0.168	U	0.164	U
26	26 + 29	1.069	C U	0.828	C U	0.335	C UJ	0.352	C U	0.423	C U	0.399	C U
27		0.299	U	0.228	U	0.103	UJ	0.110	U	0.121	U	0.115	U
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		4.851	U	3.722	U	1.513	UJ	1.563	U	1.932	U	1.871	U
32		1.229	U	0.957	U	0.383	UJ	0.392	U	0.477	U	0.463	U
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.024	U	0.018	U	0.007	UJ	0.009	U	0.009	U	0.009	U
35		0.089	U	0.084	U	0.046	UJ	0.044	U	0.068	U	0.059	U
36		0.015		0.014		0.008	UJ	0.009		0.016		0.012	
37		0.923	U	0.777	U	0.354	U	0.361	U	0.433	U	0.409	U
38		0.008	U	0.008	U	0.003	UJ	0.004	U	0.005	U	0.005	U
39		0.026	U	0.022	U	0.010	UJ	0.011	U	0.012	U	0.011	U
40	40 + 41 + 71	1.742	C U	1.444	C U	0.609	C U	0.662	C U	0.710	C U	0.651	C U
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		0.822	U	0.677	U	0.279	U	0.303	U	0.337	U	0.310	U
43		0.175	U	0.144	U	0.053	U	0.057	U	0.068	U	0.064	U
44	44 + 47 + 65	2.962	C U	2.446	C U	1.127	C U	1.426	C U	1.244	C U	1.129	C U
45	45 + 51	0.714	C U	0.601	C U	0.224	C U	0.245	C U	0.295	C U	0.271	C U
46		0.227	U	0.200	U	0.075	U	0.086	U	0.097	U	0.089	U
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		0.843	U	0.670	U	0.250	U	0.263	U	0.331	U	0.305	U
49	49 + 69	1.910	C U	1.519	C U	0.708	C U	0.904	C U	0.799	C U	0.706	C U
50	50 + 53	0.546	C U	0.439	C U	0.199	C U	0.251	C U	0.221	C U	0.190	C U
51	45 + 51		C45		C45		C45		C45		C45		C45
52		3.394	U	2.803	U	1.520	U	2.212	U	1.530	U	1.329	U
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.011	U	0.011	U	0.009	U	0.010	U	0.006	U	0.005	U
55		0.067	U	0.055	U	0.028	U	0.021	U	0.028	U	0.030	U
56		0.833	U	0.653	U	0.341	U	0.413	U	0.364	U	0.349	U
57		0.017	U	0.012	U	0.005	U	0.005	U	0.007	U	0.006	U
58		0.008	U	0.005		0.002	U	0.003	U	0.004	EMPC	0.003	
59	59 + 62 + 75	0.343	C U	0.278	C U	0.108	C U	0.109	C U	0.142	C U	0.129	C U
60		0.510	U	0.444	U	0.225	U	0.263	U	0.262	U	0.248	U
61	61 + 70 + 74 + 76	3.775	C U	3.102	C U	1.779	C U	2.503	C U	1.652	C U	1.533	C U
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		0.105	U	0.083	U	0.040	U	0.051	U	0.046	U	0.043	U
64		1.303	U	1.083	U	0.476	U	0.570	U	0.581	U	0.518	U
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		1.935	U	1.598	U	0.873	U	1.096	U	0.879	U	0.818	U
67		0.091	U	0.075	U	0.030	U	0.031	U	0.039	U	0.036	U
68		0.025	U	0.025	U	0.014	U	0.013	U	0.014	U	0.012	U
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		0.017	U	0.014	U	0.007	U	0.009	U	0.009	U	0.008	U
73		0.001	U	0.001	U	0.000	U	0.001	U	0.000	U	0.000	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		0.103	U	0.097	U	0.048	U	0.054	U	0.066	U	0.055	U
78		0.010	U	0.006	U	0.009	U	0.003	U	0.003	U	0.003	U
79		0.016	U	0.015	U	0.014		0.028		0.012	U	0.009	U
80		0.007	U	0.003	U	0.002	U	0.003	U	0.003	U	0.002	U
81		0.008	U	0.007	U	0.002	U	0.003	U	0.004	U	0.003	U
82		0.141	U	0.139	U	0.149	U	0.267		0.078	U	0.068	U
83	83 + 99	0.878	C U	0.847	C U	0.840	C U	1.580	C	0.510	C U	0.426	C U
84		0.416	U	0.396	U	0.345	U	0.595		0.234	U	0.196	U
85	85 + 116 + 117	0.294	C U	0.290	C U	0.300	C U	0.542	C	0.186	C U	0.155	C U
86	86 + 87 + 97 + 108 + 119 + 125	1.057	C U	1.006	C U	0.996	C U	1.848	C	0.605	C U	0.518	C U

Table G-9d
Data Not Used in the RI - 2007 Sediment Removal Monitoring
Semi-Permeable Membrane Device (SPMD) PCB Congener Analysis Results
10/22/07 Retrievals

IUPAC #	COELUTING CONGENERS[1]	071022-SPMD1A L10715-9		071022-SPMD1B L10715-10		071022-SPMD2A L10715-11		071022-SPMD2B L10715-12		071022-SPMD3A L10715-13		071022-SPMD3B L10715-14	
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	0.246	C U	0.237	C U	0.190	C U	0.323	C U	0.135	C U	0.111	C U
89		0.027	U	0.024	U	0.014	U	0.022	U	0.014	U	0.012	U
90	90 + 101 + 113	2.006	C U	1.887	C U	1.467	C U	2.534	C	1.125	C U	0.927	C U
91	88 + 91		C88		C88		C88		C88		C88		C88
92		0.342	U	0.321	U	0.247	U	0.427		0.210	U	0.171	U
93	93 + 95 + 98 + 100 + 102	1.755	C U	1.620	C U	1.134	C U	1.966	C U	0.927	C U	0.773	C U
94		0.014	U	0.012	U	0.007	U	0.011	U	0.005	U	0.005	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.020	U	0.018	U	0.009	U	0.014	U	0.009	U	0.008	U
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		0.013	U	0.012	U	0.008	U	0.012	U	0.008	U	0.007	U
104		0.007		0.006	U	0.001	U	0.003	U	0.003	U	0.000	U
105		0.434	U	0.462	U	0.635		1.321		0.320	U	0.268	U
106		0.005	U	0.006	U	0.003	U	0.005	U	0.003	U	0.003	U
107	107 + 124	0.050	C U	0.045	C U	0.055	C	0.107	C	0.032	C U	0.027	C U
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		0.079	U	0.081	U	0.102		0.223		0.061	U	0.053	U
110	110 + 115	1.610	C U	1.597	C U	1.676	C	3.079	C	1.056	C U	0.915	C U
111		0.002	U	0.002	U	0.001	U	0.001	U	0.001	U	0.001	U
112		0.002	U	0.002	U	0.001	U	0.001	U	0.001	U	0.000	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		0.032	U	0.030	U	0.043		0.099		0.020	U	0.016	U
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		1.123	U	1.172	U	1.724		3.858		0.748	U	0.626	U
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		0.004		0.005	EMPC	0.002	EMPC	0.002	EMPC	0.003		0.002	EMPC
121		0.002	U	0.002	U	0.001	U	0.001	U	0.001	U	0.001	U
122		0.011	U	0.011	U	0.016		0.032		0.008	U	0.007	U
123		0.035	U	0.030	U	0.036	U	0.068		0.023	U	0.016	U
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		0.007	U	0.008	U	0.004	U	0.006	U	0.005	U	0.004	U
127		0.006	U	0.008	U	0.004	EMPC	0.007	EMPC	0.004	U	0.004	U
128	128 + 166	0.164	C U	0.170	C U	0.219	C	0.402	C	0.125	C U	0.105	C U
129	129 + 138 + 160 + 163	1.526	C U	1.483	C U	1.518	C U	2.791	C	0.958	C U	0.823	C U
130		0.080	U	0.083	U	0.085		0.158		0.061	U	0.050	U
131		0.019	U	0.017	U	0.015		0.028		0.010	U	0.008	U
132		0.461	U	0.456	U	0.388	U	0.631	U	0.270	U	0.239	U
133		0.030	U	0.025	U	0.020	U	0.035		0.020	U	0.016	U
134	134 + 143	0.092	C U	0.087	C U	0.071	C U	0.117	C U	0.052	C U	0.044	C U
135	135 + 151 + 154	0.984	C U	0.889	C U	0.483	C U	0.657	C U	0.519	C U	0.454	C U
136		0.290	U	0.274	U	0.148	U	0.205	U	0.144	U	0.123	U
137		0.042	U	0.038	U	0.079		0.187		0.024	U	0.019	U
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	0.020	C	0.020	C U	0.022	C	0.040	C	0.012	C U	0.011	C U
140	139 + 140		C139		C139		C139		C139		C139		C139
141		0.359	U	0.308	U	0.210	U	0.306	U	0.163	U	0.144	U
142		0.004	U	0.005	U	0.003	U	0.004	U	0.002	U	0.002	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		0.136	U	0.120	U	0.064	U	0.094	U	0.063	U	0.059	U
145		0.001	EMPC	0.000	U	0.001	EMPC	0.001	EMPC	0.001	EMPC	0.000	U
146		0.277	U	0.258	U	0.205	U	0.359		0.168	U	0.146	U
147	147 + 149	1.829	C U	1.671	C U	1.053	C U	1.545	C U	0.979	C U	0.851	C U
148		0.002	U	0.002	U	0.001	U	0.002	EMPC	0.002	EMPC	0.002	U
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.002	U	0.002	U	0.001	U	0.002	U	0.001	U	0.001	U
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.006	U	0.005	U	0.001	U	0.004	U	0.003	U	0.001	U
153	153 + 168	1.799	C U	1.672	C U	1.360	C U	2.522	C	0.975	C U	0.852	C U
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.002	U	0.002	U	0.001	U	0.001	U	0.001	U	0.001	U
156	156 + 157	0.125	C U	0.127	C U	0.211	C	0.453	C	0.070	C U	0.059	C U
157	156 + 157		C156		C156		C156		C156		C156		C156
158		0.153	U	0.148	U	0.146	U	0.257		0.088	U	0.079	U
159		0.022	U	0.018	U	0.010	U	0.013	U	0.009	U	0.010	U
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.004	U	0.005	U	0.003	U	0.004	U	0.002	U	0.002	U
162		0.004	U	0.006	U	0.006		0.011		0.003		0.002	U
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		0.113	U	0.107	U	0.098	U	0.163		0.068	U	0.060	U
165		0.004	U	0.005	U	0.003	U	0.004	U	0.002	U	0.002	U
166	128 + 166		C128		C128		C128		C128		C128		C128
167		0.048	U	0.051	U	0.070		0.154		0.027	U	0.025	U
168	153 + 168		C153		C153		C153		C153		C153		C153
169		0.005	U	0.007	U	0.003	U	0.005	U	0.003	U	0.003	U
170		0.199	U	0.187	U	0.153	U	0.254	U	0.109	U	0.101	U
171	171 + 173	0.107	C U	0.099	C U	0.061	C U	0.081	C U	0.059	C U	0.053	C U
172		0.055	U	0.048	U	0.030	U	0.044	U	0.030	U	0.026	U

Table G-9d
Data Not Used in the RI - 2007 Sediment Removal Monitoring
Semi-Permeable Membrane Device (SPMD) PCB Congener Analysis Results
10/22/07 Retrievals
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IUPAC #	COELUTING CONGENERS[1]	071022-SPMD1A L10715-9		071022-SPMD1B L10715-10		071022-SPMD2A L10715-11		071022-SPMD2B L10715-12		071022-SPMD3A L10715-13		071022-SPMD3B L10715-14	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		0.377	U	0.351	U	0.206	U	0.256	U	0.199	U	0.181	U
175		0.026	U	0.023	U	0.012	U	0.017	U	0.014	U	0.012	U
176		0.090	U	0.077	U	0.040	U	0.046	U	0.049	U	0.043	U
177		0.245	U	0.223	U	0.135	U	0.182	U	0.146	U	0.128	U
178		0.144	U	0.131	U	0.069	U	0.087	U	0.081	U	0.073	U
179		0.303	U	0.263	U	0.131	U	0.146	U	0.154	U	0.137	U
180	180 + 193	0.676	C U	0.602	C U	0.411	C U	0.706	C U	0.356	C U	0.320	C U
181		0.004	U	0.021		0.031		0.006	U	0.002	U	0.001	U
182		0.001	U	0.001	U	0.000	U	0.000	U	0.000	U	0.000	U
183	183 + 185	0.379	C U	0.328	C U	0.186	C U	0.241	C U	0.193	C U	0.174	C U
184		0.002	U	0.003	U	0.001	U	0.001	U	0.002	U	0.001	U
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.009	U	0.006	U	0.011	U	0.003	U	0.004	U	0.002	U
187		0.738	U	0.697	U	0.398	U	0.553	U	0.424	U	0.368	U
188		0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
189		0.010	U	0.009	U	0.008	U	0.013	U	0.005	U	0.004	U
190		0.061	U	0.054	U	0.041	U	0.060	U	0.039	U	0.033	U
191		0.014	U	0.015	U	0.010	U	0.015	U	0.008	U	0.007	U
192		0.001	EMPC	0.001	U	0.001	U	0.000	U	0.001	U	0.000	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		0.082	U	0.079	U	0.053	U	0.103	U	0.050	U	0.041	U
195		0.046	U	0.041	U	0.025	U	0.034	U	0.024	U	0.020	U
196		0.072	U	0.066	U	0.037	U	0.064	U	0.038	U	0.033	U
197	197 + 200	0.033	C U	0.032	C U	0.014	C U	0.021	C U	0.018	C U	0.017	C U
198	198 + 199	0.150	C U	0.137	C U	0.079	C U	0.155	C U	0.080	C U	0.072	C U
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		0.045	U	0.044	U	0.020	U	0.029	U	0.024	U	0.020	U
202		0.073	U	0.072	U	0.033	U	0.046	U	0.036	U	0.033	U
203		0.109	U	0.102	U	0.057	U	0.086	U	0.064	U	0.055	U
204		0.004	EMPC	0.003	EMPC	0.000	U	0.002	EMPC	0.001	EMPC	0.000	U
205		0.006	U	0.007	U	0.005	U	0.006	U	0.005	U	0.003	U
206		0.059	U	0.047	U	0.030	U	0.049	U	0.034	U	0.030	U
207		0.009	U	0.009	U	0.005	U	0.007	U	0.005	U	0.004	U
208		0.021	U	0.022	U	0.010	U	0.018	U	0.012	U	0.010	U
209		0.088	U	0.077	U	0.034	U	0.039	U	0.033	U	0.023	U

Notes:

All results are in units of pg/L (picograms/Liter)

C = concentration represents coeluting congeners
U = The analyte was not detected above the reported sample specific detection limit.
J = The reported value is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
PCBs = Polychlorinated Biphenyls
[1] = When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.

Table G-9e
Data Not Used in the RI - 2007 Sediment Removal Monitoring
Semi-Permeable Membrane Device (SPMD) PCB Congener Analysis Results
11/02/07 Retrievals
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IUPAC #	COELUTING CONGENERS[1]	071102-SPMD1A L10715-15		071102-SPMD1B L10715-16		071102-SPMD2A L10715-17		071102-SPMD2B L10715-18		071102-SPMD3A L10715-19		071102-SPMD3B L10715-20	
1		0.226	U		R	0.141	U	0.157	U	0.209	U	0.184	U
2		0.102	UJ		R	0.093	U	0.100	UJ	0.161	UJ	0.131	UJ
3		0.158	U		R	0.116	U	0.117	U	0.162	U	0.149	U
4		0.700	U	0.558	U	0.486	U	0.516	U	0.737	U	0.615	U
5		0.069	UJ	0.041	UJ	0.071	U	0.059	UJ	0.071	UJ	0.067	UJ
6		0.285	UJ	0.181	UJ	0.209	U	0.208	UJ	0.302	UJ	0.282	UJ
7		0.063	UJ	0.039	UJ	0.049	U	0.051	UJ	0.075	UJ	0.065	UJ
8		1.305	UJ	0.825	UJ	0.986	U	0.953	UJ	1.370	UJ	1.269	UJ
9		0.102	UJ	0.062	UJ	0.083	U	0.081	UJ	0.124	UJ	0.106	UJ
10		0.021	UJ	0.015	UJ	0.017	U	0.017	UJ	0.021	UJ	0.021	UJ
11		16.614	J	9.113	J	22.357		16.825	J	36.264	J	32.765	J
12	12 + 13	0.246	C UJ	0.176	C UJ	0.222	C U	0.229	C UJ	0.341	C UJ	0.321	C UJ
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.005	J	0.003	UJ	0.003	U	0.004	UJ	0.004	UJ	0.005	UJ
15		0.687	U	0.412	U	0.655	U	0.547	U	0.814	U	0.680	U
16		0.678	UJ	0.382	UJ	0.615	U	0.537	UJ	0.779	U	0.693	UJ
17		0.650	UJ	0.372	UJ	0.643	U	0.537	UJ	0.830	U	0.706	UJ
18	18 + 30	1.206	C UJ	0.651	C UJ	1.130	C U	0.949	C UJ	1.505	C U	1.256	C UJ
19		0.217	UJ	0.139	U	0.181	U	0.185	U	0.227	U	0.191	U
20	20 + 28	2.077	C UJ	1.108	C UJ	2.121	C U	1.787	C UJ	2.688	C U	2.285	C UJ
21	21 + 33	1.207	C UJ	0.646	C UJ	1.154	C U	1.004	C UJ	1.418	C U	1.307	C UJ
22		0.797	UJ	0.423	UJ	0.781	U	0.680	UJ	0.952	U	0.867	UJ
23		0.004	UJ	0.002	UJ	0.003	U	0.003	UJ	0.006	U	0.004	UJ
24		0.028	UJ	0.012	UJ	0.024	U	0.023	UJ	0.038	U	0.025	UJ
25		0.153	UJ	0.080	UJ	0.156	U	0.138	UJ	0.188	U	0.172	UJ
26	26 + 29	0.373	C UJ	0.193	C UJ	0.356	C U	0.308	C UJ	0.457	C U	0.433	C UJ
27		0.100	UJ	0.053	UJ	0.104	U	0.092	UJ	0.123	U	0.108	UJ
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		1.714	UJ	0.900	UJ	1.709	U	1.458	UJ	2.217	U	1.880	UJ
32		0.416	UJ	0.226	UJ	0.389	U	0.346	UJ	0.482	U	0.420	UJ
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.008	UJ	0.004	UJ	0.007	U	0.006	UJ	0.011	U	0.011	UJ
35		0.047	UJ	0.026	UJ	0.062	U	0.044	UJ	0.088	U	0.069	UJ
36		0.009	EMPC	0.004	EMPC	0.012		0.009	UJ	0.022		0.020	EMPC
37		0.424	U	0.205	U	0.473	U	0.404	U	0.533	U	0.463	U
38		0.004	UJ	0.001	UJ	0.007	U	0.004	UJ	0.006	U	0.007	EMPC
39		0.010	UJ	0.006	UJ	0.011	U	0.010	UJ	0.015	U	0.012	UJ
40	40 + 41 + 71	0.712	C U	0.347	C U	0.797	C U	0.709	C U	0.878	C U	0.841	C U
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		0.321	U	0.161	U	0.370	U	0.318	U	0.416	U	0.393	U
43		0.061	U	0.031	U	0.071	U	0.062	U	0.080	U	0.077	U
44	44 + 47 + 65	1.115	C U	0.553	C U	1.417	C U	1.229	C U	1.494	C U	1.384	C U
45	45 + 51	0.251	C U	0.125	C U	0.291	C U	0.237	C U	0.328	C U	0.283	C U
46		0.083	U	0.043	U	0.097	U	0.082	U	0.108	U	0.095	U
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		0.300	U	0.151	U	0.339	U	0.276	U	0.393	U	0.371	U
49	49 + 69	0.660	C U	0.331	C U	0.879	C U	0.761	C U	0.942	C U	0.846	C U
50	50 + 53	0.175	C U	0.085	C U	0.227	C U	0.191	C U	0.233	C U	0.222	C U
51	45 + 51		C45		C45		C45		C45		C45		C45
52		1.184	U	0.596	U	1.770	U	1.580	U	1.776	U	1.555	U
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.005	U	0.003	U	0.007	U	0.007	U	0.007	U	0.006	U
55		0.033	U	0.012	U	0.038	U	0.035	U	0.040	U	0.037	U
56		0.419	U	0.178	U	0.464	U	0.429	U	0.498	U	0.504	U
57		0.006	U	0.003	U	0.007	U	0.006	U	0.008	U	0.007	U
58		0.004	U	0.002	U	0.004	U	0.004	U	0.005	U	0.004	U
59	59 + 62 + 75	0.129	C U	0.064	C U	0.148	C U	0.125	C U	0.172	C U	0.163	C U
60		0.272	U	0.121	U	0.319	U	0.277	U	0.355	U	0.341	U
61	61 + 70 + 74 + 76	1.556	C U	0.718	C U	2.135	C U	1.955	C U	2.181	C U	2.112	C U
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		0.040	U	0.019	U	0.054	U	0.045	U	0.057	U	0.056	U
64		0.519	U	0.248	U	0.635	U	0.542	U	0.704	U	0.649	U
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		0.843	U	0.371	U	1.069	U	0.967	U	1.175	U	1.130	U
67		0.038	U	0.018	U	0.045	U	0.040	U	0.052	U	0.048	U
68		0.013	U	0.005	U	0.016	U	0.015	U	0.020	U	0.015	U
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		0.007	U	0.003	U	0.009	U	0.007	U	0.013	U	0.009	U
73		0.000	U	0.000	U	0.001	U	0.001	U	0.001	U	0.001	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		0.051	U	0.022	U	0.067	U	0.054	U	0.073	U	0.069	U
78		0.004	U	0.002	U	0.004	U	0.005	U	0.006	U	0.004	U
79		0.007	U	0.003	U	0.013	U	0.015	U	0.013	U	0.012	U
80		0.004	U	0.002	U	0.004	U	0.004	U	0.005	U	0.004	U
81		0.004	U	0.002	U	0.004	U	0.004	U	0.007	U	0.004	U
82		0.074	U	0.035	U	0.132	U	0.142	U	0.097	U	0.092	U
83	83 + 99	0.375	C U	0.177	C U	0.749	C U	0.818	C U	0.591	C U	0.551	C U
84		0.189	U	0.092	U	0.333	U	0.350	U	0.274	U	0.249	U
85	85 + 116 + 117	0.136	C U	0.062	C U	0.260	C U	0.284	C U	0.218	C U	0.191	C U
86	86 + 87 + 97 + 108 + 119 + 125	0.501	C U	0.229	C U	0.942	C U	0.970	C U	0.744	C U	0.688	C U
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	0.107	C U	0.052	C U	0.191	C U	0.190	C U	0.158	C U	0.139	C U
89		0.013	U	0.007	U	0.018	U	0.018	U	0.017	U	0.016	U

Table G-9e
Data Not Used in the RI - 2007 Sediment Removal Monitoring
Semi-Permeable Membrane Device (SPMD) PCB Congener Analysis Results
11/02/07 Retrievals

IUPAC #	COELUTING CONGENERS[1]	071102-SPMD1A L10715-15		071102-SPMD1B L10715-16		071102-SPMD2A L10715-17		071102-SPMD2B L10715-18		071102-SPMD3A L10715-19		071102-SPMD3B L10715-20	
90	90 + 101 + 113	0.855	C U	0.404	C U	1.494	C U	1.477	C U	1.302	C U	1.183	C U
91	88 + 91		C88		C88		C88		C88		C88		C88
92		0.146	U	0.069	U	0.258	U	0.244	U	0.235	U	0.210	U
93	93 + 95 + 98 + 100 + 102	0.712	C U	0.344	C U	1.208	C U	1.177	C U	1.070	C U	0.964	C U
94		0.006	U	0.002	U	0.008	U	0.008	U	0.007	U	0.007	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.008	U	0.003	U	0.010	U	0.010	U	0.010	U	0.009	U
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		0.005	U	0.002	U	0.009	U	0.008	U	0.009	U	0.008	U
104		0.003	U	0.001	U	0.001	U	0.001	U	0.001	U	0.006	
105		0.215	U	0.093	U	0.503	U	0.586		0.353	U	0.333	U
106		0.003	U	0.002	U	0.003	U	0.004	U	0.004	U	0.004	U
107	107 + 124	0.024	C U	0.010	C U	0.050	C U	0.049	C U	0.037	C U	0.035	C U
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		0.039	U	0.017	U	0.081	U	0.101		0.070	U	0.064	U
110	110 + 115	0.809	C U	0.358	C U	1.556	C U	1.588	C U	1.263	C U	1.122	C U
111		0.001	U	0.000	U	0.002	U	0.001	U	0.001	U	0.001	U
112		0.001	U	0.000	U	0.001	U	0.001	U	0.001	U	0.001	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		0.014	U	0.007	U	0.032	U	0.042		0.021	U	0.021	U
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		0.531	U	0.233	U	1.291	U	1.632		0.840	U	0.796	U
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		0.003	EMPC	0.001	EMPC	0.002	EMPC	0.002	EMPC	0.005	EMPC	0.004	
121		0.001	U	0.000	U	0.001	U	0.001	U	0.001	U	0.001	U
122		0.006	U	0.003	U	0.012	U	0.014		0.008	U	0.009	U
123		0.013	U	0.006	U	0.028	U	0.030	U	0.021	U	0.020	U
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		0.003	U	0.002	U	0.004	U	0.005	U	0.006	U	0.005	U
127		0.003	U	0.002	U	0.004	U	0.005	U	0.005	U	0.005	U
128	128 + 166	0.093	C U	0.038	C U	0.184	C	0.194	C	0.135	C U	0.128	C U
129	129 + 138 + 160 + 163	0.740	C U	0.333	C U	1.314	C U	1.433	C U	1.104	C U	1.128	C U
130		0.045	U	0.017	U	0.077	U	0.076	U	0.063	U	0.065	U
131		0.008	U	0.004	U	0.017	U	0.016	U	0.011	U	0.013	U
132		0.250	U	0.109	U	0.374	U	0.378	U	0.332	U	0.322	U
133		0.014	U	0.005	U	0.021	U	0.020	U	0.021	U	0.020	U
134	134 + 143	0.048	C U	0.021	C U	0.070	C U	0.068	C U	0.063	C U	0.056	C U
135	135 + 151 + 154	0.446	C U	0.206	C U	0.562	C U	0.485	C U	0.593	C U	0.572	C U
136		0.130	U	0.062	U	0.166	U	0.149	U	0.165	U	0.156	U
137		0.019	U	0.008	U	0.060		0.076		0.029	U	0.027	U
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	0.010	C U	0.004	C U	0.021	C	0.020	C	0.015	C U	0.015	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		0.165	U	0.072	U	0.225	U	0.206	U	0.203	U	0.218	U
142		0.002	U	0.002	U	0.002	U	0.002	U	0.004	U	0.003	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		0.061	U	0.029	U	0.074	U	0.069	U	0.075	U	0.077	U
145		0.000	EMPC	0.000	EMPC	0.000	EMPC	0.000	EMPC	0.000	EMPC	0.000	EMPC
146		0.129	U	0.056	U	0.199	U	0.198	U	0.189	U	0.198	U
147	147 + 149	0.865	C U	0.390	C U	1.154	C U	1.064	C U	1.137	C U	1.138	C U
148		0.001	U	0.001	U	0.001	U	0.001	U	0.002	U	0.002	EMPC
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.001	U	0.000	U	0.002	U	0.001	U	0.001	U	0.001	U
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.002	U	0.000	U	0.001	U	0.001	U	0.001	U	0.005	EMPC
153	153 + 168	0.833	C U	0.370	C U	1.263	C U	1.353	C U	1.155	C U	1.186	C U
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.001	U	0.000	U	0.001	U	0.001	U	0.001	U	0.001	U
156	156 + 157	0.056	C U	0.024	C U	0.146	C U	0.189	C	0.078	C U	0.091	C U
157	156 + 157		C156		C156		C156		C156		C156		C156
158		0.074	U	0.033	U	0.140	U	0.138	U	0.106	U	0.112	U
159		0.010	U	0.004	U	0.012	U	0.012	U	0.013	U	0.014	U
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.002	U	0.001	U	0.002	U	0.002	U	0.004	U	0.003	U
162		0.003	U	0.002	U	0.004		0.005		0.004	U	0.003	EMPC
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		0.057	U	0.024	U	0.088	U	0.088	U	0.076	U	0.080	U
165		0.002	U	0.002	U	0.002	U	0.002	U	0.004	U	0.003	U
166	128 + 166		C128		C128		C128		C128		C128		C128
167		0.022	U	0.010	U	0.053	U	0.065		0.033	U	0.036	U
168	153 + 168		C153		C153		C153		C153		C153		C153
169		0.003	U	0.002	U	0.003	U	0.003	U	0.005	U	0.003	U
170		0.099	U	0.046	U	0.151	U	0.178	U	0.135	U	0.150	U
171	171 + 173	0.054	C U	0.024	C U	0.074	C U	0.072	C U	0.075	C U	0.076	C U
172		0.027	U	0.012	U	0.037	U	0.040	U	0.037	U	0.041	U
173	171 + 173		C171		C171		C171		C171		C171		C171
174		0.197	U	0.090	U	0.250	U	0.242	U	0.269	U	0.283	U
175		0.013	U	0.006	U	0.016	U	0.016	U	0.016	U	0.019	U
176		0.046	U	0.020	U	0.052	U	0.044	U	0.055	U	0.054	U
177		0.121	U	0.056	U	0.157	U	0.159	U	0.175	U	0.179	U
178		0.070	U	0.032	U	0.082	U	0.080	U	0.098	U	0.092	U

Table G-9e
Data Not Used in the RI - 2007 Sediment Removal Monitoring
Semi-Permeable Membrane Device (SPMD) PCB Congener Analysis Results
11/02/07 Retrievals
(Page 3 of 3)

IUPAC #	COELUTING CONGENERS[1]	071102-SPMD1A L10715-15		071102-SPMD1B L10715-16		071102-SPMD2A L10715-17		071102-SPMD2B L10715-18		071102-SPMD3A L10715-19		071102-SPMD3B L10715-20	
179		0.150	U	0.065	U	0.162	U	0.148	U	0.185	U	0.189	U
180	180 + 193	0.341	C U	0.150	C U	0.453	C U	0.539	C U	0.458	C U	0.511	C U
181		0.002	U	0.007	EMPC	0.004	U	0.003	U	0.005	U	0.026	
182		0.001	U	0.001	EMPC	0.001	U	0.000	U	0.001	EMPC	0.000	U
183	183 + 185	0.185	C U	0.081	C U	0.221	C U	0.226	C U	0.238	C U	0.262	C U
184		0.001	U	0.001	U	0.001	U	0.001	U	0.002	U	0.001	U
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.002	U	0.001	U	0.003	U	0.002	U	0.002	U	0.005	U
187		0.370	U	0.163	U	0.444	U	0.472	U	0.499	U	0.522	U
188		0.001	U	0.000	U	0.001	U	0.001	U	0.001	U	0.001	U
189		0.004	U	0.002	U	0.008	U	0.008	U	0.005	U	0.007	U
190		0.030	U	0.013	U	0.040	U	0.048	U	0.044	U	0.043	U
191		0.007	U	0.003	U	0.012	U	0.011	U	0.010	U	0.011	U
192		0.001	U	0.000	EMPC	0.001	EMPC	0.001	U	0.001	U	0.001	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		0.044	U	0.018	U	0.055	U	0.077	U	0.053	U	0.069	U
195		0.022	U	0.010	U	0.027	U	0.035	U	0.030	U	0.033	U
196		0.040	U	0.017	U	0.046	U	0.057	U	0.046	U	0.053	U
197	197 + 200	0.020	C U	0.008	C U	0.022	C U	0.023	C U	0.023	C U	0.024	C U
198	198 + 199	0.078	C U	0.033	C U	0.097	C U	0.115	C U	0.101	C U	0.113	C U
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		0.024	U	0.009	U	0.027	U	0.029	U	0.032	U	0.033	U
202		0.035	U	0.015	U	0.042	U	0.037	U	0.043	U	0.048	U
203		0.058	U	0.025	U	0.066	U	0.077	U	0.077	U	0.083	U
204		0.001	EMPC	0.000	U	0.001	U	0.001	U	0.001	EMPC	0.002	EMPC
205		0.004	U	0.002	U	0.005	U	0.006	U	0.005	U	0.005	U
206		0.031	U	0.011	U	0.029	U	0.032	U	0.029	U	0.041	U
207		0.005	U	0.002	U	0.006	U	0.006	U	0.005	U	0.006	U
208		0.010	U	0.005	U	0.012	U	0.014	U	0.013	U	0.017	U
209		0.031	U	0.010	U	0.031	U	0.024	U	0.034	U	0.061	U

Notes:

All results are in units of pg/L (picograms/Liter)

C = concentration represents coeluting congeners
U = The analyte was not detected above the reported sample specific detection limit.
J = The reported value is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
PCBs = Polychlorinated Biphenyls
[1] = When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.

APPENDIX H

PCB AND PAH SUMMATIONS

Memorandum

URS

To: Mike Gross, PE, U.S. Army Corps of Engineers, Portland District

From: Mike Powell, Laura McWilliams, and Chi-Wah Wong

Date: September 30, 2010

Subject: Modified Approach for Calculating Total Concentrations of PCBs and PAHs
Bradford Island Remedial Investigation
Cascade Locks, Oregon

Background

During negotiations with the Technical Advisory Group (TAG) in early 2010, the following conventions were developed for summing total concentrations of polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs) for use in the Bradford Island Remedial Investigation (RI) and risk assessments (RAs):

Total PCBs (as Congeners) – Total concentrations would be calculated using half of the reported detection limit (RDL) as a substitution value for the undetected congeners, and half of the reported value as a substitution value for the estimated maximum potential concentration (EMPC)-qualified data.

Total PCBs (as Aroclors) – Individual Aroclors which were never detected in a given media would be excluded from the sums. Aroclors that may be undetected in a certain sample but detected at least once in the remaining samples of a given media would be included in the sample-specific summations using half of the method detection limit (MDL) as a substitution value.

Total PAHs – Total concentrations would be calculated for low-molecular weight PAHs (LPAHs), high-molecular weight PAHs (HPAHs), and all PAHs (tPAHs). Individual PAHs never detected in a given media would be excluded from the sums. PAHs that may be undetected in a certain sample but detected at least once in the remaining samples of a given media would be included in the sample-specific summations using half of the MDL as a substitution value.

USACE Center of Expertise Recommendations

Upon review of the draft RI report by the USACE center of expertise, the reviewers recommended that, instead of the substitution method, the Kaplan-Meier method be used to calculate sums whenever possible. The substitution method (no matter what value – zero, the MDL, or half the MDL – is selected for the substitution) is not recommended by statisticians or the EPA (Helsel 1990, 2005b, 2005c, 2009; EPA 2006, 2010). Instead, the EPA currently recommends the Kaplan-Meier method with Efron's bias correction (EPA, 2010) which is generally applicable for summing data sets in which at least three of the components are detected. Use of the Kaplan-Meier method for calculating sums is

also consistent with the fact that the Kaplan-Meier method is already used in the RI Report for calculating statistical parameters, including mean, standard deviation, and 95% UCL (upper confidence limit on the mean), for data sets with undetected results.

In order to comply with the recently updated Department of Defense Quality Systems Manual (DoD QSM) version 4.1 (DOD, 2009), the reviewers recommended that full method reporting limit (MRL) should be used for censoring undetected values and that the full reported value should be used for censoring EMPC-qualified data. The reviewers acknowledged that statisticians strongly recommend against insider censoring (e.g., Helsel, 2005a) in which undetected results are censored using MRL values, which are greater than the "J"-flagged detected data (which fall between the MDL and the MRL and are used at face value). However, the Kaplan-Meier method is non-parametric and the plotting position of survival function is based on the detected results; therefore, this method is relatively insensitive to the choice of censoring values. The reviewers recommended that the sums could be calculated twice, once using the MDLs and once using the MRLs for censoring non-detects, and the differences discussed in the uncertainty sections of the report.

Where the Kaplan-Meier method cannot be used, the reviewers recommended using the substitution method, substituting the full method reporting limit (MRL) for undetected compounds (in compliance with the DoD QSM; DOD, 2009). The reviewers agreed that individual compounds that were never detected in site media should be excluded from the sums for total PCBs as Aroclors.

Proposed Modifications to the RI Report

The Kaplan-Meier method is a non-parametric statistical method and does not require assumptions of normality (Kaplan and Meier, 1958). It is currently the recommended method used in EPA's ProUCL software for calculating the 95% UCL for data sets with one or more censored results (EPA 2009a, 2009b). In the application of summing a group of related compounds, the Kaplan-Meier mean is estimated from a set of data (consisting of detected and non-detected values) coming from a given sample, and this Kaplan-Meier mean is then multiplied by the number of compounds (mean × n) to compute the sum for the sample.

In the revised RI Report, the Kaplan-Meier method (as encoded in the ProUCL software) will be used to calculate total PCB and PAH concentrations, with the incorporation of the Efron's bias correction, in which the minimum result (if it is a censored value) is re-coded as a detected result (EPA, 2010). The Kaplan-Meier method is used whenever it is feasible with the ProUCL software (i.e., when there are five or more components to the sum and at least two detected results [three coded-detected results if Efron's bias correction is used]). To safeguard against a potential biased-high estimate of the KM mean, if the aforementioned summation method results in a total concentration greater than a simple summation of detected concentrations and full censoring concentrations

(MDL, MRL, RDL, or EMPC value) of the non-detected data, the simple sum will establish an upper bound of the total concentration.

Total PCBs (as Congeners) – Total concentrations would be calculated using the Kaplan-Meier method, censoring undetected data at the reported detection limit (RDL) and EMPC-qualified at the reported concentration. (Please note that although censoring using a MRL was suggested by the reviewers, the laboratory only provided RDL values.) The resulting total concentration will be capped by the simple sum of detected concentrations, EMPC-qualified concentrations, and RDLs for undetected congeners. This method is more statistically robust, as well as more conservative than calculating the sums by substitution of half of the RDL for undetected results and half of the reported value for EMPC-qualified data. However, it does not change the conclusions derived from the sums (i.e., comparison to screening level values).

For all samples used in the RI Report, the attached table compares the concentrations of total PCB (as congeners) computed in five different ways:

- Simple sum with undetected and EMPC-qualified data set to zero.
- Simple sum with undetected results set at one half the RDL and EMPC-qualified data at one half the reported value.
- Simple sum with undetected results set at the RDL and EMPC-qualified data at the reported value.
- Kaplan-Meier based sum.
- Kaplan-Meier based sum, capped at the simple sum with undetected results set at the RDL and EMPC-qualified data at the reported value

URS proposes that the final column (capped Kaplan-Meier method) be used in the RI Report and associated RAs.

Total PCBs (as Aroclors) – Since no more than two individual Aroclors were ever detected in a given sample, the Kaplan-Meier method cannot be used. Therefore, the substitution method will be used. Individual compounds that were never detected in a given media will be excluded from the sums. Two sums will be calculated for each sample. In the first sum, Aroclors that may be undetected in a certain sample but detected at least once in the remaining samples of a given media would be included in the sample-specific summations using the MDL as a substitution value. In the second sum, these Aroclors would be included using the MRL as a substitution value.

Total PAHs – Total concentrations will be calculated for low-molecular weight PAHs (LPAHs), high-molecular weight PAHs (HPAHs), and all PAHs (tPAHs). No individual PAHs will be excluded from the sums. The sums will be calculated twice: once using the MDL as the censoring value for non-detects, and once using the MRL as the censoring value for non-detects. Whenever a minimum of five component PAHs are included in

the sum, and at least two component PAHs are detected, the sum will be calculated using the Kaplan-Meier method, capped by the simple sum with undetected results set at the MDL (or MRL). When these requirements are not met, the sum will be calculated as the simple sum with undetected results set at the MDL (or MRL).

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Table 1. Comparison of Concentrations of Total PCBs (as Congeners) Calculated by Different Methods

Medium	Area	Station	Prep. Fraction	Units	No. of Congeners (Excl. coeluted congeners)	No. of Detected Congeners (Excl. NDs and EMPCs)	Percentage of Detected Congeners	Total PCBs (as Congeners)				
								Simple Sum (NDs=0 and EMPCs=0)	Simple Sum (NDs=half RDL and EMPCs=half value)	Simple Sum (NDs=RDL and EMPCs=full value)	Kaplan-Meier method, Efron's corrected	Kaplan-Meier method, Efron's corrected, capped
Sediment	Reference	P22	Total	ug/kg	159	109	69%	0.4116	0.4136	0.4156	0.4134	0.4134
Sediment	Reference	P24	Total	ug/kg	159	102	64%	0.4451	0.4478	0.4505	0.4484	0.4484
Sediment	Reference	P26	Total	ug/kg	159	109	69%	0.3589	0.3613	0.3638	0.3609	0.3609
Sediment	Reference	P27	Total	ug/kg	159	118	74%	0.9282	0.9324	0.9366	0.9317	0.9317
Sediment	Reference	P28	Total	ug/kg	159	107	67%	0.4556	0.4582	0.4609	0.4579	0.4579
Sediment	Reference	P29	Total	ug/kg	159	114	72%	0.5831	0.5851	0.5872	0.5851	0.5851
Sediment	Reference	P34	Total	ug/kg	159	128	81%	1.2017	1.2031	1.2046	1.2036	1.2036
Sediment	Reference	P35	Total	ug/kg	159	104	65%	0.4019	0.4051	0.4083	0.4055	0.4055
Sediment	Reference	P36	Total	ug/kg	159	102	64%	0.3987	0.4017	0.4048	0.4023	0.4023
Sediment	Reference	P37	Total	ug/kg	159	99	62%	0.3749	0.3792	0.3834	0.3784	0.3784
Sediment	Reference	P38	Total	ug/kg	159	110	69%	0.5886	0.5905	0.5924	0.5915	0.5915
Sediment	Reference	P39	Total	ug/kg	159	91	57%	0.2673	0.2719	0.2766	0.2719	0.2719
Sediment	Reference	P40	Total	ug/kg	159	101	64%	0.4385	0.4416	0.4447	0.4420	0.4420
Sediment	Reference	P41	Total	ug/kg	159	94	59%	0.2702	0.2743	0.2784	0.2735	0.2735
Sediment	Reference	P42	Total	ug/kg	159	73	46%	0.1558	0.1622	0.1686	0.1606	0.1606
Sediment	Reference	P85	Total	ug/kg	159	107	67%	0.6319	0.6348	0.6377	0.6344	0.6344
Sediment	Reference	P86	Total	ug/kg	159	96	60%	0.3216	0.3261	0.3305	0.3260	0.3260
Sediment	Reference	P87	Total	ug/kg	159	103	65%	0.4052	0.4089	0.4126	0.4086	0.4086
Sediment	Forebay	P04	Total	ug/kg	159	130	82%	29.7236	29.7355	29.7475	29.7330	29.7330
Sediment	Forebay	P05	Total	ug/kg	159	88	55%	0.2970	0.3014	0.3058	0.3005	0.3005
Sediment	Forebay	P06	Total	ug/kg	159	97	61%	0.7718	0.7781	0.7843	0.7775	0.7775
Sediment	Forebay	P07	Total	ug/kg	159	110	69%	1.6887	1.6924	1.6962	1.6854	1.6854
Sediment	Forebay	P08	Total	ug/kg	159	105	66%	1.0805	1.0845	1.0885	1.0844	1.0844
Sediment	Forebay	P09	Total	ug/kg	159	113	71%	2.0879	2.0929	2.0978	2.0988	2.0978
Sediment	Forebay	P10	Total	ug/kg	159	120	75%	1.2338	1.2370	1.2403	1.2370	1.2370
Sediment	Forebay	P11	Total	ug/kg	159	126	79%	1.1191	1.1223	1.1256	1.1210	1.1210
Sediment	Forebay	P13	Total	ug/kg	159	108	68%	0.6788	0.6873	0.6957	0.6837	0.6837
Sediment	Forebay	P14	Total	ug/kg	159	72	45%	0.1378	0.1466	0.1553	0.1435	0.1435
Sediment	Forebay	P15	Total	ug/kg	159	114	72%	0.9703	0.9746	0.9790	0.9731	0.9731
Sediment	Forebay	P16	Total	ug/kg	159	108	68%	0.8324	0.8374	0.8424	0.8363	0.8363
Sediment	Forebay	P17	Total	ug/kg	159	105	66%	0.5856	0.5895	0.5934	0.5883	0.5883
Sediment	Forebay	P18	Total	ug/kg	159	113	71%	0.5202	0.5220	0.5239	0.5231	0.5231
Sediment	Forebay	P21	Total	ug/kg	159	108	68%	0.5681	0.5715	0.5749	0.5708	0.5708
Sediment	Forebay	P65	Total	ug/kg	159	103	65%	0.3966	0.3993	0.4019	0.3991	0.3991
Sediment	Forebay	P67	Total	ug/kg	159	61	38%	0.0559	0.0614	0.0670	0.0611	0.0611
Sediment	Forebay	P88	Total	ug/kg	159	95	60%	0.2008	0.2033	0.2058	0.2035	0.2035
Sediment	Forebay	P89	Total	ug/kg	159	79	50%	0.1460	0.1536	0.1612	0.1510	0.1510
Sediment	Other	P110	Total	ug/kg	159	105	66%	1.1946	1.2052	1.2158	1.2005	1.2005
Sediment	Other	P111	Total	ug/kg	159	106	67%	1.3351	1.3455	1.3559	1.3404	1.3404
Sediment	Other	P46	Total	ug/kg	159	59	37%	0.0821	0.0905	0.0990	0.0880	0.0880
Sediment	Other	P47	Total	ug/kg	159	85	53%	0.2099	0.2154	0.2210	0.2147	0.2147
Sediment	Other	P48	Total	ug/kg	159	86	54%	0.1684	0.1746	0.1808	0.1733	0.1733
Sediment	Other	P49	Total	ug/kg	159	103	65%	0.4123	0.4210	0.4297	0.4182	0.4182
Sediment	Other	P50	Total	ug/kg	159	110	69%	0.9151	0.9191	0.9230	0.9174	0.9174
Sediment	Other	P51	Total	ug/kg	159	77	48%	0.2079	0.2157	0.2235	0.2131	0.2131
Clam	Reference	P22	Total	ug/kg	159	144	91%	30.9084	30.9116	30.9149	30.8460	30.8460
Clam	Reference	P24	Total	ug/kg	159	139	87%	28.2942	28.3235	28.3528	28.3020	28.3020
Clam	Reference	P26	Total	ug/kg	159	123	77%	31.5801	31.5897	31.5992	31.6410	31.5992
Clam	Reference	P27	Total	ug/kg	159	123	77%	32.9696	32.9783	32.9870	32.9130	32.9130
Clam	Reference	P28	Total	ug/kg	159	140	88%	31.3838	31.3931	31.4023	31.3230	31.3230
Clam	Reference	P29	Total	ug/kg	159	144	91%	29.7757	29.7812	29.7867	29.7330	29.7330
Clam	Reference	P34	Total	ug/kg	159	141	89%	30.3789	30.3846	30.3904	30.3690	30.3690
Clam	Reference	P35	Total	ug/kg	159	142	89%	34.4403	34.4457	34.4510	34.5030	34.4510
Clam	Reference	P36	Total	ug/kg	159	144	91%	33.6567	33.6640	33.6713	33.7080	33.6713
Clam	Reference	P37	Total	ug/kg	159	141	89%	30.1738	30.2054	30.2370	30.2100	30.2100
Clam	Reference	P38	Total	ug/kg	159	138	87%	28.6382	28.6609	28.6836	28.6200	28.6200
Clam	Reference	P39	Total	ug/kg	159	136	86%	34.3547	34.3822	34.4096	34.3440	34.3440
Clam	Reference	P40	Total	ug/kg	159	142	89%	32.9312	32.9550	32.9788	32.9130	32.9130
Clam	Reference	P41	Total	ug/kg	159	139	87%	32.7845	32.8239	32.8632	32.7540	32.7540
Clam	Reference	P42	Total	ug/kg	159	131	82%	29.7961	29.8198	29.8434	29.7330	29.7330
Clam	Reference	P85	Total	ug/kg	159	135	85%	30.7472	30.7784	30.8096	30.6870	30.6870
Clam	Reference	P86	Total	ug/kg	159	134	84%	26.9842	27.0119	27.0397	27.0300	27.0300
Clam	Reference	P87	Total	ug/kg	159	136	86%	26.7974	26.8375	26.8776	26.8710	26.8710
Clam	Forebay	P04	Total	ug/kg	159	141	89%	311.5719	311.5856	311.5994	311.6400	311.5994
Clam	Forebay	P05	Total	ug/kg	159	136	86%	65.7648	65.7838	65.8028	65.8260	65.8028
Clam	Forebay	P06	Total	ug/kg	159	137	86%	95.0478	95.0562	95.0645	95.0820	95.0645
Clam	Forebay	P07	Total	ug/kg	159	138	87%	65.6834	65.6892	65.6949	65.6670	65.6670
Clam	Forebay	P08	Total	ug/kg	159	140	88%	51.5058	51.5112	51.5165	51.5160	51.5160
Clam	Forebay	P10	Total	ug/kg	159	138	87%	30.6211	30.6256	30.6302	30.6870	30.6302
Clam	Forebay	P11	Total	ug/kg	159	137	86%	26.7326	26.7378	26.7430	26.7120	26.7120
Clam	Forebay	P13	Total	ug/kg	159	140	88%	33.1352	33.1625	33.1897	33.0720	33.0720
Clam	Forebay	P14	Total	ug/kg	159	137	86%	33.9755	33.9859	33.9962	34.0260	33.9962
Clam	Forebay	P15	Total	ug/kg	159	137	86%	26.8951	26.9008	26.9065	26.8710	26.8710
Clam	Forebay	P16	Total	ug/kg	159	134	84%	25.5247	25.5304	25.5360	25.5990	25.5360
Clam	Forebay	P17	Total	ug/kg	159	139	87%	24.4511	24.4563	24.4616	24.4860	24.4616
Clam	Forebay	P18	Total	ug/kg	159	142	89%	25.9071	25.9117	25.9162	25.9170	25.9162
Clam	Forebay	P21	Total	ug/kg	159	138	87%	24.6565	24.6616	24.6668	24.6450	24.6450
Clam	Forebay	P65	Total	ug/kg	159	141	89%	33.1260	33.1315	33.1369	33.0720	33.0720
Clam	Forebay	P88	Total	ug/kg	159	139	87%	33.2737	33.3114	33.3491	33.2310	33.2310
Clam	Forebay	P89	Total	ug/kg	159	135	85%	31.6524	31.6631	31.6739	31.6410	31.6410
Clam	Other	P110	Total	ug/kg	159	136	86%	21.4316	21.4404	21.4493	21.4650	21.4493
Crayfish	Reference	P100-CF	Total	ug/kg	159	90	57%	0.9414	0.9495	0.9576	0.9461	0.9461
Crayfish	Reference	P22-CF	Total	ug/kg	159	54	34%	0.3581	0.3746	0.3910	0.3657	0.3657
Crayfish	Reference	P33-CF	Total	ug/kg	159	89	56%	0.6280	0.6377	0.6474	0.6344	0.6344
Crayfish	Reference	P38/42-CF	Total	ug/kg	159	95	60%	0.7127	0.7208	0.7289	0.7187	0.7187
Crayfish	Reference	P72-CF	Total	ug/kg	159	83	52%	0.6870	0.6966	0.7061	0.6917	0.6917
Crayfish	Reference	P73-CF	Total	ug/kg	159	86	54%	0.7288	0.7375	0.7461	0.7346	0.7346
Crayfish	Reference	P74-CF	Total	ug/kg	159	88	55%	0.7699	0.7763	0.7826	0.7743	0.7743
Crayfish	Reference	P75-CF	Total	ug/kg	159	76	48%	0.9428	0.9635	0.9841	0.9524	0.9524
Crayfish	Reference	P76-CF	Total	ug/kg	159	79	50%	0.4509	0.4602	0.4695	0.4563	0.4563
Crayfish	Reference	P78-CF	Total	ug/kg	159	86	54%	0.4903	0.5001	0.5100	0.4961	0.4961
Crayfish	Reference	P79-CF	Total	ug/kg	159	92	58%	0.8716	0.8802	0.8888	0.8761	0.8761
Crayfish	Reference	P82-CF	Total	ug/kg	159	91	57%	1.9386	1.9470	1.9554	1.9398	1.9398
Crayfish	Reference	P90-CF	Total	ug/kg	159	74	47%	1.1117	1.1234	1.1351	1.1178	1.1178
Crayfish	Reference	P91-CF	Total	ug/kg	159	88	55%	1.0105	1.0189	1.0274	1.0160	1.0160
Crayfish	Reference	P92-CF	Total	ug/kg	159	49	31%	0.4780	0.5031	0.5282	0.4977	0.4977
Crayfish	Reference	P94-CF	Total	ug/kg	159	79	50%	0.6428	0.6540	0.6653	0.6503	0.6503
Crayfish	Reference	P98-CF	Total	ug/kg	159	80	50%	0.6038	0.6121	0.6204	0.6090	0.6090
Crayfish	Forebay	P01-CF	Total	ug/kg	159	83	52%	1.4370	1.4500	1.4630	1.4421	1.4421
Crayfish	Forebay	P04-CF	Total	ug/kg	159	100	63%	16.8132	16.8268	16.8404	16.8540	16.8404
Crayfish	Forebay	P05-CF	Total	ug/kg	159	106	67%	16.8786	16.8903	16.9019	16.8540	16.8540
Crayfish	Forebay	P06-CF	Total	ug/kg	159	100	63%	42.6168	42.6752	42.7335	42.6120	42.6120
Crayfish	Forebay	P07-CF	Total	ug/kg	159	86	54%	12.4228	12.4470	12.4712	12.4338	12.4338
Crayfish	Forebay	P08-CF	Total	ug/kg	159	80	50%	3.1129	3.1255	3.1381	3.1164	3.1164
Crayfish	Forebay	P13-CF	Total	ug/kg	159	72	45%	0.5853	0.5983	0.6114	0.5915	0.5915

Crayfish	Forebay	P14-CF	Total	ug/kg	159	69	43%	0.8179	0.8318	0.8457	0.8252	0.8252
Crayfish	Forebay	P15-CF	Total	ug/kg	159	82	52%	0.8096	0.8205	0.8314	0.8157	0.8157
Crayfish	Forebay	P16-CF	Total	ug/kg	159	78	49%	1.3270	1.3438	1.3607	1.3356	1.3356
Crayfish	Forebay	P17-CF	Total	ug/kg	159	74	47%	0.5291	0.5420	0.5549	0.5358	0.5358
Crayfish	Forebay	P18-CF	Total	ug/kg	159	79	50%	1.1124	1.1219	1.1315	1.1178	1.1178
Crayfish	Forebay	P19-CF	Total	ug/kg	159	65	41%	0.7585	0.7753	0.7922	0.7664	0.7664
Crayfish	Forebay	P20-CF	Total	ug/kg	159	75	47%	0.9049	0.9204	0.9359	0.9111	0.9111
Crayfish	Forebay	P21-CF	Total	ug/kg	159	81	51%	0.9597	0.9750	0.9903	0.9667	0.9667
Crayfish	Other	P110	Total	ug/kg	159	74	47%	0.5785	0.5961	0.6138	0.5867	0.5867
Largescale Sucker	Forebay	COMP	Total	ug/kg	159	144	91%	200.9127	200.9290	200.9454	200.9760	200.9454
Sculpin	Reference	SR-01	Total	ug/kg	159	126	79%	16.8023	16.8121	16.8220	16.8540	16.8220
Sculpin	Reference	SR-02	Total	ug/kg	159	122	77%	21.9892	22.0006	22.0120	21.9420	21.9420
Sculpin	Reference	SR-03	Total	ug/kg	159	116	73%	37.5176	37.5320	37.5464	37.5240	37.5240
Sculpin	Reference	SR-04	Total	ug/kg	159	124	78%	15.9040	15.9134	15.9229	15.9000	15.9000
Sculpin	Reference	SR-05	Total	ug/kg	159	131	82%	38.3594	38.3772	38.3950	38.3190	38.3190
Sculpin	Reference	SR-06	Total	ug/kg	159	116	73%	12.2426	12.2569	12.2712	12.2430	12.2430
Sculpin	Reference	SR-07	Total	ug/kg	159	130	82%	19.2796	19.2901	19.3006	19.2390	19.2390
Sculpin	Reference	SR-08	Total	ug/kg	159	121	76%	18.1615	18.1723	18.1832	18.1260	18.1260
Sculpin	Reference	SR-09	Total	ug/kg	159	127	80%	18.5073	18.5180	18.5287	18.4440	18.4440
Sculpin	Reference	SR-10	Total	ug/kg	159	121	76%	23.9278	23.9495	23.9712	24.0090	23.9712
Sculpin	Reference	SR-11	Total	ug/kg	159	127	80%	32.4198	32.4295	32.4391	32.4360	32.4360
Sculpin	Reference	SR-12	Total	ug/kg	159	124	78%	27.5318	27.5436	27.5555	27.5070	27.5070
Sculpin	Reference	SR-13	Total	ug/kg	159	124	78%	31.4036	31.4288	31.4541	31.4820	31.4541
Sculpin	Reference	SR-14	Total	ug/kg	159	116	73%	22.2700	22.3073	22.3446	22.2600	22.2600
Sculpin	Reference	SR-15	Total	ug/kg	159	114	72%	27.1501	27.1789	27.2077	27.1890	27.1890
Sculpin	Reference	SR-16	Total	ug/kg	159	112	70%	17.3192	17.3592	17.3992	17.3310	17.3310
Sculpin	Reference	SR-17	Total	ug/kg	159	119	75%	30.5089	30.5330	30.5571	30.5280	30.5280
Sculpin	Reference	SR-18	Total	ug/kg	159	115	72%	24.2010	24.2384	24.2758	24.1680	24.1680
Sculpin	Forebay	SF-01	Total	ug/kg	159	121	76%	14.9477	14.9579	14.9681	14.9460	14.9460
Sculpin	Forebay	SF-02	Total	ug/kg	159	124	78%	48.8494	48.8617	48.8740	48.8130	48.8130
Sculpin	Forebay	SF-03	Total	ug/kg	159	90	57%	4770.5365	4777.1656	4783.7947	4773.1800	4773.1800
Sculpin	Forebay	SF-04	Total	ug/kg	159	135	85%	914.9107	914.9568	915.0028	914.8860	914.8860
Sculpin	Forebay	SF-05	Total	ug/kg	159	136	86%	558.8605	558.9068	558.9531	558.8850	558.8850
Sculpin	Forebay	SF-06	Total	ug/kg	159	133	84%	141.1439	141.1665	141.1891	141.1920	141.1891
Sculpin	Forebay	SF-07	Total	ug/kg	159	133	84%	22.9315	22.9377	22.9439	22.8960	22.8960
Sculpin	Forebay	SF-08	Total	ug/kg	159	131	82%	26.1371	26.1439	26.1507	26.0760	26.0760
Sculpin	Forebay	SF-09	Total	ug/kg	159	123	77%	12.2765	12.2835	12.2905	12.2748	12.2748
Sculpin	Forebay	SF-10	Total	ug/kg	159	130	82%	23.0658	23.0725	23.0793	23.0550	23.0550
Sculpin	Forebay	SF-11	Total	ug/kg	159	124	78%	24.1122	24.1225	24.1329	24.1680	24.1329
Sculpin	Forebay	SF-12	Total	ug/kg	159	128	81%	39.6412	39.6596	39.6779	39.5910	39.5910
Sculpin	Forebay	SF-13	Total	ug/kg	159	117	74%	9.8654	9.8839	9.9025	9.8739	9.8739
Sculpin	Forebay	SF-14	Total	ug/kg	159	127	80%	35.3683	35.3792	35.3901	35.2980	35.2980
Sculpin	Forebay	SF-15	Total	ug/kg	159	108	68%	19.4409	19.5325	19.6240	19.3980	19.3980
Sculpin	Forebay	SF-16	Total	ug/kg	159	128	81%	35.5799	35.5899	35.5999	35.6160	35.5999
Sculpin	Forebay	SF-17	Total	ug/kg	159	125	79%	40.6241	40.6405	40.6570	40.7040	40.6570
Sculpin	Other	P110	Total	ug/kg	159	112	70%	8.1340	8.1510	8.1680	8.1408	8.1408
Smallmouth Bass	Reference	R01	Total	ug/kg	159	106	67%	47.7134	47.8705	48.0277	47.8590	47.8590
Smallmouth Bass	Reference	R02	Total	ug/kg	159	112	70%	41.7646	41.9358	42.1071	41.8170	41.8170
Smallmouth Bass	Reference	R03	Total	ug/kg	159	96	60%	44.6252	44.8868	45.1484	44.6790	44.6790
Smallmouth Bass	Reference	R04	Total	ug/kg	159	95	60%	22.0679	22.2896	22.5113	22.1010	22.1010
Smallmouth Bass	Reference	R05	Total	ug/kg	159	118	74%	163.5171	163.8233	164.1295	163.6110	163.6110
Smallmouth Bass	Reference	R06	Total	ug/kg	159	100	63%	44.2532	44.6093	44.9655	44.3610	44.3610
Smallmouth Bass	Reference	R07	Total	ug/kg	159	98	62%	41.5362	41.7459	41.9557	41.6580	41.6580
Smallmouth Bass	Reference	R10	Total	ug/kg	159	140	88%	117.0512	117.0581	117.0650	117.0240	117.0240
Smallmouth Bass	Reference	R11	Total	ug/kg	159	138	87%	35.7970	35.8007	35.8043	35.7750	35.7750
Smallmouth Bass	Reference	R12	Total	ug/kg	159	134	84%	39.7672	39.7718	39.7765	39.7500	39.7500
Smallmouth Bass	Reference	R13	Total	ug/kg	159	143	90%	69.0534	69.0565	69.0595	69.0060	69.0060
Smallmouth Bass	Reference	R14	Total	ug/kg	159	136	86%	50.1909	50.1949	50.1989	50.2440	50.1989
Smallmouth Bass	Reference	R15	Total	ug/kg	159	137	86%	43.1015	43.1060	43.1105	43.0890	43.0890
Smallmouth Bass	Reference	R16	Total	ug/kg	159	137	86%	498.8557	498.8649	498.8741	498.7830	498.7830
Smallmouth Bass	Reference	R17	Total	ug/kg	159	141	89%	44.2266	44.2303	44.2340	44.2020	44.2020
Smallmouth Bass	Reference	R18	Total	ug/kg	159	135	85%	60.5882	60.6034	60.6185	60.5790	60.5790
Smallmouth Bass	Reference	R19	Total	ug/kg	159	134	84%	77.8704	77.8783	77.8862	77.9100	77.8862
Smallmouth Bass	Reference	R20	Total	ug/kg	159	131	82%	52.9297	52.9442	52.9588	52.9470	52.9470
Smallmouth Bass	Reference	R21	Total	ug/kg	159	131	82%	52.8095	52.8196	52.8297	52.7880	52.7880
Smallmouth Bass	Forebay	100	Total	ug/kg	159	137	86%	33.7364	33.7395	33.7427	33.7080	33.7080
Smallmouth Bass	Forebay	101	Total	ug/kg	159	146	92%	1440.1098	1440.1202	1440.1306	1440.0630	1440.0630
Smallmouth Bass	Forebay	102	Total	ug/kg	159	131	82%	325.1847	325.2013	325.2180	325.1550	325.1550
Smallmouth Bass	Forebay	103	Total	ug/kg	159	139	87%	1305.4760	1305.4941	1305.5122	1305.5490	1305.5122
Smallmouth Bass	Forebay	104	Total	ug/kg	159	145	91%	32.1574	32.1638	32.1701	32.1180	32.1180
Smallmouth Bass	Forebay	200	Total	ug/kg	159	142	89%	879.1798	879.1880	879.1962	879.1110	879.1110
Smallmouth Bass	Forebay	201	Total	ug/kg	159	142	89%	96.6697	96.6741	96.6784	96.6720	96.6720
Smallmouth Bass	Forebay	202	Total	ug/kg	159	141	89%	42.0157	42.0183	42.0209	41.9760	41.9760
Smallmouth Bass	Forebay	203	Total	ug/kg	159	144	91%	137.0552	137.0602	137.0653	137.0580	137.0580
Smallmouth Bass	Forebay	204	Total	ug/kg	159	143	90%	59.3803	59.3837	59.3872	59.3070	59.3070
Smallmouth Bass	Forebay	205	Total	ug/kg	159	144	91%	1733.6659	1733.6791	1733.6922	1733.1000	1733.1000
Smallmouth Bass	Forebay	207	Total	ug/kg	159	142	89%	69.7090	69.7128	69.7167	69.6420	69.6420
Smallmouth Bass	Forebay	208	Total	ug/kg	159	139	87%	148.8190	148.8257	148.8324	148.8240	148.8240
Smallmouth Bass	Forebay	209	Total	ug/kg	159	140	88%	19309.3807	19309.7193	19310.0579	19302.6000	19302.6000
Smallmouth Bass	Forebay	210	Total	ug/kg	159	145	91%	54.7992	54.8091	54.8191	54.8550	54.8191
Smallmouth Bass	Forebay	402	Total	ug/kg	159	147	92%	1192.7822	1192.8669	1192.9516	1192.8180	1192.8180
Smallmouth Bass	Forebay	403	Total	ug/kg	159	142	89%	26504.4301	26507.4819	26510.5336	26505.3000	26505.3000
Smallmouth Bass	Forebay	405	Total	ug/kg	159	142	89%	2482.1407	2482.2499	2482.3591	2481.9900	2481.9900
Smallmouth Bass	Forebay	406	Total	ug/kg	159	140	88%	40.7778	40.7861	40.7944	40.7040	40.7040
Surface Water	Reference	P57	Column	ug/L	159	79	50%	1.5341E-04	1.5392E-04	1.5444E-04	1.5363E-04	1.5363E-04
Surface Water	Reference	P57	Filter	ug/L	159	71	45%	2.4036E-05	2.4762E-05	2.5487E-05	2.4251E-05	2.4251E-05
Surface Water	Reference	P58	Column	ug/L	159	98	62%	1.0922E-04	1.0941E-04	1.0960E-04	1.0931E-04	1.0931E-04
Surface Water	Reference	P58	Filter	ug/L	159	78	49%	2.0978E-05	2.1527E-05	2.2077E-05	2.1150E-05	2.1150E-05
Surface Water	Reference	P59	Column	ug/L	159	78	49%	1.4923E-04	1.4968E-04	1.5013E-04	1.4938E-04	1.4938E-04
Surface Water	Reference	P59	Filter	ug/L	159	71	45%	2.2544E-05	2.3246E-05	2.3947E-05	2.2751E-05	2.2751E-05
Surface Water	Reference	P60	Column	ug/L	159	86	54%	1.4540E-04	1.4606E-04	1.4672E-04	1.4557E-04	1.4557E-04
Surface Water	Reference	P60	Filter	ug/L	159	82	52%	2.6497E-05	2.7069E-05	2.7640E-05	2.6698E-05	2.6698E-05
Surface Water	Reference	P61	Column	ug/L	159	90	57%	1.2263E-04	1.2288E-04	1.2312E-04	1.2273E-04	1.2273E-04
Surface Water	Reference	P61	Filter	ug/L	159	85	53%	2.5442E-05	2.5892E-05	2.6340E-05	2.5599E-05	2.5599E-05
Surface Water	Forebay	P52	Column	ug/L	159	71	45%	9.7480E-05	9.8263E-05	9.9044E-05	9.7709E-05	9.7709E-05
Surface Water	Forebay	P52	Filter	ug/L	159	70	44%	1.4492E-05	1.5376E-05	1.6260E-05	1.4750E-05	1.4750E-05
Surface Water	Forebay	P53	Column	ug/L	159	83	52%	1.5308E-04	1.5364E-04	1.5419E-04	1.5326E-04	1.5326E-04
Surface Water	Forebay	P53	Filter	ug/L	159	106	67%	5.5479E-05	5.5946E-05	5.6412E-05	5.5671E-05	5.5671E-05
Surface Water	Forebay	P54	Column	ug/L	159	73	46%	9.5450E-05	9.6191E-05	9.6932E-05	9.5656E-05	9.5656E-05
Surface Water	Forebay	P54	Filter	ug/L	159	103	65%	6.0943E-05	6.1530E-05	6.2116E-05	6.1161E-05	6.1161E-05
Surface Water	Forebay	P55	Column	ug/L	159	90	57%	1.5427E-04	1.5486E-04	1.5546E-04	1.5446E-04	1.5446E-04
Surface Water	Forebay	P55	Filter	ug/L	159	74	47%	2.2402E-05	2.3150E-05	2.3899E-05	2.2619E-05	2.2619E-05
Surface Water	Forebay	P56	Column	ug/L	159	63	40%	1.3763E-04	1.3870E-04	1.3977E-04	1.3790E-04	1.3790E-04
Surface Water	Forebay	P56	Filter	ug/L	159	88	55%	2.6282E-05	2.6730E-05	2.7178E-05	2.6439E-05	2.6439E-05

Notes:
EMPC = data flagged as estimated maximum potential concentration
ND = non-detect results
RDL = reported detection limit
ug/kg = micrograms per kilogram
ug/L = micrograms per liter

Table H-1
Landfill AOPC Soil (0-3 ft bgs) PAH Analysis Results
(Page 1 of 4)

Site ID	BIL01SSI		BIL02SSI		BIL03SSI		BIL04SSI		BIL05SSI		BIL06SSI		BIL09SSI		BIL10SSI		BIL11SSI	
Sample ID	990920BIL01SS		990920BIL02SS		990920BIL03SS		990920BIL04SS		990920BIL05SS		990920BIL06SS		990920BIL09SS		990920BIL10SS		990921BIL11SS	
Sample Date	9/20/1999		9/20/1999		9/20/1999		9/20/1999		9/20/1999		9/20/1999		9/20/1999		9/20/1999		9/21/1999	
Sample Depth (feet bgs)	0-0.33		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5		0-0.5	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs																		
2-Methylnaphthalene	180 U	180 U	170 U	170 U	180 U	180 U	**57.0 J**	**57.0 J**	180 U	180 U	**76.0 J**	**76.0 J**	180 U	180 U	180 U	180 U	190 U	190 U
Acenaphthene	180 U	180 U	**42.0 J**	**42.0 J**	**53.0 J**	**53.0 J**	**2,600 J**	**2,600 J**	**500**	**500**	**171 J**	**171 J**	180 U	180 U	180 U	180 U	**140 J**	**140 J**
Acenaphthylene	180 U	180 U	170 U	170 U	180 U	180 U	**74.0 J**	**74.0 J**	180 U	180 U	**22.0 J**	**22.0 J**	180 U	180 U	180 U	180 U	190 U	190 U
Anthracene	**12.0 J**	**12.0 J**	**18.0 J**	**18.0 J**	**110 J**	**110 J**	**2,700**	**2,700**	**460**	**460**	**176 J**	**176 J**	180 U	180 U	180 U	180 U	**100 J**	**100 J**
Fluorene	180 U	180 U	170 U	170 U	**47.0 J**	**47.0 J**	**1,200**	**1,200**	**170 J**	**170 J**	**145 J**	**145 J**	180 U	180 U	180 U	180 U	**67.0 J**	**67.0 J**
Naphthalene	180 U	180 U	170 U	170 U	180 U	180 U	**100 J**	**100 J**	**19.0 J**	**19.0 J**	**360**	**360**	180 U	180 U	180 U	180 U	190 U	190 U
Phenanthrene	**39.0 J**	**39.0 J**	**68.0 J**	**68.0 J**	**300**	**300**	**12,000**	**12,000**	**1,900**	**1,900**	**1,230**	**1,230**	**40.0 J**	**40.0 J**	**36.0 J**	**36.0 J**	**370**	**370**
Total LPAHs (full MDL/MRL)	**771 J**	**771 J**	**638 J**	**638 J**	**870 J**	**870 J**	**18,674 J**	**18,674 J**	**3,229 J**	**3,229 J**	**2,105 J**	**2,105 J**	**940 J**	**940 J**	**936 J**	**936 J**	**1,057 J**	**1,057 J**
Total LPAHs (KM)	**153 J**	**153 J**	**256 J**	**256 J**	**650 J**	**650 J**	**18,672 J**	**18,672 J**	**3,143 J**	**3,143 J**	**2,105 J**	**2,105 J**	-	-	-	-	**881 J**	**881 J**
Total LPAHs (KM, capped)	**153 J**	**153 J**	**256.02 J**	**256.02 J**	**650 J**	**650 J**	**18,674 J**	**18,674 J**	**3,143 J**	**3,143 J**	**2,105 J**	**2,105 J**	**940 J**	**940 J**	**936 J**	**936 J**	**881 J**	**881 J**
HPAHs																		
Benzo(a)anthracene	**98.0 J**	**98.0 J**	**130 J**	**130 J**	**1,600**	**1,600**	**32,000**	**32,000**	**2,200**	**2,200**	**1,400 J**	**1,400 J**	**82.0 J**	**82.0 J**	**60.0 J**	**60.0 J**	**400**	**400**
Benzo(a)pyrene	**140 J**	**140 J**	**160 J**	**160 J**	**1,800**	**1,800**	**33,000**	**33,000**	**2,200**	**2,200**	**1,400 J**	**1,400 J**	**100 J**	**100 J**	**70.0 J**	**70.0 J**	**420**	**420**
Benzo(b)fluoranthene	**110 J**	**110 J**	**170 J**	**170 J**	**2,000**	**2,000**	**65,000**	**65,000**	**340 J**	**340 J**	**2,350**	**2,350**	**82.0 J**	**82.0 J**	**58.0 J**	**58.0 J**	**66.0 J**	**66.0 J**
Benzo(g,h,i)perylene	**71.0 J**	**71.0 J**	**150 J**	**150 J**	**790**	**790**	**18,000**	**18,000**	**1,800**	**1,800**	**1,250 J**	**1,250 J**	**82.0 J**	**82.0 J**	**51.0 J**	**51.0 J**	**290**	**290**
Benzo(k)fluoranthene	**110 J**	**110 J**	**100 J**	**100 J**	**1,000**	**1,000**	**65,000**	**65,000**	**340 J**	**340 J**	**2,350**	**2,350**	**89.0 J**	**89.0 J**	**64.0 J**	**64.0 J**	**66.0 J**	**66.0 J**
Benzofluoranthenes, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**120 J**	**120 J**	**160 J**	**160 J**	**1,600**	**1,600**	**32,000**	**32,000**	**1,700**	**1,700**	**1,650 J**	**1,650 J**	**100 J**	**100 J**	**79.0 J**	**79.0 J**	**420**	**420**
Dibenz(a,h)anthracene	**37.0 J**	**37.0 J**	170 U	170 U	**450**	**450**	**9,900**	**9,900**	**540 J**	**540 J**	1,800 U	1,800 U	**32.0 J**	**32.0 J**	**24.0 J**	**24.0 J**	**150 J**	**150 J**
Fluoranthene	**130 J**	**130 J**	**160 J**	**160 J**	**1,600**	**1,600**	**54,000**	**54,000**	**3,300**	**3,300**	**795**	**795**	**120 J**	**120 J**	**88.0 J**	**88.0 J**	**700**	**700**
Indeno(1,2,3-cd)pyrene	**73.0 J**	**73.0 J**	**130 J**	**130 J**	**820**	**820**	**19,000**	**19,000**	**1,700**	**1,700**	**1,180 J**	**1,180 J**	**74.0 J**	**74.0 J**	**48.0 J**	**48.0 J**	**300**	**300**
Pyrene	**160 J**	**160 J**	**210**	**210**	**1,400**	**1,400**	**40,000**	**40,000**	**3,200**	**3,200**	**2,500 J**	**2,500 J**	**130 J**	**130 J**	**98.0 J**	**98.0 J**	**640**	**640**
Total HPAHs (full MDL/MRL)	**1,049 J**	**1,049 J**	**1,540 J**	**1,540 J**	**13,060**	**13,060**	**367,900**	**367,900**	**17,320 J**	**17,320 J**	**16,670 J**	**16,670 J**	**891 J**	**891 J**	**640 J**	**640 J**	**3,452 J**	**3,452 J**
Total HPAHs (KM)	**1,049 J**	**1,049 J**	**1,511 J**	**1,511 J**	**13,060**	**13,060**	**367,900**	**367,900**	**17,320 J**	**17,320 J**	**16,150 J**	**16,150 J**	**891 J**	**891 J**	**640 J**	**640 J**	**3,452 J**	**3,452 J**
Total HPAHs (KM-capped)	**1,049 J**	**1,049 J**	**1,511 J**	**1,511 J**	**13,060**	**13,060**	**367,900**	**367,900**	**17,320 J**	**17,320 J**	**16,150 J**	**16,150 J**	**891 J**	**891 J**	**640 J**	**640 J**	**3,452 J**	**3,452 J**

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
PAH = Polycyclic Aromatic Hydrodarbons
LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH
- = Not Analyzed

J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-1
Landfill AOPC Soil (0-3 ft bgs) PAH Analysis Results
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Site ID	BIL12SSI		BIL13SSI*		BIL17		BIL18		BIL22*		BIL28TPM		BIL29TPM		BIL01USE		BIL02USE	
Sample ID	990921BIL12SS		000413BIL13SS		011016BIL17SS		011016BIL18SS		011016BIL22SS		011017BIL28TPM		011017BIL29TPM		070410BIL01SS		070410BIL02SS	
Sample Date	9/21/1999		4/13/2000		10/16/2001		10/16/2001		10/16/2001		10/17/2001		10/17/2001		4/10/2007		4/10/2007	
Sample Depth (feet bgs)	0-0.5		0-0.5		1		2		3		0-10		0-10		0.5		0.5	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs																		
2-Methylnaphthalene	180 U	180 U	49.8 U	49.8 U	**37.5**	**37.5**	**43.4**	**43.4**	2.22 U	14.2 U	**1,530**	**1,530**	**625**	**625**	20.0 U	20.0 U	20.0 U	20.0 U
Acenaphthene	180 U	180 U	49.8 U	49.8 U	**323**	**323**	**2,530**	**2,530**	**576**	**576**	83.3 U	168 U	**168**	**168**	**16.0 J**	**16.0 J**	**23.0**	**23.0**
Acenaphthylene	180 U	180 U	49.8 U	49.8 U	**78.1**	**78.1**	**111**	**111**	**51.4**	**51.4**	73.4 U	168 U	66.4 U	152 U	20.0 U	20.0 U	20.0 U	20.0 U
Anthracene	180 U	180 U	49.8 U	49.8 U	**773**	**773**	**8,440**	**8,440**	**1,780**	**1,780**	**1,750**	**1,750**	**503**	**503**	**35.0**	**35.0**	**65.0**	**65.0**
Fluorene	180 U	180 U	49.8 U	49.8 U	**244**	**244**	**1,610**	**1,610**	**370**	**370**	78.6 U	168 U	71.1 U	152 U	20.0 U	20.0 U	**12.0 J**	**12.0 J**
Naphthalene	180 U	180 U	49.8 U	49.8 U	**78.1**	**78.1**	**176**	**176**	**47.8**	**47.8**	**791**	**791**	**823**	**823**	20.0 U	20.0 U	20.0 U	20.0 U
Phenanthrene	**13.0 J**	**13.0 J**	49.8 U	49.8 U	**2,910**	**2,910**	**21,900**	**21,900**	**4,700**	**4,700**	**5,020**	**5,020**	**1,480**	**1,480**	**180**	**180**	**300**	**300**
Total LPAHs (full MDL/MRL)	**913 J**	**913 J**	299 U	299 U	**4,406**	**4,406**	**34,767**	**34,767**	**7,531 J**	**7,531 J**	**7,796 J**	**8,065 J**	**3,112 J**	**3,278 J**	**291 J**	**291 J**	**440 J**	**440 J**
Total LPAHs (KM)	-	-	-	-	**4,406**	**4,406**	**34,770**	**34,770**	**7,530 J**	**7,530 J**	**7,782 J**	**8,064 J**	**3,107 J**	**3,278 J**	**279 J**	**279 J**	**424 J**	**424 J**
Total LPAHs (KM, capped)	**913 J**	**913 J**	299 U	299 U	**4,406**	**4,406**	**34,767**	**34,767**	**7,531 J**	**7,531 J**	**7,782 J**	**8,064 J**	**3,107 J**	**3,278 J**	**279 J**	**279 J**	**424 J**	**424 J**
HPAHs																		
Benzo(a)anthracene	**29.0 J**	**29.0 J**	49.8 U	49.8 U	**9,620**	**9,620**	**28,200**	**28,200**	**9,420**	**9,420**	**9,780**	**9,780**	92.9 U	305 U	**530**	**530**	**960**	**960**
Benzo(a)pyrene	**28.0 J**	**28.0 J**	49.8 U	49.8 U	**10,500**	**10,500**	**34,000**	**34,000**	**7,700**	**7,700**	**7,100**	**7,100**	35.5 U	152 U	**600**	**600**	**1,200**	**1,200**
Benzo(b)fluoranthene	**34.0 J**	**34.0 J**	49.8 U	49.8 U	-	-	-	-	-	-	-	-	-	-	**680**	**680**	**1,200**	**1,200**
Benzo(g,h,i)perylene	**20.0 J**	**20.0 J**	49.8 U	49.8 U	**6,150**	**6,150**	**17,000**	**17,000**	**3,020**	**3,020**	27.8 U	168 U	25.1 U	152 U	**280**	**280**	**530**	**530**
Benzo(k)fluoranthene	**40.0 J**	**40.0 J**	49.8 U	49.8 U	-	-	-	-	-	-	-	-	-	-	**450**	**450**	**1,100**	**1,100**
Benzofluoranthenes, Total	-	-	-	-	**14,700**	**14,700**	**31,300**	**31,300**	**8,490**	**8,490**	**5,100**	**5,100**	**1,080**	**1,080**	-	-	-	-
Chrysene	**62.0 J**	**62.0 J**	49.8 U	49.8 U	**8,430**	**8,430**	**35,300 J**	**35,300 J**	**8,420**	**8,420**	**8,210**	**8,210**	**2,060**	**2,060**	**670**	**670**	**1,200**	**1,200**
Dibenz(a,h)anthracene	**18.0 J**	**18.0 J**	49.8 U	49.8 U	**695**	**695**	**1,940**	**1,940**	**573**	**573**	39.2 U	168 U	35.5 U	152 U	**71.0**	**71.0**	**150**	**150**
Fluoranthene	**42.0 J**	**42.0 J**	49.8 U	49.8 U	**19,400**	**19,400**	**48,300**	**48,300**	**17,800**	**17,800**	**13,600**	**13,600**	71.1 U	152 U	**1,300**	**1,300**	**2,100**	**2,100**
Indeno(1,2,3-cd)pyrene	**18.0 J**	**18.0 J**	49.8 U	49.8 U	**6,990**	**6,990**	**20,000**	**20,000**	**2,030**	**2,030**	39.2 U	168 U	35.5 U	152 U	**270**	**270**	**510**	**510**
Pyrene	**43.0 J**	**43.0 J**	49.8 UJ	49.8 UJ	**22,900**	**22,900**	**67,100**	**67,100**	**24,200**	**24,200**	**15,500**	**15,500**	**2,540**	**2,540**	**1,200**	**1,200**	**2,400**	**2,400**
Total HPAHs (full MDL/MRL)	**334 J**	**334 J**	498 UJ	498 UJ	**84,685**	**84,685**	**251,840 J**	**251,840 J**	**73,156**	**73,156**	**54,296 J**	**54,694 J**	**4,896 J**	**5,665 J**	**6,051**	**6,051**	**11,350**	**11,350**
Total HPAHs (KM)	**334 J**	**334 J**	-	-	**84,688**	**84,688**	**251,840 J**	**251,840 J**	**73,152**	**73,152**	**54,272 J**	**54,696 J**	**4,750 J**	**5,512 J**	**6,051**	**6,051**	**11,350**	**11,350**
Total HPAHs (KM-capped)	**334 J**	**334 J**	498 UJ	498 UJ	**84,685**	**84,685**	**251,840** J	**251,840** J	**73,156**	**73,156**	**54,272 J**	**54,694 J**	**4,750 J**	**5,512 J**	**6,051**	**6,051**	**11,350**	**11,350**

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
PAH = Polycyclic Aromatic Hydrodarbons
LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH
- = Not Analyzed

J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-1
Landfill AOPC Soil (0-3 ft bgs) PAH Analysis Results
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Site ID	BIL03USE		BIL04USE		BIL05USE		BIL06USE		BIL07USE		BIL08USE		BIL09USE		L-01		L-01	
Sample ID	070410BIL03SS		070410BIL04SS		070410BIL05SS		070410BIL06SS		070410BIL07SS		070410BIL08SS		070410BIL09SS		090129-L-L1-0-1So		090129-L-L1-1-3So	
Sample Date	4/10/2007		4/10/2007		4/10/2007		4/10/2007		4/10/2007		4/10/2007		4/10/2007		1/29/2009		1/29/2009	
Sample Depth (feet bgs)	0.5		0.5		0.5		0.5		0.5		0.5		0.5		0-1		1-3	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs																		
2-Methylnaphthalene	20.0 U	20.0 U	**11.0 J**	**11.0 J**	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	59.0 U	20.0 U	20.0 U	20.0 U	20.0 U	-	-	-	-
Acenaphthene	**15.0 J**	**15.0 J**	**170**	**170**	20.0 U	20.0 U	**24.0**	**24.0**	**270**	**270**	**46.0**	**46.0**	20.0 U	20.0 U	**66.0**	**66.0**	**170**	**170**
Acenaphthylene	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	59.0 U	20.0 U	20.0 U	20.0 U	20.0 U	**3.40**	**3.40**	**12.0**	**12.0**
Anthracene	**30.0**	**30.0**	**180**	**180**	**15.0 J**	**15.0 J**	**34.0**	**34.0**	**740**	**740**	**110**	**110**	**30.0**	**30.0**	**99.0**	**99.0**	**400**	**400**
Fluorene	20.0 U	20.0 U	**73.0**	**73.0**	20.0 U	20.0 U	**13.0 J**	**13.0 J**	**140**	**140**	**24.0**	**24.0**	**10.0 J**	**10.0 J**	**33.0**	**33.0**	**99.0**	**99.0**
Naphthalene	20.0 U	20.0 U	**20.0**	**20.0**	20.0 U	20.0 U	20.0 U	20.0 U	59.0 U	59.0 U	20.0 U	20.0 U	20.0 U	20.0 U	**5.00**	**5.00**	**22.0**	**22.0**
Phenanthrene	**200**	**200**	**1,500**	**1,500**	**66.0**	**66.0**	**180**	**180**	**3,000**	**3,000**	**550**	**550**	**160**	**160**	**350**	**350**	**1,500**	**1,500**
Total LPAHs (full MDL/MRL)	**305 J**	**305 J**	**1,963 J**	**1,963 J**	**161 J**	**161 J**	**291 J**	**291 J**	**4,268 J**	**4,268 J**	**770 J**	**770 J**	**260 J**	**260 J**	**556**	**556**	**2,203**	**2,203**
Total LPAHs (KM)	**290 J**	**290 J**	**1,963 J**	**1,963 J**	**141 J**	**141 J**	**277 J**	**277 J**	**4,268 J**	**4,268 J**	**770 J**	**770 J**	**230 J**	**230 J**	**556**	**556**	**2,203**	**2,203**
Total LPAHs (KM, capped)	**290 J**	**290 J**	**1,963 J**	**1,963 J**	**141 J**	**141 J**	**277 J**	**277 J**	**4,268 J**	**4,268 J**	**770 J**	**770 J**	**230 J**	**230 J**	**556**	**556**	**2,203**	**2,203**
HPAHs																		
Benzo(a)anthracene	**330**	**330**	**1,000**	**1,000**	**78.0**	**78.0**	**250**	**250**	**4,500**	**4,500**	**1,000**	**1,000**	**180**	**180**	**690**	**690**	**4,500**	**4,500**
Benzo(a)pyrene	**360**	**360**	**1,600**	**1,600**	**85.0**	**85.0**	**240**	**240**	**6,200**	**6,200**	**1,300**	**1,300**	**140**	**140**	**820**	**820**	**5,800**	**5,800**
Benzo(b)fluoranthene	**420**	**420**	**1,600**	**1,600**	**110**	**110**	**310**	**310**	**8,200**	**8,200**	**1,500**	**1,500**	**170**	**170**	**990**	**990**	**7,100**	**7,100**
Benzo(g,h,i)perylene	**210**	**210**	**870**	**870**	**67.0**	**67.0**	**160**	**160**	**1,800**	**1,800**	**480**	**480**	**75.0**	**75.0**	**460**	**460**	**3,300**	**3,300**
Benzo(k)fluoranthene	**310**	**310**	**1,200**	**1,200**	**77.0**	**77.0**	**220**	**220**	**2,500**	**2,500**	**990**	**990**	**130**	**130**	**310**	**310**	**2,400**	**2,400**
Benzofluoranthenes, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**450**	**450**	**1,300**	**1,300**	**96.0**	**96.0**	**280**	**280**	**5,900**	**5,900**	**1,400**	**1,400**	**190**	**190**	**790**	**790**	**5,000**	**5,000**
Dibenz(a,h)anthracene	**55.0**	**55.0**	**240**	**240**	**29.0**	**29.0**	**76.0**	**76.0**	**730**	**730**	**160**	**160**	**18.0 J**	**18.0 J**	**130**	**130**	**970**	**970**
Fluoranthene	**580**	**580**	**2,700**	**2,700**	**150**	**150**	**460**	**460**	**14,000**	**14,000**	**2,800**	**2,800**	**300**	**300**	**1,200**	**1,200**	**7,700**	**7,700**
Indeno(1,2,3-cd)pyrene	**200**	**200**	**780**	**780**	**58.0**	**58.0**	**160**	**160**	**2,100**	**2,100**	**530**	**530**	**74.0**	**74.0**	**620**	**620**	**4,500**	**4,500**
Pyrene	**730**	**730**	**3,100**	**3,100**	**130**	**130**	**360**	**360**	**9,100**	**9,100**	**2,900**	**2,900**	**240 J**	**240 J**	**1,200**	**1,200**	**7,500**	**7,500**
Total HPAHs (full MDL/MRL)	**3,645**	**3,645**	**14,390**	**14,390**	**880**	**880**	**2,516**	**2,516**	**55,030**	**55,030**	**13,060**	**13,060**	**1,517 J**	**1,517 J**	**7,210**	**7,210**	**48,770**	**48,770**
Total HPAHs (KM)	**3,645**	**3,645**	**14,390**	**14,390**	**880**	**880**	**2,516**	**2,516**	**55,030**	**55,030**	**13,060**	**13,060**	**1,517 J**	**1,517 J**	**7,210**	**7,210**	**48,770**	**48,770**
Total HPAHs (KM-capped)	**3,645**	**3,645**	**14,390**	**14,390**	**880**	**880**	**2,516**	**2,516**	**55,030**	**55,030**	**13,060**	**13,060**	**1,517 J**	**1,517 J**	**7,210**	**7,210**	**48,770**	**48,770**

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
PAH = Polycyclic Aromatic Hydrodarbons
LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH
- = Not Analyzed

J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-1
Landfill AOPC Soil (0-3 ft bgs) PAH Analysis Results
(Page 4 of 4)

Site ID	L-02		L-02		L-03		L-03		L-04*		L-04	
Sample ID	090129-L-L2-0-1So		090129-L-L2-1-3So		090129-L-L3-0-1So		090129-L-L3-1-3So		090129-L-L4-0-1So		090129-L-L4-1-3So	
Sample Date	1/29/2009		1/29/2009		1/29/2009		1/29/2009		1/29/2009		1/29/2009	
Sample Depth (feet bgs)	0-1		1-3		0-1		1-3		0-1		1-3	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs												
2-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	**220**	**220**	**1,900**	**1,900**	**700**	**700**	**360**	**360**	**1,160**	**1,160**	**420**	**420**
Acenaphthylene	**15.0**	**15.0**	**41.0**	**41.0**	**13.0**	**13.0**	**15.0**	**15.0**	**19.0**	**19.0**	**13.0**	**13.0**
Anthracene	**650**	**650**	**2,100**	**2,100**	**880**	**880**	**900**	**900**	**1,070**	**1,070**	**740**	**740**
Fluorene	**130**	**130**	**630**	**630**	**340**	**340**	**210**	**210**	**510**	**510**	**240**	**240**
Naphthalene	**14.0**	**14.0**	**140**	**140**	**49.0**	**49.0**	**49.0**	**49.0**	**79.0**	**79.0**	**57.0**	**57.0**
Phenanthrene	**2,000**	**2,000**	**7,400**	**7,400**	**3,400**	**3,400**	**2,800**	**2,800**	**4,200**	**4,200**	**2,800**	**2,800**
Total LPAHs (full MDL/MRL)	**3,029**	**3,029**	**12,211**	**12,211**	**5,382**	**5,382**	**4,334**	**4,334**	**7,043**	**7,043**	**4,270**	**4,270**
Total LPAHs (KM)	**3,029**	**3,029**	**12,210**	**12,210**	**5,382**	**5,382**	**4,334**	**4,334**	**7,044**	**7,044**	**4,270**	**4,270**
Total LPAHs (KM, capped)	**3,029**	**3,029**	**12,211**	**12,211**	**5,382**	**5,382**	**4,334**	**4,334**	**7,043**	**7,043**	**4,270**	**4,270**
HPAHs												
Benzo(a)anthracene	**4,100**	**4,100**	**11,000**	**11,000**	**4,500**	**4,500**	**4,800**	**4,800**	**4,500**	**4,500**	**4,800**	**4,800**
Benzo(a)pyrene	**4,700**	**4,700**	**16,000**	**16,000**	**5,900**	**5,900**	**5,800**	**5,800**	**5,800**	**5,800**	**6,200**	**6,200**
Benzo(b)fluoranthene	**5,700**	**5,700**	**16,000**	**16,000**	**6,400**	**6,400**	**6,500**	**6,500**	**6,500**	**6,500**	**7,200**	**7,200**
Benzo(g,h,i)perylene	**2,500**	**2,500**	**9,500**	**9,500**	**3,300**	**3,300**	**3,100**	**3,100**	**3,250**	**3,250**	**3,500**	**3,500**
Benzo(k)fluoranthene	**2,000**	**2,000**	**5,900**	**5,900**	**2,300**	**2,300**	**2,400**	**2,400**	**2,300**	**2,300**	**2,500**	**2,500**
Benzofluoranthenes, Total	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**4,900**	**4,900**	**14,000**	**14,000**	**5,000**	**5,000**	**5,400**	**5,400**	**5,150**	**5,150**	**5,600**	**5,600**
Dibenz(a,h)anthracene	**710**	**710**	**2,300**	**2,300**	**1,000**	**1,000**	**900**	**900**	**900**	**900**	**1,100**	**1,100**
Fluoranthene	**7,000**	**7,000**	**21,000**	**21,000**	**8,200**	**8,200**	**8,700**	**8,700**	**8,700**	**8,700**	**8,600**	**8,600**
Indeno(1,2,3-cd)pyrene	**3,500**	**3,500**	**13,000**	**13,000**	**4,600**	**4,600**	**4,400**	**4,400**	**4,450**	**4,450**	**4,900**	**4,900**
Pyrene	**6,700**	**6,700**	**21,000**	**21,000**	**7,900**	**7,900**	**9,400**	**9,400**	**8,150**	**8,150**	**8,600**	**8,600**
Total HPAHs (full MDL/MRL)	**41,810**	**41,810**	**129,700**	**129,700**	**49,100**	**49,100**	**51,400**	**51,400**	**49,700**	**49,700**	**53,000**	**53,000**
Total HPAHs (KM)	**41,810**	**41,810**	**129,700**	**129,700**	**49,100**	**49,100**	**51,400**	**51,400**	**49,700**	**49,700**	**53,000**	**53,000**
Total HPAHs (KM-capped)	**41,810**	**41,810**	**129,700**	**129,700**	**49,100**	**49,100**	**51,400**	**51,400**	**49,700**	**49,700**	**53,000**	**53,000**

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
PAH = Polycyclic Aromatic Hydrodarbons
LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH
- = Not Analyzed

J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-2
Sandblast Area AOPC Soil (0-3 ft bgs) PAH Analysis Results
(Page 1 of 4)

Site ID	DSA01		DSA02		DSA03		DSA04		DSA05		DSA06		DSA07		DSA08		DSA09		DSA10	
Sample ID	011204DSA01SS		011204DSA02SS		011204DSA03SS		011204DSA04SS		011204DSA05SS		011204DSA06SS		011204DSA07SS		011204DSA08SS		011204DSA09SS		011204DSA10SS	
Sample Date	12/4/2001		12/4/2001		12/4/2001		12/4/2001		12/4/2001		12/4/2001		12/4/2001		12/4/2001		12/4/2001		12/4/2001	
Sample Depth (feet bgs)	0		0		0		0		0		0		0		0		0		0	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs																				
2-Methylnaphthalene	0.191 U	1.23 U	0.183 U	1.17 U	0.205 U	1.31 U	0.221 U	1.41 U	0.217 U	1.39 U	**2.98**	**2.98**	0.203 U	1.30 U	0.191 U	1.22 U	0.225 U	1.44 U	2.28 U	14.6 U
Acenaphthene	0.607 U	1.23 U	**6.44**	**6.44**	0.649 U	1.31 U	0.700 U	1.41 U	**4.46**	**4.46**	0.738 U	1.49 U	**2.60**	**2.60**	**2.81**	**2.81**	**15.4**	**15.4**	**29.3**	**29.3**
Acenaphthylene	0.535 U	1.23 U	0.510 U	1.17 U	**3.67**	**3.67**	0.616 U	1.41 U	0.607 U	1.39 U	0.650 U	1.49 U	0.567 U	1.30 U	0.533 U	1.22 U	0.629 U	1.44 U	6.38 U	14.6 U
Anthracene	**1.72**	**1.72**	**4.21**	**4.21**	**5.25**	**5.25**	0.356 U	1.41 U	**9.19**	**9.19**	**11.3**	**11.3**	**2.08**	**2.08**	**2.20**	**2.20**	**18.0**	**18.0**	**80.5**	**80.5**
Fluorene	0.573 U	1.23 U	**2.46**	**2.46**	**3.02**	**3.02**	0.660 U	1.41 U	**3.06**	**3.06**	**7.01**	**7.01**	**1.69**	**1.69**	**1.83**	**1.83**	**7.65**	**7.65**	**24.9**	**24.9**
Naphthalene	0.574 U	1.23 U	0.548 U	1.17 U	**1.70**	**1.70**	0.662 U	1.41 U	**1.95**	**1.95**	**4.17**	**4.17**	0.609 U	1.30 U	0.572 U	1.22 U	0.676 U	1.44 U	6.85 U	14.6 U
Phenanthrene	**5.64**	**5.64**	**19.4**	**19.4**	**21.8**	**21.8**	**5.80**	**5.80**	**31.3**	**31.3**	**49.8**	**49.8**	**11.3**	**11.3**	**13.6**	**13.6**	**59.0**	**59.0**	**345**	**345**
Total LPAHs (full MDL/MRL)	**9.65 J**	**12.3 J**	**33.6 J**	**34.9 J**	**36.1 J**	**36.8 J**	**8.79 J**	**12.9 J**	**50.6 J**	**51.4 J**	**73.7 J**	**75.3 J**	**18.8 J**	**20.3 J**	**21.5 J**	**22.9 J**	**101 J**	**103 J**	**493 J**	**509 J**
Total LPAHs (KM)	**9.50 J**	**12.3 J**	**33.5 J**	**34.8 J**	**36.1 J**	**36.8 J**	**-**	**-**	**50.6 J**	**51.3 J**	**73.6 J**	**75.2 J**	**18.8 J**	**20.3 J**	**21.5 J**	**22.9 J**	**101 J**	**103 J**	**492 J**	**509 J**
Total LPAHs (KM, capped)	**9.50 J**	**12.3 J**	**33.5 J**	**34.8 J**	**36.1 J**	**36.8 J**	**8.79 J**	**12.9 J**	**50.6 J**	**51.3 J**	**73.6 J**	**75.2 J**	**18.8 J**	**20.3 J**	**21.5 J**	**22.9 J**	**101 J**	**103 J**	**492 J**	**509 J**
HPAHs																				
Benzo(a)anthracene	0.749 U	2.45 U	**15.0**	**15.0**	**15.6**	**15.6**	**3.96**	**3.96**	**66.6**	**66.6**	**29.5**	**29.5**	**7.28**	**7.28**	**16.5**	**16.5**	**46.3**	**46.3**	**398**	**398**
Benzo(a)pyrene	**10.2**	**10.2**	**20.4**	**20.4**	**20.3**	**20.3**	**7.49**	**7.49**	**151**	**151**	**43.5**	**43.5**	**14.0**	**14.0**	**25.4**	**25.4**	**52.0**	**52.0**	**435**	**435**
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	0.202 U	1.23 U	**9.72**	**9.72**	0.216 U	1.31 U	0.233 U	1.41 U	**107**	**107**	0.246 U	1.49 U	**6.89**	**6.89**	**13.7**	**13.7**	**21.2**	**21.2**	**195**	**195**
Benzo(k)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
'Benzofluoranthenes, Total	**13.5**	**13.5**	**26.3**	**26.3**	**35.8**	**35.8**	**10.2**	**10.2**	**175**	**175**	**74.2**	**74.2**	**17.8**	**17.8**	**36.3**	**36.3**	**72.2**	**72.2**	**682**	**682**
Chrysene	**6.50**	**6.50**	**16.3**	**16.3**	**22.8**	**22.8**	**6.36**	**6.36**	**68.4**	**68.4**	**45.9**	**45.9**	**9.89**	**9.89**	**20.3**	**20.3**	**56.6**	**56.6**	**465**	**465**
Dibenz(a,h)anthracene	0.286 U	1.23 U	0.273 U	1.17 U	0.306 U	1.31 U	0.329 U	1.41 U	**25.8**	**25.8**	0.347 U	1.49 U	0.303 U	1.30 U	0.285 U	1.22 U	0.336 U	1.44 U	3.41 U	14.6 U
Fluoranthene	**8.47**	**8.47**	**31.6**	**31.6**	**35.4**	**35.4**	**10.0**	**10.0**	**75.9**	**75.9**	**62.9**	**62.9**	**19.0**	**19.0**	**27.2**	**27.2**	**98.2**	**98.2**	**806**	**806**
Indeno(1,2,3-cd)pyrene	0.286 U	1.23 U	**11.1**	**11.1**	**14.3**	**14.3**	**3.68**	**3.68**	**97.8**	**97.8**	0.347 U	1.49 U	**7.02**	**7.02**	**14.3**	**14.3**	**21.1**	**21.1**	**202**	**202**
Pyrene	**11.0**	**11.0**	**31.0**	**31.0**	**32.3**	**32.3**	**10.0**	**10.0**	**83.8**	**83.8**	**68.6**	**68.6**	**21.2**	**21.2**	**35.1**	**35.1**	**106**	**106**	**844**	**844**
Total HPAHs (full MDL/MRL)	**37.7 J**	**42.3 J**	**135 J**	**136 J**	**141 J**	**143 J**	**42.1 J**	**44.3 J**	**676**	**676**	**251 J**	**255 J**	**85.6 J**	**86.6 J**	**153 J**	**154 J**	**402 J**	**403 J**	**3348.41 J**	**3359.6 J**
Total HPAHs (KM)	**37.0 J**	**41.1 J**	**135 J**	**136 J**	**141 J**	**143 J**	**42.0 J**	**44.3 J**	**676**	**676**	**251 J**	**255 J**	**85.6 J**	**86.6 J**	**153 J**	**154 J**	**402 J**	**403 J**	**3348.8 J**	**3360 J**
Total HPAHs (KM-capped)	**37.0 J**	**41.1 J**	**135 J**	**136 J**	**141 J**	**143 J**	**42.0 J**	**44.3 J**	**676**	**676**	**251 J**	**255 J**	**85.6 J**	**86.6 J**	**153 J**	**154 J**	**402 J**	**403 J**	**3348.41 J**	**3359.6 J**

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
PAH = Polycyclic Aromatic Hydrodarbons
LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH
- = Not Analyzed

J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-2
Sandblast Area AOPC Soil (0-3 ft bgs) PAH Analysis Results
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Site ID	DSA11*		DSA12*		SBB18		HA1*		HA2		HA3		HA4		HA5		HA9		HA10	
Sample ID	011204DSA11SS		011204DSA12SS		011205SBB20SS		041122SGA14SS		041122SGA16SS		041122SGA17SS		041122SGA21SS		041122SGA23SS		041123SGA28SS		041123SGA29SS	
Sample Date	12/4/2001		12/4/2001		12/5/2001		11/22/2004		11/22/2004		11/22/2004		11/22/2004		11/22/2004		11/23/2004		11/23/2004	
Sample Depth (feet bgs)	0		0		2.5		0.5		0.5		0.5		3		3		0.5		0.5	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs																				
2-Methylnaphthalene	**22.9**	**22.9**	**150**	**150**	**124 J**	**124 J**	**4.84 J**	**4.84 J**	**2.53 J**	**2.53 J**	**31.8**	**31.8**	0.657 U	2.53 U	0.651 U	2.50 U	**1.29 J**	**1.29 J**	0.539 U	2.07 U
Acenaphthene	**132**	**132**	**470**	**470**	**3,200 J**	**3,200 J**	**10.9**	**10.9**	**16.1**	**16.1**	**296**	**296**	**328**	**328**	0.642 U	2.50 U	**5.41**	**5.41**	0.531 U	2.07 U
Acenaphthylene	**27.6**	**27.6**	**87.7**	**87.7**	**295 J**	**295 J**	**4.33**	**4.33**	**4.65**	**4.65**	**54.7**	**54.7**	**9.14**	**9.14**	0.737 U	2.50 U	**1.39 J**	**1.39 J**	0.610 U	2.07 U
Anthracene	**304**	**304**	**822**	**822**	**2,040 J**	**2,040 J**	**14.7**	**14.7**	**21.3**	**21.3**	**832**	**832**	**447**	**447**	0.476 U	2.50 U	**5.03**	**5.03**	0.394 U	2.07 U
Fluorene	**94.6**	**94.6**	**462**	**462**	**779 J**	**779 J**	**8.53**	**8.53**	**10.5**	**10.5**	**278**	**278**	**164**	**164**	0.809 U	2.50 U	0.714 U	2.21 U	0.669 U	2.07 U
Naphthalene	**26.8**	**26.8**	**227**	**227**	**256 J**	**256 J**	**4.11**	**4.11**	0.934 U	2.11 U	**78.2**	**78.2**	1.12 U	2.53 U	**2.04 J**	**2.04 J**	**2.56**	**2.56**	0.918 U	2.07 U
Phenanthrene	**1,050**	**1,050**	**3,020**	**3,020**	**6,550 J**	**6,550 J**	**116 J**	**116 J**	**115**	**115**	**3,250**	**3,250**	**1,580**	**1,580**	**2.47 J**	**2.47 J**	**38.2**	**38.2**	**7.86**	**7.86**
Total LPAHs (full MDL/MRL)	**1,639**	**1,639**	**5,089**	**5,089**	**13,120 J**	**13,120 J**	**158 J**	**158 J**	**168 J**	**170 J**	**4,789**	**4,789**	**2,529 J**	**2,531 J**	**7.17 J**	**14.5 J**	**53.304 J**	**54.8 J**	**11.0 J**	**18.2 J**
Total LPAHs (KM)	**1,639**	**1,639**	**5,089**	**5,089**	**13,122 J**	**13,122 J**	**158 J**	**158 J**	**168 J**	**170 J**	**4,789**	**4,789**	**2,529 J**	**2,531 J**	**6.41 J**	**13.5 J**	**53.304 J**	**54.0 J**	**-**	**-**
Total LPAHs (KM, capped)	**1,639**	**1,639**	**5,089**	**5,089**	**13,120 J**	**13,120 J**	**158 J**	**158 J**	**168 J**	**170 J**	**4,789**	**4,789**	**2,529 J**	**2,531 J**	**6.41 J**	**13.5 J**	**53.304 J**	**54.0 J**	**11.0 J**	**18.2 J**
HPAHs																				
Benzo(a)anthracene	**1,640**	**1,640**	**1,320**	**1,320**	**12,300 J**	**12,300 J**	**183 J**	**183 J**	**114 J**	**114 J**	**6,440**	**6,440**	**2,030**	**2,030**	1.26 U	2.50 U	**62.3 J**	**62.3 J**	1.05 U	2.07 U
Benzo(a)pyrene	**2,040**	**2,040**	**1,580**	**1,580**	**11,700 J**	**11,700 J**	**160**	**160**	**108**	**108**	**6,470**	**6,470**	**1,970**	**1,970**	0.792 U	2.50 U	**74.1**	**74.1**	0.656 U	2.07 U
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	**1,010**	**1,010**	**558**	**558**	**3,350 J**	**3,350 J**	**94.6 J**	**94.6 J**	**61.9 J**	**61.9 J**	**3,830**	**3,830**	**914**	**914**	**4.33 J**	**4.33 J**	**66.4 J**	**66.4 J**	0.498 U	2.07 U
Benzo(k)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
'Benzofluoranthenes, Total	**2,840**	**2,840**	**1,850**	**1,850**	**16,300 J**	**16,300 J**	**290**	**290**	**212**	**212**	**12,100**	**12,100**	**3,040**	**3,040**	**7.70**	**7.70**	**135**	**135**	0.939 U	4.14 U
Chrysene	**1,640**	**1,640**	**1,620**	**1,620**	**12,000 J**	**12,000 J**	**224**	**224**	**129**	**129**	**7,590**	**7,590**	**1,910**	**1,910**	0.895 U	2.50 U	**75.3**	**75.3**	0.741 U	2.07 U
Dibenz(a,h)anthracene	**418**	**418**	**216**	**216**	**1,080 J**	**1,080 J**	**34.2 J**	**34.2 J**	**25.4 J**	**25.4 J**	**1,430**	**1,430**	**347**	**347**	0.777 U	2.50 U	**16.5 J**	**16.5 J**	0.643 U	2.07 U
Fluoranthene	**2,290**	**2,290**	**2,610**	**2,610**	**28,600 J**	**28,600 J**	**218**	**218**	**216**	**216**	**20,700**	**20,700**	**4,330**	**4,330**	**6.29**	**6.29**	**71.9**	**71.9**	1.05 U	2.07 U
Indeno(1,2,3-cd)pyrene	**998**	**998**	**546**	**546**	**4,170 J**	**4,170 J**	**83.6 J**	**83.6 J**	**60.8 J**	**60.8 J**	**3,910**	**3,910**	**939**	**939**	**3.52 J**	**3.52 J**	**49.8 J**	**49.8 J**	0.472 U	2.07 U
Pyrene	**2,480**	**2,480**	**3,480**	**3,480**	**32,000 J**	**32,000 J**	**366 J**	**366 J**	**217**	**217**	**21,900**	**21,900**	**5,470 J**	**5,470 J**	**9.14**	**9.14**	**79.3**	**79.3**	0.352 U	2.07 U
Total HPAHs (full MDL/MRL)	**12,525**	**12,525**	**11,941**	**11,941**	**105,200 J**	**105,200 J**	**1,364 J**	**1,364 J**	**932 J**	**932 J**	**72,270**	**72,270**	**17,910 J**	**17,910 J**	**27.0 J**	**33.3 J**	**496 J**	**496 J**	5.46 U	16.6 U
Total HPAHs (KM)	**12,528**	**12,528**	**11,944**	**11,944**	**105,200 J**	**105,200 J**	**1,364 J**	**1,364 J**	**932 J**	**932 J**	**72,272**	**72,272**	**17,912 J**	**17,912 J**	**26.4 J**	**33.3 J**	**496 J**	**496 J**	**-**	**-**
Total HPAHs (KM-capped)	**12,525**	**12,525**	**11,941**	**11,941**	**105,200 J**	**105,200 J**	**1,364 J**	**1,364 J**	**932 J**	**932 J**	**72,270**	**72,270**	**17,910 J**	**17,910 J**	**26.4 J**	**33.3 J**	**496 J**	**496 J**	5.46 U	16.6 U

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
PAH = Polycyclic Aromatic Hydrodarbons
LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH
- = Not Analyzed

J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-2
Sandblast Area AOPC Soil (0-3 ft bgs) PAH Analysis Results
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Site ID	HA11		HA11		LD-01		LD-01		LD-02		LD-02		LD-03		LD-03		LD-04		LD-04	
Sample ID	041123SGA30SS		041123SGA31SS		090320-LD-1So-0-1		090320-LD-1So-1-3		090320-LD-2So-0-1		090320-LD-2So-1-3		090320-LD-3So-0-1		090320-LD-3So-1-3		090320-LD-4So-0-1		090320-LD-4So-1-3	
Sample Date	11/23/2004		11/23/2004		3/20/2009		3/20/2009		3/20/2009		3/20/2009		3/20/2009		3/20/2009		3/20/2009		3/20/2009	
Sample Depth (feet bgs)	1		3		0-1		1-3		0-1		1-3		0-1		1-3		0-1		1-3	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs																				
2-Methylnaphthalene	0.641 U	2.46 U	0.656 U	2.52 U	**40.0 J**	**40.0 J**	1.20 U	6.90 U	**40.0 J**	**40.0 J**	**3.30 J**	**3.30 J**	**43.0 J**	**43.0 J**	1.20 U	6.80 U	1.20 U	6.40 U	1.20 U	6.50 U
Acenaphthene	**5.88**	**5.88**	0.648 U	2.52 U	**160 J**	**160 J**	**1.10 J**	**1.10 J**	**140 J**	**140 J**	**9.00**	**9.00**	**430**	**430**	**4.10 J**	**4.10 J**	**1.50 J**	**1.50 J**	1.00 U	6.50 U
Acenaphthylene	0.726 U	2.46 U	0.744 U	2.52 U	35.0 U	180 U	1.40 U	6.90 U	**37.0 J**	**37.0 J**	1.40 U	6.80 U	35.0 U	170 U	1.40 U	6.80 U	1.40 U	6.40 U	1.40 U	6.50 U
Anthracene	**8.55**	**8.55**	0.480 U	2.52 U	**330**	**330**	**1.80 J**	**1.80 J**	**280**	**280**	**14.0**	**14.0**	**780**	**780**	**11.0**	**11.0**	**2.00 J**	**2.00 J**	1.40 U	6.50 U
Fluorene	**7.13**	**7.13**	0.816 U	2.52 U	**130 J**	**130 J**	1.70 U	6.90 U	**120 J**	**120 J**	**9.70**	**9.70**	**380**	**380**	**3.80 J**	**3.80 J**	1.70 U	6.40 U	1.70 U	6.50 U
Naphthalene	**2.50**	**2.50**	1.12 U	2.52 U	**66.0 J**	**66.0 J**	1.30 U	6.90 U	**69.0 J**	**69.0 J**	**6.30 J**	**6.30 J**	**62.0 J**	**62.0 J**	**2.20 J**	**2.20 J**	1.30 U	6.40 U	1.30 U	6.50 U
Phenanthrene	**24.8**	**24.8**	0.750 U	2.52 U	**1,900**	**1,900**	**15.0**	**15.0**	**1,900**	**1,900**	**71.0**	**71.0**	**4,000**	**4,000**	**59.0**	**59.0**	**16.0**	**16.0**	1.30 U	6.50 U
Total LPAHs (full MDL/MRL)	**49.6 J**	**51.3 J**	4.56 U	15.1 U	**2,621 J**	**2,766 J**	**22.3 J**	**38.6 J**	**2,546 J**	**2,546 J**	**111 J**	**117 J**	**5,687 J**	**5,822 J**	**81.5 J**	**86.9 J**	**23.9 J**	**38.7 J**	8.10 U	39.0 U
Total LPAHs (KM)	**49.6 J**	**51.3 J**	-	-	**2,621 J**	**2,705 J**	**21.2 J**	**22.2 J**	**2,546 J**	**2,546 J**	**111 J**	**116 J**	**5,687 J**	**5,714 J**	**81.5 J**	**83.5 J**	**23.5 J**	**24.8 J**	-	-
Total LPAHs (KM, capped)	**49.6 J**	**51.3 J**	4.56 U	15.1 U	**2,621 J**	**2,705 J**	**21.198 J**	**22.2 J**	**2,546 J**	**2,546 J**	**111 J**	**116 J**	**5,687 J**	**5,714 J**	**81.5 J**	**83.5 J**	**23.5 J**	**24.8 J**	8.10 U	39.0 U
HPAHs																				
Benzo(a)anthracene	**48.3 J**	**48.3 J**	1.28 U	2.52 U	**1,500**	**1,500**	**15.0**	**15.0**	**2,700**	**2,700**	**37.0**	**37.0**	**2,100**	**2,100**	**71.0**	**71.0**	**27.0**	**27.0**	1.40 U	6.50 U
Benzo(a)pyrene	**40.4**	**40.4**	0.799 U	2.52 U	**1,400**	**1,400**	**19.0**	**19.0**	**2,800**	**2,800**	**35.0**	**35.0**	**1,900**	**1,900**	**72.0**	**72.0**	**38.0**	**38.0**	1.60 U	6.50 U
Benzo(b)fluoranthene	-	-	-	-	**2,000**	**2,000**	**27.0**	**27.0**	**4,100**	**4,100**	**45.0**	**45.0**	**2,600**	**2,600**	**100**	**100**	**53.0**	**53.0**	2.50 U	6.50 U
Benzo(g,h,i)perylene	**29.8 J**	**29.8 J**	0.607 U	2.52 U	**950**	**950**	**21.0**	**21.0**	**2,000**	**2,000**	**33.0**	**33.0**	**1,100**	**1,100**	**54.0**	**54.0**	**42.0**	**42.0**	2.30 U	6.50 U
Benzo(k)fluoranthene	-	-	-	-	**770**	**770**	**10.0**	**10.0**	**1,400**	**1,400**	**16.0**	**16.0**	**880**	**880**	**36.0**	**36.0**	**19.0**	**19.0**	2.50 U	6.50 U
'Benzofluoranthenes, Total	**73.4**	**73.4**	1.14 U	5.05 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**85.8**	**85.8**	0.903 U	2.52 U	**1,900**	**1,900**	**21.0**	**21.0**	**3,500**	**3,500**	**42.0**	**42.0**	**2,300**	**2,300**	**85.0**	**85.0**	**39.0**	**39.0**	**1.80 J**	**1.80 J**
Dibenz(a,h)anthracene	**1.23 J**	**1.23 J**	0.784 U	2.52 U	**270**	**270**	**4.40 J**	**4.40 J**	**640**	**640**	**7.00**	**7.00**	**350**	**350**	**15.0**	**15.0**	**9.70**	**9.70**	2.20 U	6.50 U
Fluoranthene	**52.7**	**52.7**	1.28 U	2.52 U	**3,100**	**3,100**	**29.0**	**29.0**	**4,700**	**4,700**	**71.0**	**71.0**	**5,000**	**5,000**	**130**	**130**	**36.0**	**36.0**	2.20 U	6.50 U
Indeno(1,2,3-cd)pyrene	**26.5 J**	**26.5 J**	0.576 U	2.52 U	**1,100**	**1,100**	**16.0**	**16.0**	**2,200**	**2,200**	**25.0**	**25.0**	**1,300**	**1,300**	**55.0**	**55.0**	**35.0**	**35.0**	1.90 U	6.50 U
Pyrene	**51.6**	**51.6**	0.429 U	2.52 U	**2,800**	**2,800**	**29.0**	**29.0**	**4,400**	**4,400**	**76.0**	**76.0**	**4,200**	**4,200**	**120**	**120**	**47.0**	**47.0**	**2.10 J**	**2.10 J**
Total HPAHs (full MDL/MRL)	**336 J**	**336 J**	6.66 U	20.2 U	**15,790**	**15,790**	**191 J**	**191 J**	**28,440**	**28,440**	**387**	**387**	**21,730**	**21,730**	**738**	**738**	**346**	**346**	**20.5 J**	**55.9 J**
Total HPAHs (KM)	**336 J**	**336 J**	-	-	**15,790**	**15,790**	**191 J**	**191 J**	**28,440**	**28,440**	**387**	**387**	**21,730**	**21,730**	**738**	**738**	**346**	**346**	**16.5 J**	**19.5 J**
Total HPAHs (KM-capped)	**336 J**	**336 J**	6.66 U	20.2 U	**15,790**	**15,790**	**191 J**	**191 J**	**28,440**	**28,440**	**387**	**387**	**21,730**	**21,730**	**738**	**738**	**346**	**346**	**16.5 J**	**19.5 J**

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
PAH = Polycyclic Aromatic Hydrodarbons
LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH
- = Not Analyzed

J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-2
Sandblast Area AOPC Soil (0-3 ft bgs) PAH Analysis Results
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Site ID	LD-05		LD-05		LD-06		LD-07		LD-08		LD-09		LD-10		LD-11*		SB-EUA*		SB-EUB	
Sample ID	090320-LD-5So-0-1		090320-LD-5So-1-3		090319-LD-6-So		090319-LD-7-So		090319-LD-8-So		090319-LD-9-So		090319-LD-10-So		090319-LD-11-So		090318-SB-EUA-So		090318-SB-EUB-So	
Sample Date	3/20/2009		3/20/2009		3/19/2009		3/19/2009		3/19/2009		3/19/2009		3/19/2009		3/19/2009		3/18/2009		3/18/2009	
Sample Depth (feet bgs)	0-1		1-3		0-0.17		0-0.17		0-0.17		0-0.17		0-0.17		0-0.17		0-0.17		0-0.17	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs																				
2-Methylnaphthalene	**6.90**	**6.90**	1.20 U	6.40 U	**29.0 J**	**29.0 J**	**27.0 J**	**27.0 J**	1.20 U	10.0 U	**2.80 J**	**2.80 J**	**36.0 J**	**36.0 J**	**7.60 J**	**7.60 J**	30.0 U	160 U	60.0 U	340 U
Acenaphthene	**30.0**	**30.0**	**4.70 J**	**4.70 J**	**210**	**210**	**110**	**110**	1.00 U	10.0 U	**14.0**	**14.0**	**99.0 J**	**99.0 J**	**20.0**	**20.0**	**34.5 J**	**34.5 J**	**68.0 J**	**68.0 J**
Acenaphthylene	**4.60 J**	**4.60 J**	1.40 U	6.40 U	**15.0 J**	**15.0 J**	**31.0 J**	**31.0 J**	1.40 U	10.0 U	**2.60 J**	**2.60 J**	**25.0 J**	**25.0 J**	**3.15 J**	**3.15 J**	35.0 U	160 U	70.0 U	340 U
Anthracene	**90.0**	**90.0**	**13.0**	**13.0**	**220**	**220**	**270**	**270**	**2.90 J**	**2.90 J**	**29.0**	**29.0**	**170**	**170**	**55.0**	**55.0**	**53.5 J**	**53.5 J**	**150 J**	**150 J**
Fluorene	**29.0**	**29.0**	**5.20 J**	**5.20 J**	**130**	**130**	**130**	**130**	1.70 U	10.0 U	**13.0**	**13.0**	**75.0 J**	**75.0 J**	**17.5**	**17.5**	43.0 U	160 U	85.0 U	340 U
Naphthalene	**8.90**	**8.90**	**4.00 J**	**4.00 J**	**78.0 J**	**78.0 J**	**41.0 J**	**41.0 J**	**3.90 J**	**3.90 J**	**6.70 J**	**6.70 J**	**45.0 J**	**45.0 J**	**8.75 J**	**8.75 J**	33.0 U	160 U	65.0 U	340 U
Phenanthrene	**460**	**460**	**79.0**	**79.0**	**1,100**	**1,100**	**1,800**	**1,800**	**16.0**	**16.0**	**180**	**180**	**810**	**810**	**260**	**260**	**360**	**360**	**940**	**940**
Total LPAHs (full MDL/MRL)	**623 J**	**623 J**	**107 J**	**112 J**	**1,753 J**	**1,753 J**	**2,382 J**	**2,382 J**	**26.9 J**	**52.8 J**	**245 J**	**245 J**	**1,224 J**	**1,224 J**	**364 J**	**364 J**	**559 J**	**928 J**	**1,378 J**	**2,178 J**
Total LPAHs (KM)	**623 J**	**623 J**	**107 J**	**111 J**	**1,753 J**	**1,753 J**	**2,382 J**	**2,382 J**	**25.8 J**	**33.0 J**	**245 J**	**245 J**	**1,224 J**	**1,224 J**	**364 J**	**364 J**	**549 J**	**580 J**	**1,356 J**	**1,485 J**
Total LPAHs (KM, capped)	**623 J**	**623 J**	**107 J**	**111 J**	**1,753 J**	**1,753 J**	**2,382 J**	**2,382 J**	**25.8 J**	**33.0 J**	**245 J**	**245 J**	**1,224 J**	**1,224 J**	**364 J**	**364 J**	**549 J**	**580 J**	**1,356 J**	**1,485 J**
HPAHs																				
Benzo(a)anthracene	**530**	**530**	**96.0**	**96.0**	**960**	**960**	**1,800**	**1,800**	**16.0**	**16.0**	**190**	**190**	**660**	**660**	**275**	**275**	**455**	**455**	**1,200**	**1,200**
Benzo(a)pyrene	**450**	**450**	**86.0**	**86.0**	**1,100**	**1,100**	**1,600**	**1,600**	**17.0**	**17.0**	**200**	**200**	**670**	**670**	**265**	**265**	**435**	**435**	**1,000**	**1,000**
Benzo(b)fluoranthene	**640**	**640**	**120**	**120**	**1,500**	**1,500**	**2,600**	**2,600**	**25.0**	**25.0**	**290**	**290**	**1,100**	**1,100**	**365**	**365**	**645**	**645**	**1,600**	**1,600**
Benzo(g,h,i)perylene	**280**	**280**	**54.0**	**54.0**	**820**	**820**	**1,100**	**1,100**	**11.0**	**11.0**	**120**	**120**	**440**	**440**	**165**	**165**	**270**	**270**	**590**	**590**
Benzo(k)fluoranthene	**220**	**220**	**45.0**	**45.0**	**560**	**560**	**860**	**860**	**8.30 J**	**8.30 J**	**89.0**	**89.0**	**360**	**360**	**125**	**125**	**230**	**230**	**570**	**570**
'Benzofluoranthenes, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	**620**	**620**	**120**	**120**	**1,100**	**1,100**	**2,100**	**2,100**	**20.0**	**20.0**	**220**	**220**	**870**	**870**	**305**	**305**	**575**	**575**	**1,500**	**1,500**
Dibenz(a,h)anthracene	**91.0**	**91.0**	**18.0**	**18.0**	**240**	**240**	**350**	**350**	2.20 U	10.0 U	**38.0**	**38.0**	**130**	**130**	**47.0**	**47.0**	**95.5 J**	**95.5 J**	**220 J**	**220 J**
Fluoranthene	**1,100**	**1,100**	**170**	**170**	**1,700**	**1,700**	**3,300**	**3,300**	**31.0**	**31.0**	**350**	**350**	**1,300**	**1,300**	**555**	**555**	**825**	**825**	**2,100**	**2,100**
Indeno(1,2,3-cd)pyrene	**320**	**320**	**60.0**	**60.0**	**880**	**880**	**1,200**	**1,200**	**12.0**	**12.0**	**130**	**130**	**450**	**450**	**180**	**180**	**300**	**300**	**690**	**690**
Pyrene	**950**	**950**	**150**	**150**	**1,600**	**1,600**	**2,800**	**2,800**	**28.0**	**28.0**	**310**	**310**	**1,300**	**1,300**	**500**	**500**	**775**	**775**	**1,900**	**1,900**
Total HPAHs (full MDL/MRL)	**5,201**	**5,201**	**919**	**919**	**10,460**	**10,460**	**17,710**	**17,710**	**171 J**	**178 J**	**1,937**	**1,937**	**7,280**	**7,280**	**2,782**	**2,782**	**4,606 J**	**4,606 J**	**11,370 J**	**11,370 J**
Total HPAHs (KM)	**5,201**	**5,201**	**919**	**919**	**10,460**	**10,460**	**17,710**	**17,710**	**171 J**	**177 J**	**1,937**	**1,937**	**7,280**	**7,280**	**2,782**	**2,782**	**4,606 J**	**4,606 J**	**11,370 J**	**11,370 J**
Total HPAHs (KM-capped)	**5,201**	**5,201**	**919**	**919**	**10,460**	**10,460**	**17,710**	**17,710**	**171 J**	**177 J**	**1,937**	**1,937**	**7,280**	**7,280**	**2,782**	**2,782**	**4,606 J**	**4,606 J**	**11,370 J**	**11,370 J**

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
PAH = Polycyclic Aromatic Hydrodarbons
LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH
- = Not Analyzed

J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-3
Reference Area Soil (0-0.5 ft bgs) PAH Analysis Results
(Page 1 of 2)

Site ID	R-01		R-02		R-03		R-04		R-05		R-06		R-07*	
Sample ID	090128-R-R1-0-0.5So		090128-R-R2-0-0.5So		090128-R-R3-0-0.5So		090128-R-R4-0-0.5So		090128-R-R5-0-0.5So		090128-R-R6-0-0.5So		090128-R-R7-0-0.5So	
Sample Date	1/28/2009		1/28/2009		1/28/2009		1/28/2009		1/28/2009		1/28/2009		1/28/2009	
Sample Depth (feet bgs)	0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs														
Acenaphthene	**1.90 J**	**1.90 J**	**1.20 J**	**1.20 J**	**3.40 J**	**3.40 J**	1.00 U	10.0 U	**1.60 J**	**1.60 J**	**1.20 J**	**1.20 J**	**1.75 J**	**1.75 J**
Acenaphthylene	1.40 U	9.90 U	1.40 U	10.0 U	**1.60 J**	**1.60 J**	1.40 U	10.0 U	1.40 U	10.0 U	1.40 U	9.90 U	1.40 U	10.0 U
Anthracene	**2.70 J**	**2.70 J**	**2.00 J**	**2.00 J**	**4.90 J**	**4.90 J**	**1.50 J**	**1.50 J**	**1.90 J**	**1.90 J**	**2.00 J**	**2.00 J**	**3.30 J**	**3.30 J**
Fluorene	1.70 U	9.90 U	1.70 U	10.0 U	**3.20 J**	**3.20 J**	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.90 U	1.70 U	10.0 U
Naphthalene	1.30 U	9.90 U	**1.60 J**	**1.60 J**	**2.20 J**	**2.20 J**	1.30 U	10.0 U	1.30 U	10.0 U	**1.30 J**	**1.30 J**	**1.80 J**	**1.80 J**
Phenanthrene	**16.0**	**16.0**	**16.0**	**16.0**	**34.0**	**34.0**	**9.10 J**	**9.10 J**	**13.0**	**13.0**	**9.60 J**	**9.60 J**	**16.0**	**16.0**
Total LPAHs (full MDL/MRL)	**25.0 J**	**50.3 J**	**23.9 J**	**40.8 J**	**49.3 J**	**49.3 J**	**16.0 J**	**50.6 J**	**20.9 J**	**46.5 J**	**17.2 J**	**33.9 J**	**26.0 J**	**42.9 J**
Total LPAHs (KM)	**24.5 J**	**27.5 J**	**23.3 J**	**24.0 J**	**49.3 J**	**49.3 J**	**14.7 J**	**31.8 J**	**20.5 J**	**21.8 J**	**16.6 J**	**21.2 J**	**25.7 J**	**27.4 J**
Total LPAHs (KM, capped)	**24.5 J**	**27.5 J**	**23.3 J**	**24.0 J**	**49.3 J**	**49.3 J**	**14.7 J**	**31.8 J**	**20.5 J**	**21.8 J**	**16.6 J**	**21.2 J**	**25.7 J**	**27.4 J**
HPAHs														
Benzo(a)anthracene	**16.0**	**16.0**	**17.0**	**17.0**	**34.0**	**34.0**	**9.90 J**	**9.90 J**	**17.0**	**17.0**	**11.0**	**11.0**	**20.5**	**20.5**
Benzo(a)pyrene	**20.0**	**20.0**	**22.0**	**22.0**	**45.0**	**45.0**	**11.0**	**11.0**	**20.0**	**20.0**	**16.0**	**16.0**	**26.5**	**26.5**
Benzo(b)fluoranthene	**27.0**	**27.0**	**29.0**	**29.0**	**55.0**	**55.0**	**16.0**	**16.0**	**27.0**	**27.0**	**19.0**	**19.0**	**33.0**	**33.0**
Benzo(g,h,i)perylene	**14.0**	**14.0**	**16.0**	**16.0**	**32.0**	**32.0**	**11.0**	**11.0**	**16.0**	**16.0**	**13.0**	**13.0**	**20.5**	**20.5**
Benzo(k)fluoranthene	**8.30 J**	**8.30 J**	**9.70 J**	**9.70 J**	**19.0**	**19.0**	**6.70 J**	**6.70 J**	**9.50 J**	**9.50 J**	**7.70 J**	**7.70 J**	**10.8 J**	**10.8 J**
Chrysene	**20.0**	**20.0**	**23.0**	**23.0**	**45.0**	**45.0**	**13.0**	**13.0**	**22.0**	**22.0**	**17.0**	**17.0**	**25.5**	**25.5**
Dibenz(a,h)anthracene	**4.30 J**	**4.30 J**	2.20 U	10.0 U	**6.90 J**	**6.90 J**	2.20 U	10.0 U	**3.60 J**	**3.60 J**	**3.70 J**	**3.70 J**	**4.90 J**	**4.90 J**
Fluoranthene	**31.0**	**31.0**	**33.0**	**33.0**	**66.0**	**66.0**	**19.0**	**19.0**	**31.0**	**31.0**	**22.0**	**22.0**	**39.5**	**39.5**
Indeno(1,2,3-cd)pyrene	**17.0**	**17.0**	**16.0**	**16.0**	**34.0**	**34.0**	**12.0**	**12.0**	**16.0**	**16.0**	**12.0**	**12.0**	**22.0**	**22.0**
Pyrene	**29.0**	**29.0**	**31.0**	**31.0**	**64.0**	**64.0**	**18.0**	**18.0**	**30.0**	**30.0**	**23.0**	**23.0**	**39.0**	**39.0**
Total HPAHs (full MDL/MRL)	**187 J**	**187 J**	**199 J**	**207 J**	**401 J**	**401 J**	**119 J**	**127 J**	**192 J**	**192 J**	**144 J**	**144 J**	**242 J**	**242 J**
Total HPAHs (KM)	**187 J**	**187 J**	**199 J**	**206 J**	**401 J**	**401 J**	**119 J**	**125 J**	**192 J**	**192 J**	**144 J**	**144 J**	**242 J**	**242 J**
Total HPAHs (KM-capped)	**187 J**	**187 J**	**199 J**	**206 J**	**401 J**	**401 J**	**119 J**	**125 J**	**192 J**	**192 J**	**144 J**	**144 J**	**242 J**	**242 J**

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
PAH = Polycyclic Aromatic Hydrodarbons
LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH
NC = Not calculated

J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-3
Reference Area Soil (0-0.5 ft bgs) PAH Analysis Results
(Page 2 of 2)

Site ID	R-08		R-09		R-10		R-11		R-12		R-13		R-14	
Sample ID	090128-R-R8-0-0.5So		090128-R-R9-0-0.5So		090128-R-R10-0-0.5So		090128-R-R11-0-0.5So		090128-R-R12-0-0.5So		090128-R-R13-0-0.5So		090128-R-R14-0-0.5So	
Sample Date	1/28/2009		1/28/2009		1/28/2009		1/28/2009		1/28/2009		1/28/2009		1/28/2009	
Sample Depth (feet bgs)	0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs														
Acenaphthene	**1.80 J**	**1.80 J**	1.00 U	10.0 U	**1.50 J**	**1.50 J**	1.00 U	9.90 U	**1.40 J**	**1.40 J**	1.00 U	10.0 U	1.00 U	10.0 U
Acenaphthylene	1.40 U	10.0 U	1.40 U	10.0 U	1.40 U	10.0 U	1.40 U	9.90 U	1.40 U	10.0 U	1.40 U	10.0 U	1.40 U	10.0 U
Anthracene	**2.20 J**	**2.20 J**	**3.50 J**	**3.50 J**	**2.10 J**	**2.10 J**	1.40 U	9.90 U	**1.70 J**	**1.70 J**	**1.80 J**	**1.80 J**	1.40 U	10.0 U
Fluorene	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U
Naphthalene	**1.60 J**	**1.60 J**	1.30 U	10.0 U	**1.70 J**	**1.70 J**	1.30 U	9.90 U	1.30 U	10.0 U	1.30 U	10.0 U	1.30 U	10.0 U
Phenanthrene	**18.0**	**18.0**	**13.0**	**13.0**	**11.0**	**11.0**	**5.50 J**	**5.50 J**	**9.60 J**	**9.60 J**	**8.30 J**	**8.30 J**	**5.80 J**	**5.80 J**
Total LPAHs (full MDL/MRL)	**26.7 J**	**43.6 J**	**21.9 J**	**56.5 J**	**19.4 J**	**36.3 J**	**12.3 J**	**55.0 J**	**17.1 J**	**42.7 J**	**15.5 J**	**50.1 J**	**12.6 J**	**55.8 J**
Total LPAHs (KM)	**26.5 J**	**27.3 J**	**20.5 J**	**30.5 J**	**19.2 J**	**19.8 J**	-	-	**16.6 J**	**25.4 J**	**14.1 J**	**30.3 J**	-	-
Total LPAHs (KM, capped)	**26.5 J**	**27.3 J**	**20.5 J**	**30.5 J**	**19.2 J**	**19.8 J**	**12.3 J**	**55.0 J**	**16.6 J**	**25.4 J**	**14.1 J**	**30.3 J**	**12.6 J**	**55.8 J**
HPAHs														
Benzo(a)anthracene	**16.0**	**16.0**	**13.0**	**13.0**	**10.0**	**10.0**	**7.40 J**	**7.40 J**	**12.0**	**12.0**	**8.00 J**	**8.00 J**	**4.60 J**	**4.60 J**
Benzo(a)pyrene	**22.0**	**22.0**	**15.0**	**15.0**	**15.0**	**15.0**	**8.30 J**	**8.30 J**	**16.0**	**16.0**	**10.0**	**10.0**	**7.70 J**	**7.70 J**
Benzo(b)fluoranthene	**27.0**	**27.0**	**22.0**	**22.0**	**18.0**	**18.0**	**13.0**	**13.0**	**20.0**	**20.0**	**12.0**	**12.0**	**9.10 J**	**9.10 J**
Benzo(g,h,i)perylene	**15.0**	**15.0**	**11.0**	**11.0**	**12.0**	**12.0**	**8.20 J**	**8.20 J**	**9.70 J**	**9.70 J**	**7.30 J**	**7.30 J**	**5.80 J**	**5.80 J**
Benzo(k)fluoranthene	**8.70 J**	**8.70 J**	**7.10 J**	**7.10 J**	**6.90 J**	**6.90 J**	**3.40 J**	**3.40 J**	**7.20 J**	**7.20 J**	**4.30 J**	**4.30 J**	**2.70 J**	**2.70 J**
Chrysene	**21.0**	**21.0**	**15.0**	**15.0**	**15.0**	**15.0**	**8.90 J**	**8.90 J**	**15.0**	**15.0**	**10.0**	**10.0**	**6.40 J**	**6.40 J**
Dibenz(a,h)anthracene	**4.40 J**	**4.40 J**	2.20 U	10.0 U	2.20 U	10.0 U	**2.70 J**	**2.70 J**	2.20 U	10.0 U	2.20 U	10.0 U	2.20 U	10.0 U
Fluoranthene	**31.0**	**31.0**	**26.0**	**26.0**	**21.0**	**21.0**	**13.0**	**13.0**	**21.0**	**21.0**	**15.0**	**15.0**	**10.0**	**10.0**
Indeno(1,2,3-cd)pyrene	**17.0**	**17.0**	**12.0**	**12.0**	**5.20 J**	**5.20 J**	**8.20 J**	**8.20 J**	**12.0**	**12.0**	**7.60 J**	**7.60 J**	**6.00 J**	**6.00 J**
Pyrene	**31.0**	**31.0**	**26.0**	**26.0**	**21.0**	**21.0**	**15.0**	**15.0**	**24.0**	**24.0**	**14.0**	**14.0**	**10.0**	**10.0**
Total HPAHs (full MDL/MRL)	**193 J**	**193 J**	**149 J**	**157 J**	**126 J**	**134 J**	**88.1 J**	**88.1 J**	**139 J**	**147 J**	**90.4 J**	**98.2 J**	**64.5 J**	**72.3 J**
Total HPAHs (KM)	**193 J**	**193 J**	**149 J**	**154 J**	**126 J**	**130 J**	**88.1 J**	**88.1 J**	**139 J**	**145 J**	**90.4 J**	**95.0 J**	**64.5 J**	**68.3 J**
Total HPAHs (KM-capped)	**193 J**	**193 J**	**149 J**	**154 J**	**126 J**	**130 J**	**88.1 J**	**88.1 J**	**139 J**	**145 J**	**90.4 J**	**95.0 J**	**64.5 J**	**68.3 J**

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
PAH = Polycyclic Aromatic Hydrodarbons
LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH
NC = Not calculated

J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-4
Landfill AOPC Soil (0-10 ft bgs) PCB Aroclor Analysis Results
(Page 1 of 5)

Site ID	**BIL01SSI**		**BIL02SSI**		**BIL03SSI**		**BIL04SSI**		**BIL05SSI**		**BIL06SSI***		**BIL09SSI**		**BIL10SSI**		**BIL11SSI**	
Sample ID	**990920BIL01SS**		**990920BIL02SS**		**990920BIL03SS**		**990920BIL04SS**		**990920BIL05SS**		**990920BIL06SS**		**990920BIL09SS**		**990920BIL10SS**		**990921BIL11SS**	
Sample Date	**9/20/1999**		**9/20/1999**		**9/20/1999**		**9/20/1999**		**9/20/1999**		**9/20/1999**		**9/20/1999**		**9/20/1999**		**9/21/1999**	
Sample Depth (feet bgs)	**0-0.33**		**0-0.5**		**0-0.5**		**0-0.5**		**0-0.5**		**0-0.5**		**0-0.5**		**0-0.5**		**0-0.5**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	35.0 UJ	35.0 UJ	34.0 UJ	34.0 UJ	35.0 UJ	35.0 UJ	34.0 UJ	34.0 UJ	36.0 UJ	36.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	37.0 UJ	37.0 UJ
Aroclor 1221	35.0 UJ	35.0 UJ	34.0 UJ	34.0 UJ	35.0 UJ	35.0 UJ	34.0 UJ	34.0 UJ	36.0 UJ	36.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	37.0 UJ	37.0 UJ
Aroclor 1232	35.0 UJ	35.0 UJ	34.0 UJ	34.0 UJ	35.0 UJ	35.0 UJ	34.0 UJ	34.0 UJ	36.0 UJ	36.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	37.0 UJ	37.0 UJ
Aroclor 1242	35.0 UJ	35.0 UJ	34.0 UJ	34.0 UJ	35.0 UJ	35.0 UJ	34.0 UJ	34.0 UJ	36.0 UJ	36.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	37.0 UJ	37.0 UJ
Aroclor 1248	35.0 UJ	35.0 UJ	34.0 UJ	34.0 UJ	35.0 UJ	35.0 UJ	34.0 UJ	34.0 UJ	36.0 UJ	36.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	37.0 UJ	37.0 UJ
Aroclor 1254	35.0 UJ	35.0 UJ	34.0 UJ	34.0 UJ	35.0 UJ	35.0 UJ	34.0 UJ	34.0 UJ	36.0 UJ	36.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	37.0 UJ	37.0 UJ
Aroclor 1260	**58.0 J**	**58.0 J**	**420 J**	**420 J**	**48.0 J**	**48.0 J**	**660 J**	**660 J**	**160 J**	**160 J**	**81.5 J**	**81.5 J**	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	37.0 UJ	37.0 UJ
Total PCBs as Aroclors [1]	**128 J**	**128 J**	**488 J**	**488 J**	**118 J**	**118 J**	**728 J**	**728 J**	**232 J**	**232 J**	**152 J**	**152 J**	105 UJ	105 UJ	105 UJ	105 UJ	111 UJ	111 UJ

Notes:
[1] Only Aroclors 1248, 1254, and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Landfill AOPC soil samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-4
Landfill AOPC Soil (0-10 ft bgs) PCB Aroclor Analysis Results
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Site ID	BIL12SSI		BIL13SSI		BIL01TPG		BIL02TPG		BIL03TPG		BIL04TPG		BIL05		BIL06		BIL07	
Sample ID	990921BIL12SS		000413BIL13SS		011015BIL01TPG		011015BIL02TPG		011015BIL03TPG		011015BIL04TPG		011016BIL05SS		011016BIL06SS		011016BIL07SS	
Sample Date	9/21/1999		4/13/2000		10/15/2001		10/15/2001		10/15/2001		10/15/2001		10/16/2001		10/16/2001		10/16/2001	
Sample Depth (feet bgs)	0-0.5		0-0.5		0-10		0-10		0-10		0-10		8.0		8.0		5.0	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	35.0 UJ	35.0 UJ	50.0 UJ	50.0 UJ	1.49 U	13.6 U	1.30 U	11.8 U	1.35 U	12.3 U	1.25 U	11.3 U	1.23 U	11.2 U	1.18 U	10.8 U	1.17 U	10.6 U
Aroclor 1221	35.0 UJ	35.0 UJ	50.0 UJ	50.0 UJ	6.39 U	13.6 U	5.55 U	11.8 U	5.78 U	12.3 U	5.34 U	11.3 U	5.28 U	11.2 U	5.07 U	10.8 U	5.02 U	10.6 U
Aroclor 1232	35.0 UJ	35.0 UJ	50.0 UJ	50.0 UJ	5.10 U	13.6 U	4.43 U	11.8 U	4.61 U	12.3 U	4.26 U	11.3 U	4.21 U	11.2 U	4.04 U	10.8 U	4.00 U	10.6 U
Aroclor 1242	35.0 UJ	35.0 UJ	50.0 UJ	50.0 UJ	2.73 U	13.6 U	2.37 U	11.8 U	2.47 U	12.3 U	2.28 U	11.3 U	2.25 U	11.2 U	2.16 U	10.8 U	2.14 U	10.6 U
Aroclor 1248	35.0 UJ	35.0 UJ	50.0 UJ	50.0 UJ	**968**	**968**	5.89 U	11.8 U	**61.5**	**61.5**	5.66 U	11.3 U	5.60 U	11.2 U	5.38 U	10.8 U	5.32 U	10.6 U
Aroclor 1254	35.0 UJ	35.0 UJ	50.0 UJ	50.0 UJ	2.12 U	13.6 U	1.84 U	11.8 U	1.91 U	12.3 U	1.77 U	11.3 U	1.75 U	11.2 U	**26.7**	**26.7**	1.66 U	10.6 U
Aroclor 1260	35.0 UJ	35.0 UJ	50.0 UJ	50.0 UJ	**26.3**	**26.3**	**22.2**	**22.2**	**87.6**	**87.6**	**12.5**	**12.5**	**10.2 J**	**10.2 J**	**12.8**	**12.8**	**36.7**	**36.7**
Total PCBs as Aroclors [1]	105 UJ	105 UJ	150 UJ	150 UJ	**996 J**	**1007.9 J**	**29.9 J**	**45.8 J**	**151.01 J**	**161 J**	**19.9 J**	**35.1 J**	**17.6 J**	**32.6 J**	**44.9 J**	**50.3 J**	**43.7 J**	**57.9 J**

Notes:
[1] Only Aroclors 1248, 1254, and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Landfill AOPC soil samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-4
Landfill AOPC Soil (0-10 ft bgs) PCB Aroclor Analysis Results
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Site ID	BIL08		BIL09		BIL10		BIL11*		BIL13		BIL14		BIL15		BIL16		BIL17	
Sample ID	011016BIL08SS		011016BIL09SS		011016BIL10SS		011016BIL11SS		011016BIL13SS		011016BIL14SS		011016BIL15SS		011016BIL16SS		011016BIL17SS	
Sample Date	10/16/2001		10/16/2001		10/16/2001		10/16/2001		10/16/2001		10/16/2001		10/16/2001		10/16/2001		10/16/2001	
Sample Depth (feet bgs)	5.0		6.0		5.0		8.0		4.0		6.0		8.0		4.0		1.0	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	1.18 U	10.7 U	1.27 U	11.5 U	1.14 U	10.4 U	1.32 U	12.0 U	1.23 U	11.2 U	1.20 U	10.9 U	1.21 U	11.0 U	1.16 U	10.5 U	1.36 U	12.4 U
Aroclor 1221	5.06 U	10.7 U	5.43 U	11.5 U	4.88 U	10.4 U	5.66 U	12.0 U	5.27 U	11.2 U	5.13 U	10.9 U	5.16 U	11.0 U	4.97 U	10.5 U	5.83 U	12.4 U
Aroclor 1232	4.04 U	10.7 U	4.33 U	11.5 U	3.90 U	10.4 U	4.51 U	12.0 U	4.21 U	11.2 U	4.10 U	10.9 U	4.12 U	11.0 U	3.97 U	10.5 U	4.65 U	12.4 U
Aroclor 1242	2.16 U	10.7 U	2.32 U	11.5 U	2.08 U	10.4 U	2.41 U	12.0 U	2.25 U	11.2 U	2.19 U	10.9 U	2.20 U	11.0 U	2.12 U	10.5 U	2.49 U	12.4 U
Aroclor 1248	5.37 U	10.7 U	5.76 U	11.5 U	5.18 U	10.4 U	6.00 U	12.0 U	5.60 U	11.2 U	5.45 U	10.9 U	5.48 U	11.0 U	5.27 U	10.5 U	6.19 U	12.4 U
Aroclor 1254	1.68 U	10.7 U	1.80 U	11.5 U	1.62 U	10.4 U	**55.3**	**55.3**	**499**	**499**	1.70 U	10.9 U	1.71 U	11.0 U	1.65 U	10.5 U	**78.6**	**78.6**
Aroclor 1260	1.68 U	10.7 U	**55.3**	**55.3**	1.62 U	10.4 U	**39.8**	**39.8**	**158**	**158**	**15.0**	**15.0**	**52.4**	**52.4**	**445**	**445**	**68.0**	**68.0**
Total PCBs as Aroclors [1]	8.73 U	32.1 U	**62.9 J**	**78.3 J**	8.42 U	31.2 U	**101 J**	**107 J**	**663 J**	**668 J**	**22.2 J**	**36.8 J**	**59.6 J**	**74.4 J**	**452 J**	**466 J**	**153 J**	**159 J**

Notes:
[1] Only Aroclors 1248, 1254, and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Landfill AOPC soil samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-4
Landfill AOPC Soil (0-10 ft bgs) PCB Aroclor Analysis Results
(Page 4 of 5)

Site ID	**BIL18**		**BIL19**		**BIL20**		**BIL21**		**BIL22**		**BIL28TPM**		**BIL28TPM**		**BIL01USE**		**BIL02USE**	
Sample ID	**011016BIL18SS**		**011016BIL19SS**		**011016BIL20SS**		**011016BIL21SS**		**011016BIL22SS**		**011017BIL28TPM**		**011017BIL28TPM**		**070410BIL01SS**		**070410BIL02SS**	
Sample Date	**10/16/2001**		**10/16/2001**		**10/16/2001**		**10/16/2001**		**10/16/2001**		**10/17/2001**		**10/17/2001**		**4/10/2007**		**4/10/2007**	
Sample Depth (feet bgs)	**2.0**		**5.0**		**8.0**		**5.0**		**3.0**		**0-10**		**0-10**		**0.5**		**0.5**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	1.16 U	10.5 U	1.16 U	10.6 U	1.31 U	11.9 U	1.10 U	10.0 U	1.14 U	10.4 U	1.39 U	12.7 U	1.39 U	12.7 U	3.90 U	3.90 U	3.90 U	3.90 U
Aroclor 1221	4.96 U	10.5 U	4.98 U	10.6 U	5.62 U	11.9 U	4.72 U	10.0 U	4.89 U	10.4 U	5.96 U	12.7 U	5.96 U	12.7 U	3.90 U	3.90 U	3.90 U	3.90 U
Aroclor 1232	3.96 U	10.5 U	3.97 U	10.6 U	4.49 U	11.9 U	3.77 U	10.0 U	3.90 U	10.4 U	4.76 U	12.7 U	4.76 U	12.7 U	3.90 U	3.90 U	3.90 U	3.90 U
Aroclor 1242	2.12 U	10.5 U	2.12 U	10.6 U	2.40 U	11.9 U	2.01 U	10.0 U	2.09 U	10.4 U	2.54 U	12.7 U	2.54 U	12.7 U	3.90 U	3.90 U	3.90 U	3.90 U
Aroclor 1248	5.27 U	10.5 U	5.28 U	10.6 U	5.97 U	11.9 U	5.01 U	10.0 U	5.19 U	10.4 U	6.33 U	12.7 U	6.33 U	12.7 U	3.90 U	3.90 U	3.90 U	3.90 U
Aroclor 1254	**48.4**	**48.4**	**54.9**	**54.9**	1.86 U	11.9 U	**37.2**	**37.2**	**104**	**104**	1.98 U	12.7 U	1.98 U	12.7 U	**26.0**	**26.0**	**27.0**	**27.0**
Aroclor 1260	**39.0**	**39.0**	**74.6**	**74.6**	**2.05 J**	**2.05 J**	**41.8**	**41.8**	**91.2**	**91.2**	**46.5**	**46.5**	**46.5**	**46.5**	**50.0**	**50.0**	**24.0**	**24.0**
Total PCBs as Aroclors [1]	**92.7 J**	**97.9 J**	**135 J**	**140 J**	**9.88 J**	**25.9 J**	**84.0 J**	**89.0 J**	**200 J**	**206 J**	**54.8 J**	**71.9 J**	**54.8 J**	**71.9 J**	**79.9 J**	**79.9 J**	**54.9 J**	**54.9 J**

Notes:
[1] Only Aroclors 1248, 1254, and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Landfill AOPC soil samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-4
Landfill AOPC Soil (0-10 ft bgs) PCB Aroclor Analysis Results
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Site ID	BIL03USE		BIL04USE		BIL05USE		BIL06USE		BIL07USE		BIL08USE		BIL09USE	
Sample ID	070410BIL03SS		070410BIL04SS		070410BIL05SS		070410BIL06SS		070410BIL07SS		070410BIL08SS		070410BIL09SS	
Sample Date	4/10/2007		4/10/2007		4/10/2007		4/10/2007		4/10/2007		4/10/2007		4/10/2007	
Sample Depth (feet bgs)	0.5		0.5		0.5		0.5		0.5		0.5		0.5	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	3.90 U	3.90 U	3.90 U	3.90 U	4.00 U	4.00 U	3.90 U	3.90 U	3.90 U	3.90 U	4.00 U	4.00 U	3.80 U	3.80 U
Aroclor 1221	3.90 U	3.90 U	3.90 U	3.90 U	4.00 U	4.00 U	3.90 U	3.90 U	3.90 U	3.90 U	4.00 U	4.00 U	3.80 U	3.80 U
Aroclor 1232	3.90 U	3.90 U	3.90 U	3.90 U	4.00 U	4.00 U	3.90 U	3.90 U	3.90 U	3.90 U	4.00 U	4.00 U	3.80 U	3.80 U
Aroclor 1242	3.90 U	3.90 U	3.90 U	3.90 U	4.00 U	4.00 U	3.90 U	3.90 U	3.90 U	3.90 U	4.00 U	4.00 U	3.80 U	3.80 U
Aroclor 1248	3.90 U	3.90 U	3.90 U	3.90 U	4.00 U	4.00 U	3.90 U	3.90 U	3.90 U	3.90 U	4.00 U	4.00 U	3.80 U	3.80 U
Aroclor 1254	**19.0**	**19.0**	**8.30**	**8.30**	4.00 U	4.00 U	19.0 U	19.0 U	**49.0**	**49.0**	**24.0**	**24.0**	**5.50**	**5.50**
Aroclor 1260	**31.0 J**	**31.0 J**	**33.0**	**33.0**	**12.0**	**12.0**	**92.0**	**92.0**	**74.0**	**74.0**	**42.0**	**42.0**	**19.0**	**19.0**
Total PCBs as Aroclors [1]	**53.9 J**	**53.9 J**	**45.2 J**	**45.2 J**	**20.0 J**	**20.0 J**	**115 J**	**115 J**	**127 J**	**127 J**	**70.0 J**	**70.0 J**	**28.3 J**	**28.3 J**

Notes:
[1] Only Aroclors 1248, 1254, and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Landfill AOPC soil samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-5
Sandblast Area AOPC Soil (0 to >10 ft bgs) PCB Aroclor Analysis Results
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Site ID	**DSA01**		**DSA02**		**DSA03**		**DSA04**		**DSA05**		**DSA06**		**DSA07**		**DSA08**		**DSA09**		**DSA10**	
Sample ID	**011204DSA01SS**		**011204DSA02SS**		**011204DSA03SS**		**011204DSA04SS**		**011204DSA05SS**		**011204DSA06SS**		**011204DSA07SS**		**011204DSA08SS**		**011204DSA09SS**		**011204DSA10SS**	
Sample Date	**12/4/2001**		**12/4/2001**		**12/4/2001**		**12/4/2001**		**12/4/2001**		**12/4/2001**		**12/4/2001**		**12/4/2001**		**12/4/2001**		**12/4/2001**	
Sample Depth (feet bgs)	**0.0**		**0.0**		**0.0**		**0.0**		**0.0**		**0.0**		**0.0**		**0.0**		**0.0**		**0.0**	
Media	**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	1.20 U	10.9 U	1.09 U	9.88 U	1.22 U	11.1 U	1.24 U	11.2 U	1.08 U	9.82 U	1.22 U	11.1 U	1.14 U	10.3 U	1.09 U	9.93 U	1.22 U	11.1 U	1.19 U	10.8 U
Aroclor 1221	5.13 U	10.9 U	4.66 U	9.88 U	5.23 U	11.1 U	5.29 U	11.2 U	4.63 U	9.82 U	5.22 U	11.1 U	4.87 U	10.3 U	4.68 U	9.93 U	5.21 U	11.1 U	5.10 U	10.8 U
Aroclor 1232	4.09 U	10.9 U	3.72 U	9.88 U	4.18 U	11.1 U	4.22 U	11.2 U	3.69 U	9.82 U	4.17 U	11.1 U	3.89 U	10.3 U	3.73 U	9.93 U	4.16 U	11.1 U	4.07 U	10.8 U
Aroclor 1242	2.19 U	10.9 U	1.99 U	9.88 U	2.23 U	11.1 U	2.26 U	11.2 U	1.97 U	9.82 U	2.23 U	11.1 U	2.08 U	10.3 U	2.00 U	9.93 U	2.22 U	11.1 U	2.17 U	10.8 U
Aroclor 1248	5.44 U	10.9 U	4.94 U	9.88 U	5.55 U	11.1 U	5.62 U	11.2 U	4.91 U	9.82 U	5.54 U	11.1 U	5.17 U	10.3 U	4.96 U	9.93 U	5.53 U	11.1 U	5.41 U	10.8 U
Aroclor 1254	1.70 U	10.9 U	1.54 U	9.88 U	1.73 U	11.1 U	1.75 U	11.2 U	1.53 U	9.82 U	1.73 U	11.1 U	1.61 U	10.3 U	1.55 U	9.93 U	1.73 U	11.1 U	1.69 U	10.8 U
Aroclor 1260	**2.00 J**	**2.00 J**	1.54 U	9.88 U	**2.23 J**	**2.23 J**	**2.08 J**	**2.08 J**	**7.79 J**	**7.79 J**	**16.8**	**16.8**	1.61 U	10.3 U	1.55 U	9.93 U	**2.12 J**	**2.12 J**	**2.48 J**	**2.48 J**
Aroclor 1262	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1268	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PCBs as Aroclors [1]	**3.70 J**	**12.9 J**	3.08 U	19.8 U	**3.96 J**	**13.3 J**	**3.83 J**	**13.3 J**	**9.32 J**	**17.6 J**	**18.5 J**	**27.9 J**	3.22 U	20.6 U	3.10 U	19.9 U	**3.85 J**	**13.2 J**	**4.17 J**	**13.3 J**

Notes:
[1] Only Aroclors 1254 and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Sandlbast Area AOPC soil samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-5
Sandblast Area AOPC Soil (0 to >10 ft bgs) PCB Aroclor Analysis Results
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Site ID	**DSA11***		**DSA12***		**SBB01***		**SBB03**		**SBB04**		**SBB05**		**SBB06**		**SBB07***		**SBB09**		**SBB10**	
Sample ID	**011204DSA11SS**		**011204DSA12SS**		**011205SBB01SBG**		**011205SBB03SBG**		**011205SBB04SBG**		**011205SBB05SBG**		**011205SBB06SBG**		**011205SBB07SBG**		**011205SBB09SBG**		**011205SBB10SBG**	
Sample Date	**12/4/2001**		**12/4/2001**		**12/5/2001**		**12/5/2001**		**12/5/2001**		**12/5/2001**		**12/5/2001**		**12/5/2001**		**12/5/2001**		**12/5/2001**	
Sample Depth (feet bgs)	**0.0**		**0.0**		**0-0.5**		**0-0.5**		**0-0.5**		**0-0.5**		**0-0.5**		**0-0.5**		**0-0.5**		**0-0.5**	
Media	**Soil**		**Soil**		**Sandblast Grit**		**Sandblast Grit**		**Sandblast Grit**		**Sandblast Grit**		**Sandblast Grit**		**Sandblast Grit**		**Sandblast Grit**		**Sandblast Grit**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	1.21 U	11.0 U	1.25 U	11.4 U	1.28 U	11.7 U	1.23 U	11.2 U	1.19 U	10.8 U	1.29 U	11.7 U	1.25 U	11.4 U	1.43 U	13.0 U	1.22 U	11.1 U	1.18 U	10.7 U
Aroclor 1221	5.19 U	11.0 U	5.51 U	11.4 U	5.50 U	11.7 U	5.26 U	11.2 U	5.08 U	10.8 U	5.53 U	11.7 U	5.37 U	11.4 U	6.14 U	13.0 U	5.23 U	11.1 U	5.04 U	10.7 U
Aroclor 1232	4.15 U	11.0 U	4.28 U	11.4 U	4.39 U	11.7 U	4.20 U	11.2 U	4.06 U	10.8 U	4.42 U	11.7 U	4.29 U	11.4 U	4.90 U	13.0 U	4.17 U	11.1 U	4.02 U	10.7 U
Aroclor 1242	2.22 U	11.0 U	2.29 U	11.4 U	2.35 U	11.7 U	2.25 U	11.2 U	2.17 U	10.8 U	2.36 U	11.7 U	2.29 U	11.4 U	2.62 U	13.0 U	2.23 U	11.1 U	2.15 U	10.7 U
Aroclor 1248	5.51 U	11.0 U	5.70 U	11.4 U	5.84 U	11.7 U	5.59 U	11.2 U	5.40 U	10.8 U	5.87 U	11.7 U	5.70 U	11.4 U	6.52 U	13.0 U	5.55 U	11.1 U	5.35 U	10.7 U
Aroclor 1254	1.72 U	11.0 U	1.78 U	11.4 U	1.82 U	11.7 U	1.74 U	11.2 U	1.68 U	10.8 U	1.83 U	11.7 U	1.78 U	11.4 U	2.03 U	13.0 U	1.73 U	11.1 U	1.67 U	10.7 U
Aroclor 1260	**21.0**	**21.0**	**8.30 J**	**8.30 J**	**6.44 J**	**6.44 J**	**30.6**	**30.6**	**17.7**	**17.7**	**23.7**	**23.7**	**15.5**	**15.5**	**5.78 J**	**5.78 J**	**81.8**	**81.8**	**26.0**	**26.0**
Aroclor 1262	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1268	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PCBs as Aroclors [1]	**22.7 J**	**32.0 J**	**10.1 J**	**19.7 J**	**8.26 J**	**18.1 J**	**32.3 J**	**41.8 J**	**19.4 J**	**28.5 J**	**25.5 J**	**35.4 J**	**17.3 J**	**26.9 J**	**7.81 J**	**18.8 J**	**83.5 J**	**92.9 J**	**27.7 J**	**36.7 J**

Notes:
[1] Only Aroclors 1254 and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Sandlbast Area AOPC soil samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-5
Sandblast Area AOPC Soil (0 to >10 ft bgs) PCB Aroclor Analysis Results
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Site ID	**SBB11**		**SBB12**		**SBB13**		**SBB14**		**SBB15**		**SBB15**		**SBB16**		**SBB16**		**SBB17**		**SBB17**	
Sample ID	**011205SBB11SBG**		**011205SBB12SBG**		**011205SBB13SBG**		**011205SBB14SBG**		**011205SBB15SBG**		**011205SBB21SS**		**011205SBB16SBG**		**011206SBB22ss**		**011205SBB17SBG**		**011205SBB19SS**	
Sample Date	**12/5/2001**		**12/5/2001**		**12/5/2001**		**12/5/2001**		**12/5/2001**		**12/5/2001**		**12/5/2001**		**12/6/2001**		**12/5/2001**		**12/5/2001**	
Sample Depth (feet bgs)	**0-0.5**		**0-0.5**		**2.0**		**2.0**		**0-0.5**		**1.0**		**0-0.5**		**1.5**		**0-0.5**		**3.0**	
Media	**Sandblast Grit**		**Sandblast Grit**		**Soil**		**Sandblast Grit**		**Sandblast Grit**		**Soil**		**Sandblast Grit**		**Soil**		**Sandblast Grit**		**Soil**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	1.17 U	10.6 U	1.24 U	11.3 U	1.41 U	12.8 U	1.24 U	11.3 U	1.09 U	9.90 U	1.22 U	11.1 U	1.18 U	10.8 U	1.33 U	12.1 U	1.23 U	11.2 U	1.38 U	12.5 U
Aroclor 1221	5.02 U	10.6 U	5.32 U	11.3 U	6.04 U	12.8 U	5.32 U	11.3 U	4.66 U	9.90 U	5.21 U	11.1 U	5.07 U	10.8 U	5.70 U	12.1 U	5.28 U	11.2 U	5.89 U	12.5 U
Aroclor 1232	4.00 U	10.6 U	4.24 U	11.3 U	4.82 U	12.8 U	4.24 U	11.3 U	3.72 U	9.90 U	4.16 U	11.1 U	4.05 U	10.8 U	4.55 U	12.1 U	4.21 U	11.2 U	4.70 U	12.5 U
Aroclor 1242	2.14 U	10.6 U	2.27 U	11.3 U	2.58 U	12.8 U	2.27 U	11.3 U	1.99 U	9.90 U	2.23 U	11.1 U	2.16 U	10.8 U	2.43 U	12.1 U	2.25 U	11.2 U	2.51 U	12.5 U
Aroclor 1248	5.32 U	10.6 U	5.64 U	11.3 U	6.41 U	12.8 U	5.64 U	11.3 U	4.95 U	9.90 U	5.54 U	11.1 U	5.39 U	10.8 U	6.05 U	12.1 U	5.60 U	11.2 U	6.26 U	12.5 U
Aroclor 1254	1.66 U	10.6 U	1.76 U	11.3 U	2.00 U	12.8 U	1.76 U	11.3 U	1.54 U	9.90 U	1.73 U	11.1 U	1.68 U	10.8 U	1.89 U	12.1 U	1.75 U	11.2 U	1.95 U	12.5 U
Aroclor 1260	**52.1**	**52.1**	**202**	**202**	2.00 U	12.8 U	**4.95 J**	**4.95 J**	**64.0**	**64.0**	**20.8**	**20.8**	**193**	**193**	**13.4**	**13.4**	**18.7**	**18.7**	**4.17 J**	**4.17 J**
Aroclor 1262	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1268	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PCBs as Aroclors [1]	**53.8 J**	**62.7 J**	**204 J**	**213 J**	4.00 U	25.6 U	**6.71 J**	**16.3 J**	**65.5 J**	**73.9 J**	**22.5 J**	**31.9 J**	**195 J**	**204 J**	**15.3 J**	**25.5 J**	**20.5 J**	**29.9 J**	**6.12 J**	**16.7 J**

Notes:
[1] Only Aroclors 1254 and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Sandlbast Area AOPC soil samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-5
Sandblast Area AOPC Soil (0 to >10 ft bgs) PCB Aroclor Analysis Results
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Site ID	**SBB18**		**SBB18**		**SBB23**		**SBB24**		**TRA01**		**TRA01**		**TRA02**		**TRA03**		**TRA03**		**TRA04**	
Sample ID	**011205SBB18SBG**		**011205SBB20SS**		**011206SBB23SBG**		**011206SBB24SBG**		**011204TRA01SS**		**011204TRA14SS**		**011204TRA02SS**		**011204TRA03SS**		**011204TRA13SS**		**011204TRA04SS**	
Sample Date	**12/5/2001**		**12/5/2001**		**12/6/2001**		**12/6/2001**		**12/4/2001**		**12/4/2001**		**12/4/2001**		**12/4/2001**		**12/4/2001**		**12/4/2001**	
Sample Depth (feet bgs)	**0-0.5**		**2.5**		**0-0.5**		**0-0.5**		**0-1**		**3.0**		**0-1**		**0-1**		**1.8**		**0-1**	
Media	**Sandblast Grit**		**Soil**		**Sandblast Grit**		**Sandblast Grit**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	1.20 U	10.9 U	1.45 U	13.2 U	1.32 U	12.0 U	1.28 U	11.6 U	1.20 U	10.9 U	1.38 U	12.6 U	1.16 U	10.6 U	1.22 U	11.1 U	1.28 U	11.7 U	1.25 U	11.4 U
Aroclor 1221	5.15 U	10.9 U	6.21 U	13.2 U	5.67 U	12.0 U	5.49 U	11.6 U	5.16 U	10.9 U	5.91 U	12.6 U	4.98 U	10.6 U	5.24 U	11.1 U	5.49 U	11.7 U	5.37 U	11.4 U
Aroclor 1232	4.11 U	10.9 U	4.95 U	13.2 U	4.53 U	12.0 U	4.38 U	11.6 U	4.12 U	10.9 U	4.72 U	12.6 U	3.98 U	10.6 U	4.18 U	11.1 U	4.39 U	11.7 U	4.28 U	11.4 U
Aroclor 1242	2.20 U	10.9 U	2.65 U	13.2 U	2.42 U	12.0 U	2.34 U	11.6 U	2.20 U	10.9 U	2.52 U	12.6 U	2.13 U	10.6 U	2.24 U	11.1 U	2.34 U	11.7 U	2.29 U	11.4 U
Aroclor 1248	5.46 U	10.9 U	6.59 U	13.2 U	6.02 U	12.0 U	5.82 U	11.6 U	5.47 U	10.9 U	6.28 U	12.6 U	5.29 U	10.6 U	5.57 U	11.1 U	5.83 U	11.7 U	5.70 U	11.4 U
Aroclor 1254	1.70 U	10.9 U	2.06 U	13.2 U	1.88 U	12.0 U	1.82 U	11.6 U	1.71 U	10.9 U	1.96 U	12.6 U	1.65 U	10.6 U	1.74 U	11.1 U	1.82 U	11.7 U	1.78 U	11.4 U
Aroclor 1260	**17.4**	**17.4**	2.06 U	13.2 U	**7.09 J**	**7.09 J**	**6.95 J**	**6.95 J**	**23.5**	**23.5**	1.96 U	12.6 U	**42.2**	**42.2**	**43.2**	**43.2**	**2.64 J**	**2.64 J**	**98.8**	**98.8**
Aroclor 1262	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1268	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PCBs as Aroclors [1]	**19.1 J**	**28.3 J**	4.12 U	26.4 U	**8.97 J**	**19.1 J**	**8.77 J**	**18.6 J**	**25.2 J**	**34.4 J**	3.92 U	25.2 U	**43.9 J**	**52.8 J**	**44.9 J**	**54.3 J**	**4.46 J**	**14.3 J**	**101 J**	**110 J**

Notes:
[1] Only Aroclors 1254 and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Sandlbast Area AOPC soil samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-5
Sandblast Area AOPC Soil (0 to >10 ft bgs) PCB Aroclor Analysis Results
(Page 5 of 8)

Site ID	**TRA05**		**TRA05**		**TRA06***		**TRA07**		**TRA07**		**TRA09***		**TRA11**		**TRA12**		**DP5**		**DP6**	
Sample ID	**011204TRA05SS**		**011206TRA16ss**		**011204TRA06SS**		**011204TRA07SS**		**011206TRA15ss**		**011204TRA09SS**		**011204TRA11SS**		**011204TRA12SS**		**041116SGA02SS**		**041117SGA04SS**	
Sample Date	**12/4/2001**		**12/6/2001**		**12/4/2001**		**12/4/2001**		**12/6/2001**		**12/4/2001**		**12/4/2001**		**12/4/2001**		**11/16/2004**		**11/17/2004**	
Sample Depth (feet bgs)	**0-1**		**2.5**		**0-1**		**0-1**		**2.0**		**0-1**		**0-1**		**0-1**		**21-23**		**15-17**	
Media	**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	1.25 U	11.3 U	1.28 U	11.6 U	1.28 U	11.7 U	1.31 U	11.9 U	1.24 U	11.3 U	1.32 U	12.0 U	1.27 U	11.5 U	1.27 U	11.6 U	2.61 U	8.84 U	2.85 U	9.67 U
Aroclor 1221	5.34 U	11.3 U	5.47 U	11.6 U	5.49 U	11.7 U	5.61 U	11.9 U	5.33 U	11.3 U	5.67 U	12.0 U	5.42 U	11.5 U	5.44 U	11.6 U	2.61 U	8.84 U	2.85 U	9.67 U
Aroclor 1232	4.26 U	11.3 U	4.36 U	11.6 U	4.39 U	11.7 U	4.48 U	11.9 U	4.25 U	11.3 U	4.52 U	12.0 U	4.33 U	11.5 U	4.35 U	11.6 U	2.61 U	8.84 U	2.85 U	9.67 U
Aroclor 1242	2.28 U	11.3 U	2.33 U	11.6 U	2.22 U	11.1 U	2.39 U	11.9 U	2.27 U	11.3 U	2.42 U	12.0 U	2.31 U	11.5 U	2.32 U	11.6 U	2.61 U	8.84 U	2.85 U	9.67 U
Aroclor 1248	5.67 U	11.3 U	5.80 U	11.6 U	5.83 U	11.7 U	5.95 U	11.9 U	5.66 U	11.3 U	6.02 U	12.0 U	5.75 U	11.5 U	5.78 U	11.6 U	2.61 U	8.84 U	2.85 U	9.67 U
Aroclor 1254	1.77 U	11.3 U	1.81 U	11.6 U	1.82 U	11.7 U	1.86 U	11.9 U	1.76 U	11.3 U	1.88 U	12.0 U	1.80 U	11.5 U	1.80 U	11.6 U	1.43 U	8.84 U	1.57 U	9.67 U
Aroclor 1260	**121**	**121**	1.81 U	11.6 U	**65.8**	**65.8**	**21.7**	**21.7**	**4.42 J**	**4.42 J**	**26.8**	**26.8**	**282**	**282**	**96.2**	**96.2**	1.43 U	8.84 U	1.57 U	9.67 U
Aroclor 1262	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1268	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PCBs as Aroclors [1]	**123 J**	**132 J**	3.62 U	23.2 U	**67.6 J**	**77.5 J**	**23.6 J**	**33.6 J**	**6.18 J**	**15.7 J**	**28.7 J**	**38.8 J**	**284 J**	**294 J**	**98.0 J**	**108 J**	2.86 U	17.7 U	3.14 U	19.3 U

Notes:
[1] Only Aroclors 1254 and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Sandlbast Area AOPC soil samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-5
Sandblast Area AOPC Soil (0 to >10 ft bgs) PCB Aroclor Analysis Results
(Page 6 of 8)

Site ID	**DP7***		**DP8**		**DP9**		**HA1***		**HA2**		**HA3**		**HA9**		**HA10**		**HA11**		**HA11**	
Sample ID	**041117SGA05SS**		**041117SGA08SS**		**041117SGA09SS**		**041122SGA14SS**		**041122SGA16SS**		**041122SGA17SS**		**041123SGA28SS**		**041123SGA29SS**		**041123SGA30SS**		**041123SGA31SS**	
Sample Date	**11/17/2004**		**11/17/2004**		**11/17/2004**		**11/22/2004**		**11/22/2004**		**11/22/2004**		**11/23/2004**		**11/23/2004**		**11/23/2004**		**11/23/2004**	
Sample Depth (feet bgs)	**14-16.5**		**13-15**		**14-17**		**0.5**		**0.5**		**0.5**		**0.5**		**0.5**		**1.0**		**3.0**	
Media	**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	2.76 U	9.34 U	2.65 U	8.98 U	3.00 U	10.2 U	3.41 U	11.6 U	3.01 U	10.2 U	3.23 U	10.9 U	3.15 U	10.7 U	2.90 U	9.83 U	3.48 U	11.8 U	3.47 U	11.8 U
Aroclor 1221	2.76 U	9.34 U	2.65 U	8.98 U	3.00 U	10.2 U	3.41 U	11.6 U	3.01 U	10.2 U	3.23 U	10.9 U	3.15 U	10.7 U	2.90 U	9.83 U	3.48 U	11.8 U	3.47 U	11.8 U
Aroclor 1232	2.76 U	9.34 U	2.65 U	8.98 U	3.00 U	10.2 U	3.41 U	11.6 U	3.01 U	10.2 U	3.23 U	10.9 U	3.15 U	10.7 U	2.90 U	9.83 U	3.48 U	11.8 U	3.47 U	11.8 U
Aroclor 1242	2.76 U	9.34 U	2.65 U	8.98 U	3.00 U	10.2 U	3.41 U	11.6 U	3.01 U	10.2 U	3.23 U	10.9 U	3.15 U	10.7 U	2.90 U	9.83 U	3.48 U	11.8 U	3.47 U	11.8 U
Aroclor 1248	2.76 U	9.34 U	2.65 U	8.98 U	3.00 U	10.2 U	3.41 U	11.6 U	3.01 U	10.2 U	3.23 U	10.9 U	3.15 U	10.7 U	2.90 U	9.83 U	3.48 U	11.8 U	3.47 U	11.8 U
Aroclor 1254	1.51 U	9.34 U	1.45 U	8.98 U	1.65 U	10.2 U	1.87 U	11.6 U	1.65 U	10.2 U	1.77 U	10.9 U	1.73 U	10.7 U	1.59 U	9.83 U	1.91 U	11.8 U	1.91 U	11.8 U
Aroclor 1260	1.51 U	9.34 U	1.45 U	8.98 U	1.65 U	10.2 U	**8.54 J**	**8.54 J**	**4.11 J**	**4.11 J**	**26.1**	**26.1**	**11.9**	**11.9**	1.59 U	9.83 U	**6.40 J**	**6.40 J**	1.91 U	11.8 U
Aroclor 1262	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1268	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PCBs as Aroclors [1]	3.02 U	18.7 U	2.90 U	18.0 U	3.30 U	20.4 U	**10.4 J**	**20.1 J**	**5.76 J**	**14.3 J**	**27.9 J**	**37.0 J**	**13.6 J**	**22.6 J**	3.18 U	19.7 U	**8.31 J**	**18.2 J**	3.82 U	23.6 U

Notes:
[1] Only Aroclors 1254 and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Sandlbast Area AOPC soil samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-5
Sandblast Area AOPC Soil (0 to >10 ft bgs) PCB Aroclor Analysis Results
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Site ID	**LD-01**		**LD-01**		**LD-02**		**LD-02**		**LD-03**		**LD-03**		**LD-04**		**LD-04**		**LD-05**		**LD-05**	
Sample ID	**090320-LD-1So-0-1**		**090320-LD-1So-1-3**		**090320-LD-2So-0-1**		**090320-LD-2So-1-3**		**090320-LD-3So-0-1**		**090320-LD-3So-1-3**		**090320-LD-4So-0-1**		**090320-LD-4So-1-3**		**090320-LD-5So-0-1**		**090320-LD-5So-1-3**	
Sample Date	**3/20/2009**		**3/20/2009**		**3/20/2009**		**3/20/2009**		**3/20/2009**		**3/20/2009**		**3/20/2009**		**3/20/2009**		**3/20/2009**		**3/20/2009**	
Sample Depth (feet bgs)	**0-1**		**1-3**		**0-1**		**1-3**		**0-1**		**1-3**		**0-1**		**1-3**		**0-1**		**1-3**	
Media	**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	9.80 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	9.90 U	11.0 U	49.0 U	2.10 U	9.70 U
Aroclor 1221	2.10 U	20.0 U	2.10 U	20.0 U	2.10 U	20.0 U	2.10 U	20.0 U	2.10 U	20.0 U	2.10 U	20.0 U	2.10 U	20.0 U	2.10 U	20.0 U	11.0 U	98.0 U	2.10 U	20.0 U
Aroclor 1232	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	9.80 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	9.90 U	11.0 U	49.0 U	2.10 U	9.70 U
Aroclor 1242	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	9.80 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	9.90 U	11.0 U	49.0 U	2.10 U	9.70 U
Aroclor 1248	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	9.80 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	9.90 U	11.0 U	49.0 U	2.10 U	9.70 U
Aroclor 1254	**700**	**700**	**23.0**	**23.0**	**280**	**280**	**16.0**	**16.0**	**160**	**160**	**11.0**	**11.0**	2.10 U	10.0 U	2.10 U	9.90 U	**1,500**	**1,500**	**230**	**230**
Aroclor 1260	**690**	**690**	**22.0**	**22.0**	**130**	**130**	**18.0**	**18.0**	**160**	**160**	**11.0**	**11.0**	2.10 U	10.0 U	2.10 U	9.90 U	**480**	**480**	**130**	**130**
Aroclor 1262	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	9.80 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	9.90 U	11.0 U	49.0 U	2.10 U	9.70 U
Aroclor 1268	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	9.80 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	9.90 U	11.0 U	49.0 U	2.10 U	9.70 U
Total PCBs as Aroclors [1]	**1390**	**1390**	**45.0**	**45.0**	**410**	**410**	**34.0**	**34.0**	**320**	**320**	**22.0**	**22.0**	4.20 U	20.0 U	4.20 U	19.8 U	**1980**	**1980**	**360**	**360**

Notes:
[1] Only Aroclors 1254 and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Sandlbast Area AOPC soil samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-5
Sandblast Area AOPC Soil (0 to >10 ft bgs) PCB Aroclor Analysis Results
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Site ID	**LD-06**		**LD-07**		**LD-08**		**LD-09**		**LD-10**		**LD-11***		**SB-EUA***		**SB-EUB**	
Sample ID	**090319-LD-6-So**		**090319-LD-7-So**		**090319-LD-8-So**		**090319-LD-9-So**		**090319-LD-10-So**		**090319-LD-11-So**		**090318-SB-EUA-So**		**090318-SB-EUB-So**	
Sample Date	**3/19/2009**		**3/19/2009**		**3/19/2009**		**3/19/2009**		**3/19/2009**		**3/19/2009**		**3/18/2009**		**3/18/2009**	
Sample Depth (feet bgs)	**0-0.17**		**0-0.17**		**0-0.17**		**0-0.17**		**0-0.17**		**0-0.17**		**0-0.17**		**0-0.17**	
Media	**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**		**Soil**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	2.10 U	9.90 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	11.0 U	50.0 U	2.10 U	9.90 U	2.10 U	6.30 U	2.10 U	6.60 U
Aroclor 1221	2.10 U	20.0 U	2.10 U	20.0 U	2.10 U	20.0 U	2.10 U	20.0 U	11.0 U	100 U	2.10 U	20.0 U	2.10 U	13.0 U	2.10 U	14.0 U
Aroclor 1232	2.10 U	9.90 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	11.0 U	50.0 U	2.10 U	9.90 U	2.10 U	6.30 U	2.10 U	6.60 U
Aroclor 1242	2.10 U	9.90 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	11.0 U	50.0 U	2.10 U	9.90 U	2.10 U	6.30 U	2.10 U	6.60 U
Aroclor 1248	2.10 U	9.90 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	11.0 U	50.0 U	2.10 U	9.90 U	2.10 U	6.30 U	2.10 U	6.60 U
Aroclor 1254	2.10 U	9.90 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	**1,700**	**1,700**	**475**	**475**	2.10 U	6.30 U	2.10 U	6.60 U
Aroclor 1260	**50.0**	**50.0**	**660 J**	**660 J**	2.10 U	10.0 U	**7.50 J**	**7.50 J**	**440**	**440**	**215**	**215**	**27.0**	**27.0**	**67.0**	**67.0**
Aroclor 1262	2.10 U	9.90 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	11.0 U	50.0 U	2.10 U	9.90 U	2.10 U	6.30 U	2.10 U	6.60 U
Aroclor 1268	2.10 U	9.90 U	2.10 U	10.0 U	2.10 U	10.0 U	2.10 U	10.0 U	11.0 U	50.0 U	2.10 U	9.90 U	2.10 U	6.30 U	2.10 U	6.60 U
Total PCBs as Aroclors [1]	**52.1 J**	**59.9 J**	**662 J**	**670 J**	4.20 U	20.0 U	**9.60 J**	**17.5 J**	**2140**	**2140**	**690**	**690**	**29.1 J**	**33.3 J**	**69.1 J**	**73.6 J**

Notes:
[1] Only Aroclors 1254 and 1260 were included in summing Total PCBs as Aroclors because all other aroclors were undected in Sandlbast Area AOPC soil samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-6
Bulb Slope AOPC Soil (0-1 ft bgs) PCB Aroclor Analysis Results
(Page 1 of 2)

Site ID	**AREA A04**		**AREA A05**		**AREA B06**		**AREA B07**		**AREA C01**		**AREA C02***	
Sample ID	**021120BSA04SS**		**021120BSA05SS**		**021120BSB06SS**		**021120BSB07SS**		**021120BSC01SS**		**021120BSC02SS**	
Sample Date	**11/20/2002**		**11/20/2002**		**11/20/2002**		**11/20/2002**		**11/20/2002**		**11/20/2002**	
Sample Depth (feet bgs)	**0.17-0.33**		**0.17-0.33**		**0.17-0.33**		**0.17-0.33**		**0.08-0.25**		**0.17-0.33**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	20.0 U	20.0 U	19.0 U	19.0 U	19.0 U	19.0 U	20.0 U	20.0 U	20.0 U	20.0 U	19.0 U	19.0 U
Aroclor 1221	40.0 U	40.0 U	39.0 U	39.0 U	38.0 U	38.0 U	39.0 U	39.0 U	39.0 U	39.0 U	38.0 U	38.0 U
Aroclor 1232	20.0 U	20.0 U	19.0 U	19.0 U	19.0 U	19.0 U	20.0 U	20.0 U	20.0 U	20.0 U	19.0 U	19.0 U
Aroclor 1242	20.0 U	20.0 U	19.0 U	19.0 U	19.0 U	19.0 U	20.0 U	20.0 U	20.0 U	20.0 U	19.0 U	19.0 U
Aroclor 1248	20.0 U	20.0 U	19.0 U	19.0 U	19.0 U	19.0 U	20.0 U	20.0 U	20.0 U	20.0 U	19.0 U	19.0 U
Aroclor 1254	20.0 U	54.0 U	19.0 U	19.0 U	19.0 U	33.0 U	20.0 U	20.0 U	20.0 U	20.0 U	19.0 U	19.0 U
Aroclor 1260	**78.0**	**78.0**	**37.0**	**37.0**	**160**	**160**	**35.0**	**35.0**	**27.0**	**27.0**	19.0 U	19.0 U
Total PCBs as Aroclors [1]	**78.0**	**78.0**	**37.0**	**37.0**	**160**	**160**	**35.0**	**35.0**	**27.0**	**27.0**	19.0 U	19.0 U

Notes:

[1] Only Aroclor 1260 was included in summing Total PCBs as Aroclors because all other aroclors were undected in Bulb Slope AOPC soil samples.

MDL = method detection limit

MRL = method reporting limit

bold = analyte detected above MDL.

J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.

* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

All units are in micrograms per kilogram (µg/kg), dry weight

Table H-6
Bulb Slope AOPC Soil (0-1 ft bgs) PCB Aroclor Analysis Results
(Page 2 of 2)

Site ID	**AREA C08**		**AREA C09**		**PILE #3 BANK #1**		**PILE #3 BANK #2**		**PILE #3 BANK #3**		**PILE #3 BANK #4**	
Sample ID	**021120BSC08SS**		**021120BSC09SS**		**020419P3B1SD**		**020419P3B2SD**		**020419P3B3SD**		**020419P3B4SD**	
Sample Date	**11/20/2002**		**11/20/2002**		**4/19/2002**		**4/19/2002**		**4/19/2002**		**4/19/2002**	
Sample Depth (feet bgs)	**0.17-0.33**		**0.17-0.33**		**0**		**0**		**0**		**0**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	20.0 U	20.0 U	20.0 U	20.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U
Aroclor 1221	39.0 U	39.0 U	40.0 U	40.0 U	134 U	134 U	134 U	134 U	134.0 U	134.0 U	134 U	134 U
Aroclor 1232	20.0 U	20.0 U	20.0 U	20.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U
Aroclor 1242	20.0 U	20.0 U	20.0 U	20.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U
Aroclor 1248	20.0 U	20.0 U	20.0 U	20.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U
Aroclor 1254	20.0 U	20.0 U	20.0 U	20.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U	67.0 U
Aroclor 1260	**51.0**	**51.0**	20.0 U	20.0 U	67.0 U	67.0 U	**76.1**	**76.1**	67.0 U	67.0 U	**251**	**251**
Total PCBs as Aroclors [1]	**51.0**	**51.0**	20.0 U	20.0 U	67.0 U	67.0 U	**76.1**	**76.1**	67.0 U	67.0 U	**251**	**251**

Notes:

[1] Only Aroclor 1260 was included in summing Total PCBs as Aroclors because all other aroclors were undected in Bulb Slope AOPC soil samples.

MDL = method detection limit

MRL = method reporting limit

bold = analyte detected above MDL.

J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.

* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

All units are in micrograms per kilogram (µg/kg), dry weight

Table H-7
Smallmouth Bass and Sucker PCB Congener Analysis Results
(Page 1 of 12)

IUPAC #	COELUTING CONGENERS1	Forebay 01 060605100SB 6/5/2006		Forebay 02 060605101SB 6/5/2006		Forebay 03 060605200SB 6/5/2006		Forebay 04 060605201SB 6/5/2006		Forebay 05 060605202SB 6/5/2006		Forebay 06 060605203SB 6/5/2006	
Individual Congeners in pg/g (ng/kg), wet weight													
1		0.186	UJ	0.650	J	0.747	J	0.234	UJ	0.189	UJ	0.346	J
2		0.0880	EMPC	0.698	J	0.482	J	0.129	J	0.276	J	0.407	J
3		0.144	UJ	0.437	UJ	0.438	UJ	0.125	UJ	0.154	UJ	0.378	UJ
4		1.62	J	4.27	J	2.03	J	1.93	J	1.53	J	3.58	J
5		0.124	UJ	0.285	J	0.193	J	0.138	J	0.0720	J	0.222	J
6		0.756	J	2.01	J	1.95	J	1.07	J	1.01	J	1.98	J
7		0.154	J	0.610	J	0.366	J	0.250	J	0.234	J	0.428	J
8		3.33	J	8.87	J	4.46	J	5.10	J	4.44	J	8.56	J
9		0.217	J	0.664	J	0.361	J	0.297	J	0.283	J	0.600	J
10		0.114	UJ	0.267	J	0.125	UJ	0.112	UJ	0.0980	J	0.186	J
11		9.35	J	92.7	J	11.5	J	8.08	J	25.4	J	41.4	J
12	12 + 13	0.111	C UJ	1.12	C J	1.48	C J	0.317	C J	0.0585	C UJ	0.736	C J
13	12 + 13		C12 J		C12 J		C12 J		C12 J		C12 J		C12 J
14		0.112	UJ	0.149	J	0.123	UJ	0.107	UJ	0.0587	UJ	0.0920	J
15		1.25	J	2.68	J	1.31	J	1.02	J	0.809	J	1.91	J
16		4.05	J	11.1	J	5.60	J	8.25	J	6.42	J	11.8	J
17		6.52	J	24.2	J	10.1	J	16.7	J	10.2	J	20.9	J
18	18 + 30	13.9	C J	40.3	C J	19.4	C J	34.3	C J	21.9	C J	43.6	C J
19		1.42	J	3.18	J	1.65	J	2.24	J	1.74	J	3.35	J
20	20 + 28	66.1	C J	255	C J	132	C J	196	C J	99.9	C J	241	C J
21	21 + 33	13.4	C J	34.9	C J	16.8	C J	40.5	C J	18.7	C J	42.7	C J
22		12.4	J	32.9	J	13.2	J	34.1	J	19.2	J	50.5	J
23		0.0849	UJ	0.342	J	0.153	J	0.140	J	0.0860	J	0.293	J
24		0.271	J	0.667	J	0.315	J	0.496	J	0.405	J	1.00	J
25		2.36	J	21.1	J	4.53	J	6.41	J	3.86	J	10.5	J
26	26 + 29	7.60	C J	43.6	C J	13.2	C J	21.4	C J	10.5	C J	28.3	C J
27		0.875	J	4.66	J	1.48	J	2.01	J	1.46	J	3.80	J
28	20 + 28		C20 J		C20 J		C20 J		C20 J		C20 J		C20 J
29	26 + 29		C26 J		C26 J		C26 J		C26 J		C26 J		C26 J
30	18 + 30		C18 J		C18 J		C18 J		C18 J		C18 J		C18 J
31		32.3	J	150	J	46.4	J	90.7	J	55.6	J	147	J
32		2.13	J	12.1	J	2.71	J	6.56	J	2.87	J	6.36	J
33	21 + 33		C21 J		C21 J		C21 J		C21 J		C21 J		C21 J
34		0.0880	J	1.23	J	0.286	J	0.297	J	0.222	J	0.764	J
35		0.0861	UJ	0.0894	UJ	0.148	EMPC	0.129	UJ	0.0812	UJ	0.0808	UJ
36		0.0781	UJ	0.0811	UJ	0.0839	UJ	0.118	UJ	0.0737	UJ	0.0734	UJ
37		5.02	J	39.8	J	13.4	J	6.44	J	6.15	J	17.1	J
38		0.0790	EMPC	1.65	EMPC	0.176	EMPC	0.149	EMPC	0.112	EMPC	0.253	EMPC
39		0.504	J	8.73	EMPC	0.859	J	0.930	EMPC	0.507	J	1.65	J
40	40 + 41 + 71	28.9	C J	1,180	C J	43.8	C J	64.5	C J	42.2	C J	114	C J
41	40 + 41 + 71		C40 J		C40 J		C40 J		C40 J		C40 J		C40 J
42		21.8	J	544	J	42.4	J	43.9	J	31.6	J	112	J
43		4.32	J	91.7	J	9.09	J	13.2	J	7.36	J	18.1	J
44	44 + 47 + 65	152	C J	6,390	C J	1,290	C J	401	C J	253	C J	641	C J
45	45 + 51	6.02	C J	105	C J	10.8	C J	12.9	C J	10.7	C J	29.8	C J
46		1.22	J	15.9	J	1.58	J	2.55	J	2.27	J	4.43	J
47	44 + 47 + 65		C44 J		C44 J		C44 J		C44 J		C44 J		C44 J
48		19.4	J	352	J	32.2	J	46.2	J	25.9	J	79.0	J
49	49 + 69	121	C J	5,360	C J	1,490	C J	317	C J	179	C J	545	C J
50	50 + 53	5.72	C J	249	C J	8.88	C J	10.1	C J	8.80	C J	26.9	C J
51	45 + 51		C45 J		C45 J		C45 J		C45 J		C45 J		C45 J
52		289	J	18,500	J	3,240	J	723	J	476	J	1,220	J
53	50 + 53		C50 J		C50 J		C50 J		C50 J		C50 J		C50 J
54		0.0690	J	1.81	J	0.140	UJ	0.336	J	0.190	J	0.523	J
55		0.202	UJ	0.840	UJ	0.563	UJ	0.311	UJ	0.225	UJ	0.549	UJ
56		18.9	J	1,030	J	272	J	45.6	J	43.9	J	136	J
57		0.920	J	4.37	J	6.79	J	2.03	J	1.44	J	3.01	J
58		0.430	J	0.834	UJ	0.559	UJ	1.51	J	0.221	UJ	0.541	UJ
59	59 + 62 + 75	12.5	C J	131	C J	28.8	C J	31.3	C J	18.2	C J	48.8	C J
60		66.7	J	1,410	J	1,200	J	226	J	91.2	J	237	J
61	61 + 70 + 74 + 76	464	C J	23,500	C J	19,500	C J	1,410	C J	729	C J	2,260	C J
62	59 + 62 + 75		C59 J		C59 J		C59 J		C59 J		C59 J		C59 J
63		24.3	J	368	J	451	J	59.2	J	27.6	J	69.7	J
64		68.3	J	2,610	J	113	J	167	J	113	J	317	J
65	44 + 47 + 65		C44 J		C44 J		C44 J		C44 J		C44 J		C44 J
66		401	J	10,300	J	10,300	J	1,030	J	483	J	1,160	J
67		2.44	J	27.2	J	23.5	J	8.32	J	3.64	J	11.6	J
68		6.74	J	23.5	J	30.1	J	9.21	J	7.08	J	14.4	J
69	49 + 69		C49 J		C49 J		C49 J		C49 J		C49 J		C49 J
70	61 + 70 + 74 + 76		C61 J		C61 J		C61 J		C61 J		C61 J		C61 J
71	40 + 41 + 71		C40 J		C40 J		C40 J		C40 J		C40 J		C40 J
72		4.75	J	39.8	J	33.0	J	12.0	J	7.05	J	15.9	J
73		0.0495	UJ	0.0499	UJ	0.127	UJ	0.0805	UJ	0.0616	UJ	0.0496	UJ
74	61 + 70 + 74 + 76		C61 J		C61 J		C61 J		C61 J		C61 J		C61 J
75	59 + 62 + 75		C59 J		C59 J		C59 J		C59 J		C59 J		C59 J
76	61 + 70 + 74 + 76		C61 J		C61 J		C61 J		C61 J		C61 J		C61 J
77		24.1	J	165	J	205	J	44.8	J	31.5	J	70.3	J
78		0.776	J	16.2	J	31.4	J	1.94	J	0.226	UJ	0.551	UJ
79		4.67	J	683	J	596	J	12.4	J	9.99	J	54.2	J
80		0.176	UJ	0.734	UJ	0.492	UJ	0.279	UJ	0.202	UJ	0.493	UJ
81		1.43	J	19.5	J	23.8	J	3.84	J	2.05	J	4.22	J
82		49.1	J	10,100	J	680	J	78.1	J	95.2	J	296	J
83	83 + 99	1,550	C J	75,300	C J	63,200	C J	5,230	C J	1,820	C J	5,930	C J
84		65.3	J	14,200	J	196	J	125	J	154	J	438	J
85	85 + 116 + 117	464	C J	23,400	C J	18,600	C J	1,470	C J	549	C J	1,650	C J
86	86 + 87 + 97 + 108 + 119 + 125	750	C J	78,300	C J	22,600	C J	1,480	C J	934	C J	3,740	C J
87	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86 J		C86 J		C86 J		C86 J		C86 J
88	88 + 91	79.4	C J	10,500	C J	608	C J	144	C J	126	C J	487	C J
89		1.87	J	347	J	3.28	J	4.08	J	3.90	J	10.3	J
90	90 + 101 + 113	1,490	C J	117,000	C J	35,800	C J	3,020	C J	1,750	C J	6,610	C J
91	88 + 91		C88 J		C88 J		C88 J		C88 J		C88 J		C88 J
92		272	J	17,600	J	3,430	J	669	J	353	J	1,040	J
93	93 + 95 + 98 + 100 + 102	437	C J	47,700	C J	6,020	C J	939	C J	659	C J	2,360	C J
94		0.746	UJ	88.1	J	1.27	J	1.14	J	1.48	J	5.90	J
95	93 + 95 + 98 + 100 + 102		C93 J		C93 J		C93 J		C93 J		C93 J		C93 J
96		1.41	J	161	J	2.72	J	3.82	J	2.37	J	6.22	J
97	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86 J		C86 J		C86 J		C86 J		C86 J
98	93 + 95 + 98 + 100 + 102		C93 J		C93 J		C93 J		C93 J		C93 J		C93 J
99	83 + 99		C83 J		C83 J		C83 J		C83 J		C83 J		C83 J
100	93 + 95 + 98 + 100 + 102		C93 J		C93 J		C93 J		C93 J		C93 J		C93 J
101	90 + 101 + 113		C90 J		C90 J		C90 J		C90 J		C90 J		C90 J
102	93 + 95 + 98 + 100 + 102		C93 J		C93 J		C93 J		C93 J		C93 J		C93 J
103		5.30	J	306	J	52.3	J	10.9	J	8.31	J	28.5	J
104		0.0667	UJ	0.994	J	0.252	UJ	0.156	EMPC	0.112	EMPC	0.536	J
105		966	J	50,400	J	45,500	J	2,980	J	1,230	J	3,540	J
106		0.375	UJ	4.07	UJ	3.99	UJ	0.748	UJ	0.433	UJ	0.753	UJ
107	107 + 124	64.3	C J	3,230	C J	3,810	C J	118	C J	60.3	C J	377	C J
108	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86 J		C86 J		C86 J		C86 J		C86 J
109		295	J	8,940	J	10,600	J	584	J	317	J	954	J
110	110 + 115	1,080	C J	120,000	C J	7,140	C J	2,190	C J	1,500	C J	4,920	C J
111		2.87	J	4.22	J	5.84	J	6.44	J	3.53	J	5.73	EMPC
112		0.479	UJ	1.01	UJ	0.365	UJ	0.231	UJ	0.590	UJ	0.178	UJ
113	90 + 101 + 113		C90 J		C90 J		C90 J		C90 J		C90 J		C90 J
114		92.6	J	3,200	J	4,040	J	281	J	106	J	337	J
115	110 + 115		C110 J		C110 J		C110 J		C110 J		C110 J		C110 J
116	85 + 116 + 117		C85 J		C85 J		C85 J		C85 J		C85 J		C85 J
117	85 + 116 + 117		C85 J		C85 J		C85 J		C85 J		C85 J		C85 J
118		3,310	J	138,000	J	132,000	J	8,310	J	3,610	J	10,800	J
119	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86 J		C86 J		C86 J		C86 J		C86 J
120		15.0	J	51.7	J	35.1	J	28.2	J	17.5	J	28.5	J
121		1.32	J	4.33	J	1.56	J	3.64	J	1.80	J	3.53	J
122		0.413	UJ	474	J	523	J	0.876	UJ	11.0	J	56.3	J
123		55.7	J	1,600	J	2,450	J	118	J	63.3	J	217	J
124	107 + 124		C107 J		C107 J		C107 J		C107 J		C107 J		C107 J
125	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86 J		C86 J		C86 J		C86 J		C86 J
126		5.05	J	55.3	J	75.5	J	9.74	J	8.07	J	15.9	J

Table H-7
Smallmouth Bass and Sucker PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Forebay 01 060605100SB 6/5/2006		Forebay 02 060605101SB 6/5/2006		Forebay 03 060605200SB 6/5/2006		Forebay 04 060605201SB 6/5/2006		Forebay 05 060605202SB 6/5/2006		Forebay 06 060605203SB 6/5/2006	
127		6.90	J	241	J	265	J	26.8	J	7.03	J	34.4	J
128	128 + 166	603	C J	30,800	C J	21,000	C J	2,300	C J	806	C J	2,500	C J
129	129 + 138 + 160 + 163	4,320	C J	168,000	C J	126,000	C J	14,000	C J	5,220	C J	16,200	C J
130		172	J	9,060	J	7,720	J	302	J	232	J	1,060	J
131		9.50	J	1,520	J	395	J	16.5	J	16.9	J	119	J
132		228	J	38,700	J	3,080	J	421	J	399	J	1,910	J
133		83.5	J	1,460	J	1,450	J	208	J	96.5	J	281	J
134	134 + 143	48.6	C J	5,130	C J	3,170	C J	83.2	C J	75.3	C J	458	C J
135	135 + 151 + 154	492	C J	19,700	C J	4,910	C J	1,220	C J	703	C J	2,380	C J
136		87.0	J	9,020	J	247	J	172	J	118	J	439	J
137		283	J	11,900	J	15,300	J	1,100	J	317	J	1,220	J
138	129 + 138 + 160 + 163		C129 J		C129 J		C129 J		C129 J		C129 J		C129 J
139	139 + 140	68.7	C J	3,090	C J	1,660	C J	271	C J	81.4	C J	284	C J
140	139 + 140		C139 J		C139 J		C139 J		C139 J		C139 J		C139 J
141		250	J	18,800	J	5,770	J	723	J	294	J	1,210	J
142		0.661	UJ	2.91	UJ	2.57	UJ	1.36	UJ	0.699	UJ	0.756	UJ
143	134 + 143		C134 J		C134 J		C134 J		C134 J		C134 J		C134 J
144		52.3	J	3,490	J	1,920	J	96.6	J	67.5	J	361	J
145		0.174	EMPC	37.9	J	0.585	J	0.481	J	0.322	J	1.27	J
146		883	J	16,000	J	19,000	J	1,720	J	966	J	2,950	J
147	147 + 149	725	C J	59,800	C J	31,700	C J	1,220	C J	1,160	C J	6,370	C J
148		3.39	J	61.2	J	8.95	J	8.09	J	5.48	J	17.1	J
149	147 + 149		C147 J		C147 J		C147 J		C147 J		C147 J		C147 J
150		1.44	J	72.4	J	13.1	J	2.61	J	2.41	J	11.6	J
151	135 + 151 + 154		C135 J		C135 J		C135 J		C135 J		C135 J		C135 J
152		1.04	J	81.4	J	3.55	J	2.90	J	1.28	J	3.86	J
153	153 + 168	4,920	C J	111,000	C J	117,000	C J	16,100	C J	5,540	C J	16,800	C J
154	135 + 151 + 154		C135 J		C135 J		C135 J		C135 J		C135 J		C135 J
155		3.50	J	14.4	J	3.36	J	9.17	J	4.27	J	8.39	J
156	156 + 157	654	C J	26,600	C J	31,400	C J	2,220	C J	735	C J	2,890	C J
157	156 + 157		C156 J		C156 J		C156 J		C156 J		C156 J		C156 J
158		304	J	17,400	J	12,900	J	1,400	J	403	J	1,520	J
159		4.52	J	179	J	121	J	8.30	J	8.21	J	41.0	J
160	129 + 138 + 160 + 163		C129 J		C129 J		C129 J		C129 J		C129 J		C129 J
161		0.434	UJ	1.91	UJ	1.69	UJ	0.944	UJ	0.485	UJ	0.525	UJ
162		23.2	J	530	J	610	J	63.5	J	27.0	J	90.1	J
163	129 + 138 + 160 + 163		C129 J		C129 J		C129 J		C129 J		C129 J		C129 J
164		97.0	J	7,230	J	6,480	J	192	J	131	J	643	J
165		2.69	J	23.3	J	17.3	J	7.27	J	3.30	J	8.05	J
166	128 + 166		C128 J		C128 J		C128 J		C128 J		C128 J		C128 J
167		226	J	6,500	J	9,650	J	428	J	239	J	961	J
168	153 + 168		C153 J		C153 J		C153 J		C153 J		C153 J		C153 J
169		1.52	UJ	7.28	UJ	4.49	UJ	2.75	UJ	1.29	UJ	5.03	UJ
170		457	J	12,100	J	9,940	J	2,280	J	661	J	2,100	J
171	171 + 173	150	C J	3,890	C J	1,810	C J	685	C J	233	C J	711	C J
172		69.6	J	1,560	J	1,280	J	299	J	106	J	380	J
173	171 + 173		C171 J		C171 J		C171 J		C171 J		C171 J		C171 J
174		104	J	4,840	J	3,590	J	209	J	182	J	994	J
175		18.4	J	314	J	237	J	46.3	J	24.9	J	94.3	J
176		17.2	J	624	J	211	J	29.3	J	29.1	J	191	J
177		251	J	3,800	J	3,400	J	371	J	344	J	1,630	J
178		171	J	1,580	J	1,080	J	476	J	236	J	720	J
179		92.8	J	1,840	J	191	J	210	J	159	J	686	J
180	180 + 193	1,460	C J	20,600	C J	18,800	C J	5,930	C J	2,020	C J	5,400	C J
181		10.8	J	357	J	397	J	42.4	J	13.0	J	56.9	J
182		3.79	J	81.8	J	34.7	J	16.9	J	7.22	J	16.1	J
183	183 + 185	426	C J	6,240	C J	4,050	C J	1,620	C J	573	C J	1,660	C J
184		3.59	J	24.4	J	7.99	J	10.1	J	4.56	J	10.7	J
185	183 + 185		C183 J		C183 J		C183 J		C183 J		C183 J		C183 J
186		0.0545	UJ	5.14	J	0.189	UJ	0.107	UJ	0.0710	UJ	0.0926	UJ
187		1,510	J	8,670	J	7,970	J	2,500	J	1,730	J	4,520	J
188		3.76	J	18.2	J	12.3	J	6.22	J	4.27	J	10.8	J
189		21.6	J	482	J	531	J	75.9	J	25.0	J	113	J
190		180	J	2,350	J	1,570	J	647	J	229	J	624	J
191		27.5	J	465	J	419	J	117	J	34.8	J	98.0	J
192		0.0591	UJ	0.504	UJ	0.205	UJ	0.122	UJ	0.0810	UJ	0.106	UJ
193	180 + 193		C180 J		C180 J		C180 J		C180 J		C180 J		C180 J
194		170	J	1,720	J	1,170	J	688	J	215	J	654	J
195		85.6	J	777	J	433	J	357	J	125	J	330	J
196		117	J	881	J	597	J	445	J	141	J	349	J
197	197 + 200	19.2	C J	189	C J	88.1	C J	60.8	C J	26.1	C J	105	C J
198	198 + 199	243	C J	1,610	C J	1,150	C J	547	C J	277	C J	896	C J
199	198 + 199		C198 J		C198 J		C198 J		C198 J		C198 J		C198 J
200	197 + 200		C197 J		C197 J		C197 J		C197 J		C197 J		C197 J
201		41.0	J	226	J	135	J	76.8	J	47.0	J	159	J
202		104	J	642	J	296	J	284	J	128	J	486	J
203		241	J	1,620	J	702	J	828	J	279	J	804	J
204		0.401	J	1.71	J	0.991	J	1.09	J	0.527	J	1.17	J
205		11.1	J	97.9	J	42.2	J	39.9	J	14.0	J	49.8	J
206		93.9	J	749	J	335	J	276	J	103	J	364	J
207		18.9	J	107	J	60.7	J	50.6	J	21.5	J	56.0	J
208		30.3	J	163	J	95.8	J	57.8	J	35.3	J	132	J
209		39.1	J	164	J	83.2	J	74.2	J	43.0	J	140	J
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full RDL)		33.7	J	1,440	J	879	J	96.7	J	42.0	J	137	J
Total PCBs as Congeners (KM-based)		33.7	J	1,440	J	879	J	96.7	J	42.0	J	137	J
Total PCBs as Congeners (KM-based, capped)		33.7	J	1,440	J	879	J	96.7	J	42.0	J	137	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-7
Smallmouth Bass and Sucker PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Forebay 07 060605204SB 6/5/2006		Forebay 08 060605205SB 6/5/2006		Forebay 09 060605207SB 6/5/2006		Forebay 10 060605208SB 6/5/2006		Forebay 11 060605209SB 6/5/2006		Forebay 12 060606102SB 6/6/2006	
Individual Congeners in pg/g (ng/kg), wet weight													
1		0.309	UJ	0.773	J	0.243	UJ	0.293	UJ	1.73	J	0.572	J
2		0.614	J	0.561	J	0.370	J	0.519	J	1.46	J	0.686	J
3		0.271	UJ	0.442	UJ	0.241	UJ	0.253	UJ	1.07	J	0.372	UJ
4		5.78	J	3.17	J	3.09	J	2.50	J	8.16	J	2.95	J
5		0.247	J	0.230	J	0.156	J	0.203	UJ	0.784	J	0.353	UJ
6		2.86	J	1.61	J	1.77	J	1.45	J	9.01	J	3.84	J
7		0.517	J	0.449	J	0.347	J	0.313	J	3.98	J	0.315	UJ
8		11.3	J	6.68	J	7.60	J	7.19	J	40.1	J	6.89	J
9		0.701	J	0.579	J	0.385	J	0.381	J	5.89	J	0.387	J
10		0.337	J	0.176	J	0.155	J	0.186	UJ	0.422	J	0.323	UJ
11		130	J	53.0	J	57.2	J	95.6	J	136	J	39.3	J
12	12 + 13	0.0580	C UJ	1.77	C J	0.122	C UJ	0.178	C UJ	5.72	C J	2.78	C J
13	12 + 13		C12 J		C12 J		C12 J		C12 J		C12 J		C12 J
14		0.157	J	0.122	J	0.127	J	0.179	UJ	0.264	J	0.321	UJ
15		3.49	J	1.95	J	1.85	J	2.53	J	14.1	J	2.10	J
16		19.1	J	9.76	J	10.2	J	10.6	J	39.5	J	7.89	J
17		39.4	J	27.2	J	16.4	J	17.3	J	317	J	13.3	J
18	18 + 30	59.7	C J	44.0	C J	34.1	C J	39.2	C J	825	C J	26.5	C J
19		9.56	J	2.79	J	2.77	J	2.87	J	8.54	J	2.73	J
20	20 + 28	235	C J	414	C J	149	C J	276	C J	5,550	C J	124	C J
21	21 + 33	46.2	C J	39.0	C J	27.6	C J	42.7	C J	606	C J	21.5	C J
22		57.0	J	33.8	J	28.6	J	56.3	J	380	J	18.9	J
23		0.162	J	0.351	J	0.135	UJ	0.239	J	1.95	UJ	0.474	UJ
24		1.10	J	0.754	J	0.657	J	0.698	EMPC	2.82	J	0.510	J
25		10.7	J	12.0	J	4.48	J	9.33	J	418	J	4.30	J
26	26 + 29	27.8	C J	49.1	C J	15.6	C J	24.9	C J	745	C J	13.9	C J
27		7.72	J	4.79	J	2.52	J	3.03	J	46.8	J	2.19	J
28	20 + 28		C20 J		C20 J		C20 J		C20 J		C20 J		C20 J
29	26 + 29		C26 J		C26 J		C26 J		C26 J		C26 J		C26 J
30	18 + 30		C18 J		C18 J		C18 J		C18 J		C18 J		C18 J
31		118	J	117	J	79.5	J	127	J	5,070	J	66.7	J
32		10.2	J	14.3	J	3.98	J	6.27	J	198	J	3.98	J
33	21 + 33		C21 J		C21 J		C21 J		C21 J		C21 J		C21 J
34		0.852	J	0.758	J	0.326	J	0.544	EMPC	7.40	J	0.464	UJ
35		0.0913	UJ	0.111	UJ	0.142	UJ	0.155	UJ	2.13	UJ	0.486	UJ
36		0.0829	UJ	0.101	UJ	0.129	UJ	0.141	UJ	1.88	UJ	0.449	UJ
37		24.5	J	46.5	J	10.3	J	19.9	J	696	J	15.2	J
38		0.168	EMPC	1.01	EMPC	0.186	J	0.406	EMPC	12.3	J	0.445	UJ
39		1.47	J	6.17	J	0.993	J	1.56	EMPC	112	EMPC	1.51	J
40	40 + 41 + 71	107	C J	653	C J	51.7	C J	119	C J	14,200	C J	95.0	C J
41	40 + 41 + 71		C40 J		C40 J		C40 J		C40 J		C40 J		C40 J
42		98.2	J	541	J	39.6	J	123	J	10,100	J	66.8	J
43		14.0	J	97.3	J	8.42	J	19.8	J	1,990	J	23.1	J
44	44 + 47 + 65	450	C J	6,430	C J	302	C J	850	C J	138,000	C J	894	C J
45	45 + 51	31.2	C J	64.9	C J	11.9	C J	27.0	C J	1,040	C J	14.0	C J
46		5.76	J	8.54	J	2.51	J	4.15	J	96.3	J	2.43	J
47	44 + 47 + 65		C44 J		C44 J		C44 J		C44 J		C44 J		C44 J
48		70.0	J	299	J	37.0	J	77.8	J	4,900	J	56.7	J
49	49 + 69	346	C J	7,290	C J	236	C J	636	C J	123,000	C J	886	C J
50	50 + 53	27.9	C J	132	C J	8.52	C J	27.8	C J	3,160	C J	13.7	C J
51	45 + 51		C45 J		C45 J		C45 J		C45 J		C45 J		C45 J
52		678	J	24,100	J	585	J	1,180	J	351,000	J	2,990	J
53	50 + 53		C50 J		C50 J		C50 J		C50 J		C50 J		C50 J
54		2.13	J	1.45	J	0.266	J	0.677	J	7.71	J	0.573	UJ
55		0.445	UJ	0.677	UJ	0.360	UJ	0.478	UJ	26.4	UJ	0.304	UJ
56		124	J	357	J	44.9	J	145	J	24,900	J	87.5	J
57		2.70	J	6.38	J	1.83	J	3.28	J	27.6	UJ	1.98	J
58		2.65	J	0.667	UJ	1.57	J	0.471	UJ	25.4	UJ	0.297	UJ
59	59 + 62 + 75	39.1	C J	162	C J	25.3	C J	63.8	C J	2,120	C J	33.1	C J
60		197	J	2,070	J	156	J	484	J	30,200	J	315	J
61	61 + 70 + 74 + 76	1,140	C J	22,400	C J	1,010	C J	2,360	C J	368,000	C J	4,730	C J
62	59 + 62 + 75		C59 J		C59 J		C59 J		C59 J		C59 J		C59 J
63		47.9	J	573	J	38.2	J	120	J	9,180	J	164	J
64		231	J	2,870	J	135	J	415	J	45,400	J	397	J
65	44 + 47 + 65		C44 J		C44 J		C44 J		C44 J		C44 J		C44 J
66		912	J	12,700	J	735	J	1,700	J	143,000	J	2,690	J
67		9.53	J	20.3	J	5.00	J	12.9	J	278	J	7.81	J
68		9.92	J	15.8	J	7.94	J	22.6	J	297	J	14.3	J
69	49 + 69		C49 J		C49 J		C49 J		C49 J		C49 J		C49 J
70	61 + 70 + 74 + 76		C61 J		C61 J		C61 J		C61 J		C61 J		C61 J
71	40 + 41 + 71		C40 J		C40 J		C40 J		C40 J		C40 J		C40 J
72		13.5	J	48.9	J	9.54	J	23.4	J	469	J	10.6	J
73		0.0495	UJ	0.0491	UJ	0.132	UJ	0.119	UJ	0.516	UJ	0.519	UJ
74	61 + 70 + 74 + 76		C61 J		C61 J		C61 J		C61 J		C61 J		C61 J
75	59 + 62 + 75		C59 J		C59 J		C59 J		C59 J		C59 J		C59 J
76	61 + 70 + 74 + 76		C61 J		C61 J		C61 J		C61 J		C61 J		C61 J
77		62.4	J	214	J	36.7	J	77.2	J	3,530	J	102	J
78		0.446	UJ	0.679	UJ	1.43	J	0.479	UJ	343	J	0.302	UJ
79		10.8	J	558	J	8.22	J	26.0	J	11,000	J	37.9	J
80		0.399	UJ	0.607	UJ	0.323	UJ	0.429	UJ	22.6	UJ	0.269	UJ
81		3.24	J	19.1	EMPC	2.33	J	5.76	J	23.1	UJ	8.07	J
82		54.1	J	5,760	J	37.2	J	151	J	125,000	J	209	J
83	83 + 99	2,530	C J	105,000	C J	3,470	C J	6,850	C J	1,050,000	C J	16,400	C J
84		123	J	6,710	J	72.6	J	306	J	180,000	J	340	J
85	85 + 116 + 117	800	C J	30,300	C J	985	C J	2,030	C J	327,000	C J	4,910	C J
86	86 + 87 + 97 + 108 + 119 + 125	924	C J	72,700	C J	1,020	C J	2,520	C J	890,000	C J	5,580	C J
87	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86 J		C86 J		C86 J		C86 J		C86 J
88	88 + 91	144	C J	7,680	C J	90.0	C J	433	C J	168,000	C J	453	C J
89		3.86	J	143	J	2.75	J	5.54	J	3,000	J	12.4	J
90	90 + 101 + 113	2,110	C J	127,000	C J	2,350	C J	5,740	C J	1,400,000	C J	10,700	C J
91	88 + 91		C88 J		C88 J		C88 J		C88 J		C88 J		C88 J
92		498	J	19,500	J	530	J	1,280	J	213,000	J	2,110	J
93	93 + 95 + 98 + 100 + 102	725	C J	30,600	C J	614	C J	1,860	C J	573,000	C J	3,170	C J
94		3.56	J	26.0	J	0.809	J	6.30	J	906	J	3.63	UJ
95	93 + 95 + 98 + 100 + 102		C93 J		C93 J		C93 J		C93 J		C93 J		C93 J
96		4.54	J	100	J	2.75	J	5.53	J	1,710	J	14.9	J
97	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86 J		C86 J		C86 J		C86 J		C86 J
98	93 + 95 + 98 + 100 + 102		C93 J		C93 J		C93 J		C93 J		C93 J		C93 J
99	83 + 99		C83 J		C83 J		C83 J		C83 J		C83 J		C83 J
100	93 + 95 + 98 + 100 + 102		C93 J		C93 J		C93 J		C93 J		C93 J		C93 J
101	90 + 101 + 113		C90 J		C90 J		C90 J		C90 J		C90 J		C90 J
102	93 + 95 + 98 + 100 + 102		C93 J		C93 J		C93 J		C93 J		C93 J		C93 J
103		12.8	J	278	J	8.15	J	30.1	J	5,180	J	25.7	J
104		0.908	J	0.778	J	0.221	UJ	0.648	EMPC	9.27	EMPC	1.06	UJ
105		1,540	J	66,300	J	2,090	J	3,910	J	766,000	J	11,200	J
106		0.513	UJ	4.87	UJ	0.401	UJ	0.998	UJ	65.3	UJ	2.37	UJ
107	107 + 124	78.3	C J	2,410	C J	83.0	C J	136	C J	55,600	C J	472	C J
108	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86 J		C86 J		C86 J		C86 J		C86 J
109		392	J	13,100	J	432	J	922	J	185,000	J	3,260	J
110	110 + 115	1,660	C J	111,000	C J	1,680	C J	4,280	C J	1,270,000	C J	8,470	C J
111		5.71	J	5.58	EMPC	5.01	J	12.5	J	56.0	UJ	4.89	J
112		0.199	UJ	0.631	UJ	0.279	UJ	0.935	UJ	56.1	UJ	2.37	UJ
113	90 + 101 + 113		C90 J		C90 J		C90 J		C90 J		C90 J		C90 J
114		120	J	4,870	J	173	J	332	J	65,700	J	1,680	J
115	110 + 115		C110 J		C110 J		C110 J		C110 J		C110 J		C110 J
116	85 + 116 + 117		C85 J		C85 J		C85 J		C85 J		C85 J		C85 J
117	85 + 116 + 117		C85 J		C85 J		C85 J		C85 J		C85 J		C85 J
118		3,750	J	199,000	J	6,430	J	10,300	J	2,180,000	J	52,400	J
119	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86 J		C86 J		C86 J		C86 J		C86 J
120		28.9	J	59.6	EMPC	25.9	J	51.2	J	344	J	29.5	J
121		3.25	J	4.69	J	2.74	J	6.89	J	58.0	UJ	2.53	UJ
122		11.5	J	207	J	5.96	J	22.6	J	9,000	J	2.75	UJ
123		69.5	J	1,940	J	81.0	J	136	J	35,600	J	948	J
124	107 + 124		C107 J		C107 J		C107 J		C107 J		C107 J		C107 J
125	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86 J		C86 J		C86 J		C86 J		C86 J
126		11.1	J	85.7	J	8.90	J	14.3	J	1,260	J	26.2	J

Table H-7
Smallmouth Bass and Sucker PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Forebay 07 060605204SB 6/5/2006		Forebay 08 060605205SB 6/5/2006		Forebay 09 060605207SB 6/5/2006		Forebay 10 060605208SB 6/5/2006		Forebay 11 060605209SB 6/5/2006		Forebay 12 060606102SB 6/6/2006	
127		9.34	J	341	J	16.1	J	26.6	J	3,700	J	142	J
128	128 + 166	1,240	C J	42,000	C J	1,590	C J	2,740	C J	336,000	C J	6,640	C J
129	129 + 138 + 160 + 163	8,070	C J	239,000	C J	10,400	C J	20,400	C J	1,940,000	C J	42,300	C J
130		268	J	11,200	J	271	J	707	J	126,000	J	1,190	J
131		12.3	J	992	J	9.83	J	43.3	J	18,200	J	50.5	J
132		352	J	23,200	J	240	J	1,180	J	394,000	J	777	J
133		162	J	2,110	J	175	J	353	J	22,300	J	519	J
134	134 + 143	76.7	C J	3,770	C J	58.6	C J	198	C J	63,500	C J	235	C J
135	135 + 151 + 154	1,170	C J	19,900	C J	1,090	C J	2,680	C J	266,000	C J	2,070	C J
136		166	J	5,920	J	138	J	364	J	89,500	J	484	J
137		344	J	20,000	J	606	J	997	J	220,000	J	5,410	J
138	129 + 138 + 160 + 163		C129 J		C129 J		C129 J		C129 J		C129 J		C129 J
139	139 + 140	130	C J	4,370	C J	185	C J	330	C J	41,300	C J	695	C J
140	139 + 140		C139 J		C139 J		C139 J		C139 J		C139 J		C139 J
141		365	J	24,000	J	462	J	1,330	J	250,000	J	2,050	J
142		0.780	UJ	3.11	UJ	0.923	UJ	1.47	UJ	207	J	1.34	UJ
143	134 + 143		C134 J		C134 J		C134 J		C134 J		C134 J		C134 J
144		77.5	J	3,460	J	75.2	J	244	J	53,200	J	251	J
145		0.371	J	19.0	J	0.263	EMPC	0.756	J	356	J	0.947	UJ
146		1,300	J	25,100	J	1,440	J	3,290	J	291,000	J	7,220	J
147	147 + 149	1,180	C J	37,500	C J	738	C J	4,390	C J	598,000	C J	2,150	C J
148		9.25	J	60.0	J	7.44	J	21.6	J	667	J	9.36	J
149	147 + 149		C147 J		C147 J		C147 J		C147 J		C147 J		C147 J
150		3.54	J	37.2	J	1.41	J	8.48	J	863	J	2.73	J
151	135 + 151 + 154		C135 J		C135 J		C135 J		C135 J		C135 J		C135 J
152		2.82	J	76.3	J	2.39	J	5.33	J	891	J	9.98	J
153	153 + 168	8,500	C J	179,000	C J	11,200	C J	23,100	C J	1,440,000	C J	48,200	C J
154	135 + 151 + 154		C135 J		C135 J		C135 J		C135 J		C135 J		C135 J
155		9.28	J	12.9	J	8.48	J	14.6	J	1.01	UJ	5.88	J
156	156 + 157	846	C J	44,600	C J	1,360	C J	2,390	C J	403,000	C J	12,800	C J
157	156 + 157		C156 J		C156 J		C156 J		C156 J		C156 J		C156 J
158		660	J	24,500	J	914	J	1,730	J	237,000	J	3,500	J
159		8.36	J	129	J	5.18	J	26.1	J	3,140	J	12.1	J
160	129 + 138 + 160 + 163		C129 J		C129 J		C129 J		C129 J		C129 J		C129 J
161		0.542	UJ	2.16	UJ	0.641	UJ	1.02	UJ	79.8	UJ	0.955	UJ
162		38.3	J	846	J	47.4	J	83.7	J	9,120	J	245	J
163	129 + 138 + 160 + 163		C129 J		C129 J		C129 J		C129 J		C129 J		C129 J
164		162	J	8,820	J	154	J	478	J	91,900	J	601	J
165		6.29	J	26.0	J	5.87	J	11.5	J	88.0	UJ	8.76	J
166	128 + 166		C128 J		C128 J		C128 J		C128 J		C128 J		C128 J
167		250	J	9,350	J	311	J	574	J	116,000	J	3,650	J
168	153 + 168		C153 J		C153 J		C153 J		C153 J		C153 J		C153 J
169		2.60	UJ	11.2	UJ	3.27	UJ	5.08	UJ	127	UJ	8.24	UJ
170		1,140	J	18,900	J	1,310	J	2,570	J	198,000	J	4,720	J
171	171 + 173	493	C J	5,310	C J	520	C J	1,050	C J	60,300	C J	890	C J
172		171	J	2,540	J	191	J	441	J	31,600	J	652	J
173	171 + 173		C171 J		C171 J		C171 J		C171 J		C171 J		C171 J
174		190	J	4,060	J	134	J	755	J	117,000	J	303	J
175		35.7	J	424	J	38.0	J	103	J	6,570	J	104	J
176		38.8	J	362	J	22.3	J	124	J	11,700	J	31.7	J
177		429	J	4,150	J	408	J	1,210	J	87,300	J	1,240	J
178		447	J	2,160	J	481	J	970	J	27,700	J	627	J
179		302	J	1,680	J	244	J	632	J	26,800	J	221	J
180	180 + 193	3,040	C J	33,300	C J	3,570	C J	7,510	C J	348,000	C J	18,200	C J
181		19.3	J	639	J	28.7	J	49.6	J	6,320	J	172	J
182		10.9	J	122	J	11.7	J	28.2	J	1,130	J	27.0	J
183	183 + 185	1,060	C J	9,230	C J	1,180	C J	2,510	C J	120,000	C J	2,000	C J
184		10.7	J	28.5	J	10.6	J	18.2	J	122	J	7.27	J
185	183 + 185		C183 J		C183 J		C183 J		C183 J		C183 J		C183 J
186		0.0495	UJ	0.441	UJ	0.0658	UJ	0.148	UJ	42.4	J	0.396	UJ
187		2,260	J	12,300	J	2,470	J	5,940	J	159,000	J	9,320	J
188		6.04	J	19.7	J	5.77	J	13.0	J	139	J	7.69	J
189		39.0	J	841	J	49.1	J	91.0	J	9,300	J	324	J
190		440	J	3,580	J	487	J	870	J	36,500	J	1,210	J
191		60.0	J	756	J	70.6	J	138	J	9,430	J	300	J
192		0.0519	UJ	0.503	UJ	0.0750	UJ	0.168	UJ	11.4	UJ	0.450	UJ
193	180 + 193		C180 J		C180 J		C180 J		C180 J		C180 J		C180 J
194		399	J	3,090	J	421	J	783	J	52,500	J	1,790	J
195		265	J	1,220	J	242	J	467	J	18,800	J	568	J
196		255	J	1,600	J	260	J	535	J	31,000	J	991	J
197	197 + 200	49.5	C J	227	C J	45.5	C J	112	C J	6,130	C J	55.2	C J
198	198 + 199	371	C J	3,050	C J	401	C J	986	C J	59,600	C J	2,060	C J
199	198 + 199		C198 J		C198 J		C198 J		C198 J		C198 J		C198 J
200	197 + 200		C197 J		C197 J		C197 J		C197 J		C197 J		C197 J
201		70.5	J	370	J	73.0	J	180	J	6,980	J	211	J
202		267	J	988	J	294	J	540	J	11,000	J	288	J
203		587	J	2,760	J	618	J	1,130	J	21,900	J	654	J
204		0.903	J	1.96	J	0.933	J	1.63	J	2.98	UJ	0.724	J
205		29.1	J	155	J	32.2	J	56.4	J	1,520	J	42.9	J
206		217	J	1,440	J	233	J	364	J	13,600	J	271	J
207		41.6	J	191	J	41.9	J	71.9	J	2,550	J	71.5	J
208		58.0	J	304	J	57.1	J	110	J	3,140	J	91.8	J
209		93.6	J	221	J	82.5	J	127	J	1,080	J	65.4	J
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full RDL)		59.4	J	1,734	J	69.7	J	149	J	19,310	J	325	J
Total PCBs as Congeners (KM-based)		59.3	J	1,733	J	69.6	J	149	J	19,303	J	325	J
Total PCBs as Congeners (KM-based, capped)		59.3	J	1,733	J	69.6	J	149	J	19,303	J	325	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-7
Smallmouth Bass and Sucker PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Forebay 13 060606103SB 6/6/2006		Forebay 14 060606104SB 6/6/2006		Forebay 15 060606210SB 6/6/2006		Forebay 16 060815402SB 8/15/2006		Forebay 17 060815403SB 8/15/2006		Forebay 18 060815405SB 8/15/2006	
Individual Congeners in pg/g (ng/kg), wet weight													
1		0.484	J	0.235	UJ	0.194	UJ	7.14	J	1.31	J	0.428	J
2		0.548	J	0.237	J	0.262	J	2.84	J	1.44	J	1.01	J
3		0.328	UJ	0.0502	UJ	0.263	UJ	8.28	J	1.09	J	0.535	UJ
4		3.76	J	2.13	J	1.79	J	909	J	11.5	J	2.21	J
5		0.219	UJ	0.0900	J	0.120	J	138	J	0.424	J	0.293	UJ
6		1.98	J	1.43	J	1.01	J	1,620	J	13.7	J	1.66	J
7		0.457	J	0.225	J	0.282	J	396	J	5.86	J	0.504	J
8		8.63	J	5.25	J	4.62	J	7,240	J	50.4	J	6.14	J
9		0.788	J	0.318	J	0.266	J	643	J	16.4	J	4.94	J
10		0.206	J	0.134	J	0.131	EMPC	54.3	J	0.934	J	0.343	J
11		67.5	J	35.4	J	28.4	J	230	J	404	J	495	J
12	12 + 13	1.60	C J	0.831	C J	0.622	C J	72.2	C J	11.4	C J	9.28	C J
13	12 + 13		C12 J		C12 J		C12 J		C12 J		C12 J		C12 J
14		0.199	UJ	0.0990	J	0.0890	EMPC	0.557	J	0.176	J	0.269	UJ
15		2.18	J	1.83	J	1.30	J	1,570	J	282	J	112	J
16		12.2	J	6.26	J	5.82	J	7,050	J	117	UJ	10.1	J
17		53.1	J	8.97	J	9.45	J	14,300	J	1,360	J	37.9	J
18	18 + 30	69.5	C J	19.8	C J	20.0	C J	23,000	C J	3,090	C J	130	C J
19		4.50	J	1.89	J	1.71	J	1,290	J	23.0	J	2.66	J
20	20 + 28	452	C J	83.0	C J	90.8	C J	76,900	C J	16,100	C J	1,210	C J
21	21 + 33	49.6	C J	15.3	C J	15.8	C J	19,100	C J	2,280	C J	45.4	C J
22		43.2	J	15.2	J	16.8	J	23,500	J	856	J	45.5	J
23		0.348	J	0.0950	J	0.102	J	86.4	J	79.3	UJ	0.486	EMPC
24		0.763	J	0.415	J	0.371	J	438	J	72.8	UJ	0.790	J
25		11.8	J	2.65	J	3.11	J	4,840	J	1,140	J	125	J
26	26 + 29	61.2	C J	8.94	C J	9.60	C J	11,100	C J	2,340	C J	279	C J
27		12.0	J	1.32	J	1.30	J	1,050	J	224	EMPC	12.7	J
28	20 + 28		C20 J		C20 J		C20 J		C20 J		C20 J		C20 J
29	26 + 29		C26 J		C26 J		C26 J		C26 J		C26 J		C26 J
30	18 + 30		C18 J		C18 J		C18 J		C18 J		C18 J		C18 J
31		162	J	43.7	J	47.8	J	59,700	J	12,200	J	837	J
32		32.5	J	2.41	J	2.53	J	7,510	J	647	J	12.6	J
33	21 + 33		C21 J		C21 J		C21 J		C21 J		C21 J		C21 J
34		1.30	J	0.190	EMPC	0.195	EMPC	192	J	103	J	4.10	J
35		0.238	UJ	0.0502	UJ	0.0500	UJ	2.40	UJ	87.5	UJ	0.310	UJ
36		0.220	UJ	0.0502	UJ	0.0500	UJ	2.24	UJ	79.2	UJ	0.290	UJ
37		41.1	J	6.02	J	5.12	J	5,850	J	2,950	J	189	J
38		1.45	EMPC	0.0830	EMPC	0.0930	J	30.3	J	78.2	UJ	1.93	J
39		7.99	J	0.495	J	0.556	J	264	J	349	J	9.61	J
40	40 + 41 + 71	688	C J	21.2	C J	29.2	C J	13,600	C J	22,900	C J	799	C J
41	40 + 41 + 71		C40 J		C40 J		C40 J		C40 J		C40 J		C40 J
42		377	J	15.9	J	27.3	J	11,400	J	19,000	J	879	J
43		108	J	4.52	J	5.91	J	2,280	J	15,800	J	104	J
44	44 + 47 + 65	6,400	C J	135	C J	281	C J	47,500	C J	200,000	C J	10,100	C J
45	45 + 51	70.9	C J	7.19	C J	20.5	C J	7,400	C J	1,720	C J	63.2	C J
46		7.84	J	1.66	J	1.63	J	1,490	J	307	J	7.73	J
47	44 + 47 + 65		C44 J		C44 J		C44 J		C44 J		C44 J		C44 J
48		305	J	18.2	J	23.4	J	11,000	J	13,900	J	339	J
49	49 + 69	6,590	C J	102	C J	173	C J	34,200	C J	194,000	C J	15,100	C J
50	50 + 53	54.9	C J	5.53	C J	7.57	C J	2,630	C J	6,170	C J	124	C J
51	45 + 51		C45 J		C45 J		C45 J		C45 J		C45 J		C45 J
52		21,200	J	256	J	424	J	54,300	J	733,000	J	43,900	J
53	50 + 53		C50 J		C50 J		C50 J		C50 J		C50 J		C50 J
54		2.74	J	0.152	J	0.135	J	56.1	J	90.2	J	1.02	J
55		0.876	UJ	0.479	UJ	0.476	UJ	185	J	28,800	J	7.12	UJ
56		253	J	19.6	J	26.2	J	2,560	J	52,400	J	3,280	J
57		0.863	UJ	1.10	J	1.39	J	231	J	631	UJ	19.2	J
58		0.855	UJ	1.04	J	1.38	J	46.8	J	654	UJ	7.05	UJ
59	59 + 62 + 75	162	C J	12.6	C J	18.4	C J	4,870	C J	6,050	C J	250	C J
60		1,750	J	68.2	J	100	J	2,600	J	52,200	J	5,430	J
61	61 + 70 + 74 + 76	19,800	C J	445	C J	719	C J	39,800	C J	1,000,000	C J	87,000	C J
62	59 + 62 + 75		C59 J		C59 J		C59 J		C59 J		C59 J		C59 J
63		571	J	21.2	J	30.6	J	1,470	J	15,400	J	1,520	J
64		2,450	J	65.2	J	96.7	J	20,400	J	56,100	J	2,800	J
65	44 + 47 + 65		C44 J		C44 J		C44 J		C44 J		C44 J		C44 J
66		12,700	J	335	J	510	J	18,500	J	371,000	J	39,600	J
67		27.3	J	3.32	J	5.02	J	988	J	985	J	81.3	J
68		26.2	J	4.29	J	20.8	J	101	J	611	UJ	76.8	J
69	49 + 69		C49 J		C49 J		C49 J		C49 J		C49 J		C49 J
70	61 + 70 + 74 + 76		C61 J		C61 J		C61 J		C61 J		C61 J		C61 J
71	40 + 41 + 71		C40 J		C40 J		C40 J		C40 J		C40 J		C40 J
72		45.6	J	5.71	J	7.99	J	219	J	826	J	87.6	J
73		0.221	UJ	0.0502	UJ	0.0500	UJ	0.0491	UJ	20,600	J	0.494	UJ
74	61 + 70 + 74 + 76		C61 J		C61 J		C61 J		C61 J		C61 J		C61 J
75	59 + 62 + 75		C59 J		C59 J		C59 J		C59 J		C59 J		C59 J
76	61 + 70 + 74 + 76		C61 J		C61 J		C61 J		C61 J		C61 J		C61 J
77		186	J	21.7	J	23.6	J	334	J	8,950	J	577	J
78		0.872	UJ	0.609	J	0.447	UJ	15.1	J	1,340	J	6.70	UJ
79		192	J	3.22	J	6.88	J	300	J	21,400	J	1,850	J
80		0.775	UJ	0.622	J	0.819	J	6.53	UJ	552	UJ	6.16	UJ
81		11.7	J	1.21	J	1.30	J	19.8	J	1,190	J	6.15	UJ
82		1,130	J	12.1	J	33.4	J	2,130	J	175,000	J	10,300	J
83	83 + 99	88,200	C J	1,250	C J	2,570	C J	41,700	C J	1,680,000	C J	117,000	C J
84		1,690	J	33.2	J	62.8	J	3,630	J	201,000	J	7,280	J
85	85 + 116 + 117	26,600	C J	350	C J	723	C J	11,800	C J	483,000	C J	52,200	C J
86	86 + 87 + 97 + 108 + 119 + 125	38,900	C J	326	C J	843	C J	25,200	C J	1,350,000	C J	81,900	C J
87	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86 J		C86 J		C86 J		C86 J		C86 J
88	88 + 91	2,780	C J	38.5	C J	89.8	C J	4,040	C J	170,000	C J	10,600	C J
89		102	J	0.863	J	1.56	J	123	J	3,620	J	231	J
90	90 + 101 + 113	74,900	C J	880	C J	2,150	C J	41,600	C J	1,920,000	C J	125,000	C J
91	88 + 91		C88 J		C88 J		C88 J		C88 J		C88 J		C88 J
92		14,400	J	231	J	476	J	7,390	J	297,000	J	25,600	J
93	93 + 95 + 98 + 100 + 102	20,800	C J	282	C J	570	C J	21,500	C J	932,000	C J	54,500	C J
94		5.75	J	0.483	J	0.748	J	109	J	1,290	J	40.2	J
95	93 + 95 + 98 + 100 + 102		C93 J		C93 J		C93 J		C93 J		C93 J		C93 J
96		103	J	1.19	J	1.79	J	230	J	1,500	J	135	J
97	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86 J		C86 J		C86 J		C86 J		C86 J
98	93 + 95 + 98 + 100 + 102		C93 J		C93 J		C93 J		C93 J		C93 J		C93 J
99	83 + 99		C83 J		C83 J		C83 J		C83 J		C83 J		C83 J
100	93 + 95 + 98 + 100 + 102		C93 J		C93 J		C93 J		C93 J		C93 J		C93 J
101	90 + 101 + 113		C90 J		C90 J		C90 J		C90 J		C90 J		C90 J
102	93 + 95 + 98 + 100 + 102		C93 J		C93 J		C93 J		C93 J		C93 J		C93 J
103		164	J	3.77	J	8.42	J	217	J	6,620	J	576	J
104		0.455	UJ	0.130	EMPC	0.0940	EMPC	4.03	J	68.6	J	1.06	EMPC
105		57,700	J	717	J	1,600	J	30,100	J	1,300,000	J	109,000	J
106		3.93	UJ	3.32	UJ	5.73	UJ	44.7	UJ	1,610	J	29.5	UJ
107	107 + 124	1,720	C J	38.7	C J	62.9	C J	1,330	C J	88,700	C J	6,320	C J
108	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86 J		C86 J		C86 J		C86 J		C86 J
109		11,200	J	207	J	366	J	4,970	J	208,000	J	23,200	J
110	110 + 115	60,600	C J	593	C J	1,370	C J	36,300	C J	1,530,000	C J	91,800	C J
111		9.20	J	3.33	J	4.24	J	7.76	J	482	J	21.7	J
112		1.82	UJ	0.0698	UJ	0.0624	UJ	0.729	UJ	300	UJ	4.86	UJ
113	90 + 101 + 113		C90 J		C90 J		C90 J		C90 J		C90 J		C90 J
114		4,470	J	59.4	J	122	J	2,330	J	89,800	J	11,200	J
115	110 + 115		C110 J		C110 J		C110 J		C110 J		C110 J		C110 J
116	85 + 116 + 117		C85 J		C85 J		C85 J		C85 J		C85 J		C85 J
117	85 + 116 + 117		C85 J		C85 J		C85 J		C85 J		C85 J		C85 J
118		164,000	J	2,420	J	4,970	J	92,100	J	3,270,000	J	312,000	J
119	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86 J		C86 J		C86 J		C86 J		C86 J
120		77.6	J	16.3	J	20.4	J	35.1	J	621	J	99.0	J
121		6.64	J	1.59	J	2.33	J	3.49	J	328	UJ	5.71	J
122		4.56	UJ	3.52	UJ	6.08	UJ	296	J	24,400	J	1,610	J
123		2,070	J	32.3	J	57.4	J	1,200	J	55,300	J	6,100	J
124	107 + 124		C107 J		C107 J		C107 J		C107 J		C107 J		C107 J
125	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86 J		C86 J		C86 J		C86 J		C86 J
126		45.3	J	6.42	J	7.55	J	48.0	UJ	3,030	J	125	J

Table H-7
Smallmouth Bass and Sucker PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Forebay 13 060606103SB 6/6/2006		Forebay 14 060606104SB 6/6/2006		Forebay 15 060606210SB 6/6/2006		Forebay 16 060815402SB 8/15/2006		Forebay 17 060815403SB 8/15/2006		Forebay 18 060815405SB 8/15/2006	
127		416	J	5.94	J	12.0	J	191	J	8,100	J	878	J
128	128 + 166	33,300	C J	652	C J	1,300	C J	13,100	C J	427,000	C J	67,600	C J
129	129 + 138 + 160 + 163	197,000	C J	4,410	C J	8,540	C J	81,400	C J	2,530,000	C J	252,000	C J
130		5,270	J	121	J	237	J	3,050	J	175,000	J	21,000	J
131		285	J	3.19	J	9.41	J	331	J	29,100	J	2,380	J
132		3,870	J	100	J	216	J	6,160	J	425,000	J	37,400	J
133		1,760	J	92.0	J	140	J	862	J	27,900	J	4,180	J
134	134 + 143	1,120	C J	26.2	C J	56.7	C J	1,220	C J	93,900	C J	8,960	C J
135	135 + 151 + 154	13,300	C J	539	C J	910	C J	6,210	C J	272,000	C J	30,200	C J
136		2,960	J	60.1	J	117	J	1,870	J	78,000	J	8,580	J
137		19,600	J	199	J	481	J	7,880	J	274,000	J	39,500	J
138	129 + 138 + 160 + 163		C129 J		C129 J		C129 J		C129 J		C129 J		C129 J
139	139 + 140	3,450	C J	74.7	C J	158	C J	1,480	C J	49,200	C J	7,460	C J
140	139 + 140		C139 J		C139 J		C139 J		C139 J		C139 J		C139 J
141		16,700	J	188	J	466	J	7,660	J	242,000	J	35,300	J
142		2.66	UJ	0.710	UJ	1.91	UJ	20.4	UJ	758	UJ	72.1	UJ
143	134 + 143		C134 J		C134 J		C134 J		C134 J		C134 J		C134 J
144		1,410	J	30.9	J	71.6	J	997	J	61,000	J	6,970	J
145		8.05	J	0.0760	EMPC	0.137	EMPC	6.49	J	469	J	34.9	J
146		21,800	J	725	J	1,180	J	10,300	J	313,000	J	48,400	J
147	147 + 149	11,400	C J	358	C J	756	C J	12,800	C J	948,000	C J	86,000	C J
148		44.1	J	3.98	J	6.79	J	24.1	J	776	J	99.2	J
149	147 + 149		C147 J		C147 J		C147 J		C147 J		C147 J		C147 J
150		9.25	J	0.865	J	1.86	J	19.7	J	1,250	J	92.7	J
151	135 + 151 + 154		C135 J		C135 J		C135 J		C135 J		C135 J		C135 J
152		61.5	J	1.09	J	1.87	J	26.9	J	522	J	92.1	J
153	153 + 168	169,000	C J	5,570	C J	8,780	C J	73,000	C J	1,890,000	C J	202,000	C J
154	135 + 151 + 154		C135 J		C135 J		C135 J		C135 J		C135 J		C135 J
155		17.4	J	5.76	J	6.54	J	6.74	J	60.2	J	13.7	J
156	156 + 157	38,600	C J	541	C J	1,200	C J	16,900	C J	486,000	C J	83,000	C J
157	156 + 157		C156 J		C156 J		C156 J		C156 J		C156 J		C156 J
158		19,700	J	366	J	737	J	7,890	J	254,000	J	39,300	J
159		56.4	J	3.82	J	5.12	J	56.0	J	3,990	J	336	J
160	129 + 138 + 160 + 163		C129 J		C129 J		C129 J		C129 J		C129 J		C129 J
161		1.89	UJ	0.466	UJ	1.26	UJ	13.4	UJ	504	UJ	47.3	UJ
162		814	J	25.4	J	39.1	J	355	J	11,100	J	1,900	J
163	129 + 138 + 160 + 163		C129 J		C129 J		C129 J		C129 J		C129 J		C129 J
164		3,780	J	71.2	J	145	J	2,380	J	112,000	J	14,600	J
165		27.6	J	3.71	J	4.81	J	15.5	UJ	596	UJ	54.8	J
166	128 + 166		C128 J		C128 J		C128 J		C128 J		C128 J		C128 J
167		7,990	J	161	J	270	J	4,710	J	140,000	J	21,000	J
168	153 + 168		C153 J		C153 J		C153 J		C153 J		C153 J		C153 J
169		14.5	UJ	3.47	UJ	3.18	UJ	15.1	UJ	607	UJ	28.0	UJ
170		13,700	J	727	J	994	J	7,860	J	177,000	J	36,200	J
171	171 + 173	3,840	C J	301	C J	380	C J	1,690	C J	42,900	C J	8,260	C J
172		1,760	J	106	J	134	J	1,000	J	22,100	J	3,960	J
173	171 + 173		C171 J		C171 J		C171 J		C171 J		C171 J		C171 J
174		1,320	J	75.5	J	117	J	1,340	J	73,500	J	8,130	J
175		282	J	20.8	J	29.6	J	154	J	4,970	J	715	J
176		168	J	12.2	J	20.8	J	164	J	8,700	J	829	J
177		1,960	J	205	J	293	J	1,690	J	58,800	J	8,090	J
178		1,780	J	280	J	341	J	1,080	J	14,900	J	2,760	J
179		1,090	J	136	J	180	J	609	J	14,400	J	2,080	J
180	180 + 193	26,800	C J	2,150	C J	2,430	C J	17,300	C J	248,000	C J	59,100	C J
181		496	J	13.8	J	23.3	J	228	J	6,480	J	1,070	J
182		101	J	7.71	J	10.7	J	47.5	J	1,120	J	194	J
183	183 + 185	6,770	C J	667	C J	822	C J	3,710	C J	72,000	C J	15,100	C J
184		29.3	J	7.56	J	8.12	J	12.1	J	139	EMPC	36.6	J
185	183 + 185		C183 J		C183 J		C183 J		C183 J		C183 J		C183 J
186		0.340	UJ	0.0502	UJ	0.0770	EMPC	0.946	J	46.6	J	5.53	J
187		9,470	J	1,350	J	1,760	J	8,810	J	100,000	J	20,900	J
188		17.6	J	3.66	J	4.84	J	10.7	J	213	J	32.2	J
189		661	J	31.1	J	40.7	J	402	J	10,100	J	1,880	J
190		2,670	J	301	J	347	J	1,390	J	29,200	J	6,200	J
191		616	J	40.9	J	50.5	J	299	J	7,110	J	1,240	J
192		0.387	UJ	0.0502	UJ	0.0530	UJ	0.342	UJ	48.5	UJ	1.28	UJ
193	180 + 193		C180 J		C180 J		C180 J		C180 J		C180 J		C180 J
194		2,410	J	310	J	295	J	1,860	J	17,900	J	5,150	J
195		1,050	J	187	J	175	J	648	J	6,840	J	1,800	J
196		1,210	J	176	J	173	J	812	J	8,560	J	2,070	J
197	197 + 200	165	C J	32.7	C J	32.1	C J	104	C J	2,030	C J	315	C J
198	198 + 199	1,840	C J	240	C J	288	C J	1,980	C J	17,500	C J	4,200	C J
199	198 + 199		C198 J		C198 J		C198 J		C198 J		C198 J		C198 J
200	197 + 200		C197 J		C197 J		C197 J		C197 J		C197 J		C197 J
201		260	J	47.3	J	55.5	J	183	J	2,050	EMPC	448	J
202		860	J	214	J	233	J	582	J	3,110	J	1,290	J
203		2,060	J	438	J	415	J	997	J	10,300	J	3,080	J
204		2.47	J	0.682	J	0.668	J	1.21	J	55.9	J	3.13	J
205		123	J	24.8	J	23.5	J	64.5	J	923	J	237	J
206		928	J	199	J	179	J	546	J	5,570	J	2,020	J
207		134	J	36.5	J	31.6	J	88.1	J	702	J	247	J
208		182	J	44.9	J	45.3	J	168	J	1,370	J	404	J
209		214	J	85.3	J	69.8	J	132	J	841	J	342	J
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full RDL)		1,306	J	32.2	J	54.8	J	1,193	J	26,511	J	2,482	J
Total PCBs as Congeners (KM-based)		1,306	J	32.1	J	54.9	J	1,193	J	26,505	J	2,482	J
Total PCBs as Congeners (KM-based, capped)		1,306	J	32.1	J	54.8	J	1,193	J	26,505	J	2,482	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-7
Smallmouth Bass and Sucker PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Forebay 19 060815406SB 8/15/2006		Forebay SUCKER 070505LS 5/5/2007		Reference 20 071027R01SB 10/27/2007		Reference 21 071027R02SB 10/27/2007		Reference 22 071027R03SB 10/27/2007		Reference 23 071027R04SB 10/27/2007		Reference 24 071027R05SB 10/27/2007	
Individual Congeners in pg/g (ng/kg), wet weight															
1		0.226	UJ	0.861		50.7		257		2.64		4.88		1.42	EMPC
2		0.829	J	1.21		149		612		4.99		9.99		2.43	EMPC
3		0.279	UJ	0.482	U	7.52		330		6.57	EMPC	7.75		3.38	EMPC
4		1.77	J	13.2		6.49	U	5.78		7.12	U	6.84	U	25.4	EMPC
5		0.153	J	0.781		4.36	U	6.32		4.90	U	5.03	U	3.65	U
6		0.912	J	6.80		6.85	EMPC	13.8		4.39	U	4.51	U	16.8	
7		0.276	J	0.791		3.99	U	13.9		4.50	U	4.63	U	3.36	U
8		4.78	J	27.4		8.40		12.8	EMPC	6.67		7.82	EMPC	66.7	
9		0.284	J	1.18		3.93	U	10.7	EMPC	4.36	U	4.48	U	3.25	U
10		0.178	J	0.563		3.80	U	4.15		4.10	U	4.21	U	3.05	U
11		562	J	456		644		519		930		748		1,070	
12	12 + 13	0.126	C UJ	0.120	C U	22.6	C EMPC	31.4	C	4.77	C U	4.90	C U	3.55	C U
13	12 + 13		C12 J		C12		C12		C12		C12		C12		C12
14		0.130	J	0.199		4.14	U	10.9		4.54	U	4.66	U	3.38	U
15		9.51	J	7.07		9.85		5.92	EMPC	5.64	U	6.03	U	17.8	
16		5.61	J	68.5		8.46		9.14		11.3	EMPC	10.3	EMPC	113	
17		7.65	J	97.3		11.7	EMPC	11.5		15.3		10.9		297	
18	18 + 30	19.1	C J	164	C	25.4	C	23.8	C	33.0	C	25.8	C	458	C
19		1.65	J	12.1		3.24	EMPC	2.31		3.33	EMPC	2.16	EMPC	65.4	
20	20 + 28	112	C J	514	C	146	C	145	C	180	C	120	C	1,760	C
21	21 + 33	14.8	C J	112	C	28.9	C	24.4	C	29.5	C	22.1	C EMPC	342	C
22		15.2	J	164		32.2		25.6		34.0		30.4		310	
23		0.197	UJ	0.443		1.14	U	1.30	U	1.95	U	1.48	U	2.71	U
24		0.323	J	2.31		0.697	U	1.02	EMPC	0.913	U	1.11	EMPC	6.17	EMPC
25		3.31	J	16.3		5.67	EMPC	5.17		6.10	EMPC	2.00	EMPC	119	
26	26 + 29	10.6	C J	43.9	C	15.9	C	14.8	C	18.3	C	12.5	C	305	C
27		1.25	J	18.8		2.19	EMPC	2.20		2.56	EMPC	1.75	EMPC	75.8	
28	20 + 28		C20 J		C20		C20		C20		C20		C20		C20
29	26 + 29		C26 J		C26		C26		C26		C26		C26		C26
30	18 + 30		C18 J		C18		C18		C18		C18		C18		C18
31		47.1	J	248		84.8		74.6		97.2		73.2		889	
32		2.07	J	16.3		4.00		3.47	EMPC	3.04		2.75	EMPC	236	
33	21 + 33		C21 J		C21		C21		C21		C21		C21		C21
34		0.274	J	1.61		1.14	U	1.30	U	1.92	U	1.45	U	10.5	EMPC
35		0.290	EMPC	0.194	U	1.16	U	1.32	U	2.12	U	1.61	U	2.94	U
36		0.298	EMPC	0.181	U	1.12	U	1.28	U	1.87	U	1.42	U	2.60	U
37		28.0	J	32.8		17.1		13.6	EMPC	20.8	EMPC	16.9		127	
38		0.192	UJ	0.696	EMPC	1.18	U	1.35	U	2.04	U	1.54	U	2.82	U
39		0.800	J	4.52		1.16	U	1.32	U	1.98	U	1.50	U	9.71	EMPC
40	40 + 41 + 71	21.2	C J	262	C	62.8	C	50.9	C	55.9	C	36.2	C	1,360	C
41	40 + 41 + 71		C40 J		C40		C40		C40		C40		C40		C40
42		15.1	J	327		48.5		37.9		48.6		31.1		727	
43		4.05	J	25.2		8.55	EMPC	5.58	EMPC	9.93	EMPC	5.05		178	
44	44 + 47 + 65	115	C J	1,690	C	308	C	257	C	311	C	164	C	4,190	C
45	45 + 51	8.63	C J	65.1	C	16.8	C	14.8	C	15.4	C	10.7	C	358	C
46		2.01	J	12.7		3.54		3.38		3.45	EMPC	2.68	EMPC	60.4	
47	44 + 47 + 65		C44 J		C44		C44		C44		C44		C44		C44
48		13.3	J	202		38.3		32.1		1.11	U	21.7		503	
49	49 + 69	82.0	C J	1,010	C	228	C	191	C	233	C	128	C	3,400	C
50	50 + 53	6.83	C J	90.9	C	15.2	C	8.76	C	15.5	C	7.97	C EMPC	295	C
51	45 + 51		C45 J		C45		C45		C45		C45		C45		C45
52		225	J	1,950		551		436		558		276		5,400	
53	50 + 53		C50 J		C50		C50		C50		C50		C50		C50
54		0.350	UJ	0.901		0.706	U	0.516	EMPC	0.758	U	0.780	U	13.9	
55		0.596	UJ	1.51	U	8.47	EMPC	5.47	U	12.0	EMPC	9.48		148	EMPC
56		20.0	J	292		80.9		52.7		74.1		52.1		920	
57		1.66	J	5.69		6.38	U	5.39	U	4.45	U	5.10	U	26.7	
58		1.03	J	8.25		7.01	U	5.92	U	4.65	U	5.34	U	19.4	U
59	59 + 62 + 75	9.05	C J	124	C	27.5	C	23.9	C	30.4	C	15.3	C	392	C
60		60.3	J	623		135		129		146		73.8		1,320	
61	61 + 70 + 74 + 76	566	C J	3,710	C	959	C	821	C	936	C	480	C	5,610	C
62	59 + 62 + 75		C59 J		C59		C59		C59		C59		C59		C59
63		45.9	J	167		29.7		32.3		31.6		16.9		277	
64		47.9	J	702		148		121		159		90.7		2,010	
65	44 + 47 + 65		C44 J		C44		C44		C44		C44		C44		C44
66		505	J	2,530		593		602		626		324		5,480	
67		4.14	J	22.8		8.30	EMPC	6.77		9.76	EMPC	5.78		63.1	
68		15.8	J	40.1		10.9	EMPC	11.2		7.68	EMPC	5.18	EMPC	45.4	
69	49 + 69		C49 J		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61 J		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40 J		C40		C40		C40		C40		C40		C40
72		6.85	J	35.1		10.8		10.6		11.9		4.66	U	77.7	
73		0.361	UJ	0.240	U	0.654	U	3.74	EMPC	0.817	U	0.762	U	0.667	U
74	61 + 70 + 74 + 76		C61 J		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59 J		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61 J		C61		C61		C61		C61		C61		C61
77		56.8	J	110		47.0		35.8		43.5		25.4		195	
78		1.32	J	1.42	U	6.83	U	5.77	U	4.69	U	5.38	U	19.5	U
79		6.37	J	53.2		13.7	EMPC	9.52	EMPC	10.3	EMPC	5.71	EMPC	28.0	EMPC
80		1.15	J	2.37	EMPC	5.79	U	4.89	U	3.91	U	4.49	U	16.3	U
81		3.58	J	9.02		6.81	U	5.74	U	5.04	U	5.47	U	20.5	U
82		21.9	J	197		97.5		54.4	EMPC	68.9		42.4		323	
83	83 + 99	1,110	C J	8,420	C	1,940	C	1,680	C	1,850	C	777	C	7,520	C
84		42.5	J	562		196		108		161		77.6		621	
85	85 + 116 + 117	252	C J	2,170	C	568	C	486	C	539	C	232	C	2,500	C
86	86 + 87 + 97 + 108 + 119 + 125	345	C J	4,710	C	1,150	C	771	C	1,010	C	471	C	3,760	C
87	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86		C86		C86		C86		C86		C86
88	88 + 91	44.4	C J	862	C	187	C	126	C	164	C	81.2	C	886	C
89		1.28	UJ	13.4		4.65	EMPC	3.78		3.51	EMPC	2.12	EMPC	50.1	EMPC
90	90 + 101 + 113	816	C J	10,600	C	2,620	C	1,900	C	2,500	C	1,010	C	8,280	C
91	88 + 91		C88 J		C88		C88		C88		C88		C88		C88
92		154	J	1,900		505		410		513		200		1,880	
93	93 + 95 + 98 + 100 + 102	266	C J	4,180	C	951	C	632	C	824	C	393	C	3,440	C
94		1.34	UJ	13.9		3.71	EMPC	1.55	EMPC	2.81	EMPC	1.92	U	20.3	
95	93 + 95 + 98 + 100 + 102		C93 J		C93		C93		C93		C93		C93		C93
96		0.877	J	8.80		2.30	EMPC	2.40		3.81	EMPC	0.977	EMPC	48.9	
97	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93 J		C93		C93		C93		C93		C93		C93
99	83 + 99		C83 J		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93 J		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90 J		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93 J		C93		C93		C93		C93		C93		C93
103		4.31	J	49.7		16.5		11.7		17.0		8.46		85.6	
104		0.781	UJ	1.08		1.11	EMPC	0.535	U	0.697	U	0.454	U	2.87	EMPC
105		738	J	4,350		1,150		1,070		1,110		498		4,060	
106		3.70	UJ	11.2	U	10.0	U	8.59	U	9.75	U	4.24	U	23.6	U
107	107 + 124	45.2	C J	241	C	92.9	C	75.2	C	79.4	C	38.4	C	214	C
108	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86		C86		C86		C86		C86		C86
109		389	J	1,090		311		286		268		127		802	
110	110 + 115	498	C J	8,230	C	2,150	C	1,480	C	1,940	C	904	C	7,350	C
111		5.71	J	16.3		4.00		6.03		5.32		1.75	EMPC	13.0	
112		0.860	UJ	0.470	U	1.52	U	0.970	U	1.82	U	1.29	U	4.44	U
113	90 + 101 + 113		C90 J		C90		C90		C90		C90		C90		C90
114		115	J	289		77.0		72.3		65.2		29.2		300	
115	110 + 115		C110 J		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85 J		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85 J		C85		C85		C85		C85		C85		C85
118		3,820	J	10,300		3,300		3,050		3,010		1,330		10,200	
119	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86		C86		C86		C86		C86		C86
120		23.8	J	58.7		21.1		21.7	EMPC	21.4		10.3	EMPC	54.7	
121		1.36	J	11.3		3.26		2.66		3.01	EMPC	1.35	EMPC	11.3	
122		5.17	J	39.1		21.4	EMPC	9.49	U	14.8		4.86	U	27.0	U
123		75.0	J	179		55.4		47.7		43.5	EMPC	24.8		184	
124	107 + 124		C107 J		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86 J		C86		C86		C86		C86		C86		C86
126		12.3	J	19.1		11.2	U	11.6	EMPC	12.2	U	5.61		30.1	U

Table H-7
Smallmouth Bass and Sucker PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Forebay 19 060815406SB 8/15/2006		Forebay SUCKER 070505LS 5/5/2007		Reference 20 071027R01SB 10/27/2007		Reference 21 071027R02SB 10/27/2007		Reference 22 071027R03SB 10/27/2007		Reference 23 071027R04SB 10/27/2007		Reference 24 071027R05SB 10/27/2007	
127		6.66	J	20.2		10.2	U	8.75	U	10.1	U	4.41	U	24.5	U
128	128 + 166	399	C J	2,600	C	842	C	724	C	747	C	350	C	2,030	C
129	129 + 138 + 160 + 163	4,700	C J	23,400	C	5,820	C	5,250	C	5,640	C	2,430	C	14,300	C
130		242	J	1,260		332		276		321		154		632	
131		7.73	J	90.5		28.2		13.5		21.0		10.6	EMPC	32.6	EMPC
132		158	J	2,720		646		381		529		282		1,170	
133		122	J	431		118		108		118		52.4		323	
134	134 + 143	43.6	C J	442	C	141	C	79.6	C	120	C	60.7	C	260	C
135	135 + 151 + 154	395	C J	4,980	C	1,210	C	993	C	1,200	C	512	C	3,100	C
136		50.2	J	739		187		134		181		75.4		610	
137		314	J	730		174		147		125		68.9		573	
138	129 + 138 + 160 + 163		C129 J		C129		C129		C129		C129		C129		C129
139	139 + 140	36.7	C J	324	C	87.5	C	79.3	C	89.5	C	37.4	C	253	C
140	139 + 140		C139 J		C139		C139		C139		C139		C139		C139
141		137	J	1,610		324		255		275		153		1,490	
142		0.715	UJ	7.91	U	7.73	U	13.0	U	7.25	U	3.01	U	14.3	U
143	134 + 143		C134 J		C134		C134		C134		C134		C134		C134
144		41.5	J	530		110		81.5		109	EMPC	48.4		243	
145		0.414	UJ	2.83		0.600	U	0.555	U	0.667	U	0.491	U	0.771	U
146		1,430	J	4,360		1,020		939		978		429		2,540	
147	147 + 149	709	C J	13,000	C	2,400	C	1,450	C	1,920	C	1,060	C	3,250	C
148		3.73	J	41.2		11.6	EMPC	10.0	EMPC	11.2		4.22		36.6	
149	147 + 149		C147 J		C147		C147		C147		C147		C147		C147
150		1.56	J	23.1		6.01		3.99	EMPC	7.15	EMPC	3.76	EMPC	11.7	EMPC
151	135 + 151 + 154		C135 J		C135		C135		C135		C135		C135		C135
152		0.483	J	7.13		1.45	EMPC	1.78	EMPC	1.01	EMPC	0.956		14.4	
153	153 + 168	7,180	C J	26,400	C	5,530	C	5,250	C	5,040	C	2,510	C	15,500	C
154	135 + 151 + 154		C135 J		C135		C135		C135		C135		C135		C135
155		4.01	J	16.9		6.70		5.11		6.87		3.10	EMPC	16.0	
156	156 + 157	791	C J	1,770	C	468	C	402	C	378	C	194	C	1,390	C
157	156 + 157		C156 J		C156		C156		C156		C156		C156		C156
158		190	J	1,760		439		393		435		188		1,220	
159		8.56	J	74.2		11.5		8.69	U	9.01		6.33		24.0	
160	129 + 138 + 160 + 163		C129 J		C129		C129		C129		C129		C129		C129
161		0.469	UJ	5.19	U	5.38	U	9.04	U	5.18	U	2.15	U	10.2	U
162		33.3	J	72.6		22.7		23.6	EMPC	17.3	EMPC	8.30	EMPC	52.4	
163	129 + 138 + 160 + 163		C129 J		C129		C129		C129		C129		C129		C129
164		82.4	J	781		180		139		167		81.4		541	
165		5.19	J	17.0		6.32	EMPC	10.2	U	5.85	U	2.75	EMPC	13.6	
166	128 + 166		C128 J		C128		C128		C128		C128		C128		C128
167		356	J	565		193		169		157		84.3		536	
168	153 + 168		C153 J		C153		C153		C153		C153		C153		C153
169		4.39	UJ	11.1		5.51	U	8.90	U	5.36	U	2.27	U	10.9	U
170		632	J	2,190		438		457		406		260		1,950	
171	171 + 173	122	C J	1,120	C	238	C	242	C	249	C	122	C	766	C
172		119	J	478		84.6		94.6		79.8		57.7		376	
173	171 + 173		C171 J		C171		C171		C171		C171		C171		C171
174		157	J	1,640		270		195		229		164		642	
175		35.7	J	181		31.4		29.3		32.7		17.1	EMPC	71.8	
176		22.5	J	417		66.4		42.0		62.2		36.0		91.0	
177		506	J	2,800		535		429		557		291		903	
178		255	J	1,430		292		303		351		166		786	
179		86.7	J	1,600		321		232		342		153		810	
180	180 + 193	3,450	C J	7,180	C	1,220	C	1,310	C	1,120	C	806	C	5,270	C
181		14.6	J	33.8		10.6	EMPC	10.3		8.97	EMPC	4.54		32.5	
182		7.49	J	31.6		7.69	EMPC	5.65	EMPC	8.57		5.13		24.4	EMPC
183	183 + 185	598	C J	3,140	C	559	C	573	C	567	C	297	C	1,740	C
184		3.23	J	20.7		7.16		7.07		6.44		2.86	EMPC	19.4	
185	183 + 185		C183 J		C183		C183		C183		C183		C183		C183
186		0.158	UJ	0.459	EMPC	1.24	U	0.703	U	0.589	U	0.540	U	0.775	U
187		3,590	J	8,530		1,840		1,810		2,040		1,000		3,850	
188		6.34	J	20.8		5.67		4.91	EMPC	5.62		2.31	EMPC	11.9	
189		41.9	J	78.0		16.5	EMPC	17.4		16.8	EMPC	13.3		67.7	
190		252	J	732		179		192		185		103		570	
191		45.4	J	120		22.3		26.4		21.2		16.7		81.1	
192		0.169	UJ	0.202	U	1.29	U	0.732	U	0.626	U	0.574	U	0.824	U
193	180 + 193		C180 J		C180		C180		C180		C180		C180		C180
194		341	J	695		167		150		126		122		618	
195		157	J	422		112		105		95.2		65.2		334	
196		197	J	450		88.2		101		69.2		58.1		284	
197	197 + 200	26.5	C J	168	C	34.6	C	28.2	C	28.5	C	20.5	C	71.2	C
198	198 + 199	443	C J	1,100	C	279	C	258	C	222	C	192	C	702	C
199	198 + 199		C198 J		C198		C198		C198		C198		C198		C198
200	197 + 200		C197 J		C197		C197		C197		C197		C197		C197
201		70.1	J	274		51.2		46.2		46.9		27.9		109	
202		134	J	830		173		166		175		100		428	
203		273	J	1,040		237		237		210		169	EMPC	596	
204		0.449	J	1.68		1.64	U	0.578	U	0.640	U	0.872	EMPC	0.676	U
205		16.9	J	58.7		15.4		14.6	EMPC	14.5	EMPC	10.6	EMPC	37.9	
206		111	J	368		103		95.6		72.8		66.6		240	
207		27.0	J	62.4		19.6		16.8		13.3	EMPC	11.7	EMPC	38.8	
208		53.0	J	165		43.9		36.1		31.5	EMPC	27.7		87.1	
209		51.7	J	144		52.4		44.0		36.9		33.9		90.2	
Total PCBs as Congeners in ug/kg, wet weight															
Total PCBs as Congeners (full EMPC/full RDL)		40.8	J	201	J	48.0	J	42.1	J	45.1	J	22.5	J	164	J
Total PCBs as Congeners (KM-based)		40.7	J	201	J	47.9	J	41.8	J	44.7	J	22.1	J	164	J
Total PCBs as Congeners (KM-based, capped)		40.7	J	201	J	47.9	J	41.8	J	44.7	J	22.1	J	164	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-7
Smallmouth Bass and Sucker PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Reference 25 071027R06SB 10/27/2007		Reference 26 071115R07SB 11/15/2007		Reference 27 080517R10SB 5/17/2008		Reference 28 080517R11SB 5/17/2008		Reference 29 080517R12SB 5/17/2008		Reference 30 080517R13SB 5/17/2008	
Individual Congeners in pg/g (ng/kg), wet weight													
1		15.5	EMPC	1.63	U	1.05		0.452	EMPC	0.430	EMPC	0.626	
2		35.2		2.15	EMPC	1.66		1.11		0.666		1.34	
3		23.2	EMPC	3.29	EMPC	0.748		0.488		0.340	EMPC	0.617	
4		9.49	EMPC	4.96	U	9.61		3.81		2.37		3.55	
5		5.69	U	3.20	U	0.462		0.234	U	0.255	U	0.208	
6		5.10	U	2.87	U	5.37		1.99		1.02		2.12	
7		5.23	U	2.95	U	1.04		0.466		0.236	U	0.561	
8		22.2		6.54	EMPC	22.7		10.4		4.91		9.98	
9		5.07	U	2.85	U	1.84		0.652		0.294	EMPC	0.718	
10		4.76	U	2.68	U	0.377	EMPC	0.217	U	0.238	U	0.141	U
11		438		339		342		377		173		320	
12	12 + 13	5.54	C U	3.12	C U	0.177	C U	0.228	C U	0.250	C U	0.153	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		5.28	U	2.97	U	0.170	U	0.219	U	0.239	U	0.151	U
15		6.46	U	3.54	U	4.92		2.91		1.41		3.45	
16		40.5		10.8	EMPC	31.0		13.3		7.42		22.5	
17		80.3		18.4		86.0		19.3		10.8		52.3	
18	18 + 30	158	C	39.1	C	131	C	43.8	C	22.0	C	96.0	C
19		8.89	EMPC	2.44	EMPC	6.14		3.23		1.84		3.46	
20	20 + 28	740	C	219	C	1,020	C	215	C	150	C	666	C
21	21 + 33	155	C	33.5	C	152	C	42.8	C	30.2	C	125	C
22		151		35.1		212		51.0		30.9		115	
23		1.15	U	0.838	U	0.775		0.197		0.172	EMPC	0.680	
24		3.00	EMPC	0.776	U	2.68		0.691		0.405	EMPC	1.45	
25		30.4		6.87		37.9		7.91		5.36		18.3	
26	26 + 29	92.4	C	23.4	C EMPC	110	C	23.6	C	16.0	C	80.0	C
27		11.0		2.62		6.74		2.85		1.85		6.12	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		409		108		596		125		78.9		338	
32		27.6		5.30		34.1		6.56		4.23		24.6	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		2.02	EMPC	0.823	U	1.80		0.507		0.497		1.44	
35		1.26	U	0.911	U	0.163	U	0.127	EMPC	0.0726	U	0.118	U
36		1.11	U	0.804	U	0.142	U	0.0498	U	0.0635	U	0.101	U
37		49.4		15.4		28.1		20.0		7.00		26.8	
38		1.20	U	0.874	U	1.17		0.243	EMPC	0.247	EMPC	0.476	
39		5.27		1.38	EMPC	7.43		1.95		1.45		6.04	
40	40 + 41 + 71	240	C	64.4	C	220	C	66.9	C	62.2	C	225	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		180		58.6		239		55.0		46.1		187	
43		32.1	EMPC	12.6	EMPC	38.4		8.38		8.71		31.2	
44	44 + 47 + 65	771	C	377	C	1,090	C	271	C	260	C	824	C
45	45 + 51	59.4	C	17.9	C	58.4	C	15.8	C	13.2	C	49.1	C
46		12.9	EMPC	3.47		9.01		3.98		2.53		10.8	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		178		0.662	U	178		42.4		35.0		166	
49	49 + 69	621	C	301	C	866	C	203	C	192	C	657	C
50	50 + 53	45.4	C	12.8	C	24.2	C	12.6	C	10.0	C	38.3	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		978		575		1,280		402		384		1,140	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.814	U	0.492	U	0.370	EMPC	0.280		0.194		0.643	
55		20.2		6.11	EMPC	0.249	U	0.406	U	0.485	U	0.228	U
56		87.1		64.2		109		80.9		53.2		135	
57		8.61	U	2.29	U	8.57		2.09		2.15		5.13	
58		9.01	U	2.39	U	3.69		1.87		2.09		2.98	
59	59 + 62 + 75	83.0	C	34.6	C	107	C	25.4	C	23.3	C	81.0	C
60		145		129		325		123		116		209	
61	61 + 70 + 74 + 76	1,220	C	785	C	2,130	C	848	C	756	C	1,690	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		49.7		36.3		101		29.5		34.0		63.3	
64		400		175		554		147		121		427	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		700		572		1,590		534		601		1,040	
67		19.5		9.40		29.1		9.61		8.65		18.4	
68		11.6	EMPC	7.59		16.3		7.78		9.79		13.8	
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		13.5	EMPC	11.0		22.7		8.21		8.94		18.2	
73		0.796	U	7.72	EMPC	0.0486	U	0.0495	U	0.0484	U	0.0492	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		38.1		30.1		75.4		36.2		43.6		70.1	
78		9.08	U	2.41	U	0.238	U	0.389	U	0.465	U	0.229	U
79		16.2		7.61		17.1		13.4		11.8		27.0	
80		7.57	U	2.01	U	2.30		0.818		0.948		1.32	
81		9.44	U	2.53	U	5.52		2.56		2.63		3.26	
82		112		59.7		55.2		57.0		44.9		131	
83	83 + 99	1,660	C	1,760	C	5,090	C	1,410	C	1,530	C	2,670	C
84		147		126		122		120		93.5		279	
85	85 + 116 + 117	502	C	513	C	1,420	C	393	C	423	C	752	C
86	86 + 87 + 97 + 108 + 119 + 125	1,100	C	829	C	1,310	C G	758	C G	674	C G	1,560	C G
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	183	C	133	C	174	C	117	C	113	C	288	C
89		4.43	EMPC	1.71	U	3.79		3.01		2.84		6.39	
90	90 + 101 + 113	2,160	C	1,950	C	3,510	C	1,730	C	1,670	C	3,490	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		401		404		812		353		342		665	
93	93 + 95 + 98 + 100 + 102	835	C	653	C	979	C	563	C	552	C	1,320	C
94		4.04	EMPC	1.99	EMPC	2.17		1.84		1.87		4.30	
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		6.41	EMPC	1.88	EMPC	4.25		1.79		1.80		6.05	
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		15.8		11.6	EMPC	14.1		9.48		10.8		21.8	
104		0.947	U	0.507	U	0.261	EMPC	0.163	EMPC	0.237		0.420	
105		1,160		1,010		3,500		940		1,000		1,910	
106		12.0	U	8.48	U	0.874	U	0.583	U	0.544	U	0.304	U
107	107 + 124	95.8	C	56.8	C EMPC	132	C	71.0	C	62.2	C	128	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		251		262		677		223		285		408	
110	110 + 115	1,760	C	1,500	C	2,460	C	1,400	C	1,230	C	2,960	C
111		1.56	U	4.79	EMPC	9.55		3.48		5.06		5.82	
112		1.51	U	1.21	U	0.147	U	0.387	U	0.531	U	0.246	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		85.6	EMPC	68.4	EMPC	272		59.9		80.2		123	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		3,140		3,110		11,800		2,580		3,630		4,850	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		15.4		22.7		57.3		17.0		24.2		29.3	
121		2.91		2.35		4.77		1.76		2.26		3.49	
122		22.8	EMPC	9.72	U	7.66		12.1		5.37		22.8	
123		47.0	EMPC	53.1		148		43.0		55.3		81.1	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		15.7	U	10.7	U	25.9		6.03		9.55		12.6	

Table H-7
Smallmouth Bass and Sucker PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Reference 25 071027R06SB 10/27/2007		Reference 26 071115R07SB 11/15/2007		Reference 27 080517R10SB 5/17/2008		Reference 28 080517R11SB 5/17/2008		Reference 29 080517R12SB 5/17/2008		Reference 30 080517R13SB 5/17/2008	
127		12.5	U	8.83	U	0.900	U	0.600	U	0.561	U	0.326	U
128	128 + 166	713	C	704	C	2,400	C	545	C	551	C	1,060	C
129	129 + 138 + 160 + 163	4,680	C	5,240	C	15,500	C	4,390	C	5,020	C	7,510	C
130		282		239		405		265		246		459	
131		29.4		12.2	EMPC	13.7		17.9		11.3		36.5	
132		550		381		378		406		324		922	
133		97.8		111		280		87.2		105		163	
134	134 + 143	137	C	80.5	C	84.4	C	80.0	C	65.9	C	176	C
135	135 + 151 + 154	913	C	904	C	1,690	C	834	C	814	C	1,590	C
136		147		131		178		119		116		274	
137		178		166		720		104		151		245	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	73.6	C	75.5	C	258	C	59.3	C	62.5	C	123	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		337		269		660		191		225		432	
142		6.52	U	11.4	U	0.798	U	0.703	U	0.731	U	0.625	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		99.9		70.9		98.1		73.8		65.3		153	
145		0.733	U	0.571	U	0.0486	U	0.296	EMPC	0.235	EMPC	0.737	
146		767		901		2,380		811		1,080		1,420	
147	147 + 149	1,980	C	1,400	C	1,340	C	1,470	C	1,250	C	3,160	C
148		7.79		7.82	EMPC	12.3		7.27		8.56		13.9	
149	147 + 149		C147		C147		C147		C147		C147		C147
150		5.88	EMPC	3.81		2.54		3.48		4.18		7.60	
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.675	U	1.14		3.06		1.08		1.18		2.32	
153	153 + 168	4,230	C	5,710	C	18,200	C	4,080	C	5,650	C	7,260	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		3.02		5.00		15.2		4.36		4.97		7.66	
156	156 + 157	490	C	448	C	1,890	C	290	C	430	C	638	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		396		391		1,420		328		302		616	
159		10.4		8.50		14.1		10.9		10.6		19.0	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		4.66	U	8.16	U	0.574	U	0.506	U	0.525	U	0.440	U
162		19.2	EMPC	18.3		77.3		14.6		21.0		28.7	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		173		122		228		115		130		232	
165		5.26	U	9.22	U	11.3		3.51		5.19		6.60	
166	128 + 166		C128		C128		C128		C128		C128		C128
167		181		168		571		117		211		242	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		4.89	U	8.57	U	8.12	U	1.30	U	1.86	U	2.79	U
170		398		498		2,180		370		459		693	
171	171 + 173	208	C	241	C	966	C	214	C	201	C	380	C
172		83.6		93.3		305		75.7		86.3		138	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		254		185		231		198		194		375	
175		28.3	EMPC	26.3		58.6		25.8		27.6		46.7	
176		58.1		44.3		40.1		48.5		34.3		97.9	
177		441		382		633		496		437		829	
178		237		288		848		275		283		470	
179		230		229		411		250		215		478	
180	180 + 193	1,040	C	1,500	C	6,100	C	1,060	C	1,550	C	1,900	C
181		10.9		8.36	EMPC	45.2		6.76		9.23		12.9	
182		4.26		6.39	EMPC	20.5		4.59		6.47		8.23	
183	183 + 185	458	C	549	C	2,010	C	483	C	547	C	857	C
184		3.98	EMPC	5.95	EMPC	21.4		4.25		5.80		8.47	
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.854	U	0.553	U	0.0631	U	0.0495	U	0.0484	U	0.0630	U
187		1,450		1,690		3,880		1,680		2,180		2,730	
188		3.35	EMPC	4.31	EMPC	9.74		4.19		5.68		7.24	
189		19.5	EMPC	23.2	EMPC	102		14.7		21.7		31.3	
190		144		201		912		169		198		292	
191		24.0		25.9		121		20.1		27.2		36.0	
192		0.908	U	0.588	U	0.0715	U	0.0495	U	0.0484	U	0.0720	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		138		208		661		133		153		244	
195		77.0		122		510		97.0		97.8		177	
196		85.8	EMPC	106		424		78.2		101		148	
197	197 + 200	27.0	C	32.3	C	85.6	C	27.0	C	25.0	C	52.0	C
198	198 + 199	210	C	261	C	582	C	228	C	241	C	420	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		40.2	EMPC	41.6		127		42.6		53.9		87.4	
202		125		205		485		143		121		265	
203		191		284		1,170		221		229		367	
204		0.683	U	0.578	U	1.66		0.365		0.472		0.738	
205		11.7		16.0		58.1		12.5		12.2		23.1	
206		76.4		136		357		86.2		77.0		137	
207		12.8		24.0		75.1		14.6		17.6		25.7	
208		29.7		44.4		90.6		37.3		32.8		60.2	
209		41.1	EMPC	72.3		153		45.7		41.5		67.6	
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full RDL)		45.0	J	42.0	J	117	J	35.8	J	39.8	J	69.1	J
Total PCBs as Congeners (KM-based)		44.4	J	41.7	J	117	J	35.8	J	39.8	J	69.0	J
Total PCBs as Congeners (KM-based, capped)		44.4	J	41.7	J	117	J	35.8	J	39.8	J	69.0	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-7
Smallmouth Bass and Sucker PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Reference 31 080517R14SB 5/17/2008		Reference 32 080521R15SB 5/21/2008		Reference 33 080521R16SB 5/21/2008		Reference 34 080521R17SB 5/21/2008		Reference 35 080521R18SB 5/21/2008		Reference 36 080521R19SB 5/21/2008		Reference 37 080521R20SB 5/21/2008		Reference 38 080521R21SB 5/21/2008	
Individual Congeners in pg/g (ng/kg), wet weight																	
1		0.476	EMPC	0.403		0.566	EMPC	0.444		0.471		0.655	EMPC	0.661	EMPC	0.345	
2		0.904		0.694		0.522		0.890		0.582	EMPC	0.715		0.890		0.397	
3		0.342	EMPC	0.398	EMPC	0.391	EMPC	0.513		0.430	EMPC	0.580		0.534		0.489	
4		3.44		3.34		2.23		3.63		3.48		4.84		3.90		2.68	
5		0.184	U	0.153	EMPC	0.261	U	0.191		0.366	U	0.213	U	0.511	U	0.340	U
6		1.76		1.73		1.68		1.75		1.88		3.08		1.64		1.56	
7		0.436		0.421		0.339		0.406		0.335		0.633		0.448	U	0.350	
8		7.37		8.61		6.55		8.90		7.56		11.5		8.04		8.52	
9		0.577		0.514		0.528		0.611		0.476		0.689		0.440	U	0.451	
10		0.163	U	0.125	U	0.231	U	0.141		0.307	U	0.179	U	0.427	U	0.284	U
11		223		206		75.5		475		117		416		298		117	
12	12 + 13	0.178	C U	3.04	C EMPC	0.251	C U	0.156	C U	0.358	C U	0.209	C U	0.499	C U	0.332	C U
13	12 + 13		C12		C12		C12		C12		C12		C12		C12		C12
14		0.176	U	0.134	U	0.248	U	0.148	U	0.339	U	0.198	U	0.473	U	0.315	U
15		2.07		3.50		1.75		3.19		1.90		4.86		3.21		2.39	
16		8.80		9.25		7.26		11.4		9.53		12.8		12.5		10.0	
17		12.2		12.9		11.7		15.7		13.8		18.7		16.3		14.2	
18	18 + 30	28.0	C	26.0	C	24.6	C	34.6	C	30.1	C	40.3	C	35.9	C	29.1	C
19		2.23		2.62		1.87		2.88		2.37		3.26		2.76		2.44	
20	20 + 28	128	C	173	C	186	C	175	C	169	C	193	C	164	C	139	C
21	21 + 33	22.7	C	29.2	C	34.9	C	36.8	C	34.4	C	43.2	C	35.0	C	30.2	C
22		27.2		39.3		36.4		42.8		33.8		46.5		38.9		32.7	
23		0.151		0.124	EMPC	0.149		0.148		0.214		0.172	U	0.180	U	0.145	U
24		0.427	EMPC	0.427		0.399		0.594	EMPC	0.409	EMPC	0.688		0.138	U	0.662	EMPC
25		3.44		7.01		23.0		9.40		7.34		9.70		6.17		6.02	
26	26 + 29	12.6	C	18.7	C	47.1	C	22.3	C	19.3	C	23.3	C	18.4	C	16.2	C
27		2.00		1.87		1.64		2.76		2.43		3.03		3.11		2.31	
28	20 + 28		C20		C20		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18		C18		C18
31		59.7		94.4		99.6		101		82.5		110		84.5		81.7	
32		3.78		4.69		10.3		4.44		4.63		6.09		3.91		5.54	
33	21 + 33		C21		C21		C21		C21		C21		C21		C21		C21
34		0.326		0.501	EMPC	1.27		0.566		0.729		0.627		0.555	EMPC	0.353	EMPC
35		0.0499	U	0.0480	U	0.0832	U	0.107	U	0.203	U	0.203	U	0.213	U	0.172	U
36		0.0484	U	0.0480	U	0.0714	U	0.0919	U	0.176	U	0.175	U	0.184	U	0.148	U
37		11.5		17.6		16.5		18.8		10.0		21.0		13.4		14.0	
38		0.101	EMPC	0.154	EMPC	0.356	EMPC	0.261	EMPC	0.180	U	0.251	EMPC	0.188	U	0.152	U
39		0.998		1.49		2.02		1.68		1.51		2.03		1.75		0.150	U
40	40 + 41 + 71	30.0	C	54.2	C	126	C	68.7	C	60.0	C	90.6	C	61.2	C	65.1	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40		C40		C40
42		24.9		46.0		97.4		57.1		53.5		74.7		58.0		47.3	
43		5.23		5.30		9.49		8.90		10.9		12.8		10.7		7.92	
44	44 + 47 + 65	182	C	270	C	781	C	326	C	350	C	432	C	327	C	300	C
45	45 + 51	8.20	C	12.8	C	22.8	C	15.4	C	9.12	C EMPC	21.3	C	13.0	C	15.2	C
46		1.93		3.65		5.61		4.01		2.93		4.92		3.37		3.51	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44		C44		C44
48		24.1		30.1		39.8		38.1		39.8		53.4		44.5		32.9	
49	49 + 69	113	C	218	C	697	C	259	C	278	C	342	C	219	C	248	C
50	50 + 53	6.37	C	11.5	C	29.8	C	14.7	C	12.3	C	19.8	C	12.6	C	13.2	C
51	45 + 51		C45		C45		C45		C45		C45		C45		C45		C45
52		304		438		1,090		495		544		658		520		487	
53	50 + 53		C50		C50		C50		C50		C50		C50		C50		C50
54		0.177		0.428		0.980		0.318		0.298		0.425	EMPC	0.207		0.376	
55		0.136	U	0.208	U	0.333	U	0.204	U	0.393	U	0.393	U	0.389	U	0.326	U
56		35.0		87.3		206		112		73.3		128		74.8		88.8	
57		1.61		2.50		7.77		2.59		2.60		3.15		2.12		2.88	
58		0.930		2.04		5.14		3.12		2.38		3.12		2.27		2.53	
59	59 + 62 + 75	14.5	C	23.4	C	35.3	C	28.2	C	31.7	C	38.4	C	30.0	C	26.0	C
60		110		145		332		143		193		212		152		142	
61	61 + 70 + 74 + 76	664	C	974	C	4,660	C	992	C	1,120	C	1,390	C	905	C	1,010	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59		C59		C59
63		39.1		35.6		184		32.7		47.2		48.6		35.8		36.1	
64		83.5		136		190		151		158		204		156		146	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44		C44		C44
66		670		679		3,880		642		942		907		686		638	
67		5.21		9.34		25.7		10.6		9.50		15.6		8.27		10.7	
68		9.84		9.61		69.5		10.9		10.8		13.4		8.27		10.5	
69	49 + 69		C49		C49		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40		C40		C40
72		7.29		12.8		55.4		13.8		13.9		17.5		10.4		13.2	
73		0.0484	U	0.0480	U	0.0491	U	0.0526	U	0.0707	U	0.0760	U	0.111	U	0.0875	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61		C61		C61
77		54.8		49.3		172		53.7		59.7		70.1		52.8		49.7	
78		0.137	U	0.209	U	0.334	U	0.208	U	0.401	U	0.401	U	0.396	U	0.333	U
79		8.15		15.2		247		22.0		19.3		29.7		21.7		21.5	
80		1.00		0.862		0.286	U	0.177	U	0.341	U	0.341	U	0.337	U	1.19	
81		2.63		2.35		15.9		3.40		4.06		3.76		2.02		3.11	
82		16.7		68.4		751		86.3		79.6		125		58.9		93.5	
83	83 + 99	1,730	C	1,800	C	23,200	C	1,780	C	2,600	C	3,010	C	1,980	C	2,330	C
84		47.6		144		511		149		126		240		125		177	
85	85 + 116 + 117	465	C	533	C	5,890	C	554	C	829	C	902	C	632	C	654	C
86	86 + 87 + 97 + 108 + 119 + 125	441	C G	939	C G	10,500	C	1,100	C G	1,170	C	1,730	C G	1,050	C	1,370	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86		C86
88	88 + 91	51.7	C	138	C	838	C	155	C	137	C	253	C	131	C	196	C
89		1.16		3.30		5.90		3.32		3.75		5.15		2.88		4.12	
90	90 + 101 + 113	1,180	C	2,090	C	17,900	C	2,320	C	2,470	C	3,810	C	2,280	C	2,800	C
91	88 + 91		C88		C88		C88		C88		C88		C88		C88		C88
92		278		429		2,210		448		523		751		471		586	
93	93 + 95 + 98 + 100 + 102	354	C	672	C	3,370	C	702	C	733	C	1,150	C	694	C	848	C
94		0.492		1.63		3.40		2.08		1.47		3.51		1.31		2.90	
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93		C93
96		1.20		2.02		4.83		2.30		2.37		3.37		2.24		2.62	EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93		C93
103		3.76		11.0		47.8		12.7		12.1		22.1		10.1		16.8	
104		0.0808	U	0.220		0.223	EMPC	0.231		0.230		0.408	EMPC	0.245	U	0.343	EMPC
105		1,370		1,310		23,400		1,320		2,000		2,090		1,440		1,680	
106		0.436	U	0.316	U	1.96	U	0.536	U	1.18	U	0.686	U	0.786	U	0.548	U
107	107 + 124	57.7	C	90.0	C	1,540	C	91.4	C	90.9	C	141	C	81.9	C	118	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86		C86
109		373		308		6,030		290		443		522		362		382	
110	110 + 115	807	C	1,770	C	10,600	C	1,960	C	2,040	C	2,910	C	1,890	C	2,320	C
111		5.29		4.35		10.7		4.28		6.68	EMPC	8.35		4.00		5.35	
112		0.314	U	0.382	U	0.181	U	0.561	U	0.801	U	0.217	U	0.366	U	0.439	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90		C90		C90
114		145		87.2		2,910		82.6		132		137		97.1		106	
115	110 + 115		C110		C110		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85		C85		C85
118		6,210		3,740		98,600		3,650		5,970		5,350		4,780		4,460	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86		C86
120		29.9		21.9		57.7		22.0		32.8		37.4		28.1		27.0	
121		1.67		2.21		2.34		2.30		2.98		4.51		2.56		2.73	
122		6.75		15.3		234		19.8		10.3		28.4		9.82		20.6	
123		104		60.6		1,830		64.8		84.0		80.2		76.1		69.1	
124	107 + 124		C107		C107		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86		C86
126		14.3		9.45		74.6		9.01		13.4		12.9		10.7		8.65	

Table H-7
Smallmouth Bass and Sucker PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Reference 31 080517R14SB 5/17/2008		Reference 32 080521R15SB 5/21/2008		Reference 33 080521R16SB 5/21/2008		Reference 34 080521R17SB 5/21/2008		Reference 35 080521R18SB 5/21/2008		Reference 36 080521R19SB 5/21/2008		Reference 37 080521R20SB 5/21/2008		Reference 38 080521R21SB 5/21/2008	
127		0.469	U	0.339	U	2.10	U	0.575	U	1.27	U	0.735	U	0.843	U	0.587	U
128	128 + 166	702	C	720	C	7,850	C	727	C	1,120	C	1,250	C	849	C	912	C
129	129 + 138 + 160 + 163	6,520	C	5,160	C	66,800	C	5,450	C	7,870	C	9,990	C	6,720	C	6,760	C
130		225		298		3,900		292		296		570		303		407	
131		4.60		20.5		261		19.5		15.0		38.7		14.7		27.5	
132		167		532		3,600		476		394		867		411		640	
133		134		105		804		92.1		145		194		128		131	
134	134 + 143	36.7	C	94.8	C	718	C	87.3	C	80.1	C	176	C	85.1	C	117	C
135	135 + 151 + 154	648	C	936	C	2,980	C	914	C	1,070	C	1,870	C	1,110	C	1,270	C
136		74.2		140		558		133		137		254		151		197	
137		275		164		8,560		171		299		271		203		218	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129		C129		C129
139	139 + 140	70.5	C	73.9	C	771	C	68.1	C	108	C	136	C	87.0	C	96.9	C
140	139 + 140		C139		C139		C139		C139		C139		C139		C139		C139
141		182		244		3,540		288		420		484		313		351	
142		0.628	U	0.484	U	2.21	U	0.792	U	0.955	U	1.19	U	1.32	U	0.984	U
143	134 + 143		C134		C134		C134		C134		C134		C134		C134		C134
144		40.2		83.9		755		84.1		83.6		174		85.6		123	
145		0.0484	U	0.283	EMPC	1.08		0.379		0.206		0.571	EMPC	0.405	EMPC	0.443	EMPC
146		1,550		924		11,400		899		1,320		1,790		1,210		1,230	
147	147 + 149	640	C	1,720	C	13,000	C	1,610	C	1,310	C	3,260	C	1,440	C	2,140	C
148		4.53		7.54		12.8		7.57		8.46		17.6		8.00		11.2	
149	147 + 149		C147		C147		C147		C147		C147		C147		C147		C147
150		1.22		3.59		11.4		3.71		2.87		9.05		3.21		5.99	
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135		C135		C135
152		0.993		1.28		4.30		1.24		1.50		2.29		1.57		1.75	EMPC
153	153 + 168	9,040	C	5,090	C	69,500	C	4,850	C	8,170	C	9,180	C	7,410	C	5,650	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135		C135		C135
155		6.33		4.80		3.55		4.60		7.90		10.2		7.21		6.63	
156	156 + 157	882	C	447	C	20,000	C	420	C	786	C	714	C	557	C	544	C
157	156 + 157		C156		C156		C156		C156		C156		C156		C156		C156
158		402		406		4,520		412		606		798		490		557	
159		7.57		11.4		71.6		14.3		13.3		25.2		14.1	EMPC	15.4	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129		C129		C129
161		0.442	U	0.341	U	1.55	U	0.555	U	0.670	U	0.836	U	0.928	U	0.690	U
162		35.3		19.0		442		20.0		36.0		38.6		27.9		23.5	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129		C129		C129
164		97.1		145		2,010		143		169		228		167		185	
165		5.19		4.18		12.9		3.83		6.28		8.53		4.82		4.99	EMPC
166	128 + 166		C128		C128		C128		C128		C128		C128		C128		C128
167		380		180		6,540		175		286		242		276		198	
168	153 + 168		C153		C153		C153		C153		C153		C153		C153		C153
169		3.07	U	1.54	U	6.62	U	2.16	U	4.82	U	5.96	U	3.56	U	2.10	U
170		831		480		7,510		491		866		887		636		522	
171	171 + 173	305	C	246	C	1,020	C	245	C	389	C	548	C	345	C	311	C
172		114		86.5		869		98.0		159		193		115		101	
173	171 + 173		C171		C171		C171		C171		C171		C171		C171		C171
174		121		212		1,480		242		220		447		235		270	
175		28.3		27.7		142		29.3		36.0		71.5		37.1		39.4	
176		19.0		54.9		134		50.4		37.4		124		45.7		76.9	
177		417		512		2,030		503		462		1,220		550		675	
178		338		307		584		291		422		683		419		384	
179		154		264		271		244		243		549		315		348	
180	180 + 193	3,000	C	1,300	C	15,600	C	1,380	C	2,670	C	2,870	C	2,110	C	1,460	C
181		15.7		9.11		258		10.0		16.8		18.8		14.4		12.0	
182		6.95		5.64		27.5		7.89		13.4		15.8		10.7		9.23	
183	183 + 185	759	C	542	C	2,520	C	583	C	904	C	1,290	C	843	C	700	C
184		7.07		5.00		4.75		4.51		8.34		10.9		8.55		6.70	
185	183 + 185		C183		C183		C183		C183		C183		C183		C183		C183
186		0.0484	U	0.0597	U	0.0594	U	0.0919	U	0.126	U	0.158	U	0.187	U	0.175	U
187		2,640		1,750		6,820		1,800		2,510		4,090		2,650		2,330	
188		6.31		4.57		10.8		4.36		6.67		10.1		6.91		6.04	
189		44.4		19.7		532		20.9		38.6		37.5		29.5		20.5	
190		411		209		1,520		217		381		431		345		243	
191		48.3		25.3		308		28.4		52.0		59.5		42.3		31.9	
192		0.0500	U	0.0682	U	0.0679	U	0.119	U	0.163	U	0.205	U	0.242	U	0.226	U
193	180 + 193		C180		C180		C180		C180		C180		C180		C180		C180
194		344		163		1,150		157		285		289		204		134	
195		219		105		385		91.8		172		195		146		97.2	
196		189		93.1		478		97.1		187		193		147		96.2	
197	197 + 200	31.1	C	27.0	C	57.7	C	28.7	C	39.2	C	64.3	C	35.1	C	35.1	C
198	198 + 199	348	C	263	C	1,020	C	277	C	465	C	532	C	315	C	248	C
199	198 + 199		C198		C198		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197		C197		C197
201		71.0		46.1		113		43.6		66.9		110		67.6		55.1	
202		186		161		191		144		232		348		198		166	
203		443		255		621		252		468		506		364		234	
204		0.657		0.459		0.633		0.427		1.06		0.932	EMPC	0.540		0.491	EMPC
205		23.2		13.7		43.2		13.8		22.9		28.6		19.2		13.4	
206		131		96.9		245		94.4		185		171		107		70.8	
207		31.7		16.4		45.4		14.9		34.4		30.8		23.3		15.2	
208		44.9		37.9		71.8		37.0		65.3		73.0		38.9		31.0	
209		65.0		38.1		65.6		43.1		67.2		77.6		52.2		31.7	
Total PCBs as Congeners in ug/kg, wet weight																	
Total PCBs as Congeners (full EMPC/full RDL)		50.2	J	43.1	J	499	J	44.2	J	60.6	J	77.9	J	53.0	J	52.8	J
Total PCBs as Congeners (KM-based)		50.2	J	43.1	J	499	J	44.2	J	60.6	J	77.9	J	52.9	J	52.8	J
Total PCBs as Congeners (KM-based, capped)		50.2	J	43.1	J	499	J	44.2	J	60.6	J	77.9	J	52.9	J	52.8	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-8
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay P04 08022604SD 2/26/2008		Forebay P07 08021507SD 2/15/2008		Forebay P08 08021508SD 2/15/2008		Forebay P09 08021409SD 2/14/2008		Forebay P10 08021410SD 2/14/2008		Forebay P11 08021411SD 2/14/2008	
Individual Congeners in pg/g (ng/kg), dry weight													
1		1.16		0.181		0.168		0.296	EMPC	0.324	EMPC	0.257	
2		2.78		1.28		1.69		6.62		4.86		4.76	
3		0.500	EMPC	0.206		0.252	EMPC	0.467		0.416	EMPC	0.351	
4		7.11		1.46		0.628		0.985		0.566		2.24	
5		0.0659	U	0.0521	U	0.0719	U	0.0625	U	0.0504	U	0.0438	U
6		0.897		0.254		0.219	EMPC	0.352		0.292		0.736	
7		0.597		0.163	EMPC	0.124		0.222	EMPC	0.172		0.131	EMPC
8		4.61		1.14		0.958		1.67		1.52		3.83	
9		0.758		0.149	EMPC	0.0830	EMPC	0.161		0.119		0.197	
10		0.323		0.0670	EMPC	0.0653	U	0.0569	U	0.0477	U	0.0670	
11		79.5		42.6		52.6		68.8		84.4		86.8	
12	12 + 13	1.52	C	0.503	C EMPC	0.551	C	0.974	C	0.803	C EMPC	1.15	C
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.0612	U	0.0484	U	0.0668	U	0.0581	U	0.0477	U	0.0660	
15		6.40		1.67		2.01		2.76		3.26		4.26	
16		1.71		0.667		0.457		0.942		0.813		5.69	
17		12.1		2.28		1.14		2.44		2.67		5.25	
18	18 + 30	12.0	C	2.74	C	1.55	C	3.07	C	2.33	C	11.2	C
19		4.73		0.986		0.362		0.878	EMPC	0.394		1.56	
20	20 + 28	52.9	C	5.68	C	5.61	C	10.1	C	13.2	C	20.7	C
21	21 + 33	12.8	C	2.15	C	1.59	C	3.91	C	2.78	C	10.1	C
22		7.70		1.29		1.45		2.42		2.37		7.51	
23		0.0491	U	0.0473	U	0.0505	U	0.0495	U	0.0477	U	0.0368	U
24		0.135	EMPC	0.0473	U	0.0478	U	0.0590	EMPC	0.0477	U	0.176	
25		20.9		0.608		0.449	EMPC	0.825		0.937		1.36	
26	26 + 29	32.7	C	0.970	C	0.717	C	1.39	C	1.39	C	3.07	C
27		4.33		0.726		0.374		0.747		0.524		0.864	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		36.7		4.32		3.62		6.58		5.89		15.5	
32		13.5		1.06		0.448		1.00		0.918		3.13	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.463		0.0473	U	0.0485	U	0.0790	EMPC	0.0650	EMPC	0.0810	
35		0.488		0.173	EMPC	0.305		0.346		0.440		0.617	
36		0.132		0.0473	U	0.128	EMPC	0.106		0.143		0.154	
37		8.11		1.63		2.05		3.00		3.20		6.47	
38		0.106	EMPC	0.0473	U	0.0550	EMPC	0.129	EMPC	0.0960	EMPC	0.131	
39		0.451	EMPC	0.0580	EMPC	0.0478	U	0.0780	EMPC	0.0560	EMPC	0.104	
40	40 + 41 + 71	97.6	C	7.84	C	3.21	C	7.96	C	4.57	C	7.50	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		39.8		4.32		1.92		4.65		2.83		4.07	
43		4.96	EMPC	0.653		0.296		0.591	EMPC	0.459		0.559	
44	44 + 47 + 65	403	C	37.0	C	15.7	C	34.8	C	19.0	C	17.1	C
45	45 + 51	21.6	C	1.45	C	0.655	C	0.927	C	0.631	C	2.37	C
46		7.95		0.607		0.222		0.607		0.343		0.817	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		14.7		1.79		1.01		2.24		1.46		3.00	
49	49 + 69	299	C	23.0	C	10.2	C	24.2	C	12.1	C	9.54	C
50	50 + 53	49.8	C	3.87	C	1.49	C	3.50	C	2.18	C	1.89	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		964		87.0		34.1		70.8		32.2		24.7	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		1.28		0.109	EMPC	0.0478	U	0.136		0.0540	EMPC	0.0420	EMPC
55		4.34		0.597		0.203		0.676	EMPC	0.307		0.134	U
56		117		9.68		5.45		10.4		6.92		7.60	
57		1.19		0.0895	U	0.0814	U	0.144	U	0.146	U	0.134	U
58		1.47		0.127	EMPC	0.130	EMPC	0.178	EMPC	0.146	U	0.134	U
59	59 + 62 + 75	9.53	C	0.900	C	0.549	C	1.43	C	1.02	C	1.47	C
60		49.7		3.95		2.89		4.71		3.40		4.48	
61	61 + 70 + 74 + 76	1,250	C	85.8	C	45.7	C	85.7	C	45.6	C	33.0	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		12.7		0.963		0.711	EMPC	1.46		0.822		0.708	
64		137		13.6		6.70		13.2		6.89		7.10	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		356		27.3		16.8		33.3		20.5		17.1	
67		4.03		0.185		0.164	EMPC	0.292	EMPC	0.265		0.483	
68		2.56		0.131	EMPC	0.0830	EMPC	0.451	EMPC	0.245	EMPC	0.130	U
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		3.55		0.236		0.148	EMPC	0.582		0.277		0.175	EMPC
73		0.0491	U	0.0473	U	0.0478	U	0.0495	U	0.0477	U	0.0368	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		7.09		1.10		1.21		1.99		1.98		2.31	
78		0.406	U	0.0865	U	0.0786	U	0.139	U	0.141	U	0.130	U
79		21.7		1.16		0.648		1.44	EMPC	0.660		0.389	EMPC
80		0.373	U	0.0795	U	0.0723	U	0.128	U	0.130	U	0.119	U
81		3.40	EMPC	0.192	EMPC	0.103	EMPC	0.140	U	0.147	EMPC	0.129	U
82		232		14.0		7.06		14.7		6.50		4.67	
83	83 + 99	1,360	C	73.4	C	42.6	C	86.0	C	40.9	C	26.0	C
84		493		36.4		15.1		34.0		15.0		10.4	
85	85 + 116 + 117	426	C	25.2	C	15.2	C	27.6	C	14.0	C	9.40	C
86	86 + 87 + 97 + 108 + 119 + 125	1,580	C	93.4	C	48.4	C	94.5	C	43.7	C	31.9	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	292	C	20.0	C	9.18	C	19.3	C	9.36	C	5.51	C
89		13.0		0.851		0.414		0.905		0.389		0.301	
90	90 + 101 + 113	2,180	C	125	C	66.3	C	136	C	63.0	C	47.1	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		368		22.1		11.4		24.4		12.2		9.40	
93	93 + 95 + 98 + 100 + 102	1,550	C	121	C	51.8	C	105	C	48.0	C	35.6	C
94		6.65		0.476		0.202	EMPC	0.483	EMPC	0.226		0.141	
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		6.32		0.653		0.239		0.588		0.268		0.178	
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		8.63		0.599		0.325		0.880		0.428		0.275	
104		0.127	EMPC	0.0473	U	0.0478	U	0.0495	U	0.0477	U	0.0368	U
105		1,080		47.5		33.5		57.2		31.1		21.1	
106		2.43	U	0.178	U	0.138	U	0.127	U	0.117	U	0.0860	U
107	107 + 124	95.4	C	4.00	C	2.83	C	5.10	C	2.53	C	2.05	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		149		7.04		5.17		10.0		4.91		3.90	
110	110 + 115	2,690	C	171	C	90.1	C	171	C	84.3	C	59.2	C
111		0.216	U	0.0479	U	0.0478	U	0.0675	U	0.0477	U	0.0378	U
112		0.210	U	0.0473	U	0.0478	U	0.0656	U	0.0477	U	0.0368	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		60.3		2.80		1.85		3.27		1.71	EMPC	1.17	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		2,650		131		92.6		145		79.4		52.8	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		0.780	EMPC	0.106	EMPC	0.113	EMPC	0.317		0.229		0.206	
121		0.219	U	0.0486	U	0.0478	U	0.0684	U	0.0477	U	0.0384	U
122		27.2		1.25		0.806	EMPC	1.61		0.725		0.557	
123		36.3		1.90	EMPC	1.44		2.04		1.19		0.859	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		2.69	U	0.203	U	0.177	EMPC	0.219	EMPC	0.252	EMPC	0.212	EMPC
127		2.51	U	0.184	U	0.143	U	0.131	U	0.121	U	0.0888	U

Table H-8
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay P04 08022604SD 2/26/2008		Forebay P07 08021507SD 2/15/2008		Forebay P08 08021508SD 2/15/2008		Forebay P09 08021409SD 2/14/2008		Forebay P10 08021410SD 2/14/2008		Forebay P11 08021411SD 2/14/2008	
128	128 + 166	445	C	14.7	C	13.0	C	26.5	C	14.6	C	12.6	C
129	129 + 138 + 160 + 163	2,340	C	85.9	C	74.2	C	138	C	82.5	C	74.2	C
130		142		5.14		4.29		9.23		5.29		4.88	
131		32.4		1.11		0.742		1.68		0.881		0.775	
132		725		25.2		18.0		41.8		21.2		18.9	
133		19.8		0.866		0.791		1.68		1.07		1.06	
134	134 + 143	105	C	3.84	C	2.73	C	6.51	C	3.33	C	2.98	C
135	135 + 151 + 154	376	C	18.3	C	13.9	C	31.4	C	19.9	C	20.0	C
136		152		7.76		4.71		11.5		6.15		5.68	
137		178		5.16		4.31		7.92		3.75		3.11	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	48.2	C	1.68	C	1.26	C	2.77	C	1.42	C	1.23	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		273		7.76		6.16		15.0		7.60		7.88	
142		1.16	U	0.120	U	0.114	U	0.162	U	0.133	U	0.106	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		54.6		2.38		1.89		3.90		2.10		2.20	
145		0.838		0.0473	U	0.0478	U	0.0740	EMPC	0.0477	U	0.0368	U
146		269		12.4		10.9		20.0		12.5		11.9	
147	147 + 149	1,190	C	49.0	C	37.0	C	81.3	C	46.6	C	44.6	C
148		0.844		0.0660	EMPC	0.0478	U	0.184	EMPC	0.139		0.104	
149	147 + 149		C147		C147		C147		C147		C147		C147
150		1.54		0.0690	EMPC	0.0760	EMPC	0.181		0.106		0.106	
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		1.80		0.0780		0.0490	EMPC	0.104	EMPC	0.0600		0.0630	
153	153 + 168	1,580	C	72.6	C	62.0	C	101	C	68.0	C	64.4	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.0491	U	0.0473	U	0.0478	U	0.0495	U	0.0477	U	0.0490	EMPC
156	156 + 157	380	C	12.0	C	10.4	C	19.5	C	10.6	C	8.74	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		245		7.81		6.61		13.0		6.91		6.31	
159		6.36		0.232	EMPC	0.266		0.609		0.443		0.485	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.822	U	0.0849	U	0.0804	U	0.115	U	0.0940	U	0.0746	U
162		8.11		0.182	EMPC	0.211		0.410	EMPC	0.233		0.226	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		118		4.42		3.36		7.97		4.40		4.03	
165		0.934	U	0.0964	U	0.0913	U	0.130	U	0.107	U	0.0848	U
166	128 + 166		C128		C128		C128		C128		C128		C128
167		113		4.52		4.30		6.33		3.91		3.49	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		0.879	U	0.0923	U	0.0881	U	0.126	U	0.123	U	0.111	U
170		190		5.53		6.14		14.4		10.6		10.4	
171	171 + 173	59.2	C	1.88	C	2.28	C	5.17	C	4.06	C	4.13	C
172		30.1		0.852		1.03		2.77		2.17		2.27	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		127		4.02		4.53		12.2		9.72		9.65	
175		5.87		0.255		0.284		0.608		0.448		0.518	
176		18.1		0.625		0.761		1.82		1.39		1.56	
177		81.6		3.74		4.69		9.64		8.49		8.98	
178		22.1		1.24		1.68		3.52		3.40		3.56	
179		38.9		2.04		2.65		5.88		5.29		5.73	
180	180 + 193	316	C	11.2	C	12.7	C	29.1	C	23.7	C	24.3	C
181		4.54		0.153		0.108	EMPC	0.281	EMPC	0.180	EMPC	0.165	
182		1.41		0.0750		0.0490	EMPC	0.172	EMPC	0.108	EMPC	0.108	
183	183 + 185	102	C	3.96	C	4.58	C	10.2	C	8.38	C	9.08	C
184		0.168	EMPC	0.0473	U	0.0478	U	0.0600		0.0670	EMPC	0.0670	EMPC
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.104	EMPC	0.0473	U	0.0478	U	0.0495	U	0.0477	U	0.0368	U
187		153		8.76		11.1		24.3		22.0		23.4	
188		0.149		0.0473	U	0.0478	U	0.0710	EMPC	0.0730		0.0590	
189		9.01		0.331	EMPC	0.347	EMPC	0.787		0.617		0.589	
190		34.6		1.45		1.66		3.47		2.87		2.98	EMPC
191		7.46		0.220		0.242		0.569		0.450		0.483	
192		0.0491	U	0.0473	U	0.0478	U	0.0495	U	0.0477	U	0.146	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		40.4		2.08		2.94		6.83		6.09		5.38	
195		17.3		1.21		1.71		3.36		3.03		2.99	
196		21.7		1.11		1.48		3.79		3.17		3.05	
197	197 + 200	9.25	C J	0.610	C	0.726	C	1.23	C J	1.09	C J	1.74	C
198	198 + 199	42.6	C	2.80	C	4.05	C	9.73	C	8.92	C	8.23	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		5.47		0.371	EMPC	0.596		1.31		1.08		1.16	
202		10.2		1.02		1.57		3.19		2.96		3.06	
203		31.2		2.26		3.40		6.95		6.36		6.09	
204		0.0491	U	0.0473	U	0.0478	U	0.0495	U	0.0477	U	0.0368	U
205		2.56		0.158	EMPC	0.235	EMPC	0.437	EMPC	0.406		0.404	EMPC
206		15.5		1.88		2.85		6.96		6.35		5.52	
207		2.22		0.254	EMPC	0.405	EMPC	0.948		0.888		0.810	
208		3.84		0.707		0.988	EMPC	2.56		2.35		2.11	
209		7.48		1.85		2.94		7.14		7.75		7.16	
Total PCBs as Congeners in ug/kg, dry weight													
Total PCBs as Congeners (full EMPC/full SDL)		29.7	J	1.70	J	1.09	J	2.10	J	1.24	J	1.13	J
Total PCBs as Congeners (KM-based)		29.7	J	1.69	J	1.08	J	2.10	J	1.24	J	1.12	J
Total PCBs as Congeners (KM-based, capped)		29.7	J	1.69	J	1.08	J	2.10	J	1.24	J	1.12	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-8
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay P15 08022115SD 2/21/2008		Forebay P16 08022116SD 2/21/2008		Forebay P17 08022117SD 2/21/2008		Forebay P18 08021118SD 2/11/2008		Forebay P21 08021221SD 2/12/2008		Forebay P05 08031905SD 3/19/2008	
Individual Congeners in pg/g (ng/kg), dry weight													
1		0.671		0.298	EMPC	0.337	EMPC	0.183		0.212		0.179	
2		6.34		6.03		4.21		1.54		3.61		0.113	U
3		0.515		0.387	EMPC	0.371	EMPC	0.245	EMPC	0.294	EMPC	0.153	EMPC
4		0.965		0.892		0.457		0.466		0.386		0.777	
5		0.0700	EMPC	0.0493	U	0.0669	UJ	0.0480	U	0.0488	U	0.0479	U
6		0.431		0.472		0.294	EMPC	0.215		0.230		0.182	
7		0.133	EMPC	0.155	EMPC	0.0920	J	0.122		0.134		0.153	
8		1.95		2.65		1.27	J	0.978		1.01		0.394	U
9		0.107	EMPC	0.147		0.0800	EMPC	0.0600		0.0570		0.0750	EMPC
10		0.0618	U	0.0478	U	0.0585	UJ	0.0478	U	0.0488	U	0.0580	
11		118		92.2		65.2	J	71.5		71.1		11.9	
12	12 + 13	1.04	C EMPC	1.10	C	0.776	C J	0.740	C	0.936	C	0.185	C EMPC
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.0720		0.0640	EMPC	0.0605	UJ	0.0478	U	0.0488	U	0.0479	U
15		2.83		4.36		2.33		1.75		2.70		0.676	
16		1.99		2.09		0.817	EMPC	0.759		0.521		0.163	EMPC
17		2.18		2.47		0.970		0.759		0.646		0.804	
18	18 + 30	4.79	C	4.66	C	2.04	C	1.96	C	1.42	C	1.23	C
19		0.399		0.559	EMPC	0.255	EMPC	0.201	EMPC	0.161	EMPC	0.524	
20	20 + 28	10.7	C	13.2	C	8.21	C	5.31	C	5.49	C	1.30	C
21	21 + 33	3.53	C	5.27	C	2.87	C	1.49	C	1.53	C	0.315	C U
22		3.83		3.99		2.70		1.89		1.58		0.319	
23		0.0618	U	0.0478	U	0.0475	U	0.0478	U	0.0488	U	0.0479	U
24		0.0660	EMPC	0.0880	EMPC	0.0475	U	0.0478	U	0.0488	U	0.0479	U
25		0.600		0.861		0.435		0.250		0.250	EMPC	0.628	
26	26 + 29	1.28	C	1.73	C	0.922	C	0.498	C	0.529	C	0.781	C
27		0.429		0.377		0.140		0.182		0.114		0.282	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		7.18		8.59		5.58		3.50		3.35		0.971	
32		0.820		1.15		0.661		0.321		0.221		0.755	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.0618	U	0.0630		0.0475	U	0.0478	U	0.0488	U	0.0479	U
35		0.516		0.532		0.344		0.298		0.347	EMPC	0.0479	U
36		0.163		0.117		0.106	EMPC	0.0910	EMPC	0.115	EMPC	0.0479	U
37		4.00		5.01		2.94		2.21		2.60		0.396	U
38		0.175		0.115	EMPC	0.0920		0.0570	EMPC	0.0580		0.0479	U
39		0.0920	EMPC	0.0560	EMPC	0.0475	U	0.0478	U	0.0488	U	0.0479	U
40	40 + 41 + 71	4.98	C	3.83	C	2.55	C	2.30	C	1.52	C	1.38	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		3.66		2.43		1.55		1.75		1.11		0.724	
43		0.356		0.230	EMPC	0.191		0.143		0.119		0.105	
44	44 + 47 + 65	14.8	C	9.75	C	6.35	C	7.14	C	5.02	C	6.40	C
45	45 + 51	1.48	C	1.15	C	0.783	C	0.602	C	0.443	C	0.553	C
46		0.458		0.399		0.235		0.178	EMPC	0.142	EMPC	0.208	EMPC
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		2.11		1.63		1.05		1.05		0.680		0.241	
49	49 + 69	7.72	C	5.59	C	3.86	C	3.62	C	3.08	C	4.07	C
50	50 + 53	1.46	C	1.05	C	0.666	C	0.620	C	0.408	C	1.38	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		17.0		11.8		8.12		8.54		7.33		13.1	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.0618	U	0.0478	U	0.0486	U	0.0478	U	0.0488	U	0.0900	EMPC
55		0.189	EMPC	0.171		0.208		0.180		0.172	EMPC	0.0802	U
56		6.32		5.47		4.29		3.56		2.64		1.28	
57		0.128	U	0.0742	U	0.0854	U	0.112	U	0.0915	U	0.0768	U
58		0.135	U	0.0781	U	0.0898	U	0.118	U	0.0963	U	0.0808	U
59	59 + 62 + 75	1.13	C	0.879	C	0.577	C	0.567	C	0.450	C	0.122	C
60		3.63		2.95		2.70		2.45		1.92		0.701	
61	61 + 70 + 74 + 76	26.9	C	22.2	C	18.5	C	15.4	C	13.3	C	11.8	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		0.726		0.534		0.477		0.379		0.347	EMPC	0.127	EMPC
64		5.91		4.42		3.35		3.30		2.45		1.99	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		15.7		13.0		10.6		9.17		8.20		4.20	
67		0.368		0.341		0.225	EMPC	0.155		0.164		0.0675	U
68		0.158	EMPC	0.140	EMPC	0.0827	U	0.109	U	0.0886	U	0.0744	U
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		0.215	EMPC	0.174	EMPC	0.103	EMPC	0.109	U	0.0887	U	0.0744	U
73		0.0618	U	0.0478	U	0.0475	U	0.0478	U	0.0488	U	0.0479	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		2.40		2.17		1.51		1.32		1.47		0.209	
78		0.127	U	0.0734	U	0.0845	U	0.111	U	0.0905	U	0.0760	U
79		0.482		0.379		0.227	EMPC	0.205	EMPC	0.248		0.186	EMPC
80		0.117	U	0.0680	U	0.0783	U	0.103	U	0.0839	U	0.0704	U
81		0.138	U	0.0754	U	0.0802	U	0.115	U	0.0934	U	0.0773	U
82		2.94		2.97		1.84		1.65		1.62		1.98	
83	83 + 99	24.4	C	17.9	C	12.3	C	11.7	C	11.6	C	11.1	C
84		5.94		4.88		3.12		2.73		2.59		3.89	
85	85 + 116 + 117	7.79	C	6.93	C	4.90	C	4.22	C	4.38	C	3.98	C
86	86 + 87 + 97 + 108 + 119 + 125	23.5	C	18.2	C	12.1	C	11.8	C	11.8	C	13.0	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	4.21	C	3.24	C	2.23	C	2.06	C	1.90	C	2.39	C
89		0.251	EMPC	0.182	EMPC	0.109	EMPC	0.136		0.0750	EMPC	0.107	
90	90 + 101 + 113	36.9	C	27.6	C	18.7	C	17.3	C	18.4	C	16.6	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		7.26		5.52		4.57		3.31		3.49		2.72	
93	93 + 95 + 98 + 100 + 102	26.0	C	18.1	C	12.4	C	11.6	C	10.5	C	14.0	C
94		0.111		0.0590	EMPC	0.0600	EMPC	0.0478	U	0.0488	U	0.0670	
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.140		0.0850	EMPC	0.0600	EMPC	0.0510	EMPC	0.0540		0.0660	EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		0.295	EMPC	0.183		0.128		0.113	EMPC	0.121	EMPC	0.0770	EMPC
104		0.0618	U	0.0478	U	0.0475	U	0.0478	U	0.0488	U	0.0479	U
105		18.8		16.8		12.0		11.3		12.5		9.54	
106		0.116	U	0.0726	U	0.0494	U	0.0712	U	0.0791	U	0.0637	U
107	107 + 124	1.41	C	1.34	C	0.947	C	0.820	C	0.966	C	0.718	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		3.64		3.16		2.27		1.96		2.52		1.37	
110	110 + 115	43.6	C	39.3	C	26.8	C	22.8	C	24.8	C	23.9	C
111		0.0618	U	0.0478	U	0.0475	U	0.0478	U	0.0488	U	0.0479	U
112		0.0618	U	0.0478	U	0.0475	U	0.0478	U	0.0488	U	0.0479	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		0.965	EMPC	0.813		0.665		0.621		0.666		0.631	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		51.6		40.8		27.4		29.0		29.9		29.4	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		0.249		0.227		0.130		0.110		0.154		0.0479	U
121		0.0618	U	0.0478	U	0.0475	U	0.0478	U	0.0488	U	0.0479	U
122		0.344	EMPC	0.417		0.291		0.270		0.289		0.227	EMPC
123		0.796		0.833		0.459		0.582		0.569		0.610	EMPC
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		0.296	EMPC	0.238		0.173		0.123	EMPC	0.189		0.0725	U
127		0.118	U	0.0736	U	0.0501	U	0.0722	U	0.0802	U	0.0646	U

Table H-8
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay P15 08022115SD 2/21/2008		Forebay P16 08022116SD 2/21/2008		Forebay P17 08022117SD 2/21/2008		Forebay P18 08021118SD 2/11/2008		Forebay P21 08021221SD 2/12/2008		Forebay P05 08031905SD 3/19/2008	
128	128 + 166	9.53	C	9.51	C	6.89	C	5.57	C	7.54	C	3.22	C
129	129 + 138 + 160 + 163	62.5	C	55.9	C	39.5	C	35.5	C	43.3	C	20.9	C
130		3.78		3.62		2.56		2.16		2.90		1.10	
131		0.434		0.483	EMPC	0.277		0.237		0.389	EMPC	0.214	EMPC
132		12.0		12.2		8.41		6.06		10.1		4.47	
133		0.956	EMPC	0.836		0.607		0.559		0.743		0.177	
134	134 + 143	1.95	C	1.91	C	1.25	C	1.03	C	1.51	C	0.732	C
135	135 + 151 + 154	18.9	C	15.3	C	9.93	C	8.92	C	11.8	C	3.02	C
136		4.58		3.86		2.19		1.92		2.83		1.15	
137		1.65		1.74		1.22		1.24		1.49		1.23	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	0.855	C	0.785	C EMPC	0.550	C	0.442	C	0.648	C	0.277	C EMPC
140	139 + 140		C139		C139		C139		C139		C139		C139
141		4.92		5.21		3.59		2.71		4.09		1.64	
142		0.0772	U	0.0951	U	0.0728	U	0.0537	U	0.0868	U	0.0479	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		1.65		1.51	EMPC	1.11		0.829		1.25	EMPC	0.424	
145		0.0618	U	0.0478	U	0.0475	U	0.0478	U	0.0488	U	0.0479	U
146		12.0		10.3		7.86		7.06		7.12		2.43	
147	147 + 149	37.8	C	32.7	C	23.7	C	18.7	C	25.3	C	9.13	C
148		0.114	EMPC	0.117	EMPC	0.0770	EMPC	0.151		0.101	EMPC	0.0479	U
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.100	EMPC	0.0730	EMPC	0.0475	U	0.0478	U	0.0580		0.0479	U
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.0618	U	0.0478	U	0.0475	U	0.0478	U	0.0488	U	0.0479	U
153	153 + 168	66.7	C	51.0	C	35.1	C	38.3	C	38.8	C	20.4	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.0690		0.0478	U	0.0475	U	0.0478	U	0.0488	U	0.0479	U
156	156 + 157	6.53	C	6.61	C	4.48	C	3.81	C	4.70	C	3.50	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		4.55		4.49		3.09		2.58		3.41		1.76	
159		0.452		0.420		0.340		0.202		0.307		0.0550	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.0618	U	0.0683	U	0.0523	U	0.0478	U	0.0623	U	0.0479	U
162		0.158	EMPC	0.0727	U	0.130	EMPC	0.101		0.123	EMPC	0.0530	EMPC
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		2.92		2.94		2.08		1.59		2.27		0.931	EMPC
165		0.0642	U	0.0791	U	0.0605	U	0.0478	U	0.0722	U	0.0479	U
166	128 + 166		C128		C128		C128		C128		C128		C128
167		3.37		2.87		1.84		1.90		1.90		1.52	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		0.161	EMPC	0.132	U	0.109	U	0.0841	U	0.103	U	0.0479	U
170		9.65		10.4		8.28		4.95		6.51		1.80	
171	171 + 173	4.05	C	4.12	C	2.74	C	2.05	C	2.61	C	0.577	C
172		2.13		2.04	EMPC	1.34		1.02		1.25		0.212	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		9.67		9.52		6.72		4.68		6.26		1.01	
175		0.542		0.524		0.292		0.267		0.343		0.0479	U
176		1.60		1.47		1.09		0.801		1.11		0.140	EMPC
177		9.85		9.45		6.50		4.72		6.26		0.807	
178		4.36		3.57		2.61		2.28		2.52		0.328	EMPC
179		6.75		6.18		4.18		3.40		4.92		0.491	
180	180 + 193	27.7	C	26.1	C	20.9	C	14.0	C	16.7	C	3.50	C
181		0.134		0.152	EMPC	0.0580	EMPC	0.0750		0.107	EMPC	0.0479	U
182		0.185		0.0478	U	0.105	EMPC	0.0900		0.0488	U	0.0479	U
183	183 + 185	9.97	C	8.75	C	6.13	C	4.78	C	5.39	C	1.04	C
184		0.0660		0.0680		0.0590	EMPC	0.0478	U	0.0540		0.0479	U
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0618	U	0.0478	U	0.0475	U	0.0478	U	0.0488	U	0.0479	U
187		28.3		23.3		17.4		13.9		15.4		2.31	
188		0.0990		0.0570	EMPC	0.0475	U	0.0478	U	0.0520	EMPC	0.0479	U
189		0.534	EMPC	0.452		0.428	EMPC	0.217	EMPC	0.332		0.127	EMPC
190		3.53		2.68		1.91		1.73		2.06		0.447	
191		0.523	EMPC	0.412	EMPC	0.354		0.229		0.316		0.0600	EMPC
192		0.0618	U	0.0949	U	0.106	U	0.0478	U	0.0488	U	0.0479	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		4.82		4.86		4.77		2.40		3.67		0.429	
195		2.05		3.38		2.56		1.10		1.57		0.226	
196		2.75		2.82		2.40		1.55		2.16		0.215	
197	197 + 200	1.15	C J	1.35	C	1.31	C EMPC	0.722	C J	0.886	C J	0.0840	C
198	198 + 199	7.79	C	7.77	C	6.68	C	4.97	C	6.22	C	0.582	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		1.22		1.15		0.789		0.676		0.893		0.0810	
202		3.29		2.92		2.17		1.83		2.12		0.171	
203		6.28		5.77		4.62		3.85		4.40		0.542	
204		0.0618	U	0.0478	U	0.0475	U	0.0478	U	0.0488	U	0.0479	U
205		0.372		0.400		0.331		0.169		0.281		0.0480	
206		5.36		6.06		4.52		3.91		4.78		0.415	
207		0.700		0.763		0.569	EMPC	0.487		0.621	EMPC	0.112	U
208		2.09		2.27		1.72		1.55		1.85		0.113	U
209		5.44		7.30		4.83		3.20		8.55		0.663	U
Total PCBs as Congeners in ug/kg, dry weight													
Total PCBs as Congeners (full EMPC/full SDL)		0.979	J	0.842	J	0.593	J	0.524	J	0.575	J	0.306	J
Total PCBs as Congeners (KM-based)		0.973	J	0.836	J	0.588	J	0.523	J	0.571	J	0.301	J
Total PCBs as Congeners (KM-based, capped)		0.973	J	0.836	J	0.588	J	0.523	J	0.571	J	0.301	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-8
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay P06 08031806SD 3/18/2008		Forebay P13 08031713SD 3/17/2008		Forebay P14 08031814SD 3/18/2008		Forebay P65 08022965SD 2/29/2008		Forebay P67 08030367SD 3/3/2008		Forebay P88 08031788SD 3/17/2008	
Individual Congeners in pg/g (ng/kg), dry weight													
1		0.368	U	0.240		0.110		0.147		0.104		0.144	
2		0.711	EMPC	3.00		0.832		2.07		0.170	U	0.432	
3		0.467		0.343	EMPC	0.123	EMPC	0.206		0.0660	EMPC	0.184	EMPC
4		1.39	EMPC	0.820		0.197	EMPC	0.291		0.113		0.283	
5		0.212	UJ	0.0486	U	0.0509	U	0.0487	U	0.0479	U	0.0571	U
6		0.258	EMPC	0.359	J	0.0790		0.148		0.0600	EMPC	0.125	
7		0.202	UJ	0.487		0.177	EMPC	0.0740		0.0830	EMPC	0.0860	U
8		1.15	EMPC	1.49		0.343	U	0.690	U	0.246	U	0.460	
9		0.189	UJ	0.0930	EMPC	0.0484	U	0.0487	U	0.0479	U	0.0525	U
10		0.191	UJ	0.0486	U	0.0484	U	0.0487	U	0.0479	U	0.0514	U
11		32.1	J	110		20.9		48.5		10.5		35.1	
12	12 + 13	0.223	C UJ	0.857	C EMPC	0.456	C	0.684	C	0.156	C EMPC	0.0565	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.204	UJ	0.0486	U	0.0484	U	0.0487	U	0.0479	U	0.0546	U
15		1.02		2.75		0.771		1.74		0.346		0.876	
16		0.408		1.19		0.185		0.472		0.125	EMPC	0.402	
17		1.25		1.20		0.168		0.478		0.127	EMPC	0.389	
18	18 + 30	1.52	C	3.53	C	0.402	C	1.10	C	0.273	C	0.870	C
19		0.723		0.230		0.0630	EMPC	0.104	EMPC	0.0530	EMPC	0.136	EMPC
20	20 + 28	2.94	C	7.12	C	1.57	C	4.17	C	0.908	C	1.86	C
21	21 + 33	1.23	C	2.41	C	0.434	C U	1.13	C	0.333	C U	0.687	C
22		0.698		2.53		0.447		1.21		0.392		0.678	
23		0.0626	U	0.0486	U	0.0484	U	0.0487	U	0.0479	U	0.0423	U
24		0.0626	U	0.0486	U	0.0484	U	0.0487	U	0.0479	U	0.0423	U
25		0.405		0.401		0.0820		0.203		0.0479	U	0.107	
26	26 + 29	0.678	C	0.945	C	0.153	C	0.437	C	0.120	C	0.229	C
27		0.395		0.280		0.0520	EMPC	0.0890		0.0479	U	0.0970	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		2.49		5.00		0.927		2.46		0.593	U	1.16	
32		0.635		0.387		0.0860	EMPC	0.188		0.0900		0.178	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.0626	U	0.0486	U	0.0484	U	0.0487	U	0.0479	U	0.0423	U
35		0.150		0.418		0.0910	EMPC	0.221		0.0540	EMPC	0.118	
36		0.0626	U	0.0970		0.0484	U	0.0640	EMPC	0.0479	U	0.0423	U
37		0.808		3.96		0.745		1.88		0.439		0.811	
38		0.0626	U	0.0970		0.0484	U	0.0487	U	0.0479	U	0.0423	U
39		0.0626	U	0.0630		0.0484	U	0.0487	U	0.0479	U	0.0423	U
40	40 + 41 + 71	2.88	C	3.03	C	0.482	C	1.26	C	0.550	C	0.867	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		1.44		2.68		0.282		0.830		0.277	EMPC	0.605	
43		0.284		0.214		0.0548	U	0.0580	EMPC	0.0582	U	0.0510	
44	44 + 47 + 65	13.7	C	10.4	C	1.32	C	4.16	C	1.03	C	2.73	C
45	45 + 51	0.538	C	0.730	C	0.0880	C EMPC	0.317	C	0.104	C	0.261	C
46		0.251		0.199		0.0538	U	0.140		0.0630	EMPC	0.0840	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		0.712		1.39		0.180	EMPC	0.556		0.163		0.370	
49	49 + 69	8.72	C	4.45	C	0.733	C	2.28	C	0.515	C	1.24	C
50	50 + 53	1.61	C	0.848	C	0.118	C	0.310	C	0.102	C EMPC	0.291	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		32.9		10.9		1.73		6.22		1.07		3.50	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.0626	U	0.0486	U	0.0484	U	0.0487	U	0.0533	U	0.0423	U
55		0.121	U	0.197		0.0717	U	0.126	EMPC	0.0756	U	0.0820	EMPC
56		3.93		3.87		0.762		1.96		0.714		1.14	
57		0.115	U	0.0900	U	0.0695	U	0.105	U	0.0734	U	0.0663	U
58		0.118	U	0.0910	U	0.0704	U	0.106	U	0.0742	U	0.0659	U
59	59 + 62 + 75	0.404	C EMPC	0.828	C	0.0880	C EMPC	0.346	C EMPC	0.0510	C	0.209	C U
60		2.07		2.43		0.588		1.38		0.436		0.709	
61	61 + 70 + 74 + 76	37.3	C	17.6	C	3.69	C	10.5	C	2.07	C	4.84	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		0.489	EMPC	0.447		0.0690	EMPC	0.269		0.0712	U	0.105	EMPC
64		5.19		3.89		0.656		2.00		0.478		0.987	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		13.0		11.6		2.48		6.88		1.41		3.11	
67		0.107	EMPC	0.242		0.0622	U	0.139		0.0656	U	0.0570	EMPC
68		0.107	U	0.119	EMPC	0.0674	U	0.101	U	0.0711	U	0.0612	U
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		0.109	U	0.156		0.0672	U	0.101	U	0.0709	U	0.0630	U
73		0.0626	U	0.0486	U	0.0484	U	0.0487	U	0.0479	U	0.0423	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		0.596		1.63		0.417		1.04		0.289		0.409	
78		0.123	U	0.0867	U	0.0670	U	0.101	U	0.0707	U	0.0671	U
79		0.539		0.343		0.0568	U	0.172		0.0599	U	0.105	EMPC
80		0.110	U	0.0790	U	0.0611	U	0.0919	U	0.0644	U	0.0599	U
81		0.106	U	0.0910	U	0.0694	U	0.102	U	0.0693	U	0.0662	U
82		5.79		1.61		0.360		1.20		0.270	EMPC	0.572	
83	83 + 99	31.0	C	15.0	C	2.78	C	8.81	C	1.01	C	4.73	C
84		11.8		3.22		0.728		2.41		0.368	EMPC	1.09	
85	85 + 116 + 117	11.7	C	4.69	C	0.993	C	3.07	C	0.413	C	1.39	C
86	86 + 87 + 97 + 108 + 119 + 125	35.7	C	15.0	C	2.77	C	9.00	C	1.17	C	4.48	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	6.54	C	2.28	C	0.462	C	1.47	C	0.218	C	0.753	C
89		0.334		0.114	EMPC	0.0484	U	0.0810	EMPC	0.0479	U	0.0500	
90	90 + 101 + 113	47.4	C	24.0	C	4.27	C	14.4	C	1.59	C	7.17	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		7.97		4.06		0.802		2.62		0.293		1.24	
93	93 + 95 + 98 + 100 + 102	37.5	C	15.6	C	2.68	C	9.42	C	1.11	C EMPC	5.10	C
94		0.148		0.0640		0.0484	U	0.0487	U	0.0479	U	0.0423	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.191	EMPC	0.0630	EMPC	0.0484	U	0.0487	U	0.0479	U	0.0423	U
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		0.227	EMPC	0.129	EMPC	0.0484	U	0.101		0.0479	U	0.0423	U
104		0.0626	U	0.0486	U	0.0484	U	0.0487	U	0.0479	U	0.0423	U
105		24.6		12.4		2.87		8.49		1.30		4.02	
106		0.282	U	0.0828	U	0.0606	U	0.0577	U	0.0479	U	0.0514	U
107	107 + 124	2.04	C	1.07	C	0.239	C	0.684	C	0.0890	C EMPC	0.281	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		3.74		2.41		0.580		1.61		0.174		0.594	
110	110 + 115	67.9	C	27.4	C	5.56	C	18.8	C	2.32	C	8.56	C
111		0.0626	U	0.0486	U	0.0484	U	0.0487	U	0.0479	U	0.0423	U
112		0.0626	U	0.0486	U	0.0484	U	0.0487	U	0.0479	U	0.0423	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		1.60		0.661		0.136	EMPC	0.429		0.0580	EMPC	0.267	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		68.7		38.4		6.90		20.9		2.71		12.7	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		0.0626	U	0.165		0.0484	U	0.0830	EMPC	0.0479	U	0.0550	EMPC
121		0.0626	U	0.0486	U	0.0484	U	0.0487	U	0.0479	U	0.0423	U
122		0.619		0.249		0.0760	EMPC	0.177		0.0479	U	0.102	EMPC
123		1.11	EMPC	0.661		0.107	EMPC	0.327	EMPC	0.0640	EMPC	0.201	U
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		0.318	U	0.199	EMPC	0.0662	U	0.135	EMPC	0.0479	U	0.0635	U
127		0.299	U	0.0818	U	0.0599	U	0.0570	U	0.0479	U	0.0524	U

Table H-8
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay P06 08031806SD 3/18/2008		Forebay P13 08031713SD 3/17/2008		Forebay P14 08031814SD 3/18/2008		Forebay P65 08022965SD 2/29/2008		Forebay P67 08030367SD 3/3/2008		Forebay P88 08031788SD 3/17/2008	
128	128 + 166	8.59	C	6.15	C	1.61	C	4.96	C	0.621	C	1.75	C
129	129 + 138 + 160 + 163	52.8	C	41.1	C	9.69	C	27.0	C	3.67	C	13.8	C
130		2.98		2.17		0.620	EMPC	1.57		0.189		0.645	
131		0.602		0.281		0.0730		0.197	EMPC	0.0479	U	0.0617	U
132		13.0		7.21		2.00		5.46		0.702		2.33	
133		0.415		0.517		0.125		0.406		0.0479	U	0.153	EMPC
134	134 + 143	1.91	C	1.00	C	0.342	C	0.913	C	0.0870	C	0.330	C
135	135 + 151 + 154	7.66	C	9.28	C	2.92	C	6.77	C	0.811	C	2.94	C
136		3.12		2.32		0.531		1.52		0.198	EMPC	0.741	
137		3.50		1.09		0.257		0.809		0.0970	EMPC	0.499	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	0.911	C	0.461	C	0.125	C EMPC	0.337	C EMPC	0.0520	C	0.147	C U
140	139 + 140		C139		C139		C139		C139		C139		C139
141		4.71		2.96		0.920		2.45		0.386		1.07	
142		0.0814	U	0.0649	U	0.0484	U	0.0626	U	0.0479	U	0.0616	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		1.11		0.931		0.343		0.718		0.0840		0.283	
145		0.0626	U	0.0486	U	0.0484	U	0.0487	U	0.0479	U	0.0423	U
146		6.07		7.03		2.00	EMPC	4.70		0.531		2.17	
147	147 + 149	23.8	C	23.7	C	6.20	C	15.0	C	1.83	C	7.88	C
148		0.0626	U	0.0570		0.0484	U	0.0487	U	0.0479	U	0.0423	U
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.0626	U	0.0486	U	0.0484	U	0.0487	U	0.0479	U	0.0423	U
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.0626	U	0.0486	U	0.0484	U	0.0487	U	0.0479	U	0.0423	U
153	153 + 168	41.7	C	45.5	C	9.18	C	23.4	C	2.94	C	15.1	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.0626	U	0.0486	U	0.0484	U	0.0487	U	0.0479	U	0.0423	U
156	156 + 157	7.65	C	4.73	C	1.13	C	3.08	C	0.399	C	1.35	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		4.38		3.04		0.766		2.22		0.293		0.925	
159		0.158	EMPC	0.260		0.0650	EMPC	0.207	EMPC	0.0479	U	0.107	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.0626	U	0.0486	U	0.0484	U	0.0487	U	0.0479	U	0.0423	U
162		0.187		0.123	EMPC	0.0484	U	0.107	EMPC	0.0479	U	0.0452	U
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		2.51		1.79		0.522		1.30		0.186	EMPC	0.577	
165		0.0637	U	0.0513	U	0.0484	U	0.0495	U	0.0479	U	0.0494	U
166	128 + 166		C128		C128		C128		C128		C128		C128
167		2.55		2.46		0.461		1.37		0.173	EMPC	0.710	U
168	153 + 168		C153		C153		C153		C153		C153		C153
169		0.0626	U	0.104	U	0.0484	U	0.0931	U	0.0479	U	0.0485	U
170		4.30		8.90		2.71		5.17		0.967		1.91	
171	171 + 173	1.16	C	3.08	C	0.969	C	2.41	C	0.363	C EMPC	0.715	C
172		0.526		1.91		0.561	EMPC	1.01		0.180		0.351	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		2.79		7.10		2.29	EMPC	5.86		0.917	EMPC	1.82	
175		0.132		0.305	U	0.180	U	0.264		0.0479	U	0.100	
176		0.351	EMPC	1.15		0.386	EMPC	0.737		0.125	EMPC	0.228	
177		2.15		6.09	EMPC	1.82		5.35		0.723		1.68	
178		0.713		3.02		0.771	EMPC	1.87		0.284		0.657	
179		1.18		4.50		1.36		2.87		0.406		1.05	
180	180 + 193	8.17	C	21.3	C	5.52	C	12.5	C	2.21	C	5.16	C
181		0.125	EMPC	0.336	U	0.199	U	0.0487	U	0.0479	U	0.0423	U
182		0.0626	U	0.311	U	0.183	U	0.0590	EMPC	0.0479	U	0.0423	U
183	183 + 185	2.54	C	6.82	C	2.03	C	4.74	C	0.701	C	1.89	C
184		0.0626	U	0.246	U	0.145	U	0.0487	U	0.0479	U	0.0423	U
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0626	U	0.264	U	0.156	U	0.0487	U	0.0479	U	0.0423	U
187		5.28		17.6		4.80		13.4		1.77		4.61	
188		0.0626	U	0.229	U	0.0493	UJ	0.0487	U	0.0479	U	0.0423	U
189		0.241	EMPC	0.620	EMPC	0.814	U	0.242		0.0479	U	0.100	
190		0.980		2.52		0.602	EMPC	1.59		0.247	EMPC	0.641	
191		0.170		0.332	EMPC	0.318	EMPC	0.225		0.0479	U	0.0660	
192		0.0626	U	0.291	U	0.172	U	0.0487	U	0.0479	U	0.0423	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		1.85		6.45		1.63		2.64		0.510		1.12	
195		0.672		2.59		1.04		1.21		0.233	EMPC	0.499	
196		0.812		3.02		0.691	EMPC	1.32		0.224		0.560	
197	197 + 200	0.316	C	1.26	C	0.239	C U	0.632	C J	0.109	C EMPC	0.211	C U
198	198 + 199	2.31	C	8.61	C	1.64	C	3.91	C	0.744	C	1.49	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		0.263	EMPC	1.01	EMPC	0.333	EMPC	0.678		0.111	EMPC	0.204	U
202		0.653		2.14		0.582		1.42		0.199		0.437	
203		1.76		6.12		1.05		2.77		0.534		1.25	
204		0.0626	U	0.181	U	0.239	U	0.0487	U	0.0479	U	0.0423	U
205		0.127	EMPC	0.477	EMPC	0.305	U	0.181		0.0479	U	0.0810	
206		1.87		5.28		1.14		2.94		0.449		0.968	
207		0.267		0.751	U	0.896	U	0.508		0.145	U	0.158	
208		0.600		1.86	EMPC	0.451	EMPC	1.08		0.143	U	0.386	
209		1.83		5.33		1.34		3.51		0.366	U	1.14	
Total PCBs as Congeners in ug/kg, dry weight													
Total PCBs as Congeners (full EMPC/full SDL)		0.784	J	0.696	J	0.155	J	0.402	J	0.0670	J	0.206	J
Total PCBs as Congeners (KM-based)		0.778	J	0.684	J	0.143	J	0.399	J	0.0611	J	0.204	J
Total PCBs as Congeners (KM-based, capped)		0.778	J	0.684	J	0.143	J	0.399	J	0.0611	J	0.204	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-8
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay P89 08031789SD 3/17/2008		Reference P22 08030522SD 3/5/2008		Reference P24 08030524SD 3/5/2008		Reference P26 08030426SD 3/4/2008		Reference P27 08030427SD 3/4/2008		Reference P28 08030428SD 3/4/2008	
Individual Congeners in pg/g (ng/kg), dry weight													
1		0.100	EMPC	0.144		0.395		0.129		0.233		0.145	
2		0.636		4.82		3.23		0.937		3.04		2.16	
3		0.238	EMPC	0.362		0.244		0.162		0.319		0.242	
4		0.269	EMPC	0.293		0.352		0.301		1.19		0.278	EMPC
5		0.0834	U	0.0769	U	0.154	U	0.0682	U	0.107	U	0.135	U
6		0.0950	EMPC	0.120	EMPC	0.204	EMPC	0.129		0.346		0.180	EMPC
7		0.0780	U	0.0880	U	0.139	U	0.0618	U	0.0966	U	0.123	U
8		0.404		0.672		0.693		0.464		0.876		0.716	
9		0.0766	U	0.0740	EMPC	0.137	U	0.0606	U	0.0948	U	0.120	U
10		0.0750	U	0.0692	U	0.138	U	0.0614	U	0.0959	U	0.122	U
11		19.9		57.0		68.0		57.6		205		66.4	
12	12 + 13	0.0825	C U	0.0761	C U	0.150	C U	0.530	C	0.104	C U	0.132	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.0796	U	0.0735	U	0.143	U	0.0633	U	0.0989	U	0.125	U
15		0.660		1.52		1.59		1.12		2.59		1.83	
16		0.332		0.553		0.616		0.543		2.43		0.507	
17		0.287		0.568		0.604		0.455		1.60		0.531	EMPC
18	18 + 30	0.619	C	1.31	C	1.39	C	1.10	C	4.70	C	1.17	C
19		0.177		0.126		0.159	EMPC	0.129	EMPC	0.260	EMPC	0.107	EMPC
20	20 + 28	1.31	C	4.43	C	4.15	C	2.70	C	5.93	C	4.86	C
21	21 + 33	0.453	C U	1.25	C	1.24	C	0.855	C	1.86	C	1.37	C
22		0.482		1.37		1.38		0.913		2.94		1.48	
23		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0450	U	0.0443	U
24		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0550		0.0443	U
25		0.0870	EMPC	0.198		0.204		0.135		0.298		0.214	
26	26 + 29	0.162	C	0.461	C	0.437	C	0.341	C	0.740	C	0.471	C
27		0.100	EMPC	0.111		0.113	EMPC	0.126		0.580		0.0940	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		0.841		2.82		2.65		1.77		3.47		3.01	
32		0.128		0.244		0.222		0.190		0.285		0.264	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0450	U	0.0443	U
35		0.0600	EMPC	0.230		0.279		0.238		0.438		0.326	
36		0.0454	U	0.0850		0.0630	EMPC	0.0690		0.120		0.133	EMPC
37		0.634		1.67		1.57		1.10		2.22		1.93	
38		0.0454	U	0.0650	EMPC	0.0710	EMPC	0.0500	EMPC	0.120		0.0590	
39		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0790		0.0610	
40	40 + 41 + 71	0.588	C U	1.65	C	1.58	C	1.14	C	2.70	C	1.55	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		0.519		1.06		1.15		0.880		3.84		0.939	
43		0.0454	U	0.153		0.118	EMPC	0.0760	EMPC	0.204		0.148	EMPC
44	44 + 47 + 65	2.04	C U	4.57	C	5.29	C	3.94	C	18.0	C	4.46	C
45	45 + 51	0.185	C	0.470	C	0.415	C	0.355	C	0.771	C	0.475	C
46		0.0920	EMPC	0.150		0.144	EMPC	0.0950		0.166		0.183	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		0.231		0.650		0.687		0.484		1.48		0.643	
49	49 + 69	0.825	C	2.71	C	2.52	C	1.72	C	3.41	C	2.76	C
50	50 + 53	0.244	C U	0.410	C	0.443	C	0.369	C	1.36	C	0.391	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		2.37		6.24		6.44		4.64		12.6		6.31	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0450	U	0.0443	U
55		0.0620	EMPC	0.300		0.0990		0.115		0.207		0.225	
56		0.963		2.37		2.38		1.73		3.74		2.46	
57		0.0492	U	0.0554	U	0.0736	U	0.0362	U	0.0722	U	0.0774	U
58		0.0489	U	0.0551	U	0.0737	U	0.0362	U	0.0723	U	0.0775	U
59	59 + 62 + 75	0.148	C U	0.397	C U	0.394	C U	0.302	C U	1.01	C	0.390	C U
60		0.626	EMPC	1.67		1.58		1.03		1.95		1.70	
61	61 + 70 + 74 + 76	3.55	C	11.5	C	10.8	C	7.36	C	14.2	C	10.7	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		0.0920		0.304		0.255		0.171		0.375		0.283	
64		0.745		2.21		2.12		1.45		2.85		2.33	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		2.51		7.28		6.99		4.81		10.0		6.87	
67		0.0580		0.137		0.125		0.0970		0.196		0.133	
68		0.0454	U	0.0800		0.0760	EMPC	0.0450	EMPC	0.0820		0.0752	U
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		0.0467	U	0.0910	EMPC	0.0735	U	0.0450		0.0990	EMPC	0.0850	EMPC
73		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0450	U	0.0443	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		0.341		0.989		0.983		0.699		1.39		1.11	
78		0.0498	U	0.0561	U	0.0768	U	0.0362	U	0.0754	U	0.0808	U
79		0.0810	EMPC	0.191		0.212		0.183		0.612		0.206	
80		0.0454	U	0.0500	U	0.0689	U	0.0362	U	0.0676	U	0.0725	U
81		0.0486	U	0.0630	EMPC	0.0786	U	0.0490	EMPC	0.100	EMPC	0.0832	U
82		0.386		1.14		1.01		1.15		1.53		1.23	
83	83 + 99	3.33	C	9.91	C	9.78	C	8.11	C	19.2	C	9.86	C
84		0.811		2.55		2.43		2.12		3.94		2.48	
85	85 + 116 + 117	1.12	C	3.42	C	3.01	C	2.72	C	5.27	C EMPC	3.55	C
86	86 + 87 + 97 + 108 + 119 + 125	3.57	C U	9.22	C	9.26	C	8.05	C	21.8	C	9.40	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	0.518	C	1.59	C	1.53	C	1.35	C	2.51	C	1.48	C
89		0.0454	U	0.102	EMPC	0.0800	EMPC	0.0820		0.0990	EMPC	0.0630	EMPC
90	90 + 101 + 113	5.08	C	15.2	C	16.2	C	12.0	C	31.3	C	14.8	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		0.891		2.92		2.78		2.18		5.23		2.94	
93	93 + 95 + 98 + 100 + 102	3.65	C	9.50	C	9.52	C	8.34	C	27.1	C	9.08	C
94		0.0454	U	0.0453	U	0.0490	EMPC	0.0490		0.0940		0.0614	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.0454	U	0.0480	EMPC	0.0540	EMPC	0.0460	EMPC	0.0690	EMPC	0.0530	EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		0.0454	U	0.0940		0.101		0.0780	EMPC	0.128	EMPC	0.0920	
104		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0450	U	0.0443	U
105		3.06		8.92		8.01		7.17		13.2		9.06	
106		0.0571	U	0.0852	U	0.0713	U	0.0725	U	0.110	U	0.106	U
107	107 + 124	0.204	C	0.602	C	0.734	C	0.603	C	1.07	C	0.716	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		0.459		1.41		1.35		1.12		2.09		1.48	
110	110 + 115	6.03	C	18.7	C	17.1	C	15.1	C	33.9	C	19.4	C
111		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0450	U	0.0443	U
112		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0450	U	0.0443	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		0.174		0.410		0.485		0.378		0.798		0.479	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		10.0		22.2		22.4		20.9		64.2		22.1	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		0.0454	U	0.131		0.108	EMPC	0.0830	EMPC	0.228		0.0770	EMPC
121		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0450	U	0.0443	U
122		0.0980	EMPC	0.176		0.196	EMPC	0.191		0.373		0.220	
123		0.158	U	0.380	U	0.429	U	0.442	U	1.22		0.408	U
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		0.0693	U	0.175	EMPC	0.147	EMPC	0.117		0.234		0.185	EMPC
127		0.0582	U	0.0869	U	0.0745	U	0.0758	U	0.115	U	0.111	U

Table H-8
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay P89 08031789SD 3/17/2008		Reference P22 08030522SD 3/5/2008		Reference P24 08030524SD 3/5/2008		Reference P26 08030426SD 3/4/2008		Reference P27 08030427SD 3/4/2008		Reference P28 08030428SD 3/4/2008	
128	128 + 166	1.22	C	4.22	C	4.07	C	3.46	C	5.93	C	4.61	C
129	129 + 138 + 160 + 163	11.0	C	29.3	C	31.6	C	25.6	C	65.7	C	32.5	C
130		0.460		1.70		1.71		1.35		2.39		2.05	
131		0.100		0.163	EMPC	0.157	EMPC	0.184		0.303		0.223	
132		1.79		5.63		5.80		5.91		8.28		6.59	
133		0.116	EMPC	0.463		0.365		0.283		0.493		0.438	
134	134 + 143	0.216	C	0.807	C	0.758	C	0.707	C	1.18	C	0.948	C
135	135 + 151 + 154	2.30	C	6.76	C	7.47	C	5.60	C	11.2	C	7.66	C
136		0.581		1.62		1.96		1.47		2.59		1.83	
137		0.359		0.929		0.852		0.788		1.41		0.880	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	0.114	C U	0.381	C	0.324	C	0.327	C	0.545	C	0.443	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		0.912		2.24		2.71		2.28		3.28		2.68	
142		0.0564	U	0.0870	U	0.0614	U	0.0660	U	0.0819	U	0.0521	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		0.244		0.646		0.726		0.613		1.03		0.650	
145		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0450	U	0.0443	U
146		1.61		3.92	J	3.89	J	3.31	J	8.46	J	4.23	J
147	147 + 149	5.81	C	16.6	C	18.3	C	15.4	C	34.9	C	18.5	C
148		0.0454	U	0.0590	EMPC	0.0650	EMPC	0.0362	U	0.0720		0.0510	EMPC
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0500	EMPC	0.0480	
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0450	U	0.0443	U
153	153 + 168	12.9	C	26.9	C	31.8	C	27.1	C	100	C	27.9	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0450	U	0.0443	U
156	156 + 157	0.935	C U	2.54	C	2.58	C	2.42	C	5.17	C	2.82	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		0.777		2.11		2.23		1.91		3.67		2.35	
159		0.124		0.154		0.339		0.248		0.286		0.288	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.0454	U	0.0598	U	0.0467	U	0.0474	U	0.0588	U	0.0443	U
162		0.0454	U	0.0780		0.0840	EMPC	0.0890		0.125	EMPC	0.139	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		0.399		1.30		1.45		1.26		2.06		1.67	
165		0.0454	U	0.0699	U	0.0505	U	0.0543	U	0.0674	U	0.0443	U
166	128 + 166		C128		C128		C128		C128		C128		C128
167		0.640	U	1.18		1.30		1.25		3.84		1.18	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		0.0454	U	0.0685	U	0.102	U	0.0571	U	0.0971	U	0.110	U
170		2.18		3.76		4.89		3.87		5.51		5.64	
171	171 + 173	0.765	C	1.55	C	1.90	C	1.47	C EMPC	2.39	C	2.03	C
172		0.379		0.785		1.01		0.752		1.04		1.12	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		2.12		3.70		5.63		4.18		5.36		5.39	
175		0.105	EMPC	0.205	EMPC	0.270		0.183	EMPC	0.333		0.224	
176		0.256	EMPC	0.581		0.780		0.564		0.966		0.727	
177		1.61		3.89		4.43		3.24		5.22		4.88	
178		0.542		1.63		1.92		1.28		2.16		2.04	
179		0.987		2.54		3.41		2.44		3.65		3.22	
180	180 + 193	6.03	C	10.1	C	14.1	C	11.0	C	22.1	C	14.0	C
181		0.0454	U	0.0470	EMPC	0.0540		0.0730	EMPC	0.112		0.114	EMPC
182		0.0454	U	0.0650	U	0.0870	U	0.0580	U	0.0960	U	0.0540	U
183	183 + 185	1.81	C	3.57	C	4.84	C	3.81	C	7.36	C	4.56	C
184		0.0454	U	0.0453	U	0.0490	EMPC	0.0362	U	0.0550		0.0443	U
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0450	U	0.0443	U
187		4.24		10.5		13.0		9.68		19.8		12.8	
188		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0540	U	0.0443	U
189		0.0980		0.225		0.260		0.264	EMPC	0.351		0.416	
190		0.751		1.31		1.60		1.27		3.12		1.74	
191		0.106		0.193		0.211		0.185		0.312		0.224	
192		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0450	U	0.0443	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		1.94		2.87		3.34		2.42		3.24		3.60	
195		0.853		1.25		1.41		0.988		1.50		1.57	
196		0.909		1.38		1.77		1.34		1.90		1.85	
197	197 + 200	0.301	C U	0.375	C J	0.415	C J	0.335	C J	0.447	C J	0.491	C J
198	198 + 199	1.89	C	4.52	C	5.38	C	4.09	C	5.79	C	6.38	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		0.223	U	0.636		0.686		0.527		0.765		0.662	
202		0.362		1.53		1.71		1.13		1.92		1.86	
203		1.55		3.29		3.84		3.00		6.21		4.26	
204		0.0454	U	0.0453	U	0.0467	U	0.0362	U	0.0450	U	0.0443	U
205		0.116		0.231		0.245		0.149		0.192		0.222	
206		0.994		2.90		3.38		2.35		4.29		6.18	
207		0.107	U	0.514		0.432		0.353		0.547		0.652	
208		0.300		1.17		1.31		0.967		1.61		2.41	
209		0.669	U	3.71		3.61		2.46		4.55		6.38	
Total PCBs as Congeners in ug/kg, dry weight													
Total PCBs as Congeners (full EMPC/full SDL)		0.161	J	0.416	J	0.450	J	0.364	J	0.937	J	0.461	J
Total PCBs as Congeners (KM-based)		0.151	J	0.413	J	0.448	J	0.361	J	0.932	J	0.458	J
Total PCBs as Congeners (KM-based, capped)		0.151	J	0.413	J	0.448	J	0.361	J	0.932	J	0.458	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-8
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Reference P29 08022229SD 2/22/2008		Reference P34 08022534SD 2/25/2008		Reference P35 08022535SD 2/25/2008		Reference P36 08022536SD 2/25/2008		Reference P37 08022637SD 2/26/2008		Reference P38 08022738SD 2/27/2008	
Individual Congeners in pg/g (ng/kg), dry weight													
1		0.198		0.375		0.156		0.176	EMPC	0.186	U	0.178	EMPC
2		7.02		7.86		2.01		2.11		1.83		1.69	
3		0.580		0.880		0.253		0.222		0.469	EMPC	0.241	
4		0.928		1.22		0.400	EMPC	0.488		0.414		1.02	
5		0.130	U	0.0850	EMPC	0.0916	U	0.105	U	0.115	U	0.0987	U
6		1.10		0.878		0.218		0.243		0.285	EMPC	0.332	
7		0.258	U	0.215	U	0.0980	U	0.104	U	0.138		0.103	U
8		4.71		3.33		0.880		0.988		1.22		0.904	
9		0.364		0.219		0.0814	U	0.0938	U	0.102	U	0.0885	U
10		0.117	U	0.0761	U	0.0824	U	0.0973	U	0.106	U	0.0919	U
11		70.5		83.0		65.0		69.4		68.3		135	
12	12 + 13	1.43	C	1.40	C	0.0893	C UJ	0.102	C U	0.290	C	0.0966	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.121	U	0.110	EMPC	0.0850	U	0.0980	U	0.104	U	0.0925	U
15		5.29		5.42		1.99		2.26		2.54		1.98	
16		2.08		2.19		0.621		0.884		0.690		1.64	
17		2.57		2.64		0.797		0.958		0.814		1.29	
18	18 + 30	5.01	C	5.11	C	1.57	C	2.17	C	1.76	C	3.60	C
19		0.352		0.464		0.141		0.197	EMPC	0.196	U	0.189	
20	20 + 28	16.1	C	15.5	C	5.51	C	6.11	C	6.40	C	5.01	C
21	21 + 33	6.77	C	5.58	C J	1.47	C	1.89	C	2.07	C	1.56	C
22		5.44		4.93		1.65		2.00		1.93		2.16	
23		0.0425	U	0.0455	U	0.0466	U	0.0490	U	0.123	U	0.0440	U
24		0.0870	EMPC	0.0810		0.0466	U	0.0490	U	0.118	U	0.0440	U
25		0.930		0.883		0.259		0.290		0.313	EMPC	0.269	
26	26 + 29	2.02	C	1.83	C	0.546	C	0.659	C	0.744	C	0.657	C
27		0.364		0.466		0.129	J	0.195		0.159	EMPC	0.397	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		11.5		10.9	J	3.32	J	3.87		4.24		3.09	
32		1.07		0.859		0.258		0.316		0.321		0.238	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.0580	EMPC	0.0620	EMPC	0.0466	U	0.0490	U	0.116	U	0.0440	U
35		0.387		0.543		0.319		0.261		0.387	EMPC	0.349	
36		0.0970	EMPC	0.136		0.101	EMPC	0.103		0.109	U	0.112	EMPC
37		4.09		4.73		2.10		2.15		2.41		1.97	
38		0.0530	EMPC	0.120		0.0530		0.0490	EMPC	0.112	U	0.0440	
39		0.0680	EMPC	0.136		0.0466	U	0.0490	U	0.111	U	0.0580	EMPC
40	40 + 41 + 71	3.73	C	6.64	C	2.03	C	1.76	C	1.96	C	1.98	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		2.22		4.01		1.14		1.30		1.28		2.02	
43		0.306		0.543		0.132	EMPC	0.157	EMPC	0.131	EMPC	0.183	EMPC
44	44 + 47 + 65	8.76	C	21.4	C	5.03	C	5.26	C	4.90	C	8.45	C
45	45 + 51	1.13	C	1.80	C	0.527	C	0.523	C	0.588	C	0.470	C
46		0.362		0.646		0.167		0.140		0.171		0.160	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		1.76		3.03		0.702		0.834		0.928		1.03	
49	49 + 69	5.26	C	11.9	C	3.35	C	2.88	C	3.09	C	2.85	C
50	50 + 53	0.815	C	1.83	C	0.485	C	0.471	C	0.506	C EMPC	0.726	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		10.4		37.5		7.05		6.82		6.40		8.74	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.0425	U	0.0455	U	0.0466	U	0.0490	U	0.0532	U	0.0440	U
55		0.293		0.428		0.151		0.233		0.0648	U	0.194	
56		3.18		6.34		2.04		2.41		2.31		2.35	
57		0.0577	U	0.114	U	0.0693	U	0.0858	U	0.0610	U	0.0731	U
58		0.0578	U	0.114	U	0.0694	U	0.0896	U	0.0609	U	0.0763	U
59	59 + 62 + 75	0.822	C	1.23	C	0.396	C U	0.522	C	0.471	C EMPC	0.591	C
60		1.95		3.47		1.38		1.63		1.53		1.53	
61	61 + 70 + 74 + 76	15.0	C	40.3	C	10.5	C	11.4	C	11.0	C	11.1	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		0.393		0.777		0.261		0.269		0.257		0.248	
64		4.16		8.72		2.25		2.43		2.59		2.26	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		9.65		18.0		6.49		7.22		6.39		7.06	
67		0.263		0.368		0.159		0.174		0.160		0.155	
68		0.110	EMPC	0.122		0.0673	U	0.0809	U	0.0690		0.0689	U
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		0.128	EMPC	0.206		0.0800		0.0802	U	0.0830		0.0890	
73		0.0425	U	0.0455	U	0.0466	U	0.0490	U	0.0498	U	0.0440	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		1.40		2.01		1.04		0.965		1.02		1.13	
78		0.0602	U	0.119	U	0.0723	U	0.0871	U	0.0613	U	0.0743	U
79		0.255		0.605		0.154		0.162	EMPC	0.383	EMPC	0.295	
80		0.0541	U	0.107	U	0.0649	U	0.0804	U	0.0557	U	0.0685	U
81		0.0730	EMPC	0.143		0.0750	U	0.0896	U	0.0639	U	0.0767	U
82		1.43		5.71		0.953		1.01		0.964		1.14	
83	83 + 99	11.9	C	33.0	C	8.50	C	8.11	C	7.44	C	13.0	C
84		2.89		13.2		2.43		2.07		1.87		2.51	
85	85 + 116 + 117	3.77	C	10.6	C	2.72	C	2.58	C	2.60	C	3.83	C
86	86 + 87 + 97 + 108 + 119 + 125	11.2	C	39.1	C	8.07	C	7.70	C	6.85	C	13.3	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	1.97	C	6.79	C	1.56	C	1.36	C	1.30	C	1.80	C
89		0.100	EMPC	0.462		0.0790	EMPC	0.0690		0.0860	EMPC	0.0840	EMPC
90	90 + 101 + 113	18.4	C	58.9	C	13.1	C	13.1	C	11.8	C	20.7	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		3.28		10.3		2.41		2.46		2.51		3.87	
93	93 + 95 + 98 + 100 + 102	10.9	C	43.8	C	8.42	C	8.08	C	7.22	C	13.4	C
94		0.0650		0.209	EMPC	0.0520	EMPC	0.0670	EMPC	0.0832	U	0.0440	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.0740		0.235		0.0550	EMPC	0.0490	U	0.0710	U	0.0440	EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		0.138		0.339		0.0860		0.106	EMPC	0.101		0.104	EMPC
104		0.0425	U	0.0455	U	0.0466	U	0.0490	U	0.0710	U	0.0440	U
105		10.9		27.5		8.18		8.03		6.53		9.85	
106		0.136	U	0.156	U	0.0664	U	0.111	U	0.0988	U	0.111	U
107	107 + 124	0.794	C	2.36	C	0.623	C	0.477	C	0.594	C	0.792	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		1.79		4.61		1.38		1.27		1.17		1.52	
110	110 + 115	22.1	C	68.2	C	16.1	C	15.6	C	14.3	C	25.0	C
111		0.0425	U	0.0455	U	0.0466	U	0.0490	U	0.0565	U	0.0440	U
112		0.0425	U	0.0455	U	0.0466	U	0.0490	U	0.0598	U	0.0440	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		0.602		1.63		0.382		0.372		0.352	EMPC	0.422	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		28.3		70.5		19.9		20.7		15.7		35.6	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		0.118	EMPC	0.177		0.0990	EMPC	0.0740		0.0870		0.144	
121		0.0425	U	0.0455	U	0.0466	U	0.0490	U	0.0580	U	0.0440	U
122		0.270		0.718		0.189	EMPC	0.160	EMPC	0.113	EMPC	0.168	EMPC
123		0.446	U	0.980		0.309	U	0.401	U	0.374		0.656	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		0.205		0.337		0.126		0.139	U	0.175		0.184	
127		0.142	U	0.170		0.0694	U	0.115	U	0.0954	U	0.114	U

Table H-8
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Reference P29 08022229SD 2/22/2008		Reference P34 08022534SD 2/25/2008		Reference P35 08022535SD 2/25/2008		Reference P36 08022536SD 2/25/2008		Reference P37 08022637SD 2/26/2008		Reference P38 08022738SD 2/27/2008	
128	128 + 166	5.17	C	12.7	C	4.08	C	3.88	C	3.49	C	4.37	C
129	129 + 138 + 160 + 163	36.7	C	81.3	C	25.9	C	26.9	C	23.6	C	38.8	C
130		2.12		4.97		1.63		1.66		1.42		1.94	
131		0.244		0.868		0.188		0.185		0.159	EMPC	0.247	
132		7.24		22.6		5.81		5.23		5.15		6.08	
133		0.508		0.956		0.459		0.340		0.388		0.411	
134	134 + 143	1.10	C	3.31	C	0.809	C	0.712	C	0.718	C EMPC	0.886	C
135	135 + 151 + 154	8.30	C	17.9	C	6.04	C	6.18	C	6.69	C	7.89	C
136		2.11		6.15		1.73		1.49		1.52		1.84	
137		0.955		3.11		0.768		0.710		0.683		0.838	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	0.454	C	1.21	C	0.381	C	0.320	C	0.304	C	0.413	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		2.75		8.66		2.14		1.94		1.72		2.04	
142		0.0742	U	0.123	U	0.0648	U	0.0515	U	0.0682	U	0.0440	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		0.821		2.37		0.589		0.552		0.577		0.771	
145		0.0425	U	0.0455	U	0.0466	U	0.0490	U	0.0646	U	0.0440	U
146		4.60	J	9.76	J	3.44		3.70	J	3.90		6.01	J
147	147 + 149	21.3	C	48.8	C	15.5	C	14.3	C	14.1	C	22.0	C
148		0.0860	EMPC	0.100		0.0466	U	0.0710	EMPC	0.0815	U	0.0760	EMPC
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.0425	U	0.0970		0.0490	EMPC	0.0490	U	0.0619	U	0.0470	
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.0425	U	0.0455	U	0.0466	U	0.0490	U	0.0571	U	0.0440	U
153	153 + 168	32.8	C	63.5	C	22.9	C	25.6	C	20.1	C	47.0	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.0425	U	0.0455	U	0.0466	U	0.0490	U	0.0507	U	0.0440	U
156	156 + 157	3.19	C	8.50	C	2.42	C	2.40	C	2.25	C	3.12	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		2.47		6.86		1.99		1.91		1.69		2.56	
159		0.303		0.614		0.184	EMPC	0.211		0.250	EMPC	0.203	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.0533	U	0.0885	U	0.0466	U	0.0490	U	0.0449	U	0.0440	U
162		0.121	EMPC	0.214		0.0720		0.0950	EMPC	0.102		0.116	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		1.63		4.32		1.21		1.22		1.25		1.32	
165		0.0610	U	0.101	U	0.0533	U	0.0490	U	0.0519	U	0.0440	U
166	128 + 166		C128		C128		C128		C128		C128		C128
167		1.46		3.20		1.10	U	1.01	U	0.918		1.86	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		0.0811	U	0.179	U	0.0711	U	0.0891	U	0.0860	EMPC	0.0951	U
170		5.72		10.9		4.58		3.68		3.58		3.83	
171	171 + 173	2.16	C	4.41	C	1.84	C	1.59	C	1.60	C	1.92	C
172		1.13		1.86		0.864		0.733		0.837		0.730	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		5.45		10.6		4.36		3.72		3.89		3.62	
175		0.284		0.519		0.233		0.204	EMPC	0.170	EMPC	0.212	EMPC
176		0.842		1.54		0.646		0.605		0.650		0.718	
177		5.30		8.81		3.94		3.66		3.94		4.73	
178		2.10		3.48		1.66		1.33		1.42		1.93	
179		3.49		5.98		2.82		2.46		2.34		3.12	
180	180 + 193	14.0	C	24.5	C	11.0	C	9.20	C	9.03	C	11.3	C
181		0.0820		0.191	EMPC	0.0570	EMPC	0.0610	EMPC	0.0674	U	0.0910	EMPC
182		0.0580	U	0.143	U	0.0540	U	0.0530	U	0.0634	U	0.0710	U
183	183 + 185	4.98	C	9.01	C	3.87	C	3.40	C	3.36	C	4.70	C
184		0.0840	EMPC	0.0650		0.0466	U	0.0490	U	0.0471	U	0.0510	EMPC
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0425	U	0.0455	U	0.0466	U	0.0490	U	0.0509	U	0.0440	U
187		13.6		22.0		9.79		9.27		9.00		13.2	
188		0.0425	U	0.0660	U	0.0466	U	0.0490	U	0.0449	U	0.0440	U
189		0.357	EMPC	0.573		0.248	EMPC	0.237		0.197		0.188	
190		1.90		3.01		1.48		1.21		1.23		1.69	
191		0.224		0.457		0.223	EMPC	0.155	EMPC	0.158		0.180	
192		0.0425	U	0.0455	U	0.0466	U	0.0490	U	0.0578	U	0.0440	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		3.20		5.11		3.05		2.32		2.44		2.33	
195		1.45		2.30		1.33		1.17		1.20		1.24	
196		1.74		2.87		1.47		1.19		1.23		1.28	
197	197 + 200	0.447	C J	0.572	C J	0.474	C EMPC	0.350	C J	0.442	C	0.426	C J
198	198 + 199	5.26	C	8.78	C	5.19	C	3.27	C	3.66	C	3.25	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		0.642		1.20		0.639		0.428		0.559		0.568	
202		1.60		2.59		1.60		1.07		1.10		1.39	
203		3.96		6.34		3.71		2.61		2.50		3.19	
204		0.0425	U	0.0455	U	0.0466	U	0.0490	U	0.0629	U	0.0440	U
205		0.242		0.347		0.197		0.172	EMPC	0.156		0.194	EMPC
206		4.59		7.21		4.28		2.85		3.21		2.71	
207		0.601		0.938		0.517		0.445		0.339		0.416	
208		1.85		2.50		1.59		1.13		1.16		1.04	
209		6.12		7.86		4.05		3.47		3.42		3.33	
Total PCBs as Congeners in ug/kg, dry weight													
Total PCBs as Congeners (full EMPC/full SDL)		0.587	J	1.20	J	0.408	J	0.405	J	0.383	J	0.592	J
Total PCBs as Congeners (KM-based)		0.585	J	1.20	J	0.405	J	0.402	J	0.378	J	0.591	J
Total PCBs as Congeners (KM-based, capped)		0.585	J	1.20	J	0.405	J	0.402	J	0.378	J	0.591	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-8
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Reference P39 08022739SD 2/27/2008		Reference P40 08022740SD 2/27/2008		Reference P41 08022741SD 2/27/2008		Reference P42 08022742SD 2/27/2008		Reference P85 08030685SD 3/6/2008		Reference P86 08030686SD 3/6/2008		Reference P87 08030687SD 3/6/2008		Downstream P46 08031046SD 3/10/2008	
Individual Congeners in pg/g (ng/kg), dry weight																	
1		0.144	U	0.233	U	0.276	U	0.165	U	0.270	U	0.192	U	0.189	U	0.155	EMPC
2		1.13		1.63		1.73		0.614		3.93		2.99		2.29		0.263	J
3		0.261	EMPC	0.372	EMPC	0.238		0.193	EMPC	0.361		0.252		0.246		0.186	J
4		0.274	EMPC	0.629		0.506	EMPC	0.302	EMPC	0.655		0.336		0.318		0.531	UJ
5		0.120	U	0.107	U	0.125	U	0.113	U	0.107	UJ	0.0815	U	0.0791	U	0.268	UJ
6		0.154		0.231	EMPC	0.224		0.123	EMPC	0.306	J	0.195		0.164	EMPC	0.247	UJ
7		0.112	U	0.124	EMPC	0.114	U	0.103	U	0.0973	UJ	0.123		0.134	EMPC	0.255	UJ
8		0.543		0.771		1.05		0.436		1.14	J	0.747		0.686		0.321	J
9		0.107	U	0.0948	U	0.110	U	0.0986	U	0.112	EMPC	0.0714	U	0.0694	U	0.246	UJ
10		0.109	U	0.0961	U	0.113	U	0.102	U	0.0962	UJ	0.0736	U	0.0715	U	0.254	UJ
11		51.1		100		56.1		32.1		131	J	46.6		49.1		18.1	J
12	12 + 13	0.127	C U	0.112	C U	0.118	C U	0.106	C U	0.100	C UJ	0.449	C	0.535	C EMPC	0.259	C UJ
13	12 + 13		C12		C12		C12		C12		C12		C12		C12		C12
14		0.116	U	0.103	U	0.114	U	0.102	U	0.0965	UJ	0.0738	U	0.0716	U	0.246	UJ
15		1.55		1.91		1.74		0.924		1.86		1.41		1.56		0.286	UJ
16		0.284	U	0.815		0.498		0.356	U	1.04		0.458	EMPC	0.711		0.201	EMPC
17		0.343		0.750		0.466	EMPC	0.351		0.975		0.505	EMPC	0.648		0.202	J
18	18 + 30	0.727	C U	1.97	C	1.16	C	0.655	C U	2.52	C	1.11	C	1.49	C	0.415	C EMPC
19		0.0720		0.180		0.139		0.105	EMPC	0.225		0.150		0.184	EMPC	0.107	UJ
20	20 + 28	2.90	C	4.11	C	3.23	C	1.97	C	5.85	C	3.52	C	4.13	C	1.01	C EMPC
21	21 + 33	0.811	C	1.18	C	0.955	C	0.644	C	2.05	C	1.07	C	1.28	C	0.360	C J
22		0.889		1.64		1.16		0.670		2.15		1.04		1.32		0.366	EMPC
23		0.0474	U	0.0475	U	0.0535	U	0.0487	U	0.0619	U	0.0471	U	0.0534	U	0.0516	UJ
24		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0480	EMPC	0.0471	U	0.0457	U	0.0563	UJ
25		0.171	EMPC	0.247		0.160		0.111		0.320		0.181	EMPC	0.215	EMPC	0.0790	J
26	26 + 29	0.319	C EMPC	0.466	C	0.385	C	0.244	C EMPC	0.718	C	0.417	C	0.498	C	0.152	C J
27		0.0670		0.203	EMPC	0.124	EMPC	0.0890		0.247		0.107		0.141		0.0527	UJ
28	20 + 28		C20		C20		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18		C18		C18
31		1.81		2.42		1.90		1.17		3.85		2.23		2.76		0.679	J
32		0.131		0.207		0.199		0.142	EMPC	0.364		0.214		0.346		0.0730	J
33	21 + 33		C21		C21		C21		C21		C21		C21		C21		C21
34		0.0474	U	0.0620	EMPC	0.0513	U	0.0487	U	0.0594	U	0.0471	U	0.0512	U	0.0495	UJ
35		0.283		0.352	EMPC	0.216		0.0487	U	0.453	EMPC	0.253	EMPC	0.285		0.0890	UJ
36		0.125	EMPC	0.0950	EMPC	0.0730	EMPC	0.0487	U	0.151		0.0620	EMPC	0.0850	EMPC	0.0493	UJ
37		1.35		1.54		1.45		0.938		2.21		1.35		1.64		0.504	J
38		0.0474	U	0.0475	U	0.0502	U	0.0487	U	0.135		0.0680		0.0740		0.0493	UJ
39		0.0474	U	0.0475	U	0.0493	U	0.0487	U	0.0571	U	0.0471	U	0.0492	U	0.0493	UJ
40	40 + 41 + 71	0.791	C	1.32	C	0.867	C	0.656	C	2.03	C	1.08	C	1.53	C	0.285	C EMPC
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40		C40		C40
42		0.523		1.44		0.737	EMPC	0.416	EMPC	1.83		0.822		1.11		0.200	EMPC
43		0.0660	EMPC	0.0860		0.0630	EMPC	0.0487	U	0.136	EMPC	0.0720	EMPC	0.120		0.0683	UJ
44	44 + 47 + 65	2.44	C	5.89	C	3.11	C	2.07	C	8.10	C	3.54	C	4.43	C	1.14	C J
45	45 + 51	0.205	C	0.360	C	0.241	C	0.200	C	0.575	C EMPC	0.344	C EMPC	0.443	C	0.130	C J
46		0.0720		0.100	EMPC	0.0950		0.0680	EMPC	0.223		0.117	EMPC	0.189		0.0660	UJ
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44		C44		C44
48		0.337		0.728		0.442		0.280		0.972		0.516		0.634		0.132	EMPC
49	49 + 69	1.41	C	2.20	C	1.49	C	0.987	C	3.56	C	2.01	C	2.62	C	0.617	C J
50	50 + 53	0.227	C	0.475	C	0.283	C	0.220	C EMPC	0.687	C	0.316	C	0.353	C	0.143	C EMPC
51	45 + 51		C45		C45		C45		C45		C45		C45		C45		C45
52		3.71		6.06		3.99		2.73		9.07		4.60		5.84		1.48	J
53	50 + 53		C50		C50		C50		C50		C50		C50		C50		C50
54		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0437	U	0.0471	U	0.0457	U	0.0508	UJ
55		0.0606	U	0.0558	U	0.0992	U	0.0774	U	0.0805	U	0.0714	U	0.107	U	0.0774	UJ
56		1.51		2.30		1.47		1.10		3.14		1.74	EMPC	2.20		0.479	J
57		0.0577	U	0.0532	U	0.0928	U	0.0724	U	0.0753	U	0.0667	U	0.100	U	0.0723	UJ
58		0.0590	U	0.0544	U	0.0968	U	0.0755	U	0.0785	U	0.0696	U	0.105	U	0.0733	UJ
59	59 + 62 + 75	0.155	C EMPC	0.426	C EMPC	0.211	C	0.178	C	0.616	C	0.289	C	0.393	C	0.118	C EMPC
60		1.10		1.51		1.08		0.734		2.08		1.15		1.41	EMPC	0.359	J
61	61 + 70 + 74 + 76	7.25	C	9.82	C	6.76	C	4.36	C	14.0	C	8.19	C	10.2	C	2.42	C J
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59		C59		C59
63		0.194		0.266	EMPC	0.164	EMPC	0.103	EMPC	0.335		0.181	EMPC	0.242		0.0681	UJ
64		1.26		1.86		1.30		0.805		3.06		1.58		2.14		0.504	J
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44		C44		C44
66		4.56		6.89		4.44		2.96		8.39		4.77		5.64		1.40	J
67		0.0930		0.158		0.0849	U	0.0710	EMPC	0.221	EMPC	0.105	EMPC	0.140	EMPC	0.0633	UJ
68		0.0536	U	0.0800	EMPC	0.0921	U	0.0718	U	0.0950	EMPC	0.0662	U	0.0996	U	0.0695	UJ
69	49 + 69		C49		C49		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40		C40		C40
72		0.0547	U	0.0790		0.0906	U	0.0706	U	0.124		0.0652	U	0.105		0.0692	UJ
73		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0437	U	0.0471	U	0.0457	U	0.0493	UJ
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61		C61		C61
77		0.637		0.883		0.709		0.434		1.27		0.734		0.890		0.259	EMPC
78		0.0614	U	0.0565	U	0.0939	U	0.0732	U	0.0762	U	0.0675	U	0.102	U	0.0763	UJ
79		0.164		0.290	EMPC	0.0970	EMPC	0.0720	EMPC	0.296	EMPC	0.156		0.167		0.0602	UJ
80		0.0553	U	0.0509	U	0.0870	U	0.0678	U	0.0705	U	0.0625	U	0.0941	U	0.0684	UJ
81		0.0556	U	0.0580		0.0927	U	0.0700	U	0.0748	U	0.0680	U	0.0988	U	0.0831	UJ
82		0.660		0.821		0.584		0.310		1.57		0.852		1.17		0.157	J
83	83 + 99	5.72	C	9.46	C	5.37	C	3.47	C	13.2	C	7.01	C	8.82	C	1.65	C J
84		1.31		1.77		1.12		0.625		3.03		1.77		2.27		0.376	J
85	85 + 116 + 117	1.98	C	2.89	C	1.68	C	1.09	C	4.67	C	2.41	C	3.08	C	0.712	C EMPC
86	86 + 87 + 97 + 108 + 119 + 125	5.28	C	9.13	C	5.07	C	3.30	C	14.2	C	7.33	C	8.96	C	1.57	C J
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86		C86
88	88 + 91	0.878	C	1.36	C	0.782	C	0.525	C	2.08	C	1.23	C	1.51	C	0.334	C EMPC
89		0.0474	U	0.0475	U	0.0485	U	0.0538	U	0.0970	EMPC	0.0550	EMPC	0.0580	EMPC	0.0753	UJ
90	90 + 101 + 113	8.77	C	16.0	C	8.58	C	5.39	C	20.4	C	11.0	C	13.4	C	2.61	C J
91	88 + 91		C88		C88		C88		C88		C88		C88		C88		C88
92		1.68		2.51		1.55		0.903		4.16		2.20		2.59		0.493	J
93	93 + 95 + 98 + 100 + 102	5.11	C	9.32	C	5.25	C	3.19	C	14.5	C	6.82	C	8.18	C	1.41	C J
94		0.0474	U	0.0475	U	0.0485	U	0.0561	U	0.0656	U	0.0471	U	0.0457	U	0.0774	UJ
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93		C93
96		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0520	EMPC	0.0471	U	0.0457	U	0.0493	UJ
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93		C93
103		0.0620	EMPC	0.0780		0.0510	EMPC	0.0487	U	0.118		0.0940	EMPC	0.106		0.0625	UJ
104		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0437	U	0.0471	U	0.0457	U	0.0493	UJ
105		5.34		7.46		4.89		2.96		10.3		5.82		6.91		1.79	J
106		0.0492	U	0.0942	U	0.0487	U	0.0522	U	0.109	U	0.0604	U	0.0551	U	0.0784	UJ
107	107 + 124	0.448	C	0.641	C	0.424	C	0.240	C	0.955	C	0.492	C	0.637	C	0.159	C EMPC
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86		C86
109		0.984		1.30		0.908		0.565		1.86		1.02		1.32		0.272	EMPC
110	110 + 115	11.1	C	17.3	C	10.5	C	6.34	C	25.2	C	13.6	C	16.8	C	2.85	C J
111		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0460	U	0.0471	U	0.0457	U	0.0533	UJ
112		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0467	U	0.0471	U	0.0457	U	0.0529	UJ
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90		C90		C90
114		0.337	EMPC	0.345		0.284		0.154		0.542		0.328		0.336		0.0976	UJ
115	110 + 115		C110		C110		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85		C85		C85
118		13.1		24.4		13.9		8.31		29.8		14.1		16.8		4.09	J
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86		C86
120		0.0630	EMPC	0.120	EMPC	0.0870		0.0487	U	0.146		0.0750	EMPC	0.106	EMPC	0.0495	UJ
121		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0469	U	0.0471	U	0.0457	U	0.0546	UJ
122		0.153	EMPC	0.158		0.103		0.0630	EMPC	0.198		0.127		0.163	EMPC	0.0913	UJ
123		0.235	EMPC	0.406		0.272		0.172	EMPC	0.679		0.309		0.342		0.168	EMPC
124	107 + 124		C107		C107		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86		C86
126		0.115	EMPC	0.147	EMPC	0.0930	EMPC	0.0583	U	0.184	EMPC	0.0840		0.123		0.113	UJ
127		0.0522	U	0.100	U	0.0508	U	0.0544	U	0.114	U	0.0630	U	0.0574	U	0.0869	UJ

Table H-8
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Reference P39 08022739SD 2/27/2008		Reference P40 08022740SD 2/27/2008		Reference P41 08022741SD 2/27/2008		Reference P42 08022742SD 2/27/2008		Reference P85 08030685SD 3/6/2008		Reference P86 08030686SD 3/6/2008		Reference P87 08030687SD 3/6/2008		Downstream P46 08031046SD 3/10/2008	
128	128 + 166	2.89	C	3.29	C	2.72	C	1.49	C	6.20	C	3.91	C	4.82	C	0.767	C J
129	129 + 138 + 160 + 163	19.4	C	29.7	C	18.0	C	10.7	C	42.3	C	22.6	C	29.8	C	5.95	C J
130		1.14		1.46		1.06		0.620		2.38		1.46		1.88		0.312	J
131		0.131	EMPC	0.162		0.0780		0.0910	EMPC	0.279		0.185		0.234		0.0845	UJ
132		3.73		4.40		3.06		1.74		7.65		4.89		6.15		0.943	J
133		0.309		0.334	EMPC	0.226	EMPC	0.157		0.525	EMPC	0.362		0.426	EMPC	0.0815	UJ
134	134 + 143	0.499	C	0.724	C	0.392	C	0.278	C	1.10	C	0.664	C EMPC	0.732	C EMPC	0.117	C EMPC
135	135 + 151 + 154	4.23	C	5.98	C	4.03	C	2.28	C	9.54	C	5.80	C	6.80	C	1.34	C J
136		1.05		1.38		0.919		0.475		2.06		1.49		1.65		0.267	EMPC
137		0.541		0.754		0.454		0.313		1.37		0.643		0.892		0.158	J
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129		C129		C129
139	139 + 140	0.267	C	0.303	C EMPC	0.216	C	0.136	C	0.516	C	0.274	C EMPC	0.373	C	0.0850	C J
140	139 + 140		C139		C139		C139		C139		C139		C139		C139		C139
141		1.56	EMPC	1.56		1.26	EMPC	0.701		3.00		1.89		2.58		0.642	J
142		0.0474	U	0.0823	U	0.0558	U	0.0744	U	0.107	U	0.0499	U	0.0757	U	0.0839	UJ
143	134 + 143		C134		C134		C134		C134		C134		C134		C134		C134
144		0.441		0.563		0.399		0.251	EMPC	0.889		0.499		0.685		0.114	EMPC
145		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0437	U	0.0471	U	0.0457	U	0.0493	UJ
146		3.13		4.84		3.15		2.02		6.32		3.86		4.34		1.26	EMPC
147	147 + 149	10.7	C	16.7	C	10.1	C	6.06	C	23.9	C	13.7	C	16.5	C	3.01	C J
148		0.0474	U	0.0490	EMPC	0.0485	U	0.0487	U	0.0560	EMPC	0.0500	EMPC	0.0520	EMPC	0.0621	UJ
149	147 + 149		C147		C147		C147		C147		C147		C147		C147		C147
150		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0437	U	0.0471	U	0.0457	U	0.0493	UJ
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135		C135		C135
152		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0437	U	0.0471	U	0.0457	U	0.0493	UJ
153	153 + 168	16.5	C	33.5	C	18.9	C	12.2	C	47.7	C	20.9	C	25.3	C	5.46	C J
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135		C135		C135
155		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0437	U	0.0471	U	0.0457	U	0.0493	UJ
156	156 + 157	1.80	C	2.46	C	1.65	C	0.930	C	3.74	C	2.04	C	2.66	C	0.604	C EMPC
157	156 + 157		C156		C156		C156		C156		C156		C156		C156		C156
158		1.54		1.95		1.26		0.747	EMPC	2.93		1.72		2.25		0.446	J
159		0.197		0.152		0.101		0.0528	U	0.259		0.183		0.228		0.0790	EMPC
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129		C129		C129
161		0.0474	U	0.0559	U	0.0485	U	0.0501	U	0.0719	U	0.0471	U	0.0510	U	0.0578	UJ
162		0.0580	EMPC	0.0626	U	0.0540	EMPC	0.0545	U	0.138		0.0640	EMPC	0.112	EMPC	0.0613	UJ
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129		C129		C129
164		0.891		1.09		0.796		0.419		1.87		1.24		1.54		0.286	J
165		0.0474	U	0.0645	U	0.0485	U	0.0586	U	0.0841	U	0.0471	U	0.0596	U	0.0651	UJ
166	128 + 166		C128		C128		C128		C128		C128		C128		C128		C128
167		0.761		1.40		0.870		0.482	EMPC	1.97		0.915		1.20		0.320	J
168	153 + 168		C153		C153		C153		C153		C153		C153		C153		C153
169		0.200	U	0.100	U	0.100	U	0.0542	U	0.200	U	0.100	U	0.100	U	0.0697	UJ
170		2.79		3.13		2.55		1.38		5.22		3.53		5.16		1.03	J
171	171 + 173	1.21	C	1.42	C	1.06	C	0.598	C	2.02	C	1.53	C	2.08	C	0.410	C EMPC
172		0.565		0.550		0.446		0.269		1.15		0.816	EMPC	1.19		0.329	EMPC
173	171 + 173		C171		C171		C171		C171		C171		C171		C171		C171
174		2.60		2.94		2.38		1.31		5.52		3.58		5.30		1.12	J
175		0.168		0.187		0.119		0.0790	EMPC	0.283		0.219		0.230	EMPC	0.0600	EMPC
176		0.409		0.526		0.458		0.248	EMPC	0.818		0.566		0.732		0.0930	EMPC
177		2.78		3.38		2.46		1.53		5.10		3.67		4.55		0.830	J
178		1.09		1.37		0.918		0.567		2.22		1.52		1.86		0.449	J
179		1.82		2.17		1.59		0.931		3.45		2.41		3.01		0.523	J
180	180 + 193	7.12	C	9.27	C	6.75	C	3.99	C	15.2	C	9.26	C	13.1	C	2.87	C J
181		0.0474	U	0.0620	EMPC	0.0485	U	0.0487	U	0.0820	EMPC	0.0471	U	0.0950		0.0521	UJ
182		0.0480	EMPC	0.0540		0.0485	U	0.0487	U	0.0840	EMPC	0.0471	U	0.0990	EMPC	0.0493	UJ
183	183 + 185	2.58	C	3.61	C	2.48	C	1.50	C	5.44	C	3.37	C	4.71	C	0.947	C J
184		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0437	U	0.0471	U	0.0457	U	0.0493	UJ
185	183 + 185		C183		C183		C183		C183		C183		C183		C183		C183
186		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0437	U	0.0471	U	0.0457	U	0.0493	UJ
187		6.87		9.60		6.93		4.00		15.5		9.63		12.6		2.94	J
188		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0437	U	0.0471	U	0.0457	U	0.0493	UJ
189		0.159	EMPC	0.181		0.132		0.0720		0.250		0.158		0.243		0.0733	UJ
190		0.970		1.29		0.969		0.545		2.02		1.25		1.60		0.301	EMPC
191		0.140		0.192		0.137	EMPC	0.0540	EMPC	0.285		0.164	EMPC	0.217		0.0493	UJ
192		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0437	U	0.0471	U	0.0457	U	0.0493	UJ
193	180 + 193		C180		C180		C180		C180		C180		C180		C180		C180
194		1.90		1.82		1.40		0.778	EMPC	3.15		2.46		3.66		0.928	J
195		0.904		1.06		0.708		0.490	EMPC	1.45		1.05		1.57		0.326	J
196		0.958	EMPC	0.968		0.788		0.452		1.80		1.29		1.97		0.361	EMPC
197	197 + 200	0.332	C	0.357	C	0.316	C EMPC	0.209	C EMPC	0.658	C	0.464	C	0.741	C	0.238	C J
198	198 + 199	2.42	C	2.78	C	2.07	C	1.12	C EMPC	5.88	C	3.92	C	6.21	C	1.49	C J
199	198 + 199		C198		C198		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197		C197		C197
201		0.347		0.444		0.286	EMPC	0.209	EMPC	0.731		0.515		0.757		0.114	EMPC
202		0.885		1.05		0.686		0.466		1.97		1.36		2.00		0.589	EMPC
203		1.96		2.70		1.83		1.08		4.60		2.78		4.18		0.917	J
204		0.0474	U	0.0475	U	0.0485	U	0.0487	U	0.0437	U	0.0471	U	0.0457	U	0.0493	UJ
205		0.137	EMPC	0.152		0.119	EMPC	0.0780	EMPC	0.233		0.171	EMPC	0.256		0.0565	UJ
206		1.89		2.28		1.70		1.01	EMPC	4.38		2.98		5.79		0.784	J
207		0.276		0.376		0.244		0.141		0.607		0.481		0.799		0.128	UJ
208		0.751		0.849		0.645		0.332	EMPC	1.83		1.13		2.16		0.412	J
209		2.49		3.78		2.40		1.52		4.83		3.58		6.67		0.825	EMPC
Total PCBs as Congeners in ug/kg, dry weight																	
Total PCBs as Congeners (full EMPC/full SDL)		0.277	J	0.445	J	0.278	J	0.169	J	0.638	J	0.331	J	0.413	J	0.0990	J
Total PCBs as Congeners (KM-based)		0.272	J	0.442	J	0.273	J	0.161	J	0.634	J	0.326	J	0.409	J	0.0880	J
Total PCBs as Congeners (KM-based, capped)		0.272	J	0.442	J	0.273	J	0.161	J	0.634	J	0.326	J	0.409	J	0.0880	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-8
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Downstream P47 08031047SD 3/10/2008		Downstream P48 08031048SD 3/10/2008		Downstream P49 08031049SD 3/10/2008		Downstream P50 08031150SD 3/11/2008		Downstream P51 08031151SD 3/11/2008		Forebay - Goose Island P110 090427110S D 4/27/2009		Forebay - Goose Island P111 090429111S D 4/29/2009	
Individual Congeners in pg/g (ng/kg), dry weight															
1		0.187	J	0.226	J	1.13	J	0.276	J	0.118	EMPC	0.309	EMPC	0.339	
2		0.406	J	0.439	J	0.411	J	5.39	J	0.335	EMPC	22.8		27.2	
3		0.186	J	0.155	J	2.67	J	0.319	J	0.148	EMPC	1.02		1.06	
4		0.429	J	0.497	J	2.31	J	0.737	J	0.344	UJ	0.856	EMPC	0.862	
5		0.155	UJ	0.205	UJ	0.257	UJ	0.147	UJ	0.201	UJ	0.289	U	0.232	U
6		0.210	J	0.188	UJ	0.237	UJ	0.436	J	0.185	UJ	0.565		0.564	EMPC
7		0.148	UJ	0.195	UJ	0.245	UJ	0.140	UJ	0.191	UJ	0.252	U	0.202	U
8		0.938	J	0.738	J	1.01	J	2.25	J	0.493	J	2.41		2.79	
9		0.142	UJ	0.187	UJ	0.236	UJ	0.135	UJ	0.184	UJ	0.257	U	0.206	U
10		0.147	UJ	0.194	UJ	0.244	UJ	0.139	UJ	0.190	UJ	0.250	U	0.201	U
11		27.2	J	27.7	J	25.9	J	52.4	J	32.9	J	91.8		101	
12	12 + 13	0.150	C UJ	0.198	C UJ	0.249	C UJ	0.478	C J	0.194	C UJ	1.51	C	1.42	C EMPC
13	12 + 13		C12		C12		C12		C12		C12		C12		C12
14		0.142	UJ	0.188	UJ	0.236	UJ	0.135	UJ	0.184	UJ	0.251	U	0.202	U
15		1.15	J	1.51	J	4.98	J	3.36	J	0.685	J	5.52	EMPC	7.13	
16		0.496	J	0.347	EMPC	0.995	J	1.91	J	0.399	J	1.85		1.77	
17		0.605	J	0.361	J	1.25	J	1.91	J	0.390	J	1.93		2.00	
18	18 + 30	1.08	C J	0.981	C J	2.51	C J	4.34	C	0.832	C J	4.40	C	4.40	C
19		0.182	EMPC	0.212	J	2.66	J	0.443	J	0.121	UJ	0.395		0.385	
20	20 + 28	2.43	C J	2.80	C J	9.28	C J	11.4	C J	1.80	C J	15.2	C	17.1	C
21	21 + 33	1.07	C J	0.751	C J	3.81	C J	3.64	C J	0.523	C J	4.83	C	5.60	C
22		0.802	J	1.02	J	3.07	J	3.57	J	0.604	J	4.60		5.08	
23		0.0501	UJ	0.0492	UJ	2.17	J	0.0751	UJ	0.0691	UJ	0.104	U	0.0716	U
24		0.0503	UJ	0.0571	UJ	0.0912	UJ	0.0800	J	0.0801	UJ	0.0760	EMPC	0.0474	U
25		0.146	J	0.135	J	0.565	J	0.652	J	0.108	J	0.807		0.939	
26	26 + 29	0.331	C J	0.372	C J	1.30	C J	1.39	C J	0.224	C J	1.70	C	1.88	C
27		0.0840	J	0.0870	J	0.156	J	0.375	J	0.0750	U	0.382		0.419	
28	20 + 28		C20		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18		C18
31		1.72	J	1.77	J	7.67	J	7.66	J	1.25	J	9.39		10.5	
32		0.329	J	0.290	J	0.794	J	0.964	J	0.139	J	0.937		0.929	
33	21 + 33		C21		C21		C21		C21		C21		C21		C21
34		0.0501	UJ	0.0492	UJ	1.91	J	0.0721	UJ	0.0663	UJ	0.102	U	0.103	EMPC
35		0.113	EMPC	0.162	J	0.167	EMPC	0.259	EMPC	0.118	EMPC	0.533	EMPC	0.594	
36		0.0501	U	0.0492	UJ	0.101	UJ	0.0690	EMPC	0.0628	UJ	0.152		0.183	EMPC
37		1.04	J	1.23	J	4.29	J	3.96	J	0.819	J	5.85		7.23	
38		0.0501	UJ	0.0492	UJ	0.104	UJ	0.0705	UJ	0.0649	UJ	0.0946	U	0.0910	
39		0.0501	UJ	0.0492	UJ	0.102	UJ	0.0693	UJ	0.0638	UJ	0.0939	U	0.117	EMPC
40	40 + 41 + 71	0.659	C J	0.665	C J	3.77	C J	4.64	C J	0.901	C J	5.92	C	6.31	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40		C40
42		0.514	EMPC	0.378	J	1.94	J	2.82	J	0.522	EMPC	3.75		3.67	
43		0.0507	UJ	0.0547	UJ	0.316	EMPC	0.379	J	0.0890	U	0.301		0.474	
44	44 + 47 + 65	2.20	C J	1.80	C J	7.04	C J	12.2	C J	2.59	C J	16.9	C	16.1	C
45	45 + 51	0.260	C EMPC	0.272	C J	1.22	C J	1.51	C J	0.282	C J	1.67	C	1.83	C
46		0.0800	EMPC	0.0990	J	0.386	J	0.515	J	0.0860	UJ	0.637	EMPC	0.698	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44		C44
48		0.313	J	0.299	J	1.74	EMPC	1.65	J	0.314	EMPC	2.40		2.42	
49	49 + 69	1.31	C	1.15	C J	5.27	C J	8.71	C J	1.43	C J	9.67	C	10.7	C
50	50 + 53	0.253	C	0.194	C J	1.10	C EMPC	1.50	C J	0.215	C EMPC	1.67	C	1.50	C
51	45 + 51		C45		C45		C45		C45		C45		C45		C45
52		4.19	J	2.84	J	11.1	J	20.3	J	3.57	J	21.6		22.5	
53	50 + 53		C50		C50		C50		C50		C50		C50		C50
54		0.0501	UJ	0.0492	UJ	2.28	J	0.0473	UJ	0.0563	UJ	0.0677	U	0.0661	U
55		0.0643	UJ	0.0492	UJ	0.192	EMPC	0.192	EMPC	0.0808	UJ	0.124	U	0.117	U
56		1.02	J	0.944	J	4.57	J	5.85	J	1.14	J	6.87		8.25	
57		0.0600	UJ	0.0492	UJ	0.0635	UJ	0.0762	UJ	0.0754	UJ	0.120	U	0.113	U
58		0.0609	UJ	0.0492	UJ	0.0644	UJ	0.0810	EMPC	0.0765	UJ	0.120	U	0.113	U
59	59 + 62 + 75	0.187	C J	0.179	C EMPC	0.831	C J	1.06	C J	0.203	C J	1.61	C	1.50	C
60		0.847	J	0.714	J	2.73	J	3.10	J	0.782	J	4.46		4.83	
61	61 + 70 + 74 + 76	6.30	C J	4.78	C J	17.1	C J	30.3	C J	5.62	C J	34.6	C	39.7	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59		C59
63		0.114	J	0.102	J	0.492	J	0.727	J	0.154	J	0.997		1.18	
64		1.22	J	0.956	J	3.99	J	5.84	J	1.12		7.06		7.58	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44		C44
66		3.46	J	2.73	J	10.1	J	17.8	J	3.33	J	21.0		24.8	
67		0.0830	J	0.0600	J	0.250	J	0.346	EMPC	0.0661	UJ	0.469	EMPC	0.519	
68		0.0577	UJ	0.0492	UJ	0.0930	EMPC	0.211	EMPC	0.0725	UJ	0.243	EMPC	0.361	
69	49 + 69		C49		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40		C40
72		0.0575	U	0.0492	UJ	0.0870	J	0.299	EMPC	0.0722	UJ	0.327		0.406	
73		0.0610	EMPC	0.0492	UJ	0.0699	UJ	0.0473	UJ	0.0567	UJ	0.0731	U	0.0643	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61		C61
77		0.531	EMPC	0.478	J	1.60	J	2.01	J	0.573	J	2.85		3.53	
78		0.0633	UJ	0.0492	UJ	0.0670	UJ	0.0805	UJ	0.0796	UJ	0.117	U	0.111	U
79		0.114	EMPC	0.0880	EMPC	0.218	J	0.534	J	0.150	J	0.538		0.481	
80		0.0568	UJ	0.0492	UJ	0.0601	UJ	0.0722	UJ	0.0714	UJ	0.109	U	0.103	U
81		0.0707	UJ	0.0492	UJ	0.260	J	0.100	UJ	0.0981	UJ	0.135		0.150	EMPC
82		0.610	J	0.464	J	1.24	J	2.34	J	0.552	EMPC	3.66		4.45	
83	83 + 99	4.91	C J	3.50	C J	11.2	C J	22.0	C J	4.90	C J	30.0	C	33.8	C
84		1.17	J	0.826	J	2.41	J	6.29	J	0.926	J	8.13		9.95	
85	85 + 116 + 117	2.02	C J	1.33	C J	3.40	C J	5.73	C J	1.79	C J	9.25	C	10.4	C
86	86 + 87 + 97 + 108 + 119 + 125	4.59	C J	3.55	C J	10.1	C J	19.7	C J	4.51	C J	28.6	C	32.4	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86
88	88 + 91	0.831	C J	0.568	C J	1.59	C	4.17	C	0.775	C	5.27	C	6.11	C
89		0.0590	EMPC	0.0691	UJ	0.130	EMPC	0.268	J	0.265	U	0.309		0.359	EMPC
90	90 + 101 + 113	7.75	C J	5.61	C J	16.6	C J	30.9	C J	7.14	C J	44.2	C	51.9	C
91	88 + 91		C88		C88		C88		C88		C88		C88		C88
92		1.41		1.15	EMPC	2.90	J	9.03	J	1.20	J	8.33	J	9.58	J
93	93 + 95 + 98 + 100 + 102	4.85	C J	3.38	C J	8.51	C J	32.3	C J	4.49	C J	29.7	C	31.7	C
94		0.0529	UJ	0.0710	UJ	0.112	UJ	0.142	EMPC	0.275	UJ	0.111	U	0.125	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93
96		0.0501	UJ	0.0492	UJ	0.0760	J	0.104	J	0.145	UJ	0.133	EMPC	0.198	EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93
103		0.0700	EMPC	0.0573	UJ	0.0903	UJ	0.222	J	0.223	UJ	0.397		0.469	EMPC
104		0.0501	UJ	0.0492	UJ	0.890	J	0.0473	UJ	0.0652	UJ	0.0612	U	0.0557	U
105		6.26	J	4.26		9.43	J	19.7	J	3.98	J	24.9		27.7	
106		0.0576	UJ	0.0587	UJ	0.120	UJ	0.0733	UJ	0.328	UJ	0.200	U	0.270	U
107	107 + 124	0.398	C J	0.254	C EMPC	0.438	C J	1.17	C EMPC	0.414	C J	1.72	C	2.27	C EMPC
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86
109		0.762		0.549	EMPC	1.39	J	2.45	J	0.906	J	4.60		5.25	
110	110 + 115	10.6	C J	7.15	C J	17.2	C J	35.9	C J	8.71	C J	52.8	C	63.5	C
111		0.0501	UJ	0.0492	UJ	0.0771	UJ	0.0535	UJ	0.194	UJ	0.0723	U	0.0816	U
112		0.0501	UJ	0.0492	UJ	0.0765	UJ	0.0531	UJ	0.184	UJ	0.0716	U	0.0807	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90		C90
114		0.383	J	0.239		0.650	J	0.957	J	0.315	J	1.29		1.37	
115	110 + 115		C110		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85		C85
118		13.2	J	9.18	J	16.7	J	45.6	J	10.9	J	65.7		69.5	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86
120		0.0501	UJ	0.0590	EMPC	0.0715	UJ	0.226	EMPC	0.183	UJ	0.319	EMPC	0.291	
121		0.0501	UJ	0.0500	UJ	0.0788	UJ	0.0547	UJ	0.197	UJ	0.0774	U	0.0872	U
122		0.0910	EMPC	0.0800	J	0.144	EMPC	0.360	J	0.354	UJ	0.604		0.576	
123		0.271	J	0.130	J	0.497	J	0.874	J	0.226	J	0.963		0.970	EMPC
124	107 + 124		C107		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86
126		0.0805	UJ	0.0787	UJ	0.171	UJ	0.211	J	0.0962	UJ	0.255	EMPC	0.419	EMPC
127		0.0638	UJ	0.0650	UJ	0.133	U	0.0812	UJ	0.344	UJ	0.204	U	0.275	U

Table H-8
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Downstream P47 08031047SD 3/10/2008		Downstream P48 08031048SD 3/10/2008		Downstream P49 08031049SD 3/10/2008		Downstream P50 08031150SD 3/11/2008		Downstream P51 08031151SD 3/11/2008		Forebay - Goose Island P110 090427110SD 4/27/2009		Forebay - Goose Island P111 090429111SD 4/29/2009	
128	128 + 166	2.55	C J	1.90	C J	3.23	C J	8.95	C J	2.12	C J	14.2	C	17.3	C
129	129 + 138 + 160 + 163	15.8	C J	12.0	C J	21.9	C J	69.1	C J	16.1	C J	91.4	C	97.5	C
130		0.928	EMPC	0.708	J	1.12	J	4.02	J	0.750	EMPC	5.75		6.51	
131		0.115	UJ	0.0800	EMPC	0.272	EMPC	0.461	J	0.111	UJ	0.721	EMPC	0.761	
132		2.60	J	2.42	J	5.88	J	14.5	J	2.06	EMPC	20.9		25.3	
133		0.212	J	0.165	EMPC	0.298	J	0.818	J	0.161	EMPC	1.28		1.54	
134	134 + 143	0.433	C EMPC	0.289	C J	0.738	C EMPC	2.14	C J	0.310	C EMPC	3.04	C	3.76	C
135	135 + 151 + 154	3.00	C J	2.63	C J	6.34	C	17.0	C J	2.48	C J	20.8	C	23.5	C
136		0.815	J	0.637	J	1.72	J	4.84	J	0.664	J	6.12		7.28	
137		0.667	EMPC	0.481	J	1.04	EMPC	1.96	J	0.454	J	2.52	EMPC	3.22	EMPC
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129		C129
139	139 + 140	0.237	C EMPC	0.114	C EMPC	0.330	C	0.721	C	0.116	C EMPC	1.31	C EMPC	1.33	C
140	139 + 140		C139		C139		C139		C139		C139		C139		C139
141		1.46	J	1.22	J	2.43	J	7.30	J	1.26	J	7.80		10.7	
142		0.115	UJ	0.0793	UJ	0.112	UJ	0.114	UJ	0.110	UJ	0.168	U	0.307	U
143	134 + 143		C134		C134		C134		C134		C134		C134		C134
144		0.331	J	0.332	EMPC	0.746	J	1.64	J	0.254	J	1.98		2.66	
145		0.0501	UJ	0.0492	UJ	0.0482	UJ	0.0495	UJ	0.0563	UJ	0.0739	U	0.0643	U
146		2.82	J	2.39	J	5.31	J	13.3	J	3.80	J	9.23	J	8.91	J
147	147 + 149	7.67	C J	6.04	C J	13.4	C J	39.2	C J	6.15	C J	54.9	C	60.2	C
148		0.0501	UJ	0.0529	UJ	0.0618	UJ	0.0730	J	0.0669	UJ	0.132		0.0796	U
149	147 + 149		C147		C147		C147		C147		C147		C147		C147
150		0.0501	U	0.0492	UJ	0.0482	UJ	0.0482	UJ	0.0563	UJ	0.100		0.122	EMPC
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135		C135
152		0.0501	UJ	0.0492	UJ	0.0482	UJ	0.0473	UJ	0.0563	UJ	0.0676	U	0.0589	U
153	153 + 168	13.2	C J	9.74	C J	18.3	C	56.8	C J	12.0	C J	87.6	C	78.8	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135		C135
155		0.0501	UJ	0.0492	UJ	0.350	J	0.0473	UJ	0.0563	UJ	0.0591	U	0.0523	U
156	156 + 157	1.82	C J	1.39	C EMPC	2.89	C	6.25	C J	1.74	C	8.50	C	10.4	C
157	156 + 157		C156		C156		C156		C156		C156		C156		C156
158		1.32	J	1.01	J	2.05	J	5.59	J	1.10	J	6.63		7.51	
159		0.0817	UJ	0.144	J	0.319	J	0.987	EMPC	0.118	EMPC	0.753		0.871	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129		C129
161		0.0790	UJ	0.0547	UJ	0.0769	UJ	0.0788	UJ	0.0760	UJ	0.113	U	0.207	U
162		0.0838	UJ	0.0580	UJ	0.0816	UJ	0.226	EMPC	0.0806	UJ	0.284	EMPC	0.250	EMPC
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129		C129
164		0.714	J	0.636	J	1.21	EMPC	3.73	J	0.688	J	5.10		6.01	
165		0.0889	UJ	0.0615	UJ	0.0865	UJ	0.0887	UJ	0.0855	UJ	0.130	U	0.238	U
166	128 + 166		C128		C128		C128		C128		C128		C128		C128
167		0.697	J	0.554	J	1.03	J	2.61	J	0.765	J	4.02		3.81	
168	153 + 168		C153		C153		C153		C153		C153		C153		C153
169		0.0894	UJ	0.0630	UJ	0.0900	UJ	0.154	UJ	0.0837	UJ	0.241	U	0.250	U
170		1.86	J	2.04	J	5.34	J	12.4	J	2.73	J	13.8		17.1	
171	171 + 173	0.715	C J	0.627	C EMPC	1.67	C	4.57	C J	0.806	C	5.36	C	5.94	C
172		0.524	J	0.481	EMPC	1.16	J	2.65	J	0.705	J	2.43		3.08	
173	171 + 173		C171		C171		C171		C171		C171		C171		C171
174		1.82	J	1.69	J	4.75	J	13.1	J	2.21	J	13.9		18.8	
175		0.0870	EMPC	0.125	EMPC	0.175	J	0.612	J	0.122	EMPC	0.706		0.698	EMPC
176		0.306	EMPC	0.249	J	0.573	J	1.80	J	0.207	EMPC	1.99		2.20	
177		1.86	J	1.69	J	4.39	J	10.3	J	2.13	J	11.9		13.8	
178		0.667	EMPC	0.601	J	1.33	EMPC	4.16	J	0.998	J	5.05		5.66	
179		1.13	J	1.02	J	2.51	J	6.56	J	1.01	J	8.08		9.39	
180	180 + 193	4.66	C J	4.94	C J	12.6	C J	31.4	C J	7.15	C J	32.2	C	37.6	C
181		0.0501	UJ	0.0566	UJ	0.122	EMPC	0.160	EMPC	0.0563	UJ	0.164	EMPC	0.139	EMPC
182		0.0501	UJ	0.0522	UJ	0.0980	EMPC	0.117	EMPC	0.0920	EMPC	0.117	U	0.178	
183	183 + 185	1.67	C J	1.53	C	3.86	C	10.9	C	1.90	C	11.5	C	13.1	C
184		0.0501	UJ	0.0492	UJ	0.0482	UJ	0.0473	UJ	0.0563	UJ	0.0990	EMPC	0.0741	U
185	183 + 185		C183		C183		C183		C183		C183		C183		C183
186		0.0501	UJ	0.0492	UJ	0.0515	UJ	0.0473	UJ	0.0563	UJ	0.0974	U	0.0791	U
187		4.81	J	4.34	J	10.9	J	29.7	J	7.70	J	31.1	J	29.8	J
188		0.0501	UJ	0.0492	UJ	0.0940	J	0.0473	UJ	0.0563	UJ	0.0892	U	0.0733	U
189		0.115	EMPC	0.0970	J	0.254	J	0.596	J	0.140	J	0.615		0.869	
190		0.572	J	0.431	J	1.29	J	3.28	J	0.731	J	4.02		4.11	EMPC
191		0.0690	EMPC	0.0930	J	0.173	EMPC	0.522	J	0.104	EMPC	0.534	EMPC	0.630	
192		0.0501	UJ	0.0492	UJ	0.0603	UJ	0.0540	UJ	0.0563	UJ	0.104	U	0.0844	U
193	180 + 193		C180		C180		C180		C180		C180		C180		C180
194		1.11	J	1.17	EMPC	3.01	J	7.52	J	2.04	J	9.07		12.0	
195		0.564	J	0.578	EMPC	1.36	J	3.41	J	1.01	J	4.07		4.76	
196		0.646	EMPC	0.558	EMPC	1.45	J	3.73	J	0.932	EMPC	4.27		5.18	
197	197 + 200	0.339	C J	0.418	C J	0.670	C EMPC	1.46	C J	0.328	C UJ	0.815	C	1.01	C J
198	198 + 199	2.04	C J	1.68	C J	3.57	C EMPC	9.72	C J	2.94	C J	13.4	C	17.1	C
199	198 + 199		C198		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197		C197
201		0.321	J	0.216	EMPC	0.482	J	1.28	J	0.293	EMPC	1.64	EMPC	1.80	
202		0.738	J	0.515	J	1.14	J	3.04	J	1.15	J	4.07		4.81	
203		1.20	EMPC	1.32	J	2.39	J	6.99	J	2.28	J	9.76		10.9	
204		0.0501	UJ	0.0492	UJ	0.0487	UJ	0.0473	UJ	0.0563	UJ	0.0942	U	0.0818	U
205		0.0950	EMPC	0.0650	EMPC	0.117	J	0.398	J	0.115	EMPC	0.499		0.631	EMPC
206		2.92	J	1.05	J	1.59	J	6.16	J	2.16	J	7.73		11.1	
207		0.413	J	0.118	UJ	0.231	J	0.789	EMPC	0.287	EMPC	1.25		1.62	
208		1.40	J	0.437	J	0.574	J	2.26	J	0.876	J	2.71		3.88	
209		2.40	J	1.25	J	1.49	J	7.10	J	3.45	J	6.79		11.0	
Total PCBs as Congeners in ug/kg, dry weight															
Total PCBs as Congeners (full EMPC/full SDL)		0.221	J	0.181	J	0.430	J	0.923	J	0.223	J	1.22	J	1.36	J
Total PCBs as Congeners (KM-based)		0.215	J	0.173	J	0.418	J	0.917	J	0.213	J	1.20	J	1.34	J
Total PCBs as Congeners (KM-based, capped)		0.215	J	0.173	J	0.418	J	0.917	J	0.213	J	1.20	J	1.34	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-9
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Forebay P04 08022604TC 2/26/2008		Forebay P07 08021507TC 2/15/2008		Forebay P08 08021508TC 2/15/2008		Forebay P10 08021410TC 2/14/2008		Forebay P11 08021411TC 2/14/2008		Forebay P15 08022115TC 2/21/2008	
Individual Congeners in pg/g (ng/kg), wet weight													
1		2.74		1.68		2.18		1.41		1.66		1.65	
2		3.68		3.01		4.21	J	2.54		3.06		3.31	
3		0.763		0.592		0.795		0.435		0.654		0.642	EMPC
4		100		59.5		39.8		32.8		36.8		36.6	
5		1.08		0.834		0.805	J	0.629		0.828	J	0.800	
6		13.9		8.19		7.02	J	6.50		7.86	J	7.64	
7		0.503		0.472		0.358	J	0.290	U	0.347	J	0.379	
8		26.5		19.4		18.5	J	14.3		17.6	J	19.7	
9		0.799		0.789		0.487	J	0.405		0.539	J	0.510	EMPC
10		0.872		0.669		0.390	J	0.371		0.428	EMPC	0.493	
11		8,810		6,810		8,370	J	5,260		6,580	J	6,630	
12	12 + 13	0.124	C U	0.212	C U	0.268	C UJ	0.308	C U	0.186	C UJ	0.270	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.167		0.202	U	0.255	UJ	0.293	U	0.178	UJ	0.258	U
15		25.7		18.5		22.9		27.4		26.3		20.1	
16		127		63.8		62.4		52.7		58.0		60.9	
17		208		85.9		64.1		47.4		50.7		52.3	
18	18 + 30	346	C	144	C	131	C	110	C	121	C	123	C
19		24.8		14.3		8.00		6.35		7.40		7.74	
20	20 + 28	142	C	80.2	C	86.1	C	62.1	C	77.6	C	79.4	C
21	21 + 33	70.4	C	38.2	C	42.3	C	30.3	C	38.6	C	38.3	C
22		159		84.1		90.5		70.1		84.0		80.3	
23		0.115	U	0.0991	U	0.120	U	0.0879	U	0.0830		0.0770	
24		0.0417	U	0.758		0.0469	U	0.734	EMPC	0.0473	U	0.0481	U
25		33.9		9.37		7.96		5.64		6.52		6.53	
26	26 + 29	34.0	C	15.9	C	15.6	C	11.1	C	14.4	C	14.1	C
27		107		36.2		22.6		15.8		14.4		14.5	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		83.6		47.1		51.4		35.6		48.1		47.6	
32		23.3		7.95		5.00		3.75		4.66		4.81	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.351		0.183	EMPC	0.187		0.180		0.191		0.227	
35		14.0		12.6		12.7		8.72		11.9		11.9	
36		3.86		3.07		3.54		2.45		3.13		3.15	
37		58.1		35.1		35.9		27.7		35.3		35.2	
38		2.77		1.04		1.15		0.815		0.832	EMPC	0.868	
39		7.79		2.26	J	2.44	J	1.79	J	1.98	J	1.91	J
40	40 + 41 + 71	494	C	104	C	83.8	C	63.7	C	68.1	C	64.4	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		982		255		195		133		121		124	
43		14.3		5.57		6.01		4.04		4.35		3.83	
44	44 + 47 + 65	8,950	C	1,710	C	1,050	C	633	C	456	C	458	C
45	45 + 51	65.2	C	19.9	C	17.5	C	13.4	C	14.7	C	15.6	C
46		7.57		3.13		2.86		2.15		2.69		2.60	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		209		63.1		63.1		45.3		51.1		48.0	
49	49 + 69	771	C	140	C	121	C	85.9	C	92.9	C	88.1	C
50	50 + 53	455	C	90.4	C	58.8	C	37.8	C	31.7	C	32.9	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		3,660		501		392		284		279		262	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.452	EMPC	0.219		0.124		0.0750		0.0730		0.135	
55		0.968	U	0.340	U	0.339	U	0.241	U	0.421	U	0.395	U
56		697		147		115		89.0		91.0		86.5	
57		1.20		0.579		0.566		0.450		0.624		0.496	
58		0.910	U	0.328	U	0.328	U	0.233	U	0.406	U	0.381	U
59	59 + 62 + 75	74.6	C	28.8	C	30.1	C	22.8	C	25.5	C	24.7	C
60		178		60.0		58.1		42.5		51.8		51.2	
61	61 + 70 + 74 + 76	3,230	C	542	C	446	C	317	C	344	C	319	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		42.6		11.6		10.7		7.84		9.51		8.78	
64		368		90.3		82.3		59.8		68.3		67.9	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		1,680		387		337		244		280		258	
67		20.9		8.22		8.43		6.66		8.23		7.55	
68		5.15		2.48		2.36		1.78		2.36		2.15	
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		5.58		2.37		2.33		1.76		2.05		1.99	
73		0.0417	U	0.0468	U	0.0469	U	0.0488	U	0.0473	U	0.0481	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		69.0		35.9		34.8		26.9		33.6		33.3	
78		0.920	U	0.343	U	0.343	U	0.244	U	0.425	U	0.398	U
79		613		125		78.5		43.8		23.9		24.5	
80		0.830	U	0.298	U	0.298	U	0.212	U	0.369	U	0.346	U
81		3.30	EMPC	1.56	EMPC	1.42	EMPC	0.693	EMPC	1.42	EMPC	1.31	EMPC
82		357		43.2		31.9		24.6		19.3		19.1	
83	83 + 99	9,730	C	1,520	C	1,210	C	726	C	621	C	579	C
84		834		110		81.8		57.3		52.3		51.2	
85	85 + 116 + 117	1,880	C	291	C	242	C	157	C	145	C	142	C
86	86 + 87 + 97 + 108 + 119 + 125	17,400	C	2,880	C	1,860	C	1,070	C	615	C	614	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	1,010	C	129	C	105	C	69.7	C	61.1	C	59.4	C
89		31.7		3.90		2.99		2.17		1.99		2.04	
90	90 + 101 + 113	15,900	C	2,200	C	1,790	C	1,100	C	992	C	923	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		1,290		187		162		112		115		109	
93	93 + 95 + 98 + 100 + 102	15,200	C	2,410	C	1,620	C	899	C	593	C	603	C
94		10.5		1.53		1.28		0.906		0.943		0.923	
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		8.86		1.27		0.979		0.732		0.662		0.667	
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		16.2		3.03		2.92		2.10		2.26		2.10	
104		0.366		0.101	EMPC	0.0910	EMPC	0.0598	U	0.0940	EMPC	0.0840	EMPC
105		6,200		924		741		455		407		397	
106		1.06	U	0.453	U	0.405	U	0.301	U	0.167	U	0.293	U
107	107 + 124	521	C	77.4	C	62.7	C	37.4	C	32.8	C	32.4	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		653		120		102		66.5		69.8		69.1	
110	110 + 115	12,400	C	1,720	C	1,360	C	928	C	852	C	812	C
111		0.359	U	0.295	U	0.321		0.260	EMPC	0.524	EMPC	0.495	EMPC
112		0.359	U	0.275	U	0.261	U	0.225	U	0.206	U	0.185	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		445		65.5		52.5		28.1		23.8		23.1	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		64,700		12,100		7,970		4,090		2,260		2,300	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		15.5		6.92		7.21		5.52		7.17		6.72	
121		0.506		0.297	U	0.339		0.266		0.309		0.319	
122		60.9		13.4		12.7		6.55		4.83		5.10	
123		1,150		229		152		83.7		46.2		47.1	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		11.0		4.57		4.17		3.37		4.13		3.86	
127		23.4		5.19		2.92		1.68		0.178	U	1.04	

Table H-9
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Forebay P04 08022604TC 2/26/2008		Forebay P07 08021507TC 2/15/2008		Forebay P08 08021508TC 2/15/2008		Forebay P10 08021410TC 2/14/2008		Forebay P11 08021411TC 2/14/2008		Forebay P15 08022115TC 2/21/2008	
128	128 + 166	1,220	C	231	C	200	C	130	C	128	C	135	C
129	129 + 138 + 160 + 163	30,900	C	5,610	C	4,250	C	2,590	C	2,080	C	2,070	C
130		488		112		96.1		65.3		68.5		69.4	
131		87.8		14.5		11.8		7.50		7.00		6.90	
132		1,420		265		223		157		152		147	
133		80.0		23.5		21.9		14.9		17.9		17.7	
134	134 + 143	253	C	50.1	C	43.3	C	28.9	C	29.0	C	29.2	C
135	135 + 151 + 154	1,440	C	343	C	323	C	223	C	258	C	256	C
136		406		67.2		59.2		41.6		41.4		41.3	
137		956		164		113		65.6		37.9		37.5	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	183	C	31.9	C	27.6	C	16.5	C	15.5	C	15.3	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		299		61.6		58.8		43.3		35.9		39.5	
142		0.834	U	0.433	U	0.443	U	0.546	U	0.596	U	0.759	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		204		36.1		33.0		21.7		23.4		22.3	
145		2.16		0.288		0.290		0.232		0.108		0.143	EMPC
146		2,310		584		501		327		331		324	
147	147 + 149	10,000	C	1,910	C	1,640	C	1,070	C	1,070	C	1,040	C
148		5.32		1.86		1.94		1.42		1.71		1.54	
149	147 + 149		C147		C147		C147		C147		C147		C147
150		5.10		1.31		1.38		0.918		1.09		1.01	
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		4.02		0.611		0.541		0.349		0.332		0.314	
153	153 + 168	61,300	C	14,400	C	10,100	C	5,270	C	3,560	C	3,830	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		1.06		0.802		0.869	EMPC	0.664		0.894		0.856	
156	156 + 157	3,610	C	584	C	405	C	228	C	136	C	133	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		1,480		264		215		126		115		115	
159		5.83		2.11		1.77		1.47		1.85		1.78	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.554	U	0.304	U	0.311	U	0.383	U	0.418	U	0.533	U
162		25.6		5.18		4.23		2.51		2.71		2.92	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		255		46.0		42.1		30.7		32.0		33.2	
165		1.63		0.636		0.575		0.439	U	0.587		0.610	U
166	128 + 166		C128		C128		C128		C128		C128		C128
167		3,800		944		566		302		146		157	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		16.5	U	5.60	U	4.73	U	3.37	U	3.27	U	3.56	U
170		188		49.4		44.6		32.9		38.9		39.3	
171	171 + 173	283	C	88.2	C	79.6	C	55.6	C	62.4	C	66.8	C
172		18.4		6.23		5.91		4.70		5.65		5.45	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		129		41.6		39.7		31.6		36.1		37.9	
175		28.9		9.62		9.47		6.50		7.84		8.34	
176		86.4		31.0		29.8		21.7		25.6		25.8	
177		485		196		188		136		164		170	
178		179		88.2		88.0		62.9		80.6		82.3	
179		245		116		115		84.2		105		105	
180	180 + 193	2,720	C	874	C	692	C	491	C	476	C	509	C
181		30.8		5.60		4.57		2.73		2.16		2.34	
182		3.27		1.40		1.51		1.19		1.21		1.14	
183	183 + 185	865	C	265	C	243	C	171	C	194	C	201	C
184		2.00		1.29		1.43		1.00		1.31		1.38	
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0417	U	0.0468	U	0.0469	U	0.0488	U	0.0473	U	0.0481	U
187		1,490		679		671		479		602		617	
188		1.86		1.27		1.22		0.917		1.11		1.20	
189		10.1		2.22		2.12		1.52		1.71		1.56	
190		435		130		114		78.7		79.8		84.1	
191		32.2		8.64		7.73		5.50		5.77		6.07	
192		0.0417	U	0.0468	U	0.0495	U	0.0488	U	0.0473	U	0.0481	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		19.5		8.22		8.38		6.54		8.52		7.72	
195		54.0		24.7		24.5		18.0		22.2		22.6	
196		34.2		13.9		14.0		10.5		12.7		12.4	
197	197 + 200	17.0	C	7.61	C	7.75	C	5.70	C	6.96	C	7.31	C
198	198 + 199	61.1	C	29.1	C	28.6	C	22.6	C	28.0	C	27.3	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		40.6		19.7		19.2		14.2		17.8		18.6	
202		101		60.9		61.2		45.2		57.8		58.2	
203		324		144		136		98.7		111		116	
204		0.0820		0.0740	EMPC	0.0810		0.0930		0.0730	EMPC	0.0530	
205		9.52		4.16		4.14		2.98		3.65		3.69	
206		30.2		15.7		15.9		11.8		14.7		14.8	
207		5.44		3.05		3.05		2.26		2.84		2.77	
208		11.7		7.24		7.20		5.51		7.00		7.09	
209		13.5		10.8		11.2		8.26		10.8		10.9	
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full SDL)		312	J	65.7	J	51.5	J	30.6	J	26.7	J	26.9	J
Total PCBs as Congeners (KM-based)		312	J	65.7	J	51.5	J	30.7	J	26.7	J	26.9	J
Total PCBs as Congeners (KM-based, capped)		312	J	65.7	J	51.5	J	30.6	J	26.7	J	26.9	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-9
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Forebay P16 08022116TC 2/21/2008		Forebay P17 08022117TC 2/21/2008		Forebay P18 08021118TC 2/12/2008		Forebay P21 08021221TC 2/12/2008		Forebay P05 08031905TC 3/19/2008		Forebay P06 08031806TC 3/18/2008	
Individual Congeners in pg/g (ng/kg), wet weight													
1		1.32		1.78		1.91		1.80		2.83		4.56	
2		3.05		3.56		3.45		3.64		2.78		3.68	
3		0.654		0.677		0.634		0.576	EMPC	0.763		0.914	
4		36.2		33.1		37.1		38.9		93.7		227	
5		0.728		0.740		0.719		0.610		0.956		1.11	
6		7.43		7.39		8.01		8.30		9.60		12.9	
7		0.297		0.321		0.355		0.296		0.493		1.06	
8		16.3		17.5		19.8		17.0		24.0		37.0	
9		0.456	EMPC	0.504		0.576		0.444		0.801		1.64	
10		0.426		0.408		0.443		0.392		1.02		2.45	
11		6,220		6,080		6,840		6,470		7,750		9,620	
12	12 + 13	0.225	C U	0.132	C U	0.108	C U	0.150	C U	0.229	C U	0.173	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.214	U	0.128	U	0.127		0.146	U	0.218	U	0.168	U
15		23.3		16.4		17.3		20.4		23.0	J	25.7	
16		62.0		63.7		66.0		68.7		77.3		97.0	
17		51.9		53.1		55.3		54.0		105		159	
18	18 + 30	127	C	127	C	132	C	133	C	193	C	235	C
19		6.67		6.71		7.63		6.96		13.8		40.9	
20	20 + 28	74.7	C	75.5	C	77.8	C	69.8	C	97.1	C	115	C
21	21 + 33	35.2	C	37.6	C	41.8	C	34.2	C	46.7	C	56.9	C
22		77.8		82.4		86.6		76.3		107		117	
23		0.0860		0.0996	U	0.0820		0.0750		0.219	U	0.175	U
24		0.0484	U	0.723	EMPC	0.0466	U	0.0457	U	0.571		0.0487	U
25		6.13		6.55		6.53		5.80		12.6		15.4	
26	26 + 29	13.4	C	13.4	C	14.4	C	13.0	C	18.7	C	23.8	C
27		15.5		14.3		14.5		15.8		42.1		68.1	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		42.7		45.1		48.4		39.3		61.3		76.2	
32		4.43		5.03		5.87		4.41		8.09		17.8	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.183		0.215		0.225		0.213		0.259		0.348	
35		9.93		9.60		10.4		9.54		14.3		16.5	
36		2.84		2.76		2.98		2.75		3.68		4.31	
37		30.6		31.8		36.1		32.4		43.0		53.7	
38		0.797		0.845		0.887		0.791		1.49		1.53	
39		1.85	J	2.06		2.26		1.95		3.32		3.85	
40	40 + 41 + 71	64.3	C	66.5	C	77.6	C	63.2	C	114	C	182	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		128		132		141		122		262		341	
43		4.33		4.24		4.68		4.15		4.49		10.9	
44	44 + 47 + 65	484	C	484	C	504	C	452	C	1,760	C	2,430	C
45	45 + 51	14.2	C	16.7	C	18.0	C	14.8	C	22.2	C	34.2	C
46		2.45		2.77		3.03		2.51		3.71		6.15	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		49.9		54.0		58.0		49.7		72.2		101	
49	49 + 69	83.7	C	95.0	C	101	C	83.7	C	171	C	310	C
50	50 + 53	34.1	C	37.4	C	38.3	C	34.2	C	104	C	158	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		261		277		296		261		665		1,320	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.0484	U	0.0660		0.0710		0.0580	EMPC	0.175	EMPC	0.544	
55		0.488	U	0.424	U	0.496	U	0.449	U	1.08	U	0.575	U
56		80.0		89.6		101		79.6		180		243	
57		0.535		0.563		0.600		0.497		0.948	U	0.813	
58		0.472	U	0.399	U	0.466	U	0.422	U	1.06	U	0.541	U
59	59 + 62 + 75	26.3	C	26.6	C	28.1	C	26.3	C	35.0	C	43.4	C
60		45.3		49.0		56.2		46.6		76.2		104	
61	61 + 70 + 74 + 76	307	C	330	C	358	C	300	C	729	C	1,210	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		8.57		9.25		10.0		8.44		15.1		21.5	
64		61.6		69.2		76.2		61.9		110		186	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		249		269		300		253		516		714	
67		6.99		8.06		8.39		7.32		11.6		15.0	
68		1.94		2.22		2.18		1.76		2.50		3.66	
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		1.87		2.13		2.07		1.81		2.61		3.33	
73		0.0484	U	0.0469	U	0.0466	U	0.0457	U	0.0495	U	0.0487	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		30.1		30.7		33.9		32.0		41.0		52.3	
78		0.493	U	0.403	U	0.471	U	0.427	U	1.02	U	0.547	U
79		22.8		22.8		23.6		22.1		152		160	
80		0.429	U	0.363	U	0.425	U	0.385	U	0.903	U	0.493	U
81		1.54	EMPC	1.55	EMPC	1.42	EMPC	1.38	EMPC	2.70	EMPC	1.97	EMPC
82		15.6		18.7		19.0		16.0		57.4		120	
83	83 + 99	567	C	583	C	592	C	554	C	1,540	C	2,710	C
84		45.9		52.6		54.2		48.8		123		301	
85	85 + 116 + 117	129	C	136	C	143	C	134	C	330	C	591	C
86	86 + 87 + 97 + 108 + 119 + 125	583	C	599	C	600	C	573	C	2,790	C	4,080	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	55.3	C	64.2	C	63.6	C	57.9	C	146	C	303	C
89		1.80		1.98		2.21		1.90		4.63		9.91	
90	90 + 101 + 113	899	C	968	C	967	C	927	C	2,310	C	4,200	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		104		114		117		109		207		423	
93	93 + 95 + 98 + 100 + 102	605	C	676	C	648	C	591	C	2,390	C	3,930	C
94		0.766		0.894		0.950		0.735		1.68		4.22	
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.591		0.743		0.724		0.647		1.57		3.71	
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		2.13		2.47		2.49		2.04		3.57		6.70	
104		0.0740	EMPC	0.0740		0.0810		0.0720	EMPC	0.167	EMPC	0.132	EMPC
105		361		365		377		371		1,020		1,730	
106		0.280	U	0.314	U	0.212	U	0.287	U	0.391	U	0.715	U
107	107 + 124	29.4	C	29.9	C	30.1	C	30.8	C	88.9	C	136	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		64.5		60.9		62.5		61.4		148		224	
110	110 + 115	738	C	786	C	796	C	784	C	1,920	C	3,490	C
111		0.383	EMPC	0.545		0.412	EMPC	0.418		0.657	U	0.680	U
112		0.124	U	0.184	U	0.205	U	0.220	U	0.636	U	0.680	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		20.9		20.2		22.8		21.6		77.4		126	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		2,170		2,080		2,130		2,050		10,300		15,900	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		6.52		6.40		6.56		6.40		8.05		9.61	
121		0.321		0.363		0.321		0.311		0.649	U	0.699	U
122		3.84		3.95		3.80		3.87		19.9	EMPC	22.3	
123		42.0		38.4		41.3		39.2		239		293	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		4.02		3.39		3.63		4.00		5.27		5.74	
127		1.13		0.319	U	1.03		1.15		5.67		7.75	

Table H-9
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Forebay P16 08022116TC 2/21/2008		Forebay P17 08022117TC 2/21/2008		Forebay P18 08021118TC 2/12/2008		Forebay P21 08021221TC 2/12/2008		Forebay P05 08031905TC 3/19/2008		Forebay P06 08031806TC 3/18/2008	
128	128 + 166	114	C	114	C	122	C	118	C	244	C	416	C
129	129 + 138 + 160 + 163	1,970	C	1,800	C	1,890	C	1,890	C	5,880	C	7,400	C
130		61.2		57.6		58.6		57.4		125		176	
131		6.11		5.92		5.90		5.96		13.3		27.3	
132		131		129		132		127		272		497	
133		16.3		14.8		15.3		14.7		24.9		35.1	
134	134 + 143	26.4	C	26.4	C	26.9	C	24.8	C	51.0	C	96.0	C
135	135 + 151 + 154	241	C	246	C	259	C	243	C	362	C	579	C
136		39.3		44.2		44.5		39.3		71.9		143	
137		37.3		28.8		33.8		30.6		163		237	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	14.5	C	13.6	C	14.5	C	13.4	C	29.6	C	54.8	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		33.2		33.0		37.5		33.7		104		100	
142		0.745	U	0.588	U	0.589	U	0.754	U	2.04	U	0.910	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		21.6		21.0		23.5		20.9		39.9		69.2	
145		0.0970	EMPC	0.117		0.116		0.107		0.340		0.686	
146		311		270		290		286		591		776	
147	147 + 149	993	C	941	C	1,000	C	962	C	1,920	C	2,760	C
148		1.58		1.64		1.74		1.66		2.12		2.99	
149	147 + 149		C147		C147		C147		C147		C147		C147
150		1.05		1.14		1.21		1.06		1.45		2.49	
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.325	EMPC	0.357		0.371		0.322		0.702		1.45	
153	153 + 168	3,740	C	2,980	C	3,160	C	2,950	C	13,300	C	18,100	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.720		0.822	EMPC	0.826		0.732		1.09		1.18	
156	156 + 157	128	C	120	C	124	C	121	C	614	C	828	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		103		98.8		104		103		259		397	
159		1.56		1.49		1.62		1.71		2.58		2.88	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.523	U	0.390	U	0.392	U	0.501	U	1.43	U	0.604	U
162		2.06		2.23		2.24		2.20		4.31		8.18	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		27.4		29.3		31.3		29.8		60.4		88.6	
165		0.599	U	0.521		0.580		0.580	U	1.62	U	0.700	U
166	128 + 166		C128		C128		C128		C128		C128		C128
167		149		134		131		125		956		1,180	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		3.53	U	3.40	U	3.66	U	3.62	U	1.73	U	6.60	U
170		32.3		32.2		34.7		34.3		58.5		78.4	
171	171 + 173	56.3	C	55.5	C	55.1	C	57.2	C	91.8	C	119	C
172		4.60		4.53		5.02		4.75		7.22		8.92	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		31.1		30.8		32.9		32.1		46.6		61.2	
175		7.20		6.90		7.01		7.22		10.6		13.7	
176		23.3		21.2		21.1		22.2		31.3		41.3	
177		148		146		141		151		217		266	
178		72.4		70.3		70.0		72.9		90.9		118	
179		95.7		88.2		86.2		88.3		116		149	
180	180 + 193	489	C	420	C	424	C	433	C	929	C	1,050	C
181		2.13		1.95		2.04		2.07		5.76		8.24	
182		0.0484	U	1.18		1.23		1.12		1.55		2.18	
183	183 + 185	183	C	170	C	175	C	184	C	288	C	343	C
184		1.20		1.10		1.05		1.09		1.44		1.67	
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0484	U	0.0469	U	0.0466	U	0.0463	U	0.0929	U	0.0487	U
187		549		502		520		556		736		879	
188		1.08		1.02		1.06		1.00		1.18		1.64	
189		1.56		1.67		1.60		1.66		2.77		4.03	
190		76.5		68.5		71.6		77.5		142		162	
191		5.28		5.26		5.28		5.14		10.7		12.7	
192		0.0484	U	0.0469	U	0.0466	U	0.0539	U	0.110	U	0.0563	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		6.83		7.11		7.23		7.74		10.0		11.8	
195		19.9		19.5		18.5		19.3		25.3		30.9	
196		11.4		11.9		11.8		11.6		15.2		18.9	
197	197 + 200	6.44	C	6.39	C	6.30	C	6.09	C	8.14	C	9.58	C
198	198 + 199	24.0	C	25.2	C	25.1	C	23.9	C	31.4	C	38.5	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		16.4		16.3		15.8		15.6		19.9		25.0	
202		52.1		49.2		47.4		49.4		59.7		73.6	
203		111		106		107		104		144		171	
204		0.0660	EMPC	0.0660	EMPC	0.0670	EMPC	0.0610	EMPC	0.0970		0.132	EMPC
205		3.36		3.35		3.26		3.22		4.26		5.31	
206		13.1		13.1		12.5		12.7		16.7		19.7	
207		2.58		2.71		2.51		2.64		3.29		3.90	
208		6.10		6.13		5.82		5.95		7.88		9.00	
209		9.41		9.45		8.11		8.91		11.0		12.7	
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full SDL)		25.5	J	24.5	J	25.9	J	24.7	J	65.8	J	95.1	J
Total PCBs as Congeners (KM-based)		25.6	J	24.5	J	25.9	J	24.6	J	65.8	J	95.1	J
Total PCBs as Congeners (KM-based, capped)		25.5	J	24.5	J	25.9	J	24.6	J	65.8	J	95.1	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-9
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Forebay P13 08031713TC 3/17/2008		Forebay P14 08031814TC 3/18/2008		Forebay P65 08022965TC 2/29/2008		Forebay P88 08031788TC 3/17/2008		Forebay P89 08031789TC 3/17/2008		Reference P22 08030522TC 3/5/2008	
Individual Congeners in pg/g (ng/kg), wet weight													
1		1.66		1.87		1.87		1.69		1.85		1.73	
2		3.32		3.72		3.48		3.25		3.31		5.27	
3		0.716	U	0.777	U	0.846	U	0.755	U	0.723	U	0.699	U
4		42.9		44.6		46.3		39.3		34.7		37.7	
5		0.940		1.16		1.14		1.08		0.946		1.09	
6		11.4		10.9		11.4		9.06		8.02		9.53	
7		0.443		0.460		0.474		0.446		0.567		0.447	
8		24.8		25.0		25.6		23.4		22.3		20.3	
9		0.647		0.752		0.714		0.668		0.648	EMPC	0.583	
10		0.596		0.729		0.664		0.674		0.647		0.620	
11		7,780		7,370		8,450		8,120		7,760		8,040	
12	12 + 13	51.1	C	59.3	C	71.7	C	59.9	C EMPC	59.1	C	40.7	C
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.174		0.240	EMPC	0.201		0.182		0.194	EMPC	0.193	EMPC
15		16.2		15.3		18.7		14.2		13.5		12.8	
16		89.6		86.3		96.8		81.9		71.1		84.7	
17		80.6		76.3		81.1		69.7		62.4		64.4	
18	18 + 30	195	C	188	C	195	C	164	C	146	C	164	C
19		7.78		8.22		8.42		8.38		8.24		7.95	
20	20 + 28	102	C	104	C	99.8	C	89.2	C	86.6	C	83.8	C
21	21 + 33	47.3	C	48.6	C	49.1	C	44.1	C	43.4	C	41.8	C
22		109		109		105		97.9		87.7		93.1	
23		0.121	EMPC	0.127	EMPC	0.104	EMPC	0.0960	EMPC	0.118	EMPC	0.127	EMPC
24		1.50		0.956		1.25		1.14		1.05		1.01	
25		9.05		8.79		9.06		8.33		7.62		7.56	
26	26 + 29	18.3	C	18.2	C	19.2	C	17.1	C	16.7	C	16.7	C
27		21.1		20.6		20.9		18.0		16.4		17.4	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		58.6		60.7		61.3		55.4		57.4		49.2	
32		7.07		7.58		6.82		5.90		6.00		5.55	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.294		0.295		0.273		0.286	EMPC	0.258	EMPC	0.307	
35		12.4		13.3		13.6		14.4		13.7		13.2	
36		3.60		3.83		4.07		3.80		3.55		3.58	
37		39.0		41.7		45.1		42.5		39.9		38.5	
38		1.12		1.30		1.13		1.25	EMPC	1.09	EMPC	1.32	
39		2.44		2.66		2.59		2.52		2.34		2.47	
40	40 + 41 + 71	81.1	C	80.6	C	87.8	C	79.8	C	77.5	C	76.3	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		184		179		163		154		149		148	
43		3.92		3.72		4.21		3.47		3.65		3.19	
44	44 + 47 + 65	665	C	647	C	610	C	592	C	558	C	556	C
45	45 + 51	21.4	C	20.6	C	22.4	C	20.2	C	19.8	C	18.3	C
46		3.53		3.43		3.78		3.55		3.72		3.18	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		69.5		67.0		72.5		63.1		60.0		59.6	
49	49 + 69	117	C	115	C	132	C	122	C	122	C	104	C
50	50 + 53	51.4	C	47.9	C	49.2	C	45.1	C	42.1	C	41.7	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		347		339		376		356		342		319	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.0860		0.0600	EMPC	0.136		0.126	EMPC	0.118	EMPC	0.109	EMPC
55		2.38	J	4.37		4.43		4.02	EMPC	5.20		3.08	
56		106		115		106		108		100		108	
57		0.839		0.912	EMPC	1.01		0.737		0.853		0.964	
58		0.929		1.02		1.22		1.30		1.23		0.980	
59	59 + 62 + 75	32.1	C	31.5	C	33.7	C	30.0	C	26.9	C	28.8	C
60		57.9		60.6		65.3		63.1		61.4		56.9	
61	61 + 70 + 74 + 76	425	C	446	C	459	C	444	C	432	C	395	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		11.9		12.4		12.9		12.1		12.0		10.7	
64		83.3		83.6		92.3		88.0		87.4		77.7	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		347		361		362		347		328		319	
67		11.4		11.6		11.6		10.6		10.0		10.0	
68		2.77		2.78		3.26		2.87		2.58		2.67	
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		2.47		2.62		3.00		2.69		2.39		2.65	
73		0.0481	U	0.0488	U	0.0492	U	0.0471	U	0.0495	U	0.0477	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		37.5		38.8		42.0		39.8		35.9		37.8	
78		0.404	U	0.428	U	0.309	U	0.319	U	0.325	U	0.308	U
79		25.0		29.5		26.1		29.1		27.3		26.8	
80		0.356	U	0.377	U	0.278	U	0.287	U	0.293	U	0.277	U
81		1.94		2.08	EMPC	2.46		2.01		2.38		1.89	
82		17.9		20.1		20.5		20.9		20.6		19.0	
83	83 + 99	709	C	729	C	771	C	764	C	701	C	683	C
84		60.5		61.6		66.6		68.2		65.3		60.7	
85	85 + 116 + 117	163	C	173	C	186	C	189	C	172	C	169	C
86	86 + 87 + 97 + 108 + 119 + 125	777	C	803	C	744	C	792	C	753	C	694	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	76.1	C	75.6	C	83.9	C	81.2	C	76.1	C	69.8	C
89		2.36		2.25		2.51		2.47		2.55		2.14	
90	90 + 101 + 113	1,160	C	1,190	C	1,250	C	1,240	C	1,130	C	1,110	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		132		135		146		140		134		129	
93	93 + 95 + 98 + 100 + 102	835	C	811	C	768	C	796	C	753	C	710	C
94		1.10		1.09		1.20		1.22		1.14		1.09	
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.923		0.857		0.944		0.949		0.998		0.772	
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		2.91		2.92		3.29		3.08		2.89		2.79	
104		0.123	EMPC	0.104	EMPC	0.149		0.0900	EMPC	0.0880	EMPC	0.127	
105		437		464		478		476		444		438	
106		2.73	U	2.96	U	2.41	U	3.02	U	2.56	U	1.95	U
107	107 + 124	37.1	C	41.6	C	41.3	C	41.6	C	39.2	C	41.0	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		79.8		82.3		89.3		84.9		77.4		80.0	
110	110 + 115	956	C	1,010	C	1,050	C	1,050	C	955	C	978	C
111		0.400	EMPC	0.445	EMPC	0.624	EMPC	0.645		0.590		0.609	
112		0.0793	U	0.0904	U	0.0580	U	0.173	U	0.148	U	0.174	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		26.0		27.4		29.1		28.7		27.3		26.7	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		2,730		2,870		2,540		2,760		2,670		2,420	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		8.10		8.63		8.59		8.27		7.57		8.63	
121		0.352		0.459		0.498		0.401		0.392	EMPC	0.353	
122		4.18		4.47	EMPC	3.65		4.77		4.80	EMPC	5.96	
123		51.2		59.5		43.8		52.0		54.4		48.4	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		5.06		5.31		5.30		5.10		4.72		5.01	
127		2.78	U	3.00	U	2.56	U	3.22	U	2.72	U	2.08	

Table H-9
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Forebay P13 08031713TC 3/17/2008		Forebay P14 08031814TC 3/18/2008		Forebay P65 08022965TC 2/29/2008		Forebay P88 08031788TC 3/17/2008		Forebay P89 08031789TC 3/17/2008		Reference P22 08030522TC 3/5/2008	
128	128 + 166	145	C	157	C	170	C	164	C	151	C	158	C
129	129 + 138 + 160 + 163	2,550	C	2,740	C	2,610	C	2,650	C	2,430	C	2,410	C
130		78.6		84.0		85.7		80.9		73.9		75.4	
131		7.82		8.42		8.56		8.61		7.99		7.87	
132		170		181		182		191		173		175	
133		19.9		21.2		23.6		21.6		19.8		20.5	
134	134 + 143	32.0	C	36.3	C	36.3	C	35.3	C	32.4	C	34.2	C
135	135 + 151 + 154	318	C	333	C	353	C	347	C	322	C	320	C
136		53.8		55.7		58.9		60.3		55.4		52.5	
137		43.6	EMPC	44.5		42.5		47.8		41.9		38.3	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	18.5	C	19.8	C	19.8	C	20.0	C	18.1	C	17.8	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		37.3		38.5		34.9		40.6		37.4		32.3	
142		0.450	U	0.594	U	0.401	U	0.378	U	0.280	U	0.437	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		29.5		30.3		32.2		32.1		29.6		28.8	
145		0.171	EMPC	0.174		0.218	EMPC	0.170	EMPC	0.207	EMPC	0.143	
146		402		434		412		401		377		367	
147	147 + 149	1,270	C	1,330	C	1,340	C	1,340	C	1,220	C	1,230	C
148		2.13		2.20	EMPC	2.42		2.19		2.00		2.09	
149	147 + 149		C147		C147		C147		C147		C147		C147
150		1.44		1.48		1.63		1.51		1.38		1.31	
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.459		0.405		0.471	EMPC	0.477		0.474		0.449	
153	153 + 168	5,180	C	5,530	C	4,140	C	4,590	C	4,620	C	4,070	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.952		1.14		1.18	EMPC	1.03		0.919		1.01	
156	156 + 157	157	C	171	C	156	C	168	C	158	C	138	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		125		134		141		139		128		129	
159		1.91		1.98		2.52		2.47		2.40	EMPC	2.36	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.305	U	0.403	U	0.284	U	0.267	U	0.198	U	0.309	U
162		2.43		3.00		3.31		2.89		2.66	EMPC	3.10	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		36.8		41.3		42.7		42.1		41.3		41.3	
165		0.675	EMPC	0.596		0.750		0.594		0.601		0.647	
166	128 + 166		C128		C128		C128		C128		C128		C128
167		209		213		154		185		201		149	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		1.35	U	1.09	U	0.940	U	0.901	U	1.10	U	0.809	U
170		38.8		43.3		44.5		45.4		40.8		42.6	
171	171 + 173	66.7	C	72.5	C	73.6	C	71.2	C	63.9	C	70.1	C
172		5.74		6.00		6.35		6.37		6.01		6.14	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		39.1		40.7		44.0		46.2		42.2		42.4	
175		8.71		9.35		9.56		9.44		8.02		8.78	
176		27.8		29.4		30.9		30.1		26.3		27.5	
177		177		189		203		189		166		184	
178		87.2		93.0		97.5		89.8		78.9		87.8	
179		114		119		128		122		108		115	
180	180 + 193	657	C	696	C	508	C	558	C	540	C	512	C
181		2.45		2.64		2.42		2.57		2.40		2.45	
182		1.01		1.03		0.916		0.989		0.901		0.938	EMPC
183	183 + 185	225	C	242	C	227	C	229	C	209	C	214	C
184		1.47		1.52		1.69		1.44		1.44		1.43	
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0481	U	0.0713	U	0.0492	U	0.0498	U	0.0495	U	0.0477	U
187		656		709		700		672		615		656	
188		1.25		1.36		1.39		1.36		1.21		1.35	
189		1.66		2.03		2.21		2.18		1.81		1.83	
190		95.5		102		90.3		94.1		85.6		90.1	
191		6.11		6.48		6.27		6.56		5.92		6.18	
192		0.0481	U	0.0807	U	0.0492	U	0.0560	U	0.0495	U	0.0477	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		8.78		9.54		10.7		10.3		9.10		8.77	
195		24.7		26.7		27.8		26.5		23.7		26.3	
196		14.4		14.9		15.8		16.0		13.9		14.8	
197	197 + 200	7.73	C	8.23	C	9.13	C	8.90	C	7.85	C	8.37	C
198	198 + 199	31.6	C	32.4	C	35.1	C	33.5	C	29.3	C	32.3	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		19.6		21.6		21.9		21.4		18.8		19.9	
202		62.8		66.4		69.5		60.8		54.4		62.4	
203		155		159		123		131		129		130	
204		0.0530	EMPC	0.0820	EMPC	0.132	EMPC	0.0790		0.0890		0.0940	
205		3.97		4.34		4.66		4.30		3.78		4.12	
206		16.7		17.2		18.3		16.1		14.6		17.0	
207		3.24		3.46		3.56		3.38		2.94		3.55	
208		7.78		8.28		8.63		7.69		6.97		8.18	
209		12.0		12.6		12.8		10.4		10.3		11.2	
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full SDL)		33.2	J	34.0	J	33.1	J	33.3	J	31.7	J	30.9	J
Total PCBs as Congeners (KM-based)		33.1	J	34.0	J	33.1	J	33.2	J	31.6	J	30.8	J
Total PCBs as Congeners (KM-based, capped)		33.1	J	34.0	J	33.1	J	33.2	J	31.6	J	30.8	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-9
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Reference P24 08030524TC 3/5/2008		Reference P27 08030427TC 3/4/2008		Reference P26 08030426TC 3/4/2008		Reference P28 08030428TC 3/4/2008		Reference P29 08022229TC 2/22/2008		Reference P34 08022534TC 2/25/2008	
Individual Congeners in pg/g (ng/kg), wet weight													
1		1.41		1.59		1.41		1.57		3.03		2.71	
2		3.57		4.31		3.24		3.59		7.28		5.79	
3		0.686	U	0.675	U	0.584	U	0.687	U	0.920		0.853	U
4		35.8		33.3		31.8		40.3		126		142	
5		0.917		0.399	U	0.236	U	1.01		1.78		1.82	
6		9.05		10.9		9.35		9.62		35.3		39.9	
7		0.544		0.376	U	0.222	U	0.380		0.810		0.905	
8		19.1		24.6		22.0		19.3		46.9		49.6	
9		0.552		0.359	U	0.212	U	0.488		1.44		1.50	
10		0.528		0.331	U	0.195	U	0.544		1.56		1.62	
11		6,830		8,520		7,970		7,030		6,960		6,720	
12	12 + 13	46.1	C EMPC	0.401	C U	0.237	C U	33.1	C	31.7	C	32.8	C
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.129		0.369	U	0.218	U	0.152	EMPC	0.170		0.126	EMPC
15		15.0		11.0		8.81		14.8		19.8		21.8	
16		90.0		88.4		88.0		99.2		187		208	
17		68.0		78.3		73.8		74.1		165		197	
18	18 + 30	174	C	193	C	184	C	192	C	406	C	457	C
19		6.96		8.54		8.48		7.71		18.2		19.2	
20	20 + 28	81.9	C	101	C	99.2	C	86.0	C	154	C	163	C
21	21 + 33	40.1	C	45.8	C	46.5	C	40.8	C	95.9	C	103	C
22		91.3		103		105		101		170		191	
23		0.101		0.183	U	0.157	U	0.0990	EMPC	0.127	EMPC	0.136	
24		1.11		0.946		1.08		0.986		2.21		1.84	
25		7.13		8.61		8.64		7.50		15.3		17.0	
26	26 + 29	15.3	C	18.2	C	18.4	C	16.3	C	35.0	C	37.5	C
27		18.4		21.9		20.4		20.7		38.4		43.6	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		46.8		60.4		60.3		46.9		95.4		100	
32		5.06		6.10		6.19		5.41		19.6		22.3	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.252		0.349		0.246	EMPC	0.228		0.419		0.436	
35		11.1		13.9		13.2		11.9		12.4		11.6	
36		3.17		3.96		3.97		3.25		3.27		3.08	
37		35.2		31.5		30.6		36.8		56.3		58.2	
38		1.12		1.24		1.20		1.20		1.44		1.53	
39		2.26		2.92		2.79	EMPC	2.42		3.86		4.37	
40	40 + 41 + 71	74.7	C	82.5	C	84.9	C	79.1	C	138	C	150	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		156		180		168		179		235		261	
43		3.61		0.122	U	0.0799	U	3.48		6.01		6.02	
44	44 + 47 + 65	591	C	648	C	630	C	680	C	784	C	818	C
45	45 + 51	20.2	C	20.3	C	23.3	C	20.9	C	37.4	C	41.4	C
46		3.14		3.47		3.82		3.23		5.74		6.16	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		63.7		65.1		71.6		66.9		111		126	
49	49 + 69	109	C	112	C	124	C	108	C	159	C	170	C
50	50 + 53	47.7	C	48.7	C	52.6	C	52.6	C	75.0	C	81.9	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		327		339		381		337		431		442	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.0890	EMPC	0.0789	U	0.0485	U	0.108		0.138		0.171	
55		4.40		0.353	U	0.192	U	3.34		4.10		5.26	
56		93.8		111		95.5		106		106		108	
57		0.820	EMPC	1.01		0.862		0.643		1.24		1.08	
58		1.19	EMPC	0.364	U	0.198	U	1.35		1.14		1.12	EMPC
59	59 + 62 + 75	30.9	C	32.7	C	35.2	C	33.0	C	46.2	C	49.7	C
60		52.2		65.4		56.5		54.2		58.9		60.2	
61	61 + 70 + 74 + 76	366	C	426	C	382	C	381	C	445	C	454	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		10.5		11.6		10.9		10.8		13.3		13.7	
64		77.0		0.0694	U	84.7		78.0		112		117	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		301		342		306		319		336		348	
67		9.85		10.8		9.84		10.5		13.2		14.0	
68		2.52		3.11		2.86		2.76		2.88		2.97	
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		2.52		2.86		2.68		2.49		2.93		3.10	
73		0.0476	U	2.69		2.78		0.0499	U	0.0492	U	0.0491	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		33.8		34.3		33.2		37.3		36.4		36.1	
78		0.363	U	0.360	U	0.196	U	0.356	U	0.305	U	0.318	U
79		21.7		32.3		26.3		26.9		22.2		24.2	
80		0.327	U	0.309	U	0.169	U	0.320	U	0.274	U	0.286	U
81		2.04		0.961	EMPC	1.43	EMPC	2.11		2.07		2.23	EMPC
82		16.5		18.5		18.9		16.4		18.2		18.5	
83	83 + 99	663	C	728	C	760	C	716	C	668	C	690	C
84		56.8		60.4		63.9		59.3		63.2		64.5	
85	85 + 116 + 117	161	C	166	C	170	C	165	C	159	C	166	C
86	86 + 87 + 97 + 108 + 119 + 125	652	C	779	C	785	C	760	C	644	C	662	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	70.7	C	74.2	C	75.9	C	73.4	C	75.4	C	78.3	C
89		2.06		2.20		2.29		2.17		2.47		2.64	
90	90 + 101 + 113	1,070	C	1,200	C	1,240	C	1,160	C	1,090	C	1,130	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		122		132		127		128		133		136	
93	93 + 95 + 98 + 100 + 102	742	C	787	C	822	C	854	C	742	C	754	C
94		1.09		1.11	EMPC	1.21	EMPC	1.06		1.25		1.42	
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.786		0.735		1.05		0.843		1.04		1.05	
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		2.94		2.94		2.95		2.77		3.11		3.37	
104		0.0950		0.122	U	0.116	U	0.0990		0.0890		0.104	
105		399		370		350		434		406		424	
106		2.29	U	1.97	U	1.56	U	2.28	U	1.85	U	1.65	U
107	107 + 124	36.1	C	42.7	C	36.9	C	39.6	C	36.6	C	37.5	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		72.6		84.2		73.5		75.6		76.1		79.4	
110	110 + 115	892	C	981	C	986	C	954	C	936	C	954	C
111		0.601	EMPC	0.233	U	0.218	U	0.520		0.549		0.674	EMPC
112		0.132	U	0.225	U	0.211	U	0.0861	U	0.0997	U	0.151	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		22.8		24.2		21.3		25.8		23.6		24.6	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		2,220		2,130		1,910		2,660		2,140		2,200	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		7.84		8.78		8.71		8.51		7.58		7.98	
121		0.358		0.392	EMPC	0.217	U	0.333		0.444	EMPC	0.490	
122		4.09		6.44		4.53		4.21	EMPC	4.18	EMPC	4.37	
123		42.3		42.1		39.0		54.0		40.3		38.4	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		4.44		4.51		4.07		5.04		4.05		4.03	
127		2.44	U	1.86	U	1.48	U	2.42	U	1.96	U	1.94	EMPC

Table H-9
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Reference P24 08030524TC 3/5/2008		Reference P27 08030427TC 3/4/2008		Reference P26 08030426TC 3/4/2008		Reference P28 08030428TC 3/4/2008		Reference P29 08022229TC 2/22/2008		Reference P34 08022534TC 2/25/2008	
128	128 + 166	144	C	184	C	174	C	140	C	144	C	147	C
129	129 + 138 + 160 + 163	2,270	C	2,700	C	2,650	C	2,550	C	2,150	C	2,210	C
130		72.7		79.6		72.8		71.0		71.4		73.6	
131		7.40		8.12		0.674	U	7.07		7.81		7.94	
132		161		172		169		162		160		169	
133		20.2		22.2		21.4		18.8		20.0		19.8	
134	134 + 143	32.4	C	31.1	C	33.1	C	30.5	C	32.9	C	35.1	C
135	135 + 151 + 154	314	C	325	C	352	C	305	C	316	C	328	C
136		53.9		0.0686	U	0.0753	U	51.7		54.1		56.9	
137		36.7		45.5		40.8		40.3		33.9		35.2	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	17.5	C	19.3	C	19.4	C	17.2	C	17.2	C	17.8	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		31.0		39.2		35.3		33.7		28.9		31.2	
142		0.417	U	0.668	U	0.686	U	0.533	U	0.313	U	0.326	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		27.9		29.6		30.7		27.0		27.6		29.0	
145		0.175	EMPC	0.0724	U	0.181	EMPC	0.165	EMPC	0.155	EMPC	0.205	EMPC
146		343		432		412		386		335		348	
147	147 + 149	1,210	C	1,400	C	1,370	C	1,280	C	1,140	C	1,200	C
148		2.07		2.26		2.32	EMPC	2.04		2.11		2.18	
149	147 + 149		C147		C147		C147		C147		C147		C147
150		1.47		1.55		1.74		1.44		1.48		1.56	
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.416		0.445	EMPC	0.0748	U	0.406		0.441		0.472	
153	153 + 168	3,660	C	5,010	C	4,530	C	4,570	C	3,450	C	3,500	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.948		1.01		1.05		0.861		0.956		1.02	
156	156 + 157	126	C	149	C	137	C	152	C	125	C	129	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		120		140		136		129		117		124	
159		1.95		1.94		1.92		2.16	EMPC	1.95		2.26	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.295	U	0.412	U	0.423	U	0.377	U	0.221	U	0.231	U
162		2.99		3.18		2.80		2.64	EMPC	3.00		2.87	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		35.5		39.2		38.1		38.1		36.0		38.3	
165		0.639	EMPC	0.480	U	0.493	U	0.476		0.589		0.257	U
166	128 + 166		C128		C128		C128		C128		C128		C128
167		127		167		151		170		130		127	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		0.933	U	1.70	U	1.53	U	0.872	U	0.900	U	0.939	U
170		36.4		41.0		37.8		38.8		36.5		39.9	
171	171 + 173	65.8	C	70.8	C	66.3	C	67.0	C	65.2	C	68.4	C
172		5.30		6.08		5.70		5.47		5.27		5.93	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		36.9		38.5		37.0		40.0		37.6		41.2	
175		8.31		9.04		8.29		8.63		8.38		8.54	
176		27.4		28.8		28.3		27.2		27.8		28.4	
177		171		179		165		174		172		174	
178		83.9		86.8		83.4		83.9		85.5		86.9	
179		112		0.0805	U	113		111		112		116	
180	180 + 193	440	C	529	C	465	C	584	C	422	C	431	C
181		2.16		2.58		2.47		2.39		2.20		2.32	
182		0.889	EMPC	0.102	U	0.933		0.991	EMPC	0.803		0.998	
183	183 + 185	195	C	216	C	202	C	220	C	191	C	198	C
184		1.45		1.54		1.58		1.32		1.55		1.45	
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0476	U	0.0816	U	0.0602	U	0.0499	U	0.0580	U	0.0491	U
187		605		691		650		661		615		631	
188		1.23		1.54		1.32		1.27		1.33		1.31	
189		1.75		1.51	EMPC	1.44		1.85		1.68		1.98	
190		79.1		90.9		80.3		98.6		78.0		78.5	
191		5.39		6.14		5.82		6.20		5.33		5.86	
192		0.0476	U	0.0834	U	0.0615	U	0.0499	U	0.0653	U	0.0491	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		7.58		9.49		9.21		8.56		7.56		8.38	
195		23.9		26.3		25.3		26.2		24.0		25.1	
196		12.9		14.8		13.9		15.0		13.3		14.5	
197	197 + 200	7.77	C	7.80	C	8.48	C	8.04	C	8.07	C	8.11	C
198	198 + 199	29.9	C	29.3	C	29.2	C	32.0	C	30.6	C	33.5	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		19.4		19.8		19.7		20.2		20.1		20.6	
202		58.7		72.1		65.4		61.8		61.6		62.0	
203		113		131		126		146		114		115	
204		0.0810		0.0638	U	0.0870	EMPC	0.0820		0.100		0.0940	
205		3.75		4.21		3.85		4.03		3.97		4.00	
206		15.7		17.2		15.5		16.6		17.5		19.3	
207		3.26		3.47		3.37		3.44		3.42		4.00	
208		7.31		7.67		7.34		8.00		8.87		9.49	
209		10.2		11.5		10.0		11.4		12.4		13.1	
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full SDL)		28.4	J	33.0	J	31.6	J	31.4	J	29.8	J	30.4	J
Total PCBs as Congeners (KM-based)		28.3	J	32.9	J	31.6	J	31.3	J	29.7	J	30.4	J
Total PCBs as Congeners (KM-based, capped)		28.3	J	32.9	J	31.6	J	31.3	J	29.7	J	30.4	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-9
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Reference P35 08022535TC 2/25/2008		Reference P36 08022536TC 2/25/2008		Reference P37 08022637TC 2/26/2008		Reference P38 08022738TC 2/27/2008		Reference P39 08022739TC 2/27/2008		Reference P40 08022740TC 2/27/2008	
Individual Congeners in pg/g (ng/kg), wet weight													
1		2.98		3.16		2.89		2.59		2.42		2.64	
2		5.12		4.70		4.12		3.88		4.08		4.58	
3		1.02		0.929		0.891		0.863		0.777		0.853	
4		95.4		95.0		93.8		80.3		77.0		79.2	
5		1.66		1.02		1.53		1.30		1.18		1.43	
6		25.8		23.0		22.7		19.1		17.9		16.9	
7		0.896		0.774		0.701		0.721		0.686		0.618	
8		43.7		43.2		40.0		35.0		34.2		32.1	
9		1.53		1.53		1.44		1.34		1.22		1.14	
10		1.50		1.52		1.33		1.19		1.13		1.12	
11		8,190		8,770		7,370		7,100		8,990		8,260	
12	12 + 13	55.4	C	83.8	C	53.0	C EMPC	70.1	C	113	C	90.6	C
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.221		0.226		0.187		0.157		0.187		0.251	U
15		19.7		23.8		20.3		30.4	EMPC	35.6	EMPC	35.1	EMPC
16		147		133		127		111		111		107	
17		142		133		122		106		104		103	
18	18 + 30	315	C	310	C	300	C	252	C	252	C	242	C
19		15.6		15.6		15.2		13.4		13.0		12.9	
20	20 + 28	147	C	161	C	163	C	138	C	133	C	128	C
21	21 + 33	79.3	C	80.7	C	79.8	C	68.9	C	66.5	C	65.7	C
22		149		165		162		138		141		135	
23		0.201	EMPC	0.148		0.123	EMPC	0.184		0.134	U	0.120	EMPC
24		1.56		2.35		1.69		1.95		1.55		1.56	
25		13.8		14.5		14.2		11.9		11.7		12.1	
26	26 + 29	31.9	C	31.1	C	30.9	C	26.8	C	25.3	C	25.2	C
27		32.1		31.0		30.6		26.4		25.5		25.9	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		103		103		95.8		83.0		83.2		83.9	
32		15.1		16.3		16.5		13.4		11.1		11.3	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.499	EMPC	0.418		0.395		0.365		0.328	EMPC	0.366	
35		16.0		13.5		12.1		11.1		13.7		14.3	
36		4.22		3.86		3.29		3.08		3.79		3.71	
37		54.6		53.0		49.8		43.9		48.0		53.7	
38		1.41		1.15	EMPC	1.06		0.913		1.08		1.10	
39		3.39		2.43		2.13		2.00		2.31		2.95	J
40	40 + 41 + 71	132	C	121	C	98.3	C	98.1	C	103	C	102	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		233		207		203		168		185		183	
43		5.77		7.01		5.94		6.44		6.63		7.40	
44	44 + 47 + 65	791	C	699	C	689	C	599	C	665	C	681	C
45	45 + 51	35.4	C	31.2	C	31.2	C	26.9	C	27.0	C	28.7	C
46		6.10		5.76		5.40		4.93		4.81		4.83	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		105		98.1		90.6		77.5		83.4		84.2	
49	49 + 69	172	C	159	C	143	C	126	C	138	C	141	C
50	50 + 53	70.4	C	62.6	C	63.1	C	53.7	C	57.4	C	60.0	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		462		416		385		353		394		420	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.176	EMPC	0.158		0.149		0.172		0.144		0.133	
55		2.65		6.30		3.85		7.14		7.25		7.12	
56		121		117		107		102		114		112	
57		1.40		1.03		0.936		0.977	EMPC	0.930	EMPC	0.874	
58		1.89		1.12	EMPC	0.924		0.987		1.01	EMPC	1.35	
59	59 + 62 + 75	45.0	C	41.8	C	39.8	C	36.0	C	39.2	C	40.0	C
60		70.5		75.3		64.2		60.8		66.6		63.8	
61	61 + 70 + 74 + 76	521	C	518	C	437	C	434	C	493	C	455	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		15.3		14.0		12.0		11.4		12.1		12.7	
64		122		114		102		91.1		101		101	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		397		420		360		345		387		366	
67		14.4		13.0		11.2		10.5		11.4		11.5	
68		3.67		3.14		2.73		2.46		2.97		2.91	
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		3.47		3.11		2.73		2.41		2.86		3.11	
73		0.0491	U	0.0491	U	0.0484	U	0.0475	U	0.0499	U	0.0497	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		42.8		44.3		38.4		37.1		43.2		46.3	
78		0.274	U	0.516	U	0.348	U	0.453	U	0.593	U	0.509	U
79		26.3		19.7		17.8		17.6		22.8		23.0	
80		0.247	U	0.484	U	0.326	U	0.425	U	0.556	U	0.476	U
81		2.60		2.51		1.67	EMPC	1.99	EMPC	2.13	EMPC	2.75	
82		22.0		24.5		20.6		21.5		25.1		21.7	
83	83 + 99	806	C	833	C	720	C	717	C	849	C	738	C
84		78.3		79.1		69.4		64.2		78.4		70.9	
85	85 + 116 + 117	198	C	202	C	173	C	166	C	203	C	175	C
86	86 + 87 + 97 + 108 + 119 + 125	768	C	773	C	692	C	668	C	792	C	702	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	91.4	C	94.7	C	82.7	C	75.7	C	91.9	C	83.8	C
89		3.00		2.86		2.47		2.51		2.97		2.47	
90	90 + 101 + 113	1,320	C	1,350	C	1,170	C	1,140	C	1,350	C	1,220	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		163		160		143		133		163		146	
93	93 + 95 + 98 + 100 + 102	862	C	821	C	761	C	701	C	855	C	811	C
94		1.50		1.33		1.22		1.15	EMPC	1.43		1.34	
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		1.27		1.22		1.08		1.06		1.16		1.10	EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		3.85		3.76		3.24		2.95		3.50		3.46	
104		0.125	EMPC	0.111		0.118	EMPC	0.108	EMPC	0.0910	EMPC	0.126	
105		484		484		419		416		484		535	
106		1.41	U	2.60	U	1.74	U	2.55	U	3.10	U	2.93	U
107	107 + 124	44.2	C	49.1	C	37.6	C	38.7	C	44.5	C	41.6	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		89.0		97.9		82.4		80.1		96.6		83.5	
110	110 + 115	1,120	C	1,120	C	982	C	972	C	1,140	C	999	C
111		0.664		0.778		0.688	EMPC	0.635	EMPC	0.669		0.590	EMPC
112		0.0930	U	0.233	U	0.275	U	0.283	U	0.232	U	0.292	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		29.9		27.2		24.0		23.3		28.7		30.8	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		2,470		2,420		2,180		2,140		2,520		2,770	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		9.18		9.24		8.11		7.90		9.36		8.34	
121		0.513		0.500	EMPC	0.416		0.372		0.435	EMPC	0.446	
122		6.06		6.07		5.46		5.39		6.58		4.83	
123		46.1		43.9		41.8		36.8		46.9		53.2	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		5.35		5.19		4.64		4.74		5.33		5.64	
127		1.90		2.71	U	1.80	U	2.65	U	3.22	U	3.00	U

Table H-9
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Reference P35 08022535TC 2/25/2008		Reference P36 08022536TC 2/25/2008		Reference P37 08022637TC 2/26/2008		Reference P38 08022738TC 2/27/2008		Reference P39 08022739TC 2/27/2008		Reference P40 08022740TC 2/27/2008	
128	128 + 166	178	C	159	C	166	C	144	C	168	C	165	C
129	129 + 138 + 160 + 163	2,590	C	2,240	C	2,170	C	2,050	C	2,370	C	2,440	C
130		92.3		87.2		77.9		75.8		88.1		85.2	
131		9.53		9.27		7.82		7.84		9.01		9.07	
132		207		188		177		171		202		192	
133		25.4		24.1		20.9		18.8		22.3		22.9	
134	134 + 143	40.0	C	38.8	C	35.7	C	35.8	C	41.9	C	38.9	C
135	135 + 151 + 154	405	C	367	C	332	C	321	C	376	C	362	C
136		70.3		63.5		58.6		55.2		64.4		60.0	
137		44.1		37.3		35.6		34.4		46.8		41.8	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	21.9	C	21.9	C	18.8	C	18.1	C	20.1	C	20.3	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		37.2		32.6		30.4		32.8		40.7		40.9	
142		0.452	U	1.57	U	0.460	U	0.935	U	1.18	U	0.673	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		36.4		33.0		30.1		29.4		34.6		32.8	
145		0.231	EMPC	0.158		0.165		0.171	EMPC	0.241	EMPC	0.185	
146		421		374		342		319		389		397	
147	147 + 149	1,460	C	1,290	C	1,190	C	1,190	C	1,360	C	1,360	C
148		2.70		2.53		2.10		1.98		2.54		2.35	
149	147 + 149		C147		C147		C147		C147		C147		C147
150		1.89		1.72		1.46		1.42		1.73		1.60	
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.600		0.495		0.475		0.410		0.522		0.447	
153	153 + 168	3,970	C	3,420	C	3,340	C	3,030	C	3,800	C	3,670	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		1.25		1.28		1.06		1.06		1.37		1.27	
156	156 + 157	148	C	154	C	138	C	135	C	166	C	158	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		149		139		125		124		147		142	
159		2.45		1.98		1.41	EMPC	1.54		2.03	EMPC	1.98	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.320	U	1.06	U	0.312	U	0.634	U	0.801	U	0.469	U
162		3.69		3.68		3.38		2.99		3.80		3.76	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		45.7		43.1		38.0		36.9		41.5		41.1	
165		0.791	EMPC	1.26	U	0.825		0.752	U	0.949	U	0.700	EMPC
166	128 + 166		C128		C128		C128		C128		C128		C128
167		139		139		146		123		154		146	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		0.901	U	1.32	U	0.698	U	0.987	U	1.01	U	1.25	U
170		45.6		52.1		43.2		43.9		54.3		46.5	
171	171 + 173	78.9	C	84.3	C	71.2	C	70.7	C	83.9	C	76.0	C
172		6.78		7.29		6.24		6.01		6.98		6.32	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		47.7		46.2		40.1		38.1		46.9		42.6	
175		10.4		10.4		8.84		8.54		10.3		9.73	
176		34.0		33.6		28.8		28.0		33.0		31.7	
177		205		220		188		181		216		198	
178		101		110		90.5		87.9		107		97.4	
179		140		136		116		113		134		129	
180	180 + 193	474	C	494	C	489	C	414	C	547	C	476	C
181		2.49		2.53		2.23		2.38		2.84		2.31	
182		0.986		1.24		1.11		0.0475	U	1.55		1.61	
183	183 + 185	231	C	228	C	202	C	197	C	243	C	220	C
184		1.83		1.87		1.54		1.59		2.05		1.93	
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0598	U	0.0491	U	0.0484	U	0.0475	U	0.0499	U	0.0680	U
187		733		734		625		625		758		704	
188		1.50		1.52		1.30		1.25		1.39		1.57	
189		2.23		2.40		2.09		1.95		2.34		2.41	
190		89.2		93.8		84.8		80.3		102		88.7	
191		6.52		6.81		6.20		6.01		7.62		6.69	
192		0.0673	U	0.0491	U	0.0484	U	0.0475	U	0.0499	U	0.0766	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		9.99		10.2		9.10		8.85		10.9		10.3	
195		29.8		29.6		26.4		24.4		29.6		28.8	
196		16.3		17.4		14.9		14.6		16.6		15.8	
197	197 + 200	10.0	C	9.91	C	8.47	C	7.81	C	9.62	C	8.90	C
198	198 + 199	38.0	C	37.7	C	32.9	C	29.4	C	36.7	C	33.8	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		24.8		23.7		20.3		19.1		23.0		22.1	
202		71.0		77.3		65.6		60.3		73.2		69.3	
203		131		122		120		101		130		122	
204		0.102		0.129		0.0920	EMPC	0.0820	EMPC	0.150	EMPC	0.123	
205		4.76	EMPC	5.01		4.33		4.04		4.93		4.93	
206		20.6		21.2		18.8		17.1		20.3		19.4	
207		4.26		4.00		3.58		3.37		4.18		3.76	
208		10.1		10.3		9.20		8.06		9.69		8.93	
209		14.1		17.0		15.0		12.8		16.1		13.3	
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full SDL)		34.5	J	33.7	J	30.2	J	28.7	J	34.4	J	33.0	J
Total PCBs as Congeners (KM-based)		34.5	J	33.7	J	30.2	J	28.6	J	34.3	J	32.9	J
Total PCBs as Congeners (KM-based, capped)		34.5	J	33.7	J	30.2	J	28.6	J	34.3	J	32.9	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-9
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Reference P41 08022741TC 2/27/2008		Reference P42 08022742TC 2/27/2008		Reference P85 08030685TC 3/6/2008		Reference P86 08030686TC 3/6/2008		Reference P87 08030687TC 3/6/2008		Forebay - Goose Island P110 09042911OT C 4/29/2009	
Individual Congeners in pg/g (ng/kg), wet weight													
1		2.41		1.95		1.68		1.66		1.84		1.62	
2		4.36		3.40		3.81		3.71		3.68		3.65	
3		0.785		0.610	EMPC	0.811		0.697		0.686	EMPC	0.805	EMPC
4		70.6		54.1		37.1		38.4		38.9		36.8	
5		1.33		1.18		0.997		0.876		0.929		0.700	
6		15.4		11.1		8.17		8.41		8.15		7.82	
7		0.674	EMPC	0.500	EMPC	0.362		0.351	EMPC	0.363		0.480	
8		29.0		23.1		21.6		18.9		19.4		22.6	
9		0.988		0.752	EMPC	0.543		0.470		0.524		0.597	
10		0.982		0.736	EMPC	0.517		0.452		0.524		0.501	EMPC
11		8,070		7,380		7,720		6,790		7,180		4,480	
12	12 + 13	62.5	C EMPC	118	C	109	C	93.8	C	62.3	C EMPC	0.385	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.235	U	0.203	U	0.241	U	0.263	U	0.245	U	0.366	U
15		21.8		20.1	EMPC	30.8	EMPC	32.8	EMPC	17.8		36.9	
16		105		85.4		75.7		74.4		72.0		53.7	
17		98.9		75.9		67.8		65.8		59.3		49.7	
18	18 + 30	236	C	186	C	159	C	156	C	151	C	116	C
19		11.7		9.16		7.22		7.21		7.72		9.19	
20	20 + 28	122	C	101	C	94.5	C	81.9	C	80.3	C	110	C
21	21 + 33	60.1	C	49.4	C	46.5	C	41.4	C	42.1	C	56.2	C
22		131		109		104		98.5		93.2		102	
23		0.116		0.116	U	0.0965	U	0.0738	U	0.114	EMPC	0.127	EMPC
24		1.44		1.40		1.08		1.22		1.08		1.35	
25		11.2		9.22		8.62		7.68		7.61		10.1	
26	26 + 29	23.6	C	18.7	C	16.8	C	15.3	C	15.6	C	21.0	C
27		24.9		20.2		18.2		17.2		16.4		13.0	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		78.4		64.1		59.0		50.6		49.2		76.2	
32		9.77		7.08		6.09		5.53		5.44		9.78	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.340		0.235	EMPC	0.256		0.225		0.271		0.325	
35		14.8		13.3		13.1		11.3		11.6		11.0	
36		3.81		3.47		3.60		2.86		2.91		2.49	
37		52.1		45.1		43.2		39.1		37.7		47.7	
38		0.946		0.923		1.02		0.888		0.951		0.867	
39		2.85		2.34	J	2.43		2.18	J	1.99		2.04	
40	40 + 41 + 71	98.7	C	81.9	C	78.2	C	74.3	C	71.8	C	102	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		178		151		165		148		137		107	
43		7.19		6.16		5.06		4.80		5.18		6.41	
44	44 + 47 + 65	678	C	598	C	619	C	567	C	538	C	399	C
45	45 + 51	27.8	C	22.6	C	21.1	C	20.5	C	20.0	C	22.4	C
46		4.82		3.86		3.48		3.45		3.27		5.07	EMPC
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		81.7		67.9		67.4		64.8		58.4		57.7	
49	49 + 69	139	C	119	C	121	C	113	C	104	C	120	C
50	50 + 53	59.0	C	50.4	C	46.3	C	46.7	C	44.9	C	33.3	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		419		368		346		332		329		322	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.144		0.108	EMPC	0.0690		0.0660	EMPC	0.0880	EMPC	0.131	
55		6.01		8.15		5.80		7.86		7.59		8.48	
56		112		98.9		97.8		97.1		92.6		109	
57		1.01		0.723		0.802		0.776	EMPC	0.662		1.01	
58		1.63		1.37	EMPC	1.30	EMPC	1.14		1.07		1.12	
59	59 + 62 + 75	38.9	C	33.5	C	32.2	C	31.2	C	29.8	C	29.6	C
60		64.9		58.9		58.7		54.0		50.6		60.1	
61	61 + 70 + 74 + 76	458	C	411	C	406	C	373	C	346	C	394	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		13.0		11.4		11.5		10.5		9.72		10.5	
64		99.7		85.8		85.3		79.1		74.5		94.4	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		368		332		332		313		287		295	
67		11.3		9.74		9.98		9.56		8.51		9.20	
68		2.91		2.60		2.79		2.62		2.52		2.75	
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		3.04		2.68		2.75		2.43		2.44		2.59	
73		0.0495	U	0.0481	U	0.0487	U	0.0452	U	0.0476	U	0.0585	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		46.8		41.4		40.8		38.4		35.7		33.7	
78		0.453	U	0.522	U	0.433	U	0.482	U	0.435	U	0.714	U
79		22.0		20.3		20.9		19.5		18.7		15.8	
80		0.423	U	0.488	U	0.405	U	0.451	U	0.407	U	0.624	U
81		2.21		2.03		1.88	EMPC	1.80		1.51	EMPC	2.17	EMPC
82		20.9		18.8		18.8		16.8		17.1		29.3	
83	83 + 99	750	C	674	C	686	C	629	C	590	C	529	C
84		73.1		64.4		62.4		56.0		52.7		64.7	
85	85 + 116 + 117	174	C	158	C	164	C	145	C	136	C	134	C
86	86 + 87 + 97 + 108 + 119 + 125	707	C	645	C	684	C	596	C	578	C	489	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	85.7	C	75.1	C	77.8	C	71.0	C	65.9	C	59.6	C
89		2.53		2.25		2.36		2.06		2.01		2.82	
90	90 + 101 + 113	1,260	C	1,130	C	1,140	C	1,030	C	965	C	845	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		152		136		129		116		113		110	
93	93 + 95 + 98 + 100 + 102	829	C	746	C	769	C	687	C	682	C	500	C
94		1.30	EMPC	1.15		1.10		1.03		1.08	EMPC	1.25	EMPC
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		1.00		0.923		0.913		0.785		0.760		0.989	
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		3.35		3.27		3.13		2.96		2.68		2.35	
104		0.128	EMPC	0.0652	U	0.0564	U	0.0780		0.0500	EMPC	0.0970	
105		556		488		478		440		414		352	
106		3.39	U	3.30	U	4.08	U	3.05	U	2.77	U	0.935	U
107	107 + 124	41.6	C	36.4	C	35.8	C	32.9	C	30.8	C	28.9	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		88.0		79.4		76.9		70.2		66.6		60.4	
110	110 + 115	999	C	910	C	877	C	809	C	779	C	786	C
111		0.464		0.639	EMPC	0.582	EMPC	0.385		0.413		0.344	EMPC
112		0.308	U	0.286	U	0.271	U	0.244	U	0.262	U	0.173	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		33.0		28.1		27.1		24.9		24.7		22.8	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		2,820		2,530		2,640		2,290		2,270		1,590	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		8.56		8.04		7.81		6.36		6.68		5.09	
121		0.362		0.415	EMPC	0.416		0.305	EMPC	0.289		0.287	EMPC
122		6.65		6.11	EMPC	4.58	U	5.52	EMPC	6.59		8.27	
123		50.6		43.8		50.0		41.2		40.9		28.0	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		5.36		5.12		5.88	U	4.46		4.51		3.07	
127		3.47	U	3.38	U	4.17	U	3.12	U	2.84	U	1.64	

Table H-9
Sediment PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS1	Reference P41 08022741TC 2/27/2008		Reference P42 08022742TC 2/27/2008		Reference P85 08030685TC 3/6/2008		Reference P86 08030686TC 3/6/2008		Reference P87 08030687TC 3/6/2008		Forebay - Goose Island P110 090429110TC 4/29/2009	
128	128 + 166	171	C	154	C	150	C	140	C	127	C	141	C
129	129 + 138 + 160 + 163	2,470	C	2,260	C	2,270	C	2,060	C	1,990	C	1,640	C
130		87.7		78.3		77.8		71.3		64.1		61.3	
131		9.29		8.15		7.96		7.22		6.33		7.67	
132		193		171		165		156		146		162	
133		23.6		20.8		20.9		17.3		16.9		16.7	
134	134 + 143	39.1	C	34.5	C	34.1	C	31.1	C	28.6	C	31.9	C
135	135 + 151 + 154	355	C	324	C	316	C	282	C	268	C	270	C
136		59.7		53.7		53.6		50.0		44.4		48.9	
137		40.2		37.3		32.6		32.6		32.6		32.7	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	20.4	C	17.8	C	18.6	C	17.1	C	15.3	C	14.8	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		44.8		40.7		39.1		38.3		39.6		45.1	
142		1.09	U	1.14	U	1.05	U	1.10	U	0.806	U	0.913	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		33.6		29.4		30.0		26.5		23.5		26.2	
145		0.209	EMPC	0.200		0.210	EMPC	0.220	EMPC	0.173		0.256	
146		395		361		353		302		314		270	
147	147 + 149	1,350	C	1,240	C	1,230	C	1,140	C	1,080	C	930	C
148		2.32		2.10		2.04		1.61		1.64		1.49	
149	147 + 149		C147		C147		C147		C147		C147		C147
150		1.57		1.50		1.45		1.38		1.23		1.12	
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.421		0.426		0.448		0.383		0.375		0.447	
153	153 + 168	3,630	C	3,380	C	4,070	C	3,060	C	3,190	C	2,540	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		1.35		1.18	EMPC	1.09		0.946	EMPC	0.846		0.907	
156	156 + 157	161	C	145	C	137	C	123	C	125	C	96.9	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		144		129		126		117		108		103	
159		2.16		1.72		1.61	EMPC	1.53	EMPC	1.51		2.45	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.761	U	0.793	U	0.733	U	0.767	U	0.561	U	0.641	U
162		3.56		3.07		2.68		2.74		2.41	EMPC	2.92	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		43.5		39.1		37.0		34.0		32.9		37.4	
165		0.868	U	0.905	U	0.836	U	0.875	U	0.640	U	0.733	U
166	128 + 166		C128		C128		C128		C128		C128		C128
167		146		137		165		123		131		92.5	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		1.03	U	1.01	U	1.73	U	1.17	U	1.57	U	1.08	U
170		47.9		43.4		37.0		37.3		35.6		38.7	
171	171 + 173	78.5	C	70.4	C	68.0	C	64.4	C	56.0	C	52.7	C
172		6.59		6.01		5.19		5.14		4.85		6.10	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		43.3		40.1		34.6		34.5		32.5		39.6	
175		10.1		8.98		8.11		7.15		6.96		7.22	
176		32.0		29.5		27.3		25.5		23.4		22.0	
177		206		188		180		169		153		139	
178		99.9		90.4		87.0		78.2		73.3		65.3	
179		131		119		116		108		97.9		87.2	
180	180 + 193	476	C	458	C	474	C	390	C	384	C	295	C
181		2.46		2.22	EMPC	2.07		1.97		2.17		1.72	
182		1.57	EMPC	1.25		1.28	EMPC	1.20	EMPC	1.21	EMPC	0.144	U
183	183 + 185	223	C	209	C	189	C	171	C	168	C	153	C
184		1.74		1.53		1.41		1.12		1.13		1.06	
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0649	U	0.0481	U	0.0533	U	0.0452	U	0.0550	U	0.122	U
187		705		660		614		555		541		477	
188		1.48		1.41		1.48		1.16		1.24		1.09	
189		2.37		2.17		2.01		1.71		1.72		1.57	
190		89.6		84.7		79.4		72.8		72.4		52.6	
191		7.04		6.73		5.99		5.43		5.45		5.48	
192		0.0730	U	0.0481	U	0.0600	U	0.0467	U	0.0618	U	0.129	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		10.6		10.4		7.99		7.57		8.29		8.03	
195		30.2		27.1		24.5		25.0		21.6		17.8	
196		16.3		14.7		12.2		12.0		11.7		11.4	
197	197 + 200	9.36	C	8.25	C	7.71	C	6.94	C	6.61	C	6.84	C
198	198 + 199	35.9	C	32.0	C	29.0	C	29.2	C	27.6	C	28.2	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		23.2		20.2		19.6		16.8		16.7		13.5	
202		72.1		64.9		67.4		58.8		58.2		44.5	
203		122		115		117		97.3		99.5		74.5	
204		0.0960	EMPC	0.0680		0.0840		0.0820	EMPC	0.109	EMPC	0.0634	U
205		5.16		4.65		4.26		4.02		3.78		2.87	
206		20.1		17.7		16.5		15.9		15.7		10.9	
207		3.99		3.45		3.14		2.96		3.02		2.25	
208		9.49		8.61		7.81		7.63		7.36		5.71	
209		14.3		12.5		11.9		10.6		10.6		7.10	
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full SDL)		32.9	J	29.8	J	30.8	J	27.0	J	26.9	J	21.4	J
Total PCBs as Congeners (KM-based)		32.8	J	29.7	J	30.7	J	27.0	J	26.9	J	21.5	J
Total PCBs as Congeners (KM-based, capped)		32.8	J	29.7	J	30.7	J	27.0	J	26.9	J	21.4	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-10
Crayfish PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay P01-CF 08021901CF 2/19/2008		Forebay P04-CF 08021904CF 2/19/2008		Forebay P05-CF 08021505CF 2/15/2008		Forebay P06-CF 08021406CF 2/14/2008		Forebay P07-CF 08021407CF 2/14/2008		Forebay P08-CF 08021408CF 2/14/2008	
Individual Congeners in pg/g (ng/kg), wet weight													
1		0.135		0.196		0.260		0.243		0.255	EMPC	0.144	EMPC
2		0.0780		0.109		0.146		0.236		0.0531	U	0.121	EMPC
3		0.175	EMPC	0.230		0.192		0.215	EMPC	0.220	EMPC	0.167	
4		0.474	U	0.535	U	2.29		0.919		0.706	U	0.462	U
5		0.0959	U	0.163	U	0.101	U	0.0854	U	0.137	U	0.139	U
6		0.235		0.248		0.217		0.235		0.239		0.156	
7		0.0910		0.144	U	0.0960	EMPC	0.0757	U	0.121	U	0.123	U
8		1.05	U	0.991	U	0.895	U	0.661	U	0.900	U	0.505	U
9		0.101		0.164	EMPC	0.184	EMPC	0.0870	EMPC	0.121	U	0.123	U
10		0.0826	U	0.140	U	0.114	EMPC	0.0736	U	0.118	U	0.120	U
11		50.1		30.2		36.9		75.9		16.4		31.0	
12	12 + 13	0.0920	C U	0.156	C U	0.0967	C U	0.0819	C U	0.131	C U	0.134	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.0888	U	0.151	U	0.0934	U	0.0791	U	0.127	U	0.129	U
15		1.98	EMPC	1.35		3.55	EMPC	2.50	EMPC	2.44	EMPC	1.35	EMPC
16		0.530		0.369	EMPC	0.411	EMPC	0.655		0.373	EMPC	0.328	EMPC
17		0.510		0.537		1.11		0.806		0.504		0.314	EMPC
18	18 + 30	1.71	C U	1.04	C U	2.12	C U	2.31	C U	1.27	C U	1.06	C U
19		0.131	U	0.189	U	0.847		0.235	U	0.179	U	0.121	U
20	20 + 28	2.63	C U	2.58	C U	3.24	C	3.00	C	2.13	C U	1.44	C U
21	21 + 33	0.746	C U	0.687	C U	0.804	C U	0.774	C U	0.507	C U	0.386	C U
22		0.544		0.568		0.489		0.695		0.501	EMPC	0.369	EMPC
23		0.0636	U	0.0652	U	0.0634	U	0.0497	U	0.0696	U	0.0669	U
24		0.0489	U	0.0592	U	0.0500	U	0.0497	U	0.0785	U	0.0498	U
25		0.0860	EMPC	0.177	EMPC	0.256		0.169	EMPC	0.115	EMPC	0.0750	EMPC
26	26 + 29	0.443	C U	0.474	C U	1.22	C	0.580	C	0.336	C U	0.283	C U
27		0.107	EMPC	0.233		0.348		0.332		0.106	EMPC	0.0560	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		1.29	U	1.28	U	1.63	U	1.19	U	1.06	U	0.701	U
32		0.289		0.266		0.453		0.246		0.327		0.145	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.0649	U	0.0665	U	0.0647	U	0.0497	U	0.0710	U	0.0682	U
35		0.271	EMPC	0.143		0.280		0.351		0.0690	U	0.124	EMPC
36		0.0700	EMPC	0.0569	U	0.0554	U	0.0920		0.0607	U	0.0584	U
37		3.31		2.55		4.15		4.29		8.02		1.79	
38		0.0590	U	0.0606	U	0.0589	U	0.0497	U	0.0646	U	0.0621	U
39		0.0620	U	0.0636	U	0.151		0.0497	U	0.0678	U	0.0652	U
40	40 + 41 + 71	0.487	C EMPC	0.987	C	1.34	C	1.57	C	0.751	C	0.461	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		0.608		1.44		0.791		2.24		0.591		0.577	EMPC
43		0.0514	U	0.0696	U	0.182	EMPC	0.143	EMPC	0.109	EMPC	0.0716	U
44	44 + 47 + 65	4.56	C	12.4	C	7.96	C	24.0	C	6.23	C	4.23	C
45	45 + 51	0.141	C	0.258	C	0.431	C	0.311	C	0.250	C	0.159	C EMPC
46		0.0489	U	0.0750		0.149		0.0710		0.0755	U	0.0673	U
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		0.291	U	0.372	U	0.431	U	0.672		0.395	U	0.220	U
49	49 + 69	0.743	C	2.91	C	3.89	C	2.79	C	1.62	C	0.776	C
50	50 + 53	0.275	C EMPC	0.573	C	1.02	C	1.14	C	0.346	C	0.219	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		2.76		10.0		16.9		17.8		4.46		2.56	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.0489	U	0.0641	U	0.0520		0.0497	U	0.0586	U	0.0498	U
55		0.157	U	0.259	U	0.135	U	0.112	U	0.330	U	0.194	U
56		0.544	U	1.60		1.47		2.13		1.23		0.383	U
57		0.143	U	0.235	U	0.141	EMPC	0.101	U	0.300	U	0.176	U
58		0.167	U	0.275	U	0.143	U	0.119	U	0.351	U	0.206	U
59	59 + 62 + 75	0.158	C U	0.119	C U	0.192	C U	0.396	C EMPC	0.163	C U	0.0960	C U
60		0.840	EMPC	1.78		1.59		1.89		1.00	EMPC	0.474	U
61	61 + 70 + 74 + 76	13.9	C	44.6	C	213	C	140	C	109	C	16.1	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		1.70		10.6		23.5		33.8		14.6		5.17	
64		0.494	U	1.51		2.10		1.18		0.819	U	0.473	U
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		13.2		35.7		57.7		96.7		142		18.0	
67		0.174		0.237	U	0.292	EMPC	0.459		0.303	U	0.178	U
68		0.353		1.02	EMPC	1.80		0.911		0.539		0.741	
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		0.130	U	0.214	U	0.250		0.180		0.273	U	0.160	U
73		0.0489	U	0.0496	U	0.0500	U	0.0497	U	0.0500	EMPC	0.0498	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		3.76		6.54		14.8		20.7		10.5		4.33	
78		0.166	U	0.273	U	0.142	U	0.118	U	0.348	U	0.204	U
79		0.516	EMPC	2.67		0.870		2.47		0.711		0.529	
80		0.142	U	0.234	U	0.122	U	0.101	U	0.299	U	0.175	U
81		0.239	EMPC	0.446		0.823	EMPC	1.32		0.361	U	0.228	U
82		0.396	EMPC	2.73		1.96		1.45		0.831	EMPC	0.203	EMPC
83	83 + 99	18.6	C	92.8	C	69.0	C	87.2	C	276	C	37.8	C
84		0.470	U	4.02		4.02		2.46		0.894		0.519	U
85	85 + 116 + 117	6.37	C	123	C	92.4	C	347	C	94.4	C	28.7	C
86	86 + 87 + 97 + 108 + 119 + 125	7.22	C	42.5	C	10.0	C	39.8	C	14.6	C	9.11	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	0.513	C	3.48	C	2.50	C	2.15	C	1.08	C	0.504	C
89		0.0615	U	0.0834	U	0.119		0.100	U	0.155	U	0.131	U
90	90 + 101 + 113	11.6	C	57.7	C	60.8	C	169	C	70.6	C	17.2	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		1.83		6.84		5.38		6.39		2.43		1.76	
93	93 + 95 + 98 + 100 + 102	6.85	C	34.1	C	18.1	C	40.1	C	11.6	C	7.46	C
94		0.0611	U	0.0828	U	0.0893	U	0.0997	U	0.154	U	0.130	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.0489	U	0.0496	U	0.104	EMPC	0.0497	U	0.0565	U	0.0498	U
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		0.0500	U	0.189		0.166		0.110		0.171		0.106	U
104		0.0489	U	0.0496	U	0.0500	U	0.0497	U	0.0796	U	0.0498	U
105		14.6		93.1		56.6		86.3	EMPC	134		34.7	
106		0.481	U	2.58	U	2.31	U	4.51	U	5.36	U	0.856	U
107	107 + 124	0.887	C	3.94	C	2.61	C	4.95	C U	5.89	C U	2.35	C EMPC
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		16.1		301		401		1,040		227		57.5	
110	110 + 115	4.32	C	31.8	C	19.4	C	24.7	C	9.47	C	4.96	C
111		0.229	EMPC	0.605		0.661		0.842	EMPC	0.194		0.238	
112		0.0489	U	0.0645	U	0.0695	U	0.0777	U	0.120	U	0.101	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		6.61		351		355		804		121		48.4	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		206		3,520		6,340		14,000		4,400		847	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		1.10		2.95		2.51		3.74		1.17		1.20	
121		0.0489	U	0.0639	U	0.0689	U	0.0770	U	0.119	U	0.100	U
122		0.595	U	3.19	U	2.85	U	5.57	U	6.62	U	1.06	U
123		4.75		247		206		460		69.0		30.2	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		0.800		3.51	U	3.60		7.83		2.60	U	1.30	U
127		0.560	U	34.8		29.5		78.5		15.2		3.46	

Table H-10
Crayfish PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay P01-CF 08021901CF 2/19/2008		Forebay P04-CF 08021904CF 2/19/2008		Forebay P05-CF 08021505CF 2/15/2008		Forebay P06-CF 08021406CF 2/14/2008		Forebay P07-CF 08021407CF 2/14/2008		Forebay P08-CF 08021408CF 2/14/2008	
128	128 + 166	3.34	C	132	C	59.7	C	112	C	28.7	C	11.4	C
129	129 + 138 + 160 + 163	136	C	1,490	C	1,250	C	3,840	C	983	C	260	C
130		6.23		13.1		15.7		31.0		89.7		11.2	
131		0.160	U	0.521		0.226	U	0.281	U	0.632	U	0.164	U
132		1.64	EMPC	8.32		4.01		3.69		3.12		1.25	
133		3.90		11.3		32.3		39.5		26.8		5.97	
134	134 + 143	0.164	C U	2.94	C	0.988	C	0.288	C U	0.648	C U	0.907	C
135	135 + 151 + 154	7.02	C	13.2	C	11.8	C	8.25	C	34.1	C	5.84	C
136		0.679		3.94		3.02		1.79		27.8		1.05	
137		11.9		698		662		1,770		291		83.3	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	0.444	C EMPC	1.84	C	1.40	C	0.260	C U	13.9	C	0.878	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		0.154	U	0.204	U	0.218	U	0.271	U	0.609	U	0.158	U
142		0.166	U	0.220	U	0.235	U	0.292	U	0.657	U	0.171	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		0.433		1.45		0.977		0.957		0.853	EMPC	0.461	
145		0.0489	U	0.0496	U	0.0514	U	0.0497	U	0.0641	U	0.0550	U
146		52.3		483		601		1,790		323		101	
147	147 + 149	11.8	C	52.2	C	27.4	C	92.6	C	57.3	C	14.5	C
148		0.0910		0.0840		0.113		0.0850	EMPC	0.737		0.0724	U
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.0489	U	0.0820	EMPC	0.0500	U	0.0497	U	0.317		0.0508	U
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.0489	U	0.0496	U	0.0500	U	0.0497	U	0.0532	U	0.0498	U
153	153 + 168	242	C	2,060	C	2,870	C	7,730	C	2,320	C	570	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.0820		0.0496	U	0.112		0.191	EMPC	0.190	EMPC	0.0770	
156	156 + 157	38.2	C	2,280	C	1,620	C	3,910	C	655	C	211	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		2.61		10.5		5.41		7.03		9.62		3.49	
159		0.198	EMPC	0.360	EMPC	0.177	U	0.220	U	1.01	EMPC	0.189	EMPC
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.117	U	0.155	U	0.165	U	0.205	U	0.462	U	0.120	U
162		1.46		38.2		31.8		74.6		13.1		4.77	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		0.124	U	0.164	U	0.175	U	0.217	U	0.489	U	0.127	U
165		0.133	U	0.524		0.866	EMPC	0.234	U	0.528	U	0.172	EMPC
166	128 + 166		C128		C128		C128		C128		C128		C128
167		23.0		1,180		629		1,530		222		97.1	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		0.597	U	2.95	U	1.80	U	1.20	U	2.22	U	0.487	U
170		21.6		137		160		326		239		29.3	
171	171 + 173	2.99	C	5.30	C	4.06	C	3.04	C	18.8	C	1.86	C
172		2.97		5.77		10.3		11.5		24.4		3.38	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		2.39		8.43		6.02		3.65		16.2		2.45	EMPC
175		0.921		1.56		2.38		3.30		5.92		1.01	
176		0.531		1.08		0.443	EMPC	0.351		1.39		0.299	
177		22.1		34.2		25.9		36.4		58.5		17.4	
178		7.12		9.28		13.6		10.2		21.1		6.02	
179		1.62		2.86		2.26		1.89		2.80		1.62	
180	180 + 193	143	C	1,710	C	0.0552	C U	2,450	C	495	C	194	C
181		0.776	EMPC	28.1		14.7		30.6		8.48		2.06	
182		0.0596	U	0.0594	U	0.0632	U	0.0593	U	1.47		0.0879	U
183	183 + 185	16.8	C	28.4	C	40.5	C	42.5	C	81.3	C	13.6	C
184		0.0940		0.0496	U	0.0500	U	0.0497	U	0.147	EMPC	0.0613	U
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0489	U	0.0496	U	0.0500	U	0.0497	U	0.0574	U	0.0680	U
187		165		792		424		896		238		160	
188		0.349	EMPC	1.27		0.657		0.755		0.422		0.317	
189		2.69		68.3		41.4		82.1		16.0		5.48	
190		14.1		130		49.4		40.3		51.9		13.8	
191		1.75		13.3		13.6		33.6		11.6		3.01	
192		0.0560	U	0.0558	U	0.0593	U	0.0557	U	0.0697	U	0.0826	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		11.0		39.5		36.3		37.8		47.1		9.33	
195		7.44		19.1		14.7		12.6		15.9		4.55	
196		9.34		35.9		19.8		22.1		27.4		6.12	
197	197 + 200	1.05	C	2.37	C	1.36	C	0.678	C	3.82	C	0.475	C
198	198 + 199	19.0	C	57.7	C	38.6	C	38.9	C	62.9	C	14.1	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		3.70		8.46		5.73		4.90		8.53		2.42	
202		2.79		3.73		3.95		3.21		11.0		2.74	
203		16.1		43.4		18.8		13.0		44.2		9.43	
204		0.0489	U	0.0615	U	0.0572	U	0.0702	U	0.0597	U	0.0720	U
205		0.689	EMPC	1.50		1.37		0.796		2.02		0.545	EMPC
206		4.40		6.06		7.23		4.38		25.4		3.63	
207		1.88		4.24		2.49		1.54		4.31		1.03	
208		2.57		4.14		3.50		2.98		7.18		1.91	
209		5.07		4.84		5.75		4.94		4.45		3.19	
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full SDL)		1.46	J	16.8	J	16.9	J	42.7	J	12.5	J	3.14	J
Total PCBs as Congeners (KM-based)		1.44	J	16.9	J	16.9	J	42.6	J	12.4	J	3.12	J
Total PCBs as Congeners (KM-based, capped)		1.44	J	16.8	J	16.9	J	42.6	J	12.4	J	3.12	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-10
Crayfish PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay P13-CF 08021413CF 2/14/2008		Forebay P14-CF 08022014CF 2/20/2008		Forebay P15-CF 08021915CF 2/19/2008		Forebay P16-CF 08022216CF 2/22/2008		Forebay P17-CF 08021917CF 2/19/2008		Forebay P18-CF 08021918CF 2/19/2008	
Individual Congeners in pg/g (ng/kg), wet weight													
1		0.138		0.134		0.153		0.224		0.151		0.128	EMPC
2		0.0970	EMPC	0.123	EMPC	0.139		0.175		0.108	EMPC	0.139	EMPC
3		0.193	EMPC	0.209	EMPC	0.203	EMPC	0.191	EMPC	0.239	EMPC	0.227	EMPC
4		0.224	U	0.275	U	0.520	U	0.884	U	0.483	U	0.308	U
5		0.156	U	0.114	U	0.129	U	0.745	U	0.163	U	0.161	U
6		0.138	U	0.147		0.192		0.653	U	0.145	U	0.143	U
7		0.142	U	0.104	U	0.118	U	0.655	U	0.149	U	0.147	U
8		0.339	U	0.579	U	0.782	U	0.585	U	0.530	U	0.466	U
9		0.140	U	0.102	U	0.116	U	0.654	U	0.146	U	0.144	U
10		0.144	U	0.105	U	0.120	U	0.648	U	0.151	U	0.149	U
11		12.0		16.7		32.3		56.4		37.9		41.9	
12	12 + 13	0.156	C U	0.114	C U	0.130	C U	0.714	C U	0.164	C U	0.162	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.147	U	0.108	U	0.122	U	0.677	U	0.155	U	0.152	U
15		0.931		0.832		3.11		1.03	U	1.02	EMPC	1.15	
16		0.172		0.321		0.365		0.378	EMPC	0.409	EMPC	0.278	
17		0.143	EMPC	0.340	EMPC	0.341		0.389		0.488		0.306	EMPC
18	18 + 30	0.460	C U	0.668	C U	1.16	C U	1.30	C U	1.03	C U	0.828	C U
19		0.0964	U	0.0679	U	0.0970	U	0.157	U	0.104	U	0.147	U
20	20 + 28	1.27	C U	1.87	C U	2.61	C U	2.21	C U	1.91	C U	2.07	C U
21	21 + 33	0.395	C U	0.507	C U	0.743	C U	0.480	C U	0.481	C U	0.544	C U
22		0.320		0.399	EMPC	0.564		0.362		0.786		0.492	EMPC
23		0.0692	U	0.0515	U	0.0709	U	0.0981	U	0.0862	U	0.0598	U
24		0.0682	U	0.0509	U	0.0683	U	0.0802	U	0.0615	U	0.0606	U
25		0.0618	U	0.0630		0.122		0.101	EMPC	0.0850		0.0535	U
26	26 + 29	0.239	C U	0.247	C U	0.479	C U	0.488	C U	0.310	C U	0.358	C U
27		0.0659	U	0.0520	EMPC	0.103		0.0748	U	0.0850	EMPC	0.0586	U
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		0.607	U	0.932	U	1.14	U	1.05	U	1.03	U	0.880	U
32		0.125	EMPC	0.199		0.239		0.185		0.148		0.161	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.0709	U	0.0527	U	0.0726	U	0.0998	U	0.0883	U	0.0613	U
35		0.0870	EMPC	0.0680	EMPC	0.120	EMPC	0.157		0.0961	U	0.149	
36		0.0672	U	0.0500	U	0.0689	U	0.0950	EMPC	0.0838	U	0.0582	U
37		1.52		1.01		5.58		3.88		1.51		2.84	
38		0.0692	U	0.0515	U	0.0709	U	0.0956	U	0.0862	U	0.0598	U
39		0.149		0.0567	U	0.0781	U	0.106	U	0.0950	U	0.0659	U
40	40 + 41 + 71	0.343	C	0.435	C	0.627	C	0.502	C	0.666	C	0.534	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		0.154	U	0.174	U	0.464		0.409	U	0.916		0.369	U
43		0.0837	U	0.0849	U	0.0880	U	0.118	U	0.0942	U	0.0936	U
44	44 + 47 + 65	1.13	C	1.28	C	2.98	C	3.12	C	3.28	C	2.17	C
45	45 + 51	0.129	C EMPC	0.0900	C	0.144	C	0.261	C EMPC	0.194	C	0.184	C
46		0.0852	U	0.0864	U	0.0896	U	0.110	U	0.0959	U	0.0953	U
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		0.145	U	0.184	U	0.189	U	0.275	U	0.454	U	0.204	U
49	49 + 69	0.603	C	0.659	C	0.716	C	0.892	C EMPC	1.36	C	0.738	C EMPC
50	50 + 53	0.137	C	0.107	C EMPC	0.195	C	0.194	C	0.212	C	0.124	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		1.56		1.72		2.28		2.58		2.72		2.14	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.0644	U	0.0578	U	0.0616	U	0.0711	U	0.0655	U	0.0733	U
55		0.191	U	0.109	U	0.234	U	0.268	U	0.140	U	0.130	U
56		0.287	U	0.329	U	0.414	U	0.612	U	0.822	U	0.427	U
57		0.172	U	0.0979	U	0.211	U	0.254	U	0.126	U	0.117	U
58		0.187	U	0.106	U	0.229	U	0.285	U	0.137	U	0.127	U
59	59 + 62 + 75	0.0960	C U	0.0573	C U	0.151	C U	0.130	C U	0.124	C U	0.0850	C U
60		0.222	U	0.282	U	0.462	U	0.691		0.726		0.619	
61	61 + 70 + 74 + 76	6.77	C	4.72	C	7.95	C	14.0	C	8.04	C	8.64	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		1.75		1.24		1.88		2.48		0.615		1.91	
64		0.339	U	0.458	U	0.563	U	0.578	U	0.892	U	0.488	U
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		7.05		3.86		8.47		19.0		6.72		10.8	
67		0.161	U	0.0917	U	0.197	U	0.250	U	0.118	U	0.110	U
68		0.870	EMPC	0.424		0.520		0.741		0.225		0.629	EMPC
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		0.165	U	0.0936	U	0.201	U	0.234	U	0.121	U	0.112	U
73		0.0590	U	0.0598	U	0.0620	U	0.0715	U	0.0664	U	0.0659	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		2.11		1.74		4.38		5.14		1.57		4.12	
78		0.195	U	0.111	U	0.238	U	0.286	U	0.143	U	0.133	U
79		0.150	U	0.0854	U	0.227	EMPC	0.240	EMPC	0.189	EMPC	0.206	EMPC
80		0.167	U	0.0951	U	0.205	U	0.228	U	0.123	U	0.114	U
81		0.215	U	0.125	U	0.273	U	0.289	U	0.164	U	0.313	EMPC
82		0.206	EMPC	0.198		0.237	EMPC	0.259	EMPC	0.372	EMPC	0.224	
83	83 + 99	7.35	C	3.17	C	7.66	C	18.9	C	8.36	C	9.81	C
84		0.402	U	0.453	U	0.597	EMPC	0.533	U	0.657		0.419	U
85	85 + 116 + 117	4.58	C	3.10	C	4.28	C	6.45	C	2.80	C	5.87	C
86	86 + 87 + 97 + 108 + 119 + 125	1.73	C	1.62	C U	3.39	C	4.91	C	5.21	C	2.83	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	0.256	C U	0.290	C U	0.375	C	0.276	C U	0.788	C	0.343	C
89		0.0941	U	0.0759	U	0.0950	U	0.108	U	0.129	U	0.0851	U
90	90 + 101 + 113	5.43	C	4.32	C	6.03	C	9.84	C	9.08	C	7.35	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		0.626	EMPC	0.515	EMPC	0.781	EMPC	1.98		1.32		0.900	
93	93 + 95 + 98 + 100 + 102	1.88	C U	1.82	C U	3.68	C	7.50	C	4.28	C	3.13	C
94		0.0971	U	0.0783	U	0.0980	U	0.111	U	0.133	U	0.0878	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.0491	U	0.0726	U	0.0500	U	0.0711	U	0.0520	U	0.0491	U
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		0.0806	U	0.0651	U	0.0814	U	0.0926	U	0.111	U	0.0730	U
104		0.0541	U	0.0771	U	0.0501	U	0.0711	U	0.0559	U	0.0532	U
105		4.89	EMPC	3.67	EMPC	7.46		13.2		6.36		7.37	
106		0.193	U	0.168	U	0.285	U	0.778	U	0.278	U	0.339	U
107	107 + 124	0.441	C	0.176	C U	0.694	C EMPC	1.15	C	0.363	C	0.577	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		10.7		10.9		9.05		16.2		5.55		16.3	
110	110 + 115	2.42	C	2.52	C	3.48	C	3.06	C	7.22	C	3.33	C
111		0.303		0.283		0.159	EMPC	0.326		0.131		0.311	
112		0.0655	U	0.0529	U	0.0662	U	0.0826	U	0.0900	U	0.0593	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		3.70		5.69		4.07		6.61		2.14		6.10	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		95.5		112		122		248		82.4		173	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		0.985		1.20		0.778		1.41		0.561		1.32	
121		0.0702	U	0.0567	U	0.0708	U	0.0799	U	0.0964	U	0.0635	U
122		0.214	U	0.186	U	0.316	U	0.899	U	0.308	U	0.376	U
123		2.42		5.81		3.37		6.82		2.11		5.06	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		0.306		0.238		0.468		1.10	U	0.397	U	0.469	
127		0.438		0.494	EMPC	0.340	U	0.852	U	0.331	U	0.540	EMPC

Table H-10
Crayfish PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay P13-CF 08021413CF 2/14/2008		Forebay P14-CF 08022014CF 2/20/2008		Forebay P15-CF 08021915CF 2/19/2008		Forebay P16-CF 08022216CF 2/22/2008		Forebay P17-CF 08021917CF 2/19/2008		Forebay P18-CF 08021918CF 2/19/2008	
128	128 + 166	1.63	C EMPC	1.61	C	1.91	C	2.59	C	2.30	C EMPC	2.21	C
129	129 + 138 + 160 + 163	60.4	C	54.7	C	69.1	C	122	C	44.8	C	99.8	C
130		3.21		0.988	EMPC	3.58		7.22		1.47		4.35	
131		0.147	U	0.226	U	0.207	U	0.185	U	0.188	U	0.141	U
132		0.857		0.819		0.999		0.945	EMPC	1.72		0.871	
133		2.55		1.60		1.64		3.42		1.11		2.83	
134	134 + 143	0.143	C U	0.220	C U	0.450	C EMPC	0.185	C U	0.457	C EMPC	0.431	C
135	135 + 151 + 154	0.0574	C U	1.54	C	3.26	C	7.56	C	3.32	C	3.24	C
136		0.433		0.329		0.548		1.05		0.678		0.561	EMPC
137		6.57		9.31		5.97		10.9		4.34		10.1	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	0.236	C	0.203	C U	0.187	C	0.435	C EMPC	0.297	C EMPC	0.310	C EMPC
140	139 + 140		C139		C139		C139		C139		C139		C139
141		0.133	U	0.205	U	1.64		0.183	U	0.171	U	0.128	U
142		0.149	U	0.230	U	0.211	U	0.185	U	0.192	U	0.143	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		0.186	EMPC	0.174	EMPC	0.244		0.516		0.314	EMPC	0.235	
145		0.0491	U	0.0499	U	0.0654	U	0.0711	U	0.0711	U	0.0502	U
146		30.9		26.1		27.0		55.0		13.9		46.9	
147	147 + 149	4.72	C	3.96	C	6.55	C	9.04	C	9.22	C	6.66	C
148		0.0590	U	0.0587	U	0.0828	U	0.113		0.0900	U	0.0635	U
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.0491	U	0.0499	U	0.0626	U	0.0711	U	0.0680	U	0.0491	U
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.0491	U	0.0499	U	0.0592	U	0.0711	U	0.0644	U	0.0491	U
153	153 + 168	122	C	201	C	151	C	322	C	76.0	C	220	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.150	EMPC	0.0499	U	0.0722	U	0.0820		0.0662	U	0.0518	U
156	156 + 157	13.8	C	26.3	C	16.9	C	28.0	C	13.6	C	25.7	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		0.898		0.612		1.44		2.55	EMPC	1.41	EMPC	1.40	
159		0.157		0.172	U	0.158	U	0.221		0.144	U	0.123	EMPC
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.102	U	0.157	U	0.144	U	0.133	U	0.131	U	0.0975	U
162		0.973		1.28		0.820	EMPC	1.18		0.454	EMPC	1.42	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		0.108	U	0.166	U	0.153	U	0.137	U	0.139	U	0.104	U
165		0.201	EMPC	0.174	U	0.159	U	0.153	U	0.145	U	0.178	
166	128 + 166		C128		C128		C128		C128		C128		C128
167		8.53		22.8		12.1		21.5		11.8		17.7	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		0.249	U	0.257	U	0.350	U	0.539	U	0.167	U	0.254	U
170		9.04		12.5		11.3		14.4		4.86		13.8	
171	171 + 173	0.958	C EMPC	0.571	C	1.05	C	2.27	C	1.18	C EMPC	1.25	C
172		1.75		0.953		1.85		2.17		0.456		1.45	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		1.34		1.09	EMPC	2.33		2.37		0.855	EMPC	1.36	
175		0.571		0.341	EMPC	0.595		0.925		0.203	EMPC	0.617	
176		0.134	EMPC	0.156	EMPC	0.292	EMPC	0.474		0.345		0.164	
177		8.44		4.28		10.6		19.1		3.60		11.6	
178		3.88		1.81		3.77		7.59		1.92		4.27	
179		0.599		0.549		1.06		2.48		1.17		0.911	EMPC
180	180 + 193	0.0610	C U	111	C	73.9	C	0.0766	C U	47.3	C	104	C
181		0.340		0.507		0.363		0.631		0.241		0.613	EMPC
182		0.0648	U	0.0788	U	0.167	EMPC	0.584		0.0719	U	0.0521	U
183	183 + 185	6.59	C	3.75	C	8.26	C	14.8	C	4.09	C	8.75	C
184		0.0910		0.0574	U	0.0500	U	0.0711	U	0.0524	U	0.0491	U
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0519	U	0.0631	U	0.0500	U	0.0711	U	0.0576	U	0.0491	U
187		78.2		101		81.1		138		50.9		136	
188		0.380		0.408		0.267	EMPC	0.354		0.219	EMPC	0.474	
189		1.17		1.62	EMPC	1.26		1.55	EMPC	0.926		1.58	
190		4.84		2.85		7.76		11.9		2.82		7.41	
191		0.982		1.45		1.10		1.59		0.565	EMPC	1.49	
192		0.0651	U	0.0791	U	0.0610	U	0.0798	U	0.0722	U	0.0523	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		6.30		7.03		6.69		6.53		2.14		8.18	
195		2.18		3.96		3.12		3.95		1.67		4.16	
196		4.04		6.38		4.03		4.69		2.51		5.90	
197	197 + 200	0.407	C	0.298	C	0.500	C	0.533	C EMPC	0.504	C	0.440	C
198	198 + 199	11.1	C	9.40	C	12.1	C	12.9	C	4.20	C	13.4	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		1.79		2.67		1.85		2.77		1.45		3.00	
202		1.87		0.890	EMPC	2.29		4.22		1.09		2.54	
203		5.37		2.53		10.2		13.1		2.84		6.41	
204		0.0509	U	0.0561	U	0.0543	U	0.0711	U	0.0564	U	0.0491	U
205		0.305		0.216		0.421		0.633		0.123		0.363	
206		2.23		1.62		3.50		3.32		1.26		2.22	
207		0.852		1.38		0.853	EMPC	0.931		0.763		1.27	
208		1.42		1.01		1.84		1.84		0.541		1.64	
209		2.17	EMPC	2.83		2.76		3.47		1.77		2.61	
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full SDL)		0.611	J	0.846	J	0.831	J	1.36	J	0.555	J	1.13	J
Total PCBs as Congeners (KM-based)		0.591	J	0.825	J	0.816	J	1.34	J	0.536	J	1.12	J
Total PCBs as Congeners (KM-based, capped)		0.591	J	0.825	J	0.816	J	1.34	J	0.536	J	1.12	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-10
Crayfish PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay P19-CF 08021919CF 2/19/2008		Forebay P20-CF 08021920CF 2/19/2008		Forebay P21-CF 08021921CF 2/19/2008		Reference P38/42-CF 08021838/42 CF 2/28/2008		Reference P22-CF 08022622CF 2/26/2008		Reference P33-CF 08022233CF 2/26/2008	
Individual Congeners in pg/g (ng/kg), wet weight													
1		0.161	EMPC	0.182	EMPC	0.142		0.176	U	0.130		0.156	U
2		0.106	EMPC	0.167	EMPC	0.123		0.186		0.138		0.186	EMPC
3		0.222	EMPC	0.261		0.130		0.156		0.186		0.188	EMPC
4		0.467	U	0.514	U	0.790	U	0.695	U	0.889	U	0.445	
5		0.168	U	0.130	U	0.655	U	0.532	U	0.735	U	0.184	U
6		0.149	EMPC	0.251		0.573	U	0.466	U	0.644	U	0.164	U
7		0.153	U	0.118	U	0.576	U	0.468	U	0.647	U	0.168	U
8		0.477	U	0.889	U	0.514	U	0.627		0.577	U	0.682	
9		0.150	U	0.116	U	0.574	U	0.467	U	0.645	U	0.162	U
10		0.155	U	0.120	U	0.569	U	0.463	U	0.639	U	0.163	U
11		49.4		48.2		49.7		64.3		15.1		35.8	
12	12 + 13	0.168	C U	0.130	C U	0.627	C U	0.510	C U	0.705	C U	0.181	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.159	U	0.123	U	0.595	U	0.484	U	0.668	U	0.170	U
15		1.73	EMPC	1.57	EMPC	4.50	EMPC	2.12		0.998	U	1.87	
16		0.397	EMPC	0.519		0.408		0.488		0.225	EMPC	0.497	
17		0.274		0.524	EMPC	0.359	EMPC	0.578		0.188		0.614	EMPC
18	18 + 30	1.55	C U	1.52	C U	1.64	C U	1.40	C U	0.447	C U	1.28	C U
19		0.0967	U	0.119	U	0.145	U	0.142		0.0870	U	0.111	
20	20 + 28	2.30	C U	3.10	C	2.53	C U	4.70	C	0.883	C U	3.94	C
21	21 + 33	0.386	C U	0.722	C U	0.482	C U	0.625	C U	0.310	C U	0.780	C U
22		0.386	EMPC	0.587		0.522		0.638		0.260		0.691	
23		0.0855	U	0.0751	U	0.0952	U	0.0709	U	0.0750	U	0.0497	U
24		0.0830	U	0.0614	U	0.0797	U	0.0527	U	0.0633	U	0.0497	U
25		0.121	EMPC	0.105		0.0834	U	0.0720		0.0657	U	0.177	
26	26 + 29	0.378	C U	0.414	C U	0.951	C	0.544	C	0.149	C U	0.460	C
27		0.109		0.0720		0.131	EMPC	0.0900		0.0590	U	0.0880	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		0.782	U	1.58	U	1.10	U	1.54	U	0.495	U	1.60	U
32		0.101	EMPC	0.270		0.168		0.240	U	0.118	EMPC	0.264	U
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.0876	U	0.0770	U	0.0968	U	0.0721	U	0.0763	U	0.0497	U
35		0.254		0.147	EMPC	0.157	EMPC	0.408	EMPC	0.0790	U	0.112	EMPC
36		0.0831	U	0.0731	U	0.0890	U	0.177		0.0701	U	0.0497	U
37		2.37		2.81		6.25		4.39		1.02		3.32	
38		0.0855	U	0.0752	U	0.0928	U	0.0691	U	0.0731	U	0.0497	U
39		0.0941	U	0.0828	U	0.103	U	0.0765	U	0.0809	U	0.0497	U
40	40 + 41 + 71	0.460	C EMPC	0.553	C	0.513	C	0.652	C U	0.277	C EMPC	0.594	C U
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		0.459	EMPC	0.564	EMPC	0.673	EMPC	0.460		0.187	U	0.510	
43		0.105	U	0.0913	U	0.126	U	0.0900		0.0919	U	0.0742	U
44	44 + 47 + 65	3.98	C	3.41	C	4.45	C	2.87	C	1.05	C	2.30	C U
45	45 + 51	0.171	C	0.213	C	0.187	C EMPC	0.276	C EMPC	0.138	C	0.223	C
46		0.107	U	0.0930	U	0.118	U	0.0827	U	0.0857	U	0.0748	U
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		0.185	U	0.343	U	0.342	U	0.362		0.0890	U	0.365	EMPC
49	49 + 69	0.499	C	0.911	C EMPC	0.991	C	1.10	C U	0.368	C	1.05	C U
50	50 + 53	0.224	C EMPC	0.239	C	0.258	C EMPC	0.235	C	0.0800	C EMPC	0.266	C EMPC
51	45 + 51		C45		C45		C45		C45		C45		C45
52		2.03		2.63		2.93		2.94		0.872		2.36	U
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.0692	U	0.0558	U	0.0742	U	0.0500	U	0.0567	U	0.0497	U
55		0.192	U	0.125	U	0.191	U	0.158	U	0.133	U	0.138	U
56		0.362	U	0.502	U	0.744	U	0.542		0.269	U	0.429	EMPC
57		0.173	U	0.112	U	0.182	U	0.148	U	0.126	U	0.127	U
58		0.188	U	0.122	U	0.203	U	0.152	U	0.141	U	0.128	U
59	59 + 62 + 75	0.156	C U	0.113	C U	0.128	C U	0.162	C EMPC	0.0568	C U	0.177	C
60		0.857		1.08		1.01		1.01		0.207	U	0.957	
61	61 + 70 + 74 + 76	9.75	C	11.3	C	14.5	C	11.6	C	2.66	C U	9.41	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		1.10		1.59		1.69		1.20		0.612		1.06	
64		0.321	U	0.536	U	0.599	U	0.653		0.247	U	0.718	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		10.3		10.5		17.6		11.9		2.43		7.92	
67		0.162	U	0.130	EMPC	0.307	EMPC	0.152	EMPC	0.124	U	0.109	U
68		0.304	EMPC	0.342	EMPC	0.352		0.384		0.235	EMPC	0.446	
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		0.165	U	0.108	U	0.167	U	0.145	U	0.116	U	0.121	U
73		0.0737	U	0.0644	U	0.0763	U	0.0536	U	0.0555	U	0.0526	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		2.67		3.38		3.66		2.88		1.30		2.39	
78		0.196	U	0.127	U	0.204	U	0.154	U	0.142	U	0.138	U
79		0.343		0.338		0.368		0.141		0.115	U	0.155	
80		0.168	U	0.109	U	0.163	U	0.133	U	0.113	U	0.123	U
81		0.218	U	0.211		0.250		0.175	U	0.135	U	0.176	
82		0.139	EMPC	0.204	EMPC	0.257	EMPC	0.180		0.0880	EMPC	0.144	
83	83 + 99	13.8	C	13.4	C	17.4	C	12.7	C	2.57	C	9.17	C
84		0.311	U	0.371	U	0.489	U	0.424		0.219	U	0.489	
85	85 + 116 + 117	3.21	C	3.90	C EMPC	3.71	C	3.47	C	1.31	C	2.87	C
86	86 + 87 + 97 + 108 + 119 + 125	5.66	C	4.85	C	6.75	C	3.23	C	1.12	C U	2.99	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	0.324	C U	0.426	C EMPC	0.576	C	0.353	C	0.141	C U	0.477	C EMPC
89		0.117	U	0.0794	U	0.104	U	0.0798	U	0.0730	U	0.0798	U
90	90 + 101 + 113	6.68	C	7.56	C	9.91	C	6.46	C	2.15	C	5.33	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		1.27		1.09		1.88		1.22		0.267	EMPC	0.852	
93	93 + 95 + 98 + 100 + 102	5.14	C	4.75	C	6.91	C	3.46	C	1.07	C U	2.43	C
94		0.121	U	0.0819	U	0.107	U	0.0819	U	0.0750	U	0.0814	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.0557	U	0.0637	U	0.0580	U	0.0500	U	0.0494	U	0.0497	U
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		0.100	U	0.0681	U	0.0886	U	0.0682	U	0.0624	U	0.0660	U
104		0.0626	U	0.0611	U	0.0633	U	0.0507	U	0.0494	U	0.0497	U
105		11.1		11.0		12.7		8.98		1.97		7.62	
106		0.462	U	0.500	U	0.435	U	0.281	U	0.153	U	0.197	U
107	107 + 124	0.530	C EMPC	0.609	C EMPC	0.711	C	0.526	C EMPC	0.160	C U	0.330	C EMPC
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		8.00		10.8		8.96		7.79		3.90		6.80	
110	110 + 115	3.35	C	3.46	C	5.81	C	3.13	C	1.36	C U	3.44	C
111		0.131	EMPC	0.171	EMPC	0.117		0.0990	EMPC	0.0810	EMPC	0.172	
112		0.0816	U	0.0553	U	0.0790	U	0.0590	U	0.0556	U	0.0565	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		2.61	EMPC	3.61		3.89		2.92		2.62		3.20	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		111		152		156		107		52.6		95.3	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		0.668		0.903		0.754		0.585		0.418	EMPC	0.669	
121		0.0874	U	0.0592	U	0.0764	U	0.0588	U	0.0538	U	0.0583	U
122		0.513	U	0.554	U	0.503	U	0.324	U	0.177	U	0.221	U
123		3.11	EMPC	3.62		4.00		2.45		1.93		2.71	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		0.650	U	0.748	U	0.547	U	0.377		0.207	U	0.273	U
127		0.551	U	0.596	U	0.476	U	0.307	U	0.265		0.221	U

Table H-10
Crayfish PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay P19-CF 08021919CF 2/19/2008		Forebay P20-CF 08021920CF 2/19/2008		Forebay P21-CF 08021921CF 2/19/2008		Reference P38/42-CF 08021838/42 CF 2/28/2008		Reference P22-CF 08022622CF 2/26/2008		Reference P33-CF 08022233CF 2/26/2008	
128	128 + 166	1.84	C	1.60	C	2.97	C	1.58	C	0.887	C EMPC	1.84	C
129	129 + 138 + 160 + 163	73.8	C	81.0	C	79.1	C	58.0	C	23.2	C	51.0	C
130		3.33		3.48		4.29		3.30		0.614		1.80	
131		0.265	U	0.246	U	0.249	U	0.130	U	0.171	U	0.0961	U
132		1.35		1.36		1.98		1.08		0.407	U	1.18	
133		1.84		2.00		1.95		1.69		0.574	EMPC	1.33	
134	134 + 143	0.487	C EMPC	0.240	C U	0.249	C U	0.488	C	0.171	C U	0.277	C EMPC
135	135 + 151 + 154	5.73	C	4.19	C	6.96	C	4.01	C	0.856	C U	2.61	C
136		0.641		0.472	EMPC	0.867		0.454		0.246	U	0.403	EMPC
137		4.72		6.25		6.00		4.02		4.35		5.15	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	0.262	C EMPC	0.221	C U	0.419	C	0.361	C	0.156	C U	0.262	C EMPC
140	139 + 140		C139		C139		C139		C139		C139		C139
141		0.241	U	0.224	U	0.247	U	0.130	U	0.170	U	1.33	
142		0.270	U	0.251	U	0.250	U	0.131	U	0.171	U	0.100	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		0.341		0.404		0.453		0.374		0.0800		0.259	
145		0.0621	U	0.0498	U	0.0572	U	0.0500	U	0.0494	U	0.0497	U
146		24.8		32.5		27.9		22.7		9.49		23.5	
147	147 + 149	9.47	C	8.93	C	11.0	C	5.57	C	1.72	C	5.76	C
148		0.0786	U	0.0610	U	0.0712	U	0.0500	U	0.0494	U	0.0594	U
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.0594	U	0.0498	U	0.0541	U	0.0500	U	0.0494	U	0.0497	U
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.0563	U	0.0498	U	0.0513	U	0.0500	U	0.0494	U	0.0497	U
153	153 + 168	158	C	192	C	181	C	113	C	77.4	C	115	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.111	EMPC	0.0660		0.113	EMPC	0.0500	U	0.0494	U	0.0497	U
156	156 + 157	13.9	C	19.2	C	19.1	C	12.7	C	14.3	C	14.7	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		2.07		1.37	EMPC	2.35		1.52		0.216		1.16	
159		0.202	U	0.188	U	0.191	U	0.100	U	0.132	U	0.0770	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.184	U	0.171	U	0.179	U	0.0936	U	0.123	U	0.0693	U
162		0.616		0.820	EMPC	0.741	EMPC	0.470		0.389	EMPC	0.572	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		0.195	U	0.182	U	0.721	EMPC	0.514		0.127	U	0.308	
165		0.204	U	0.189	U	0.206	U	0.108	U	0.142	U	0.0850	
166	128 + 166		C128		C128		C128		C128		C128		C128
167		12.0		14.1		14.4		8.88		9.80		9.44	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		0.240	U	0.298	U	0.265	U	0.126	U	0.180	U	0.158	U
170		6.75		8.53		9.35		7.25		6.33		7.41	
171	171 + 173	1.50	C EMPC	1.25	C EMPC	2.69	C	1.59	C	0.341	C	1.06	C
172		0.835	EMPC	0.829		1.18		1.06		0.314	EMPC	0.750	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		1.18		1.01		2.02		1.53		0.395		0.943	
175		0.475	EMPC	0.420	EMPC	0.647	EMPC	0.372		0.141	EMPC	0.254	EMPC
176		0.376	EMPC	0.335	EMPC	0.648		0.265		0.0870	EMPC	0.227	
177		9.27		11.5		12.5		10.0		2.34		5.32	
178		4.25		3.43		5.11		4.64		0.892		2.18	
179		1.53		0.765		2.41		0.916		0.253		0.681	
180	180 + 193	54.2	C	66.8	C	73.8	C	47.6	C	63.0	C	52.3	C
181		0.272	EMPC	0.430		0.445	EMPC	0.247		0.323	EMPC	0.325	
182		0.294	EMPC	0.0717	U	0.0912	U	0.0571	U	0.0601	U	0.242	
183	183 + 185	7.93	C	8.16	C	11.9	C	7.37	C	2.89	C	5.09	C
184		0.0830	EMPC	0.0570		0.103		0.0500	U	0.0494	U	0.0497	U
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0632	U	0.0575	U	0.0744	U	0.0500	U	0.0494	U	0.0497	U
187		67.1		87.6		77.7		69.8		27.8		65.6	
188		0.197	EMPC	0.237		0.383	EMPC	0.197		0.153		0.159	
189		0.923		1.09	EMPC	1.23		0.767		1.24		0.956	
190		5.92		6.14		7.38		4.95		2.39		3.57	
191		0.684		0.867		0.814		0.651		0.688	EMPC	0.740	
192		0.0792	U	0.0720	U	0.0902	U	0.0565	U	0.0595	U	0.0509	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		3.41		4.08		4.48		3.38		2.79		3.76	
195		2.43		3.11		3.38		2.28		2.34	EMPC	2.33	
196		2.60		3.24		4.02		2.42		3.20		2.87	
197	197 + 200	0.364	C	0.396	C	0.979	C	0.421	C EMPC	0.215	C EMPC	0.360	C
198	198 + 199	6.57	C	7.03	C	7.98	C	7.41	C	2.93	C	6.53	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		1.70		2.09		2.35		1.56		0.705	EMPC	1.23	
202		2.16		1.65		2.88		2.45		0.575	EMPC	0.948	
203		6.31		5.08		8.24		5.50		1.79		2.70	
204		0.0670	U	0.0572	U	0.0510	U	0.0500	U	0.0494	U	0.0497	U
205		0.260		0.242		0.428		0.322		0.162		0.238	
206		1.75		1.56		2.51		2.25		0.714		1.62	
207		0.609		0.816		1.17		0.606		0.808		0.787	
208		0.977	EMPC	1.10		1.47		1.34		0.442		0.999	
209		2.16		2.41		3.43		2.07		2.95		2.60	
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full SDL)		0.792	J	0.936	J	0.990	J	0.729	J	0.391	J	0.647	J
Total PCBs as Congeners (KM-based)		0.766	J	0.911	J	0.967	J	0.71868	J	0.366	J	0.634	J
Total PCBs as Congeners (KM-based, capped)		0.766	J	0.911	J	0.967	J	0.71868	J	0.366	J	0.634	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-10
Crayfish PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Reference P72-CF 08030372CF 3/3/2008		Reference P73-CF 08030373CF 3/3/2008		Reference P74-CF 08030374CF 3/3/2008		Reference P75-CF 08030375CF 3/3/2008		Reference P76-CF 08030376CF 3/3/2008	
Individual Congeners in pg/g (ng/kg), wet weight											
1		0.152	U	0.191	U	0.140	U	0.100	U	0.152	U
2		0.665		0.474		0.0900		0.457	EMPC	0.268	
3		0.109	EMPC	0.213		0.175		0.122	EMPC	0.114	
4		0.367	U	0.434		0.313		0.648	U	0.320	
5		0.257	U	0.229	U	0.165	U	0.531	U	0.249	U
6		0.228	U	0.204	U	0.147	U	0.465	U	0.221	U
7		0.234	U	0.209	U	0.150	U	0.467	U	0.227	U
8		0.588		0.559		0.334		0.417	U	0.639	
9		0.227	U	0.202	U	0.146	U	0.466	U	0.220	U
10		0.227	U	0.202	U	0.146	U	0.462	U	0.220	U
11		57.0		40.0		30.9		50.5		40.5	
12	12 + 13	0.253	C U	0.226	C U	0.163	C U	0.509	C U	0.245	C U
13	12 + 13		C12		C12		C12		C12		C12
14		0.237	U	0.212	U	0.153	U	0.483	U	0.230	U
15		1.35		1.24		0.891		0.721	U	0.782	
16		0.284		0.264		0.298		0.523		0.249	
17		0.317		0.281	EMPC	0.220		0.407		0.376	
18	18 + 30	0.756	C U	0.804	C U	0.733	C U	1.29	C U	0.836	C U
19		0.126		0.140	EMPC	0.0717	U	0.0991	U	0.0780	EMPC
20	20 + 28	1.80	C U	1.95	C U	2.54	C	2.43	C	1.32	C U
21	21 + 33	0.464	C U	0.364	C U	0.379	C U	0.405	C U	0.380	C U
22		0.342		0.344		0.297		0.604		0.285	
23		0.0683	U	0.0717	U	0.0490	U	0.0882	U	0.0570	U
24		0.0534	U	0.0587	U	0.0490	U	0.0782	U	0.0550	U
25		0.0770		0.0603	U	0.0750	EMPC	0.0772	U	0.0750	
26	26 + 29	0.267	C	0.270	C	0.208	C	0.274	C EMPC	0.228	C
27		0.0496	U	0.0546	U	0.0650		0.0870	EMPC	0.0511	U
28	20 + 28		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18
31		0.904	U	0.779	U	0.705	U	0.874	U	0.725	U
32		0.178	U	0.229	U	0.129	U	0.137	U	0.205	U
33	21 + 33		C21		C21		C21		C21		C21
34		0.0659	U	0.0800	EMPC	0.0490	U	0.0897	U	0.0550	U
35		0.348		0.384		0.0502	U	0.251		0.281	EMPC
36		0.116	EMPC	0.143		0.0490	U	0.0913	U	0.0740	EMPC
37		2.40		3.36		2.38		2.68		1.33	
38		0.0667	U	0.0699	U	0.0490	U	0.0859	U	0.0557	U
39		0.0689	U	0.0723	U	0.0490	U	0.0951	U	0.0575	U
40	40 + 41 + 71	0.500	C U	0.412	C U	0.433	C U	0.505	C U	0.441	C U
41	40 + 41 + 71		C40		C40		C40		C40		C40
42		0.240	EMPC	0.255	EMPC	0.433	EMPC	0.794		0.267	
43		0.0705	U	0.0838	U	0.0620	U	0.139	U	0.0770	U
44	44 + 47 + 65	1.82	C U	1.63	C U	2.45	C	3.92	C	1.43	C U
45	45 + 51	0.210	C	0.211	C EMPC	0.141	C	0.243	C	0.181	C
46		0.0710	U	0.0844	U	0.0625	U	0.130	U	0.0776	U
47	44 + 47 + 65		C44		C44		C44		C44		C44
48		0.250	EMPC	0.179	EMPC	0.239		0.339		0.189	EMPC
49	49 + 69	0.722	C U	0.504	C U	0.722	C U	1.06	C U	0.535	C U
50	50 + 53	0.124	C EMPC	0.195	C EMPC	0.173	C EMPC	0.281	C EMPC	0.132	C EMPC
51	45 + 51		C45		C45		C45		C45		C45
52		1.84	U	1.36	U	1.87	U	2.23	U	1.39	U
53	50 + 53		C50		C50		C50		C50		C50
54		0.0497	U	0.0820		0.0490	U	0.0745	U	0.0497	U
55		0.160	U	0.132	U	0.107	U	0.168	U	0.115	U
56		0.423		0.365		0.416		0.543	EMPC	0.266	
57		0.147	U	0.122	U	0.0987	U	0.158	U	0.106	U
58		0.149	U	0.123	U	0.0998	U	0.162	U	0.107	U
59	59 + 62 + 75	0.102	C EMPC	0.0760	C EMPC	0.112	C EMPC	0.189	C	0.104	C
60		0.392		0.583		1.56		1.18	EMPC	0.324	
61	61 + 70 + 74 + 76	7.41	C	8.95	C	10.3	C	12.3	C	4.04	C
62	59 + 62 + 75		C59		C59		C59		C59		C59
63		1.19		1.23		1.22		1.19		0.811	
64		0.480		0.379		0.483		0.678	EMPC	0.358	
65	44 + 47 + 65		C44		C44		C44		C44		C44
66		5.78		8.94		13.6		12.9		3.81	
67		0.126	U	0.104	U	0.100	EMPC	0.142	U	0.0909	U
68		0.444		0.414		0.405		0.352		0.215	
69	49 + 69		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40
72		0.140	U	0.116	U	0.0939	U	0.154	U	0.101	U
73		0.0499	U	0.0593	U	0.0490	U	0.0841	U	0.0545	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61
77		2.62		3.29		2.99		2.57		1.87	
78		0.160	U	0.132	U	0.107	U	0.164	U	0.115	U
79		0.139	EMPC	0.208		0.208		0.246	EMPC	0.0941	U
80		0.143	U	0.118	U	0.0960	U	0.142	U	0.103	U
81		0.169	U	0.161	EMPC	0.167		0.194	U	0.127	U
82		0.247	EMPC	0.166		0.0707	U	1.31	U	0.0854	U
83	83 + 99	5.76	C	9.09	C	16.3	C	16.2	C	4.44	C
84		0.421		0.272		0.365		1.30	U	0.373	
85	85 + 116 + 117	3.64	C	3.53	C	3.68	C	3.51	C	2.47	C
86	86 + 87 + 97 + 108 + 119 + 125	2.03	C	2.21	C	3.49	C	6.42	C	1.63	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86
88	88 + 91	0.319	C	0.325	C	0.403	C	1.16	C U	0.260	C
89		0.0601	U	0.106	U	0.0655	U	1.22	U	0.0791	U
90	90 + 101 + 113	4.97	C	4.86	C	6.91	C	9.00	C	3.68	C
91	88 + 91		C88		C88		C88		C88		C88
92		0.781		0.546		0.926		1.19	U	0.546	
93	93 + 95 + 98 + 100 + 102	2.31	C	2.30	C	3.17	C	5.36	C	1.86	C U
94		0.0614	U	0.108	U	0.0668	U	1.25	U	0.0807	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93
96		0.0496	U	0.0512	U	0.0490	U	0.344	U	0.0497	U
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93
103		0.0497	U	0.0877	U	0.0542	U	1.04	U	0.0654	U
104		0.0496	U	0.0549	U	0.0490	U	0.339	U	0.0497	U
105		3.57		6.03		12.7		10.6		3.01	
106		0.186	U	0.258	U	0.266	U	1.42	U	0.171	U
107	107 + 124	0.327	C	0.402	C	0.405	C	1.49	C U	0.265	C EMPC
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86
109		8.91		8.22		7.05		9.24		5.65	
110	110 + 115	2.71	C	2.03	C	3.33	C	5.47	C	2.11	C
111		0.205	EMPC	0.123		0.137	EMPC	0.916	U	0.0660	EMPC
112		0.0496	U	0.0752	U	0.0490	U	0.904	U	0.0561	U
113	90 + 101 + 113		C90		C90		C90		C90		C90
114		3.69		3.51		3.90		3.64		2.52	
115	110 + 115		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85
118		95.8		111		138		157		63.6	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86
120		0.737		0.704		0.865		0.866	U	0.517	EMPC
121		0.0496	U	0.0775	U	0.0490	U	0.901	U	0.0578	U
122		0.209	U	0.290	U	0.299	U	1.64	U	0.217	
123		2.47		3.07		3.76		3.72		1.96	
124	107 + 124		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86
126		0.450		0.455		0.376	U	1.96	U	0.231	U
127		0.209	U	0.290	U	0.299	U	1.56	U	0.192	U

Table H-10
Crayfish PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Reference P72-CF 08030372CF 3/3/2008		Reference P73-CF 08030373CF 3/3/2008		Reference P74-CF 08030374CF 3/3/2008		Reference P75-CF 08030375CF 3/3/2008		Reference P76-CF 08030376CF 3/3/2008	
128	128 + 166	1.46	C	1.46	C	2.70	C	2.94	C	1.19	C
129	129 + 138 + 160 + 163	59.5	C	62.7	C	61.4	C	78.4	C	37.8	C
130		2.94		3.43		2.66		3.00		1.58	
131		0.124	U	0.137	U	0.0754	U	0.200	U	0.0938	U
132		0.919		0.957		1.08		1.88		0.655	
133		1.99		1.85		1.21		1.92		0.878	
134	134 + 143	0.229	C	0.438	C	0.312	C	0.674	C	0.183	C EMPC
135	135 + 151 + 154	2.80	C	3.23	C	2.78	C	5.26	C	1.67	C
136		0.435		0.401		0.425		0.679		0.340	
137		5.78		5.84		5.10		7.00		3.80	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129
139	139 + 140	0.158	C	0.258	C	0.339	C	0.354	C	0.105	C
140	139 + 140		C139		C139		C139		C139		C139
141		1.00		0.132	U	0.0731	U	0.199	U	0.0909	U
142		0.130	U	0.142	U	0.0786	U	0.201	U	0.0977	U
143	134 + 143		C134		C134		C134		C134		C134
144		0.141	EMPC	0.201	EMPC	0.261	EMPC	0.343		0.131	EMPC
145		0.0496	U	0.0598	U	0.0490	U	0.0591	U	0.0497	U
146		27.9		25.2		21.6		29.4		16.5	
147	147 + 149	4.56	C	4.97	C	6.85	C	10.1	C	3.54	C
148		0.0496	U	0.0764	U	0.0511	U	0.0736	U	0.0521	U
149	147 + 149		C147		C147		C147		C147		C147
150		0.0496	U	0.0574	U	0.0490	U	0.0559	U	0.0497	U
151	135 + 151 + 154		C135		C135		C135		C135		C135
152		0.0496	U	0.0547	U	0.0490	U	0.0531	U	0.0497	U
153	153 + 168	115	C	142	C	174	C	199	C	83.2	C
154	135 + 151 + 154		C135		C135		C135		C135		C135
155		0.0550	EMPC	0.0630	EMPC	0.0570	EMPC	0.0524	U	0.0497	U
156	156 + 157	17.3	C	16.9	C	18.8	C	22.2	C	12.3	C
157	156 + 157		C156		C156		C156		C156		C156
158		0.855		0.957		1.88		2.25		0.410	
159		0.0966	U	0.106	U	0.0586	U	0.154	U	0.0729	U
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129
161		0.0898	U	0.0985	U	0.0544	U	0.144	U	0.0677	U
162		0.847		0.642	EMPC	0.522	EMPC	0.679		0.540	EMPC
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129
164		0.240		0.0989	U	0.357		0.345	EMPC	0.264	EMPC
165		0.102	U	0.118	EMPC	0.0670	EMPC	0.175		0.0771	U
166	128 + 166		C128		C128		C128		C128		C128
167		10.6		10.6		13.6		16.7		8.46	
168	153 + 168		C153		C153		C153		C153		C153
169		0.0992	U	0.154	U	0.103	U	0.171	U	0.105	U
170		12.6		13.2		7.82		7.37		6.92	
171	171 + 173	0.879	C	1.33	C	1.32	C	2.00	C	0.560	C EMPC
172		1.30	EMPC	1.17		0.535		0.414		0.551	
173	171 + 173		C171		C171		C171		C171		C171
174		1.26		1.04		0.802		0.888		0.870	
175		0.391		0.493		0.316		0.476		0.206	
176		0.172	EMPC	0.233		0.324		0.526		0.108	EMPC
177		8.23		10.9		7.16		9.14		4.52	
178		3.61		4.15		2.71		5.19		1.45	
179		0.504	EMPC	0.474		0.750		1.48		0.478	EMPC
180	180 + 193	59.1	C	61.3	C	55.5	C	74.1	C	39.2	C
181		0.393	EMPC	0.343		0.324		0.381	EMPC	0.267	
182		0.0496	U	0.0718	U	0.0490	U	0.0807	U	0.0670	U
183	183 + 185	6.19	C	7.93	C	7.07	C	9.00	C	3.55	C
184		0.0496	U	0.0541	U	0.0490	U	0.0591	U	0.0505	U
185	183 + 185		C183		C183		C183		C183		C183
186		0.0496	U	0.0585	U	0.0490	U	0.0658	U	0.0546	U
187		75.8		69.5		55.2		87.9		47.6	
188		0.147		0.275		0.214		0.238		0.163	
189		1.33		1.19		1.04		1.25		0.851	
190		5.05		5.69		5.00		5.95		3.09	
191		0.750		0.639		0.727		0.997		0.304	
192		0.0496	U	0.0726	U	0.0490	U	0.0798	U	0.0678	U
193	180 + 193		C180		C180		C180		C180		C180
194		6.01		5.36		3.88		3.73		3.47	
195		3.41		3.75		3.38		2.76		1.97	
196		3.28		3.72		3.42		3.07		2.06	
197	197 + 200	0.395	C	0.359	C	0.521	C	0.565	C	0.140	C
198	198 + 199	8.55	C	8.71	C	5.10	C	6.56	C	3.64	C
199	198 + 199		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197
201		1.45		1.74		1.50		1.83		0.856	
202		1.31		1.88		1.84		2.76		0.635	
203		4.17		5.11		5.08		4.41		2.46	
204		0.0496	U	0.0494	U	0.0490	U	0.0570	U	0.0511	U
205		0.335		0.300		0.287		0.286		0.156	
206		2.11		2.18		1.63		1.31		1.06	
207		0.787		0.789	EMPC	0.772	EMPC	0.760		0.414	
208		1.24		1.18		0.799		0.735		0.506	
209		2.48		2.46		2.43		1.82		1.68	
Total PCBs as Congeners in ug/kg, wet weight											
Total PCBs as Congeners (full EMPC/full SDL)		0.706	J	0.746	J	0.783	J	0.984	J	0.469	J
Total PCBs as Congeners (KM-based)		0.692	J	0.735	J	0.774	J	0.952	J	0.456	J
Total PCBs as Congeners (KM-based, capped)		0.692	J	0.735	J	0.774	J	0.952	J	0.456	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-10
Crayfish PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Reference P78-CF 08030378CF 3/3/2008		Reference P79-CF 08030379CF 3/3/2008		Reference P82-CF 08030382CF 3/3/2008		Reference P90-CF 08031290CF 3/12/2008		Reference P91-CF 08031291CF 3/12/2008	
Individual Congeners in pg/g (ng/kg), wet weight											
1		0.228	U	0.238	U	0.127	U	0.0970	U	0.132	U
2		0.235	EMPC	0.324		0.130		0.0790		0.130	
3		0.204		0.185		0.166	EMPC	0.106		0.176	EMPC
4		0.627		0.544		0.337		0.262	U	0.297	
5		0.197	U	0.260	U	0.215	U	0.251	U	0.113	U
6		0.324		0.273		0.191	U	0.223	U	0.104	U
7		0.179	U	0.237	U	0.195	U	0.228	U	0.106	U
8		1.05		0.937		0.433		0.380		0.418	
9		0.174	U	0.229	U	0.189	U	0.221	U	0.101	U
10		0.174	U	0.230	U	0.190	U	0.222	U	0.100	U
11		42.9		71.1		60.0		25.9		51.0	
12	12 + 13	0.194	C U	0.256	C U	0.212	C U	0.247	C U	0.119	C U
13	12 + 13		C12		C12		C12		C12		C12
14		0.182	U	0.240	U	0.199	U	0.232	U	0.110	U
15		0.898		1.41		1.35		0.527		1.21	
16		0.365		0.349		0.414		0.263		0.320	
17		0.516		0.524		0.367		0.357		0.332	
18	18 + 30	1.30	C U	1.49	C U	1.29	C U	0.767	C U	1.34	C U
19		0.150		0.138	EMPC	0.0980		0.0760		0.0696	U
20	20 + 28	1.93	C U	2.59	C	4.47	C	2.65	C	2.75	C
21	21 + 33	0.622	C U	0.671	C U	0.554	C U	0.433	C U	0.336	C U
22		0.467		0.369		0.413	EMPC	0.384		0.328	
23		0.0536	U	0.0721	U	0.0675	U	0.0570	U	0.0644	U
24		0.0498	U	0.0529	U	0.0497	U	0.0500	U	0.0517	U
25		0.106	EMPC	0.101		0.0568	U	0.0710		0.0660	
26	26 + 29	0.311	C	0.500	C	0.355	C	0.195	C	0.252	C
27		0.0660		0.0760	EMPC	0.0940	EMPC	0.0498	U	0.0690	
28	20 + 28		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18
31		1.30	U	1.18	U	1.29	U	0.833	U	0.866	U
32		0.324	U	0.203	U	0.160	U	0.177	U	0.120	U
33	21 + 33		C21		C21		C21		C21		C21
34		0.0516	U	0.0695	U	0.0651	U	0.0549	U	0.0633	U
35		0.431		0.854		0.152	EMPC	0.0647	U	0.186	
36		0.0539	U	0.491		0.0679	U	0.0573	U	0.0635	U
37		1.96		3.13		4.20		1.96		4.04	
38		0.0523	U	0.0704	U	0.0658	U	0.0556	U	0.0633	U
39		0.0540	U	0.0728	U	0.0681	U	0.0575	U	0.0653	U
40	40 + 41 + 71	0.552	C U	0.536	C U	0.657	C U	0.590	C U	0.411	C U
41	40 + 41 + 71		C40		C40		C40		C40		C40
42		0.348	EMPC	0.342		0.762		0.608		0.841	
43		0.0640	U	0.0859	U	0.0871	U	0.0837	U	0.0782	U
44	44 + 47 + 65	1.68	C U	2.42	C	4.31	C	2.24	C U	4.11	C
45	45 + 51	0.287	C	0.227	C EMPC	0.262	C EMPC	0.234	C EMPC	0.157	C EMPC
46		0.0710		0.0866	U	0.0877	U	0.0843	U	0.0789	U
47	44 + 47 + 65		C44		C44		C44		C44		C44
48		0.271		0.267		0.394	EMPC	0.301		0.272	EMPC
49	49 + 69	0.658	C U	0.872	C U	1.14	C U	0.852	C U	0.738	C U
50	50 + 53	0.146	C EMPC	0.198	C	0.271	C	0.171	C	0.227	C
51	45 + 51		C45		C45		C45		C45		C45
52		1.79	U	2.31	U	3.57		1.87	U	2.06	U
53	50 + 53		C50		C50		C50		C50		C50
54		0.0498	U	0.0529	U	0.0497	U	0.0498	U	0.0492	U
55		0.0898	U	0.141	U	0.160	U	0.166	U	0.167	U
56		0.405		0.428		0.501		0.360		0.436	
57		0.0828	U	0.130	U	0.147	U	0.153	U	0.153	U
58		0.0837	U	0.132	U	0.149	U	0.155	U	0.150	U
59	59 + 62 + 75	0.0960	C	0.135	C	0.183	C	0.169	C EMPC	0.166	C
60		0.468	EMPC	0.764		2.63		1.47		1.55	
61	61 + 70 + 74 + 76	5.99	C	9.99	C	26.6	C	10.6	C	17.6	C
62	59 + 62 + 75		C59		C59		C59		C59		C59
63		0.752		1.49		2.13		0.626		1.34	
64		0.467		0.596		0.671		0.566	EMPC	0.429	
65	44 + 47 + 65		C44		C44		C44		C44		C44
66		5.43		9.40		27.9		14.4		16.5	
67		0.0710	U	0.151		0.203		0.131	U	0.201	EMPC
68		0.232		0.524		0.745		0.327	EMPC	0.403	
69	49 + 69		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40
72		0.0787	U	0.124	U	0.191		0.145	U	0.143	U
73		0.0498	U	0.0609	U	0.0617	U	0.0592	U	0.0550	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61
77		2.09		3.49		4.66		1.87		3.80	
78		0.0897	U	0.141	U	0.159	U	0.166	U	0.164	U
79		0.114	EMPC	0.264		0.434		0.176	EMPC	0.387	
80		0.0805	U	0.126	U	0.143	U	0.149	U	0.143	U
81		0.104	U	0.162	U	0.250	EMPC	0.204	U	0.188	U
82		0.187		0.153	EMPC	0.212		0.0887	U	0.170	EMPC
83	83 + 99	5.29	C	10.6	C	41.2	C	24.3	C	20.3	C
84		0.365		0.470		0.600		0.432		0.396	
85	85 + 116 + 117	2.44	C	4.25	C	7.65	C	2.14	C	4.15	C
86	86 + 87 + 97 + 108 + 119 + 125	1.61	C	3.53	C	10.2	C	3.29	C	6.91	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86
88	88 + 91	0.263	C	0.404	C	0.657	C	0.527	C	0.699	C EMPC
89		0.0653	U	0.0734	U	0.0927	U	0.0822	U	0.0955	U
90	90 + 101 + 113	3.55	C	7.01	C	17.1	C	5.30	C	9.27	C
91	88 + 91		C88		C88		C88		C88		C88
92		0.515		1.39		2.40		0.693	EMPC	1.25	
93	93 + 95 + 98 + 100 + 102	1.88	C U	3.47	C	6.93	C	2.75	C	5.56	C
94		0.0666	U	0.0749	U	0.0947	U	0.0839	U	0.0971	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93
96		0.0498	U	0.0496	U	0.0497	U	0.0498	U	0.0492	U
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93
103		0.0540	U	0.0607	U	0.0767	U	0.0680	U	0.0797	U
104		0.0498	U	0.0496	U	0.0497	U	0.0498	U	0.0492	U
105		3.34		7.99		24.8		15.5		14.3	
106		0.188	U	0.281	U	0.514	U	0.237	U	0.0985	U
107	107 + 124	0.217	C EMPC	0.665	C	1.67	C	0.264	C	0.945	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86
109		5.37		9.59		16.7		5.82		10.0	
110	110 + 115	2.04	C	3.44	C	4.76	C	3.40	C	3.36	C
111		0.0930	EMPC	0.189	EMPC	0.266	EMPC	0.0607	U	0.221	
112		0.0498	U	0.0520	U	0.0657	U	0.0582	U	0.0687	U
113	90 + 101 + 113		C90		C90		C90		C90		C90
114		2.36		3.56		8.15		4.71		4.17	
115	110 + 115		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85
118		69.7		122		323		264		163	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86
120		0.438	EMPC	0.769	EMPC	1.41		1.10		0.970	
121		0.0498	U	0.0536	U	0.0677	U	0.0600	U	0.0706	U
122		0.212	U	0.316	U	0.578	U	0.267	U	0.109	U
123		2.05		3.26		7.36		6.45		3.72	
124	107 + 124		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86
126		0.267	U	0.530		0.792	U	0.329	U	0.402	
127		0.212	U	0.315	U	0.587	EMPC	0.267	U	0.107	U

Table H-10
Crayfish PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Reference P78-CF 08030378CF 3/3/2008		Reference P79-CF 08030379CF 3/3/2008		Reference P82-CF 08030382CF 3/3/2008		Reference P90-CF 08031290CF 3/12/2008		Reference P91-CF 08031291CF 3/12/2008	
128	128 + 166	0.835	C	2.66	C	3.35	C	2.56	C	2.85	C
129	129 + 138 + 160 + 163	38.9	C	74.5	C	167	C	67.9	C	91.9	C
130		2.07		4.19		8.80		2.09	EMPC	4.86	
131		0.100	U	0.117	U	0.168	U	0.0908	U	0.159	EMPC
132		0.763		0.965	EMPC	2.19		1.16		2.32	
133		1.14		2.11		3.55		0.786		2.12	
134	134 + 143	0.180	C	0.443	C	0.580	C	0.355	C EMPC	0.358	C
135	135 + 151 + 154	2.13	C	4.33	C	8.38	C	2.25	C	5.58	C
136		0.435	EMPC	0.597		0.701		0.476		0.545	
137		4.02		6.47		14.5		8.45		5.64	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129
139	139 + 140	0.214	C	0.277	C EMPC	0.653	C	0.296	C EMPC	0.347	C
140	139 + 140		C139		C139		C139		C139		C139
141		0.0973	U	0.113	U	0.163	U	0.0880	U	0.923	EMPC
142		0.105	U	0.122	U	0.175	U	0.0946	U	0.158	U
143	134 + 143		C134		C134		C134		C134		C134
144		0.137		0.284	EMPC	0.994		0.205	EMPC	0.487	
145		0.0498	U	0.0496	U	0.0497	U	0.0498	U	0.0595	U
146		17.2		31.9		66.0		19.0		31.0	
147	147 + 149	3.72	C	6.69	C	15.9	C	5.17	C	12.0	C
148		0.0498	U	0.0579	U	0.0550	U	0.0514	U	0.0753	U
149	147 + 149		C147		C147		C147		C147		C147
150		0.0498	U	0.0496	U	0.0497	U	0.0498	U	0.0550	U
151	135 + 151 + 154		C135		C135		C135		C135		C135
152		0.0498	U	0.0496	U	0.0497	U	0.0498	U	0.0527	U
153	153 + 168	90.6	C	155	C	472	C	323	C	204	C
154	135 + 151 + 154		C135		C135		C135		C135		C135
155		0.0498	U	0.0560	EMPC	0.0840	EMPC	0.0498	U	0.0980	
156	156 + 157	13.0	C	18.8	C	39.1	C	29.6	C	20.4	C
157	156 + 157		C156		C156		C156		C156		C156
158		0.537		1.58		3.55		2.29		2.14	
159		0.0870		0.133	EMPC	0.172	EMPC	0.0730	EMPC	0.117	U
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129
161		0.0725	U	0.0844	U	0.122	U	0.0655	U	0.104	U
162		0.478		0.851	EMPC	1.48		0.464		0.895	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129
164		0.0728	U	0.525		1.17	EMPC	0.0658	U	0.377	EMPC
165		0.0825	U	0.141	EMPC	0.138	U	0.0746	U	0.135	EMPC
166	128 + 166		C128		C128		C128		C128		C128
167		8.16		11.2		30.1		27.3		13.4	
168	153 + 168		C153		C153		C153		C153		C153
169		0.0911	U	0.114	U	0.200	U	0.223	U	0.237	U
170		6.83		14.5		22.0		7.97		10.7	
171	171 + 173	1.02	C	1.50	C	2.96	C	2.87	C	2.60	C
172		0.632		1.42		2.50		0.262	EMPC	0.808	
173	171 + 173		C171		C171		C171		C171		C171
174		0.777		1.69		2.36		0.846	EMPC	0.949	
175		0.260		0.497		0.990		0.214	EMPC	0.578	EMPC
176		0.158		0.309		0.577		0.298	EMPC	0.665	
177		6.63		11.1		19.9		4.96		18.2	
178		2.81		4.35		8.53		2.81		5.70	
179		0.387		1.05		0.970		0.608		1.41	
180	180 + 193	41.9	C	70.1	C	145	C	98.6	C	71.1	C
181		0.303		0.457		0.789	EMPC	0.409		0.389	EMPC
182		0.0498	U	0.0563	U	0.0725	U	0.0589	U	0.0860	U
183	183 + 185	4.61	C	8.46	C	22.7	C	15.0	C	12.4	C
184		0.0498	U	0.0496	U	0.0546	U	0.0498	U	0.0621	U
185	183 + 185		C183		C183		C183		C183		C183
186		0.0498	U	0.0496	U	0.0591	U	0.0498	U	0.0726	U
187		47.4		85.3		167		53.4		83.7	
188		0.132		0.189		0.268		0.234		0.204	EMPC
189		0.907		1.31		2.20		1.29		1.14	EMPC
190		3.11		7.28		12.9		4.71		7.11	
191		0.452		0.996		2.02		1.61		0.641	EMPC
192		0.0498	U	0.0569	U	0.0734	U	0.0596	U	0.0850	U
193	180 + 193		C180		C180		C180		C180		C180
194		2.90		6.15		9.42		2.89		3.96	
195		2.28		3.87		5.80		3.45		3.94	
196		2.31		4.18		6.28		3.85		3.26	
197	197 + 200	0.296	C	0.479	C	0.713	C	0.827	C	0.638	C
198	198 + 199	4.93	C	9.03	C	14.9	C	3.19	C	7.24	C
199	198 + 199		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197
201		1.26		1.84		2.85		1.15		2.16	
202		1.27		1.98		2.91		1.42	EMPC	2.62	
203		2.70		8.67		11.8		4.45		5.92	
204		0.0498	U	0.0496	U	0.0514	U	0.0499	U	0.0661	U
205		0.207	EMPC	0.378		0.710		0.139	EMPC	0.380	
206		1.14		2.76		3.22		1.07		1.83	
207		0.599		0.766		1.27		0.849		0.892	
208		0.669		1.23		1.40		0.449	EMPC	1.06	
209		2.00		2.50		2.95		1.72		2.23	
Total PCBs as Congeners in ug/kg, wet weight											
Total PCBs as Congeners (full EMPC/full SDL)		0.510	J	0.889	J	1.96	J	1.14	J	1.03	J
Total PCBs as Congeners (KM-based)		0.496	J	0.876	J	1.94	J	1.12	J	1.02	J
Total PCBs as Congeners (KM-based, capped)		0.496	J	0.876	J	1.94	J	1.12	J	1.02	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-10
Crayfish PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Reference P92-CF 08031292CF 3/12/2008		Reference P94-CF 08031294CF 3/12/2008		Reference P98-CF 08031298CF 3/12/2008		Reference P100-CF 080312100CF 3/12/2008		Forebay - Goose Island P110 090429110CF 4/29/2009	
Individual Congeners in pg/g (ng/kg), wet weight											
1		0.341	U	0.162	U	0.145	U	0.135	U	0.201	U
2		0.327	EMPC	1.14		0.171		0.492		0.209	U
3		0.936		0.238		0.166		0.191		0.258	U
4		0.610	U	0.410		0.280		0.369		1.29	U
5		0.415	U	0.165	U	0.119	U	0.123	U	0.703	U
6		0.383	U	0.164	EMPC	0.110	U	0.152	EMPC	0.639	U
7		0.390	U	0.188		0.112	U	0.122		0.657	U
8		0.892	EMPC	0.718		0.414		0.586		0.600	U
9		0.369	U	0.147	U	0.106	U	0.109	U	0.634	U
10		0.369	U	0.147	U	0.105	U	0.109	U	0.626	U
11		37.3		61.9		28.1		58.0		19.8	
12	12 + 13	0.436	C U	0.174	C U	0.125	C U	0.129	C U	0.724	C U
13	12 + 13		C12		C12		C12		C12		C12
14		0.403	U	0.160	U	0.115	U	0.119	U	0.687	U
15		1.00	EMPC	1.00		0.932		1.24		0.914	U
16		0.326	U	0.323		0.214		0.407		0.292	
17		0.463	EMPC	0.424		0.202		0.452		0.295	EMPC
18	18 + 30	0.854	C U	1.02	C U	0.611	C U	1.31	C U	0.655	C EMPC
19		0.269	U	0.101		0.117	EMPC	0.117	EMPC	0.214	U
20	20 + 28	1.68	C U	1.79	C U	1.15	C U	2.60	C	2.23	C
21	21 + 33	0.582	C U	0.552	C U	0.311	C U	0.439	C U	0.460	C EMPC
22		0.430		0.431		0.286		0.433		0.566	EMPC
23		0.215	U	0.0928	U	0.0604	U	0.0513	U	0.115	U
24		0.201	U	0.0670	U	0.0577	U	0.0496	U	0.104	U
25		0.187	U	0.119		0.0650		0.100		0.117	
26	26 + 29	0.263	C	0.303	C EMPC	0.193	C	0.375	C	0.348	C
27		0.189	U	0.0652	U	0.0542	U	0.0660		0.0930	U
28	20 + 28		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18
31		1.03	U	1.06	U	0.553	U	0.911	U	1.09	
32		0.255	U	0.251	U	0.0990	U	0.221	U	0.132	
33	21 + 33		C21		C21		C21		C21		C21
34		0.212	U	0.0912	U	0.0594	U	0.0505	U	0.116	U
35		0.249	U	0.650		0.171		0.389		0.136	U
36		0.212	U	0.231		0.0596	U	0.112	EMPC	0.119	U
37		1.60		2.06		2.18		3.58		2.59	
38		0.212	U	0.0912	U	0.0594	U	0.0504	U	0.120	U
39		0.218	U	0.0941	U	0.0613	U	0.0520	U	0.117	U
40	40 + 41 + 71	0.672	C U	0.419	C U	0.269	C U	0.522	C U	0.647	C EMPC
41	40 + 41 + 71		C40		C40		C40		C40		C40
42		0.286	U	0.310	EMPC	0.248		0.670		0.512	
43		0.303	U	0.102	U	0.0911	U	0.0799	U	0.103	U
44	44 + 47 + 65	1.59	C U	1.72	C U	1.32	C U	2.84	C	2.15	C
45	45 + 51	0.263	C U	0.210	C EMPC	0.0792	C U	0.225	C	0.138	C EMPC
46		0.305	U	0.103	U	0.0919	U	0.0806	U	0.104	U
47	44 + 47 + 65		C44		C44		C44		C44		C44
48		0.303		0.214		0.150		0.270		0.321	
49	49 + 69	0.866	C U	0.659	C U	0.475	C U	0.759	C U	0.907	C
50	50 + 53	0.255	C U	0.185	C	0.0768	C U	0.205	C	0.150	C
51	45 + 51		C45		C45		C45		C45		C45
52		2.15	U	1.45	U	1.18	U	2.07	U	1.89	
53	50 + 53		C50		C50		C50		C50		C50
54		0.188	U	0.0742	U	0.0760		0.0496	U	0.130	U
55		0.360	U	0.145	U	0.0796	U	0.146	U	0.187	EMPC
56		0.349	U	0.300	EMPC	0.294		0.347		0.802	
57		0.328	U	0.132	U	0.0725	U	0.133	U	0.125	U
58		0.323	U	0.130	U	0.0712	U	0.131	U	0.133	U
59	59 + 62 + 75	0.205	C U	0.0690	C	0.0618	C U	0.134	C EMPC	0.207	C
60		0.425	EMPC	0.383	EMPC	0.404		0.977		0.875	
61	61 + 70 + 74 + 76	4.90	C	5.52	C	5.15	C	13.2	C	6.60	C
62	59 + 62 + 75		C59		C59		C59		C59		C59
63		0.762	EMPC	0.887	EMPC	1.02		1.42		0.777	
64		0.500	EMPC	0.420		0.355		0.462	EMPC	0.650	
65	44 + 47 + 65		C44		C44		C44		C44		C44
66		3.39		5.75		5.65		14.0		7.41	
67		0.288	U	0.116	U	0.0636	U	0.117	U	0.112	U
68		0.313	U	0.316		0.252	EMPC	0.423	EMPC	0.128	
69	49 + 69		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40
72		0.309	U	0.124	U	0.0681	U	0.125	U	0.121	U
73		0.213	U	0.0714	U	0.0641	U	0.0562	U	0.0568	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61
77		1.90		2.74		2.28		4.02		2.26	
78		0.353	U	0.142	U	0.0780	U	0.143	U	0.137	U
79		0.296	U	0.119	U	0.118	EMPC	0.379		0.146	
80		0.307	U	0.124	U	0.0678	U	0.124	U	0.120	U
81		0.401	U	0.151	U	0.146	EMPC	0.193	EMPC	0.145	U
82		0.362	U	0.135	EMPC	0.137		0.150		0.168	U
83	83 + 99	3.59	C	5.65	C	5.64	C	16.4	C	7.64	C
84		0.545	EMPC	0.375		0.208		0.491		0.560	
85	85 + 116 + 117	2.28	C	2.21	C	2.34	C	3.93	C	2.58	C
86	86 + 87 + 97 + 108 + 119 + 125	1.70	C	1.52	C	1.69	C	4.78	C	3.47	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86
88	88 + 91	0.383	C EMPC	0.287	C	0.243	C	0.439	C	0.404	C
89		0.333	U	0.0861	U	0.0579	U	0.0594	U	0.161	U
90	90 + 101 + 113	3.57	C	3.67	C	3.28	C	6.61	C	5.26	C EMPC
91	88 + 91		C88		C88		C88		C88		C88
92		0.475		0.548		0.504		0.951		0.850	
93	93 + 95 + 98 + 100 + 102	2.78	C	1.78	C U	1.71	C U	3.65	C	2.43	C
94		0.339	U	0.0875	U	0.0588	U	0.0604	U	0.162	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93
96		0.172	U	0.0652	U	0.0496	U	0.0496	U	0.0644	U
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93
103		0.278	U	0.0718	U	0.0495	U	0.0496	U	0.137	U
104		0.184	U	0.0744	U	0.0680	EMPC	0.0496	U	0.106	U
105		2.25		4.00		4.33		11.8		6.24	
106		0.240	U	0.152	U	0.0804	U	0.0962	U	0.190	U
107	107 + 124	0.254	C U	0.208	C EMPC	0.271	C	0.674	C	0.399	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86
109		5.65		6.22		5.98		10.0		4.75	
110	110 + 115	1.88	C EMPC	1.90	C	1.93	C	2.86	C	3.99	C
111		0.248	U	0.0950	EMPC	0.132	EMPC	0.178	EMPC	0.120	U
112		0.240	U	0.0652	U	0.0495	U	0.0496	U	0.108	U
113	90 + 101 + 113		C90		C90		C90		C90		C90
114		2.86		3.02		3.47		4.58		2.35	
115	110 + 115		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85
118		69.7		112		101		149		87.0	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86
120		0.500	EMPC	0.584		0.685		0.891	EMPC	0.398	
121		0.246	U	0.0652	U	0.0495	U	0.0496	U	0.118	U
122		0.264	U	0.167	U	0.0885	U	0.106	U	0.232	U
123		2.26		2.91		3.00		4.17		2.56	
124	107 + 124		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86
126		0.275	U	0.243	EMPC	0.261	EMPC	0.481		0.261	EMPC
127		0.261	U	0.165	U	0.0875	U	0.105	U	0.223	U

Table H-10
Crayfish PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Reference P92-CF 08031292CF 3/12/2008		Reference P94-CF 08031294CF 3/12/2008		Reference P98-CF 08031298CF 3/12/2008		Reference P100-CF 080312100CF 3/12/2008		Forebay - Goose Island P110 090429110CF 4/29/2009	
128	128 + 166	1.18	C	1.33	C	1.30	C	2.55	C	1.48	C EMPC
129	129 + 138 + 160 + 163	37.3	C	40.1	C	44.3	C	82.1	C	44.5	C
130		1.09		1.45		1.74		3.50		1.77	
131		0.368	U	0.174	U	0.0844	U	0.136	EMPC	0.195	U
132		0.558		0.534		0.584		1.07		1.42	
133		1.01		1.17		0.994		2.30		0.924	
134	134 + 143	0.354	C U	0.176	C EMPC	0.229	C EMPC	0.271	C EMPC	0.689	C EMPC
135	135 + 151 + 154	1.47	C	1.69	C	1.73	C	4.50	C	3.04	C
136		0.394		0.391		0.380		0.659		0.636	
137		4.20		3.77		4.24		5.77		4.13	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129
139	139 + 140	0.314	C U	0.148	C U	0.111	C EMPC	0.321	C EMPC	0.178	C U
140	139 + 140		C139		C139		C139		C139		C139
141		0.344	U	0.597		0.322	EMPC	0.711		0.177	U
142		0.368	U	0.173	U	0.0843	U	0.124	U	0.198	U
143	134 + 143		C134		C134		C134		C134		C134
144		0.256	U	0.0970		0.100	EMPC	0.366	EMPC	0.290	EMPC
145		0.204	U	0.0652	U	0.0495	U	0.0496	U	0.0866	U
146		15.6		17.7		17.4		31.8		15.0	
147	147 + 149	2.98	C	3.12	C	3.29	C	8.45	C	6.32	C
148		0.259	U	0.0779	U	0.0495	U	0.0496	U	0.111	U
149	147 + 149		C147		C147		C147		C147		C147
150		0.189	U	0.0652	U	0.0495	U	0.0496	U	0.0823	U
151	135 + 151 + 154		C135		C135		C135		C135		C135
152		0.181	U	0.0652	U	0.0495	U	0.0496	U	0.0787	U
153	153 + 168	78.8	C	140	C	129	C	171	C	136	C
154	135 + 151 + 154		C135		C135		C135		C135		C135
155		0.210	U	0.0684	U	0.160		0.0660		0.118	U
156	156 + 157	15.1	C	16.7	C	20.1	C	24.4	C	13.3	C
157	156 + 157		C156		C156		C156		C156		C156
158		0.249	U	0.652		0.625		1.69		1.04	
159		0.272	U	0.128	U	0.0624	U	0.0914	U	0.138	U
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129
161		0.242	U	0.114	U	0.0554	U	0.0812	U	0.139	U
162		0.678	EMPC	0.570	EMPC	0.757		0.882		0.400	EMPC
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129
164		0.266	U	0.126	U	0.0611	U	0.356	EMPC	0.579	EMPC
165		0.289	U	0.136	U	0.0663	U	0.0971	U	0.159	U
166	128 + 166		C128		C128		C128		C128		C128
167		9.47		12.3		16.6		18.0		11.2	
168	153 + 168		C153		C153		C153		C153		C153
169		0.301	U	0.307	U	0.0971	U	0.325	U	0.164	U
170		7.26		8.06		7.72		9.43		8.66	
171	171 + 173	0.667	C EMPC	0.817	C	0.768	C EMPC	1.89	C	0.960	C
172		0.750	EMPC	0.531		0.472		0.921	EMPC	0.676	EMPC
173	171 + 173		C171		C171		C171		C171		C171
174		0.723	EMPC	0.623		0.759		1.17		1.55	
175		0.281	U	0.317		0.219		0.435	EMPC	0.290	
176		0.210	U	0.174	EMPC	0.150		0.463	EMPC	0.285	EMPC
177		5.45		7.30		5.60		10.3		4.80	
178		2.29	EMPC	2.64		2.36		4.95		2.42	
179		0.305	EMPC	0.463		0.556		0.882		1.07	
180	180 + 193	58.7	C	57.2	C	65.5	C	79.3	C	57.3	C
181		0.336		0.344		0.278	EMPC	0.507		0.267	EMPC
182		0.274	U	0.0857	U	0.0549	U	0.123		0.142	EMPC
183	183 + 185	4.21	C	6.21	C	4.69	C	9.06	C	5.11	C
184		0.198	U	0.0652	U	0.0495	U	0.0496	U	0.0568	U
185	183 + 185		C183		C183		C183		C183		C183
186		0.231	U	0.0723	U	0.0495	U	0.0562	U	0.0589	U
187		58.6		53.6		60.0		79.9		52.2	
188		0.222	U	0.209		0.202	EMPC	0.297		0.155	EMPC
189		1.31		0.936		1.32		1.65		0.662	
190		4.30		6.46		4.93		10.7		4.73	
191		0.460		0.566	EMPC	0.483		0.857		0.841	
192		0.271	U	0.0847	U	0.0542	U	0.0658	U	0.0623	U
193	180 + 193		C180		C180		C180		C180		C180
194		3.85		2.91		3.44		4.53		3.76	
195		2.32	EMPC	3.12		2.36		3.87		2.48	
196		2.55		2.37		2.27		3.43		3.05	
197	197 + 200	0.244	C U	0.284	C	0.214	C	0.448	C	0.297	C EMPC
198	198 + 199	6.09	C	4.47	C	4.59	C	8.19	C	5.37	C EMPC
199	198 + 199		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197
201		1.27		1.51		1.28		2.01		1.20	
202		0.961	EMPC	1.21		1.18		2.22		1.63	
203		3.04		4.86		4.32		9.69		5.47	
204		0.238	U	0.0786	U	0.0495	U	0.0648	U	0.0637	U
205		0.288	U	0.319	EMPC	0.242	EMPC	0.450		0.315	EMPC
206		1.28		1.63		1.35		2.54		1.53	EMPC
207		0.757	EMPC	0.666		0.499		0.813		0.425	
208		0.701	U	0.739	EMPC	0.641		1.19		0.758	
209		2.02		2.37		1.71	EMPC	2.67		1.80	
Total PCBs as Congeners in ug/kg, wet weight											
Total PCBs as Congeners (full EMPC/full SDL)		0.528	J	0.665	J	0.620	J	0.958	J	0.614	J
Total PCBs as Congeners (KM-based)		0.498	J	0.650	J	0.609	J	0.946	J	0.587	J
Total PCBs as Congeners (KM-based, capped)		0.498	J	0.650	J	0.609	J	0.946	J	0.587	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-11
Sculpin PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay SF-01 F-1 9/17/2008		Forebay SF-02 F-2 9/17/2008		Forebay SF-03 F-3 9/17/2008		Forebay SF-04 F-4 9/17/2008		Forebay SF-05 F-5 10/22/2008		Forebay SF-06 F-6 9/19/2008	
Individual Congeners in pg/g (ng/kg), wet weight													
1		0.121	EMPC	0.161		66.3	U	0.205		0.246		0.382	
2		0.482		0.409		72.3	U	0.561		0.444		1.22	
3		0.220	EMPC	0.444	EMPC	77.0	U	0.496	EMPC	0.247		0.665	EMPC
4		1.03	EMPC	1.22	EMPC	336	U	1.01		1.78		2.94	
5		0.151	U	0.148	U	251	U	0.184	U	0.132	U	0.216	U
6		0.681		0.684		226	U	1.21	EMPC	0.961		1.75	
7		0.267	EMPC	0.154	EMPC	229	U	0.191	EMPC	0.233		0.469	EMPC
8		3.47		3.40		209	U	2.78		4.36		8.63	
9		0.233	EMPC	0.268		225	U	0.744		0.304		0.652	EMPC
10		0.139	U	0.136	U	230	U	0.169	U	0.121	U	0.206	U
11		211		191		233	U	90.5		124		450	
12	12 + 13	0.146	C U	0.143	C U	233	C U	1.07	C EMPC	0.127	C U	0.221	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.139	U	0.135	U	228	U	0.168	U	0.120	U	0.208	U
15		1.16	EMPC	1.19		278	U	0.620		0.854		2.93	EMPC
16		3.94		3.64		130	U	2.63		5.38		11.5	
17		6.55		5.96		189		14.6		14.8		36.3	
18	18 + 30	15.6	C	15.1	C	882	C EMPC	65.2	C	25.9	C	60.1	C
19		0.437		0.499	EMPC	111	U	0.492		1.01		1.76	
20	20 + 28	68.0	C	60.6	C	2,330	C	283	C	122	C	280	C
21	21 + 33	9.90	C	7.60	C	380	C	20.7	C	14.1	C	40.1	C
22		9.74		8.99		86.1	U	14.6		13.3		48.1	
23		0.0740	EMPC	0.0497	U	80.7	U	0.418		0.196	U	0.330	U
24		0.314	EMPC	0.248		79.9	U	0.290		0.376		0.655	
25		1.53		1.32		69.3	U	5.51		2.62		10.5	
26	26 + 29	7.77	C	6.49	C	211	C EMPC	31.4	C	12.4	C	38.8	C
27		1.00		1.02		79.0	U	2.75		2.39		7.03	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		29.8		23.0		850		243		37.4		170	
32		1.61		1.23		75.3	U	4.21		4.08		13.3	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.234	EMPC	0.210		79.8	U	0.804		0.397		1.02	
35		0.0680	EMPC	0.141		77.7	U	0.325	U	0.198	U	0.343	U
36		0.0517	U	0.0860		74.0	U	0.882	EMPC	0.169	U	0.302	U
37		2.53		3.54		96.5		28.7		9.62		13.9	
38		0.119	EMPC	0.108		78.9	U	1.99		0.559		0.972	
39		0.315	EMPC	0.184		76.6	U	8.92		1.95		3.59	
40	40 + 41 + 71	10.6	C	7.53	C	3,320	C	322	C	162	C	227	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		7.19		6.24		3,610		505		82.5		115	
43		2.21	EMPC	1.62		2,880		54.4		17.3		23.3	
44	44 + 47 + 65	71.3	C	67.5	C	52,400	C	5,620	C	1,120	C	1,300	C
45	45 + 51	2.10	C	1.52	C	313	C EMPC	5.89	C	11.8	C	20.4	C
46		0.359		0.385	EMPC	94.7	U	0.515		2.14		2.66	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		8.08		6.12		2,690		0.250	U	52.9		93.1	
49	49 + 69	56.3	C	53.1	C	35,700	C	8,730	C	909	C	1,090	C
50	50 + 53	1.05	C	0.876	C EMPC	1,090	C	18.7	C	18.5	C	15.5	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		142		109		165,000		29,800		3,220		3,640	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.0620	EMPC	0.0497	U	59.6	U	0.261		0.214	EMPC	1.38	
55		0.198	U	0.240	U	258	U	4.22	U	1.64	U	1.70	U
56		7.85		6.63		5,290		1,340		18.1		217	
57		0.622		0.608	EMPC	260	U	7.88		1.68		2.88	EMPC
58		0.405	EMPC	0.461		262	U	3.85	U	4.39	EMPC	4.32	EMPC
59	59 + 62 + 75	6.14	C	5.80	C	1,070	C	97.1	C	25.5	C	44.7	C
60		41.4		63.5		8,840		1,950		370		357	
61	61 + 70 + 74 + 76	246	C	360	C	131,000	C	41,600	C	3,970	C	5,880	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		14.2		31.5		2,480		501		199		82.5	
64		29.7		26.5		9,120		1,710		417		559	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		201		396		73,300		16,800		3,060		1,970	
67		1.28		1.39		225	U	10.4		2.07		8.86	
68		2.62		3.22		236	U	12.1		7.68		10.6	
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		3.46		3.83		237	U	19.2		9.09		15.4	
73		0.0505	U	0.0497	U	58.2	U	0.192	U	0.178	U	0.124	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		10.8		19.9		443		111		40.0		48.7	
78		0.494		0.241	U	251	U	47.1		26.2		6.78	EMPC
79		1.63		1.90		3,020		471		71.4		59.4	
80		0.456		0.486	EMPC	233	U	9.75	EMPC	3.83		1.57	
81		0.449	EMPC	0.807	EMPC	295	U	9.50	U	5.23	U	3.88	U
82		2.29	EMPC	1.23	EMPC	22,200		2,230		361		227	
83	83 + 99	708	C	1,480	C	315,000	C	69,000	C	33,400	C	8,610	C
84		6.44		4.50		29,200		1,240		588		420	
85	85 + 116 + 117	198	C	365	C	73,900	C	18,800	C	8,850	C	2,650	C
86	86 + 87 + 97 + 108 + 119 + 125	117	C	129	C	196,000	C	33,500	C	7,090	C	5,600	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	9.41	C	6.34	C	23,900	C	2,730	C	566	C	535	C
89		0.294		0.229	EMPC	366	U	6.26		31.7		25.4	
90	90 + 101 + 113	302	C	311	C	303,000	C	58,700	C	12,600	C	10,000	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		82.8		85.9		49,100		9,270		1,840		1,760	
93	93 + 95 + 98 + 100 + 102	96.2	C	75.1	C	113,000	C	12,100	C	2,720	C	2,860	C
94		0.0830		0.0908	U	363	U	1.96		4.01		1.48	
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.507	EMPC	0.300		234	EMPC	8.61		19.0		19.6	
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		1.35		0.795	EMPC	954		120		24.4		26.7	
104		0.0505	U	0.0615	U	52.9	U	0.490	U	0.400	U	0.189	U
105		383		881		269,000		38,200		21,400		5,130	
106		1.28	U	2.55	U	325	U	23.9	U	13.5	U	7.53	U
107	107 + 124	14.5	C	14.6	C	10,400	C	2,180	C	182	C	465	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		100		283		40,600		7,130		3,890		955	
110	110 + 115	197	C	197	C	247,000	C	45,700	C	12,200	C	9,350	C
111		1.83		5.01		256	U	6.01		4.76		3.22	
112		0.0505	U	0.0639	U	235	U	0.657	U	0.441	U	0.194	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		44.8		162		19,900		3,510		2,890		356	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		1,630		6,700		757,000		111,000		86,900		19,300	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		9.36		26.6		234	U	33.1		32.0		19.5	
121		0.677		1.11		259	U	1.55		1.54	EMPC	1.63	
122		1.44	U	2.87	U	4,460		257		15.2	U	56.0	
123		22.9		61.0		11,800		1,660		920		268	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		3.21		7.31		405	EMPC	54.0		29.1		11.7	
127		4.51		15.0		1,950		283		14.0	U	31.9	

Table H-11
Sculpin PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay SF-01 F-1 9/17/2008		Forebay SF-02 F-2 9/17/2008		Forebay SF-03 F-3 9/17/2008		Forebay SF-04 F-4 9/17/2008		Forebay SF-05 F-5 10/22/2008		Forebay SF-06 F-6 9/19/2008	
128	128 + 166	305	C	597	C	60,700	C	20,800	C	17,100	C	2,510	C
129	129 + 138 + 160 + 163	2,040	C	4,800	C	463,000	C	113,000	C	91,300	C	15,100	C
130		32.6		44.2		23,600		3,040		774		577	
131		0.630		0.562	U	2,350		332		48.0		38.7	
132		16.0		9.49		38,400		4,080		1,010		874	
133		37.7		107		4,820		912		827		176	
134	134 + 143	5.45	C	3.43	C	10,400	C	1,330	C	233	C	200	C
135	135 + 151 + 154	164	C	204	C	31,900	C	6,240	C	1,740	C	1,710	C
136		16.1		12.6		13,700		1,280		493		453	
137		130		424		57,700		12,800		14,700		979	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	34.3	C	70.6	C	6,590	C	2,040	C	1,530	C	306	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		63.5		74.5		37,700		7,460		2,330		1,220	
142		0.206	U	0.561	U	233	U	6.08	U	3.32	U	2.18	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		7.37		5.71		7,050		1,100		195		191	
145		0.0505	U	0.0497	U	55.1	EMPC	0.343	U	2.17		1.88	
146		304		845		59,200		10,500		7,890		1,840	
147	147 + 149	57.5	C	49.8	C	69,800	C	8,440	C	1,360	C	1,480	C
148		1.07	EMPC	1.15		91.1	EMPC	17.2		5.27		7.33	
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.0940		0.0497	U	61.9	EMPC	8.60		1.37		1.72	
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.377		0.332		49.8	U	10.4		9.62		8.39	
153	153 + 168	2,940	C	13,600	C	423,000	C	105,000	C	106,000	C	14,500	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		2.34	EMPC	5.11		46.1	U	4.50		5.38		4.76	
156	156 + 157	306	C	1,220	C	118,000	C	21,900	C	25,400	C	2,020	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		169		380		40,500		12,800		11,400		1,450	
159		1.03		1.11	EMPC	375		31.3		7.48		7.47	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.136	U	0.371	U	158	U	4.01	U	2.19	U	1.47	U
162		10.8		36.1		2,740		426		475		53.8	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		20.8		20.3		15,200		2,580		618		456	
165		1.73		4.68		177	U	14.5		14.3		1.64	U
166	128 + 166		C128		C128		C128		C128		C128		C128
167		97.9		322		30,800		5,230		3,520		766	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		2.46	U	7.04	U	164	U	23.2	U	28.8	U	5.51	U
170		285		1,120		49,200		9,460		12,900		988	
171	171 + 173	103	C	281	C	6,420	C	2,160	C	2,240	C	379	C
172		37.6		71.5		5,030		851		830		134	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		12.7		8.59		8,400		687		134		152	
175		5.64		11.3		839		125		63.5		27.8	
176		1.55		0.819		566		64.3		10.7		20.8	
177		40.6		58.0		8,900		851		309		311	
178		81.8		246		4,160		659		599		300	
179		26.8		21.3		2,220		318		121		220	
180	180 + 193	975	C	7,050	C	84,000	C	16,500	C	26,600	C	2,040	C
181		6.76		26.4		1,410		311		412		28.4	
182		2.35		3.95		266	EMPC	48.0		47.7		7.86	
183	183 + 185	234	C	788	C	16,100	C	3,520	C	3,550	C	721	C
184		2.66		6.37		48.8	U	12.0		12.0		5.82	
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0513	U	0.0497	U	53.4	U	0.475	U	0.246	U	0.137	EMPC
187		451		952		28,700		3,350		2,620		1,750	
188		1.06		2.28		53.1	U	6.22		4.29		3.12	
189		12.8		88.1		2,480		400		501		43.7	
190		107		421		7,060		1,640		1,990		294	
191		15.9		84.3		2,130		337		438		39.8	
192		0.0570	U	0.274	EMPC	56.0	U	0.528	U	0.273	U	0.124	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		101		422		9,210		950		1,480		147	
195		60.8		394		3,180		371		534		90.2	
196		59.5		445		3,890		462		688		86.5	
197	197 + 200	9.52	C	39.6	C	393	C	44.2	C	63.9	C	17.8	C
198	198 + 199	72.8	C	172	C	7,560	C	564	C	449	C	193	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		11.1		30.4		830	EMPC	65.7		48.2		29.6	
202		53.2		205		1,790		226		309		131	
203		128		409		2,960		717		1,220		232	
204		0.214	EMPC	0.765		35.6	U	0.801		1.10		0.363	
205		6.94		27.4		265		50.5		67.1		12.7	
206		54.5		147		1,650		321		635		75.8	
207		12.0		57.0		405		60.6		92.8		12.3	
208		10.7		26.7		631		54.2		54.7		20.0	
209		28.5		75.0		282		67.0		85.5		28.5	
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full SDL)		15.0	J	48.9	J	4,784	J	915	J	559	J	141	J
Total PCBs as Congeners (KM-based)		14.9	J	48.8	J	4,773	J	915	J	559	J	141	J
Total PCBs as Congeners (KM-based, capped)		14.9	J	48.8	J	4,773	J	915	J	559	J	141	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-11
Sculpin PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay SF-07 F-7 10/21/2008		Forebay SF-08 F-8 9/17/2008		Forebay SF-09 F-9 9/19/2008		Forebay SF-10 F-10 10/21/2008		Forebay SF-11 F-11 9/17/2008		Forebay SF-12 F-12 2/22/2008	
Individual Congeners in pg/g (ng/kg), wet weight													
1		0.234		0.178		0.160	EMPC	0.251	EMPC	0.175		0.929	J
2		0.446		0.473		0.535		0.479	EMPC	0.384		1.14	J
3		0.251	EMPC	0.265	EMPC	0.368	EMPC	0.594	EMPC	0.236	EMPC	0.702	EMPC
4		1.27		1.10		1.36		1.84		1.01		5.26	J
5		0.0876	U	0.112	U	0.172	U	0.134	EMPC	0.112	U	0.347	EMPC
6		0.687		0.657		0.161	U	0.125	U	0.518		2.55	J
7		0.146	EMPC	0.176		0.165	U	0.289		0.114	EMPC	0.477	J
8		3.26		3.58		3.05		5.69		2.44		12.2	J
9		0.241		0.244		0.237		0.391		0.178	EMPC	0.946	EMPC
10		0.0890	EMPC	0.106	U	0.163	U	0.125	U	0.106	U	0.257	EMPC
11		128		213		152		132		179		332	J
12	12 + 13	0.0896	C U	0.114	C U	0.176	C U	0.125	C U	0.114	C U	0.132	C UJ
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.0845	U	0.108	U	0.166	U	0.125	U	0.108	U	0.125	UJ
15		0.784		1.51	EMPC	0.923	EMPC	1.19		1.16	EMPC	1.98	EMPC
16		4.02		4.16		3.47		5.68		2.70		12.7	J
17		7.31		8.49		5.65		9.32		4.84		21.4	J
18	18 + 30	16.5	C	18.8	C	12.6	C	20.5	C	11.9	C	49.6	C J
19		0.561		0.461		0.534	EMPC	0.754		0.423		1.89	J
20	20 + 28	89.0	C	97.6	C	66.2	C	99.7	C	66.3	C	184	C J
21	21 + 33	11.8	C	13.0	C	8.45	C	16.7	C	7.27	C	28.3	C J
22		11.2		13.1		9.07		14.8		7.21		27.8	J
23		0.126		0.0752	U	0.0650	EMPC	0.125	U	0.0815	U	0.184	J
24		0.319		0.299		0.309		0.419		0.214		0.880	EMPC
25		1.75		1.90		1.31		2.45		1.13		3.53	J
26	26 + 29	9.60	C	10.5	C	6.89	C	11.5	C	6.60	C	18.2	C J
27		1.04		1.16		0.877		1.40		0.649		3.56	J
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		36.8		40.5		26.7		50.6		22.3		93.8	J
32		1.60		1.81		1.20		2.83		1.10		4.38	J
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.394		0.394	EMPC	0.280		0.422		0.273		0.630	J
35		0.0880	U	0.105	EMPC	0.107	EMPC	0.239		0.0847	U	0.179	UJ
36		0.0775	U	0.0689	U	0.0510	EMPC	0.138		0.0746	U	0.157	UJ
37		2.29		11.4		2.55		3.23		3.24		3.70	J
38		0.170	EMPC	0.151		0.125	EMPC	0.235	EMPC	0.108	EMPC	0.407	EMPC
39		0.464		0.454		0.364		0.653	EMPC	0.244		1.21	J
40	40 + 41 + 71	17.5	C	16.8	C	10.7	C	24.3	C	7.51	C	43.3	C J
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		14.3		12.4		9.84		15.5		5.21		42.9	J
43		3.47		3.43		1.97		4.51		2.04	EMPC	8.19	J
44	44 + 47 + 65	118	C	119	C	69.0	C	138	C	65.9	C	307	C J
45	45 + 51	2.74	C	2.59	C	2.00	C	4.74	C	1.32	C	8.77	C J
46		0.550		0.413	EMPC	0.489		0.836		0.300	EMPC	1.71	J
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		15.1		13.7		0.0623	U	0.125	U	6.24		40.9	J
49	49 + 69	105	C	105	C	62.2	C	128	C	57.5	C	208	C J
50	50 + 53	1.40	C	1.22	C	1.25	C	2.31	C	0.829	C	6.12	C J
51	45 + 51		C45		C45		C45		C45		C45		C45
52		231		234		122		310		123		564	J
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.0870	EMPC	0.0750	EMPC	0.0527	U	0.125	U	0.0570		0.125	UJ
55		0.236	U	0.396	U	0.262	U	0.361	U	0.341	U	0.745	UJ
56		11.2		11.6		8.27		15.7		5.84		37.9	J
57		1.12		1.48		0.775	EMPC	1.39		0.728		2.22	J
58		0.960		0.589		0.450		1.47		0.525		2.00	EMPC
59	59 + 62 + 75	10.5	C	10.1	C	5.95	C	12.8	C	5.67	C	26.4	C J
60		68.6		77.2		46.0		70.9		54.5		154	J
61	61 + 70 + 74 + 76	402	C	505	C	259	C	514	C	307	C	940	C J
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		19.2		31.0		14.4		16.6		22.1		33.5	J
64		58.4		54.8		37.4		73.9		27.7		0.125	UJ
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		330		458		227		318		319		633	J
67		2.17		2.52		1.52		2.71		1.23		4.86	J
68		3.55		4.22		2.92		3.66		3.36		7.33	J
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		5.47		5.89		3.24		5.80		3.92		9.79	J
73		0.0500	U	0.0501	U	0.0497	U	0.125	U	0.0498	U	0.125	UJ
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		12.8		29.8		11.4		14.3		14.2		29.2	J
78		0.905	EMPC	0.831		0.621		0.349	U	0.920		1.44	J
79		2.87		2.68		1.76		3.91		1.59		10.9	J
80		0.315	EMPC	0.441	EMPC	0.298	EMPC	0.306	U	0.385		0.717	J
81		0.553	U	1.45		0.382	EMPC	0.524	U	0.710	EMPC	0.818	UJ
82		4.11	EMPC	3.48		3.07		6.08		2.22	EMPC	16.8	J
83	83 + 99	1,020	C	1,210	C	524	C	1,060	C	877	C	1,880	C J
84		11.0		9.27		7.46		18.2		4.05		56.4	J
85	85 + 116 + 117	280	C	347	C	154	C	316	C	234	C	608	C J
86	86 + 87 + 97 + 108 + 119 + 125	241	C	227	C	133	C	342	C	110	C	733	C J
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	19.8	C	17.2	C	11.4	C	30.9	C	6.16	C	90.2	C J
89		0.750		0.638		0.470	EMPC	1.14		0.208	U	1.93	EMPC
90	90 + 101 + 113	730	C	661	C	375	C	920	C	291	C	2,080	C J
91	88 + 91		C88		C88		C88		C88		C88		C88
92		166		169		76.4		203		74.4		469	J
93	93 + 95 + 98 + 100 + 102	180	C	180	C	88.8	C	240	C	76.6	C	520	C J
94		0.232	U	0.214	U	0.262	U	0.224		0.214	U	0.449	J
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.928		0.804		0.448	EMPC	1.25		0.361	EMPC	2.09	J
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		3.09		2.50		1.54		3.67		0.943		7.22	J
104		0.103	U	0.103	U	0.113	U	0.137	U	0.106	U	0.141	UJ
105		600		752		325		652		527		1,210	J
106		1.73	U	1.97	U	1.18	U	1.60	U	1.74	U	3.09	U
107	107 + 124	25.9	C	33.6	C	16.7	C	43.3	C	17.7	C	63.8	C J
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		159		187		107		143		171		320	J
110	110 + 115	462	C	430	C	263	C	649	C	172	C	1,720	C J
111		2.87		3.04		1.87		2.16		3.10		4.08	J
112		0.159	U	0.146	U	0.179	U	0.144	U	0.147	U	0.219	UJ
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		55.3		73.4		32.7		47.8		68.2		63.8	J
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		2,430		3,000		1,360		2,090		2,880		3,840	J
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		14.7		16.2		8.97		11.0		16.8		22.6	J
121		1.17		1.09		0.633		1.08		0.789		2.38	J
122		1.94	U	2.20	U	1.32	U	1.79	U	1.95	U	3.46	U
123		32.6		37.6		21.4		24.1		39.4		30.3	J
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		4.35		5.97		3.21		4.20		5.50		10.2	J
127		3.82		6.00		2.78		4.89		5.91		3.17	U

Table H-11
Sculpin PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay SF-07 F-7 10/21/2008		Forebay SF-08 F-8 9/17/2008		Forebay SF-09 F-9 9/19/2008		Forebay SF-10 F-10 10/21/2008		Forebay SF-11 F-11 9/17/2008		Forebay SF-12 F-12 2/22/2008	
128	128 + 166	392	C	500	C	207	C	476	C	347	C	834	C J
129	129 + 138 + 160 + 163	3,090	C	3,700	C	1,550	C	3,270	C	2,960	C	5,390	C J
130		72.7		65.2		43.8		78.9		37.5		183	J
131		1.67		1.45		1.03		2.26		0.492	U	2.39	U
132		33.7		31.4		19.6		60.4		8.62		237	J
133		61.3		70.4		34.8		56.5		61.3		117	J
134	134 + 143	14.4	C	11.6	C	7.45	C	20.4	C	3.34	C	59.8	C J
135	135 + 151 + 154	320	C	307	C	144	C	356	C	138	C	1,030	C J
136		34.9		32.9		16.6		45.3		12.2		129	J
137		138		180		73.3		140		163		59.6	J
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	46.3	C	56.8	C	22.3	C	56.3	C	40.1	C	62.6	C J
140	139 + 140		C139		C139		C139		C139		C139		C139
141		115		130		53.5		161		65.4		123	J
142		0.370	U	0.424	U	0.330	U	0.520	U	0.501	U	2.44	UJ
143	134 + 143		C134		C134		C134		C134		C134		C134
144		16.8		14.2		8.62		22.3		5.07		31.2	J
145		0.101	U	0.0808	U	0.0954	U	0.125	U	0.0685	U	0.125	UJ
146		525		570		310		420		538		935	J
147	147 + 149	109	C	105	C	65.2	C	158	C	40.9	C	808	C J
148		2.23		1.86		1.11		2.52		0.727		8.49	J
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.202		0.152	EMPC	0.0900	U	0.273		0.0647	U	1.14	J
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.598		0.0745	U	0.341		0.808		0.305		1.94	J
153	153 + 168	4,650	C	5,270	C	2,190	C	3,950	C	6,260	C	5,280	C J
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		3.62		4.12		1.77		3.97		3.47		6.51	J
156	156 + 157	340	C	428	C	179	C	337	C	414	C	283	C J
157	156 + 157		C156		C156		C156		C156		C156		C156
158		233		293		106		284		205		186	J
159		1.63		1.64		0.922		1.93		0.778	EMPC	3.66	J
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.250	U	0.286	U	0.223	U	0.351	U	0.338	U	1.65	UJ
162		14.7		18.9		8.77		14.1		17.7		18.1	J
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		41.5		43.3		20.9		58.6		18.8		160	J
165		2.70		3.12		1.72		2.31		2.83		3.77	EMPC
166	128 + 166		C128		C128		C128		C128		C128		C128
167		116		140		71.6		93.5		165		131	J
168	153 + 168		C153		C153		C153		C153		C153		C153
169		3.65		3.63	U	2.18	U	3.22	U	4.79	U	4.05	U
170		328		388		175		373		478		218	J
171	171 + 173	152	C	177	C	77.6	C	188	C	159	C	127	C J
172		49.9		57.4		27.5		52.7		64.3		42.1	J
173	171 + 173		C171		C171		C171		C171		C171		C171
174		21.0		19.4		12.0		32.3		7.51		70.8	J
175		9.72		9.21		5.65		9.54		8.02		10.6	J
176		3.09		2.74		1.73		5.13		0.614	EMPC	13.6	J
177		85.4		72.4		57.1		91.3		45.5		414	J
178		159		168		87.7		147		133		386	J
179		67.1		53.3		34.3		82.8		17.5		333	J
180	180 + 193	1,290	C	1,460	C	693	C	1,150	C	2,270	C	744	C J
181		8.39		10.0		4.24		8.19		9.88		6.22	J
182		3.00		3.49		1.73	EMPC	3.59		2.68		3.09	J
183	183 + 185	347	C	384	C	172	C	379	C	398	C	309	C J
184		4.22		4.81		2.20		5.12		4.13		5.36	J
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0500	U	0.0574	U	0.0507	U	0.125	U	0.0498	U	0.125	UJ
187		705		643		468		526		654		2,230	J
188		1.83		1.76		1.34		1.47		1.75		5.34	J
189		13.5		15.7		8.13		13.6		20.9		9.62	J
190		172		202		83.0		170		242		161	J
191		19.9		24.2		10.3		21.1		33.3		11.1	J
192		0.0542	U	0.0647	U	0.0571	U	0.175	EMPC	0.101	EMPC	0.125	UJ
193	180 + 193		C180		C180		C180		C180		C180		C180
194		124		130		69.5		118		190		65.9	J
195		84.9		92.0		44.6		83.0		123		67.9	J
196		68.4		77.7		40.9		71.8		120		40.7	J
197	197 + 200	14.1	C	15.1	C	7.56	C	16.7	C	18.3	C	10.3	C J
198	198 + 199	115	C	108	C	73.7	C	91.8	C	110	C	155	C J
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		19.6		17.6		13.0		15.5		18.5		20.7	J
202		106		113		57.8		104		93.2		199	J
203		213		227		102		217		288		142	J
204		0.407		0.420		0.214		0.374	EMPC	0.476		0.229	J
205		11.2		11.6		5.74		10.7		14.3		5.73	J
206		73.4		74.9		40.7		66.6		73.4		34.8	J
207		14.5		15.6		8.48		14.6		18.3		7.46	J
208		17.4		16.3		10.9		13.9		14.4		14.8	J
209		37.1		39.3		20.9		29.6		34.9		15.9	J
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full SDL)		22.9	J	26.2	J	12.3	J	23.1	J	24.1	J	39.7	J
Total PCBs as Congeners (KM-based)		22.9	J	26.1	J	12.3	J	23.1	J	24.2	J	39.6	J
Total PCBs as Congeners (KM-based, capped)		22.9	J	26.1	J	12.3	J	23.1	J	24.1	J	39.6	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-11
Sculpin PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay SF-13 F-13 2/22/2008		Forebay SF-14 F-14 10/22/2008		Forebay SF-15 F-15 10/21/2008		Forebay SF-16 F-16 10/21/2008		Forebay SF-17 F-17 10/21/2008		Reference SR-01 R-1 7/23/2008	
Individual Congeners in pg/g (ng/kg), wet weight													
1		0.540	EMPC	0.160		1.94		0.218	EMPC	0.266	EMPC	0.165	
2		0.664	J	0.376		2.04		0.411		0.454		0.407	EMPC
3		2.45	EMPC	0.221	EMPC	20.9	EMPC	0.461	EMPC	0.595	EMPC	0.275	
4		2.43	J	1.32		0.989	EMPC	1.27		1.70		1.24	
5		0.157	UJ	0.0960		0.273	U	0.0870	EMPC	0.233	U	0.275	U
6		1.21	J	0.748		0.379	EMPC	0.637		1.34		0.641	
7		0.289	EMPC	0.202	EMPC	0.651		0.187		0.254		0.253	U
8		4.86	J	3.44		1.92		2.84		6.59		3.15	
9		0.547	J	0.286	EMPC	0.975	EMPC	0.221	EMPC	0.435		0.244	U
10		0.150	UJ	0.0830	EMPC	0.241	U	0.0760		0.206	U	0.257	U
11		114	J	127		138	EMPC	134		133		143	
12	12 + 13	0.924	C EMPC	0.0822	C U	0.269	C U	0.0759	C U	0.230	C U	0.257	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.152	UJ	0.0769	U	0.252	U	0.0710	U	0.215	U	0.246	U
15		0.731	J	0.975	EMPC	1.41		0.779		1.15		1.03	
16		4.24	J	3.92		0.937		3.27		6.22		3.55	
17		5.96	J	11.2		1.84		5.58		13.7		6.49	
18	18 + 30	15.2	C J	22.5	C	4.69	C	15.3	C	29.9	C	14.3	C
19		0.735	J	0.456	EMPC	0.272	EMPC	0.475		0.621		0.429	EMPC
20	20 + 28	66.4	C J	106	C	44.9	C	78.9	C	226	C	91.5	C
21	21 + 33	6.95	C J	13.3	C	3.29	C	7.60	C	26.2	C	12.5	C
22		6.41	J	14.5		3.51		8.85		23.2		12.6	
23		0.141	UJ	0.106	EMPC	0.132	U	0.117	EMPC	0.203	U	0.133	U
24		0.263	EMPC	0.352	EMPC	0.132	U	0.243		0.529	EMPC	0.239	
25		0.866	J	2.06		0.576		1.35		3.63		2.01	
26	26 + 29	6.67	C J	11.7	C	3.79	C	8.35	C	18.8	C	9.87	C
27		1.03	J	1.33		0.291	EMPC	0.954		1.91		0.802	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		35.4	J	44.5		15.2		32.2		88.9		46.4	
32		1.79	J	1.85		0.452	EMPC	1.35		7.15		1.36	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.153	EMPC	0.383		0.132	U	0.256		0.467		0.314	
35		0.141	UJ	0.114	EMPC	0.132	U	0.0929	U	0.219	U	0.133	U
36		0.141	UJ	0.0776	U	0.132	U	0.0800	U	0.188	U	0.114	U
37		0.874	J	2.34		0.716		2.51		4.10		2.85	
38		0.141	UJ	0.223		0.132	U	0.134	EMPC	0.342	EMPC	0.123	U
39		0.158	EMPC	0.663	EMPC	0.132	U	0.350		0.821		0.483	
40	40 + 41 + 71	7.86	C J	17.2	C	2.61	C	8.07	C	35.9	C	14.8	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		5.17	J	18.0		1.72		10.9		25.4		11.0	
43		1.55	J	0.245		0.880	EMPC	2.91		6.71		3.37	EMPC
44	44 + 47 + 65	66.9	C J	154	C	57.4	C	102	C	279	C	112	C
45	45 + 51	1.80	C J	2.51	C	1.21	C	2.00	C	4.69	C	2.33	C
46		0.493	EMPC	0.367	EMPC	0.132	U	0.395	EMPC	0.619	EMPC	0.380	EMPC
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		6.69	J	19.4		2.37		9.48		24.9		12.1	
49	49 + 69	58.7	C J	136	C	29.1	C	82.0	C	221	C	103	C
50	50 + 53	1.27	C J	1.03	C	0.223	C	0.972	C	2.17	C	0.952	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		151	J	277		61.8		165		361		216	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.141	UJ	0.0810	EMPC	0.132	U	0.0760	EMPC	0.108	EMPC	0.0903	U
55		0.240	UJ	0.819	U	0.336	U	0.349	U	1.18	U	0.334	U
56		5.32	J	9.89		1.47		6.50		22.3		12.4	
57		0.564	J	1.30		0.409		1.10		2.27		1.00	
58		0.285	J	0.734	U	0.301	U	0.509		1.06	U	1.06	
59	59 + 62 + 75	6.09	C J	13.0	C	3.84	C	8.31	C	22.2	C	9.92	C
60		43.9	J	108		51.1		59.4		249		69.0	
61	61 + 70 + 74 + 76	255	C J	585	C	257	C	477	C	1,090	C	415	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		10.4	J	28.2		12.9		29.4		49.5		15.1	
64		0.141	UJ	68.0		14.2		42.5		114		55.3	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		188	J	517		266		383		982		313	
67		0.612	J	2.45		0.479		1.44	EMPC	3.52		2.43	
68		2.22	J	4.44		2.11		6.21		5.00		3.30	
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		3.20	J	6.62		2.81		4.89		8.77		5.64	
73		0.141	UJ	0.0499	U	0.132	U	0.0501	U	0.100	U	0.0823	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		4.31	J	15.3		4.64		18.7		15.4		11.4	
78		0.365	J	1.21		0.505	EMPC	1.32		1.63	EMPC	0.318	U
79		1.26	J	3.25		0.664		1.91		4.36		2.03	
80		0.238	EMPC	0.682	U	0.280	U	0.460	EMPC	1.92	EMPC	0.390	EMPC
81		0.225	UJ	0.756	U	0.278	U	0.846	EMPC	1.11	U	0.938	EMPC
82		2.64	EMPC	2.98		0.629	EMPC	2.73		11.6		4.10	
83	83 + 99	502	C J	1,710	C	913	C	878	C	2,490	C	868	C
84		6.50	J	8.94		1.27	EMPC	6.94		21.6		11.2	
85	85 + 116 + 117	157	C J	454	C	158	C	252	C	708	C	266	C
86	86 + 87 + 97 + 108 + 119 + 125	119	C J	288	C	58.4	C	151	C	447	C	212	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	7.34	C J	18.9	C	2.27	C	11.2	C	33.3	C	18.0	C
89		0.210	EMPC	0.642		0.209	U	0.382		0.967		0.483	
90	90 + 101 + 113	342	C J	953	C	161	C	485	C	1,020	C	632	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		99.1	J	228		55.0		109		251		161	
93	93 + 95 + 98 + 100 + 102	100	C J	207	C	46.7	C	114	C	246	C	172	C
94		0.197	UJ	0.0839	U	0.214	U	0.138	U	0.286	U	0.113	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.342	EMPC	0.836		0.150	U	0.572		1.19		0.734	
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		1.43	J	3.07		0.430	EMPC	2.05		4.13		2.53	
104		0.145	UJ	0.0743	U	0.211	U	0.0719	U	0.167	U	0.0591	U
105		303	J	997		549		530		1,570		505	
106		0.900	UJ	2.63	U	1.58	U	3.47	U	3.90	U	1.27	U
107	107 + 124	13.0	C J	35.7	C	8.36	C	17.6	C	37.5	C	29.4	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		72.4	J	221		98.3		393		270		123	
110	110 + 115	191	C J	551	C	97.2	C	289	C	756	C	458	C
111		1.20	J	3.71		3.25		3.81		4.41		1.88	
112		0.141	UJ	0.0586	U	0.150	U	0.0964	U	0.200	U	0.0723	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		21.2	J	81.8		48.8		239		128		32.0	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		870	J	3,750		1,860		7,340		4,800		1,540	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		6.40	EMPC	22.0		8.18		19.8		18.5		10.2	
121		0.897	J	1.87		0.669	EMPC	1.15		2.29		0.984	
122		1.01	U	2.99	U	1.80	U	3.94	U	4.42	U	2.19	EMPC
123		12.8	EMPC	48.7		19.6		160		56.6		20.2	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		2.39	J	6.32		2.90		7.26		5.96		3.06	
127		1.62	J	5.70		3.59		20.6		10.7		1.30	U

Table H-11
Sculpin PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Forebay SF-13 F-13 2/22/2008		Forebay SF-14 F-14 10/22/2008		Forebay SF-15 F-15 10/21/2008		Forebay SF-16 F-16 10/21/2008		Forebay SF-17 F-17 10/21/2008		Reference SR-01 R-1 7/23/2008	
128	128 + 166	190	C J	670	C	401	C	335	C	877	C	361	C
129	129 + 138 + 160 + 163	1,380	C J	5,510	C	3,010	C	3,230	C	5,830	C	2,440	C
130		30.9	J	98.3		19.7		65.4		103		54.1	
131		0.754	EMPC	1.69	EMPC	0.507	U	0.997		3.00		1.51	
132		16.8	J	32.1		2.82		18.5		66.6		40.0	
133		27.1	J	100		60.4		73.6		91.2		45.1	
134	134 + 143	5.18	C J	14.3	C	1.24	C	6.60	C	17.2	C	11.1	C
135	135 + 151 + 154	180	C J	488	C	114	C	211	C	407	C	310	C
136		0.141	UJ	42.9		5.90		20.7		46.2		32.9	
137		47.2	J	180		95.0		602		366		76.5	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	22.3	C	78.3	C	22.9	C	31.3	C	95.7	C	39.1	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		66.6	J	148		47.9		81.5		266		108	
142		0.555	UJ	0.722	U	0.506	U	0.633	U	1.04	U	0.274	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		8.04	J	21.1		2.30		10.4		25.6		15.0	
145		0.141	UJ	0.0610	EMPC	0.132	U	0.0703	U	0.161	U	0.0554	U
146		216	J	840		547		977		721		352	
147	147 + 149	53.4	C J	128	C	17.8	C	82.6	C	196	C	131	C
148		1.32	J	3.54		0.597		1.89		3.14		2.23	
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.141	U	0.126	EMPC	0.132	U	0.0655	U	0.301	EMPC	0.251	EMPC
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.141	UJ	0.852		0.132	U	0.449		0.651	EMPC	0.597	
153	153 + 168	1,480	C	7,790	C	4,780	C	8,030	C	6,930	C	2,900	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		1.98		6.24		1.76		3.29		6.24		2.55	
156	156 + 157	123	C J	485	C	381	C	1,550	C	759	C	183	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		90.3	J	414		183		150		552		195	
159		0.799	J	1.34		0.556	EMPC	1.14	EMPC	2.38	EMPC	1.70	EMPC
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.375	UJ	0.504	U	0.353	U	0.442	U	0.724	U	0.183	U
162		6.02	J	20.6		13.4		37.4		28.5		9.42	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		25.1	J	52.9		12.3		27.0		73.1		41.0	
165		1.30	J	4.53		4.52		3.88		3.85	EMPC	1.64	
166	128 + 166		C128		C128		C128		C128		C128		C128
167		43.2	J	179		87.5		671		193		70.8	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		1.45	UJ	5.62	U	3.69	U	4.16	U	3.70	U	3.36	U
170		148	J	411		526		392		641		212	
171	171 + 173	67.6	C J	271	C	130	C	112	C	227	C	110	C
172		27.5	J	64.0		81.2		44.5		102		39.4	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		12.8	J	17.9		3.01		12.9		32.7		21.4	
175		5.47	J	15.2		5.04		11.3		14.8		6.60	
176		1.61	J	3.85		0.132	U	1.73		4.77		3.59	
177		38.4	J	110		19.2		78.6		93.9		60.8	
178		79.7	J	292		128		170		200		118	
179		35.1	J	91.6		10.2		36.5		61.0		57.7	
180	180 + 193	448	C J	1,650	C	1,620	C	2,710	C	1,860	C	624	C
181		3.13	J	11.3		5.02		20.4		13.8		4.30	
182		2.19	J	5.01		2.22	EMPC	3.02		6.29		2.14	
183	183 + 185	175	C J	595	C	319	C	360	C	520	C	224	C
184		1.86	J	7.70		1.58		3.24		5.89		3.14	
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.141	UJ	0.0570	U	0.132	U	0.0592	U	0.109	U	0.0672	U
187		306	J	1,100		710		1,350		720		450	
188		0.880	EMPC	2.90		0.692		2.99		2.25		1.19	
189		5.86	J	15.8		20.5		41.3		24.8		6.91	
190		67.0	J	246		169		193		191		97.8	
191		8.32	J	28.3		20.2		29.8		32.2		10.1	
192		0.141	UJ	0.225		0.132	U	0.184	EMPC	0.141	EMPC	0.0750	
193	180 + 193		C180		C180		C180		C180		C180		C180
194		62.3	J	116		179		155		204		65.2	
195		31.1	J	109		85.5		98.3		98.1		45.2	
196		42.7	J	86.9		68.2		121		109		38.0	
197	197 + 200	6.51	C J	20.7	C	12.1	C	12.8	C	16.2	C	9.08	C
198	198 + 199	87.9	C J	136	C	166	C	166	C	169	C	81.8	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		10.3	J	32.6		9.75		33.9		20.8		13.3	
202		49.4	J	193		49.4		100		122		67.5	
203		112	J	288		208		185		268		114	
204		0.225	J	0.483		0.276		0.319	EMPC	0.696		0.244	
205		4.88	J	14.8		12.0		9.79		13.1		5.36	
206		46.3	J	82.3		68.2		58.2		102		34.8	
207		13.2	J	18.3		12.0		24.1		18.4		7.22	
208		15.6	J	22.4		12.0		20.3		20.9		10.8	
209		22.4	J	41.9		22.8		34.8		31.6		17.8	
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full SDL)		9.90	J	35.4	J	19.6	J	35.6	J	40.7	J	16.8	J
Total PCBs as Congeners (KM-based)		9.87	J	35.3	J	19.4	J	35.6	J	40.7	J	16.9	J
Total PCBs as Congeners (KM-based, capped)		9.87	J	35.3	J	19.4	J	35.6	J	40.7	J	16.8	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-11
Sculpin PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Reference SR-02 R-2 7/24/2008		Reference SR-03 R-3 3/14/2008		Reference SR-04 R-4 10/9/2008		Reference SR-05 R-5 7/24/2008		Reference SR-06 R-6 2/26/2008		Reference SR-07 R-7 3/10/2008	
Individual Congeners in pg/g (ng/kg), wet weight													
1		0.190	EMPC	0.179	EMPC	0.213		0.323	EMPC	0.433		1.43	J
2		0.440	EMPC	0.235		0.413	EMPC	0.611		0.656	EMPC	0.719	J
3		0.241	EMPC	0.218	EMPC	0.212	EMPC	0.353		0.458	EMPC	0.424	J
4		1.41		1.26		2.03	EMPC	3.18	EMPC	1.81		16.9	J
5		0.250	U	0.192	U	0.198	U	0.242	EMPC	0.423	U	0.513	UJ
6		0.913		0.573		1.03		1.98		1.05		7.90	J
7		0.231	U	0.177	U	0.233	EMPC	0.419	EMPC	0.402	EMPC	0.726	EMPC
8		4.41		2.60		0.172	U	8.86		5.25		23.9	J
9		0.305	EMPC	0.201	EMPC	0.334		0.639		0.450	EMPC	2.21	J
10		0.234	U	0.179	U	0.184	U	0.198	EMPC	0.393	U	0.886	J
11		149		119		140		215		112		178	J
12	12 + 13	0.234	C U	0.179	C U	0.190	C U	0.182	C U	0.405	C U	1.65	C EMPC
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.224	U	0.171	U	0.185	U	0.177	U	0.395	U	0.479	UJ
15		1.25		0.587	EMPC	0.903		2.30		0.976		1.92	J
16		5.85		2.64		4.06		12.0		4.91		17.8	J
17		9.45		4.21		7.34		21.0		6.38		31.3	J
18	18 + 30	21.8	C	9.94	C	17.9	C	44.9	C	16.0	C	68.6	C J
19		0.741		0.392	EMPC	0.633		1.56		0.916		3.18	J
20	20 + 28	99.4	C	57.0	C	112	C	166	C	68.5	C	251	C J
21	21 + 33	15.2	C	5.84	C	15.1	C	29.9	C	9.51	C	39.8	C J
22		15.1		6.81		16.2		31.3		7.54		28.8	J
23		0.0906	U	0.118	U	0.109		0.239		0.246	U	0.221	EMPC
24		0.315		0.183	EMPC	0.277		0.532	EMPC	0.337		1.06	J
25		2.30		1.00		2.90		3.96		1.03		4.00	J
26	26 + 29	12.1	C	6.10	C	12.8	C	19.9	C	6.79	C	27.3	C J
27		1.62		0.658	EMPC	1.23		3.23		1.09		4.32	J
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		39.6		21.0		57.7		74.1		33.2		90.2	J
32		2.85		1.08		1.89		5.54		2.18		11.6	J
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.394	EMPC	0.165	EMPC	0.407		0.722		0.266	EMPC	0.561	J
35		0.198	EMPC	0.118	U	0.137	EMPC	0.288		0.253	U	0.164	UJ
36		0.160	EMPC	0.102	U	0.0852	U	0.138		0.210	U	0.136	UJ
37		4.47		2.27		2.06		7.28		0.674		1.41	J
38		0.171	EMPC	0.109	U	0.0926	U	0.276		0.228	U	0.149	EMPC
39		0.606	EMPC	0.108	U	0.0937	U	1.22	EMPC	0.245	EMPC	0.911	J
40	40 + 41 + 71	24.4	C	7.61	C	19.5	C	7.73	C	12.7	C	40.5	C J
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		19.4		10.9		15.2		40.8		7.92		24.9	J
43		5.15		2.22		4.15		7.29		2.78		7.10	J
44	44 + 47 + 65	156	C	103	C	126	C	257	C	82.8	C	204	C J
45	45 + 51	4.43	C	1.34	C	2.95	C	6.83	C	2.84	C	7.65	C J
46		0.709		0.124		0.434	EMPC	1.85		0.792	EMPC	1.76	J
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		18.5		8.93		16.0		35.7		9.05		30.3	J
49	49 + 69	121	C	86.1	C	123	C	183	C	67.3	C	177	C J
50	50 + 53	2.48	C	0.784	C	1.88	C	6.32	C	2.41	C	4.50	C J
51	45 + 51		C45		C45		C45		C45		C45		C45
52		284		175		256		424		161		347	J
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.0830	EMPC	0.0588	U	0.0597	U	0.182		0.141	U	0.149	EMPC
55		0.481	U	0.475	U	0.311	U	0.362	U	0.750	U	0.709	U
56		18.8		5.48	EMPC	18.6		39.5		7.33		14.0	J
57		1.02		0.803	EMPC	1.08		1.43		0.811		1.59	J
58		0.717	EMPC	0.502	EMPC	1.12		1.33	EMPC	0.725	U	0.813	J
59	59 + 62 + 75	13.2	C	8.70	C	12.1	C	21.4	C	7.98	C	18.1	C J
60		82.1		78.7		67.4		130		52.6		92.3	J
61	61 + 70 + 74 + 76	420	C	366	C	463	C	680	C	282	C	504	C J
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		19.5		22.5		17.0		28.0		12.0		23.7	J
64		64.0		41.0		70.2		116		38.8		0.122	UJ
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		387		409		310		579		215		409	J
67		2.81		1.73		3.48		4.59		0.972	EMPC	2.48	J
68		2.53		2.37		3.89		4.18		2.11		3.06	J
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		5.95		5.39		6.15		8.38		3.93		6.59	J
73		0.0706	U	0.0604	U	0.0582	U	0.0484	U	0.138	U	0.122	UJ
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		12.9		10.7		13.8		21.7		5.19		9.81	J
78		0.458	U	0.452	U	0.300	U	0.349	U	0.724	U	0.683	UJ
79		3.24		2.19		2.74		6.22		1.42		2.65	J
80		0.421	U	0.576		0.374	EMPC	0.542	EMPC	0.649	U	0.613	UJ
81		1.40	EMPC	1.36	EMPC	0.689	EMPC	1.98	EMPC	0.711	U	1.41	EMPC
82		6.24		1.61		9.57		15.7		4.30		5.96	J
83	83 + 99	1,200	C	1,730	C	817	C	1,930	C	632	C	1,010	C J
84		16.7		4.57		22.4		40.3		11.0		11.3	J
85	85 + 116 + 117	324	C	445	C	239	C	522	C	192	C	285	C J
86	86 + 87 + 97 + 108 + 119 + 125	263	C	233	C	274	C	496	C	145	C	269	C J
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	23.3	C	9.67	C	29.0	C	52.6	C	12.1	C	16.7	C J
89		0.984	EMPC	0.203		0.674		1.83		0.461	EMPC	0.568	J
90	90 + 101 + 113	758	C	775	C	758	C	1,270	C	412	C	748	C J
91	88 + 91		C88		C88		C88		C88		C88		C88
92		203		213		188		305		127		197	J
93	93 + 95 + 98 + 100 + 102	204	C	149	C	204	C	347	C	134	C	197	C J
94		0.209	U	0.186	U	0.225	EMPC	0.420		0.221	U	0.351	UJ
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		1.04		0.497		0.758		1.71		0.569		1.19	J
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		2.99		2.07		4.04		4.47		1.49	EMPC	3.21	J
104		0.0624	U	0.0757	U	0.0619	U	0.136	EMPC	0.119	U	0.131	UJ
105		685		972		455		1,040		358		591	J
106		2.10	U	2.11	U	1.27	U	2.23	U	0.903	U	1.48	UJ
107	107 + 124	25.9	C	23.7	C	32.9	C	41.6	C	13.6	C	22.9	C J
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		159		261		104		214		80.7		144	J
110	110 + 115	498	C	390	C	568	C	1,030	C	289	C	460	C J
111		2.70		4.18		1.70	EMPC	3.81		1.39	EMPC	2.44	J
112		0.134	U	0.119	U	0.118	U	0.106	U	0.142	U	0.225	UJ
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		47.1		82.1		27.2		71.6		25.0		39.2	J
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		2,180		3,870		1,270		3,490		1,050		1,710	J
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		14.1		24.1		8.82		21.2		7.27		11.7	J
121		1.68		0.133	U	0.985		1.95		0.878		1.62	J
122		2.24	U	2.25	U	2.92		3.59	EMPC	0.993	U	1.62	UJ
123		25.8		44.5		21.4		45.3		15.3		25.5	J
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		3.64		4.62		2.54		5.89		2.72		3.97	J
127		2.16	U	7.38		2.86		7.33		2.47		3.00	J

Table H-11
Sculpin PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Reference SR-02 R-2 7/24/2008		Reference SR-03 R-3 3/14/2008		Reference SR-04 R-4 10/9/2008		Reference SR-05 R-5 7/24/2008		Reference SR-06 R-6 2/26/2008		Reference SR-07 R-7 3/10/2008	
128	128 + 166	450	C	803	C	319	C	840	C	271	C	366	C J
129	129 + 138 + 160 + 163	3,310	C	6,350	C	2,110	C	5,890	C	1,820	C	2,740	C J
130		56.5		76.2		79.7		124		45.5		81.1	J
131		1.33	EMPC	0.470	U	3.10		3.26	EMPC	1.08		1.94	J
132		48.5		13.8		72.1		122		25.7		32.4	J
133		66.5		123		40.6		97.1		34.4		53.8	J
134	134 + 143	13.2	C	7.32	C	19.1	C	29.3	C	7.86	C	12.4	C J
135	135 + 151 + 154	398	C	531	C	354	C	623	C	243	C	378	C J
136		40.7		29.8		43.1		73.6		24.0		36.2	J
137		94.4		179		62.4		172		57.8		64.6	J
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	52.4	C	91.9	C	35.6	C	88.2	C	28.3	C	40.8	C J
140	139 + 140		C139		C139		C139		C139		C139		C139
141		124		138		110		197		78.2		107	J
142		0.543	U	0.458	U	0.209	U	2.05	U	0.379	U	0.569	UJ
143	134 + 143		C134		C134		C134		C134		C134		C134
144		17.6		15.7		24.0		32.0		10.7		19.0	J
145		0.0920		0.0663	U	0.0653	U	0.0970	EMPC	0.119	U	0.153	UJ
146		470		922		353		722		280		447	J
147	147 + 149	149	C	81.2	C	186	C	330	C	76.6	C	101	C J
148		2.72		3.30		2.86		4.08		2.00		2.91	J
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.171	EMPC	0.0639	U	0.469		0.509		0.119	U	0.147	UJ
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.783	EMPC	0.735	EMPC	0.555		1.24		0.472	EMPC	0.738	J
153	153 + 168	4,190	C	9,000	C	2,290	C	7,430	C	1,950	C	2,930	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		3.90		7.09		2.47	EMPC	6.49		2.12		3.24	J
156	156 + 157	239	C	464	C	148	C	438	C	140	C	187	C J
157	156 + 157		C156		C156		C156		C156		C156		C156
158		268		504		173		482		148		206	J
159		1.84		0.324	U	2.21		3.48	EMPC	1.63	EMPC	2.01	EMPC
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.362	U	0.305	U	0.144	U	1.41	U	0.262	U	0.393	UJ
162		12.1		27.8		7.82		19.7		6.76		9.81	J
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		42.3		35.8		49.1		87.1		31.1		57.1	J
165		2.65		4.47		1.58	EMPC	3.99		1.65		1.88	EMPC
166	128 + 166		C128		C128		C128		C128		C128		C128
167		91.2		175		60.6		149		51.9		77.0	J
168	153 + 168		C153		C153		C153		C153		C153		C153
169		4.03	U	7.77	U	2.14	U	7.56	U	2.90	U	3.95	UJ
170		245		528		186		560		188		188	J
171	171 + 173	153	C	361	C	100	C	304	C	91.3	C	113	C J
172		43.8		80.5		34.8		78.8		33.8		35.2	J
173	171 + 173		C171		C171		C171		C171		C171		C171
174		21.5		9.27		31.8		50.6		16.3		21.9	J
175		8.12		15.1		8.19		13.7		5.72		9.25	J
176		3.43		1.58		5.38		8.51		1.97		3.13	J
177		62.0		79.9		84.5		146		47.4		75.6	J
178		164		357		109		257		93.4		150	J
179		59.1		67.8		72.6		127		44.7		69.2	J
180	180 + 193	756	C	1,940	C	514	C	1,650	C	523	C	576	C J
181		5.84		13.6		3.82		11.5		3.39	EMPC	4.84	J
182		3.00		5.69		2.14	EMPC	5.39		2.46	EMPC	2.91	J
183	183 + 185	321	C	722	C	203	C	550	C	194	C	279	C J
184		4.75		9.57		2.70		7.93		2.38		3.31	J
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0495	U	0.0683	U	0.0721	U	0.0777	U	0.192	U	0.133	UJ
187		520		1,060		503		917		381		634	J
188		1.54		2.85		1.32		2.43		1.12		1.67	J
189		8.59		0.318	U	5.20		17.2		5.98		6.73	J
190		131		322		78.1		260		78.2		102	J
191		14.6		36.9		8.48		28.6		9.42		11.8	J
192		0.0680	EMPC	0.0719	U	0.0870	EMPC	0.193	EMPC	0.208	U	0.144	UJ
193	180 + 193		C180		C180		C180		C180		C180		C180
194		75.0		158		52.9		162		57.7		57.6	J
195		59.2		158		37.3		133		38.8		40.3	J
196		49.0		117		32.4		97.3		34.2		42.3	J
197	197 + 200	11.5	C	27.7	C	7.31	C	22.5	C	7.29	C	8.82	C J
198	198 + 199	83.8	C	153	C	73.8	C	132	C	67.1	C	87.0	C J
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		14.7		37.4		12.5		25.7		10.7		16.3	J
202		91.1		225		55.0		151		48.2		72.1	J
203		155		420		82.7		296		90.6		122	J
204		0.259		0.650		0.133	EMPC	0.378	EMPC	0.129	U	0.187	J
205		6.54		17.8		4.58		13.4		3.91		5.26	J
206		36.0		88.4		25.8		78.8		27.4		34.1	J
207		8.85		22.0		5.72		17.0		6.57		7.86	J
208		10.2		21.8		9.30		17.5		8.42		12.4	J
209		15.1		41.1		13.1		32.3		12.9		21.6	J
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full SDL)		22.0	J	37.5	J	15.9	J	38.4	J	12.3	J	19.3	J
Total PCBs as Congeners (KM-based)		21.9	J	37.5	J	15.9	J	38.3	J	12.2	J	19.2	J
Total PCBs as Congeners (KM-based, capped)		21.9	J	37.5	J	15.9	J	38.3	J	12.2	J	19.2	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-11
Sculpin PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Reference SR-08 R-8 10/9/2008		Reference SR-09 R-9 7/24/2008		Reference SR-10 R-10 7/23/2008		Reference SR-11 R-11 3/3/2008		Reference SR-12 R-12 10/9/2008		Reference SR-13 R-13 7/23/2008	
Individual Congeners in pg/g (ng/kg), wet weight													
1		0.182		0.166	EMPC	0.360	EMPC	0.231	EMPC	0.185	EMPC	0.231	EMPC
2		0.411	EMPC	0.672	EMPC	0.631	EMPC	0.450		0.483	EMPC	0.440	
3		0.236	EMPC	0.227	EMPC	0.428	EMPC	0.235	EMPC	0.245	EMPC	0.333	EMPC
4		2.10		2.49		4.05	EMPC	2.74		1.50		2.36	
5		0.229	U	0.199	U	0.371	U	0.207	U	0.140	U	0.220	U
6		1.10		1.70		2.18		1.70		0.818		1.75	
7		0.256	EMPC	0.283	EMPC	0.523	EMPC	0.221		0.180		0.218	EMPC
8		4.49		5.79		8.77		5.86		4.02		6.09	
9		0.366	EMPC	0.486		0.854		0.485	EMPC	0.286		0.310	
10		0.213	U	0.187	U	0.345	U	0.195	U	0.131	U	0.207	U
11		135		145		188		153		204		177	
12	12 + 13	0.219	C U	0.865	C EMPC	1.14	C	1.14	C EMPC	0.899	C	0.868	C EMPC
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.214	U	0.185	U	0.346	U	0.192	U	0.130	U	0.205	U
15		1.03		1.48		2.11		1.32		1.20		1.46	
16		4.60		7.35		10.4		7.77		4.10		13.9	
17		11.3		14.6		16.6		13.9		8.35		23.8	
18	18 + 30	21.0	C	31.9	C	35.4	C	32.1	C	18.1	C	53.1	C
19		0.566		0.918		1.90		1.17		0.552		0.986	
20	20 + 28	138	C	132	C	137	C	135	C	120	C	122	C
21	21 + 33	17.3	C	20.2	C	23.1	C	16.2	C	15.6	C	21.2	C
22		18.4		21.4		25.6		19.5		16.6		31.9	
23		0.137	U	0.0960		0.179	U	0.161		0.0764	U	0.165	U
24		0.245		0.421		0.490	EMPC	0.476	EMPC	0.306		0.505	EMPC
25		2.80		2.82		3.63		2.52		2.79		3.72	
26	26 + 29	14.5	C	14.6	C	16.3	C	15.1	C	14.2	C	15.5	C
27		1.25		2.25		2.91		2.21		1.17	EMPC	4.40	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		65.6		60.9		65.1		53.2		56.5		57.6	
32		2.65		3.92		5.34		3.61		1.84		3.38	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.434		0.514	EMPC	0.480		0.494		0.527		0.367	
35		0.141	U	0.0840	U	0.184	U	0.173	EMPC	0.148	EMPC	0.194	EMPC
36		0.117	U	0.0880	EMPC	0.153	U	0.117	EMPC	0.0724	U	0.157	U
37		1.73		3.61		6.08		3.97		2.59		2.41	
38		0.127	U	0.0747	U	0.166	U	0.0917	U	0.129	EMPC	0.217	EMPC
39		0.651	EMPC	0.821		0.842		0.763	EMPC	0.589		1.32	
40	40 + 41 + 71	20.4	C	27.1	C	39.5	C	23.7	C	18.6	C	29.1	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		14.4		24.8		31.6		22.6		0.0810	U	54.5	
43		4.02		5.23		5.78		5.05		4.49		4.26	
44	44 + 47 + 65	140	C	167	C	195	C	184	C	149	C	218	C
45	45 + 51	2.69	C	4.45	C	8.79	C	4.06	C	2.35	C EMPC	3.76	C
46		0.425	EMPC	0.753	EMPC	2.14	EMPC	0.814		0.447	EMPC	0.788	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		18.0		23.4		25.8		21.0		16.4		29.1	
49	49 + 69	135	C	132	C	138	C	154	C	141	C	134	C
50	50 + 53	0.994	C	2.28	C	7.73	C	3.31	C	1.18	C EMPC	4.64	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		253		285		333		307		315		312	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.0740	EMPC	0.0687	U	0.131	EMPC	0.0833	U	0.0780	EMPC	0.102	EMPC
55		0.283	U	0.256	U	0.278	U	0.313	U	0.214	U	0.381	U
56		13.4		17.7		34.0		15.1		15.1		26.5	
57		1.37		1.22		1.15		1.46		1.43		1.07	EMPC
58		1.14	EMPC	0.941		1.04		0.976		1.03	EMPC	0.607	EMPC
59	59 + 62 + 75	13.1	C	14.7	C	16.7	C	16.4	C	13.9	C	15.5	C
60		84.7		80.6		84.0		113		100		96.9	
61	61 + 70 + 74 + 76	520	C	466	C	493	C	602	C	575	C	574	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		20.9		19.2		20.0		29.3		23.8		20.8	
64		64.5		77.5		89.5		0.0727	U	71.0		77.5	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		393		380		389		536		477		481	
67		3.37		3.13		3.69		3.16		3.69		4.39	
68		3.57		3.39		3.49		4.12		4.16		3.46	
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		6.68		5.74		6.17		7.90		8.43		5.17	
73		0.0560	U	0.0595	U	0.0994	U	0.0732	U	0.0593	U	0.0525	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		13.9		13.2		17.8		13.8		17.7		21.3	
78		0.272	U	0.246	U	0.269	U	0.302	U	0.206	U	0.367	U
79		2.53	EMPC	3.07		5.75	EMPC	3.47		2.58	EMPC	7.86	
80		0.244	U	0.529		0.241	U	0.446	EMPC	0.423	EMPC	0.474	
81		1.19	EMPC	1.04	EMPC	1.39	EMPC	1.42	EMPC	0.998	EMPC	1.56	EMPC
82		3.60		5.26		17.9		4.65		4.09		11.8	EMPC
83	83 + 99	1,060	C	940	C	1,220	C	1,720	C	1,490	C	1,290	C
84		7.56		12.8		43.3		12.4		10.8		22.4	
85	85 + 116 + 117	280	C	269	C	335	C	456	C	403	C	368	C
86	86 + 87 + 97 + 108 + 119 + 125	235	C	256	C	366	C	322	C	289	C	411	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	14.9	C	23.7	C	51.1	C	21.8	C	20.0	C	33.8	C
89		0.486	EMPC	0.781	EMPC	1.92	EMPC	0.582		0.598	EMPC	1.29	U
90	90 + 101 + 113	688	C	746	C	925	C	926	C	953	C	1,050	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		176		181		227		262		254		207	
93	93 + 95 + 98 + 100 + 102	166	C	198	C	283	C	232	C	240	C	238	C
94		0.258	U	0.123	U	0.326	U	0.226	U	0.248	U	1.33	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.850		0.921		1.60		0.883	EMPC	0.927		1.08	
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		3.11		2.84	EMPC	4.21		3.12		3.45		3.55	
104		0.110	U	0.0526	U	0.137	U	0.0866	U	0.104	U	0.155	U
105		593		531		692		937		828		885	
106		1.45	U	1.47	U	1.86	U	1.65	U	1.60	U	2.45	U
107	107 + 124	31.2	C	28.3	C	33.3	C	36.5	C	46.5	C	41.7	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		139		133		138		220		206		178	
110	110 + 115	425	C	544	C	748	C	585	C	554	C	768	C
111		2.20		1.90		2.61		3.97		2.98		2.97	
112		0.166	U	0.0788	U	0.209	U	0.145	U	0.159	U	0.886	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		37.6		34.7		47.8		68.3		54.4		60.5	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		1,790		1,720		2,190		3,130		2,800		2,790	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		11.8		11.0		13.6		21.6		17.7		12.1	
121		0.184	U	1.13		0.232	U	2.16		1.84		1.28	
122		1.59	U	1.70	U	3.66	EMPC	1.92	U	2.40	EMPC	2.83	U
123		21.6		23.2		29.8		35.8		33.3		47.0	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		3.40		3.35	EMPC	3.80		5.19		5.93		4.83	
127		2.65	EMPC	3.13		4.57	EMPC	5.76		4.70		7.05	

Table H-11
Sculpin PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Reference SR-08 R-8 10/9/2008		Reference SR-09 R-9 7/24/2008		Reference SR-10 R-10 7/23/2008		Reference SR-11 R-11 3/3/2008		Reference SR-12 R-12 10/9/2008		Reference SR-13 R-13 7/23/2008	
128	128 + 166	367	C	353	C	465	C	682	C	550	C	614	C
129	129 + 138 + 160 + 163	2,660	C	2,550	C	3,310	C	4,910	C	4,120	C	5,200	C
130		71.4		72.1		93.2		95.1		88.0		101	
131		1.41		1.48		4.08		1.37		1.72		3.67	EMPC
132		26.3		42.4		120		37.8		39.5		68.6	
133		50.8		48.8		59.8		96.1		76.3		62.4	
134	134 + 143	9.89	C	13.3	C	25.8	C	12.3	C	14.5	C	24.7	C
135	135 + 151 + 154	308	C	359	C	456	C	556	C	484	C	386	C
136		27.3		36.2		58.8		44.2		41.4		44.5	
137		73.3		64.1		106		150		132		168	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	40.8	C	38.1	C	53.3	C	80.6	C	66.6	C	65.5	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		91.2		94.5		135		144		155		155	
142		0.270	U	0.472	U	0.486	U	0.415	U	0.399	U	1.45	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		15.6		17.3		26.1		21.4		21.5		23.7	
145		0.0546	U	0.0551	U	0.184	EMPC	0.0546	U	0.0788	U	0.112	
146		413		421		531		769		645		642	
147	147 + 149	95.5	C	156	C	322	C	164	C	139	C	243	C
148		2.63		2.67		3.11		3.92		3.39		2.59	
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.145	EMPC	0.269	EMPC	0.773		0.268	EMPC	0.226		0.302	EMPC
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.571		0.691		1.02		0.890		0.904		1.07	
153	153 + 168	2,960	C	3,130	C	4,000	C	6,740	C	5,350	C	7,400	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		3.39		3.10		4.40		6.36		4.76		3.29	
156	156 + 157	192	C	178	C	270	C	374	C	322	C	402	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		219		191		265		415		338		383	
159		1.39		1.46		2.68	EMPC	1.83		1.46	EMPC	1.26	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.187	U	0.327	U	0.336	U	0.288	U	0.276	U	1.00	U
162		10.2		8.85		11.6		18.8		15.2		14.1	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		36.5		49.7		57.7		58.0		56.3		55.8	
165		1.98		1.89		2.26		3.87		2.85		2.15	
166	128 + 166		C128		C128		C128		C128		C128		C128
167		73.9		81.1		101		142		136		170	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		2.94	U	3.84	U	4.56	U	5.86	U	3.84	U	5.05	U
170		196		181		281		425		340		297	
171	171 + 173	121	C	112	C	150	C	263	C	190	C	177	C
172		36.5		33.8		49.7		65.1		58.7		46.0	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		15.7		22.8		47.4		21.9		21.9		24.7	
175		7.83		7.42		9.47		12.8		10.1		12.6	
176		2.40		3.50		8.24		3.44		3.43		6.51	
177		65.8		80.4		115		93.7		79.6		127	
178		136		131		159		247		189		193	
179		52.6		68.1		93.6		78.8		74.4		99.4	
180	180 + 193	584	C	576	C	841	C	1,360	C	1,020	C	998	C
181		4.27		3.94		5.73		9.47		7.52		9.42	EMPC
182		2.14		2.23		3.24	EMPC	4.87		3.17		6.30	
183	183 + 185	242	C	233	C	319	C	508	C	379	C	362	C
184		3.47		3.25		4.93		7.63		5.13		3.80	
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0565	U	0.0690	U	0.112	U	0.0644	U	0.0647	U	0.384	U
187		509		627		661		844		673		818	
188		1.40	EMPC	1.31		1.67		2.45		1.95		2.45	
189		6.40		5.93		9.63		14.2		11.5		9.74	
190		98.2		98.7		135		227		172		146	
191		10.3		10.2		14.7		25.6		17.5		19.2	
192		0.0960		0.0960		0.121	U	0.199		0.104		0.427	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		53.1		55.1		84.5		130		104		71.4	
195		41.6		44.3		66.2		124		83.2		70.8	
196		32.4		34.7		54.3		90.8		62.5		50.3	
197	197 + 200	8.12	C	8.57	C	12.2	C	20.6	C	14.6	C	13.5	C
198	198 + 199	67.5	C	81.0	C	96.6	C	130	C	112	C	93.6	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		12.2		14.6		17.6		26.8		21.6		27.6	
202		70.4		71.3		84.0		161		120		118	
203		98.9		113		151		290		193		188	
204		0.194	EMPC	0.245		0.212	EMPC	0.401	EMPC	0.315		0.392	EMPC
205		4.93		5.08		7.20		13.0		8.62		8.12	
206		31.0		31.1		46.3		66.0		45.8		42.1	
207		6.60		6.47		10.3		16.2		11.1		9.85	
208		10.1		10.5		13.5		17.9		14.0		13.7	
209		16.8		16.9		23.6		34.6		24.0		20.9	
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full SDL)		18.2	J	18.5	J	24.0	J	32.4	J	27.6	J	31.5	J
Total PCBs as Congeners (KM-based)		18.1	J	18.4	J	24.0	J	32.4	J	27.5	J	31.5	J
Total PCBs as Congeners (KM-based, capped)		18.1	J	18.4	J	24.0	J	32.4	J	27.5	J	31.5	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-11
Sculpin PCB Congener Analysis Results
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IUPAC #	COELUTING CONGENERS[1]	Reference SR-14 R-14 10/10/2008		Reference SR-15 R-15 10/9/2008		Reference SR-16 R-16 10/10/2008		Reference SR-17 R-17 10/9/2008		Reference SR-18 R-18 7/24/2008		Forebay - Goose Island P110 09042911 0S C 4/29/2009	
Individual Congeners in pg/g (ng/kg), wet weight													
1		0.368	EMPC	0.175		0.163	EMPC	0.234	EMPC	0.228		0.437	EMPC
2		0.523		0.295	EMPC	0.396	EMPC	0.589		0.447	EMPC	0.294	
3		0.471	EMPC	0.231	EMPC	0.241		0.274	EMPC	0.238		0.388	EMPC
4		2.46	EMPC	1.29		1.88		1.80		1.94		3.87	EMPC
5		0.605	U	0.290	U	0.251	U	0.245	U	0.407	U	0.519	U
6		1.36	EMPC	0.637		1.10		1.08		1.23	EMPC	2.16	
7		0.572	U	0.268	U	0.233		0.298	EMPC	0.375	U	0.485	U
8		5.51		2.81		4.46		5.31		5.02		7.58	
9		0.560	EMPC	0.259	U	0.272		0.380		0.406	EMPC	0.540	EMPC
10		0.562	U	0.273	U	0.236	U	0.230	U	0.383	U	0.462	U
11		183		109		177		264		139		34.1	
12	12 + 13	0.580	C U	0.694	C	0.239	C U	0.233	C U	0.388	C U	0.534	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.565	U	0.270	U	0.233	U	0.227	U	0.378	U	0.507	U
15		1.10	EMPC	0.932		1.15	EMPC	1.88	EMPC	1.41		1.05	EMPC
16		7.31		2.89		6.85		5.43		6.97		8.56	
17		12.9		5.33		9.92		12.2		11.4		17.8	
18	18 + 30	28.1	C	13.2	C	23.7	C	27.9	C	26.3	C	37.6	C
19		1.03	EMPC	0.573		0.674		0.444		1.05	EMPC	1.26	
20	20 + 28	142	C	67.2	C	76.9	C	155	C	117	C	155	C
21	21 + 33	21.3	C	8.28	C	12.8	C	23.4	C	17.2	C	29.7	C
22		23.5		8.69		15.4		21.2		16.8		23.1	
23		0.210	U	0.171	U	0.233	U	0.152	EMPC	0.142	EMPC	0.143	EMPC
24		0.398		0.201		0.262	EMPC	0.357	EMPC	0.360		0.644	EMPC
25		3.39		1.33		2.14		3.37		2.69		2.42	
26	26 + 29	16.4	C	7.57	C	9.32	C	17.9	C	13.9	C	14.2	C
27		2.01		0.839		1.73		1.70		1.90		3.15	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		70.6		27.5		38.7		80.1		55.9		38.0	
32		3.64		1.12		1.70	EMPC	3.30		3.40		9.17	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.201	U	0.225	EMPC	0.349	EMPC	0.612		0.527		0.537	
35		0.215	U	0.183	U	0.248	U	0.199	EMPC	0.142	U	0.123	U
36		0.179	U	0.162	U	0.221	U	0.146	EMPC	0.126	U	0.107	U
37		2.13		2.50		2.79	EMPC	3.33		2.64		2.36	
38		0.194	U	0.162	U	1.25	U	0.268	EMPC	0.126	U	0.108	U
39		0.948		0.279	EMPC	0.496		0.948	EMPC	0.739		0.556	
40	40 + 41 + 71	33.4	C	8.80	C	12.8	C	22.3	C	22.5	C	35.1	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		31.5		6.15		14.3		11.7		18.2		15.6	
43		5.61		2.25		2.41		5.71		4.45		5.01	
44	44 + 47 + 65	196	C	70.2	C	87.6	C	156	C	142	C	104	C
45	45 + 51	5.36	C	1.39	C EMPC	2.41	C	2.93	C	4.54	C	4.24	C
46		1.09		0.248	EMPC	0.225		0.394	EMPC	0.963	EMPC	0.608	EMPC
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		26.3		7.80		11.5		18.9		18.6		15.2	
49	49 + 69	148	C	61.2	C	65.0	C	146	C	117	C	92.5	C
50	50 + 53	2.89	C	0.790	C	1.70	C	0.234	C EMPC	3.02	C EMPC	1.99	C EMPC
51	45 + 51		C45		C45		C45		C45		C45		C45
52		356		143		157		374		296		161	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.152	U	0.0919	U	0.0958	U	0.166	EMPC	0.132	EMPC	0.130	U
55		0.618	U	0.358	U	0.328	U	0.409	U	0.401	U	6.82	
56		25.7		7.88		11.5		17.8		23.0		17.1	
57		1.60	EMPC	0.745		0.639		1.70		1.23		0.714	
58		1.55	EMPC	0.517	EMPC	0.567	EMPC	1.23	EMPC	0.762	EMPC	0.752	U
59	59 + 62 + 75	17.7	C	6.41	C	4.90	C	14.7	C	12.8	C	10.4	C
60		91.3		68.7		48.3		123		95.7		62.1	
61	61 + 70 + 74 + 76	575	C	332	C	293	C	660	C	490	C	249	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		21.3		20.9		12.8		24.6		20.4		12.2	
64		94.3		31.3		36.4		80.3		65.3		51.4	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		432		342		244		524		381		236	
67		4.19		1.52		2.28		4.26		2.86		1.60	
68		5.28		3.06		2.30	EMPC	5.20		3.34		0.811	
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		7.11		4.59		3.79		8.47		6.59		3.30	
73		0.135	U	0.0820	U	0.0832	U	0.0585	U	0.0940	U	0.103	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		19.4		16.0		14.0		25.9		13.2		7.99	
78		0.596	U	0.344	U	0.316	U	0.394	U	0.386	U	0.772	U
79		4.54		2.03	EMPC	2.89		3.58		5.94		0.997	
80		0.785	EMPC	0.428	EMPC	0.287	U	0.662		0.567	EMPC	0.675	U
81		1.57	EMPC	1.49	EMPC	0.829	EMPC	2.21	EMPC	1.22	EMPC	0.882	EMPC
82		10.4		2.35		3.81		2.79	EMPC	10.2	EMPC	4.24	EMPC
83	83 + 99	1,040	C	1,160	C	664	C	1,670	C	1,080	C	398	C
84		27.0		5.05		8.10		8.84		18.7		4.60	
85	85 + 116 + 117	300	C	290	C	213	C	450	C	308	C	132	C
86	86 + 87 + 97 + 108 + 119 + 125	403	C	148	C	170	C	279	C	300	C	103	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	45.1	C	7.63	C	12.8	C	22.4	C	25.0	C	5.64	C
89		1.75	EMPC	0.306	U	0.497		1.23	EMPC	1.27	U	0.343	U
90	90 + 101 + 113	1,150	C	397	C	445	C	1,050	C	823	C	176	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		253		115		104		281		215		56.4	
93	93 + 95 + 98 + 100 + 102	268	C	90.3	C	124	C	261	C	230	C	73.0	C
94		0.607	U	0.318	U	0.198	U	0.265	U	1.30	U	0.345	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		1.50		0.350		0.390	U	1.22		1.16		0.509	EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		5.31		1.10	EMPC	1.46	EMPC	3.56		3.61	EMPC	0.749	EMPC
104		0.150	U	0.144	U	0.171	U	0.111	U	0.262	U	0.119	U
105		614		694		442		908		717		362	
106		2.16	U	2.76	U	1.67	U	2.37	U	2.21	U	0.851	U
107	107 + 124	41.1	C	18.9	C	26.1	C	58.2	C	30.9	C	12.9	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		151		201		125		210		160		53.1	
110	110 + 115	889	C	216	C	363	C	693	C	566	C	186	C
111		2.36		3.56		1.92		3.11		2.04	EMPC	1.00	
112		0.389	U	0.204	U	0.127	U	0.170	U	0.870	U	0.231	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		40.3		64.4		33.7		57.8		43.9		22.0	
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		1,920		3,110		1,610		2,850		1,930		872	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		12.6		18.3		10.0		17.9		11.8		3.45	
121		1.28	EMPC	1.24	EMPC	0.795		1.80		1.22		0.455	
122		2.38	U	3.21	U	1.94	U	2.75	U	10.3	EMPC	1.04	U
123		32.0	EMPC	42.3		21.9		40.2		31.3		16.3	
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		5.20		4.93		3.13		5.52		3.91		3.15	
127		2.20	U	7.99	EMPC	3.94		7.91		4.02	EMPC	1.51	EMPC

Table H-11
Sculpin PCB Congener Analysis Results
(Page 12 of 12)

IUPAC #	COELUTING CONGENERS[1]	Reference SR-14 R-14 10/10/2008		Reference SR-15 R-15 10/9/2008		Reference SR-16 R-16 10/10/2008		Reference SR-17 R-17 10/9/2008		Reference SR-18 R-18 7/24/2008		Forebay - Goose Island P110 09042911OS C 4/29/2009	
128	128 + 166	391	C	570	C	344	C	653	C	519	C	194	C
129	129 + 138 + 160 + 163	2,960	C	4,940	C	2,800	C	5,620	C	4,110	C	1,130	C
130		127		48.8		56.5		102		102		18.2	
131		3.25		0.829	EMPC	1.82	EMPC	2.13		2.35	EMPC	0.798	U
132		101		18.0		32.1		47.5		66.9		10.7	
133		54.9		78.8		46.1		79.4		70.2		16.8	
134	134 + 143	1.62	C U	5.99	C	0.467	C U	17.9	C	19.5	C	2.28	C
135	135 + 151 + 154	479	C	219	C	235	C	460	C	438	C	94.7	C
136		62.9		15.6		20.2		47.6		44.5		9.96	
137		76.0		163		80.0		146		105		33.1	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	42.9	C	60.8	C	35.4	C	71.5	C	57.0	C	15.6	C
140	139 + 140		C139		C139		C139		C139		C139		C139
141		138		90.1		81.9		188		1.55	U	49.7	
142		1.61	U	0.524	U	0.465	U	0.557	U	1.75	U	0.812	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		35.6		7.52		11.6		21.3		21.1		4.25	
145		0.160	U	0.0861	U	0.0872	U	0.0896	U	0.132	U	0.113	U
146		517		627		410		661		617		114	
147	147 + 149	315	C	64.2	C	119	C	158	C	225	C	38.4	C
148		4.41		1.17		1.65		3.16		3.46		0.473	EMPC
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.524	EMPC	0.126		0.106		0.242		0.258		0.107	U
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		1.00		0.427	EMPC	0.225	EMPC	1.16	EMPC	0.828	EMPC	0.254	EMPC
153	153 + 168	3,230	C	6,360	C	4,080	C	5,380	C	4,970	C	1,050	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		3.71		4.95		2.35	EMPC	5.48		4.10		1.20	EMPC
156	156 + 157	203	C	402	C	193	C	350	C	257	C	106	C
157	156 + 157		C156		C156		C156		C156		C156		C156
158		215		356		194		395		314		86.7	
159		3.35		1.54	EMPC	1.07	EMPC	2.56		2.40		0.567	U
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		1.12	U	0.363	U	0.323	U	0.386	U	1.21	U	0.570	U
162		10.1		19.4		9.38		17.2		13.7		4.48	
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		71.6		21.2		34.3		68.2		66.0		23.4	
165		1.91		3.33	EMPC	1.75		3.18	EMPC	2.26		0.718	
166	128 + 166		C128		C128		C128		C128		C128		C128
167		96.8		146		91.0		139		99.2		34.8	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		3.66	U	9.29	U	4.88	U	7.12	U	4.67	U	1.31	U
170		205		398		186		342		252		113	
171	171 + 173	120	C	221	C	108	C	194	C	150	C	47.8	C
172		41.6		56.0		31.3	EMPC	60.0		48.7		17.4	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		49.3		15.4		14.2		31.4		30.5		8.12	
175		12.1		9.08		6.65		11.8		11.5		2.37	
176		8.71		1.82	EMPC	2.90	EMPC	4.44		4.85	EMPC	0.687	
177		155		50.7		63.3		94.0		88.8		19.3	
178		159		195		115		196		173		41.6	
179		123		31.6		48.6		96.2		79.0		11.5	
180	180 + 193	630	C	1,510	C	670	C	1,020	C	756	C	264	C
181		4.38	EMPC	10.8	EMPC	5.26	EMPC	6.52		7.05		1.52	
182		2.74		5.63		4.19	EMPC	3.01	EMPC	7.02	EMPC	1.28	EMPC
183	183 + 185	273	C	445	C	239	C	396	C	316	C	89.0	C
184		3.62		6.29		3.05	EMPC	6.34		4.22		0.886	
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.154	U	0.417	U	0.352	U	0.402	U	0.332	U	0.149	U
187		889		668		515		700		723		200	
188		2.32		2.02		1.51		1.92		2.28		0.414	EMPC
189		6.90		15.4		8.20		11.0	EMPC	9.20		3.83	
190		102		229		101		158		120		44.0	
191		11.0		32.9		14.5		19.3		16.5		5.34	
192		0.167	U	0.464	U	0.392	U	0.447	U	0.369	U	0.157	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		56.8		144		67.3		107		74.8		35.7	
195		43.5		127		56.8		77.0		59.6		23.6	
196		38.0		95.7		40.4		60.8		46.6		19.6	
197	197 + 200	10.8	C	18.6	C	9.27	C	15.7	C	11.2	C	3.63	C
198	198 + 199	99.5	C	107	C	70.8	C	109	C	99.0	C	45.2	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		20.1		21.6		16.9		20.7		18.8		3.32	
202		74.1		129		72.3		115		86.6		26.9	
203		111		274		141		184		137		60.7	
204		0.174		0.367	U	0.364	U	0.368	U	0.482	EMPC	0.132	
205		5.00		12.3		5.91		8.02		6.69		3.29	
206		30.8		63.1		35.6		49.3		37.6		21.3	
207		6.81		15.9		8.05		9.45		8.40		3.24	
208		12.4		13.5		9.81		13.4		11.9		6.62	
209		15.8		30.6		17.2		24.2		20.4		11.0	
Total PCBs as Congeners in ug/kg, wet weight													
Total PCBs as Congeners (full EMPC/full SDL)		22.3	J	27.2	J	17.4	J	30.6	J	24.3	J	8.17	J
Total PCBs as Congeners (KM-based)		22.3	J	27.2	J	17.3	J	30.5	J	24.2	J	8.14	J
Total PCBs as Congeners (KM-based, capped)		22.3	J	27.2	J	17.3	J	30.5	J	24.2	J	8.14	J

Notes:

C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
ng/kg = nanogram/kilogram
ug/kg = micrograms/kilogram
pg/g = picograms/gram

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
RDL = Reported detection limit
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-12
High-Volume Surface Water PCB Congener Analysis Results
(Page 1 of 6)

		Forebay - P52				Forebay - P53				Forebay - P54			
IUPAC #	COELUTING CONGENERS[1]	08021252XAD 2/12/2008 (Filter)		08021252XAD 2/12/2008 (Column)		08022453XAD 2/24/2008 (Filter)		08022453XAD 2/24/2008 (Column)		08021354XAD 2/13/2008 (Filter)		08021354XAD 2/13/2008 (Column)	
1		0.13		0.385		0.021	U	0.191		0.051	U	0.267	
2		0.265		0.371		0.042	U	0.27		0.125		0.293	
3		0.201		0.324		0.041	U	0.162	U	0.14		0.249	
4		0.02	U	0.369		0.063	U	0.409		0.082	U	0.42	
5		0.007	U	0.014	EMPC	0.004	U	0.022		0.0069	U	0.012	
6		0.009	U	0.101		0.0037	U	0.115		0.011	U	0.109	
7		0.011	U	0.036	U	0.009	U	0.031	U	0.0064	U	0.033	U
8		0.043	U	0.416		0.0034	U	0.518		0.051	U	0.487	
9		0.007	U	0.029	U	0.005	U	0.039		0.0061	U	0.039	
10		0.0058	U	0.015	EMPC	0.006		0.017		0.011	EMPC	0.021	
11		4.12		83.5		10.8		137		7.16		82.4	
12	12 + 13	0.054	C	0.0091	C U	0.004	C U	0.0051	C U	0.0069	C U	0.0049	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.0067	U	0.009		0.0038	U	0.01		0.0064	U	0.008	
15		0.054	U	0.654		0.07	U	0.741		0.073	U	0.531	
16		0.034	U	0.261		0.039	U	0.287		0.034	U	0.279	
17		0.032	U	0.24		0.104		0.267		0.11		0.253	
18	18 + 30	0.071	C U	0.588	C	0.104	C U	0.637	C	0.079	C U	0.64	C
19		0.01	U	0.097		0.208		0.1		0.306		0.101	
20	20 + 28	0.165	C U	0.67	C	0.259	C	0.741	C	0.216	C	0.656	C
21	21 + 33	0.053	C U	0.269	C	0.096	C U	0.3	C	0.081	C U	0.257	C
22		0.051	U	0.25		0.077	EMPC	0.271		0.068		0.235	
23		0.0017	U	0.006	U	0.004	U	0.003	U	0.018	U	0.0038	U
24		0.0014	U	0.015	EMPC	0.0008	U	0.014	EMPC	0.0014	U	0.012	EMPC
25		0.01	U	0.047	EMPC	0.028		0.052		0.028		0.044	
26	26 + 29	0.023	C U	0.112	C	0.046	C	0.126	C	0.041	C	0.116	C
27		0.007	U	0.045		0.062		0.051		0.074		0.05	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		0.121	U	0.532		0.178		0.632		0.148		0.555	
32		0.015	U	0.121		0.066		0.14		0.078		0.138	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.0016	U	0.005	U	0.006	U	0.003	U	0.016	U	0.0038	U
35		0.018		0.079		0.035		0.121		0.028		0.081	
36		0.006	EMPC	0.02	EMPC	0.009		0.031		0.003	EMPC	0.02	
37		0.057	U	0.12		0.082		0.147		0.078	EMPC	0.121	
38		0.0017	U	0.0049	U	0.004	EMPC	0.003	EMPC	0.02	EMPC	0.007	
39		0.0017	U	0.006	EMPC	0.002		0.0029	U	0.0028	U	0.0037	U
40	40 + 41 + 71	0.081	C	0.21	C	0.204	C	0.213	C	0.223	C	0.198	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		0.037		0.101		0.082		0.113		0.083		0.097	
43		0.004	EMPC	0.0033	U	0.025		0.027		0.03		0.021	
44	44 + 47 + 65	0.202	C U	0.53	C	1.61	C	0.707	C	1.95	C	0.506	C U
45	45 + 51	0.031	C U	0.096	C U	0.381	C	0.11	C U	0.483	C	0.088	C U
46		0.006	U	0.033		0.023	EMPC	0.035	EMPC	0.022	EMPC	0.032	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		0.03		0.0027	U	0.051		0.0013	U	0.047		0.085	
49	49 + 69	0.104	C	0.289	C	0.484	C	0.309	C	0.574	C	0.275	C
50	50 + 53	0.021	C	0.083	C EMPC	0.262	C	0.08	C	0.344	C	0.085	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		0.254		0.878		0.629		0.941		0.629		0.856	
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.002	U	0.004	U	0.121		0.002	U	0.175		0.004	U
55		0.005	EMPC	0.0096	U	0.0051	U	0.006	EMPC	0.009	EMPC	0.01	
56		0.101		0.121	EMPC	0.135		0.147		0.125		0.12	
57		0.0045	U	0.009	U	0.005		0.0055	U	0.01		0.0061	U
58		0.0047	U	0.0091	U	0.0052	U	0.0056	U	0.0048	U	0.0061	U
59	59 + 62 + 75	0.016	C	0.045	C	0.076	C	0.047	C	0.086	C	0.046	C EMPC
60		0.056	EMPC	0.076		0.073		0.086		0.065		0.074	
61	61 + 70 + 74 + 76	0.429	C	0.669	C	0.574	C	0.744	C	0.558	C	0.664	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		0.009		0.019	EMPC	0.012		0.017		0.015	EMPC	0.009	
64		0.083		0.201		0.118		0.225		0.106		0.198	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		0.23		0.276		0.314		0.277		0.319		0.283	
67		0.007	EMPC	0.01		0.006		0.012		0.009	EMPC	0.0055	U
68		0.007	U	0.014	U	0.022	U	0.021	U	0.025	U	0.0065	U
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		0.0044	U	0.0089	U	0.008	EMPC	0.0054	U	0.012		0.006	U
73		0.0015	U	0.015	EMPC	0.027		0.016		0.038		0.003	
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		0.031	U	0.033	U	0.056		0.077	EMPC	0.046		0.033	U
78		0.005	U	0.0096	U	0.0055	U	0.0059	U	0.0051	U	0.0064	U
79		0.008	EMPC	0.0085	U	0.013		0.009	EMPC	0.013		0.0057	U
80		0.004	U	0.0083	U	0.0044	U	0.0051	U	0.0045	U	0.0056	U
81		0.0045	U	0.0098	U	0.0052	U	0.0059	U	0.006	U	0.0064	U
82		0.06		0.047		0.082		0.063		0.073		0.049	EMPC
83	83 + 99	0.295	C	0.257	C	0.922	C	0.31	C	0.973	C	0.243	C
84		0.091		0.147		0.19		0.168		0.202		0.141	
85	85 + 116 + 117	0.101	C	0.065	C EMPC	0.178	C	0.104	C	0.173	C	0.076	C
86	86 + 87 + 97 + 108 + 119 + 125	0.358	C	0.339	C	0.717	C	0.463	C	0.685	C	0.332	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	0.057	C	0.069	C EMPC	0.202	C	0.071	C	0.249	C	0.065	C EMPC
89		0.005	EMPC	0.006	EMPC	0.007	EMPC	0.007	EMPC	0.009	EMPC	0.005	EMPC
90	90 + 101 + 113	0.542	C	0.54	C	1.54	C	0.633	C	1.78	C	0.505	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		0.108		0.104		0.337		0.117		0.421		0.1	
93	93 + 95 + 98 + 100 + 102	0.323	C	0.548	C	1.25	C	0.627	C	1.43	C	0.51	C
94		0.0025	U	0.004		0.054		0.003	U	0.079		0.0025	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.003		0.004		0.026		0.005	EMPC	0.028		0.002	EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		0.003		0.0029	U	0.062		0.0024	U	0.082		0.003	EMPC
104		0.001	U	0.002	U	0.022	U	0.001	U	0.035	EMPC	0.0012	U
105		0.221		0.119		0.339		0.163		0.332		0.114	
106		0.0039	U	0.0049	U	0.0049	U	0.007		0.0097	U	0.0038	U
107	107 + 124	0.023	C	0.01	C EMPC	0.037	C EMPC	0.021	C EMPC	0.035	C	0.017	C EMPC
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		0.046		0.034		0.075		0.041	EMPC	0.078		0.027	EMPC
110	110 + 115	0.644	C	0.575	C	1.08	C	0.721	C	1.04	C	0.551	C
111		0.0018	U	0.0025	U	0.003		0.0021	U	0.0012	U	0.0017	U

Table H-12
High-Volume Surface Water PCB Congener Analysis Results
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		Forebay - P52				Forebay - P53				Forebay - P54			
IUPAC #	COELUTING CONGENERS[1]	08021252XAD 2/12/2008 (Filter)		08021252XAD 2/12/2008 (Column)		08022453XAD 2/24/2008 (Filter)		08022453XAD 2/24/2008 (Column)		08021354XAD 2/13/2008 (Filter)		08021354XAD 2/13/2008 (Column)	
112		0.0018	U	0.0025	U	0.0017	U	0.0021	U	0.072		0.0017	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		0.017	U	0.012	U	0.02	U	0.009	U	0.025	U	0.008	U
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		0.518		0.36		1.07		0.499		0.947		0.325	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		0.0017	U	0.0023	U	0.007		0.002	U	0.009	EMPC	0.0016	U
121		0.0018	U	0.0024	U	0.007		0.0021	U	0.009		0.0017	U
122		0.008	EMPC	0.0053	U	0.01	EMPC	0.0034	U	0.0106	U	0.0041	U
123		0.013	U	0.007	U	0.017	U	0.009	EMPC	0.018	U	0.0037	U
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		0.004	U	0.0054	U	0.0057	U	0.006	U	0.0112	U	0.0042	U
127		0.0041	U	0.0047	U	0.0051	U	0.003	U	0.0097	U	0.0036	U
128	128 + 166	0.13	C	0.04	C	0.344	C	0.053	C	0.389	C	0.036	C
129	129 + 138 + 160 + 163	0.864	C	0.288	C	4.18	C	0.379	C	4.43	C	0.246	C
130		0.052		0.019		0.15		0.024		0.159		0.018	
131		0.008		0.004	U	0.024		0.006	EMPC	0.024	EMPC	0.003	U
132		0.209		0.094		0.74		0.115		0.799		0.081	
133		0.015	EMPC	0.0038	U	0.061		0.007	U	0.076		0.006	U
134	134 + 143	0.038	C	0.019	C EMPC	0.134	C	0.021	C	0.175	C	0.017	C
135	135 + 151 + 154	0.209	C	0.124	C	1.19	C	0.116	C	1.6	C	0.105	C
136		0.063	EMPC	0.038		0.32		0.039		0.393		0.031	
137		0.04		0.012	EMPC	0.08		0.015		0.07	EMPC	0.009	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	0.012	C	0.0036	C U	0.027	C EMPC	0.008	C	0.031	C	0.003	C EMPC
140	139 + 140		C139		C139		C139		C139		C139		C139
141		0.129		0.044		0.8		0.05		1		0.039	
142		0.0023	U	0.004	U	0.009	U	0.0014	U	0.012	U	0.003	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		0.027		0.016		0.143		0.014	EMPC	0.188		0.012	
145		0.0008	U	0.0015	U	0.001	EMPC	0.0011	U	0.002	EMPC	0.0013	U
146		0.115		0.047		0.563		0.055		0.686		0.044	
147	147 + 149	0.54	C	0.257	C	2.75	C	0.275	C	2.94	C	0.228	C
148		0.002		0.0018	U	0.012		0.0013	U	0.016		0.0016	U
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.001	EMPC	0.0014	U	0.011		0.001	U	0.016		0.0012	U
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.001	EMPC	0.0013	U	0.011		0.001	U	0.017		0.0012	U
153	153 + 168	0.686	C	0.261	C	4.13	C	0.301	C	4.99	C	0.214	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.002	U	0.002	U	0.006	U	0.001	U	0.011	U	0.002	U
156	156 + 157	0.085	C	0.026	C U	0.319	C	0.036	C	0.359	C	0.023	C U
157	156 + 157		C156		C156		C156		C156		C156		C156
158		0.07		0.029		0.284		0.031		0.351		0.021	EMPC
159		0.008	EMPC	0.0027	U	0.036	EMPC	0.003	EMPC	0.056		0.002	U
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.0016	U	0.0027	U	0.0062	U	0.001	U	0.0085	U	0.0021	U
162		0.0017	U	0.0029	U	0.0068	U	0.001	U	0.0088	U	0.0022	U
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		0.056		0.018		0.169		0.025		0.209		0.014	
165		0.0019	U	0.0031	U	0.0072	U	0.0011	U	0.0096	U	0.0023	U
166	128 + 166		C128		C128		C128		C128		C128		C128
167		0.033		0.014		0.139		0.013		0.148		0.01	
168	153 + 168		C153		C153		C153		C153		C153		C153
169		0.0017	U	0.0029	U	0.0066	U	0.0014	U	0.0088	U	0.0021	U
170		0.161		0.033		1.51		0.032		2.08		0.019	U
171	171 + 173	0.056	C EMPC	0.011	C	0.398	C	0.011	C EMPC	0.539	C	0.006	C EMPC
172		0.028		0.009	EMPC	0.247		0.006		0.343		0.006	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		0.168		0.051	U	0.878		0.046	U	1.18		0.03	U
175		0.008	EMPC	0.0016	U	0.047		0.001	EMPC	0.069		0.002	EMPC
176		0.019		0.008	EMPC	0.131		0.006	EMPC	0.178		0.005	EMPC
177		0.121	EMPC	0.033		0.835		0.03		1.19		0.023	
178		0.043		0.016		0.245		0.015	EMPC	0.337		0.011	EMPC
179		0.068		0.023	EMPC	0.391		0.02		0.499		0.015	
180	180 + 193	0.359	C	0.115	C U	3.51	C	0.107	C U	4.82	C	0.061	C U
181		0.001	U	0.0016	U	0.006		0.0012	U	0.012		0.0014	U
182		0.002	U	0.002	U	0.008	U	0.002	U	0.012	U	0.0013	U
183	183 + 185	0.129	C	0.04	C EMPC	0.907	C	0.039	C U	1.27	C	0.023	C U
184		0.002	EMPC	0.0011	U	0.003	EMPC	0.0009	U	0.002	EMPC	0.001	U
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.0008	U	0.0012	U	0.0009	U	0.0009	U	0.0009	U	0.0011	U
187		0.265		0.112	U	1.7		0.09	U	2.47		0.07	U
188		0.002	U	0.001	U	0.004	U	0.0008	U	0.008	U	0.0009	U
189		0.007	U	0.004	U	0.064		0.0022	U	0.09	EMPC	0.0025	U
190		0.038		0.008		0.287		0.009		0.409		0.006	EMPC
191		0.01	EMPC	0.002	EMPC	0.055		0.0009	U	0.076		0.001	U
192		0.0009	U	0.0014	U	0.001	U	0.001	U	0.001	U	0.0012	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		0.075		0.032	U	0.656		0.029	U	0.88		0.01	U
195		0.028		0.008		0.241		0.01	EMPC	0.302		0.005	EMPC
196		0.038		0.031		0.257		0.027		0.374		0.013	U
197	197 + 200	0.014	C EMPC	0.016	C EMPC	0.064	C	0.013	C EMPC	0.09	C	0.006	C
198	198 + 199	0.099	C EMPC	0.101	C U	0.489	C	0.102	C	0.711	C	0.041	C U
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		0.012	EMPC	0.012	EMPC	0.049		0.013		0.078		0.006	EMPC
202		0.028	EMPC	0.024	EMPC	0.077		0.023		0.109		0.01	U
203		0.063		0.075		0.331		0.081		0.466		0.03	EMPC
204		0.0008	U	0.001	U	0.0008	U	0.001	U	0.001		0.0009	U
205		0.003	U	0.003	U	0.033		0.003	U	0.048		0.002	U
206		0.054		0.034		0.118		0.036		0.15		0.018	EMPC
207		0.008		0.014	EMPC	0.016		0.016	EMPC	0.021	EMPC	0.0048	U
208		0.021	U	0.034		0.028		0.028	U	0.035		0.011	U
209		0.067		0.017	U	0.071		0.012	U	0.073		0.012	U
Total PCBs as Congeners (full EMPC/full SDL)		16.3	J	99.0	J	56.4	J	154	J	62.1	J	96.9	J
Total PCBs as Congeners (KM-based)		14.7	J	97.7	J	55.7	J	153	J	61.2	J	95.7	J
Total PCBs as Congeners (KM-based, capped)		14.7	J	97.7	J	55.7	J	153	J	61.2	J	95.7	J

Notes:

All results are in units of pg/L (picograms/Liter)
C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
RDL = Reported detection limit

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-12
High-Volume Surface Water PCB Congener Analysis Results
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		Forebay - P55				Forebay - P56				Reference - P57				Reference - P58			
IUPAC #	COELUTING CONGENERS[1]	08022555XAD 2/25/2008 (Filter)		08022555XAD 2/25/2008 (Column)		08022156XAD 2/26/2008 (Filter)		08022156XAD 2/26/2008 (Column)		08022757XAD 2/27/2008 (Filter)		08022757XAD 2/27/2008 (Column)		08030758XAD 3/7/2008 (Filter)		08030758XAD 3/7/2008 (Column)	
1		0.019	U	0.197		0.026	U	0.211		0.01	U	0.164		0.016	U	0.185	
2		0.055		0.256		0.069		0.282		0.033	U	0.291		0.034	U	0.236	
3		0.033	U	0.133		0.057	U	0.192	U	0.016	U	0.132		0.028	U	0.135	
4		0.03	U	0.43		0.033	U	0.496		0.024	U	0.364		0.024	U	0.392	
5		0.0065	U	0.02		0.0053	U	0.02		0.0071	U	0.023		0.005	U	0.013	
6		0.011	U	0.108		0.017	U	0.127		0.009	U	0.114		0.012	U	0.106	
7		0.013	U	0.034	U	0.015	U	0.038	U	0.008	U	0.029	U	0.005	U	0.037	U
8		0.055	U	0.487		0.09	U	0.487		0.045	U	0.497		0.056	U	0.501	
9		0.007	U	0.037		0.006	U	0.045		0.0063	U	0.038		0.0045	U	0.037	
10		0.0054	U	0.016		0.0045	U	0.021	EMPC	0.006	U	0.018		0.0042	U	0.017	
11		9.26		139		9.18		125		13.3		140		7.85		91.6	
12	12 + 13	0.0065	C U	0.0054	C U	0.0053	C U	0.0052	C U	0.0071	C U	0.0081	C U	0.005	C U	0.385	C
13	12 + 13		C12		C12		C12		C12		C12		C12		C12		C12
14		0.0061	U	0.011		0.005	U	0.009	EMPC	0.0067	U	0.0077	U	0.0047	U	0.01	
15		0.065	U	0.586	EMPC	0.141		0.275	U	0.044	U	0.261		0.056	U	0.761	
16		0.032	U	0.295		0.074		0.287		0.031	U	0.288		0.038	U	0.289	
17		0.035	U	0.261		0.073		0.292		0.039	U	0.244		0.039	U	0.25	
18	18 + 30	0.081	C U	0.647	C	0.146	C U	0.666	C	0.072	C U	0.6	C	0.088	C U	0.646	C
19		0.014	U	0.097		0.018	U	0.106		0.013	U	0.093		0.014	U	0.091	
20	20 + 28	0.202	C	0.745	C	0.452	C	0.717	C	0.198	C	0.655	C	0.205	C	1.02	C
21	21 + 33	0.073	C U	0.284	C	0.198	C	0.283	C	0.082	C U	0.306	C	0.08	C U	0.0022	C U
22		0.069	EMPC	0.29		0.158		0.268		0.07		0.283		0.076		0.267	
23		0.0018	U	0.004	U	0.0022	U	0.004	U	0.002	U	0.0057	U	0.0029	U	0.0025	U
24		0.001	EMPC	0.012		0.003	EMPC	0.013	EMPC	0.0018	U	0.011		0.002		0.012	
25		0.013	U	0.047	EMPC	0.029		0.044		0.013	U	0.05		0.012	U	0.049	
26	26 + 29	0.029	C U	0.125	C	0.064	C	0.127	C	0.027	C U	0.123	C	0.028	C U	0.124	C
27		0.007	U	0.051		0.014		0.05		0.007	U	0.047		0.007	U	0.054	
28	20 + 28		C20		C20		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18		C18		C18
31		0.156		0.61		0.356		0.609		0.151		0.559		0.156		0.612	
32		0.018	U	0.142		0.032	U	0.141		0.016	U	0.145	EMPC	0.026	U	0.149	
33	21 + 33		C21		C21		C21		C21		C21		C21		C21		C21
34		0.0018	U	0.006	U	0.0022	U	0.006	U	0.003	U	0.0057	U	0.0029	U	0.003	U
35		0.029	EMPC	0.122		0.038		0.101		0.043		0.11		0.03	EMPC	0.091	
36		0.009	EMPC	0.029		0.009		0.032		0.01		0.025		0.007		0.021	
37		0.061	U	0.124		0.12		0.131		0.065		0.127		0.071		0.146	
38		0.0019	U	0.0039	U	0.006	EMPC	0.006	EMPC	0.002	EMPC	0.0056	U	0.0031	U	0.013	EMPC
39		0.002		0.006	EMPC	0.003	EMPC	0.0035	U	0.002	EMPC	0.0056	U	0.003	U	0.005	
40	40 + 41 + 71	0.091	C	0.215	C	0.153	C	0.196	C	0.097	C	0.185	C	0.098	C	0.219	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40		C40		C40
42		0.057		0.113		0.084		0.101		0.055		0.102		0.065		0.123	
43		0.008	EMPC	0.022	EMPC	0.014	EMPC	0.0024	U	0.007	EMPC	0.017	EMPC	0.008		0.021	
44	44 + 47 + 65	0.268	C U	0.617	C	0.46	C	0.525	C U	0.27	C U	0.543	C	0.341	C	0.801	C
45	45 + 51	0.033	C U	0.093	C	0.048	C U	0.09	C U	0.033	C U	0.085	C	0.038	C U	0.11	C
46		0.009	EMPC	0.033		0.014	EMPC	0.031	EMPC	0.009		0.03		0.01	EMPC	0.033	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44		C44		C44
48		0.037		0.0024	U	0.057		0.0019	U	0.04		0.08	EMPC	0.04		0.002	U
49	49 + 69	0.14	C	0.304	C	0.214	C	0.274	C	0.126	C	0.243	C	0.135	C	0.3	C
50	50 + 53	0.021	C	0.091	C	0.031	C	0.079	C	0.02	C U	0.071	C	0.026	C	0.092	C
51	45 + 51		C45		C45		C45		C45		C45		C45		C45		C45
52		0.359		0.935		0.556		0.846		0.333		0.754		0.37		0.99	
53	50 + 53		C50		C50		C50		C50		C50		C50		C50		C50
54		0.001	U	0.002	U	0.001	U	0.004	U	0.003	U	0.004	U	0.002	U	0.0014	U
55		0.0073	U	0.01		0.0081	U	0.0077	U	0.0056	U	0.0072	U	0.004	U	0.008	
56		0.116		0.149		0.181		0.134		0.114		0.126		0.131		0.14	
57		0.007	U	0.0057	U	0.0078	U	0.0073	U	0.0054	U	0.0068	U	0.0039	U	0.0068	U
58		0.0071	U	0.0057	U	0.0079	U	0.0073	U	0.0055	U	0.0069	U	0.0039	U	0.0069	U
59	59 + 62 + 75	0.021	C	0.045	C	0.027	C	0.043	C	0.021	C	0.042	C EMPC	0.022	C EMPC	0.052	C
60		0.071		0.076		0.104		0.073		0.062		0.068	EMPC	0.069		0.075	
61	61 + 70 + 74 + 76	0.563	C	0.687	C	1	C	0.678	C	0.515	C	0.624	C	0.583	C	0.791	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59		C59		C59
63		0.011	EMPC	0.011	EMPC	0.014		0.011	EMPC	0.01		0.01		0.011		0.016	
64		0.11		0.21		0.17		0.205		0.097		0.184		0.102		0.217	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44		C44		C44
66		0.282		0.302		0.43		0.281		0.251		0.26		0.276		0.313	
67		0.008		0.01		0.009		0.012	EMPC	0.006		0.012	EMPC	0.008		0.013	EMPC
68		0.0069	U	0.011	U	0.015	U	0.0079	U	0.0053	U	0.014	U	0.009	U	0.017	U
69	49 + 69		C49		C49		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40		C40		C40
72		0.0071	U	0.0056	U	0.0079	U	0.0072	U	0.0055	U	0.0067	U	0.0039	U	0.0068	U
73		0.001	U	0.013	EMPC	0.0009	U	0.01	EMPC	0.001	U	0.003		0.0008	U	0.0015	U
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61		C61		C61
77		0.039	U	0.048	EMPC	0.051		0.029	U	0.032	U	0.047		0.047		0.092	
78		0.0076	U	0.0061	U	0.0084	U	0.0077	U	0.0058	U	0.0072	U	0.0042	U	0.0067	U
79		0.0065	U	0.009		0.01	EMPC	0.0069	U	0.007	EMPC	0.007	EMPC	0.012		0.021	
80		0.0066	U	0.0052	U	0.0074	U	0.0067	U	0.0051	U	0.0063	U	0.0037	U	0.0061	U
81		0.0073	U	0.006	U	0.0084	U	0.0076	U	0.0055	U	0.0073	U	0.0043	U	0.007	U
82		0.079	EMPC	0.05		0.107		0.045	EMPC	0.057		0.042		0.074		0.061	
83	83 + 99	0.422	C	0.281	C	0.494	C	0.244	C	0.351	C	0.229	C	0.397	C	0.342	C
84		0.12		0.161		0.165		0.141		0.112		0.137		0.115		0.175	
85	85 + 116 + 117	0.14	C	0.092	C	0.18	C	0.078	C	0.112	C	0.075	C	0.13	C	0.101	C
86	86 + 87 + 97 + 108 + 119 + 125	0.476	C	0.387	C	0.609	C	0.335	C	0.409	C	0.333	C	0.483	C	0.482	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86		C86
88	88 + 91	0.075	C	0.071	C	0.089	C	0.064	C	0.057	C	0.05	C EMPC	0.074	C	0.08	C
89		0.0019	U	0.005		0.006	EMPC	0.0023	U	0.006	EMPC	0.0034	U	0.004	EMPC	0.004	EMPC
90	90 + 101 + 113	0.73	C	0.589	C	0.856	C	0.532	C	0.609	C	0.485	C	0.72	C	0.675	C
91	88 + 91		C88		C88		C88		C88		C88		C88		C88		C88
92		0.126		0.111		0.142		0.109		0.114	EMPC	0.092		0.127		0.125	
93	93 + 95 + 98 + 100 + 102	0.453	C	0.584	C	0.515	C	0.514	C	0.405	C	0.497	C	0.472	C	0.691	C
94		0.0019	U	0.002		0.002	EMPC	0.0024	U	0.0027	U	0.0035	U	0.002	EMPC	0.0027	U
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93		C93
96		0.003		0.004		0.003		0.003		0.002	EMPC	0.003	EMPC	0.002	EMPC	0.004	EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93		C93		C93
103		0.005	EMPC	0.005	EMPC	0.004	EMPC	0.003		0.003		0.003		0.004		0.004	
104		0.001	U	0.001	U	0.002	U	0.0011	U	0.003	U	0.0018	U	0.002	U	0.0009	U
105		0.339		0.147		0.421		0.119		0.262		0.125		0.282		0.178	
106		0.004	U	0.005		0.005	U	0.0053	U	0.0049	U	0.0067	U	0.0037	U	0.003	U
107	107 + 124	0.038	C EMPC	0.02	C	0.049	C	0.017	C EMPC	0.03	C	0.016	C EMPC	0.032	C	0.019	C
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86		C86
109		0.064		0.039		0.075		0.041		0.054		0.032	EMPC	0.062		0.033	
110	110 + 115	0.836	C	0.66	C	1.09	C	0.57	C	0.721	C	0.549	C	0.793	C	0.74	C
111		0.0014	U	0.0013	U	0.002	EMPC	0.0017	U	0.002	U	0.0025	U	0.0012	U	0.0018	U

Table H-12
High-Volume Surface Water PCB Congener Analysis Results
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		Forebay - P55				Forebay - P56				Reference - P57				Reference - P58			
IUPAC #	COELUTING CONGENERS[1]	08022555XAD 2/25/2008 (Filter)		08022555XAD 2/25/2008 (Column)		08022156XAD 2/26/2008 (Filter)		08022156XAD 2/26/2008 (Column)		08022757XAD 2/27/2008 (Filter)		08022757XAD 2/27/2008 (Column)		08030758XAD 3/7/2008 (Filter)		08030758XAD 3/7/2008 (Column)	
112		0.002	EMPC	0.0013	U	0.0014	U	0.0017	U	0.0019	U	0.0025	U	0.0012	U	0.0018	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90		C90		C90
114		0.021	U	0.015	U	0.02	U	0.01	U	0.014	U	0.011	U	0.02	U	0.011	U
115	110 + 115		C110		C110		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85		C85		C85
118		0.825		0.448		1.07		0.361		0.743		0.378		0.932		0.593	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86		C86
120		0.005	EMPC	0.0012	U	0.004	EMPC	0.0016	U	0.004	EMPC	0.0023	U	0.005		0.002	
121		0.0014	U	0.0013	U	0.0014	U	0.0017	U	0.0019	U	0.0025	U	0.0012	U	0.0019	U
122		0.0044	U	0.006	EMPC	0.007	EMPC	0.0057	U	0.006	EMPC	0.0072	U	0.007		0.004	EMPC
123		0.015	U	0.006	U	0.023	U	0.01	EMPC	0.017	U	0.007	U	0.019	U	0.014	U
124	107 + 124		C107		C107		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86		C86		C86
126		0.0046	U	0.006	U	0.0059	U	0.0057	U	0.0055	U	0.0068	U	0.007	U	0.006	U
127		0.004	U	0.0023	U	0.005	U	0.005	U	0.0049	U	0.0063	U	0.0037	U	0.0029	U
128	128 + 166	0.167	C	0.043	C	0.154	C	0.033	C	0.121	C	0.038	C EMPC	0.127	C	0.044	C
129	129 + 138 + 160 + 163	1.07	C	0.319	C	1	C	0.255	C	0.809	C	0.29	C	1.04	C	0.375	C
130		0.067		0.022		0.06		0.018	EMPC	0.043	EMPC	0.017	EMPC	0.049		0.02	
131		0.008	EMPC	0.004	EMPC	0.012		0.004	EMPC	0.007	EMPC	0.0044	U	0.007		0.0034	U
132		0.238		0.102		0.255		0.088	EMPC	0.176		0.078		0.2		0.111	
133		0.015		0.006	U	0.015	EMPC	0.004	U	0.012	EMPC	0.004	U	0.011	EMPC	0.005	U
134	134 + 143	0.04	C	0.016	C EMPC	0.041	C EMPC	0.018	C EMPC	0.026	C	0.019	C	0.025	C EMPC	0.021	C EMPC
135	135 + 151 + 154	0.276	C	0.127	C	0.25	C	0.116	C	0.194	C	0.101	C	0.237	C	0.133	C
136		0.075		0.04	EMPC	0.074		0.033		0.053		0.0021	U	0.061		0.043	
137		0.043	EMPC	0.014		0.041		0.013	EMPC	0.033		0.013		0.037		0.012	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129		C129		C129
139	139 + 140	0.016	C	0.003	C U	0.019	C	0.004	C EMPC	0.013	C EMPC	0.004	C U	0.012	C	0.0031	C U
140	139 + 140		C139		C139		C139		C139		C139		C139		C139		C139
141		0.126		0.041		0.123		0.034	EMPC	0.093		0.033		0.1		0.044	
142		0.0055	U	0.0033	U	0.0033	U	0.0026	U	0.0023	U	0.0044	U	0.0043	U	0.0034	U
143	134 + 143		C134		C134		C134		C134		C134		C134		C134		C134
144		0.03		0.013	EMPC	0.035		0.014	EMPC	0.023		0.012	EMPC	0.025		0.015	
145		0.0008	U	0.0012	U	0.0008	U	0.0012	U	0.0008	U	0.0022	U	0.0009	U	0.0013	U
146		0.159		0.053		0.142		0.044		0.125		0.049		0.161		0.061	
147	147 + 149	0.672	C	0.282	C	0.65	C	0.23	C	0.506	C	0.225	C	0.634	C	0.322	C
148		0.003	EMPC	0.0015	U	0.002	EMPC	0.0015	U	0.002	EMPC	0.0027	U	0.001	EMPC	0.0016	U
149	147 + 149		C147		C147		C147		C147		C147		C147		C147		C147
150		0.001	EMPC	0.0011	U	0.001	EMPC	0.0011	U	0.002	EMPC	0.0021	U	0.001	EMPC	0.0012	U
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135		C135		C135
152		0.0008	U	0.0011	U	0.0008	U	0.0011	U	0.001	EMPC	0.002	U	0.0008	U	0.001	EMPC
153	153 + 168	1.04	C	0.304	C	0.881	C	0.239	C	0.834	C	0.28	C	1.18	C	0.406	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135		C135		C135
155		0.002	U	0.002	U	0.004	U	0.001	U	0.002	U	0.0018	U	0.003	U	0.001	U
156	156 + 157	0.11	C	0.028	C U	0.101	C	0.023	C U	0.085	C	0.026	C U	0.094	C	0.036	C U
157	156 + 157		C156		C156		C156		C156		C156		C156		C156		C156
158		0.082		0.029		0.084		0.022		0.062		0.022		0.074		0.031	
159		0.007		0.0022	U	0.008		0.0018	U	0.005	EMPC	0.003	U	0.005	EMPC	0.002	EMPC
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129		C129		C129
161		0.0039	U	0.0023	U	0.0023	U	0.0018	U	0.0016	U	0.003	U	0.0031	U	0.0024	U
162		0.004	U	0.0024	U	0.004	EMPC	0.0019	U	0.004		0.0032	U	0.0032	U	0.0023	U
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129		C129		C129
164		0.057		0.021		0.06		0.018		0.041	EMPC	0.014		0.048	EMPC	0.022	
165		0.0043	U	0.0026	U	0.0026	U	0.0021	U	0.0018	U	0.0034	U	0.0034	U	0.0027	U
166	128 + 166		C128		C128		C128		C128		C128		C128		C128		C128
167		0.049		0.014	U	0.044		0.011	EMPC	0.041		0.013	U	0.057		0.018	U
168	153 + 168		C153		C153		C153		C153		C153		C153		C153		C153
169		0.004	U	0.0023	U	0.0024	U	0.0018	U	0.0017	U	0.003	U	0.0034	U	0.0024	U
170		0.152		0.026	U	0.142		0.02	U	0.099		0.027	U	0.106		0.025	U
171	171 + 173	0.049	C	0.012	C	0.051	C	0.008	C	0.037	C	0.008	C	0.04	C EMPC	0.009	C
172		0.031		0.007	EMPC	0.032		0.007	EMPC	0.02		0.007	EMPC	0.024		0.006	
173	171 + 173		C171		C171		C171		C171		C171		C171		C171		C171
174		0.152		0.05	EMPC	0.141		0.033	U	0.111		0.043		0.108		0.036	
175		0.009	EMPC	0.002	EMPC	0.009		0.0016	U	0.007	EMPC	0.0023	U	0.009		0.002	EMPC
176		0.022		0.006	EMPC	0.021		0.007	EMPC	0.015		0.006	EMPC	0.017	EMPC	0.005	
177		0.13		0.031		0.124		0.026		0.079		0.025		0.09		0.023	
178		0.045		0.015		0.043		0.013	EMPC	0.036		0.011	EMPC	0.033	EMPC	0.012	EMPC
179		0.074		0.021		0.072		0.016		0.057		0.018		0.068		0.019	
180	180 + 193	0.365	C	0.125	C	0.341	C	0.067	C U	0.265	C	0.109	C	0.321	C	0.105	C
181		0.003	EMPC	0.0012	U	0.002	EMPC	0.0016	U	0.002	EMPC	0.0023	U	0.002		0.0015	U
182		0.003	U	0.0012	U	0.003	U	0.0016	U	0.002	U	0.0023	U	0.0008	U	0.0015	U
183	183 + 185	0.129	C	0.044	C	0.117	C	0.025	C U	0.09	C	0.026	C	0.119	C	0.032	C
184		0.002		0.0009	U	0.004	EMPC	0.0012	U	0.002		0.0017	U	0.002	EMPC	0.0012	U
185	183 + 185		C183		C183		C183		C183		C183		C183		C183		C183
186		0.0008	U	0.001	U	0.0008	U	0.0013	U	0.001	U	0.0018	U	0.0008	U	0.0012	U
187		0.295		0.113		0.284		0.078	U	0.224		0.101		0.276		0.09	
188		0.0008	U	0.0008	U	0.0008	U	0.0011	U	0.0008	U	0.0016	U	0.002	U	0.0011	U
189		0.006	U	0.0022	U	0.008	U	0.0018	U	0.005	U	0.0036	U	0.004	U	0.0021	U
190		0.038		0.01		0.039		0.004	EMPC	0.035		0.007		0.043	EMPC	0.008	
191		0.008		0.001		0.007		0.0013	U	0.005		0.0018	U	0.005	EMPC	0.0012	U
192		0.0008	U	0.001	U	0.0008	U	0.0014	U	0.0011	U	0.002	U	0.0008	U	0.0013	U
193	180 + 193		C180		C180		C180		C180		C180		C180		C180		C180
194		0.063		0.034		0.067		0.014	U	0.043		0.037		0.048		0.029	
195		0.026		0.015	EMPC	0.027		0.008	EMPC	0.019	EMPC	0.013	EMPC	0.018		0.009	
196		0.035		0.045		0.04	EMPC	0.013	U	0.027		0.033	EMPC	0.031		0.03	
197	197 + 200	0.016	C	0.021	C	0.017	C EMPC	0.007	C EMPC	0.01	C EMPC	0.013	C	0.01	C	0.009	C
198	198 + 199	0.096	C	0.135	C	0.096	C	0.054	C U	0.079	C EMPC	0.111	C	0.075	C	0.086	C
199	198 + 199		C198		C198		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197		C197		C197
201		0.013		0.016	EMPC	0.01	EMPC	0.005		0.01		0.012		0.008		0.008	
202		0.029		0.029		0.027		0.012	U	0.024	EMPC	0.02	EMPC	0.021		0.015	U
203		0.071		0.099		0.066		0.035		0.052		0.083		0.064		0.076	
204		0.0008	U	0.0008	U	0.0008	U	0.0012	U	0.0008	U	0.0016	U	0.001	EMPC	0.0013	U
205		0.005	U	0.003	U	0.006	U	0.0016	U	0.002	U	0.0025	U	0.004	U	0.002	U
206		0.049		0.049		0.061		0.019	EMPC	0.04		0.053	EMPC	0.039		0.04	
207		0.01	EMPC	0.02	EMPC	0.012		0.008		0.006	EMPC	0.015		0.007	EMPC	0.013	
208		0.02	U	0.041		0.024		0.012	U	0.016	U	0.041		0.02	U	0.027	
209		0.056		0.015	U	0.105		0.009	U	0.106		0.016	U	0.048		0.016	U
Total PCBs as Congeners (full EMPC/full SDL)		23.9	J	155	J	27.2	J	140	J	25.5	J	154	J	22.1	J	110	J
Total PCBs as Congeners (KM-based)		22.6	J	154	J	26.4	J	138	J	24.3	J	154	J	21.2	J	109	J
Total PCBs as Congeners (KM-based, capped)		22.6	J	154	J	26.4	J	138	J	24.3	J	154	J	21.2	J	109	J

Notes:

All results are in units of pg/L (picograms/Liter)
C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
RDL = Reported detection limit

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-12
High-Volume Surface Water PCB Congener Analysis Results
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		Reference - P59				Reference - P60				Reference - P61			
IUPAC #	COELUTING CONGENERS[1]	08022959XAD 2/29/2008 (Filter)		08022959XAD 2/29/2008 (Column)		08030460XAD 3/4/2008 (Filter)		08030460XAD 3/4/2008 (Column)		08030661XAD 3/6/2008 (Filter)		08030661XAD 3/6/2008 (Column)	
1		0.015	U	0.209		0.019	U	0.213		0.015	U	0.18	
2		0.042	U	0.256		0.056		0.292		0.047	U	0.237	
3		0.032	U	0.147		0.036	U	0.17		0.034	U	0.155	
4		0.026	U	0.634		0.038	U	0.554		0.026	U	0.391	
5		0.008	U	0.0051	U	0.0047	U	0.0046	U	0.0056	U	0.009	EMPC
6		0.011	U	0.144		0.019	U	0.129		0.012	U	0.103	
7		0.011	U	0.032	U	0.014	U	0.027	U	0.0052	U	0.033	U
8		0.046	U	0.512		0.004	U	0.5		0.064	U	0.462	
9		0.0071	U	0.041	EMPC	0.007	U	0.039		0.005	U	0.038	
10		0.0067	U	0.026		0.004	U	0.017		0.0047	U	0.016	
11		9.81		133		11.3		130		8.97		107	
12	12 + 13	0.008	C U	0.0052	C U	0.0047	C U	0.0046	C U	0.0056	C U	0.0055	C U
13	12 + 13		C12		C12		C12		C12		C12		C12
14		0.0075	U	0.0049	U	0.0044	U	0.0044	U	0.0052	U	0.0052	U
15		0.059	U	0.839		0.081	U	0.543	EMPC	0.072	U	0.737	
16		0.042	U	0.348		0.052	U	0.322		0.04	U	0.302	
17		0.048	U	0.303		0.052	U	0.28		0.042	U	0.243	
18	18 + 30	0.093	C U	0.763	C	0.116	C U	0.729	C	0.09	C U	0.657	C
19		0.015	U	0.139		0.017	U	0.115		0.015	U	0.09	
20	20 + 28	0.195	C	0.749	C	0.237	C	0.736	C	0.293	C	0.728	C
21	21 + 33	0.063	C U	0.284	C	0.094	C U	0.289	C EMPC	0.129	C	0.286	C
22		0.072	EMPC	0.271		0.089		0.288		0.115		0.282	
23		0.0043	U	0.017	U	0.006	U	0.0032	U	0.0019	U	0.002	U
24		0.003	EMPC	0.014	EMPC	0.003		0.013		0.002	EMPC	0.013	
25		0.013	U	0.051		0.015		0.05		0.018		0.043	EMPC
26	26 + 29	0.028	C U	0.136	C	0.035	C U	0.131	C	0.042	C	0.121	C
27		0.009	U	0.062		0.01	U	0.056		0.01	U	0.052	
28	20 + 28		C20		C20		C20		C20		C20		C20
29	26 + 29		C26		C26		C26		C26		C26		C26
30	18 + 30		C18		C18		C18		C18		C18		C18
31		0.144	U	0.622		0.179		0.612		0.22		0.588	
32		0.023	U	0.16		0.029	U	0.149		0.025	U	0.136	
33	21 + 33		C21		C21		C21		C21		C21		C21
34		0.0043	U	0.026	U	0.005	U	0.005	U	0.002	U	0.006	U
35		0.03		0.118		0.039		0.125		0.041		0.103	
36		0.005	EMPC	0.027	EMPC	0.007	EMPC	0.027		0.006	EMPC	0.022	
37		0.067		0.147		0.08		0.145		0.105		0.146	
38		0.0045	U	0.003	EMPC	0.003	EMPC	0.01		0.004		0.004	
39		0.0044	U	0.006	EMPC	0.002	EMPC	0.01		0.002	EMPC	0.005	EMPC
40	40 + 41 + 71	0.089	C	0.221	C	0.101	C	0.224	C	0.121	C	0.229	C
41	40 + 41 + 71		C40		C40		C40		C40		C40		C40
42		0.067		0.129	EMPC	0.075		0.127		0.075		0.125	
43		0.007	EMPC	0.02		0.013		0.023		0.009	EMPC	0.02	
44	44 + 47 + 65	0.302	C	0.644	C	0.368	C	0.654	C	0.432	C	0.736	C
45	45 + 51	0.038	C U	0.103	C	0.045	C U	0.091	C	0.044	C U	0.105	C
46		0.01	EMPC	0.034	EMPC	0.01	EMPC	0.033		0.009	EMPC	0.031	
47	44 + 47 + 65		C44		C44		C44		C44		C44		C44
48		0.039		0.0017	U	0.046		0.0014	U	0.045		0.0015	U
49	49 + 69	0.134	C	0.318	C	0.146	C	0.281	C	0.164	C	0.294	C
50	50 + 53	0.027	C	0.091	C	0.03	C	0.09	C	0.028	C	0.094	C
51	45 + 51		C45		C45		C45		C45		C45		C45
52		0.335		0.973		0.393		0.898		0.45		0.0014	U
53	50 + 53		C50		C50		C50		C50		C50		C50
54		0.001	U	0.018	U	0.005	U	0.002	U	0.003	U	0.001	U
55		0.0046	U	0.01	EMPC	0.0046	U	0.0061	U	0.0058	U	0.008	
56		0.104		0.153		0.118		0.162		0.163		0.165	
57		0.0044	U	0.0064	U	0.0044	U	0.0059	U	0.0056	U	0.0062	U
58		0.0045	U	0.0067	U	0.0045	U	0.0062	U	0.0056	U	0.0065	U
59	59 + 62 + 75	0.021	C	0.051	C	0.023	C	0.053	C	0.027	C	0.048	C
60		0.064	EMPC	0.088		0.067		0.087		0.088		0.089	
61	61 + 70 + 74 + 76	0.495	C	0.739	C	0.571	C	0.746	C	0.816	C	0.783	C
62	59 + 62 + 75		C59		C59		C59		C59		C59		C59
63		0.01	EMPC	0.016	EMPC	0.011	EMPC	0.015		0.012		0.018	
64		0.097		0.0013	U	0.114		0.209		0.136		0.213	
65	44 + 47 + 65		C44		C44		C44		C44		C44		C44
66		0.261		0.299		0.279		0.324		0.363		0.318	
67		0.008	EMPC	0.015	EMPC	0.008	EMPC	0.012	EMPC	0.008	EMPC	0.014	
68		0.0043	U	0.0068	U	0.011	U	0.014	U	0.012	U	0.0066	U
69	49 + 69		C49		C49		C49		C49		C49		C49
70	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
71	40 + 41 + 71		C40		C40		C40		C40		C40		C40
72		0.0045	U	0.0063	U	0.0045	U	0.0058	U	0.0057	U	0.0061	U
73		0.0014	U	0.0013	U	0.0008	U	0.013		0.0008	U	0.012	
74	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
75	59 + 62 + 75		C59		C59		C59		C59		C59		C59
76	61 + 70 + 74 + 76		C61		C61		C61		C61		C61		C61
77		0.039	U	0.043	U	0.057		0.041	U	0.071		0.08	
78		0.0048	U	0.0071	U	0.0048	U	0.0066	U	0.006	U	0.0068	U
79		0.01	EMPC	0.009	EMPC	0.015		0.01	EMPC	0.015	EMPC	0.011	
80		0.0042	U	0.0057	U	0.0042	U	0.0053	U	0.0053	U	0.0055	U
81		0.0047	U	0.007	U	0.0047	U	0.0062	U	0.0057	U	0.0066	U
82		0.058		0.05		0.068		0.055		0.084		0.057	
83	83 + 99	0.388	C	0.296	C	0.448	C	0.302	C	0.479	C	0.324	C
84		0.109		0.153		0.124		0.142		0.144		0.165	
85	85 + 116 + 117	0.12	C	0.088	C	0.136	C EMPC	0.089	C	0.164	C	0.104	C
86	86 + 87 + 97 + 108 + 119 + 125	0.442	C	0.387	C	0.512	C	0.411	C	0.616	C	0.468	C
87	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
88	88 + 91	0.07	C	0.067	C	0.074	C	0.067	C	0.078	C	0.076	C
89		0.004	EMPC	0.005		0.006	EMPC	0.005		0.006		0.005	EMPC
90	90 + 101 + 113	0.684	C	0.607	C	0.779	C	0.606	C	0.857	C	0.649	C
91	88 + 91		C88		C88		C88		C88		C88		C88
92		0.123		0.115		0.128		0.112		0.14		0.125	
93	93 + 95 + 98 + 100 + 102	0.46	C	0.632	C	0.512	C	0.613	C	0.537	C	0.637	C
94		0.0032	U	0.0034	U	0.0019	U	0.003	EMPC	0.004	EMPC	0.003	
95	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
96		0.003		0.004	EMPC	0.003		0.004	EMPC	0.003	EMPC	0.004	EMPC
97	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
98	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
99	83 + 99		C83		C83		C83		C83		C83		C83
100	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
101	90 + 101 + 113		C90		C90		C90		C90		C90		C90
102	93 + 95 + 98 + 100 + 102		C93		C93		C93		C93		C93		C93
103		0.004		0.0028	U	0.003	EMPC	0.002	EMPC	0.004		0.005	EMPC
104		0.002	U	0.017	U	0.004	U	0.001	U	0.001	U	0.0009	U
105		0.297		0.149		0.327		0.144		0.403		0.16	
106		0.0057	U	0.005		0.0051	U	0.0039	U	0.0041	U	0.0061	U
107	107 + 124	0.036	C EMPC	0.022	C	0.037	C	0.023	C	0.044	C	0.024	C EMPC
108	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
109		0.058		0.033	EMPC	0.065		0.036	EMPC	0.075		0.034	
110	110 + 115	0.765	C	0.692	C	0.869	C	0.705	C	1.08	C	0.781	C
111		0.0024	U	0.0025	U	0.0014	U	0.0016	U	0.0011	U	0.0018	U

Table H-12
High-Volume Surface Water PCB Congener Analysis Results
(Page 6 of 6)

		Reference - P59				Reference - P60				Reference - P61			
IUPAC #	COELUTING CONGENERS[1]	08022959XAD 2/29/2008 (Filter)		08022959XAD 2/29/2008 (Column)		08030460XAD 3/4/2008 (Filter)		08030460XAD 3/4/2008 (Column)		08030661XAD 3/6/2008 (Filter)		08030661XAD 3/6/2008 (Column)	
112		0.0023	U	0.0025	U	0.0014	U	0.0016	U	0.0011	U	0.0018	U
113	90 + 101 + 113		C90		C90		C90		C90		C90		C90
114		0.017	U	0.017	U	0.02	U	0.01	U	0.022	U	0.009	U
115	110 + 115		C110		C110		C110		C110		C110		C110
116	85 + 116 + 117		C85		C85		C85		C85		C85		C85
117	85 + 116 + 117		C85		C85		C85		C85		C85		C85
118		0.884		0.489		1.08		0.553		1.22		0.552	
119	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
120		0.004		0.0023	U	0.004		0.002	EMPC	0.002		0.002	EMPC
121		0.0023	U	0.0025	U	0.0014	U	0.0016	U	0.0011	U	0.0018	U
122		0.0062	U	0.004	U	0.009		0.005	EMPC	0.008		0.0066	U
123		0.02	U	0.009	U	0.026	U	0.014	U	0.026	U	0.011	U
124	107 + 124		C107		C107		C107		C107		C107		C107
125	86 + 87 + 97 + 108 + 119 + 125		C86		C86		C86		C86		C86		C86
126		0.0063	U	0.0039	U	0.008	U	0.0041	U	0.008	U	0.007	U
127		0.0057	U	0.0039	U	0.0051	U	0.0041	U	0.0041	U	0.0064	U
128	128 + 166	0.137	C	0.044	C	0.146	C	0.045	C	0.156	C	0.049	C
129	129 + 138 + 160 + 163	1.04	C	0.351	C	1.28	C	0.381	C	1.11	C	0.388	C
130		0.053		0.02		0.057		0.02		0.058		0.021	
131		0.01	EMPC	0.004	EMPC	0.012	EMPC	0.003	EMPC	0.01	EMPC	0.005	
132		0.213		0.091		0.226		0.091		0.247		0.106	
133		0.014		0.006	U	0.013		0.004	U	0.017		0.007	U
134	134 + 143	0.033	C	0.018	C EMPC	0.032	C	0.016	C	0.035	C	0.019	C
135	135 + 151 + 154	0.247	C	0.111	C	0.278	C	0.127	C	0.285	C	0.128	C
136		0.063		0.032		0.071		0.035		0.07		0.036	
137		0.035	EMPC	0.016		0.047		0.01		0.048		0.017	
138	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
139	139 + 140	0.014	C EMPC	0.006	C EMPC	0.016	C	0.005	C EMPC	0.016	C	0.007	C EMPC
140	139 + 140		C139		C139		C139		C139		C139		C139
141		0.089		0.037		0.116		0.037		0.122		0.042	EMPC
142		0.0027	U	0.0013	U	0.0042	U	0.0023	U	0.0034	U	0.0019	U
143	134 + 143		C134		C134		C134		C134		C134		C134
144		0.027		0.01	EMPC	0.027		0.015		0.033		0.015	
145		0.0011	U	0.0011	U	0.0008	U	0.0006	U	0.0008	U	0.0009	U
146		0.156		0.059		0.183		0.063		0.167		0.063	
147	147 + 149	0.644	C	0.288	C	0.778	C	0.298	C	0.725	C	0.307	C
148		0.0013	U	0.0014	U	0.0008	U	0.0008	U	0.002		0.0011	U
149	147 + 149		C147		C147		C147		C147		C147		C147
150		0.002	EMPC	0.0011	U	0.0008	U	0.002	EMPC	0.001	EMPC	0.0008	U
151	135 + 151 + 154		C135		C135		C135		C135		C135		C135
152		0.001	U	0.001	U	0.0008	U	0.001	EMPC	0.0008	U	0.0008	U
153	153 + 168	1.19	C	0.327	C	1.52	C	0.356	C	1.26	C	0.402	C
154	135 + 151 + 154		C135		C135		C135		C135		C135		C135
155		0.003	U	0.012	U	0.004	U	0.001	U	0.003	U	0.002	U
156	156 + 157	0.099	C	0.032	C U	0.115	C	0.03	C U	0.104	C	0.034	C U
157	156 + 157		C156		C156		C156		C156		C156		C156
158		0.073		0.027		0.083		0.025		0.084		0.031	
159		0.008		0.002		0.005		0.0017	U	0.007	EMPC	0.002	
160	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
161		0.0019	U	0.0009	U	0.003	U	0.0016	U	0.0024	U	0.0013	U
162		0.003	EMPC	0.002	EMPC	0.0031	U	0.0018	U	0.003	EMPC	0.0014	U
163	129 + 138 + 160 + 163		C129		C129		C129		C129		C129		C129
164		0.044		0.022		0.053		0.02		0.055		0.021	
165		0.0022	U	0.0011	U	0.0033	U	0.0019	U	0.0027	U	0.0015	U
166	128 + 166		C128		C128		C128		C128		C128		C128
167		0.056		0.015	U	0.07		0.016	U	0.06		0.018	U
168	153 + 168		C153		C153		C153		C153		C153		C153
169		0.002	U	0.001	U	0.0032	U	0.0016	U	0.0024	U	0.0014	U
170		0.132		0.022	U	0.123		0.019	U	0.14		0.02	U
171	171 + 173	0.05	C	0.01	C	0.054	C	0.009	C	0.054	C	0.005	C EMPC
172		0.025		0.005	EMPC	0.027		0.006	EMPC	0.031		0.005	
173	171 + 173		C171		C171		C171		C171		C171		C171
174		0.128		0.034		0.131		0.031		0.145		0.033	
175		0.009	EMPC	0.0011	U	0.008	EMPC	0.001	EMPC	0.008		0.002	
176		0.02		0.006	EMPC	0.021		0.0005	U	0.02		0.004	EMPC
177		0.104		0.024		0.112		0.021		0.11		0.024	
178		0.044	EMPC	0.012		0.042		0.011		0.037		0.009	
179		0.068		0.022	EMPC	0.077		0.018		0.07		0.018	
180	180 + 193	0.369	C	0.087	C	0.392	C	0.07	C EMPC	0.389	C	0.078	C
181		0.002	EMPC	0.0011	U	0.002	EMPC	0.0008	U	0.002	EMPC	0.001	U
182		0.001	U	0.003	U	0.003	U	0.001	U	0.0008	U	0.001	U
183	183 + 185	0.131	C	0.03	C	0.142	C	0.026	C	0.122	C	0.031	C
184		0.001		0.001		0.002	EMPC	0.001	EMPC	0.002	EMPC	0.0007	U
185	183 + 185		C183		C183		C183		C183		C183		C183
186		0.001	U	0.0009	U	0.0008	U	0.0006	U	0.0008	U	0.0008	U
187		0.319		0.105		0.349		0.09		0.323		0.098	
188		0.001	U	0.006	U	0.003	U	0.001	U	0.001	U	0.0007	U
189		0.006	U	0.002	U	0.004	U	0.002	U	0.005	U	0.0014	U
190		0.045		0.007	EMPC	0.048		0.008		0.05	EMPC	0.01	
191		0.001	U	0.0009	U	0.007		0.001	EMPC	0.006		0.002	EMPC
192		0.0011	U	0.001	U	0.0008	U	0.0006	U	0.0008	U	0.0009	U
193	180 + 193		C180		C180		C180		C180		C180		C180
194		0.054		0.019	EMPC	0.052		0.01		0.069		0.016	EMPC
195		0.029		0.005		0.024		0.004	EMPC	0.033		0.005	EMPC
196		0.036		0.016		0.036		0.009	EMPC	0.041		0.011	
197	197 + 200	0.014	C EMPC	0.006	C	0.013	C EMPC	0.004	C	0.013	C	0.007	C
198	198 + 199	0.093	C	0.054	C	0.087	C	0.029	C	0.096	C	0.046	C
199	198 + 199		C198		C198		C198		C198		C198		C198
200	197 + 200		C197		C197		C197		C197		C197		C197
201		0.012		0.005		0.01	EMPC	0.004		0.013	EMPC	0.006	EMPC
202		0.024	EMPC	0.016	U	0.028	EMPC	0.008	U	0.029		0.01	U
203		0.084		0.037		0.078		0.021		0.073		0.032	
204		0.0008	U	0.0009	U	0.0008	U	0.0006	U	0.0008	U	0.0008	U
205		0.004	U	0.002	U	0.005	U	0.001	U	0.006	U	0.002	U
206		0.047		0.027	EMPC	0.056		0.01		0.048		0.014	EMPC
207		0.007		0.005	U	0.006		0.0037	U	0.007	EMPC	0.005	EMPC
208		0.022	U	0.015	U	0.021	U	0.007	U	0.02	U	0.011	U
209		0.062		0.012	U	0.064		0.01	U	0.062		0.009	U
Total PCBs as Congeners (full EMPC/full SDL)		23.9	J	150	J	27.6	J	147	J	26.3	J	123	J
Total PCBs as Congeners (KM-based)		22.8	J	149	J	26.7	J	146	J	25.6	J	123	J
Total PCBs as Congeners (KM-based, capped)		22.8	J	149	J	26.7	J	146	J	25.6	J	123	J

Notes:

All results are in units of pg/L (picograms/Liter)
C = Concentration represents coeluting congeners.
U = The analyte was not detected above the RDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The RDL is an estimate.
RDL = Reported detection limit

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
1= When two or more congeners can not be resolved in the chromatogram they are considered to be 'coeluting' and are reported as a single concentration. This concentration is reported once for all the coeluting congeners.
KM-based = Kaplan–Meier-based with Efron's bias correction
KM-based, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-13
Forebay - Random Sediment and Tissue PCB Aroclor Analysis Results
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Media	Sediment		Sediment		Sediment		Sediment		Sediment		Sediment		Sediment		Sediment		Sediment		Sediment	
Site ID	P04		P05		P06		P07		P08		P09		P10		P11		P13		P14	
Sample ID	08022604SD		08031905SD		08031806SD		08021507SD		08021508SD		08021409SD		08021410SD		08021411SD		08031713SD		08031814SD	
Sample Date	2/26/2008		3/19/2008		3/18/2008		2/15/2008		2/15/2008		2/14/2008		2/14/2008		2/14/2008		3/17/2008		3/18/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	1.70 U	10.0 U	1.70 U	7.00 U	1.70 U	7.20 U	1.70 U	10.0 U	1.70 U	9.80 U	1.70 U	9.90 U	10.0 U	10.0 U	1.70 U	10.0 U	1.70 U	8.50 U	1.70 U	6.90 U
Aroclor 1221	1.70 U	20.0 U	1.70 U	14.0 U	1.70 U	15.0 U	2.20 U	20.0 U	12.0 U	20.0 U	1.70 U	20.0 U	21.0 U	21.0 U	20.0 U	20.0 U	1.70 U	17.0 U	1.70 U	14.0 U
Aroclor 1232	1.70 U	10.0 U	1.70 U	7.00 U	1.70 U	7.20 U	7.90 U	10.0 U	7.40 U	9.80 U	1.70 U	9.90 U	8.20 U	10.0 U	6.30 U	10.0 U	1.70 U	8.50 U	1.70 U	6.90 U
Aroclor 1242	1.70 U	10.0 U	1.70 U	7.00 U	1.70 U	7.20 U	4.30 U	10.0 U	5.70 U	9.80 U	1.70 U	9.90 U	2.20 U	10.0 U	1.70 U	10.0 U	1.70 U	8.50 U	1.70 U	6.90 U
Aroclor 1248	1.70 U	10.0 U	1.70 U	7.00 U	1.70 U	7.20 U	3.50 U	10.0 U	1.70 U	9.80 U	1.70 U	9.90 U	1.90 U	10.0 U	4.00 U	10.0 U	1.70 U	8.50 U	1.70 U	6.90 U
Aroclor 1254	**27.0**	**27.0**	1.70 U	7.00 U	**4.60 J**	**4.60 J**	2.50 U	10.0 U	1.90 U	9.80 U	2.60 U	9.90 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	8.50 U	1.70 U	6.90 U
Aroclor 1260	1.70 U	10.0 U	1.70 U	7.00 U	1.70 U	7.20 U	1.70 U	10.0 U	1.70 U	9.80 U	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	8.50 U	1.70 U	6.90 U
Aroclor 1262	1.70 U	10.0 U	1.70 U	7.00 U	1.70 U	7.20 U	1.70 U	10.0 U	1.70 U	9.80 U	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	8.50 U	1.70 U	6.90 U
Aroclor 1268	1.70 U	10.0 U	1.70 U	7.00 U	1.70 U	7.20 U	1.70 U	10.0 U	1.70 U	9.80 U	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	8.50 U	1.70 U	6.90 U
Total PCBs as Aroclors [1]	**28.7 J**	**37.0 J**	3.40 U	14.0 U	**6.30 J**	**11.8 J**	6.80 U	20.0 U	7.60 U	19.6 U	4.30 U	19.8 U	3.90 U	20.0 U	3.40 U	20.0 U	3.40 U	17.0 U	3.40 U	13.8 U

Notes:
[1] Only Aroclors 1248 and 1254 were included in summing sediment Total PCBs as Aroclors because all other aroclors were undected in Forebay sediment samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
- = Not Analyzed
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
Sediment is in micrograms per kilogram (µg/kg), dry weight

Table H-13
Forebay - Random Sediment and Tissue PCB Aroclor Analysis Results
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Media	Sediment		Sediment		Sediment		Sediment		Sediment		Sediment		Sediment		Sediment		Sediment	
Site ID	P15		P16		P17		P18		P21		P65		P67		P88		P89	
Sample ID	08022115SD		08022116SD		08022117SD		08021118SD		08021221SD		08022965SD		08030367SD		08031788SD		08031789SD	
Sample Date	2/21/2008		2/21/2008		2/21/2008		2/11/2008		2/12/2008		2/29/2008		3/3/2008		3/17/2008		3/17/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	1.70 U	9.90 U	1.70 U	10.0 U	9.90 U	9.90 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	7.30 U	1.70 U	6.70 U	1.70 U	6.40 U	1.70 U	7.00 U
Aroclor 1221	1.70 U	20.0 U	1.70 U	20.0 U	29.0 U	29.0 U	13.0 U	20.0 U	16.0 U	20.0 U	1.70 U	15.0 U	1.70 U	14.0 U	1.70 U	13.0 U	1.70 U	14.0 U
Aroclor 1232	1.70 U	9.90 U	1.70 U	10.0 U	18.0 U	18.0 U	7.50 U	10.0 U	14.0 U	14.0 U	1.70 U	7.30 U	1.70 U	6.70 U	1.70 U	6.40 U	1.70 U	7.00 U
Aroclor 1242	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	9.90 U	2.90 U	10.0 U	5.70 U	10.0 U	1.70 U	7.30 U	1.70 U	6.70 U	1.70 U	6.40 U	1.70 U	7.00 U
Aroclor 1248	1.70 U	9.90 U	1.70 U	10.0 U	1.90 U	9.90 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	7.30 U	1.70 U	6.70 U	1.70 U	6.40 U	1.70 U	7.00 U
Aroclor 1254	1.70 U	9.90 U	1.70 U	10.0 U	2.20 U	9.90 U	1.70 U	10.0 U	2.40 U	10.0 U	1.70 U	7.30 U	1.70 U	6.70 U	1.70 U	6.40 U	1.70 U	7.00 U
Aroclor 1260	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	9.90 U	1.70 U	10.0 U	4.70 U	10.0 U	1.70 U	7.30 U	1.70 U	6.70 U	1.70 U	6.40 U	1.70 U	7.00 U
Aroclor 1262	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	7.30 U	1.70 U	6.70 U	1.70 U	6.40 U	1.70 U	7.00 U
Aroclor 1268	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	7.30 U	1.70 U	6.70 U	1.70 U	6.40 U	1.70 U	7.00 U
Total PCBs as Aroclors [1]	3.40 U	19.8 U	3.40 U	20.0 U	3.90 U	19.80 U	4.60 U	20.0 U	8.10 U	20.0 U	3.40 U	14.6 U	3.40 U	13.40 U	3.40 U	12.80 U	3.40 U	14.00 U

Notes:

[1] Only Aroclors 1248 and 1254 were included in summing sediment Total PCBs as Aroclors because all other aroclors were undected in Forebay sediment samples.

MDL = method detection limit

MRL = method reporting limit

bold = analyte detected above MDL.

- = Not Analyzed

J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.

Sediment is in micrograms per kilogram (µg/kg), dry weight

Table H-13
Forebay - Random Sediment and Tissue PCB Aroclor Analysis Results
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Media	Clam		Clam		Clam		Clam		Clam		Clam		Clam		Clam		Clam		Clam	
Site ID	P04		P05		P06		P07		P08		P09		P10		P11		P13		P14	
Sample ID	08022604TC		08031905TC		08031806TC		08021507TC		08021508TC		08021409TC		08021410TC		08021411TC		08031713TC		08031814TC	
Sample Date	2/26/2008		3/19/2008		3/18/2008		2/15/2008		2/15/2008		2/14/2008		2/14/2008		2/14/2008		3/17/2008		3/18/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	18.0 U	18.0 U	2.40 U	9.90 U	2.40 U	10.0 U	19.0 U	19.0 U	23.0 U	23.0 U	23.0 U	23.0 U	23.0 U	23.0 U	21.0 U	21.0 U	2.40 U	9.90 U	2.40 U	9.90 U
Aroclor 1221	20.0 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U
Aroclor 1232	40.0 U	40.0 U	2.30 U	9.90 U	2.30 U	10.0 U	27.0 U	27.0 U	25.0 U	25.0 U	30.0 U	30.0 U	34.0 U	34.0 U	36.0 U	36.0 U	2.30 U	9.90 U	2.30 U	9.90 U
Aroclor 1242	48.0 U	48.0 U	2.20 U	9.90 U	2.20 U	10.0 U	35.0 U	35.0 U	29.0 U	29.0 U	30.0 U	30.0 U	19.0 U	19.0 U	19.0 U	19.0 U	2.20 U	9.90 U	2.20 U	9.90 U
Aroclor 1248	0.510 U	9.80 U	0.510 U	9.90 U	0.510 U	10.0 U	26.0 U	26.0 U	13.0 U	13.0 U	6.00 U	9.60 U	12.0 U	12.0 U	9.90 U	10.0 U	0.510 U	9.90 U	0.510 U	9.90 U
Aroclor 1254	**120 J**	**120 J**	**23.0 J**	**23.0 J**	**32.0 J**	**32.0 J**	74.0 U	74.0 U	55.0 U	55.0 U	49.0 U	49.0 U	36.0 U	36.0 U	32.0 U	32.0 U	**22.0**	**22.0**	**22.0**	**22.0**
Aroclor 1260	1.90 U	9.80 U	1.90 U	9.90 U	1.90 U	10.0 U	11.0 U	11.0 U	9.40 U	9.80 U	8.50 U	9.60 U	6.90 U	9.90 U	6.40 U	10.0 U	1.90 U	9.90 U	1.90 U	9.90 U
Aroclor 1262	2.50 U	9.80 U	2.50 U	9.90 U	2.50 U	10.0 U	2.50 U	9.90 U	2.50 U	9.80 U	2.50 U	9.60 U	2.50 U	9.90 U	2.50 U	10.0 U	2.50 U	9.90 U	2.50 U	9.90 U
Aroclor 1268	2.00 U	9.80 U	2.00 U	9.90 U	2.00 U	10.0 U	2.00 U	9.90 U	2.00 U	9.80 U	2.00 U	9.60 U	2.00 U	9.90 U	2.00 U	10.0 U	2.00 U	9.90 U	2.00 U	9.90 U
Total PCBs as Aroclors [1]	**120 J**	**120 J**	**23.0 J**	**23.0 J**	**32.0 J**	**32.0 J**	74.0 U	74.0 U	55.0 U	55.0 U	49.0 U	49.0 U	36.0 U	36.0 U	32.0 U	32.0 U	**22.0**	**22.0**	**22.0**	**22.0**

Notes:
[1] Only Aroclor 1254 was included in summing Total PCBs as Aroclors because all other aroclors were undected in Forebay clam samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
- = Not Analyzed
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-13
Forebay - Random Sediment and Tissue PCB Aroclor Analysis Results
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Media	Clam		Clam		Clam		Clam		Clam		Clam		Clam		Clam		Clam	
Site ID	P15		P16		P17		P18		P21		P65		P67		P88		P89	
Sample ID	08022115TC		08022116TC		08022117TC		08021118TC		08021221TC		08022965TC		08030367TC		08031788TC		08031789TC	
Sample Date	2/21/2008		2/21/2008		2/21/2008		2/12/2008		2/12/2008		2/29/2008		3/3/2008		3/17/2008		3/17/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	19.0 U	19.0 U	17.0 U	17.0 U	17.0 U	17.0 U	17.0 U	17.0 U	15.0 U	15.0 U	2.40 U	9.80 U	2.40 U	10.0 U	2.40 U	10.0 U	2.40 U	9.90 U
Aroclor 1221	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U
Aroclor 1232	35.0 U	35.0 U	30.0 U	30.0 U	31.0 U	31.0 U	23.0 U	23.0 U	19.0 U	19.0 U	2.30 U	9.80 U	2.30 U	10.0 U	2.30 U	10.0 U	2.30 U	9.90 U
Aroclor 1242	17.0 U	17.0 U	15.0 U	15.0 U	15.0 U	15.0 U	22.0 U	22.0 U	10.0 U	10.0 U	2.20 U	9.80 U	2.20 U	10.0 U	2.20 U	10.0 U	2.20 U	9.90 U
Aroclor 1248	4.60 U	9.90 U	4.50 U	9.80 U	9.20 U	10.0 U	9.90 U	9.90 U	4.60 U	9.80 U	0.510 U	9.80 U	0.510 U	10.0 U	0.510 U	10.0 U	0.510 U	9.90 U
Aroclor 1254	32.0 U	32.0 U	30.0 U	30.0 U	28.0 U	28.0 U	28.0 U	28.0 U	30.0 U	30.0 U	**21.0**	**21.0**	**21.0**	**21.0**	**23.0**	**23.0**	**21.0**	**21.0**
Aroclor 1260	6.70 U	9.90 U	6.80 U	9.80 U	5.90 U	10.0 U	5.90 U	9.90 U	6.20 U	9.80 U	1.90 U	9.80 U	1.90 U	10.0 U	1.90 U	10.0 U	1.90 U	9.90 U
Aroclor 1262	2.50 U	9.90 U	2.50 U	9.80 U	2.50 U	10.0 U	2.50 U	9.90 U	2.50 U	9.80 U	2.50 U	9.80 U	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	9.90 U
Aroclor 1268	2.00 U	9.90 U	2.00 U	9.80 U	2.00 U	10.0 U	2.00 U	9.90 U	2.00 U	9.80 U	2.00 U	9.80 U	2.00 U	10.0 U	2.00 U	10.0 U	2.00 U	9.90 U
Total PCBs as Aroclors [1]	32.0 U	32.0 U	30.0 U	30.0 U	28.0 U	28.0 U	28.0 U	28.0 U	30.0 U	30.0 U	**21.0**	**21.0**	**21.0**	**21.0**	**23.0**	**23.0**	**21.0**	**21.0**

Notes:
[1] Only Aroclor 1254 was included in summing Total PCBs as Aroclors because all other aroclors were undected in Forebay clam samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
- = Not Analyzed
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-13
Forebay - Random Sediment and Tissue PCB Aroclor Analysis Results
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Media	Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish	
Site ID	**P01-CF**		**P02-CF**		**P03-CF**		**P04-CF**		**P05-CF**		**P06-CF**		**P07-CF**		**P08-CF**		**P13-CF**		**P14-CF**	
Sample ID	**08021901CF**		**08021902CF**		**08022003CF**		**08021904CF**		**08021505CF**		**08021406CF**		**08021407CF**		**08021408CF**		**08021413CF**		**08022014CF**	
Sample Date	**2/19/2008**		**2/19/2008**		**2/20/2008**		**2/19/2008**		**2/15/2008**		**2/14/2008**		**2/14/2008**		**2/14/2008**		**2/14/2008**		**2/20/2008**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	2.40 U	9.90 U	2.40 U	10.0 U	2.40 U	9.90 U	2.40 U	9.90 U	2.40 U	9.80 U	2.40 U	10.0 U	2.40 U	9.90 U	2.40 U	9.90 U	2.40 U	9.80 U	2.40 U	9.60 U
Aroclor 1221	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U
Aroclor 1232	2.30 U	9.90 U	2.30 U	10.0 U	2.30 U	9.90 U	2.30 U	9.90 U	2.30 U	9.80 U	2.30 U	10.0 U	2.30 U	9.90 U	2.30 U	9.90 U	2.30 U	9.80 U	2.30 U	9.60 U
Aroclor 1242	2.20 U	9.90 U	2.20 U	10.0 U	2.20 U	9.90 U	2.20 U	9.90 U	2.20 U	9.80 U	2.20 U	10.0 U	2.20 U	9.90 U	2.20 U	9.90 U	2.20 U	9.80 U	2.20 U	9.60 U
Aroclor 1248	0.510 U	9.90 U	0.510 U	10.0 U	0.510 U	9.90 U	0.510 U	9.90 U	0.510 U	9.80 U	0.510 U	10.0 U	0.510 U	9.90 U	0.510 U	9.90 U	0.510 U	9.80 U	0.510 U	9.60 U
Aroclor 1254	1.80 U	9.90 U	1.80 U	10.0 U	1.80 U	9.90 U	1.80 U	9.90 U	1.80 U	9.80 U	19.0 U	19.0 U	1.90 U	9.90 U	1.80 U	9.90 U	1.80 U	9.80 U	1.80 U	9.60 U
Aroclor 1260	1.90 U	9.90 U	1.90 U	10.0 U	1.90 U	9.90 U	8.60 U	9.90 U	7.10 U	9.80 U	17.0 U	17.0 U	4.00 U	9.90 U	1.90 U	9.90 U	1.90 U	9.80 U	1.90 U	9.60 U
Aroclor 1262	2.50 U	9.90 U	2.50 U	10.0 U	2.50 U	9.90 U	2.50 U	9.90 U	9.80 U	9.80 U	10.0 U	10.0 U	2.60 U	9.90 U	2.50 U	9.90 U	2.50 U	9.80 U	2.50 U	9.60 U
Aroclor 1268	2.00 U	9.90 U	2.00 U	10.0 U	2.00 U	9.90 U	2.00 U	9.90 U	2.00 U	9.80 U	2.00 U	10.0 U	2.00 U	9.90 U	2.00 U	9.90 U	2.00 U	9.80 U	2.00 U	9.60 U
Total PCBs as Aroclors [1]	2.60 U	20.00 U	2.60 U	20.0 U	2.60 U	20.0 U	8.60 U	20.0 U	9.80 U	20.0 U	19.0 U	20.0 U	4.00 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U

Notes:
[1] The crayfish Total PCBs as Aroclors is shown as the maximum MDL/MRL because all aroclors were undected in Forebay crayfish samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
- = Not Analyzed
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-13
Forebay - Random Sediment and Tissue PCB Aroclor Analysis Results
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Media	Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Sculpin		Sculpin		Sculpin	
Site ID	**P15-CF**		**P16-CF**		**P17-CF**		**P18-CF**		**P19-CF**		**P20-CF**		**P21-CF**		**SF-01**		**SF-02**		**SF-03**	
Sample ID	**08021915CF**		**08022216CF**		**08021917CF**		**08021918CF**		**08021919CF**		**08021920CF**		**08021921CF**		**F-1**		**F-2**		**F-3**	
Sample Date	**2/19/2008**		**2/22/2008**		**2/19/2008**		**2/19/2008**		**2/19/2008**		**2/19/2008**		**2/19/2008**		**9/17/2008**		**9/17/2008**		**9/17/2008**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	2.40 U	9.60 U	2.40 U	9.90 U	2.40 U	10.0 U	2.40 U	9.60 U	2.40 U	9.80 U	2.40 U	9.80 U	2.40 U	9.80 U	2.40 U	9.20 U	2.40 U	9.20 U	12.0 U	50.0 U
Aroclor 1221	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	19.0 U	2.60 U	19.0 U	13.0 U	99.0 U
Aroclor 1232	2.30 U	9.60 U	2.30 U	9.90 U	2.30 U	10.0 U	2.30 U	9.60 U	2.30 U	9.80 U	2.30 U	9.80 U	2.30 U	9.80 U	2.30 U	9.20 U	2.30 U	9.20 U	12.0 U	50.0 U
Aroclor 1242	2.20 U	9.60 U	2.20 U	9.90 U	2.20 U	10.0 U	2.20 U	9.60 U	2.20 U	9.80 U	2.20 U	9.80 U	2.20 U	9.80 U	2.20 U	9.20 U	2.20 U	9.20 U	11.0 U	50.0 U
Aroclor 1248	0.510 U	9.60 U	0.510 U	9.90 U	0.510 U	10.0 U	0.510 U	9.60 U	0.510 U	9.80 U	0.510 U	9.80 U	0.510 U	9.80 U	0.510 U	9.20 U	0.510 U	9.20 U	2.60 U	50.0 U
Aroclor 1254	1.80 U	9.60 U	1.80 U	9.90 U	1.80 U	10.0 U	1.80 U	9.60 U	1.80 U	9.80 U	1.80 U	9.80 U	1.80 U	9.80 U	13.0 U	13.0 U	43.0 U	43.0 U	**1700**	**1700**
Aroclor 1260	1.90 U	9.60 U	1.90 U	9.90 U	1.90 U	10.0 U	1.90 U	9.60 U	1.90 U	9.80 U	1.90 U	9.80 U	1.90 U	9.80 U	1.90 U	9.20 U	36.0 U	36.0 U	9.50 U	50.0 U
Aroclor 1262	2.50 U	9.60 U	2.50 U	9.90 U	2.50 U	10.0 U	2.50 U	9.60 U	2.50 U	9.80 U	2.50 U	9.80 U	2.50 U	9.80 U	2.50 U	9.20 U	2.50 U	9.20 U	13.0 U	50.0 U
Aroclor 1268	2.00 U	9.60 U	2.00 U	9.90 U	2.00 U	10.0 U	2.00 U	9.60 U	2.00 U	9.80 U	2.00 U	9.80 U	2.00 U	9.80 U	2.00 U	9.20 U	2.00 U	9.20 U	10.0 U	50.0 U
Total PCBs as Aroclors [1]	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	13.0 U	13.0 U	43.0 U	43.0 U	**1700**	**1700**

Notes:

[1] The crayfish Total PCBs as Aroclors is shown as the maximum MDL/MRL because all aroclors were undected in Forebay crayfish samples.
Only Aroclor 1254 was included in summing sculpin Total PCBs as Aroclors because all other aroclors were undected in Forebay sculpin samples.

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
- = Not Analyzed
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-13
Forebay - Random Sediment and Tissue PCB Aroclor Analysis Results
(Page 3 of 10)

Media	Sculpin		Sculpin		Sculpin		Sculpin		Sculpin		Sculpin		Sculpin		Sculpin		Sculpin		Sculpin	
Site ID	SF-04		SF-05		SF-06		SF-07		SF-08		SF-09		SF-10		SF-11		SF-12		SF-13	
Sample ID	F-4		F-5		F-6		F-7		F-8		F-9		F-10		F-11		F-12		F-13	
Sample Date	9/17/2008		10/22/2008		9/19/2008		10/21/2008		9/17/2008		9/19/2008		10/21/2008		9/17/2008		2/22/2008		2/22/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	2.40 U	9.90 U	2.40 U	9.20 U	2.40 U	9.50 U	2.40 U	9.40 U	2.40 U	9.20 U	2.40 U	9.40 U	2.40 U	9.80 U	2.40 U	9.60 U	14.0 UJ	38.0 UJ	8.20 UJ	35.0 UJ
Aroclor 1221	2.60 U	20.0 U	2.60 U	19.0 U	2.60 U	19.0 U	2.60 U	19.0 U	2.60 U	19.0 U	2.60 U	19.0 U	2.60 U	20.0 U	2.60 U	20.0 U	27.0 UJ	75.0 UJ	69.0 UJ	69.0 UJ
Aroclor 1232	2.30 U	9.90 U	2.30 U	9.20 U	2.30 U	9.50 U	2.30 U	9.40 U	2.30 U	9.20 U	2.30 U	9.40 U	2.30 U	9.80 U	2.30 U	9.60 U	38.0 UJ	38.0 UJ	62.0 UJ	62.0 UJ
Aroclor 1242	2.20 U	9.90 U	2.20 U	9.20 U	2.20 U	9.50 U	2.20 U	9.40 U	2.20 U	9.20 U	2.20 U	9.40 U	2.20 U	9.80 U	2.20 U	9.60 U	23.0 UJ	38.0 UJ	35.0 UJ	35.0 UJ
Aroclor 1248	0.510 U	9.90 U	0.510 U	9.20 U	0.510 U	9.50 U	0.510 U	9.40 U	0.510 U	9.20 U	0.510 U	9.40 U	0.510 U	9.80 U	0.510 U	9.60 U	13.0 UJ	38.0 UJ	6.70 UJ	35.0 UJ
Aroclor 1254	**470**	**470**	**130**	**130**	130 U	130 U	28.0 U	28.0 U	20.0 U	20.0 U	27.0 U	27.0 U	19.0 U	19.0 U	28.0 U	28.0 U	23.0 UJ	38.0 UJ	35.0 UJ	35.0 UJ
Aroclor 1260	1.90 U	9.90 U	1.90 U	9.20 U	82.0 U	82.0 U	1.90 U	9.40 U	1.90 U	9.20 U	13.0 U	13.0 U	1.90 U	9.80 U	1.90 U	9.60 U	38.0 UJ	38.0 UJ	6.50 UJ	35.0 UJ
Aroclor 1262	2.50 U	9.90 U	2.50 U	9.20 U	2.50 U	9.50 U	2.50 U	9.40 U	2.50 U	9.20 U	2.50 U	9.40 U	2.50 U	9.80 U	2.50 U	9.60 U	9.30 UJ	38.0 UJ	8.60 UJ	35.0 UJ
Aroclor 1268	2.00 U	9.90 U	2.00 U	9.20 U	2.00 U	9.50 U	2.00 U	9.40 U	2.00 U	9.20 U	2.00 U	9.40 U	2.00 U	9.80 U	2.00 U	9.60 U	7.50 UJ	38.0 UJ	6.90 UJ	35.0 UJ
Total PCBs as Aroclors [1]	**470**	**470**	**130**	**130**	130 U	130 U	28.0 U	28.0 U	20.0 U	20.0 U	27.0 U	27.0 U	19.0 U	19.0 U	28.0 U	28.0 U	23.0 UJ	38.0 UJ	35.0 UJ	35.0 UJ

Notes:

[1] Only Aroclor 1254 was included in summing sculpin Total PCBs as Aroclors because all other aroclors were undected in Forebay sculpin samples.

MDL = method detection limit

MRL = method reporting limit

bold = analyte detected above MDL.

- = Not Analyzed

J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.

UJ = The analyte was not detected. The reported MDL/MRL is an estimate.

Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-13
Forebay - Random Sediment and Tissue PCB Aroclor Analysis Results
(Page 4 of 10)

Media	Sculpin		Sculpin		Sculpin		Sculpin		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass	
Site ID	SF-14		SF-15		SF-16		SF-17		01		02		03		04		05	
Sample ID	F-14		F-15		F-16		F-17		060605100SB		060605101SB		060605200SB		060605201SB		060605202SB	
Sample Date	10/22/2008		10/21/2008		10/21/2008		10/21/2008		6/5/2006		6/5/2006		6/5/2006		6/5/2006		6/5/2006	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	2.40 U	10.0 U	2.40 U	9.90 U	2.40 U	9.80 U	2.40 U	9.30 U	2.40 UJ	10.0 UJ	24.0 UJ	100 UJ	2.40 UJ	10.0 UJ	2.40 UJ	10.0 UJ	2.40 UJ	10.0 UJ
Aroclor 1221	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	19.0 U	2.60 UJ	20.0 UJ	26.0 UJ	200 UJ	2.60 UJ	20.0 UJ	2.60 UJ	20.0 UJ	2.60 UJ	20.0 UJ
Aroclor 1232	2.30 U	10.0 U	2.30 U	9.90 U	2.30 U	9.80 U	2.30 U	9.30 U	2.30 UJ	10.0 UJ	23.0 UJ	100 UJ	2.30 UJ	10.0 UJ	2.30 UJ	10.0 UJ	2.30 UJ	10.0 UJ
Aroclor 1242	2.20 U	10.0 U	2.20 U	9.90 U	2.20 U	9.80 U	2.20 U	9.30 U	2.20 UJ	10.0 UJ	22.0 UJ	100 UJ	2.20 UJ	10.0 UJ	2.20 UJ	10.0 UJ	2.20 UJ	10.0 UJ
Aroclor 1248	0.510 U	10.0 U	0.510 U	9.90 U	0.510 U	9.80 U	0.510 U	9.30 U	0.510 UJ	10.0 UJ	5.10 UJ	100 UJ	68.0 UJ	68.0 UJ	0.510 UJ	10.0 UJ	5.00 UJ	10.0 UJ
Aroclor 1254	29.0 U	29.0 U	27.0 U	27.0 U	37.0 U	37.0 U	32.0 U	32.0 U	28.0 UJ	28.0 UJ	**1300 J**	**1300 J**	240 UJ	240 UJ	67.0 UJ	67.0 UJ	**51.0 J**	**51.0 J**
Aroclor 1260	1.90 U	10.0 U	1.90 U	9.90 U	1.90 U	9.80 U	1.90 U	9.30 U	24.0 UJ	24.0 UJ	19.0 UJ	100 UJ	150 UJ	150 UJ	48.0 UJ	48.0 UJ	25.0 UJ	25.0 UJ
Aroclor 1262	2.50 U	10.0 U	2.50 U	9.90 U	2.50 U	9.80 U	2.50 U	9.30 U	2.50 UJ	10.0 UJ	25.0 UJ	100 UJ	98.0 UJ	98.0 UJ	21.0 UJ	21.0 UJ	8.40 UJ	10.0 UJ
Aroclor 1268	2.00 U	10.0 U	2.00 U	9.90 U	2.00 U	9.80 U	2.00 U	9.30 U	2.00 UJ	10.0 UJ	20.0 UJ	100 UJ	2.00 UJ	10.0 UJ	2.00 UJ	10.0 UJ	2.00 UJ	10.0 UJ
Total PCBs as Aroclors [1]	29.0 U	29.0 U	27.0 U	27.0 U	37.0 U	37.0 U	32.0 U	32.0 U	30.2 UJ	38.0 UJ	**1322 J**	**1400 J**	242 UJ	250 UJ	69.2 UJ	77.0 UJ	**53.2 J**	**61.0 J**

Notes:

[1] Only Aroclor 1254 was included in summing sculpin Total PCBs as Aroclors because all other aroclors were undected in Forebay sculpin samples.
Only Aroclors 1242 and 1254 were included in summing smallmouth bass Total PCBs as Aroclors because all other aroclors were undected in Forebay smallmouth bass samples.

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
- = Not Analyzed
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-13
Forebay - Random Sediment and Tissue PCB Aroclor Analysis Results
(Page 5 of 10)

Media	Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass	
Site ID	06		07		08		09		10		11		12		13		14	
Sample ID	060605203SB		060605204SB		060605205SB		060605207SB		060605208SB		060605209SB		060606102SB		060606103SB		060606104SB	
Sample Date	6/5/2006		6/5/2006		6/5/2006		6/5/2006		6/5/2006		6/5/2006		6/6/2006		6/6/2006		6/6/2006	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	2.50 UJ	11.0 UJ	2.40 UJ	10.0 UJ	24.0 UJ	100 UJ	4.70 UJ	9.90 UJ	2.40 UJ	10.0 UJ	240 UJ	1000 UJ	2.40 UJ	10.0 UJ	120 UJ	120 UJ	6.00 UJ	10.0 UJ
Aroclor 1221	2.70 UJ	21.0 UJ	2.60 UJ	20.0 UJ	26.0 UJ	200 UJ	25.0 UJ	25.0 UJ	2.60 UJ	20.0 UJ	260 UJ	2000 UJ	2.60 UJ	20.0 UJ	20.0 UJ	20.0 UJ	32.0 UJ	32.0 UJ
Aroclor 1232	2.40 UJ	11.0 UJ	2.30 UJ	10.0 UJ	23.0 UJ	100 UJ	14.0 UJ	14.0 UJ	2.30 UJ	10.0 UJ	230 UJ	1000 UJ	2.30 UJ	10.0 UJ	8.90 UJ	9.90 UJ	12.0 UJ	12.0 UJ
Aroclor 1242	2.30 UJ	11.0 UJ	2.20 UJ	10.0 UJ	22.0 UJ	100 UJ	4.40 UJ	9.90 UJ	2.20 UJ	10.0 UJ	220 UJ	1000 UJ	2.20 UJ	10.0 UJ	3.80 UJ	9.90 UJ	10.0 UJ	10.0 UJ
Aroclor 1248	12.0 UJ	12.0 UJ	11.0 UJ	11.0 UJ	5.10 UJ	100 UJ	9.10 UJ	9.90 UJ	12.0 UJ	12.0 UJ	51.0 UJ	1000 UJ	33.0 UJ	33.0 UJ	61.0 UJ	61.0 UJ	4.20 UJ	10.0 UJ
Aroclor 1254	95.0 UJ	95.0 UJ	38.0 UJ	38.0 UJ	**1300 J**	**1300 J**	25.0 UJ	25.0 UJ	96.0 UJ	96.0 UJ	**14000 J**	**14000 J**	85.0 UJ	85.0 UJ	420 UJ	420 UJ	11.0 UJ	11.0 UJ
Aroclor 1260	73.0 UJ	73.0 UJ	37.0 UJ	37.0 UJ	19.0 UJ	100 UJ	67.0 UJ	67.0 UJ	78.0 UJ	78.0 UJ	190 UJ	1000 UJ	300 UJ	300 UJ	200 UJ	200 UJ	26.0 UJ	26.0 UJ
Aroclor 1262	21.0 UJ	21.0 UJ	12.0 UJ	12.0 UJ	25.0 UJ	100 UJ	24.0 UJ	24.0 UJ	50.0 UJ	50.0 UJ	250 UJ	1000 UJ	110 UJ	110 UJ	160 UJ	160 UJ	16.0 UJ	16.0 UJ
Aroclor 1268	2.10 UJ	11.0 UJ	2.00 UJ	10.0 UJ	20.0 UJ	100 UJ	6.40 UJ	9.90 UJ	16.0 UJ	16.0 UJ	200 UJ	1000 UJ	5.90 UJ	10.0 UJ	9.90 UJ	9.90 UJ	5.00 UJ	10.0 UJ
Total PCBs as Aroclors [1]	97.3 UJ	106 UJ	40.2 UJ	48.0 UJ	**1322 J**	**1400 J**	29.4 UJ	34.9 UJ	98.2 UJ	106 UJ	**14220 J**	**15000 J**	87.2 UJ	95.0 UJ	424 UJ	429.9 UJ	21.0 UJ	21.0 UJ

Notes:

[1] Only Aroclors 1242 and 1254 were included in summing smallmouth bass Total PCBs as Aroclors because all other aroclors were undected in Forebay smallmouth bass samples.

MDL = method detection limit

MRL = method reporting limit

bold = analyte detected above MDL.

- = Not Analyzed

J = The reported value is an estimate.

U = The analyte was not detected at or above the MDL.

UJ = The analyte was not detected. The reported MDL/MRL is an estimate.

Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-13
Forebay - Random Sediment and Tissue PCB Aroclor Analysis Results
(Page 6 of 10)

Media	Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Large Scale Sucker	
Site ID	15		16		17		18		19		SUCKER	
Sample ID	060606210SB		060815402SB		060815403SB		060815405SB		060815406SB		070505LS	
Sample Date	6/6/2006		8/15/2006		8/15/2006		8/15/2006		8/15/2006		5/5/2007	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	10.0 UJ	10.0 UJ	2.40 UJ	10.0 UJ	120 UJ	500 UJ	24.0 UJ	99.0 UJ	9.90 UJ	9.90 UJ	2.40 U	10.0 U
Aroclor 1221	20.0 UJ	20.0 UJ	2.60 UJ	20.0 UJ	130 UJ	990 UJ	26.0 UJ	200 UJ	2.60 UJ	20.0 UJ	2.60 U	20.0 U
Aroclor 1232	10.0 UJ	10.0 UJ	2.30 UJ	10.0 UJ	120 UJ	500 UJ	23.0 UJ	99.0 UJ	9.90 UJ	9.90 UJ	2.30 U	10.0 U
Aroclor 1242	8.50 UJ	10.0 UJ	**260 J**	**260 J**	110 UJ	500 UJ	22.0 UJ	99.0 UJ	4.70 UJ	9.90 UJ	2.20 U	10.0 U
Aroclor 1248	10.0 UJ	10.0 UJ	0.510 UJ	10.0 UJ	26.0 UJ	500 UJ	5.10 UJ	99.0 UJ	5.70 UJ	9.90 UJ	0.510 U	10.0 U
Aroclor 1254	16.0 UJ	16.0 UJ	**330 J**	**330 J**	**18000 J**	**18000 J**	**1400 J**	**1400 J**	13.0 UJ	13.0 UJ	**160**	**160**
Aroclor 1260	31.0 UJ	31.0 UJ	1.90 UJ	10.0 UJ	95.0 UJ	500 UJ	19.0 UJ	99.0 UJ	37.0 UJ	37.0 UJ	1.90 U	10.0 U
Aroclor 1262	10.0 UJ	10.0 UJ	2.50 UJ	10.0 UJ	130 UJ	500 UJ	25.0 UJ	99.0 UJ	12.0 UJ	12.0 UJ	-	-
Aroclor 1268	2.50 UJ	10.0 UJ	2.00 UJ	10.0 UJ	100 UJ	500 UJ	20.0 UJ	99.0 UJ	3.50 UJ	9.90 UJ	2.00 U	10.0 U
Total PCBs as Aroclors [1]	24.5 UJ	26.0 UJ	**590 J**	**590 J**	**18110 J**	**18500 J**	**1422 J**	**1499 J**	17.7 UJ	22.9 UJ	**160**	**160**

Notes:

[1] Only Aroclors 1242 and 1254 were included in summing bass Total PCBs as Aroclors because all other aroclors were undected in Forebay smallmouth bass samples.
Only Aroclor 1254 was included in summing sucker Total PCBs as Aroclors because all other aroclors were undected in Forebay large scale sucker samples.

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
- = Not Analyzed
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-14
Forebay - Targeted Sediment and Tissue PCB Aroclor Analysis Results
(Page 1 of 1)

Area	Forebay - Eagle Creek		Forebay - Eagle Creek		Forebay - Goose Island		Forebay - Goose Island		Forebay - Goose Island		Forebay - Goose Island	
Media	**Sediment**		**Sediment**		**Sediment**		**Sediment**		**Clam**		**Crayfish**	
Site ID	**P43**		**P44**		**P110**		**P111**		**P110**		**P110**	
Sample ID	**08032043SD**		**08032044SD**		**090427110SD**		**090429111SD**		**090429110TC**		**090429110CF**	
Sample Date	**3/20/2008**		**3/20/2008**		**4/27/2009**		**4/29/2009**		**4/29/2009**		**4/29/2009**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	1.70 U	7.40 U	1.70 U	7.30 U	2.50 U	12.0 U	2.70 U	13.0 U	6.10 UJ	9.70 UJ	2.40 U	9.50 U
Aroclor 1221	1.70 U	15.0 U	1.70 U	15.0 U	2.50 U	24.0 U	2.70 U	26.0 U	5.90 UJ	9.70 UJ	2.60 U	9.50 U
Aroclor 1232	1.70 U	7.40 U	1.70 U	7.30 U	2.50 U	12.0 U	2.70 U	13.0 U	9.70 UJ	9.70 UJ	2.30 U	9.50 U
Aroclor 1242	1.70 U	7.40 U	1.70 U	7.30 U	2.50 U	12.0 U	2.70 U	13.0 U	6.60 UJ	9.70 UJ	2.20 U	9.50 U
Aroclor 1248	**76.0**	**76.0**	1.70 U	7.30 U	2.50 U	12.0 U	2.70 U	13.0 U	5.20 UJ	9.70 UJ	0.510 U	9.50 U
Aroclor 1254	1.70 U	7.40 U	1.70 U	7.30 U	2.50 U	12.0 U	**9.90 J**	**9.90 J**	14.0 UJ	14.0 UJ	1.80 U	9.50 U
Aroclor 1260	1.70 U	7.40 U	1.70 U	7.30 U	2.50 UJ	12.0 UJ	2.70 UJ	13.0 UJ	6.30 UJ	9.70 UJ	1.90 U	9.50 U
Aroclor 1262	1.70 U	7.40 U	1.70 U	7.30 U	-	-	-	-	3.20 UJ	9.70 UJ	2.50 U	9.50 U
Aroclor 1268	1.70 U	7.40 U	1.70 U	7.30 U	-	-	-	-	2.00 UJ	9.70 UJ	2.00 U	9.50 U
Total PCBs as Aroclors [1]	**77.7 J**	**83.4 J**	3.40 U	14.6 U	5.00 U	24.0 U	**12.6 J**	**22.9 J**	14.0 UJ	14.0 UJ	2.60 U	9.50 U

Notes:

[1] Only Aroclors 1248 and 1254 were included in summing sediment Total PCBs as Aroclors because all other aroclors were undected in Forebay sediment samples.
Only Aroclor 1254 was included in summing clam Total PCBs as Aroclors because all other aroclors were undected in Forebay clam samples.
The crayfish Total PCBs as Aroclors is shown as the maximum MDL/MRL because all aroclors were undected in Forebay crayfish samples.

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
- = Not Analyzed
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
Sediment is in micrograms per kilogram (µg/kg), dry weight
Tissue is in micrograms per kilogram (µg/kg), wet weight

Table H-15
Reference Area Sediment and Tissue PCB Aroclor Analysis Results
(Page 1 of 10)

Media	Sediment		Sediment		Sediment		Sediment		Sediment		Sediment		Sediment		Sediment		Sediment	
Site ID	P22		P24		P26		P27		P28		P29		P34		P35		P36	
Sample ID	08030522SD		08030524SD		08030426SD		08030427SD		08030428SD		08022229SD		08022534SD		08022535SD		08022536SD	
Sample Date	3/5/2008		3/5/2008		3/4/2008		3/4/2008		3/4/2008		2/22/2008		2/25/2008		2/25/2008		2/25/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.60 U	1.80 U	11.0 U	1.70 U	10.0 U	1.70 U	10.0 U	10.0 U	10.0 U	1.70 U	10.0 U
Aroclor 1221	1.70 U	20.0 U	1.70 U	20.0 U	1.70 U	20.0 U	1.70 U	20.0 U	1.80 U	21.0 U	1.70 U	20.0 U	1.70 U	20.0 U	6.00 U	20.0 U	1.70 U	20.0 U
Aroclor 1232	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.60 U	1.80 U	11.0 U	1.70 U	10.0 U	1.70 U	10.0 U	10.0 U	10.0 U	1.70 U	10.0 U
Aroclor 1242	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.60 U	1.80 U	11.0 U	1.70 U	10.0 U	1.70 U	10.0 U	16.0 U	16.0 U	1.70 U	10.0 U
Aroclor 1248	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.60 U	1.80 U	11.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U
Aroclor 1254	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.60 U	1.80 U	11.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U
Aroclor 1260	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.60 U	1.80 U	11.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U
Aroclor 1262	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.60 U	1.80 U	11.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U
Aroclor 1268	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.60 U	1.80 U	11.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U
Total PCBs as Aroclors [1]	1.70 U	20.0 U	1.70 U	20.0 U	1.70 U	20.0 U	1.70 U	20.0 U	1.80 U	21.0 U	1.70 U	20.0 U	1.70 U	20.0 U	16.0 U	20.0 U	1.70 U	20.0 U

Notes:

[1] The sediment Total PCBs as Aroclors is shown as the maximum MDL/MRL because all aroclors were undected in Reference Area sediment samples.

MDL = method detection limit

MRL = method reporting limit

bold = analyte detected above MDL.

U = The analyte was not detected at or above the MDL.

Sediment is in micrograms per kilogram (µg/kg), dry weight

Table H-15
Reference Area Sediment and Tissue PCB Aroclor Analysis Results
(Page 2 of 10)

Media	Sediment		Sediment		Sediment		Sediment		Sediment		Sediment		Sediment		Sediment		Sediment	
Site ID	P37		P38		P39		P40		P41		P42		P85		P86		P87	
Sample ID	08022637SD		08022738SD		08022739SD		08022740SD		08022741SD		08022742SD		08030685SD		08030686SD		08030687SD	
Sample Date	2/26/2008		2/27/2008		2/27/2008		2/27/2008		2/27/2008		2/27/2008		3/6/2008		3/6/2008		3/6/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	1.70 U	10.0 U	13.0 U	13.0 U	1.70 U	9.90 U	3.40 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U
Aroclor 1221	9.80 U	20.0 U	11.0 U	20.0 U	1.70 U	20.0 U	6.20 U	20.0 U	1.70 U	20.0 U	1.70 U	20.0 U	1.70 U	20.0 U	1.70 U	20.0 U	1.70 U	20.0 U
Aroclor 1232	11.0 U	11.0 U	12.0 U	12.0 U	1.70 U	9.90 U	10.0 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U
Aroclor 1242	14.0 U	14.0 U	1.70 U	10.0 U	1.70 U	9.90 U	13.0 U	13.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U
Aroclor 1248	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U
Aroclor 1254	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U
Aroclor 1260	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U
Aroclor 1262	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U
Aroclor 1268	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U
Total PCBs as Aroclors [1]	14.0 U	20.0 U	13.0 U	20.0 U	1.70 U	20.0 U	13.0 U	20.0 U	1.70 U	20.0 U	1.70 U	20.0 U	1.70 U	20.0 U	1.70 U	20.0 U	1.70 U	20.0 U

Notes:

[1] The sediment Total PCBs as Aroclors is shown as the maximum MDL/MRL because all aroclors were undected in Reference Area sediment samples.

MDL = method detection limit

MRL = method reporting limit

bold = analyte detected above MDL.

U = The analyte was not detected at or above the MDL.

Sediment is in micrograms per kilogram (µg/kg), dry weight

Table H-15
Reference Area Sediment and Tissue PCB Aroclor Analysis Results
(Page 3 of 10)

Media	Clam		Clam		Clam		Clam		Clam		Clam		Clam		Clam		Clam	
Site ID	P22		P24		P26		P27		P28		P29		P34		P35		P36	
Sample ID	08030522TC		08030524TC		08030426TC		08030427TC		08030428TC		08022229TC		08022534TC		08022535TC		08022536TC	
Sample Date	3/5/2008		3/5/2008		3/4/2008		3/4/2008		3/4/2008		2/22/2008		2/25/2008		2/25/2008		2/25/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	13.0 U	13.0 U	11.0 U	11.0 U	11.0 U	11.0 U	12.0 U	12.0 U	8.90 U	9.80 U	13.0 U	13.0 U	12.0 U	12.0 U	9.50 U	9.90 U	8.40 U	9.90 U
Aroclor 1221	14.0 U	20.0 U	14.0 U	20.0 U	14.0 U	20.0 U	8.20 U	20.0 U	9.60 U	20.0 U	16.0 U	20.0 U	15.0 U	20.0 U	8.80 U	20.0 U	12.0 U	20.0 U
Aroclor 1232	19.0 U	19.0 U	18.0 U	18.0 U	22.0 U	22.0 U	27.0 U	27.0 U	18.0 U	18.0 U	26.0 U	26.0 U	23.0 U	23.0 U	28.0 U	28.0 U	19.0 U	19.0 U
Aroclor 1242	13.0 U	13.0 U	7.90 U	9.70 U	11.0 U	11.0 U	12.0 U	12.0 U	12.0 U	12.0 U	13.0 U	13.0 U	13.0 U	13.0 U	14.0 U	14.0 U	13.0 U	13.0 U
Aroclor 1248	5.70 U	10.0 U	5.70 U	9.70 U	7.60 U	9.90 U	8.30 U	9.90 U	5.70 U	9.80 U	7.70 U	9.80 U	6.40 U	9.90 U	9.10 U	9.90 U	9.90 U	9.90 U
Aroclor 1254	**36.0**	**36.0**	**30.0**	**30.0**	**35.0**	**35.0**	**37.0**	**37.0**	**33.0**	**33.0**	**32.0**	**32.0**	**32.0**	**32.0**	**37.0**	**37.0**	**38.0**	**38.0**
Aroclor 1260	6.40 U	10.0 U	6.20 U	9.70 U	6.50 U	9.90 U	6.80 U	9.90 U	6.60 U	9.80 U	5.70 U	9.80 U	5.90 U	9.90 U	7.70 U	9.90 U	7.60 U	9.90 U
Aroclor 1262	9.30 U	10.0 U	7.20 U	9.70 U	7.70 U	9.90 U	7.80 U	9.90 U	7.50 U	9.80 U	8.00 U	9.80 U	8.10 U	9.90 U	8.10 U	9.90 U	7.70 U	9.90 U
Aroclor 1268	2.00 U	10.0 U	2.00 U	9.70 U	2.00 U	9.90 U	2.00 U	9.90 U	2.00 U	9.80 U	2.00 U	9.80 U	2.00 U	9.90 U	2.00 U	9.90 U	2.00 U	9.90 U
Total PCBs as Aroclors [1]	**36.0**	**36.0**	**30.0**	**30.0**	**35.0**	**35.0**	**37.0**	**37.0**	**33.0**	**33.0**	**32.0**	**32.0**	**32.0**	**32.0**	**37.0**	**37.0**	**38.0**	**38.0**

Notes:
[1] Only Aroclors 1254 was included in summing clam Total PCBs as Aroclors because all other aroclors were undected in Reference Area clam samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
U = The analyte was not detected at or above the MDL.
Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-15
Reference Area Sediment and Tissue PCB Aroclor Analysis Results
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Media	Clam		Clam		Clam		Clam		Clam		Clam		Clam		Clam		Clam	
Site ID	P37		P38		P39		P40		P41		P42		P85		P86		P87	
Sample ID	08022637TC		08022738TC		08022739TC		08022740TC		08022741TC		08022742TC		08030685TC		08030686TC		08030687TC	
Sample Date	2/26/2008		2/27/2008		2/27/2008		2/27/2008		2/27/2008		2/27/2008		3/6/2008		3/6/2008		3/6/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	9.70 U	9.90 U	15.0 U	15.0 U	15.0 U	15.0 U	12.0 U	12.0 U	14.0 U	14.0 U	12.0 U	12.0 U	14.0 U	14.0 U	12.0 U	12.0 U	9.50 U	10.0 U
Aroclor 1221	16.0 U	20.0 U	6.30 U	20.0 U	7.40 U	20.0 U	12.0 U	20.0 U	7.50 U	20.0 U	16.0 U	20.0 U	12.0 U	20.0 U	9.10 U	20.0 U	9.20 U	20.0 U
Aroclor 1232	29.0 U	29.0 U	35.0 U	35.0 U	33.0 U	33.0 U	22.0 U	22.0 U	31.0 U	31.0 U	20.0 U	20.0 U	28.0 U	28.0 U	24.0 U	24.0 U	26.0 U	26.0 U
Aroclor 1242	9.30 U	9.90 U	12.0 U	12.0 U	11.0 U	11.0 U	9.70 U	10.0 U	14.0 U	14.0 U	9.40 U	10.0 U	9.90 U	9.90 U	9.20 U	9.90 U	9.50 U	10.0 U
Aroclor 1248	9.90 U	9.90 U	9.40 U	9.90 U	9.60 U	9.60 U	8.70 U	10.0 U	8.90 U	9.80 U	8.20 U	10.0 U	9.90 U	9.90 U	7.10 U	9.90 U	5.50 U	10.0 U
Aroclor 1254	**35.0**	**35.0**	**37.0**	**37.0**	**38.0**	**38.0**	**37.0**	**37.0**	**39.0**	**39.0**	**35.0**	**35.0**	**34.0**	**34.0**	**31.0**	**31.0**	**33.0**	**33.0**
Aroclor 1260	7.30 U	9.90 U	8.10 U	9.90 U	7.50 U	9.60 U	6.90 U	10.0 U	7.70 U	9.80 U	7.50 U	10.0 U	6.70 U	9.90 U	6.20 U	9.90 U	6.60 U	10.0 U
Aroclor 1262	3.70 U	9.90 U	7.60 U	9.90 U	9.10 U	9.60 U	9.90 U	10.0 U	7.80 U	9.80 U	9.10 U	10.0 U	8.20 U	9.90 U	7.90 U	9.90 U	8.40 U	10.0 U
Aroclor 1268	2.00 U	9.90 U	2.00 U	9.90 U	2.00 U	9.60 U	2.00 U	10.0 U	2.00 U	9.80 U	2.00 U	10.0 U	2.00 U	9.90 U	2.00 U	9.90 U	2.00 U	10.0 U
Total PCBs as Aroclors [1]	**35.0**	**35.0**	**37.0**	**37.0**	**38.0**	**38.0**	**37.0**	**37.0**	**39.0**	**39.0**	**35.0**	**35.0**	**34.0**	**34.0**	**31.0**	**31.0**	**33.0**	**33.0**

Notes:
[1] Only Aroclors 1254 was included in summing clam Total PCBs as Aroclors because all other aroclors were undected in Reference Area clam samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
U = The analyte was not detected at or above the MDL.
Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-15
Reference Area Sediment and Tissue PCB Aroclor Analysis Results
(Page 1 of 10)

Media	Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish	
Site ID	**P100-CF**		**P105-CF**		**P22-CF**		**P33-CF**		**P38-CF**		**P42-CF**		**P72-CF**		**P73-CF**		**P74-CF**		**P75-CF**	
Sample ID	**080312100CF**		**080314105CF**		**08022622CF**		**08022233CF**		**08021838CF**		**08022842CF**		**08030372CF**		**08030373CF**		**08030374CF**		**08030375CF**	
Sample Date	**3/12/2008**		**3/14/2008**		**2/26/2008**		**2/26/2008**		**2/18/2008**		**2/28/2008**		**3/3/2008**		**3/3/2008**		**3/3/2008**		**3/3/2008**	
Censoring Level for Undetected Results	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**	**MDL**	**MRL**
Aroclor 1016	2.40 U	9.90 U	3.00 U	13.0 U	2.40 U	9.40 U	2.40 U	9.90 U	4.60 U	20.0 U	2.40 U	10.0 U	2.40 U	10.0 U	2.40 U	9.50 U	2.40 U	9.90 U	2.40 U	9.80 U
Aroclor 1221	2.60 U	20.0 U	3.30 U	25.0 U	2.60 U	19.0 U	2.60 U	20.0 U	5.00 U	39.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	19.0 U	2.60 U	20.0 U	2.60 U	20.0 U
Aroclor 1232	2.30 U	9.90 U	2.90 U	13.0 U	2.30 U	9.40 U	2.30 U	9.90 U	4.40 U	20.0 U	2.30 U	10.0 U	2.30 U	10.0 U	2.30 U	9.50 U	2.30 U	9.90 U	2.30 U	9.80 U
Aroclor 1242	2.20 U	9.90 U	2.80 U	13.0 U	2.20 U	9.40 U	2.20 U	9.90 U	4.30 U	20.0 U	2.20 U	10.0 U	2.20 U	10.0 U	2.20 U	9.50 U	2.20 U	9.90 U	2.20 U	9.80 U
Aroclor 1248	0.510 U	9.90 U	0.64 U	13.0 U	0.510 U	9.40 U	0.510 U	9.90 U	0.98 U	20.0 U	0.510 U	10.0 U	0.510 U	10.0 U	0.510 U	9.50 U	0.510 U	9.90 U	0.510 U	9.80 U
Aroclor 1254	1.80 U	9.90 U	2.30 U	13.0 U	1.80 U	9.40 U	1.80 U	9.90 U	3.50 U	20.0 U	1.80 U	10.0 U	1.80 U	10.0 U	1.80 U	9.50 U	1.80 U	9.90 U	1.80 U	9.80 U
Aroclor 1260	1.90 U	9.90 U	2.40 U	13.0 U	1.90 U	9.40 U	1.90 U	9.90 U	3.70 U	20.0 U	1.90 U	10.0 U	1.90 U	10.0 U	1.90 U	9.50 U	1.90 U	9.90 U	1.90 U	9.80 U
Aroclor 1262	2.50 U	9.90 U	3.20 U	13.0 U	2.50 U	9.40 U	2.50 U	9.90 U	4.80 U	20.0 U	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	9.50 U	2.50 U	9.90 U	2.50 U	9.80 U
Aroclor 1268	2.00 U	9.90 U	2.50 U	13.0 U	2.00 U	9.40 U	2.00 U	9.90 U	3.90 U	20.0 U	2.00 U	10.0 U	2.00 U	10.0 U	2.00 U	9.50 U	2.00 U	9.90 U	2.00 U	9.80 U
Total PCBs as Aroclors [1]	2.60 U	20.00 U	3.30 U	25.0 U	2.60 U	19.00 U	2.60 U	20.00 U	5.00 U	39.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	19.00 U	2.60 U	20.00 U	2.60 U	20.00 U

Notes:
[1] The crayfish Total PCBs as Aroclors is shown as the maximum MDL/MRL because all aroclors were undected in Reference Area crayfish samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-15
Reference Area Sediment and Tissue PCB Aroclor Analysis Results
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Media	Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Crayfish		Sculpin	
Site ID	P76-CF		P78-CF		P79-CF		P82-CF		P90-CF		P91-CF		P92-CF		P94-CF		P98-CF		SR-01	
Sample ID	08030376CF		08030378CF		08030379CF		08030382CF		08031290CF		08031291CF		08031292CF		08031294CF		08031298CF		R-1	
Sample Date	3/3/2008		3/3/2008		3/3/2008		3/3/2008		3/12/2008		3/12/2008		3/12/2008		3/12/2008		3/12/2008		7/23/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	2.40 U	10.0 U	2.40 U	10.0 U	2.40 U	9.80 U	2.40 U	10.0 U	2.40 U	9.40 U	4.80 U	20.0 U	2.40 U	9.90 U	2.40 U	9.90 U	2.40 U	10.0 U	2.40 U	9.70 U
Aroclor 1221	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	19.0 U	5.20 U	40.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U
Aroclor 1232	2.30 U	10.0 U	2.30 U	10.0 U	2.30 U	9.80 U	2.30 U	10.0 U	2.30 U	9.40 U	4.60 U	20.0 U	2.30 U	9.90 U	2.30 U	9.90 U	2.30 U	10.0 U	2.30 U	9.70 U
Aroclor 1242	2.20 U	10.0 U	2.20 U	10.0 U	2.20 U	9.80 U	2.20 U	10.0 U	2.20 U	9.40 U	4.40 U	20.0 U	2.20 U	9.90 U	2.20 U	9.90 U	2.20 U	10.0 U	2.20 U	9.70 U
Aroclor 1248	0.510 U	10.0 U	0.510 U	10.0 U	0.510 U	9.80 U	0.510 U	10.0 U	0.510 U	9.40 U	1.10 U	20.0 U	0.510 U	9.90 U	0.510 U	9.90 U	0.510 U	10.0 U	45.0 U	45.0 U
Aroclor 1254	1.80 U	10.0 U	1.80 U	10.0 U	1.80 U	9.80 U	1.80 U	10.0 U	1.80 U	9.40 U	3.60 U	20.0 U	1.80 U	9.90 U	1.80 U	9.90 U	1.80 U	10.0 U	1.80 U	9.70 U
Aroclor 1260	1.90 U	10.0 U	1.90 U	10.0 U	1.90 U	9.80 U	1.90 U	10.0 U	1.90 U	9.40 U	3.80 U	20.0 U	1.90 U	9.90 U	1.90 U	9.90 U	1.90 U	10.0 U	1.90 U	9.70 U
Aroclor 1262	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	9.80 U	2.50 U	10.0 U	2.50 U	9.40 U	5.00 U	20.0 U	2.50 U	9.90 U	2.50 U	9.90 U	2.50 U	10.0 U	2.50 U	9.70 U
Aroclor 1268	2.00 U	10.0 U	2.00 U	10.0 U	2.00 U	9.80 U	2.00 U	10.0 U	2.00 U	9.40 U	4.00 U	20.0 U	2.00 U	9.90 U	2.00 U	9.90 U	2.00 U	10.0 U	2.00 U	9.70 U
Total PCBs as Aroclors [1]	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.00 U	2.60 U	20.0 U	2.60 U	19.00 U	5.20 U	40.0 U	2.60 U	20.00 U	2.60 U	20.00 U	2.60 U	20.0 U	45.0 U	45.00 U

Notes:

[1] The crayfish and sculpin Total PCBs as Aroclors are shown as the maximum MDL/MRL because all aroclors were undected in Reference Area crayfish and sculpin samples.

MDL = method detection limit

MRL = method reporting limit

bold = analyte detected above MDL.

J = The reported value is an estimate.

UJ = The analyte was not detected. The reported MDL/MRL is an estimate.

U = The analyte was not detected at or above the MDL.

Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-15
Reference Area Sediment and Tissue PCB Aroclor Analysis Results
(Page 3 of 10)

Media	Sculpin		Sculpin		Sculpin		Sculpin		Sculpin		Sculpin		Sculpin		Sculpin		Sculpin		Sculpin	
Site ID	SR-02		SR-03		SR-04		SR-05		SR-06		SR-07		SR-08		SR-09		SR-10		SR-11	
Sample ID	R-2		R-3		R-4		R-5		R-6		R-7		R-8		R-9		R-10		R-11	
Sample Date	7/24/2008		3/14/2008		10/9/2008		7/24/2008		2/26/2008		3/10/2008		10/9/2008		7/24/2008		7/23/2008		3/3/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	2.40 U	9.80 U	2.40 U	10.0 U	2.40 U	10.0 U	2.40 U	9.50 U	2.40 U	9.40 U	2.40 U	9.60 U	2.40 U	9.90 U	2.40 U	9.60 U	2.40 U	9.80 U	2.40 U	9.50 U
Aroclor 1221	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	19.0 U	2.60 U	19.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	19.0 U
Aroclor 1232	2.30 U	9.80 U	2.30 U	10.0 U	2.30 U	10.0 U	2.30 U	9.50 U	2.30 U	9.40 U	2.30 U	9.60 U	2.30 U	9.90 U	2.30 U	9.60 U	2.30 U	9.80 U	2.30 U	9.50 U
Aroclor 1242	2.20 U	9.80 U	2.20 U	10.0 U	2.20 U	10.0 U	2.20 U	9.50 U	2.20 U	9.40 U	2.20 U	9.60 U	2.20 U	9.90 U	2.20 U	9.60 U	2.20 U	9.80 U	2.20 U	9.50 U
Aroclor 1248	0.510 U	9.80 U	0.510 U	10.0 U	0.510 U	10.0 U	0.510 U	9.50 U	0.510 U	9.40 U	0.510 U	9.60 U	0.510 U	9.90 U	0.510 U	9.60 U	0.510 U	9.80 U	0.510 U	9.50 U
Aroclor 1254	17.0 U	17.0 U	19.0 U	19.0 U	21.0 U	21.0 U	23.0 U	23.0 U	22.0 U	22.0 U	17.0 U	17.0 U	39.0 U	39.0 U	19.0 U	19.0 U	28.0 U	28.0 U	24.0 U	24.0 U
Aroclor 1260	1.90 U	9.80 U	1.90 U	10.0 U	1.90 U	10.0 U	1.90 U	9.50 U	1.90 U	9.40 U	1.90 U	9.60 U	1.90 U	9.90 U	1.90 U	9.60 U	1.90 U	9.80 U	1.90 U	9.50 U
Aroclor 1262	2.50 U	9.80 U	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	9.50 U	2.50 U	9.40 U	2.50 U	9.60 U	2.50 U	9.90 U	2.50 U	9.60 U	2.50 U	9.80 U	2.50 U	9.50 U
Aroclor 1268	2.00 U	9.80 U	2.00 U	10.0 U	2.00 U	10.0 U	2.00 U	9.50 U	2.00 U	9.40 U	2.00 U	9.60 U	2.00 U	9.90 U	2.00 U	9.60 U	2.00 U	9.80 U	2.00 U	9.50 U
Total PCBs as Aroclors [1]	17.0 U	20.0 U	19.0 U	20.0 U	21.0 U	21.0 U	23.0 U	23.0 U	22.0 U	22.0 U	17.0 U	20.0 U	39.0 U	39.0 U	19.0 U	20.0 U	28.0 U	28.0 U	24.0 U	24.0 U

Notes:

[1] The sculpin Total PCBs as Aroclors is shown as the maximum MDL/MRL because all aroclors were undected in Reference Area sculpin samples.

MDL = method detection limit

MRL = method reporting limit

bold = analyte detected above MDL.

J = The reported value is an estimate.

UJ = The analyte was not detected. The reported MDL/MRL is an estimate.

U = The analyte was not detected at or above the MDL.

Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-15
Reference Area Sediment and Tissue PCB Aroclor Analysis Results
(Page 4 of 10)

Media	Sculpin		Sculpin		Sculpin		Sculpin		Sculpin		Sculpin		Sculpin		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass	
Site ID	SR-12		SR-13		SR-14		SR-15		SR-16		SR-17		SR-18		20		21		22	
Sample ID	R-12		R-13		R-14		R-15		R-16		R-17		R-18		071027R01SB		071027R02SB		071027R03SB	
Sample Date	10/9/2008		7/23/2008		10/10/2008		10/9/2008		10/10/2008		10/9/2008		7/24/2008		10/27/2007		10/27/2007		10/27/2007	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	2.40 U	9.20 U	2.40 U	9.20 U	2.40 U	9.40 U	2.40 U	9.60 U	2.40 U	9.50 U	2.40 U	9.70 U	2.40 U	9.80 U	3.50 U	10.0 U	4.70 U	10.0 U	3.40 U	9.90 U
Aroclor 1221	2.60 U	19.0 U	2.60 U	19.0 U	2.60 U	19.0 U	2.60 U	20.0 U	2.60 U	19.0 U	2.60 U	20.0 U	2.60 U	20.0 U	4.70 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U
Aroclor 1232	2.30 U	9.20 U	2.30 U	9.20 U	2.30 U	9.40 U	2.30 U	9.60 U	2.30 U	9.50 U	2.30 U	9.70 U	2.30 U	9.80 U	6.10 U	10.0 U	5.90 U	10.0 U	3.90 U	9.90 U
Aroclor 1242	2.20 U	9.20 U	2.20 U	9.20 U	2.20 U	9.40 U	2.20 U	9.60 U	2.20 U	9.50 U	2.20 U	9.70 U	2.20 U	9.80 U	4.50 UJ	10.0 UJ	6.30 UJ	10.0 UJ	2.20 UJ	9.90 UJ
Aroclor 1248	0.510 U	9.20 U	0.510 U	9.20 U	0.510 U	9.40 U	0.510 U	9.60 U	0.510 U	9.50 U	0.510 U	9.70 U	0.510 U	9.80 U	0.510 U	10.0 U	0.510 U	10.0 U	0.510 U	9.90 U
Aroclor 1254	13.0 U	13.0 U	36.0 U	36.0 U	20.0 U	20.0 U	35.0 U	35.0 U	38.0 U	38.0 U	30.0 U	30.0 U	44.0 U	44.0 U	**59.0 J**	**59.0 J**	**32.0 J**	**32.0 J**	**51.0 J**	**51.0 J**
Aroclor 1260	1.90 U	9.20 U	1.90 U	9.20 U	1.90 U	9.40 U	1.90 U	9.60 U	1.90 U	9.50 U	1.90 U	9.70 U	1.90 U	9.80 U	1.90 U	10.0 U	1.90 U	10.0 U	1.90 U	9.90 U
Aroclor 1262	2.50 U	9.20 U	2.50 U	9.20 U	2.50 U	9.40 U	2.50 U	9.60 U	2.50 U	9.50 U	2.50 U	9.70 U	2.50 U	9.80 U	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	9.90 U
Aroclor 1268	2.00 U	9.20 U	2.00 U	9.20 U	2.00 U	9.40 U	2.00 U	9.60 U	2.00 U	9.50 U	2.00 U	9.70 U	2.00 U	9.80 U	2.00 U	10.0 U	2.00 U	10.0 U	2.00 U	9.90 U
Total PCBs as Aroclors [1]	13.0 U	19.0 U	36.0 U	36.0 U	20.0 U	20.0 U	35.0 U	35.0 U	38.0 U	38.0 U	30.0 U	30.0 U	44.0 U	44.0 U	**63.5 J**	**69.0 J**	**38.3 J**	**42.0 J**	**53.2 J**	**60.9 J**

Notes:

[1] The sculpin Total PCBs as Aroclors is shown as the maximum MDL/MRL because all aroclors were undected in Reference Area sculpin samples.
Only Aroclor 1242 and 1254 were included in summing bass Total PCBs as Aroclors because all other aroclors were undected in Reference Area smallmouth bass samples.

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-15
Reference Area Sediment and Tissue PCB Aroclor Analysis Results
(Page 5 of 10)

Media	Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass	
Site ID	23		24		25		26		27		28		29		30		31	
Sample ID	071027R04SB		071027R05SB		071027R06SB		071115R07SB		080517R10SB		080517R11SB		080517R12SB		080517R13SB		080517R14SB	
Sample Date	10/27/2007		10/27/2007		10/27/2007		11/15/2007		5/17/2008		5/17/2008		5/17/2008		5/17/2008		5/17/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	2.40 U	10.0 U	9.90 U	9.90 U	2.40 U	10.0 U	3.80 U	10.0 U	2.40 U	10.0 U	7.90 U	10.0 U	4.80 U	10.0 U	2.40 U	10.0 U	6.00 U	9.90 U
Aroclor 1221	2.60 U	20.0 U	20.0 U	20.0 U	2.60 U	20.0 U	3.80 U	20.0 U	2.60 U	20.0 U	18.0 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	20.0 U	20.0 U
Aroclor 1232	2.30 U	10.0 U	9.90 U	9.90 U	2.30 U	10.0 U	3.10 U	10.0 U	2.30 U	10.0 U	10.0 U	10.0 U	5.10 U	10.0 U	2.30 U	10.0 U	9.90 U	9.90 U
Aroclor 1242	2.20 UJ	10.0 UJ	**14.0 J**	**14.0 J**	**9.50 J**	**9.50 J**	2.20 UJ	10.0 UJ	**5.60 J**	**5.60 J**	10.0 UJ	10.0 UJ	2.20 UJ	10.0 UJ	**2.40 J**	**2.40 J**	2.20 UJ	9.90 UJ
Aroclor 1248	0.510 U	10.0 U	0.510 U	9.90 U	0.510 U	10.0 U	0.510 U	10.0 U	0.510 U	10.0 U	0.510 U	10.0 U	0.510 U	10.0 U	0.510 U	10.0 U	6.90 U	9.90 U
Aroclor 1254	9.60 UJ	10.0 UJ	**110 J**	**110 J**	**58.0 J**	**58.0 J**	**27.0 J**	**27.0 J**	**34.0 J**	**34.0 J**	**37.0 J**	**37.0 J**	**29.0 J**	**29.0 J**	**80.0 J**	**80.0 J**	17.0 UJ	17.0 UJ
Aroclor 1260	14.0 U	14.0 U	1.90 U	9.90 U	1.90 U	10.0 U	1.90 U	10.0 U	1.90 U	10.0 U	1.90 U	10.0 U	1.90 U	10.0 U	1.90 U	10.0 U	46.0 U	46.0 U
Aroclor 1262	2.50 U	10.0 U	2.50 U	9.90 U	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	10.0 U	21.0 U	21.0 U
Aroclor 1268	2.00 U	10.0 U	2.00 U	9.90 U	2.00 U	10.0 U	2.00 U	10.0 U	2.00 U	10.0 U	2.00 U	10.0 U	2.00 U	10.0 U	2.00 U	10.0 U	3.40 U	9.90 U
Total PCBs as Aroclors [1]	11.8 UJ	20.0 UJ	**124 J**	**124 J**	**67.5 J**	**67.5 J**	**29.2 J**	**37.0 J**	**39.6 J**	**39.6 J**	**47.0 J**	**47.0 J**	**31.2 J**	**39.0 J**	**82.4 J**	**82.4 J**	19.2 UJ	26.9 UJ

Notes:

[1] Only Aroclor 1242 and 1254 were included in summing bass Total PCBs as Aroclors because all other aroclors were undected in Reference Area smallmouth bass samples.

MDL = method detection limit

MRL = method reporting limit

bold = analyte detected above MDL.

J = The reported value is an estimate.

UJ = The analyte was not detected. The reported MDL/MRL is an estimate.

U = The analyte was not detected at or above the MDL.

Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-15
Reference Area Sediment and Tissue PCB Aroclor Analysis Results
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Media	Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass		Smallmouth Bass	
Site ID	32		33		34		35		36		37		38	
Sample ID	080521R15SB		080521R16SB		080521R17SB		080521R18SB		080521R19SB		080521R20SB		080521R21SB	
Sample Date	5/21/2008		5/21/2008		5/21/2008		5/21/2008		5/21/2008		5/21/2008		5/21/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	3.10 U	10.0 U	5.90 U	10.0 U	5.20 U	10.0 U	4.50 U	10.0 U	5.40 U	10.0 U	7.30 U	10.0 U	4.50 U	9.90 U
Aroclor 1221	2.60 U	20.0 U	6.90 U	20.0 U	5.90 U	20.0 U	7.40 U	20.0 U	20.0 U	20.0 U	12.0 U	20.0 U	3.70 U	20.0 U
Aroclor 1232	10.0 U	10.0 U	5.70 U	10.0 U	3.90 U	10.0 U	4.40 U	10.0 U	5.40 U	10.0 U	10.0 U	10.0 U	11.0 U	11.0 U
Aroclor 1242	2.20 UJ	10.0 UJ	2.20 UJ	10.0 UJ	2.90 UJ	10.0 UJ	10.0 UJ	10.0 UJ	2.20 UJ	10.0 UJ	10.0 UJ	10.0 UJ	3.80 UJ	9.90 UJ
Aroclor 1248	0.510 U	10.0 U	33.0 U	33.0 U	0.510 U	10.0 U	0.510 U	10.0 U	0.510 U	10.0 U	0.510 U	10.0 U	0.510 U	9.90 U
Aroclor 1254	**47.0 J**	**47.0 J**	130 UJ	130 UJ	**47.0 J**	**47.0 J**	**46.0 J**	**46.0 J**	**85.0 J**	**85.0 J**	**37.0 J**	**37.0 J**	**58.0 J**	**58.0 J**
Aroclor 1260	1.90 U	10.0 U	140 U	140 U	1.90 U	10.0 U	1.90 U	10.0 U	1.90 U	10.0 U	1.90 U	10.0 U	1.90 U	9.90 U
Aroclor 1262	2.50 U	10.0 U	110 U	110 U	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	9.90 U
Aroclor 1268	2.00 U	10.0 U	10.0 U	10.0 U	2.00 U	10.0 U	2.00 U	10.0 U	2.00 U	10.0 U	2.00 U	10.0 U	2.00 U	9.90 U
Total PCBs as Aroclors [1]	**49.2 J**	**57.0 J**	132 UJ	140 UJ	**49.9 J**	**57.0 J**	**56.0 J**	**56.0 J**	**87.2 J**	**95.0 J**	**47.0 J**	**47.0 J**	**58.0 J**	**58.0 J**

Notes:

[1] Only Aroclor 1242 and 1254 were included in summing bass Total PCBs as Aroclors because all other aroclors were undected in Reference Area smallmouth bass samples.
Only Aroclor 1254 was included in summing sucker Total PCBs as Aroclors because all other aroclors were undected in Reference Area large scale sucker samples.

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
Tissues are in micrograms per kilogram (µg/kg), wet weight

Table H-16
Forebay - Pre-Removal Sediment and Tissue PCB Aroclor Analysis Results
(Page 1 of 1)

Media	Sediment		Sediment		Sediment		Sediment		Sediment		Clam		Clam		Clam		Clam	
Site ID	A1		A2*		A3		A4		A5		A1*		A2		A3		A5	
Sample ID	070926A1 SD		070926A2 SD		070927A3 SD		070925A4 SD		070925A5 SD		070926A1TC		070926A2TC		070927A3TC		070925A5TC	
Sample Date	9/26/2007		9/26/2007		9/27/2007		9/25/2007		9/25/2007		9/26/2007		9/26/2007		9/27/2007		9/25/2007	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	2.60 U	7.60 U	2.80 U	8.00 U	5.80 U	17.0 U	3.00 U	8.50 U	2.80 U	8.10 U	2.40 U	10.0 U	2.40 U	9.90 U	2.40 U	9.80 U	4.70 U	20.0 U
Aroclor 1221	2.60 U	16.0 U	2.80 U	16.0 U	5.80 U	34.0 U	3.00 U	17.0 U	2.80 U	17.0 U	2.60 U	20.0 U	2.60 U	20.0 U	2.60 U	20.0 U	5.10 U	40.0 U
Aroclor 1232	2.60 U	7.60 U	2.80 U	8.00 U	5.80 U	17.0 U	3.00 U	8.50 U	2.80 U	8.10 U	2.30 U	10.0 U	2.30 U	9.90 U	2.30 U	9.80 U	4.50 U	20.0 U
Aroclor 1242	2.60 U	7.60 U	2.80 U	8.00 U	5.80 U	17.0 U	3.00 U	8.50 U	2.80 U	8.10 U	2.20 U	10.0 U	2.20 U	9.90 U	2.20 U	9.80 U	4.40 U	20.0 U
Aroclor 1248	2.60 U	7.60 U	2.80 U	8.00 U	5.80 U	17.0 U	3.00 U	8.50 U	2.80 U	8.10 U	0.510 U	10.0 U	0.510 U	9.90 U	0.510 U	9.80 U	1.00 U	20.0 U
Aroclor 1254	**130**	**130**	**44.0**	**44.0**	5.80 U	17.0 U	**100**	**100**	**13.0**	**13.0**	**355**	**355**	**250**	**250**	**180**	**180**	**120**	**120**
Aroclor 1260	2.60 U	7.60 U	2.80 U	8.00 U	5.80 U	17.0 U	3.00 U	8.50 U	2.80 U	8.10 U	1.90 U	10.0 U	1.90 U	9.90 U	1.90 U	9.80 U	3.80 U	20.0 U
Aroclor 1262	2.60 U	7.60 U	2.80 U	8.00 U	5.80 U	17.0 U	3.00 U	8.50 U	2.80 U	8.10 U	-	-	-	-	-	-	-	-
Aroclor 1268	2.60 U	7.60 U	2.80 U	8.00 U	5.80 U	17.0 U	3.00 U	8.50 U	2.80 U	8.10 U	2.00 U	10.0 U	2.00 U	9.90 U	2.00 U	9.80 U	4.00 U	20.0 U
Total PCBs as Aroclors [1]	**133 J**	**138 J**	**46.8 J**	**52.0 J**	11.6 U	34.0 U	**103 J**	**109 J**	**15.8 J**	**21.1 J**	**355**	**355**	**250**	**250**	**180**	**180**	**120**	**120**

Notes:

[1] Only Aroclor 1248 and 1254 were included in summing sediment Total PCBs as Aroclors because all other aroclors were undected in Forebay sediment samples.
Only Aroclor 1254 was included in summing clam Total PCBs as Aroclors because all other aroclors were undected in Forebay clam samples.

MDL = method detection limit

MRL = method reporting limit

bold = analyte detected above MDL.

- = Not Analyzed

U = The analyte was not detected at or above the MDL.

* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Sediment is in micrograms per kilogram (µg/kg), dry weight

Tissue is in micrograms per kilogram (µg/kg), wet weight

Table H-17
Downstream Sediment PCB Aroclor Analysis Results
(Page 1 of 1)

Site ID	P46		P47		P48		P49		P50		P51	
Sample ID	08031046SD		08031047SD		08031048SD		08031049SD		08031150SD		08031151SD	
Sample Date	3/10/2008		3/10/2008		3/10/2008		3/10/2008		3/11/2008		3/11/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
Aroclor 1016	1.70 U	7.00 U	1.70 U	7.00 U	1.70 U	7.10 U	1.70 U	7.30 U	1.70 U	8.80 U	1.70 U	7.30 U
Aroclor 1221	1.70 U	14.0 U	1.70 U	14.0 U	1.70 U	15.0 U	1.70 U	15.0 U	1.70 U	18.0 U	1.70 U	15.0 U
Aroclor 1232	1.70 U	7.00 U	1.70 U	7.00 U	1.70 U	7.10 U	1.70 U	7.30 U	1.70 U	8.80 U	1.70 U	7.30 U
Aroclor 1242	1.70 U	7.00 U	1.70 U	7.00 U	1.70 U	7.10 U	1.70 U	7.30 U	1.70 U	8.80 U	1.70 U	7.30 U
Aroclor 1248	1.70 U	7.00 U	1.70 U	7.00 U	1.70 U	7.10 U	1.70 U	7.30 U	1.70 U	8.80 U	1.70 U	7.30 U
Aroclor 1254	1.70 U	7.00 U	1.70 U	7.00 U	1.70 U	7.10 U	1.70 U	7.30 U	1.70 U	8.80 U	1.70 U	7.30 U
Aroclor 1260	1.70 U	7.00 U	1.70 U	7.00 U	1.70 U	7.10 U	1.70 U	7.30 U	1.70 U	8.80 U	1.70 U	7.30 U
Aroclor 1262	1.70 U	7.00 U	1.70 U	7.00 U	1.70 U	7.10 U	1.70 U	7.30 U	1.70 U	8.80 U	1.70 U	7.30 U
Aroclor 1268	1.70 U	7.00 U	1.70 U	7.00 U	1.70 U	7.10 U	1.70 U	7.30 U	1.70 U	8.80 U	1.70 U	7.30 U
Total PCBs as Aroclors [1]	1.70 U	14.0 U	1.70 U	14.0 U	1.70 U	15.0 U	1.70 U	15.0 U	1.70 U	18.0 U	1.70 U	15.0 U

Notes:

[1] Total PCBs as Aroclors is shown as the maximum MDL/MRL because all aroclors were undected in Downstream sediment samples.
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
- = Not Analyzed
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1
All units are in micrograms per kilogram (µg/kg), dry weight

Table H-18
Forebay - Random Sediment PAH Analysis Results
(Page 1 of 2)

Site ID	P04		P05		P06		P07		P08		P09		P10		P11		P13		P14	
Sample ID	08022604SD		08031905SD		08031806SD		08021507SD		08021508SD		08021409SD		08021410SD		08021411SD		08031713SD		08031814SD	
Sample Date	2/26/2008		3/19/2008		3/18/2008		2/15/2008		2/15/2008		2/14/2008		2/14/2008		2/14/2008		3/17/2008		3/18/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs																				
Acenaphthene	1.00 U	10.0 U	1.00 U	10.0 U	1.00 U	9.80 U	1.00 U	9.90 U	1.00 U	9.80 U	1.00 U	9.90 U	1.00 U	9.90 U	1.00 U	10.0 U	1.00 U	9.80 U	1.00 U	9.90 U
Anthracene	1.40 U	10.0 U	1.40 U	10.0 U	1.40 U	9.80 U	1.40 U	9.90 U	1.40 U	9.80 U	1.40 U	9.90 U	1.40 U	9.90 U	**2.00 J**	**2.00 J**	**2.70 J**	**2.70 J**	1.40 U	9.90 U
Fluorene	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.80 U	1.70 U	9.90 U	1.70 U	9.80 U	1.70 U	9.90 U	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	9.80 U	1.70 U	9.90 U
Phenanthrene	**3.30 J**	**3.30 J**	**1.40 J**	**1.40 J**	1.30 U	9.80 U	**3.40 J**	**3.40 J**	1.30 U	9.80 U	**1.80 J**	**1.80 J**	**1.90 J**	**1.90 J**	**7.10 J**	**7.10 J**	**5.40 J**	**5.40 J**	**2.10 J**	**2.10 J**
Total LPAHs (full MDL/MRL)	**7.40 J**	**33.3 J**	**5.50 J**	**31.4 J**	5.40 U	39.2 U	**7.50 J**	**33.1 J**	5.40 U	39.2 U	**5.90 J**	**31.5 J**	**6.00 J**	**31.6 J**	**11.8 J**	**29.1 J**	**10.8 J**	**27.7 J**	**6.20 J**	**31.8 J**
Total LPAHs (KM)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Total LPAHs (KM, capped)	**7.40 J**	**33.3 J**	**5.50 J**	**31.4 J**	5.40 U	39.2 U	**7.50 J**	**33.1 J**	5.40 U	39.2 U	**5.90 J**	**31.5 J**	**6.00 J**	**31.6 J**	**11.8 J**	**29.1 J**	**10.8 J**	**27.7 J**	**6.20 J**	**31.8 J**
HPAHs																				
Benzo(a)anthracene	**3.90 J**	**3.90 J**	**1.60 J**	**1.60 J**	1.40 U	9.80 U	1.40 U	9.90 U	1.40 U	9.80 U	**2.70 J**	**2.70 J**	**2.30 J**	**2.30 J**	**7.40 J**	**7.40 J**	**12.0**	**12.0**	**2.20 J**	**2.20 J**
Benzo(a)pyrene	**4.40 J**	**4.40 J**	**1.70 J**	**1.70 J**	1.60 U	9.80 U	1.60 U	9.90 U	1.60 U	9.80 U	**4.50 J**	**4.50 J**	**3.00 J**	**3.00 J**	**7.50 J**	**7.50 J**	**6.10 J**	**6.10 J**	**2.00 J**	**2.00 J**
Benzo(b)fluoranthene	**6.10 J**	**6.10 J**	2.50 U	10.0 U	2.50 U	9.80 U	2.50 U	9.90 U	2.50 U	9.80 U	**5.80 J**	**5.80 J**	**4.10 J**	**4.10 J**	**9.10 J**	**9.10 J**	**6.00 J**	**6.00 J**	2.50 U	9.90 U
Benzo(g,h,i)perylene	**3.90 J**	**3.90 J**	2.30 U	10.0 U	2.30 U	9.80 U	2.30 U	9.90 U	2.30 U	9.80 U	**3.30 J**	**3.30 J**	**2.90 J**	**2.90 J**	**4.40 J**	**4.40 J**	**3.50 J**	**3.50 J**	2.30 U	9.90 U
Benzo(k)fluoranthene	**2.50 J**	**2.50 J**	2.50 U	10.0 U	2.50 U	9.80 U	2.50 U	9.90 U	2.50 U	9.80 U	2.50 U	9.90 U	2.50 U	9.90 U	**3.30 J**	**3.30 J**	**4.90 J**	**4.90 J**	2.50 U	9.90 U
Chrysene	**7.80 J**	**7.80 J**	**1.80 J**	**1.80 J**	**1.50 J**	**1.50 J**	**1.40 J**	**1.40 J**	1.40 U	9.80 U	**4.20 J**	**4.20 J**	**4.10 J**	**4.10 J**	**9.30 J**	**9.30 J**	**20.0**	**20.0**	**2.40 J**	**2.40 J**
Dibenz(a,h)anthracene	2.20 U	10.0 U	2.20 U	10.0 U	2.20 U	9.80 U	2.20 U	9.90 U	2.20 U	9.80 U	2.20 U	9.90 U	2.20 U	9.90 U	2.20 U	10.0 U	2.20 U	9.80 U	2.20 U	9.90 U
Fluoranthene	**5.50 J**	**5.50 J**	**3.00 J**	**3.00 J**	2.20 U	9.80 U	**2.50 J**	**2.50 J**	2.20 U	9.80 U	**3.70 J**	**3.70 J**	**3.80 J**	**3.80 J**	**10.0**	**10.0**	**5.30 J**	**5.30 J**	**3.20 J**	**3.20 J**
Indeno(1,2,3-cd)pyrene	**3.30 J**	**3.30 J**	1.90 U	10.0 U	1.90 U	9.80 U	1.90 U	9.90 U	1.90 U	9.80 U	**3.20 J**	**3.20 J**	**2.20 J**	**2.20 J**	**4.70 J**	**4.70 J**	**3.60 J**	**3.60 J**	1.90 U	9.90 U
Pyrene	**5.60 J**	**5.60 J**	**2.40 J**	**2.40 J**	**1.80 J**	**1.80 J**	**2.00 J**	**2.00 J**	1.30 U	9.80 U	**3.50 J**	**3.50 J**	**3.70 J**	**3.70 J**	**12.0**	**12.0**	**8.90 J**	**8.90 J**	**3.20 J**	**3.20 J**
Total HPAHs (full MDL/MRL)	**45.2 J**	**53.0 J**	**21.9 J**	**60.5 J**	**19.9 J**	**81.7 J**	**20.3 J**	**75.2 J**	19.3 U	98.0 U	**35.6 J**	**50.7 J**	**30.8 J**	**45.9 J**	**69.9 J**	**77.7 J**	**72.5 J**	**80.1 J**	**24.4 J**	**62.5 J**
Total HPAHs (KM)	**45.2 J**	**47.8 J**	**19.2 J**	**21.0 J**	**15.4 J**	**16.5 J**	**16.2 J**	**19.7 J**	NC	NC	**35.3 J**	**38.6 J**	**30.5 J**	**32.6 J**	**69.9 J**	**74.2 J**	**72.5 J**	**75.8 J**	**23.0 J**	**26.0 J**
Total HPAHs (KM, capped)	**45.2 J**	**47.8 J**	**19.2 J**	**21.0 J**	**15.4 J**	**16.5 J**	**16.2 J**	**19.7 J**	19.3 U	98.0 U	**35.3 J**	**38.6 J**	**30.5 J**	**32.6 J**	**69.9 J**	**74.2 J**	**72.5 J**	**75.8 J**	**23.0 J**	**26.0 J**
Total PAHs (full MDL/MRL)	**52.6 J**	**86.3 J**	**27.4 J**	**91.9 J**	**25.3 J**	**121 J**	**27.8 J**	**108 J**	24.7 U	137 U	**41.5 J**	**82.2 J**	**36.8 J**	**77.5 J**	**81.7 J**	**107 J**	**83.3 J**	**108 J**	**30.6 J**	**94.3 J**
Total PAHs (KM)	**50.3 J**	**64.8 J**	**22.3 J**	**27.8 J**	**16.6 J**	**23.1 J**	**20.5 J**	**32.6 J**	NC	NC	**38.1 J**	**50.9 J**	**33.7 J**	**43.6 J**	**80.1 J**	**95.1 J**	**81.4 J**	**93.9 J**	**25.0 J**	**35.2 J**
Total PAHs (KM, capped)	**50.3 J**	**64.8 J**	**22.3 J**	**27.8 J**	**16.6 J**	**23.1 J**	**20.5 J**	**32.6 J**	24.7 U	137 U	**38.1 J**	**50.9 J**	**33.7 J**	**43.6 J**	**80.1 J**	**95.1 J**	**81.4 J**	**93.9 J**	**25.0 J**	**35.2 J**

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
PAH = Polycyclic Aromatic Hydrodarbons
LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
All units are in micrograms per kilogram (µg/kg), dry weight
NC = Not calculated
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-18
Forebay - Random Sediment PAH Analysis Results
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Site ID	P15		P16		P17		P18		P21		P65		P67		P88		P89	
Sample ID	08022115SD		08022116SD		08022117SD		08021118SD		08021221SD		08022965SD		08030367SD		08031788SD		08031789SD	
Sample Date	2/21/2008		2/21/2008		2/21/2008		2/11/2008		2/12/2008		2/29/2008		3/3/2008		3/17/2008		3/17/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs																		
Acenaphthene	1.00 U	10.0 U	1.00 U	9.90 U	1.00 U	10.0 U	1.00 U	10.00 U	1.00 U	10.0 U	1.00 U	9.90 U	1.00 U	9.90 U	1.00 U	9.80 U	1.00 U	9.80 U
Anthracene	1.40 U	10.0 U	**1.90 J**	**1.90 J**	**1.90 J**	**1.90 J**	1.40 U	10.0 U	1.40 U	10.0 U	**1.50 J**	**1.50 J**	1.40 U	9.90 U	1.40 U	9.80 U	1.40 U	9.80 U
Fluorene	1.70 U	10.0 U	1.70 U	9.90 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	10.0 U	1.70 U	9.90 U	1.70 U	9.90 U	1.70 U	9.80 U	1.70 U	9.80 U
Phenanthrene	**4.60 J**	**4.60 J**	**5.00 J**	**5.00 J**	**7.40 J**	**7.40 J**	**2.90 J**	**2.90 J**	1.30 U	10.0 U	**2.20 J**	**2.20 J**	1.30 U	9.90 U	**1.70 J**	**1.70 J**	1.30 U	9.80 U
Total LPAHs (full MDL/MRL)	**8.70 J**	**34.6 J**	**9.60 J**	**26.7 J**	**12.0 J**	**29.3 J**	**7.00 J**	**32.9 J**	5.40 U	40.0 U	**6.40 J**	**23.5 J**	5.40 U	39.6 U	**5.80 J**	**31.1 J**	5.40 U	39.2 U
Total LPAHs (KM)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Total LPAHs (KM, capped)	**8.70 J**	**34.6 J**	**9.60 J**	**26.7 J**	**12.0 J**	**29.3 J**	**7.00 J**	**32.9 J**	5.40 U	40.0 U	**6.40 J**	**23.5 J**	5.40 U	39.6 U	**5.80 J**	**31.1 J**	5.40 U	39.2 U
HPAHs																		
Benzo(a)anthracene	**2.10 J**	**2.10 J**	**5.90 J**	**5.90 J**	**6.00 J**	**6.00 J**	**2.00 J**	**2.00 J**	1.40 U	10.0 U	**7.00 J**	**7.00 J**	1.40 U	9.90 U	1.40 U	9.80 U	1.40 U	9.80 U
Benzo(a)pyrene	1.60 U	10.0 U	**6.50 J**	**6.50 J**	**7.20 J**	**7.20 J**	**2.60 J**	**2.60 J**	1.60 U	10.0 U	**6.10 J**	**6.10 J**	1.60 U	9.90 U	1.60 U	9.80 U	1.60 U	9.80 U
Benzo(b)fluoranthene	2.50 U	10.0 U	**8.00 J**	**8.00 J**	**7.50 J**	**7.50 J**	**4.00 J**	**4.00 J**	2.50 U	10.0 U	**5.60 J**	**5.60 J**	2.50 U	9.90 U	2.50 U	9.80 U	2.50 U	9.80 U
Benzo(g,h,i)perylene	2.30 U	10.0 U	**5.00 J**	**5.00 J**	**6.20 J**	**6.20 J**	**2.60 J**	**2.60 J**	2.30 U	10.0 U	**4.20 J**	**4.20 J**	2.30 U	9.90 U	2.30 U	9.80 U	2.30 U	9.80 U
Benzo(k)fluoranthene	2.50 U	10.0 U	**3.10 J**	**3.10 J**	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	10.0 U	**3.20 J**	**3.20 J**	2.50 U	9.90 U	2.50 U	9.80 U	2.50 U	9.80 U
Chrysene	**3.40 J**	**3.40 J**	**7.60 J**	**7.60 J**	**7.90 J**	**7.90 J**	**3.20 J**	**3.20 J**	**1.80 J**	**1.80 J**	**12.0**	**12.0**	1.40 U	9.90 U	**1.70 J**	**1.70 J**	1.40 U	9.80 U
Dibenz(a,h)anthracene	2.20 U	10.0 U	2.20 U	9.90 U	2.20 U	10.0 U	2.20 U	10.0 U	2.20 U	10.0 U	2.20 U	9.90 U	2.20 U	9.90 U	2.20 U	9.80 U	2.20 U	9.80 U
Fluoranthene	**4.00 J**	**4.00 J**	**9.70 J**	**9.70 J**	**12.0**	**12.0**	**4.80 J**	**4.80 J**	**2.70 J**	**2.70 J**	**4.60 J**	**4.60 J**	2.20 U	9.90 U	**2.60 J**	**2.60 J**	2.20 U	9.80 U
Indeno(1,2,3-cd)pyrene	1.90 U	10.0 U	**5.40 J**	**5.40 J**	**5.70 J**	**5.70 J**	**2.50 J**	**2.50 J**	1.90 U	10.0 U	**4.10 J**	**4.10 J**	1.90 U	9.90 U	1.90 U	9.80 U	1.90 U	9.80 U
Pyrene	**5.30 J**	**5.30 J**	**11.0**	**11.0**	**17.0**	**17.0**	**4.80 J**	**4.80 J**	**2.20 J**	**2.20 J**	**4.40 J**	**4.40 J**	1.30 U	9.90 U	**2.20 J**	**2.20 J**	1.30 U	9.80 U
Total HPAHs (full MDL/MRL)	**27.8 J**	**74.8 J**	**64.4 J**	**72.1 J**	**74.2 J**	**89.5 J**	**31.2 J**	**46.5 J**	**21.1 J**	**76.7 J**	**53.4 J**	**61.1 J**	19.3 U	99.0 U	**20.9 J**	**75.1 J**	19.3 U	98.0 U
Total HPAHs (KM)	**25.1 J**	**37.0 J**	**64.4 J**	**68.6 J**	**73.9 J**	**83.0 J**	**30.5 J**	**33.1 J**	**17.5 J**	**22.3 J**	**53.4 J**	**56.1 J**	NC	NC	**17.2 J**	**21.7 J**	NC	NC
Total HPAHs (KM, capped)	**25.1 J**	**37.0 J**	**64.4 J**	**68.6 J**	**73.9 J**	**83.0 J**	**30.5 J**	**33.1 J**	**17.5 J**	**22.3 J**	**53.4 J**	**56.1 J**	19.3 U	99.0 U	**17.2 J**	**21.7 J**	19.3 U	98.0 U
Total PAHs (full MDL/MRL)	**36.5 J**	**109 J**	**74.0 J**	**98.8 J**	**86.2 J**	**119 J**	**38.2 J**	**79.4 J**	**26.5 J**	**117 J**	**59.8 J**	**84.6 J**	24.7 U	139 U	**26.7 J**	**106 J**	24.7 U	137 U
Total PAHs (KM)	**29.1 J**	**54.3 J**	**72.4 J**	**86.5 J**	**83.4 J**	**104 J**	**34.9 J**	**45.7 J**	**18.6 J**	**31.3 J**	**58.4 J**	**67.8 J**	NC	NC	**19.5 J**	**28.7 J**	NC	NC
Total PAHs (KM, capped)	**29.1 J**	**54.3 J**	**72.4 J**	**86.5 J**	**83.4 J**	**104 J**	**34.9 J**	**45.7 J**	**18.6 J**	**31.3 J**	**58.4 J**	**67.8 J**	24.7 U	139 U	**19.5 J**	**28.7 J**	24.7 U	137 U

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
PAH = Polycyclic Aromatic Hydrodarbons
LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH

J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
All units are in micrograms per kilogram (µg/kg), dry weight
NC = Not calculated
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-19
Forebay - Targeted Sediment PAH Analysis Results
(Page 1 of 1)

Site	Forebay - Eagle Creek		Forebay - Eagle Creek		Forebay - Goose Island		Forebay - Goose Island	
Site ID	P43		P44		P110		P111	
Sample ID	08032043SD		08032044SD		090427110SD		090429111SD	
Sample Date	3/20/2008		3/20/2008		4/27/2009		4/29/2009	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs								
Acenaphthene	1.00 U	9.90 U	1.00 U	9.90 U	1.20 U	12.0 U	1.30 U	13.0 U
Anthracene	1.40 U	9.90 U	**2.60 J**	**2.60 J**	1.70 U	12.0 U	1.80 U	13.0 U
Fluorene	1.70 U	9.90 U	1.70 U	9.90 U	2.10 U	12.0 U	2.20 U	13.0 U
Phenanthrene	**2.30 J**	**2.30 J**	**6.50 J**	**6.50 J**	**3.80 J**	**3.80 J**	**4.60 J**	**4.60 J**
Total LPAHs (full MDL/MRL)	**6.40 J**	**32.0 J**	**11.8 J**	**28.9 J**	**8.80 J**	**39.8 J**	**9.90 J**	**43.6 J**
Total LPAHs (KM)	NC	NC	NC	NC	NC	NC	NC	NC
Total LPAHs (KM, capped)	**6.40 J**	**32.0 J**	**11.8 J**	**28.9 J**	**8.80 J**	**39.8 J**	**9.90 J**	**43.6 J**
HPAHs								
Benzo(a)anthracene	1.40 U	9.90 U	**6.60 J**	**6.60 J**	**4.20 J**	**4.20 J**	**7.80 J**	**7.80 J**
Benzo(a)pyrene	1.60 U	9.90 U	**7.10 J**	**7.10 J**	**8.70 J**	**8.70 J**	**13.0 J**	**13.0 J**
Benzo(b)fluoranthene	2.50 U	9.90 U	**11.0**	**11.0**	**6.50 J**	**6.50 J**	**15.0**	**15.0**
Benzo(g,h,i)perylene	2.30 U	9.90 U	**5.00 J**	**5.00 J**	**5.60 J**	**5.60 J**	**9.90 J**	**9.90 J**
Benzo(k)fluoranthene	2.50 U	9.90 U	**3.40 J**	**3.40 J**	3.00 U	12.0 U	**4.10 J**	**4.10 J**
Chrysene	**1.80 J**	**1.80 J**	**13.0**	**13.0**	**5.80 J**	**5.80 J**	**11.0 J**	**11.0 J**
Dibenz(a,h)anthracene	2.20 U	9.90 U	2.20 U	9.90 U	2.70 U	12.0 U	2.80 U	13.0 U
Fluoranthene	2.20 U	9.90 U	**11.0**	**11.0**	**7.30 J**	**7.30 J**	**9.60 J**	**9.60 J**
Indeno(1,2,3-cd)pyrene	1.90 U	9.90 U	**4.60 J**	**4.60 J**	**5.00 J**	**5.00 J**	**7.10 J**	**7.10 J**
Pyrene	**3.40 J**	**3.40 J**	**17.0**	**17.0**	**7.20 J**	**7.20 J**	**8.80 J**	**8.80 J**
Total HPAHs (full MDL/MRL)	**21.8 J**	**84.4 J**	**80.9 J**	**88.6 J**	**56.0 J**	**74.3 J**	**89.1 J**	**99.3 J**
Total HPAHs (KM)	**17.2 J**	**26.0 J**	**80.9 J**	**84.0 J**	**55.7 J**	**62.9 J**	**89.1 J**	**94.6 J**
Total HPAHs (KM, capped)	**17.2 J**	**26.0 J**	**80.9 J**	**84.0 J**	**55.7 J**	**62.9 J**	**89.1 J**	**94.6 J**
Total PAHs (full MDL/MRL)	**28.2 J**	**116 J**	**92.7 J**	**118 J**	**64.8 J**	**114 J**	**99.0 J**	**143 J**
Total PAHs (KM)	**19.5 J**	**35.0 J**	**90.8 J**	**103 J**	**60.1 J**	**84.2 J**	**96.1 J**	**122 J**
Total PAHs (KM, capped)	**19.5 J**	**35.0 J**	**90.8 J**	**103 J**	**60.1 J**	**84.2 J**	**96.1 J**	**122 J**

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
PAH = Polycyclic Aromatic Hydrodarbons

LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH
All units are in micrograms per kilogram (µg/kg), dry weight
NC = Not calculated
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-20
Reference Area Sediment PAH Analysis Results
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Site ID	P22		P24		P26		P27		P28		P29		P34		P35		P36	
Sample ID	08030522SD		08030524SD		08030426SD		08030427SD		08030428SD		08022229SD		08022534SD		08022535SD		08022536SD	
Sample Date	3/5/2008		3/5/2008		3/4/2008		3/4/2008		3/4/2008		2/22/2008		2/25/2008		2/25/2008		2/25/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs																		
Acenaphthene	1.00 U	10.0 U	1.00 U	10.0 U	1.00 U	9.90 U	1.00 U	9.50 U	1.10 U	11.0 U	1.00 U	10.0 U	1.00 U	10.0 U	1.00 U	10.0 U	1.00 U	9.90 U
Anthracene	1.40 U	10.0 U	1.40 U	10.0 U	1.40 U	9.90 U	1.40 U	9.50 U	1.50 U	11.0 U	1.40 U	10.0 U	1.40 U	10.0 U	**2.30 J**	**2.30 J**	1.40 U	9.90 U
Fluorene	1.70 UJ	10.0 UJ	1.70 UJ	10.0 UJ	1.70 UJ	9.90 UJ	1.70 UJ	9.50 UJ	1.80 UJ	11.0 UJ	1.70 UJ	10.0 UJ	1.70 UJ	10.0 UJ	1.70 UJ	10.0 UJ	1.70 UJ	9.90 UJ
Phenanthrene	**2.30 J**	**2.30 J**	**2.20 J**	**2.20 J**	**3.60 J**	**3.60 J**	**3.30 J**	**3.30 J**	**2.10 J**	**2.10 J**	**3.70 J**	**3.70 J**	**3.00 J**	**3.00 J**	**2.30 J**	**2.30 J**	**3.20 J**	**3.20 J**
Total LPAHs (full MDL/MRL)	**6.40 J**	**32.3 J**	**6.30 J**	**32.2 J**	**7.70 J**	**33.3 J**	**7.40 J**	**31.8 J**	**6.50 J**	**35.1 J**	**7.80 J**	**33.7 J**	**7.10 J**	**33.0 J**	**7.30 J**	**24.6 J**	**7.30 J**	**32.9 J**
Total LPAHs (KM)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Total LPAHs (KM, capped)	**6.40 J**	**32.3 J**	**6.30 J**	**32.2 J**	**7.70 J**	**33.3 J**	**7.40 J**	**31.8 J**	**6.50 J**	**35.1 J**	**7.80 J**	**33.7 J**	**7.10 J**	**33.0 J**	**7.30 J**	**24.6 J**	**7.30 J**	**32.9 J**
HPAHs																		
Benzo(a)anthracene	**1.80 J**	**1.80 J**	**1.60 J**	**1.60 J**	**2.30 J**	**2.30 J**	**3.60 J**	**3.60 J**	**3.60 J**	**3.60 J**	**3.30 J**	**3.30 J**	**2.90 J**	**2.90 J**	**2.20 J**	**2.20 J**	**3.30 J**	**3.30 J**
Benzo(a)pyrene	**1.60 J**	**1.60 J**	1.60 U	10.0 U	**3.20 J**	**3.20 J**	1.60 U	9.50 U	**4.80 J**	**4.80 J**	**3.80 J**	**3.80 J**	1.60 U	10.0 U	1.60 U	10.0 U	**6.20 J**	**6.20 J**
Benzo(b)fluoranthene	2.50 U	10.0 U	2.50 U	10.0 U	**4.40 J**	**4.40 J**	**4.80 J**	**4.80 J**	**5.80 J**	**5.80 J**	**5.00 J**	**5.00 J**	**5.50 J**	**5.50 J**	**3.70 J**	**3.70 J**	**8.30 J**	**8.30 J**
Benzo(g,h,i)perylene	2.30 U	10.0 U	2.30 U	10.0 U	**4.70 J**	**4.70 J**	**3.20 J**	**3.20 J**	**3.60 J**	**3.60 J**	**3.50 J**	**3.50 J**	**3.60 J**	**3.60 J**	**2.70 J**	**2.70 J**	**7.90 J**	**7.90 J**
Benzo(k)fluoranthene	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	9.90 U	2.50 U	9.50 U	2.60 U	11.0 U	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	9.90 U
Chrysene	**9.70 J**	**9.70 J**	**2.10 J**	**2.10 J**	**3.70 J**	**3.70 J**	**3.50 J**	**3.50 J**	**4.90 J**	**4.90 J**	**4.00 J**	**4.00 J**	**4.40 J**	**4.40 J**	**3.10 J**	**3.10 J**	**4.80 J**	**4.80 J**
Dibenz(a,h)anthracene	2.20 U	10.0 U	2.20 U	10.0 U	2.20 U	9.90 U	2.20 U	9.50 U	2.30 U	11.0 U	2.20 U	10.0 U	2.20 U	10.0 U	2.20 U	10.0 U	2.20 U	9.90 U
Fluoranthene	**3.60 J**	**3.60 J**	**2.60 J**	**2.60 J**	**6.40 J**	**6.40 J**	**6.20 J**	**6.20 J**	**6.10 J**	**6.10 J**	2.20 UJ	10.0 UJ	**5.10 J**	**5.10 J**	**5.60 J**	**5.60 J**	**5.50 J**	**5.50 J**
Indeno(1,2,3-cd)pyrene	1.90 UJ	10.0 UJ	1.90 UJ	10.0 UJ	**3.30 J**	**3.30 J**	**2.70 J**	**2.70 J**	**3.20 J**	**3.20 J**	1.90 UJ	10.0 UJ	1.90 UJ	10.0 UJ	**2.20 J**	**2.20 J**	**8.80 J**	**8.80 J**
Pyrene	**2.60 J**	**2.60 J**	**1.70 J**	**1.70 J**	**7.00 J**	**7.00 J**	**4.50 J**	**4.50 J**	**4.90 J**	**4.90 J**	**4.90 J**	**4.90 J**	**4.80 J**	**4.80 J**	**3.30 J**	**3.30 J**	**7.10 J**	**7.10 J**
Total HPAHs (full MDL/MRL)	**30.7 J**	**69.3 J**	**21.0 J**	**68.0 J**	**39.7 J**	**54.8 J**	**34.8 J**	**57.0 J**	**41.8 J**	**58.9 J**	**33.3 J**	**64.5 J**	**34.5 J**	**66.3 J**	**29.1 J**	**52.8 J**	**56.6 J**	**71.7 J**
Total HPAHs (KM)	**27.8 J**	**38.6 J**	**18.1 J**	**20.0 J**	**39.5 J**	**43.8 J**	**33.3 J**	**40.7 J**	**41.5 J**	**46.1 J**	**32.1 J**	**40.8 J**	**32.7 J**	**43.8 J**	**27.9 J**	**32.6 J**	**56.3 J**	**64.9 J**
Total HPAHs (KM, capped)	**27.8 J**	**38.6 J**	**18.1 J**	**20.0 J**	**39.5 J**	**43.8 J**	**33.3 J**	**40.7 J**	**41.5 J**	**46.1 J**	**32.1 J**	**40.8 J**	**32.7 J**	**43.8 J**	**27.9 J**	**32.6 J**	**56.3 J**	**64.9 J**
Total PAHs (full MDL/MRL)	**37.1 J**	**102 J**	**27.3 J**	**100 J**	**47.4 J**	**88.1 J**	**42.2 J**	**88.8 J**	**48.3 J**	**94.0 J**	**41.1 J**	**98.2 J**	**41.6 J**	**99.3 J**	**36.4 J**	**77.4 J**	**63.9 J**	**105 J**
Total PAHs (KM)	**31.6 J**	**50.4 J**	**21.2 J**	**28.6 J**	**43.9 J**	**60.0 J**	**37.8 J**	**55.7 J**	**45.0 J**	**60.7 J**	**35.2 J**	**56.4 J**	**36.3 J**	**58.6 J**	**33.0 J**	**42.6 J**	**60.1 J**	**85.7 J**
Total PAHs (KM, capped)	**31.6 J**	**50.4 J**	**21.2 J**	**28.6 J**	**43.9 J**	**60.0 J**	**37.8 J**	**55.7 J**	**45.0 J**	**60.7 J**	**35.2 J**	**56.4 J**	**36.3 J**	**58.6 J**	**33.0 J**	**42.6 J**	**60.1 J**	**85.7 J**

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
PAH = Polycyclic Aromatic Hydrodarbons
LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH

J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
All units are in micrograms per kilogram (µg/kg), dry weight
NC = Not calculated
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-20
Reference Area Sediment PAH Analysis Results
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Site ID	P37		P38		P39		P40		P41		P42		P85		P86		P87	
Sample ID	08022637SD		08022738SD		08022739SD		08022740SD		08022741SD		08022742SD		08030685SD		08030686SD		08030687SD	
Sample Date	2/26/2008		2/27/2008		2/27/2008		2/27/2008		2/27/2008		2/27/2008		3/6/2008		3/6/2008		3/6/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs																		
Acenaphthene	1.00 U	10.0 U	1.00 U	10.0 U	1.00 U	10.0 U	1.00 U	9.80 U	1.00 U	9.80 U	1.00 U	9.90 U	1.00 U	10.0 U	1.00 U	9.90 U	1.00 UJ	10.0 UJ
Anthracene	1.40 U	10.0 U	1.40 U	10.0 U	1.40 U	10.0 U	1.40 U	9.80 U	**1.40 J**	**1.40 J**	1.40 U	9.90 U	1.40 U	10.0 U	1.40 U	9.90 U	1.40 UJ	10.0 UJ
Fluorene	1.70 UJ	10.0 UJ	1.70 UJ	10.0 UJ	1.70 UJ	10.0 UJ	1.70 UJ	9.80 UJ	1.70 UJ	9.80 UJ	1.70 UJ	9.90 UJ	1.70 UJ	10.0 UJ	1.70 UJ	9.90 UJ	1.70 UJ	10.0 UJ
Phenanthrene	**4.40 J**	**4.40 J**	**2.60 J**	**2.60 J**	1.30 U	10.0 U	**1.30 J**	**1.30 J**	**5.90 J**	**5.90 J**	1.30 U	9.90 U	**1.90 J**	**1.90 J**	**2.00 J**	**2.00 J**	**3.60 J**	**3.60 J**
Total LPAHs (full MDL/MRL)	**8.50 J**	**34.4 J**	**6.70 J**	**32.6 J**	5.40 U	40.0 U	**5.40 J**	**30.7 J**	**10.0 J**	**26.9 J**	5.40 U	39.6 U	**6.00 J**	**31.9 J**	**6.10 J**	**31.7 J**	**7.70 J**	**33.6 J**
Total LPAHs (KM)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Total LPAHs (KM, capped)	**8.50 J**	**34.4 J**	**6.70 J**	**32.6 J**	5.40 UJ	40.0 UJ	**5.40 J**	**30.7 J**	**10.0 J**	**26.9 J**	5.40 UJ	39.6 UJ	**6.00 J**	**31.9 J**	**6.10 J**	**31.7 J**	**7.70 J**	**33.6 J**
HPAHs																		
Benzo(a)anthracene	**3.90 J**	**3.90 J**	**2.50 J**	**2.50 J**	1.40 U	10.0 U	1.40 U	9.80 U	**10.0**	**10.0**	1.40 U	9.90 U	1.40 U	10.0 U	**1.80 J**	**1.80 J**	**3.00 J**	**3.00 J**
Benzo(a)pyrene	**4.60 J**	**4.60 J**	1.60 U	10.0 U	1.60 U	10.0 U	1.60 U	9.80 U	**11.0**	**11.0**	1.60 U	9.90 U	**2.80 J**	**2.80 J**	1.60 U	9.90 U	**2.60 J**	**2.60 J**
Benzo(b)fluoranthene	**6.90 J**	**6.90 J**	**4.20 J**	**4.20 J**	2.50 U	10.0 U	2.50 U	9.80 U	**17.0**	**17.0**	2.50 U	9.90 U	**3.60 J**	**3.60 J**	**2.70 J**	**2.70 J**	**3.50 J**	**3.50 J**
Benzo(g,h,i)perylene	**4.60 J**	**4.60 J**	2.30 U	10.0 U	2.30 U	10.0 U	2.30 U	9.80 U	**7.30 J**	**7.30 J**	2.30 U	9.90 U	2.30 U	10.0 U	2.30 U	9.90 U	**2.30 J**	**2.30 J**
Benzo(k)fluoranthene	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	10.0 U	2.50 U	9.80 U	**5.00 J**	**5.00 J**	2.50 U	9.90 U	2.50 U	10.0 U	2.50 U	9.90 U	2.50 UJ	10.0 UJ
Chrysene	**4.80 J**	**4.80 J**	**3.20 J**	**3.20 J**	1.40 U	10.0 U	**1.90 J**	**1.90 J**	**9.80**	**9.80**	1.40 U	9.90 U	1.40 U	10.0 U	**2.40 J**	**2.40 J**	**3.10 J**	**3.10 J**
Dibenz(a,h)anthracene	2.20 U	10.0 U	2.20 U	10.0 U	2.20 U	10.0 U	2.20 U	9.80 U	2.20 U	9.80 U	2.20 U	9.90 U	2.20 U	10.0 U	2.20 U	9.90 U	2.20 UJ	10.0 UJ
Fluoranthene	**9.70 J**	**9.70 J**	**4.10 J**	**4.10 J**	**2.30 J**	**2.30 J**	**2.30 J**	**2.30 J**	**31.0 J**	**31.0 J**	2.20 UJ	9.90 UJ	2.20 UJ	10.0 UJ	**3.60 J**	**3.60 J**	**5.00 J**	**5.00 J**
Indeno(1,2,3-cd)pyrene	**4.90 J**	**4.90 J**	**2.30 J**	**2.30 J**	1.90 UJ	10.0 UJ	1.90 UJ	9.80 UJ	**8.40 J**	**8.40 J**	1.90 UJ	9.90 UJ	1.90 UJ	10.0 UJ	1.90 UJ	9.90 UJ	**2.00 J**	**2.00 J**
Pyrene	**7.80 J**	**7.80 J**	**3.60 J**	**3.60 J**	**2.10 J**	**2.10 J**	**1.80 J**	**1.80 J**	**23.0 J**	**23.0 J**	**1.50 J**	**1.50 J**	**2.70 J**	**2.70 J**	**2.10 J**	**2.10 J**	**4.90 J**	**4.90 J**
Total HPAHs (full MDL/MRL)	**51.9 J**	**67.2 J**	**28.5 J**	**59.9 J**	**20.2 J**	**84.4 J**	**20.4 J**	**74.6 J**	**125 J**	**132 J**	**19.5 J**	**90.6 J**	**23.0 J**	**79.1 J**	**23.1 J**	**62.1 J**	**31.1 J**	**46.4 J**
Total HPAHs (KM)	**51.6 J**	**59.0 J**	**26.5 J**	**33.2 J**	**16.4 J**	**22.0 J**	**16.9 J**	**20.0 J**	**125 J**	**129 J**	NC	NC	**18.9 J**	**30.3 J**	**21.4 J**	**25.2 J**	**30.5 J**	**33.0 J**
Total HPAHs (KM, capped)	**51.6 J**	**59.0 J**	**26.5 J**	**33.2 J**	**16.4 J**	**22.0 J**	**16.9 J**	**20.0 J**	**125 J**	**129 J**	**19.5 J**	**90.6 J**	**18.9 J**	**30.3 J**	**21.4 J**	**25.2 J**	**30.5 J**	**33.0 J**
Total PAHs (full MDL/MRL)	**60.4 J**	**102 J**	**35.2 J**	**92.5 J**	**25.6 J**	**124 J**	**25.8 J**	**105 J**	**135 J**	**159 J**	**24.9 J**	**130 J**	**29.0 J**	**111 J**	**29.2 J**	**93.8 J**	**38.8 J**	**80.0 J**
Total PAHs (KM)	**56.6 J**	**80.3 J**	**29.7 J**	**45.0 J**	**17.1 J**	**30.8 J**	**19.6 J**	**25.6 J**	**133 J**	**147 J**	NC	NC	**21.5 J**	**38.5 J**	**24.0 J**	**34.1 J**	**35.7 J**	**46.7 J**
Total PAHs (KM, capped)	**56.6 J**	**80.3 J**	**29.7 J**	**45.0 J**	**17.1 J**	**30.8 J**	**19.6 J**	**25.6 J**	**133 J**	**147 J**	**24.9 J**	**130 J**	**21.5 J**	**38.5 J**	**24.0 J**	**34.1 J**	**35.7 J**	**46.7 J**

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
PAH = Polycyclic Aromatic Hydrodarbons
LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH

J = The reported value is an estimate.
UJ = The analyte was not detected. The reported MDL/MRL is an estimate.
U = The analyte was not detected at or above the MDL.
All units are in micrograms per kilogram (µg/kg), dry weight
NC = Not calculated
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table H-21
Forebay - Pre-Removal Sediment PAH Analysis Results
(Page 1 of 1)

Site ID	A1		A2*		A3		A4		A5	
Sample ID	070926A1 SD		070926A2 SD		070927A3 SD		070925A4 SD		070925A5 SD	
Sample Date	9/26/2007		9/26/2007		9/27/2007		9/25/2007		9/25/2007	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs										
Acenaphthene	1.40 U	7.70 U	1.40 U	7.80 U	2.40 U	17.0 U	1.40 U	8.60 U	1.40 U	8.10 U
Anthracene	**4.30 J**	**4.30 J**	14.0 U	78.0 U	2.30 U	17.0 U	1.40 U	8.40 U	1.40 U	10.00 U
Fluorene	1.10 U	7.70 U	1.10 U	7.80 U	1.90 U	17.0 U	1.10 U	8.60 U	1.10 U	8.10 U
Phenanthrene	**9.10**	**9.10**	**3.25 J**	**3.25 J**	**2.90 J**	**2.90 J**	**4.50 J**	**4.50 J**	**5.00 J**	**5.00 J**
Total LPAHs (full MDL/MRL)	**15.9 J**	**28.8 J**	**19.8 J**	**96.9 J**	**9.50 J**	**53.9 J**	**8.40 J**	**30.1 J**	**8.90 J**	**31.2 J**
Total LPAHs (KM)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Total LPAHs (KM, capped)	**15.9 J**	**28.8 J**	**19.8 J**	**96.9 J**	**9.50 J**	**53.9 J**	**8.40 J**	**30.1 J**	**8.90 J**	**31.2 J**
HPAHs										
Benzo(a)anthracene	**5.70 J**	**5.70 J**	**3.05 J**	**3.05 J**	**3.70 J**	**3.70 J**	**3.30 J**	**3.30 J**	**3.50 J**	**3.50 J**
Benzo(a)pyrene	**32.0**	**32.0**	16.0 U	78.0 U	2.60 U	17.0 U	**6.10 J**	**6.10 J**	**7.40 J**	**7.40 J**
Benzo(b)fluoranthene	**11.0**	**11.0**	**7.05 J**	**7.05 J**	**4.20 J**	**4.20 J**	**6.40 J**	**6.40 J**	**7.40 J**	**7.40 J**
Benzo(g,h,i)perylene	**5.40 J**	**5.40 J**	**3.70 J**	**3.70 J**	**5.20 J**	**5.20 J**	**4.40 J**	**4.40 J**	**4.70 J**	**4.70 J**
Benzo(k)fluoranthene	**3.20 J**	**3.20 J**	**3.40 J**	**3.40 J**	**3.30 J**	**3.30 J**	**2.30 J**	**2.30 J**	**2.50 J**	**2.50 J**
Chrysene	**7.90**	**7.90**	**5.35 J**	**5.35 J**	**4.10 J**	**4.10 J**	**4.70 J**	**4.70 J**	**5.20 J**	**5.20 J**
Dibenz(a,h)anthracene	1.50 U	7.70 U	**2.50 J**	**2.50 J**	**3.10 J**	**3.10 J**	1.50 U	8.60 U	1.50 U	8.10 U
Fluoranthene	**13.0**	**13.0**	**7.10 J**	**7.10 J**	**4.40 J**	**4.40 J**	**7.10 J**	**7.10 J**	**8.30**	**8.30**
Indeno(1,2,3-cd)pyrene	**6.30 J**	**6.30 J**	**4.60 J**	**4.60 J**	**13.0 J**	**13.0 J**	**4.00 J**	**4.00 J**	**3.90 J**	**3.90 J**
Pyrene	**13.0**	**13.0**	**6.85 J**	**6.85 J**	**4.50 J**	**4.50 J**	**6.60 J**	**6.60 J**	**7.80 J**	**7.80 J**
Total HPAHs (full MDL/MRL)	**99.0 J**	**105 J**	**59.6 J**	**121.6 J**	**48.1 J**	**62.5 J**	**46.4 J**	**53.5 J**	**52.2 J**	**58.8 J**
Total HPAHs (KM)	**99.0 J**	**103 J**	**48.4 J**	**48.4 J**	**48.1 J**	**50.6 J**	**46.4 J**	**49.9 J**	**52.2 J**	**56.0 J**
Total HPAHs (KM, capped)	**99.0 J**	**103 J**	**48.4 J**	**48.4 J**	**48.1 J**	**50.6 J**	**46.4 J**	**49.9 J**	**52.2 J**	**56.0 J**
Total PAHs (full MDL/MRL)	**115 J**	**134 J**	**79.4 J**	**218.5 J**	**57.6 J**	**116.4 J**	**54.8 J**	**83.6 J**	**61.1 J**	**90.0 J**
Total PAHs (KM)	**114 J**	**126 J**	**57.2 J**	**65.6 J**	**56.0 J**	**67.8 J**	**53.8 J**	**69.2 J**	**60.1 J**	**77.0 J**
Total PAHs (KM, capped)	**114 J**	**126 J**	**57.2 J**	**65.6 J**	**56.0 J**	**67.8 J**	**53.8 J**	**69.2 J**	**60.1 J**	**77.0 J**

Notes:
MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
All units are in micrograms per kilogram (µg/kg), dry weight

PAH = Polycyclic Aromatic Hydrodarbons
LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH
NC = Not calculated
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped

* = The data displayed are the result of averaging primary and field duplicate results at this sampling location as described in Section 5.1

Table H-22
Downstream Sediment PAH Analysis Results
(Page 1 of 1)

Site ID	P46		P47		P48		P49		P50		P51	
Sample ID	08031046SD		08031047SD		08031048SD		08031049SD		08031150SD		08031151SD	
Sample Date	3/10/2008		3/10/2008		3/10/2008		3/10/2008		3/11/2008		3/11/2008	
Censoring Level for Undetected Results	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL	MDL	MRL
LPAHs												
Acenaphthene	1.00 U	10.0 U	1.00 U	9.70 U	1.00 U	9.70 U	1.00 U	9.90 U	1.00 U	9.90 U	1.00 U	9.80 U
Anthracene	**2.70 J**	**2.70 J**	1.40 U	9.70 U	1.40 U	9.70 U	1.40 U	9.90 U	**3.10 J**	**3.10 J**	**1.60 J**	**1.60 J**
Fluorene	1.70 U	10.0 U	1.70 U	9.70 U	1.70 U	9.70 U	1.70 U	9.90 U	1.70 U	9.90 U	1.70 U	9.80 U
Phenanthrene	**4.80 J**	**4.80 J**	1.30 U	9.70 U	1.30 U	9.70 U	**2.20 J**	**2.20 J**	**4.90 J**	**4.90 J**	**4.00 J**	**4.00 J**
Total LPAHs (full MDL/MRL)	**10.2 J**	**27.5 J**	5.40 U	38.8 U	5.40 U	38.8 U	**6.30 J**	**31.9 J**	**10.7 J**	**27.8 J**	**8.30 J**	**25.2 J**
Total LPAHs (KM)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Total LPAHs (KM, capped)	**10.2 J**	**27.5 J**	5.40 U	38.8 U	5.40 U	38.8 U	**6.30 J**	**31.9 J**	**10.7 J**	**27.8 J**	**8.30 J**	**25.2 J**
HPAHs												
Benzo(a)anthracene	**9.60 J**	**9.60 J**	**1.70 J**	**1.70 J**	**1.80 J**	**1.80 J**	**3.30 J**	**3.30 J**	**12.0**	**12.0**	**3.70 J**	**3.70 J**
Benzo(a)pyrene	**11.0**	**11.0**	**1.90 J**	**1.90 J**	1.60 U	9.70 U	**4.30 J**	**4.30 J**	**14.0**	**14.0**	**4.50 J**	**4.50 J**
Benzo(b)fluoranthene	**9.70 J**	**9.70 J**	2.50 U	9.70 U	2.50 U	9.70 U	**4.50 J**	**4.50 J**	**16.0**	**16.0**	**3.30 J**	**3.30 J**
Benzo(g,h,i)perylene	**5.80 J**	**5.80 J**	2.30 U	9.70 U	2.30 U	9.70 U	**2.80 J**	**2.80 J**	**6.80 J**	**6.80 J**	2.30 U	9.80 U
Benzo(k)fluoranthene	**4.20 J**	**4.20 J**	2.50 U	9.70 U	2.50 U	9.70 U	2.50 U	9.90 U	**6.50 J**	**6.50 J**	2.50 U	9.80 U
Chrysene	**9.60 J**	**9.60 J**	**1.60 J**	**1.60 J**	1.40 U	9.70 U	**3.50 J**	**3.50 J**	**18.0**	**18.0**	**3.40 J**	**3.40 J**
Dibenz(a,h)anthracene	2.20 U	10.0 U	2.20 U	9.70 U	2.20 U	9.70 U	2.20 U	9.90 U	**2.30 J**	**2.30 J**	2.20 U	9.80 U
Fluoranthene	**20.0**	**20.0**	**2.90 J**	**2.90 J**	2.20 U	9.70 U	**4.30 J**	**4.30 J**	**22.0**	**22.0**	**6.20 J**	**6.20 J**
Indeno(1,2,3-cd)pyrene	**6.30 J**	**6.30 J**	1.90 U	9.70 U	1.90 U	9.70 U	**2.80 J**	**2.80 J**	**8.20 J**	**8.20 J**	1.90 U	9.80 U
Pyrene	**20.0**	**20.0**	**2.60 J**	**2.60 J**	**1.80 J**	**1.80 J**	**4.60 J**	**4.60 J**	**21.0**	**21.0**	**6.40 J**	**6.40 J**
Total HPAHs (full MDL/MRL)	**98.4 J**	**106 J**	**22.1 J**	**59.2 J**	**20.2 J**	**81.2 J**	**34.8 J**	**49.9 J**	**127 J**	**127 J**	**36.4 J**	**66.7 J**
Total HPAHs (KM)	**98.4 J**	**104 J**	**19.2 J**	**21.4 J**	**16.0 J**	NC **J**	**34.5 J**	**37.6 J**	**127 J**	**127 J**	**35.1 J**	**45.8 J**
Total HPAHs (KM-capped)	**98.4 J**	**104 J**	**19.2 J**	**21.4 J**	**16.0 J**	**81.2 J**	**34.5 J**	**37.6 J**	**127 J**	**127 J**	**35.1 J**	**45.8 J**
Total PAHs (full MDL/MRL)	**109 J**	**134 J**	**27.5 J**	**98.0 J**	**25.6 J**	**120 J**	**41.1 J**	**81.8 J**	**138 J**	**155 J**	**44.7 J**	**91.9 J**
Total PAHs (KM)	**107 J**	**123 J**	**21.4 J**	**30.0 J**	**16.8 J**	NC	**37.5 J**	**50.2 J**	**137 J**	**145 J**	**40.6 J**	**57.9 J**
Total PAHs (KM, capped)	**107 J**	**123 J**	**21.4 J**	**30.0 J**	**16.8 J**	**120 J**	**37.5 J**	**50.2 J**	**137 J**	**145 J**	**40.6 J**	**57.9 J**

Notes:

MDL = method detection limit
MRL = method reporting limit
bold = analyte detected above MDL.
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
PAH = Polycyclic Aromatic Hydrodarbons

LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH
All units are in micrograms per kilogram (µg/kg), dry weight
NC = Not calculated
KM = Kaplan–Meier-based with Efron's bias correction
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped

APPENDIX I

DATA SUMMARY AND STATISTICS

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	Metals	Total	Aluminum	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	7,560	19,100	10	100%	No	--
Soil	Metals	Total	Aluminum	0-3 ft	mg/kg	12	-	-	-	-	0	-	12	6,000	19,100	12	100%	No	--
Soil	Metals	Total	Aluminum	0-10 ft	mg/kg	26	-	-	-	-	0	-	26	2,380	23,100	26	100%	No	Yes
Soil	Metals	Total	Antimony	0-1 ft	mg/kg	20	0.200	2.90	0.200	2.90	16	1	3	0.309	4.20	4	20%	No	Yes
Soil	Metals	Total	Antimony	0-3 ft	mg/kg	22	0.200	2.90	0.200	3.04	16	2	4	0.309	4.20	6	27%	No	Yes
Soil	Metals	Total	Antimony	0-10 ft	mg/kg	36	0.200	2.90	0.200	3.04	16	4	16	0.309	8.19	20	56%	No	Yes
Soil	Metals	Total	Arsenic	0-1 ft	mg/kg	21	-	-	-	-	0	-	21	1.50	30.1	21	100%	No	Yes
Soil	Metals	Total	Arsenic	0-3 ft	mg/kg	23	-	-	-	-	0	-	23	1.50	30.1	23	100%	No	Yes
Soil	Metals	Total	Arsenic	0-10 ft	mg/kg	37	-	-	-	-	0	-	37	1.50	30.1	37	100%	No	Yes
Soil	Metals	Total	Barium	0-1 ft	mg/kg	21	-	-	-	-	0	-	21	58.9	242	21	100%	No	Yes
Soil	Metals	Total	Barium	0-3 ft	mg/kg	23	-	-	-	-	0	-	23	42.6	242	23	100%	No	Yes
Soil	Metals	Total	Barium	0-10 ft	mg/kg	37	-	-	-	-	0	-	37	34.0	242	37	100%	No	Yes
Soil	Metals	Total	Beryllium	0-1 ft	mg/kg	21	0.189	0.280	0.270	0.467	4	-	17	0.300	0.576	17	81%	No	Yes
Soil	Metals	Total	Beryllium	0-3 ft	mg/kg	23	0.157	0.280	0.270	0.467	6	-	17	0.300	0.576	17	74%	No	Yes
Soil	Metals	Total	Beryllium	0-10 ft	mg/kg	37	0.155	0.280	0.270	0.550	11	9	17	0.186	0.576	26	70%	No	Yes
Soil	Metals	Total	Cadmium	0-1 ft	mg/kg	21	0.260	0.290	0.260	0.290	6	-	15	0.343	2.09	15	71%	No	Yes
Soil	Metals	Total	Cadmium	0-3 ft	mg/kg	23	0.260	0.290	0.260	0.290	6	-	17	0.343	3.54	17	74%	No	Yes
Soil	Metals	Total	Cadmium	0-10 ft	mg/kg	37	0.260	0.290	0.260	0.290	6	-	31	0.343	3.54	31	84%	No	Yes
Soil	Metals	Total	Chromium	0-1 ft	mg/kg	21	-	-	-	-	0	-	21	14.7	801	21	100%	No	Yes
Soil	Metals	Total	Chromium	0-3 ft	mg/kg	23	-	-	-	-	0	-	23	14.7	1,950	23	100%	No	Yes
Soil	Metals	Total	Chromium	0-10 ft	mg/kg	37	-	-	-	-	0	-	37	11.0	2,300	37	100%	No	Yes
Soil	Metals	Total	Cobalt	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	6.40	22.7	10	100%	No	--
Soil	Metals	Total	Cobalt	0-3 ft	mg/kg	12	-	-	-	-	0	-	12	6.40	41.0	12	100%	No	--
Soil	Metals	Total	Cobalt	0-10 ft	mg/kg	26	-	-	-	-	0	-	26	3.99	42.3	26	100%	No	Yes
Soil	Metals	Total	Copper	0-1 ft	mg/kg	21	-	-	-	-	0	-	21	23.5	494	21	100%	No	Yes
Soil	Metals	Total	Copper	0-3 ft	mg/kg	23	-	-	-	-	0	-	23	23.5	494	23	100%	No	Yes
Soil	Metals	Total	Copper	0-10 ft	mg/kg	37	-	-	-	-	0	-	37	17.9	494	37	100%	No	Yes
Soil	Metals	Total	Lead	0-1 ft	mg/kg	21	-	-	-	-	0	-	21	5.34	741	21	100%	No	Yes
Soil	Metals	Total	Lead	0-3 ft	mg/kg	29	-	-	-	-	0	-	29	5.34	1,660	29	100%	No	Yes
Soil	Metals	Total	Lead	0-10 ft	mg/kg	43	-	-	-	-	0	-	43	5.34	1,660	43	100%	No	Yes
Soil	Metals	Total	Manganese	0-1 ft	mg/kg	21	-	-	-	-	0	-	21	196	720	21	100%	No	Yes
Soil	Metals	Total	Manganese	0-3 ft	mg/kg	23	-	-	-	-	0	-	23	196	1,710	23	100%	No	Yes
Soil	Metals	Total	Manganese	0-10 ft	mg/kg	37	-	-	-	-	0	-	37	146	1,710	37	100%	No	Yes
Soil	Metals	Total	Mercury	0-1 ft	mg/kg	23	0.100	0.110	0.100	0.110	5	-	18	0.0700	4.15	18	78%	No	Yes
Soil	Metals	Total	Mercury	0-3 ft	mg/kg	25	0.100	0.110	0.100	0.110	5	-	20	0.0475	4.15	20	80%	No	Yes
Soil	Metals	Total	Mercury	0-10 ft	mg/kg	39	0.100	0.110	0.0192	0.110	5	1	33	0.0150	4.15	34	87%	No	Yes
Soil	Metals	Total	Nickel	0-1 ft	mg/kg	21	-	-	-	-	0	-	21	13.4	570	21	100%	No	Yes
Soil	Metals	Total	Nickel	0-3 ft	mg/kg	23	-	-	-	-	0	-	23	13.4	1,610	23	100%	No	Yes
Soil	Metals	Total	Nickel	0-10 ft	mg/kg	37	-	-	-	-	0	-	37	7.85	1,760	37	100%	No	Yes
Soil	Metals	Total	Selenium	0-1 ft	mg/kg	21	0.200	1.50	0.200	1.50	18	1	2	0.205	0.848	3	14%	No	Yes
Soil	Metals	Total	Selenium	0-3 ft	mg/kg	23	0.200	1.50	0.200	2.02	18	3	2	0.205	0.879	5	22%	No	Yes
Soil	Metals	Total	Selenium	0-10 ft	mg/kg	37	0.0774	1.50	0.200	2.02	26	9	2	0.106	0.879	11	30%	No	Yes
Soil	Metals	Total	Silver	0-1 ft	mg/kg	21	0.200	0.570	0.200	0.570	14	-	7	0.200	1.50	7	33%	No	Yes
Soil	Metals	Total	Silver	0-3 ft	mg/kg	23	0.200	0.570	0.200	2.02	14	2	7	0.126	1.50	9	39%	No	Yes
Soil	Metals	Total	Silver	0-10 ft	mg/kg	37	0.200	0.570	0.200	2.02	14	12	11	0.101	1.52	23	62%	No	Yes
Soil	Metals	Total	Thallium	0-1 ft	mg/kg	21	0.200	0.300	0.117	0.300	19	1	1	0.0953	0.378	2	10%	No	Yes
Soil	Metals	Total	Thallium	0-3 ft	mg/kg	23	0.200	0.300	0.0970	0.506	19	3	1	0.0578	0.378	4	17%	No	Yes
Soil	Metals	Total	Thallium	0-10 ft	mg/kg	37	0.200	0.300	0.0970	0.951	19	10	8	0.0361	0.378	18	49%	No	Yes
Soil	Metals	Total	Vanadium	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	34.3	56.3	10	100%	No	--
Soil	Metals	Total	Vanadium	0-3 ft	mg/kg	12	-	-	-	-	0	-	12	34.3	56.3	12	100%	No	--
Soil	Metals	Total	Vanadium	0-10 ft	mg/kg	26	-	-	-	-	0	-	26	15.9	93.4	26	100%	No	Yes
Soil	Metals	Total	Zinc	0-1 ft	mg/kg	21	-	-	-	-	0	-	21	41.6	635	21	100%	No	Yes
Soil	Metals	Total	Zinc	0-3 ft	mg/kg	23	-	-	-	-	0	-	23	41.6	1,140	23	100%	No	Yes
Soil	Metals	Total	Zinc	0-10 ft	mg/kg	37	-	-	-	-	0	-	37	41.6	1,140	37	100%	No	Yes
Soil	Butyltins	Total	Dibutyltin	0-1 ft	ug/kg	7	0.730	0.899	2.27	2.79	5	-	2	20.0	20.2	2	29%	Yes	--

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(2 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	Butyltins	Total	Dibutyltin	0-3 ft	ug/kg	9	0.685	0.899	2.13	2.79	7	-	2	20.0	20.2	2	22%	No	--
Soil	Butyltins	Total	Dibutyltin	0-10 ft	ug/kg	22	0.567	7.62	1.76	23.7	20	-	2	20.0	20.2	2	9%	No	Yes
Soil	Butyltins	Total	Monobutyltin	0-1 ft	ug/kg	7	1.61	1.98	3.03	3.73	5	-	2	9.08	38.0	2	29%	Yes	--
Soil	Butyltins	Total	Monobutyltin	0-3 ft	ug/kg	9	1.51	1.98	2.84	3.73	7	-	2	9.08	38.0	2	22%	No	--
Soil	Butyltins	Total	Monobutyltin	0-10 ft	ug/kg	22	1.25	16.8	2.35	31.6	20	-	2	9.08	38.0	2	9%	No	Yes
Soil	Butyltins	Total	Tetrabutyltin	0-1 ft	ug/kg	7	0.564	0.694	1.51	1.86	7	-	-	-	-	0	0%	Yes	--
Soil	Butyltins	Total	Tetrabutyltin	0-3 ft	ug/kg	9	0.529	0.694	1.42	1.86	9	-	-	-	-	0	0%	No	--
Soil	Butyltins	Total	Tetrabutyltin	0-10 ft	ug/kg	22	0.438	5.89	1.18	15.8	22	-	-	-	-	0	0%	No	No
Soil	Butyltins	Total	Tributyltin	0-1 ft	ug/kg	7	1.20	1.43	3.13	3.73	4	-	3	5.12	165	3	43%	Yes	--
Soil	Butyltins	Total	Tributyltin	0-3 ft	ug/kg	9	1.18	1.43	3.07	3.73	5	-	4	5.12	165	4	44%	No	--
Soil	Butyltins	Total	Tributyltin	0-10 ft	ug/kg	22	0.903	12.1	2.35	31.6	18	-	4	5.12	165	4	18%	No	Yes
Soil	Herbicides	Total	2,4,5-T	0-1 ft	ug/kg	12	1.79	50.0	3.10	50.0	10	-	2	63.0	93.0	2	17%	No	--
Soil	Herbicides	Total	2,4,5-T	0-3 ft	ug/kg	14	1.54	50.0	3.10	50.0	12	-	2	63.0	93.0	2	14%	No	--
Soil	Herbicides	Total	2,4,5-T	0-10 ft	ug/kg	21	1.46	50.0	3.10	50.0	19	-	2	63.0	93.0	2	10%	No	Yes
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-1 ft	ug/kg	12	2.50	50.0	2.50	50.0	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-3 ft	ug/kg	14	2.25	50.0	2.50	50.0	14	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-10 ft	ug/kg	21	2.14	50.0	2.50	50.0	21	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	2,4-D	0-1 ft	ug/kg	12	0.675	50.0	8.18	50.0	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4-D	0-3 ft	ug/kg	14	0.581	50.0	7.04	50.0	14	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4-D	0-10 ft	ug/kg	21	0.520	50.0	6.70	50.0	21	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	2,4-DB	0-1 ft	ug/kg	12	1.15	50.0	5.00	50.0	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4-DB	0-3 ft	ug/kg	14	0.988	50.0	5.00	50.0	14	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4-DB	0-10 ft	ug/kg	21	0.939	50.0	5.00	50.0	21	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	4-Nitrophenol	0-1 ft	ug/kg	1	1.81	1.81	8.18	8.18	1	-	-	-	-	0	0%	Yes	--
Soil	Herbicides	Total	4-Nitrophenol	0-3 ft	ug/kg	3	1.56	1.81	7.04	8.18	3	-	-	-	-	0	0%	Yes	--
Soil	Herbicides	Total	4-Nitrophenol	0-10 ft	ug/kg	10	1.48	1.81	6.70	8.18	10	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dalapon	0-1 ft	ug/kg	12	2.50	50.0	8.18	50.0	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dalapon	0-3 ft	ug/kg	14	2.15	50.0	7.04	50.0	14	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dalapon	0-10 ft	ug/kg	21	2.04	50.0	6.70	50.0	21	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	Dicamba	0-1 ft	ug/kg	12	1.99	50.0	2.10	50.0	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dicamba	0-3 ft	ug/kg	14	1.71	50.0	2.10	50.0	14	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dicamba	0-10 ft	ug/kg	21	1.63	50.0	2.10	50.0	21	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	Dichloroprop	0-1 ft	ug/kg	12	0.871	400	8.18	400	10	-	2	170	180	2	17%	No	--
Soil	Herbicides	Total	Dichloroprop	0-3 ft	ug/kg	14	0.750	400	7.04	400	12	-	2	170	180	2	14%	No	--
Soil	Herbicides	Total	Dichloroprop	0-10 ft	ug/kg	21	0.713	400	6.70	400	19	-	2	170	180	2	10%	No	Yes
Soil	Herbicides	Total	Dinoseb	0-1 ft	ug/kg	12	0.675	50.0	8.18	50.0	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dinoseb	0-3 ft	ug/kg	14	0.581	50.0	7.04	50.0	14	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dinoseb	0-10 ft	ug/kg	21	0.552	50.0	6.70	50.0	21	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	MCPA	0-1 ft	ug/kg	12	1.23	25,000	8.18	25,000	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	MCPA	0-3 ft	ug/kg	14	1.06	25,000	7.04	25,000	14	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	MCPA	0-10 ft	ug/kg	21	1.01	25,000	6.70	25,000	21	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	MCPP	0-1 ft	ug/kg	12	2.24	38,000	8.18	38,000	10	-	2	9,500	14,000	2	17%	No	--
Soil	Herbicides	Total	MCPP	0-3 ft	ug/kg	14	1.93	38,000	7.04	38,000	12	-	2	9,500	14,000	2	14%	No	--
Soil	Herbicides	Total	MCPP	0-10 ft	ug/kg	21	1.83	38,000	6.70	38,000	19	-	2	9,500	14,000	2	10%	No	Yes
Soil	Herbicides	Total	Pentachlorophenol	0-1 ft	ug/kg	1	0.955	0.955	8.18	8.18	1	-	-	-	-	0	0%	Yes	--
Soil	Herbicides	Total	Pentachlorophenol	0-3 ft	ug/kg	3	0.822	0.955	7.04	8.18	3	-	-	-	-	0	0%	Yes	--
Soil	Herbicides	Total	Pentachlorophenol	0-10 ft	ug/kg	10	0.781	0.955	6.70	8.18	10	-	-	-	-	0	0%	No	--
Soil	Pesticides	Total	4,4'-DDD	0-1 ft	ug/kg	21	1.00	25.0	1.00	25.0	21	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	4,4'-DDD	0-3 ft	ug/kg	23	1.00	25.0	1.00	25.0	23	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	4,4'-DDD	0-10 ft	ug/kg	30	0.214	25.0	1.00	25.0	30	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	4,4'-DDE	0-1 ft	ug/kg	21	1.00	9.40	1.00	9.40	20	-	1	17.0	17.0	1	5%	No	No
Soil	Pesticides	Total	4,4'-DDE	0-3 ft	ug/kg	23	1.00	9.40	1.00	9.40	22	-	1	17.0	17.0	1	4%	No	No
Soil	Pesticides	Total	4,4'-DDE	0-10 ft	ug/kg	30	0.253	9.40	1.00	9.40	29	-	1	17.0	17.0	1	3%	No	No
Soil	Pesticides	Total	4,4'-DDT	0-1 ft	ug/kg	21	1.00	13.0	1.00	13.0	14	-	7	6.40	28.0	7	33%	No	Yes
Soil	Pesticides	Total	4,4'-DDT	0-3 ft	ug/kg	23	1.00	13.0	1.00	13.0	16	-	7	6.40	28.0	7	30%	No	Yes

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(3 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	Pesticides	Total	4,4'-DDT	0-10 ft	ug/kg	30	0.285	13.0	1.00	13.0	23	-	7	6.40	28.0	7	23%	No	Yes
Soil	Pesticides	Total	Aldrin	0-1 ft	ug/kg	21	0.970	1.90	0.970	1.90	21	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Aldrin	0-3 ft	ug/kg	23	0.970	1.90	0.970	1.90	23	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Aldrin	0-10 ft	ug/kg	30	0.474	1.90	0.970	1.90	30	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	BHC (alpha)	0-1 ft	ug/kg	21	0.500	1.90	0.500	1.90	21	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	BHC (alpha)	0-3 ft	ug/kg	23	0.500	1.90	0.500	1.90	22	-	1	2.02	2.02	1	4%	No	No
Soil	Pesticides	Total	BHC (alpha)	0-10 ft	ug/kg	30	0.341	1.90	0.500	1.90	29	-	1	2.02	2.02	1	3%	No	No
Soil	Pesticides	Total	BHC (beta)	0-1 ft	ug/kg	21	0.900	12.0	0.900	12.0	20	-	1	2.60	2.60	1	5%	No	No
Soil	Pesticides	Total	BHC (beta)	0-3 ft	ug/kg	23	0.900	12.0	0.900	12.0	22	-	1	2.60	2.60	1	4%	No	No
Soil	Pesticides	Total	BHC (beta)	0-10 ft	ug/kg	30	0.465	12.0	0.900	12.0	29	-	1	2.60	2.60	1	3%	No	No
Soil	Pesticides	Total	BHC (delta)	0-1 ft	ug/kg	21	0.600	1.90	0.600	1.90	21	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	BHC (delta)	0-3 ft	ug/kg	23	0.600	1.90	0.600	1.90	23	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	BHC (delta)	0-10 ft	ug/kg	30	0.422	1.90	0.600	1.90	30	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	BHC (gamma) Lindane	0-1 ft	ug/kg	21	0.970	1.90	0.970	1.90	21	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	BHC (gamma) Lindane	0-3 ft	ug/kg	23	0.970	1.90	0.970	1.90	23	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	BHC (gamma) Lindane	0-10 ft	ug/kg	30	0.420	1.90	0.970	1.90	30	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Chlordane (alpha)	0-1 ft	ug/kg	20	0.800	19.0	0.800	19.0	19	-	1	4.00	4.00	1	5%	No	No
Soil	Pesticides	Total	Chlordane (alpha)	0-3 ft	ug/kg	20	0.800	19.0	0.800	19.0	19	-	1	4.00	4.00	1	5%	No	No
Soil	Pesticides	Total	Chlordane (alpha)	0-10 ft	ug/kg	20	0.800	19.0	0.800	19.0	19	-	1	4.00	4.00	1	5%	No	No
Soil	Pesticides	Total	Chlordane (gamma)	0-1 ft	ug/kg	20	0.700	14.0	0.700	14.0	20	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Chlordane (gamma)	0-3 ft	ug/kg	20	0.700	14.0	0.700	14.0	20	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Chlordane (gamma)	0-10 ft	ug/kg	20	0.700	14.0	0.700	14.0	20	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Chlordane (technical)	0-1 ft	ug/kg	1	-	-	-	-	0	-	1	1,560	1,560	1	100%	Yes	--
Soil	Pesticides	Total	Chlordane (technical)	0-3 ft	ug/kg	3	-	-	-	-	0	-	3	65.6	1,560	3	100%	Yes	--
Soil	Pesticides	Total	Chlordane (technical)	0-10 ft	ug/kg	10	1.55	11.8	9.94	11.8	4	-	6	49.4	1,560	6	60%	No	--
Soil	Pesticides	Total	Dieldrin	0-1 ft	ug/kg	21	1.90	8.00	1.90	8.00	20	-	1	2.10	2.10	1	5%	No	No
Soil	Pesticides	Total	Dieldrin	0-3 ft	ug/kg	23	1.90	8.00	1.90	8.00	22	-	1	2.10	2.10	1	4%	No	No
Soil	Pesticides	Total	Dieldrin	0-10 ft	ug/kg	30	0.360	8.00	1.90	8.00	29	-	1	2.10	2.10	1	3%	No	No
Soil	Pesticides	Total	Endosulfan I	0-1 ft	ug/kg	21	0.970	3.50	0.970	3.50	21	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Endosulfan I	0-3 ft	ug/kg	23	0.970	3.50	0.970	3.50	23	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Endosulfan I	0-10 ft	ug/kg	30	0.468	3.50	0.970	3.50	30	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Endosulfan II	0-1 ft	ug/kg	21	1.90	4.90	1.90	4.90	20	-	1	8.84	8.84	1	5%	No	No
Soil	Pesticides	Total	Endosulfan II	0-3 ft	ug/kg	23	1.90	4.90	1.90	4.90	22	-	1	8.84	8.84	1	4%	No	No
Soil	Pesticides	Total	Endosulfan II	0-10 ft	ug/kg	30	0.425	4.90	1.90	4.90	29	-	1	8.84	8.84	1	3%	No	No
Soil	Pesticides	Total	Endosulfan Sulfate	0-1 ft	ug/kg	21	1.00	8.00	1.00	8.00	20	-	1	5.97	5.97	1	5%	No	No
Soil	Pesticides	Total	Endosulfan Sulfate	0-3 ft	ug/kg	23	1.00	8.00	1.00	8.00	22	-	1	5.97	5.97	1	4%	No	No
Soil	Pesticides	Total	Endosulfan Sulfate	0-10 ft	ug/kg	30	0.400	8.00	1.00	8.00	29	-	1	5.97	5.97	1	3%	No	No
Soil	Pesticides	Total	Endrin Aldehyde	0-1 ft	ug/kg	21	1.90	13.0	1.90	13.0	21	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Endrin Aldehyde	0-3 ft	ug/kg	23	1.90	13.0	1.90	13.0	23	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Endrin Aldehyde	0-10 ft	ug/kg	30	0.448	13.0	1.90	13.0	30	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Endrin Ketone	0-1 ft	ug/kg	20	1.90	17.0	1.90	17.0	20	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Endrin Ketone	0-3 ft	ug/kg	22	1.90	17.0	1.90	17.0	22	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Endrin Ketone	0-10 ft	ug/kg	29	0.309	17.0	1.90	17.0	29	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Endrin	0-1 ft	ug/kg	21	1.90	10.0	1.90	10.0	21	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Endrin	0-3 ft	ug/kg	23	1.90	10.0	1.90	10.0	23	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Endrin	0-10 ft	ug/kg	30	0.397	10.0	1.90	10.0	30	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-1 ft	ug/kg	21	0.970	7.10	0.970	7.10	20	-	1	14.4	14.4	1	5%	No	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-3 ft	ug/kg	23	0.970	7.10	0.970	7.10	22	-	1	14.4	14.4	1	4%	No	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-10 ft	ug/kg	30	0.401	7.10	0.970	7.10	29	-	1	14.4	14.4	1	3%	No	No
Soil	Pesticides	Total	Heptachlor	0-1 ft	ug/kg	21	0.970	1.90	0.970	1.90	20	-	1	2.83	2.83	1	5%	No	No
Soil	Pesticides	Total	Heptachlor	0-3 ft	ug/kg	23	0.970	1.90	0.970	1.90	21	-	2	2.83	3.07	2	9%	No	Yes
Soil	Pesticides	Total	Heptachlor	0-10 ft	ug/kg	30	0.378	1.90	0.970	1.90	28	-	2	2.83	3.07	2	7%	No	Yes
Soil	Pesticides	Total	Methoxychlor	0-1 ft	ug/kg	21	4.00	19.0	4.00	19.0	21	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Methoxychlor	0-3 ft	ug/kg	23	4.00	19.0	4.00	19.0	23	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Methoxychlor	0-10 ft	ug/kg	30	1.51	19.0	4.00	19.0	30	-	-	-	-	0	0%	No	No

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(4 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	Pesticides	Total	Toxaphene	0-1 ft	ug/kg	21	34.0	190	34.0	190	21	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Toxaphene	0-3 ft	ug/kg	23	34.0	190	34.0	190	23	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Toxaphene	0-10 ft	ug/kg	30	6.89	190	34.0	190	30	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1016	0-1 ft	ug/kg	27	1.25	50.0	3.80	50.0	27	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1016	0-3 ft	ug/kg	29	1.14	50.0	3.80	50.0	29	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1016	0-10 ft	ug/kg	43	1.10	50.0	3.80	50.0	43	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1221	0-1 ft	ug/kg	27	3.80	50.0	3.80	50.0	27	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1221	0-3 ft	ug/kg	29	3.80	50.0	3.80	50.0	29	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1221	0-10 ft	ug/kg	43	3.80	50.0	3.80	50.0	43	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1232	0-1 ft	ug/kg	27	3.80	50.0	3.80	50.0	27	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1232	0-3 ft	ug/kg	29	3.80	50.0	3.80	50.0	29	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1232	0-10 ft	ug/kg	43	3.77	50.0	3.80	50.0	43	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1242	0-1 ft	ug/kg	27	2.28	50.0	3.80	50.0	27	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1242	0-3 ft	ug/kg	29	2.09	50.0	3.80	50.0	29	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1242	0-10 ft	ug/kg	43	2.01	50.0	3.80	50.0	43	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1248	0-1 ft	ug/kg	27	3.80	50.0	3.80	50.0	25	-	2	61.5	968	2	7%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1248	0-3 ft	ug/kg	29	3.80	50.0	3.80	50.0	27	-	2	61.5	968	2	7%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1248	0-10 ft	ug/kg	43	3.80	50.0	3.80	50.0	41	-	2	61.5	968	2	5%	No	No
Soil	PCB Aroclors	Total	Aroclor 1254	0-1 ft	ug/kg	27	1.77	50.0	4.00	50.0	18	-	9	5.50	78.6	9	33%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1254	0-3 ft	ug/kg	29	1.77	50.0	4.00	50.0	18	-	11	5.50	104	11	38%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1254	0-10 ft	ug/kg	43	1.62	50.0	4.00	50.0	27	-	16	5.50	499	16	37%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	ug/kg	27	35.0	50.0	35.0	50.0	5	-	22	12.0	660	22	81%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1260	0-3 ft	ug/kg	29	35.0	50.0	35.0	50.0	5	-	24	12.0	660	24	83%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1260	0-10 ft	ug/kg	43	1.62	50.0	10.4	50.0	7	2	34	2.05	660	36	84%	No	Yes
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	ug/kg	27	105	150	105	150	-	-	-	19.9	996	22	81%	No	Yes
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-3 ft	ug/kg	29	105	150	105	150	-	-	-	19.9	996	24	83%	No	Yes
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-10 ft	ug/kg	43	8.42	150	31.2	150	-	-	-	9.88	996	36	84%	No	Yes
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	mg/kg	18	25.0	25.0	25.0	25.0	1	-	17	17.0	5,100	17	94%	No	--
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-3 ft	mg/kg	20	25.0	25.0	25.0	25.0	1	-	19	17.0	5,100	19	95%	No	Yes
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-10 ft	mg/kg	34	12.3	25.0	25.0	28.9	4	1	29	17.0	9,740	30	88%	No	Yes
Soil	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	mg/kg	18	100	100	100	100	1	-	17	100	23,900	17	94%	No	--
Soil	NWTPH-Dx	Total	Residual Range Organics	0-3 ft	mg/kg	20	100	100	100	100	1	-	19	100	23,900	19	95%	No	Yes
Soil	NWTPH-Dx	Total	Residual Range Organics	0-10 ft	mg/kg	34	25.5	100	51.1	100	2	1	31	31.1	41,900	32	94%	No	Yes
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	mg/kg	13	4.78	20.0	4.78	20.0	10	-	3	214	586	3	23%	No	--
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-3 ft	mg/kg	15	4.31	20.0	4.31	20.0	11	1	3	3.28	586	4	27%	No	--
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-10 ft	mg/kg	22	4.08	20.0	4.02	20.0	16	3	3	2.10	586	6	27%	No	Yes
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	ug/kg	26	13.0	190	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-3 ft	ug/kg	28	11.8	190	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-10 ft	ug/kg	35	11.0	190	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-1 ft	ug/kg	26	16.1	190	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-3 ft	ug/kg	28	14.6	190	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-10 ft	ug/kg	35	13.6	190	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-1 ft	ug/kg	26	20.0	236	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-3 ft	ug/kg	28	19.9	236	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-10 ft	ug/kg	35	18.5	236	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-1 ft	ug/kg	26	20.0	269	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-3 ft	ug/kg	28	20.0	269	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-10 ft	ug/kg	35	20.0	269	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-1 ft	ug/kg	27	28.1	930	49.8	1,680	27	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-3 ft	ug/kg	29	19.5	930	49.8	1,680	29	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-10 ft	ug/kg	36	19.5	930	49.8	1,680	36	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-1 ft	ug/kg	27	20.8	300	49.8	1,680	27	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-3 ft	ug/kg	29	18.9	300	49.8	1,680	29	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-10 ft	ug/kg	36	17.6	300	49.8	1,680	36	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dichlorophenol	0-1 ft	ug/kg	27	17.2	300	49.8	1,680	27	-	-	-	-	0	0%	No	No

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(5 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	SVOCs	Total	2,4-Dichlorophenol	0-3 ft	ug/kg	29	15.6	300	49.8	1,680	29	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dichlorophenol	0-10 ft	ug/kg	36	14.5	300	49.8	1,680	36	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dimethylphenol	0-1 ft	ug/kg	27	17.2	190	20.0	1,680	27	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dimethylphenol	0-3 ft	ug/kg	29	15.6	190	20.0	1,680	29	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dimethylphenol	0-10 ft	ug/kg	36	14.5	190	20.0	1,680	36	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrophenol	0-1 ft	ug/kg	23	37.5	930	200	4,210	23	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrophenol	0-3 ft	ug/kg	25	34.1	930	200	4,210	25	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrophenol	0-10 ft	ug/kg	32	17.1	930	200	4,210	32	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-1 ft	ug/kg	26	20.3	366	98.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-3 ft	ug/kg	28	18.5	366	98.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-10 ft	ug/kg	35	17.2	366	98.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-1 ft	ug/kg	26	28.1	303	98.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-3 ft	ug/kg	28	25.6	303	98.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-10 ft	ug/kg	35	23.8	303	98.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chloronaphthalene	0-1 ft	ug/kg	26	4.68	190	15.6	190	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chloronaphthalene	0-3 ft	ug/kg	28	4.27	190	14.2	190	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chloronaphthalene	0-10 ft	ug/kg	35	3.97	190	13.2	190	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chlorophenol	0-1 ft	ug/kg	27	20.0	252	20.0	1,680	27	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chlorophenol	0-3 ft	ug/kg	29	20.0	252	20.0	1,680	29	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chlorophenol	0-10 ft	ug/kg	36	19.8	252	20.0	1,680	36	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Methylphenol	0-1 ft	ug/kg	27	18.7	202	20.0	1,680	27	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Methylphenol	0-3 ft	ug/kg	29	17.1	202	20.0	1,680	29	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Methylphenol	0-10 ft	ug/kg	36	15.9	202	20.0	1,680	36	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitroaniline	0-1 ft	ug/kg	26	20.3	930	98.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitroaniline	0-3 ft	ug/kg	28	18.5	930	98.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitroaniline	0-10 ft	ug/kg	35	17.1	930	98.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitrophenol	0-1 ft	ug/kg	27	21.9	300	49.8	1,680	27	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitrophenol	0-3 ft	ug/kg	29	19.9	300	49.8	1,680	29	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitrophenol	0-10 ft	ug/kg	36	18.5	300	49.8	1,680	36	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-1 ft	ug/kg	26	17.2	2,490	98.0	2,490	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-3 ft	ug/kg	28	15.6	2,490	98.0	2,490	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-10 ft	ug/kg	35	14.5	2,490	98.0	2,490	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3-Nitroaniline	0-1 ft	ug/kg	26	26.5	930	98.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3-Nitroaniline	0-3 ft	ug/kg	28	24.2	930	98.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3-Nitroaniline	0-10 ft	ug/kg	35	22.5	930	98.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-1 ft	ug/kg	23	57.8	930	200	4,210	23	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-3 ft	ug/kg	25	52.6	930	200	4,210	25	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-10 ft	ug/kg	32	24.6	930	200	4,210	32	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-1 ft	ug/kg	26	20.0	224	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-3 ft	ug/kg	28	18.9	224	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-10 ft	ug/kg	35	17.6	224	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-1 ft	ug/kg	27	17.2	300	49.8	1,680	27	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-3 ft	ug/kg	29	15.6	300	49.8	1,680	29	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-10 ft	ug/kg	36	14.5	300	49.8	1,680	36	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloroaniline	0-1 ft	ug/kg	26	14.5	300	98.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloroaniline	0-3 ft	ug/kg	28	13.2	300	98.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloroaniline	0-10 ft	ug/kg	35	12.3	300	98.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-1 ft	ug/kg	26	20.0	283	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-3 ft	ug/kg	28	20.0	283	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-10 ft	ug/kg	35	20.0	283	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitroaniline	0-1 ft	ug/kg	26	26.5	930	98.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitroaniline	0-3 ft	ug/kg	28	24.2	930	98.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitroaniline	0-10 ft	ug/kg	35	22.5	930	98.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitrophenol	0-1 ft	ug/kg	27	29.7	930	98.0	4,210	27	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitrophenol	0-3 ft	ug/kg	29	27.0	930	98.0	4,210	29	-	-	-	-	0	0%	No	No

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(6 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	SVOCs	Total	4-Nitrophenol	0-10 ft	ug/kg	36	25.1	930	98.0	4,210	36	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Aniline	0-1 ft	ug/kg	17	42.2	454	49.8	1,680	17	-	-	-	-	0	0%	No	--
Soil	SVOCs	Total	Aniline	0-3 ft	ug/kg	19	38.4	454	49.8	1,680	19	-	-	-	-	0	0%	No	--
Soil	SVOCs	Total	Aniline	0-10 ft	ug/kg	26	35.7	454	49.8	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Benzidine	0-1 ft	ug/kg	16	29.5	1,800	390	4,210	16	-	-	-	-	0	0%	No	--
Soil	SVOCs	Total	Benzidine	0-3 ft	ug/kg	18	26.9	1,800	355	4,210	18	-	-	-	-	0	0%	No	--
Soil	SVOCs	Total	Benzidine	0-10 ft	ug/kg	25	25.0	1,800	330	4,210	25	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Benzoic Acid	0-1 ft	ug/kg	23	200	930	200	4,210	16	2	5	20.0	553	7	30%	No	Yes
Soil	SVOCs	Total	Benzoic Acid	0-3 ft	ug/kg	25	200	930	200	4,210	16	4	5	20.0	553	9	36%	No	Yes
Soil	SVOCs	Total	Benzoic Acid	0-10 ft	ug/kg	32	44.9	930	200	4,210	22	5	5	20.0	553	10	31%	No	Yes
Soil	SVOCs	Total	Benzyl Alcohol	0-1 ft	ug/kg	27	20.0	353	20.0	1,680	26	1	-	14.0	14.0	1	4%	No	No
Soil	SVOCs	Total	Benzyl Alcohol	0-3 ft	ug/kg	29	20.0	353	20.0	1,680	28	1	-	14.0	14.0	1	3%	No	No
Soil	SVOCs	Total	Benzyl Alcohol	0-10 ft	ug/kg	36	20.0	353	20.0	1,680	35	1	-	14.0	14.0	1	3%	No	No
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-1 ft	ug/kg	26	18.7	202	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-3 ft	ug/kg	28	17.1	202	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-10 ft	ug/kg	35	15.9	202	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-1 ft	ug/kg	26	20.0	321	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-3 ft	ug/kg	28	20.0	321	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-10 ft	ug/kg	35	20.0	321	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-1 ft	ug/kg	26	20.0	438	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-3 ft	ug/kg	28	20.0	438	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-10 ft	ug/kg	35	20.0	438	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	ug/kg	27	50.0	690	50.0	4,210	3	-	24	92.0	21,000	24	89%	No	Yes
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-3 ft	ug/kg	29	50.0	690	50.0	4,210	3	-	26	92.0	21,000	26	90%	No	Yes
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-10 ft	ug/kg	36	50.0	690	50.0	4,210	3	2	31	92.0	21,000	33	92%	No	Yes
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	ug/kg	26	20.0	320	20.0	1,680	23	2	1	22.0	68.7	3	12%	No	Yes
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-3 ft	ug/kg	28	20.0	320	20.0	1,680	25	2	1	22.0	68.7	3	11%	No	Yes
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-10 ft	ug/kg	35	20.0	320	20.0	1,680	30	3	2	22.0	152	5	14%	No	Yes
Soil	SVOCs	Total	Carbazole	0-1 ft	ug/kg	27	20.0	180	20.0	180	8	3	16	14.0	2,650	19	70%	No	Yes
Soil	SVOCs	Total	Carbazole	0-3 ft	ug/kg	29	20.0	180	20.0	180	8	3	18	14.0	2,840	21	72%	No	Yes
Soil	SVOCs	Total	Carbazole	0-10 ft	ug/kg	36	5.28	180	13.5	180	10	3	23	14.0	2,840	26	72%	No	Yes
Soil	SVOCs	Total	Dibenzofuran	0-1 ft	ug/kg	27	20.0	195	20.0	1,680	16	5	6	20.0	810	11	41%	No	Yes
Soil	SVOCs	Total	Dibenzofuran	0-3 ft	ug/kg	29	20.0	195	20.0	1,680	16	6	7	20.0	810	13	45%	No	Yes
Soil	SVOCs	Total	Dibenzofuran	0-10 ft	ug/kg	36	15.7	195	20.0	1,680	18	9	9	20.0	810	18	50%	No	Yes
Soil	SVOCs	Total	Diethyl Phthalate	0-1 ft	ug/kg	26	20.0	286	20.0	1,680	23	1	2	44.0	73.4	3	12%	No	Yes
Soil	SVOCs	Total	Diethyl Phthalate	0-3 ft	ug/kg	28	20.0	286	20.0	1,680	23	3	2	28.9	73.4	5	18%	No	Yes
Soil	SVOCs	Total	Diethyl Phthalate	0-10 ft	ug/kg	35	20.0	286	20.0	1,680	29	4	2	28.9	73.4	6	17%	No	Yes
Soil	SVOCs	Total	Dimethyl Phthalate	0-1 ft	ug/kg	26	17.2	190	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Dimethyl Phthalate	0-3 ft	ug/kg	28	15.6	190	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Dimethyl Phthalate	0-10 ft	ug/kg	35	14.5	190	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	ug/kg	26	20.0	1,460	20.0	8,420	22	1	3	15.0	1,800	4	15%	No	Yes
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-3 ft	ug/kg	28	20.0	1,460	20.0	8,420	24	1	3	15.0	1,800	4	14%	No	Yes
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-10 ft	ug/kg	35	20.0	1,460	20.0	8,420	31	1	3	15.0	1,800	4	11%	No	Yes
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-1 ft	ug/kg	26	20.0	730	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-3 ft	ug/kg	28	20.0	730	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-10 ft	ug/kg	35	20.0	730	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobenzene	0-1 ft	ug/kg	26	17.2	190	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobenzene	0-3 ft	ug/kg	28	15.6	190	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobenzene	0-10 ft	ug/kg	35	13.4	190	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobutadiene	0-1 ft	ug/kg	26	14.1	190	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobutadiene	0-3 ft	ug/kg	28	12.8	190	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobutadiene	0-10 ft	ug/kg	35	11.9	190	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-1 ft	ug/kg	26	22.0	300	98.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-3 ft	ug/kg	28	20.0	300	98.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-10 ft	ug/kg	35	16.6	300	98.0	1,680	35	-	-	-	-	0	0%	No	No

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(7 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	SVOCs	Total	Hexachloroethane	0-1 ft	ug/kg	26	20.0	320	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachloroethane	0-3 ft	ug/kg	28	20.0	320	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachloroethane	0-10 ft	ug/kg	35	16.4	320	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Isophorone	0-1 ft	ug/kg	26	20.0	236	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Isophorone	0-3 ft	ug/kg	28	19.9	236	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Isophorone	0-10 ft	ug/kg	35	18.5	236	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Nitrobenzene	0-1 ft	ug/kg	26	20.0	231	20.0	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Nitrobenzene	0-3 ft	ug/kg	28	19.5	231	20.0	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Nitrobenzene	0-10 ft	ug/kg	35	18.1	231	20.0	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-1 ft	ug/kg	22	17.2	300	98.0	4,210	22	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-3 ft	ug/kg	24	15.6	300	98.0	4,210	24	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-10 ft	ug/kg	31	10.8	300	98.0	4,210	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-1 ft	ug/kg	26	17.2	300	49.8	1,680	26	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-3 ft	ug/kg	28	15.6	300	49.8	1,680	28	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-10 ft	ug/kg	35	14.5	300	49.8	1,680	35	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-1 ft	ug/kg	23	12.5	190	20.0	1,680	23	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-3 ft	ug/kg	25	11.4	190	20.0	1,680	25	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-10 ft	ug/kg	32	10.6	190	20.0	1,680	32	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	ug/kg	27	20.0	249	20.0	1,680	26	1	-	64.0	64.0	1	4%	No	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-3 ft	ug/kg	29	20.0	249	20.0	1,680	28	1	-	64.0	64.0	1	3%	No	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-10 ft	ug/kg	36	19.6	249	20.0	1,680	35	1	-	64.0	64.0	1	3%	No	No
Soil	SVOCs	Total	Pentachlorophenol	0-1 ft	ug/kg	27	32.8	900	98.0	1,680	25	-	2	72.0	201	2	7%	No	Yes
Soil	SVOCs	Total	Pentachlorophenol	0-3 ft	ug/kg	29	29.9	900	98.0	1,680	27	-	2	72.0	201	2	7%	No	Yes
Soil	SVOCs	Total	Pentachlorophenol	0-10 ft	ug/kg	36	27.8	900	98.0	1,680	34	-	2	72.0	201	2	6%	No	Yes
Soil	SVOCs	Total	Phenol	0-1 ft	ug/kg	27	20.0	337	20.0	1,680	27	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Phenol	0-3 ft	ug/kg	29	20.0	337	20.0	1,680	29	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Phenol	0-10 ft	ug/kg	36	20.0	337	20.0	1,680	36	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Methylnaphthalene	0-1 ft	ug/kg	27	2.45	190	15.7	190	19	1	7	11.0	1,530	8	30%	No	Yes
Soil	SVOCs	Total	2-Methylnaphthalene	0-3 ft	ug/kg	29	2.22	190	14.2	190	20	1	8	11.0	1,530	9	31%	No	Yes
Soil	SVOCs	Total	2-Methylnaphthalene	0-10 ft	ug/kg	36	2.06	190	13.2	190	24	1	11	11.0	1,530	12	33%	No	Yes
Soil	SVOCs	Total	Acenaphthene	0-1 ft	ug/kg	27	20.0	180	20.0	180	8	2	17	15.0	2,600	19	70%	No	Yes
Soil	SVOCs	Total	Acenaphthene	0-3 ft	ug/kg	33	20.0	180	20.0	180	8	2	23	15.0	2,600	25	76%	No	Yes
Soil	SVOCs	Total	Acenaphthene	0-10 ft	ug/kg	44	6.80	180	14.7	1,440	10	2	32	15.0	3,040	34	77%	No	Yes
Soil	SVOCs	Total	Acenaphthylene	0-1 ft	ug/kg	27	20.0	190	20.0	190	20	-	7	3.40	78.1	7	26%	No	Yes
Soil	SVOCs	Total	Acenaphthylene	0-3 ft	ug/kg	33	20.0	190	20.0	190	20	-	13	3.40	111	13	39%	No	Yes
Soil	SVOCs	Total	Acenaphthylene	0-10 ft	ug/kg	44	5.90	190	13.5	190	25	-	19	3.40	111	19	43%	No	Yes
Soil	SVOCs	Total	Anthracene	0-1 ft	ug/kg	27	49.8	180	20.0	180	4	1	22	12.0	2,700	23	85%	No	Yes
Soil	SVOCs	Total	Anthracene	0-3 ft	ug/kg	33	49.8	180	20.0	180	4	1	28	12.0	8,440	29	88%	No	Yes
Soil	SVOCs	Total	Anthracene	0-10 ft	ug/kg	44	3.70	180	14.7	180	5	1	38	12.0	8,440	39	89%	No	Yes
Soil	SVOCs	Total	Fluorene	0-1 ft	ug/kg	27	20.0	180	20.0	180	11	3	13	10.0	1,200	16	59%	No	Yes
Soil	SVOCs	Total	Fluorene	0-3 ft	ug/kg	33	20.0	180	20.0	180	11	3	19	10.0	1,610	22	67%	No	Yes
Soil	SVOCs	Total	Fluorene	0-10 ft	ug/kg	44	6.86	180	14.7	180	12	3	29	10.0	1,610	32	73%	No	Yes
Soil	SVOCs	Total	Naphthalene	0-1 ft	ug/kg	27	20.0	190	20.0	190	16	-	11	5.00	823	11	41%	No	Yes
Soil	SVOCs	Total	Naphthalene	0-3 ft	ug/kg	33	20.0	190	20.0	190	16	-	17	5.00	823	17	52%	No	Yes
Soil	SVOCs	Total	Naphthalene	0-10 ft	ug/kg	44	6.34	190	13.5	190	20	-	24	5.00	1,710	24	55%	No	Yes
Soil	SVOCs	Total	Phenanthrene	0-1 ft	ug/kg	27	49.8	49.8	49.8	49.8	1	-	26	13.0	12,000	26	96%	No	Yes
Soil	SVOCs	Total	Phenanthrene	0-3 ft	ug/kg	33	49.8	49.8	49.8	49.8	1	-	32	13.0	21,900	32	97%	No	Yes
Soil	SVOCs	Total	Phenanthrene	0-10 ft	ug/kg	44	2.93	49.8	49.8	11,400	2	-	42	13.0	21,900	42	95%	No	Yes
Soil	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	27	299	299	299	299	-	-	-	141	18,674	26	96%	No	Yes
Soil	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	ug/kg	33	299	299	299	299	-	-	-	141	34,767	32	97%	No	Yes
Soil	SVOCs	Total	Benzo(a)anthracene	0-1 ft	ug/kg	27	49.8	92.9	49.8	305	2	-	25	29.0	32,000	25	93%	No	Yes
Soil	SVOCs	Total	Benzo(a)anthracene	0-3 ft	ug/kg	33	49.8	92.9	49.8	305	2	-	31	29.0	32,000	31	94%	No	Yes
Soil	SVOCs	Total	Benzo(a)anthracene	0-10 ft	ug/kg	44	49.8	92.9	49.8	305	2	-	42	29.0	32,000	42	95%	No	Yes
Soil	SVOCs	Total	Benzo(a)pyrene	0-1 ft	ug/kg	27	35.5	49.8	49.8	152	2	-	25	28.0	33,000	25	93%	No	Yes
Soil	SVOCs	Total	Benzo(a)pyrene	0-3 ft	ug/kg	33	35.5	49.8	49.8	152	2	-	31	28.0	34,000	31	94%	No	Yes

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(8 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	SVOCs	Total	Benzo(a)pyrene	0-10 ft	ug/kg	44	35.5	49.8	49.8	152	2	-	42	28.0	34,000	42	95%	No	Yes
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	ug/kg	24	49.8	49.8	49.8	49.8	1	-	23	34.0	65,000	23	96%	No	Yes
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-3 ft	ug/kg	28	49.8	49.8	49.8	49.8	1	-	27	34.0	65,000	27	96%	No	Yes
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-10 ft	ug/kg	28	49.8	49.8	49.8	49.8	1	-	27	34.0	65,000	27	96%	No	Yes
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	ug/kg	27	25.1	49.8	49.8	168	3	-	24	20.0	18,000	24	89%	No	Yes
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-3 ft	ug/kg	33	25.1	49.8	49.8	168	3	-	30	20.0	18,000	30	91%	No	Yes
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-10 ft	ug/kg	44	25.1	49.8	49.8	168	3	-	41	20.0	18,000	41	93%	No	Yes
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	ug/kg	24	49.8	49.8	49.8	49.8	1	-	23	40.0	65,000	23	96%	No	Yes
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-3 ft	ug/kg	28	49.8	49.8	49.8	49.8	1	-	27	40.0	65,000	27	96%	No	Yes
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-10 ft	ug/kg	28	49.8	49.8	49.8	49.8	1	-	27	40.0	65,000	27	96%	No	Yes
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-1 ft	ug/kg	3	-	-	-	-	0	-	3	1,080	14,700	3	100%	Yes	--
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-3 ft	ug/kg	5	-	-	-	-	0	-	5	1,080	31,300	5	100%	Yes	--
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-10 ft	ug/kg	16	-	-	-	-	0	-	16	197	31,300	16	100%	No	--
Soil	SVOCs	Total	Chrysene	0-1 ft	ug/kg	27	49.8	49.8	49.8	49.8	1	-	26	62.0	32,000	26	96%	No	Yes
Soil	SVOCs	Total	Chrysene	0-3 ft	ug/kg	33	49.8	49.8	49.8	49.8	1	-	32	62.0	35,300	32	97%	No	Yes
Soil	SVOCs	Total	Chrysene	0-10 ft	ug/kg	44	49.8	49.8	49.8	49.8	1	-	43	62.0	35,300	43	98%	No	Yes
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	ug/kg	27	35.5	1,800	20.0	1,800	5	1	21	18.0	9,900	22	81%	No	Yes
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-3 ft	ug/kg	33	35.5	1,800	20.0	1,800	5	1	27	18.0	9,900	28	85%	No	Yes
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-10 ft	ug/kg	44	3.08	1,800	13.2	1,800	8	1	35	18.0	9,900	36	82%	No	Yes
Soil	SVOCs	Total	Fluoranthene	0-1 ft	ug/kg	27	49.8	71.1	49.8	152	2	-	25	42.0	54,000	25	93%	No	Yes
Soil	SVOCs	Total	Fluoranthene	0-3 ft	ug/kg	33	49.8	71.1	49.8	152	2	-	31	42.0	54,000	31	94%	No	Yes
Soil	SVOCs	Total	Fluoranthene	0-10 ft	ug/kg	44	49.8	71.1	49.8	152	2	-	42	42.0	54,000	42	95%	No	Yes
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	ug/kg	27	35.5	49.8	49.8	168	3	-	24	18.0	19,000	24	89%	No	Yes
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-3 ft	ug/kg	33	35.5	49.8	49.8	168	3	-	30	18.0	20,000	30	91%	No	Yes
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-10 ft	ug/kg	44	35.5	49.8	49.8	168	3	-	41	18.0	20,000	41	93%	No	Yes
Soil	SVOCs	Total	Pyrene	0-1 ft	ug/kg	27	49.8	49.8	49.8	49.8	1	-	26	43.0	40,000	26	96%	No	Yes
Soil	SVOCs	Total	Pyrene	0-3 ft	ug/kg	33	49.8	49.8	49.8	49.8	1	-	32	43.0	67,100	32	97%	No	Yes
Soil	SVOCs	Total	Pyrene	0-10 ft	ug/kg	44	49.8	49.8	49.8	49.8	1	-	43	43.0	67,100	43	98%	No	Yes
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	27	498	498	498	498	-	-	-	334	367,900	26	96%	No	Yes
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	ug/kg	33	498	498	498	498	-	-	-	334	367,900	32	97%	No	Yes
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,2-Trichloroethane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,1,2-Trichloroethane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,2-Trichloroethane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloroethane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,1-Dichloroethane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloroethane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloroethene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,1-Dichloroethene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloroethene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloropropene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,1-Dichloropropene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloropropene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichloropropane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(9 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	VOCs	Total	1,2,3-Trichloropropane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichloropropane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	ug/kg	18	0.218	100	0.437	100	15	-	3	672	14,300	3	17%	No	--
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-3 ft	ug/kg	20	0.212	100	0.424	100	17	-	3	672	14,300	3	15%	No	Yes
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-10 ft	ug/kg	27	0.174	100	0.349	100	23	1	3	0.230	14,300	4	15%	No	Yes
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichlorobenzene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,2-Dichlorobenzene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichlorobenzene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloropropane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,2-Dichloropropane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloropropane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	ug/kg	18	0.218	100	0.437	509	15	2	1	326	5,410	3	17%	No	--
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-3 ft	ug/kg	20	0.212	100	0.424	509	17	2	1	326	5,410	3	15%	No	Yes
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-10 ft	ug/kg	27	0.174	100	0.349	509	24	2	1	326	5,410	3	11%	No	Yes
Soil	VOCs	Total	1,3-Dichlorobenzene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,3-Dichlorobenzene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3-Dichlorobenzene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3-Dichloropropane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,3-Dichloropropane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3-Dichloropropane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	1,4-Dichlorobenzene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,4-Dichlorobenzene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2,2-Dichloropropane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	2,2-Dichloropropane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2,2-Dichloropropane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2-Butanone (MEK)	0-1 ft	ug/kg	18	1.09	11,500	2.18	23,000	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	2-Butanone (MEK)	0-3 ft	ug/kg	20	1.06	11,500	2.12	23,000	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2-Butanone (MEK)	0-10 ft	ug/kg	27	0.872	11,500	1.74	23,000	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2-Chlorotoluene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	2-Chlorotoluene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2-Chlorotoluene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2-Hexanone	0-1 ft	ug/kg	18	1.09	11,500	2.18	23,000	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	2-Hexanone	0-3 ft	ug/kg	20	1.06	11,500	2.12	23,000	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2-Hexanone	0-10 ft	ug/kg	27	0.872	11,500	1.74	23,000	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	4-Chlorotoluene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	4-Chlorotoluene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	4-Chlorotoluene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	4-Isopropyltoluene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	4-Isopropyltoluene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	4-Isopropyltoluene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	26	-	1	0.457	0.457	1	4%	No	No
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	ug/kg	18	1.09	11,500	2.18	23,000	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-3 ft	ug/kg	20	1.06	11,500	2.12	23,000	20	-	-	-	-	0	0%	No	No

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(10 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-10 ft	ug/kg	27	0.872	11,500	1.74	23,000	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Acetone	0-1 ft	ug/kg	18	1.09	11,500	2.18	23,000	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Acetone	0-3 ft	ug/kg	20	1.06	11,500	2.12	23,000	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Acetone	0-10 ft	ug/kg	27	0.872	11,500	1.74	23,000	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Benzene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Benzene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Benzene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromobenzene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Bromobenzene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromobenzene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromochloromethane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Bromochloromethane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromochloromethane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromodichloromethane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Bromodichloromethane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromodichloromethane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromoform	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Bromoform	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromoform	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromomethane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Bromomethane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromomethane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Carbon Disulfide	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Carbon Disulfide	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Carbon Disulfide	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Carbon Tetrachloride	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Carbon Tetrachloride	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Carbon Tetrachloride	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chlorobenzene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Chlorobenzene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chlorobenzene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chloroethane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Chloroethane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chloroethane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chloroform	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Chloroform	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chloroform	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chloromethane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Chloromethane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chloromethane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dibromochloromethane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Dibromochloromethane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dibromochloromethane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dibromomethane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Dibromomethane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dibromomethane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dichlorodifluoromethane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Dichlorodifluoromethane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dichlorodifluoromethane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	26	1	-	0.221	0.221	1	4%	No	No

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(11 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	ug/kg	18	0.218	2,300	0.674	4,600	17	-	1	12.0	12.0	1	6%	No	--
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-3 ft	ug/kg	20	0.212	2,300	0.674	4,600	19	-	1	12.0	12.0	1	5%	No	No
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	26	-	1	12.0	12.0	1	4%	No	No
Soil	VOCs	Total	Ethylbenzene	0-1 ft	ug/kg	18	0.218	255	0.437	4,600	17	1	-	2,700	2,700	1	6%	No	--
Soil	VOCs	Total	Ethylbenzene	0-3 ft	ug/kg	20	0.212	255	0.424	4,600	19	1	-	2,700	2,700	1	5%	No	No
Soil	VOCs	Total	Ethylbenzene	0-10 ft	ug/kg	27	0.174	255	0.349	4,600	25	2	-	0.282	2,700	2	7%	No	Yes
Soil	VOCs	Total	Hexachlorobutadiene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Hexachlorobutadiene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Hexachlorobutadiene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Isopropylbenzene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Isopropylbenzene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Isopropylbenzene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	m,p-Xylenes	0-1 ft	ug/kg	18	0.437	509	0.873	1,020	17	-	1	9,800	9,800	1	6%	No	--
Soil	VOCs	Total	m,p-Xylenes	0-3 ft	ug/kg	20	0.424	509	0.849	1,020	19	-	1	9,800	9,800	1	5%	No	No
Soil	VOCs	Total	m,p-Xylenes	0-10 ft	ug/kg	27	0.242	509	0.698	1,020	25	1	1	0.552	9,800	2	7%	No	Yes
Soil	VOCs	Total	Naphthalene	0-1 ft	ug/kg	18	0.218	100	0.437	100	15	-	3	504	8,360	3	17%	No	--
Soil	VOCs	Total	Naphthalene	0-3 ft	ug/kg	20	0.212	100	0.424	100	17	-	3	504	8,360	3	15%	No	Yes
Soil	VOCs	Total	Naphthalene	0-10 ft	ug/kg	27	0.192	100	0.383	100	24	-	3	504	8,360	3	11%	No	Yes
Soil	VOCs	Total	n-Butylbenzene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	n-Butylbenzene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	n-Butylbenzene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	n-Propylbenzene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	n-Propylbenzene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	n-Propylbenzene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	o-Xylene	0-1 ft	ug/kg	18	0.0590	255	0.437	509	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	o-Xylene	0-3 ft	ug/kg	24	0.0590	255	0.424	509	24	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	o-Xylene	0-10 ft	ug/kg	35	0.0590	255	0.349	4,600	32	2	1	0.368	4,260	3	9%	No	Yes
Soil	VOCs	Total	sec-Butylbenzene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	sec-Butylbenzene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	sec-Butylbenzene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Styrene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Styrene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Styrene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	tert-Butylbenzene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	tert-Butylbenzene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	tert-Butylbenzene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	ug/kg	18	2.10	255	2.10	509	10	2	6	1.07	65.0	8	44%	No	--
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-3 ft	ug/kg	24	2.10	255	2.10	509	10	3	11	0.734	65.0	14	58%	No	Yes
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-10 ft	ug/kg	35	2.10	255	2.10	509	10	3	22	0.605	403,000	25	71%	No	Yes
Soil	VOCs	Total	Toluene	0-1 ft	ug/kg	18	0.218	255	0.437	509	13	4	1	0.350	5.30	5	28%	No	--
Soil	VOCs	Total	Toluene	0-3 ft	ug/kg	24	0.212	255	0.424	509	14	9	1	0.170	5.30	10	42%	No	Yes
Soil	VOCs	Total	Toluene	0-10 ft	ug/kg	35	0.208	255	0.349	509	16	13	6	0.170	133,000	19	54%	No	Yes
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Trichloroethene (TCE)	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Trichloroethene (TCE)	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Trichloroethene (TCE)	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Trichlorofluoromethane	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Trichlorofluoromethane	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Trichlorofluoromethane	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	26	1	-	0.325	0.325	1	4%	No	No
Soil	VOCs	Total	Vinyl Acetate	0-1 ft	ug/kg	17	1.09	11,500	2.18	23,000	17	-	-	-	-	0	0%	No	--

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(12 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	VOCs	Total	Vinyl Acetate	0-3 ft	ug/kg	19	1.06	11,500	2.12	23,000	19	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Vinyl Acetate	0-10 ft	ug/kg	26	0.872	11,500	1.74	23,000	26	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Vinyl Chloride	0-1 ft	ug/kg	18	0.218	2,300	0.437	4,600	18	-	-	-	-	0	0%	No	--
Soil	VOCs	Total	Vinyl Chloride	0-3 ft	ug/kg	20	0.212	2,300	0.424	4,600	20	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Vinyl Chloride	0-10 ft	ug/kg	27	0.174	2,300	0.349	4,600	27	-	-	-	-	0	0%	No	No
MW Soil Subset	Metals	Total	Aluminum	0-1 ft	mg/kg	9	-	-	-	-	0	-	9	10,500	19,100	9	100%	No	--
MW Soil Subset	Metals	Total	Antimony	0-1 ft	mg/kg	9	0.200	0.300	0.200	0.300	9	-	-	-	-	0	0%	No	--
MW Soil Subset	Metals	Total	Arsenic	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	1.98	6.20	10	100%	No	--
MW Soil Subset	Metals	Total	Barium	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	95.1	242	10	100%	No	--
MW Soil Subset	Metals	Total	Beryllium	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	0.300	0.576	10	100%	No	--
MW Soil Subset	Metals	Total	Cadmium	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	0.343	1.70	10	100%	No	--
MW Soil Subset	Metals	Total	Chromium	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	15.6	801	10	100%	No	--
MW Soil Subset	Metals	Total	Cobalt	0-1 ft	mg/kg	9	-	-	-	-	0	-	9	6.40	22.7	9	100%	No	--
MW Soil Subset	Metals	Total	Copper	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	24.4	60.5	10	100%	No	--
MW Soil Subset	Metals	Total	Lead	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	5.34	680	10	100%	No	--
MW Soil Subset	Metals	Total	Manganese	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	263	614	10	100%	No	--
MW Soil Subset	Metals	Total	Mercury	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	0.0700	0.320	10	100%	No	--
MW Soil Subset	Metals	Total	Nickel	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	15.0	570	10	100%	No	--
MW Soil Subset	Metals	Total	Selenium	0-1 ft	mg/kg	10	0.200	0.300	0.200	0.300	8	-	2	0.300	0.848	2	20%	No	--
MW Soil Subset	Metals	Total	Silver	0-1 ft	mg/kg	10	0.200	0.300	0.200	0.300	5	-	5	0.200	0.500	5	50%	No	--
MW Soil Subset	Metals	Total	Thallium	0-1 ft	mg/kg	10	0.200	0.300	0.200	0.300	9	-	1	0.378	0.378	1	10%	No	--
MW Soil Subset	Metals	Total	Vanadium	0-1 ft	mg/kg	9	-	-	-	-	0	-	9	34.8	56.3	9	100%	No	--
MW Soil Subset	Metals	Total	Zinc	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	41.6	221	10	100%	No	--
MW Soil Subset	Herbicides	Total	2,4,5-T	0-1 ft	ug/kg	1	50.0	50.0	50.0	50.0	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	Herbicides	Total	2,4,5-TP (Silvex)	0-1 ft	ug/kg	1	50.0	50.0	50.0	50.0	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	Herbicides	Total	2,4-D	0-1 ft	ug/kg	1	50.0	50.0	50.0	50.0	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	Herbicides	Total	2,4-DB	0-1 ft	ug/kg	1	50.0	50.0	50.0	50.0	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	Herbicides	Total	Dalapon	0-1 ft	ug/kg	1	50.0	50.0	50.0	50.0	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	Herbicides	Total	Dicamba	0-1 ft	ug/kg	1	50.0	50.0	50.0	50.0	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	Herbicides	Total	Dichloroprop	0-1 ft	ug/kg	1	50.0	50.0	50.0	50.0	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	Herbicides	Total	Dinoseb	0-1 ft	ug/kg	1	50.0	50.0	50.0	50.0	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	Herbicides	Total	MCPA	0-1 ft	ug/kg	1	25,000	25,000	25,000	25,000	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	Herbicides	Total	MCPP	0-1 ft	ug/kg	1	25,000	25,000	25,000	25,000	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	Pesticides	Total	4,4'-DDD	0-1 ft	ug/kg	10	1.00	3.80	1.00	3.80	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	4,4'-DDE	0-1 ft	ug/kg	10	1.00	3.80	1.00	3.80	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	4,4'-DDT	0-1 ft	ug/kg	10	1.00	5.00	1.00	5.00	3	-	7	6.40	28.0	7	70%	No	--
MW Soil Subset	Pesticides	Total	Aldrin	0-1 ft	ug/kg	10	0.970	1.90	0.970	1.90	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	BHC (alpha)	0-1 ft	ug/kg	10	0.500	1.90	0.500	1.90	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	BHC (beta)	0-1 ft	ug/kg	10	0.900	12.0	0.900	12.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	BHC (delta)	0-1 ft	ug/kg	10	0.600	1.90	0.600	1.90	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	BHC (gamma) Lindane	0-1 ft	ug/kg	10	0.970	1.90	0.970	1.90	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	Chlordane (alpha)	0-1 ft	ug/kg	10	0.800	5.50	0.800	5.50	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	Chlordane (gamma)	0-1 ft	ug/kg	10	0.700	14.0	0.700	14.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	Dieldrin	0-1 ft	ug/kg	10	1.90	8.00	1.90	8.00	9	-	1	2.10	2.10	1	10%	No	--
MW Soil Subset	Pesticides	Total	Endosulfan I	0-1 ft	ug/kg	10	0.970	1.90	0.970	1.90	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	Endosulfan II	0-1 ft	ug/kg	10	1.90	3.80	1.90	3.80	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	Endosulfan Sulfate	0-1 ft	ug/kg	10	1.00	8.00	1.00	8.00	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	Endrin Aldehyde	0-1 ft	ug/kg	10	1.90	10.0	1.90	10.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	Endrin Ketone	0-1 ft	ug/kg	9	1.90	17.0	1.90	17.0	9	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	Endrin	0-1 ft	ug/kg	10	1.90	10.0	1.90	10.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	Heptachlor Epoxide	0-1 ft	ug/kg	10	0.970	1.90	0.970	1.90	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	Heptachlor	0-1 ft	ug/kg	10	0.970	1.90	0.970	1.90	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	Methoxychlor	0-1 ft	ug/kg	10	4.00	19.0	4.00	19.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	Pesticides	Total	Toxaphene	0-1 ft	ug/kg	10	50.0	190	50.0	190	10	-	-	-	-	0	0%	No	--
MW Soil Subset	PCB Aroclors	Total	Aroclor 1016	0-1 ft	ug/kg	10	3.80	50.0	3.80	50.0	10	-	-	-	-	0	0%	No	--

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
MW Soil Subset	PCB Aroclors	Total	Aroclor 1221	0-1 ft	ug/kg	10	3.80	50.0	3.80	50.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	PCB Aroclors	Total	Aroclor 1232	0-1 ft	ug/kg	10	3.80	50.0	3.80	50.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	PCB Aroclors	Total	Aroclor 1242	0-1 ft	ug/kg	10	3.80	50.0	3.80	50.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	PCB Aroclors	Total	Aroclor 1248	0-1 ft	ug/kg	10	3.80	50.0	3.80	50.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	PCB Aroclors	Total	Aroclor 1254	0-1 ft	ug/kg	10	4.00	50.0	4.00	50.0	3	-	7	5.50	49.0	7	70%	No	--
MW Soil Subset	PCB Aroclors	Total	Aroclor 1260	0-1 ft	ug/kg	10	50.0	50.0	50.0	50.0	1	-	9	12.0	92.0	9	90%	No	--
MW Soil Subset	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	ug/kg	10	150	150	150	150	-	-	-	20.0	127	9	90%	No	--
MW Soil Subset	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	mg/kg	1	25.0	25.0	25.0	25.0	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	mg/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	mg/kg	1	20.0	20.0	20.0	20.0	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	SVOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	1,2-Dichlorobenzene	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	1,3-Dichlorobenzene	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	1,4-Dichlorobenzene	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	2,4,5-Trichlorophenol	0-1 ft	ug/kg	10	49.8	300	49.8	300	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	2,4,6-Trichlorophenol	0-1 ft	ug/kg	10	49.8	300	49.8	300	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	2,4-Dichlorophenol	0-1 ft	ug/kg	10	49.8	300	49.8	300	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	2,4-Dimethylphenol	0-1 ft	ug/kg	10	20.0	99.7	20.0	99.7	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	2,4-Dinitrophenol	0-1 ft	ug/kg	10	200	590	200	590	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	2,4-Dinitrotoluene	0-1 ft	ug/kg	10	98.0	300	98.0	300	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	2,6-Dinitrotoluene	0-1 ft	ug/kg	10	98.0	300	98.0	300	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	2-Chloronaphthalene	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	2-Chlorophenol	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	2-Methylphenol	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	2-Nitroaniline	0-1 ft	ug/kg	10	98.0	300	98.0	300	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	2-Nitrophenol	0-1 ft	ug/kg	10	49.8	300	49.8	300	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	3,3'-Dichlorobenzidine	0-1 ft	ug/kg	10	98.0	2,490	98.0	2,490	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	3-Nitroaniline	0-1 ft	ug/kg	10	98.0	300	98.0	300	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-1 ft	ug/kg	10	200	590	200	590	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	4-Chloro-3-methylphenol	0-1 ft	ug/kg	10	49.8	300	49.8	300	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	4-Chloroaniline	0-1 ft	ug/kg	10	98.0	300	98.0	300	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	4-Nitroaniline	0-1 ft	ug/kg	10	98.0	300	98.0	300	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	4-Nitrophenol	0-1 ft	ug/kg	10	98.0	300	98.0	300	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	Aniline	0-1 ft	ug/kg	1	49.8	49.8	49.8	49.8	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	SVOCs	Total	Benzoic Acid	0-1 ft	ug/kg	10	200	590	200	590	7	2	1	130	300	3	30%	No	--
MW Soil Subset	SVOCs	Total	Benzyl Alcohol	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	9	1	-	14.0	14.0	1	10%	No	--
MW Soil Subset	SVOCs	Total	Bis(2-chloroethoxy)methane	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	Bis(2-chloroethyl) Ether	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	ug/kg	10	50.0	50.0	50.0	50.0	1	-	9	92.0	420	9	90%	No	--
MW Soil Subset	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	Carbazole	0-1 ft	ug/kg	10	20.0	49.8	20.0	49.8	2	3	5	14.0	210	8	80%	No	--
MW Soil Subset	SVOCs	Total	Dibenzofuran	0-1 ft	ug/kg	10	20.0	49.8	20.0	59.0	8	1	1	31.0	36.0	2	20%	No	--
MW Soil Subset	SVOCs	Total	Diethyl Phthalate	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	Dimethyl Phthalate	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	6	1	3	15.0	1,800	4	40%	No	--
MW Soil Subset	SVOCs	Total	Di-n-octyl Phthalate	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	Hexachlorobenzene	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	Hexachlorobutadiene	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	Hexachlorocyclopentadiene	0-1 ft	ug/kg	10	98.0	300	98.0	300	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	Hexachloroethane	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	Isophorone	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	Nitrobenzene	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(14 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
MW Soil Subset	SVOCs	Total	N-Nitrosodimethylamine	0-1 ft	ug/kg	9	98.0	300	98.0	300	9	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	N-Nitrosodi-n-propylamine	0-1 ft	ug/kg	10	49.8	300	49.8	300	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	N-Nitrosodiphenylamine	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	Pentachlorophenol	0-1 ft	ug/kg	10	98.0	300	98.0	300	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	Phenol	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	10	-	-	-	-	0	0%	No	--
MW Soil Subset	SVOCs	Total	2-Methylnaphthalene	0-1 ft	ug/kg	10	20.0	59.0	20.0	59.0	9	1	-	11.0	11.0	1	10%	No	--
MW Soil Subset	SVOCs	Total	Acenaphthene	0-1 ft	ug/kg	14	20.0	49.8	20.0	49.8	3	2	9	15.0	1,160	11	79%	No	--
MW Soil Subset	SVOCs	Total	Acenaphthylene	0-1 ft	ug/kg	14	20.0	59.0	20.0	59.0	10	-	4	3.40	19.0	4	29%	No	--
MW Soil Subset	SVOCs	Total	Anthracene	0-1 ft	ug/kg	14	49.8	49.8	20.0	49.8	1	1	12	15.0	1,070	13	93%	No	--
MW Soil Subset	SVOCs	Total	Fluorene	0-1 ft	ug/kg	14	20.0	49.8	20.0	49.8	4	3	7	10.0	510	10	71%	No	--
MW Soil Subset	SVOCs	Total	Naphthalene	0-1 ft	ug/kg	14	20.0	59.0	20.0	59.0	9	-	5	5.00	79.0	5	36%	No	--
MW Soil Subset	SVOCs	Total	Phenanthrene	0-1 ft	ug/kg	14	49.8	49.8	49.8	49.8	1	-	13	66.0	4,200	13	93%	No	--
MW Soil Subset	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	14	299	299	299	299	-	-	-	141	7,043	13	93%	No	--
MW Soil Subset	SVOCs	Total	Benzo(a)anthracene	0-1 ft	ug/kg	14	49.8	49.8	49.8	49.8	1	-	13	78.0	4,500	13	93%	No	--
MW Soil Subset	SVOCs	Total	Benzo(a)pyrene	0-1 ft	ug/kg	14	49.8	49.8	49.8	49.8	1	-	13	85.0	6,200	13	93%	No	--
MW Soil Subset	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	ug/kg	14	49.8	49.8	49.8	49.8	1	-	13	110	8,200	13	93%	No	--
MW Soil Subset	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	ug/kg	14	49.8	49.8	49.8	49.8	1	-	13	67.0	3,300	13	93%	No	--
MW Soil Subset	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	ug/kg	14	49.8	49.8	49.8	49.8	1	-	13	77.0	2,500	13	93%	No	--
MW Soil Subset	SVOCs	Total	Chrysene	0-1 ft	ug/kg	14	49.8	49.8	49.8	49.8	1	-	13	96.0	5,900	13	93%	No	--
MW Soil Subset	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	ug/kg	14	49.8	49.8	20.0	49.8	1	1	12	18.0	1,000	13	93%	No	--
MW Soil Subset	SVOCs	Total	Fluoranthene	0-1 ft	ug/kg	14	49.8	49.8	49.8	49.8	1	-	13	150	14,000	13	93%	No	--
MW Soil Subset	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	ug/kg	14	49.8	49.8	49.8	49.8	1	-	13	58.0	4,600	13	93%	No	--
MW Soil Subset	SVOCs	Total	Pyrene	0-1 ft	ug/kg	14	49.8	49.8	49.8	49.8	1	-	13	130	9,100	13	93%	No	--
MW Soil Subset	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	14	498	498	498	498	-	-	-	880	55,030	13	93%	No	--
MW Soil Subset	VOCs	Total	1,1,1,2-Tetrachloroethane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,1,2,2-Tetrachloroethane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,1,2-Trichloroethane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,1-Dichloroethane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,1-Dichloroethene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,1-Dichloropropene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,2,3-Trichlorobenzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,2,3-Trichloropropane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,2-Dibromo-3-chloropropane	0-1 ft	ug/kg	1	500	500	500	500	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,2-Dibromoethane (EDB)	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,2-Dichlorobenzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,2-Dichloroethane (EDC)	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,2-Dichloropropane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,3-Dichlorobenzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,3-Dichloropropane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	2,2-Dichloropropane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	2-Butanone (MEK)	0-1 ft	ug/kg	1	1,000	1,000	1,000	1,000	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	2-Chlorotoluene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	2-Hexanone	0-1 ft	ug/kg	1	1,000	1,000	1,000	1,000	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	4-Chlorotoluene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	4-Isopropyltoluene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	ug/kg	1	1,000	1,000	1,000	1,000	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Acetone	0-1 ft	ug/kg	1	1,000	1,000	1,000	1,000	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Benzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Bromobenzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(15 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
MW Soil Subset	VOCs	Total	Bromochloromethane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Bromodichloromethane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Bromoform	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Bromomethane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Carbon Disulfide	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Carbon Tetrachloride	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Chlorobenzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Chloroethane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Chloroform	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Chloromethane	0-1 ft	ug/kg	1	500	500	500	500	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	cis-1,3-Dichloropropene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Dibromochloromethane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Dibromomethane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Dichlorodifluoromethane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	ug/kg	1	1,000	1,000	1,000	1,000	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Ethylbenzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Hexachlorobutadiene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Isopropylbenzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	m,p-Xylenes	0-1 ft	ug/kg	1	200	200	200	200	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Naphthalene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	n-Butylbenzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	n-Propylbenzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	o-Xylene	0-1 ft	ug/kg	5	0.0590	100	4.70	100	5	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	sec-Butylbenzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Styrene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	tert-Butylbenzene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	ug/kg	5	100	100	4.70	100	1	2	2	1.50	9.70	4	80%	Yes	--
MW Soil Subset	VOCs	Total	Toluene	0-1 ft	ug/kg	5	100	100	4.70	100	1	4	-	0.350	1.46	4	80%	Yes	--
MW Soil Subset	VOCs	Total	trans-1,2-Dichloroethene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	trans-1,3-Dichloropropene	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Trichloroethene (TCE)	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Trichlorofluoromethane	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
MW Soil Subset	VOCs	Total	Vinyl Chloride	0-1 ft	ug/kg	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Total	Antimony	N/A	ug/L	19	3.00	50.0	3.00	50.0	11	7	1	0.294	3.89	8	42%	No	--
Groundwater	Metals	Total	Arsenic	N/A	ug/L	53	0.500	5.00	0.500	5.00	10	6	37	0.138	21.3	43	81%	No	Yes
Groundwater	Metals	Total	Barium	N/A	ug/L	19	-	-	-	-	0	-	19	7.15	304	19	100%	No	--
Groundwater	Metals	Total	Beryllium	N/A	ug/L	19	0.0142	5.00	0.500	5.00	12	7	-	0.222	0.435	7	37%	No	--
Groundwater	Metals	Total	Cadmium	N/A	ug/L	19	0.00710	5.00	0.500	5.00	13	3	3	0.0100	5.60	6	32%	No	--
Groundwater	Metals	Total	Chromium	N/A	ug/L	19	1.00	10.0	1.00	10.0	12	-	7	3.36	18.5	7	37%	No	--
Groundwater	Metals	Total	Copper	N/A	ug/L	19	10.0	10.0	10.0	10.0	8	-	11	2.33	201	11	58%	No	--
Groundwater	Metals	Total	Iron	N/A	ug/L	53	33.7	60.6	20.0	60.6	3	2	48	9.40	42,900	50	94%	No	Yes
Groundwater	Metals	Total	Lead	N/A	ug/L	53	0.00600	3.00	0.0200	3.00	21	-	32	0.0400	78.2	32	60%	No	Yes
Groundwater	Metals	Total	Manganese	N/A	ug/L	53	10.0	10.0	5.00	10.0	1	2	50	0.810	5,380	52	98%	No	Yes
Groundwater	Metals	Total	Mercury	N/A	ug/L	24	0.0500	0.200	0.200	0.200	20	2	2	0.0300	0.330	4	17%	No	Yes
Groundwater	Metals	Total	Nickel	N/A	ug/L	19	10.0	10.0	1.00	10.0	8	1	10	0.850	116	11	58%	No	--
Groundwater	Metals	Total	Selenium	N/A	ug/L	19	0.385	5.00	3.00	5.00	12	3	4	0.530	32.9	7	37%	No	--
Groundwater	Metals	Total	Silver	N/A	ug/L	19	0.100	10.0	0.100	10.0	14	1	4	0.0810	0.658	5	26%	No	--
Groundwater	Metals	Total	Thallium	N/A	ug/L	19	5.00	5.00	0.500	5.00	10	9	-	0.115	0.323	9	47%	No	--
Groundwater	Metals	Total	Zinc	N/A	ug/L	19	10.0	10.0	10.0	10.0	4	-	15	4.27	2,660	15	79%	No	--
Groundwater	Metals	Dissolved	Antimony	N/A	ug/L	3	50.0	50.0	50.0	50.0	3	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Arsenic	N/A	ug/L	36	0.500	5.00	0.500	5.00	7	3	26	0.220	19.3	29	81%	No	Yes
Groundwater	Metals	Dissolved	Barium	N/A	ug/L	3	-	-	-	-	0	-	3	21.2	134	3	100%	Yes	--
Groundwater	Metals	Dissolved	Beryllium	N/A	ug/L	3	5.00	5.00	5.00	5.00	3	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Cadmium	N/A	ug/L	3	5.00	5.00	5.00	5.00	3	-	-	-	-	0	0%	Yes	--

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(16 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Groundwater	Metals	Dissolved	Calcium	N/A	ug/L	9	-	-	-	-	0	-	9	9,510	172,000	9	100%	No	--
Groundwater	Metals	Dissolved	Chromium	N/A	ug/L	3	10.0	10.0	10.0	10.0	3	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Copper	N/A	ug/L	3	10.0	10.0	10.0	10.0	3	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Iron	N/A	ug/L	36	4.00	50.0	20.0	50.0	11	6	19	5.80	35,400	25	69%	No	Yes
Groundwater	Metals	Dissolved	Lead	N/A	ug/L	36	0.00600	3.00	0.0200	3.00	20	7	9	0.0120	3.50	16	44%	No	Yes
Groundwater	Metals	Dissolved	Magnesium	N/A	ug/L	9	-	-	-	-	0	-	9	1,210	25,800	9	100%	No	--
Groundwater	Metals	Dissolved	Manganese	N/A	ug/L	36	0.400	0.400	0.400	5.00	2	2	32	0.120	5,540	34	94%	No	Yes
Groundwater	Metals	Dissolved	Mercury	N/A	ug/L	8	0.0300	0.200	0.200	0.200	8	-	-	-	-	0	0%	No	--
Groundwater	Metals	Dissolved	Nickel	N/A	ug/L	3	10.0	10.0	10.0	10.0	2	-	1	18.6	18.6	1	33%	Yes	--
Groundwater	Metals	Dissolved	Potassium	N/A	ug/L	9	-	-	2,000	2,000	0	1	8	808	12,900	9	100%	No	--
Groundwater	Metals	Dissolved	Selenium	N/A	ug/L	3	5.00	5.00	5.00	5.00	3	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Silver	N/A	ug/L	3	10.0	10.0	10.0	10.0	3	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Sodium	N/A	ug/L	9	-	-	-	-	0	-	9	4,040	740,000	9	100%	No	--
Groundwater	Metals	Dissolved	Thallium	N/A	ug/L	3	5.00	5.00	5.00	5.00	3	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Zinc	N/A	ug/L	3	10.0	10.0	10.0	10.0	2	-	1	196	196	1	33%	Yes	--
Groundwater	Butyltins	Total	Dibutyltin	N/A	ug/L	39	0.00111	0.00810	0.00302	0.0500	28	2	9	0.00501	0.447	11	28%	No	Yes
Groundwater	Butyltins	Total	Monobutyltin	N/A	ug/L	39	0.00105	0.0290	0.00302	0.0870	32	1	6	0.00449	0.240	7	18%	No	Yes
Groundwater	Butyltins	Total	Tetrabutyltin	N/A	ug/L	8	0.00110	0.00119	0.00300	0.00325	8	-	-	-	-	0	0%	No	--
Groundwater	Butyltins	Total	Tributyltin	N/A	ug/L	8	0.00156	0.00163	0.00402	0.00419	2	-	6	0.0171	0.0601	6	75%	No	--
Groundwater	Herbicides	Total	2,4,5-T	N/A	ug/L	21	0.0566	0.150	0.100	0.160	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	2,4,5-TP (Silvex)	N/A	ug/L	21	0.0227	0.100	0.0800	0.100	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	2,4-D	N/A	ug/L	21	0.0296	1.00	0.0800	1.00	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	2,4-DB	N/A	ug/L	21	0.0557	1.00	0.160	1.00	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	4-Nitrophenol	N/A	ug/L	8	0.0114	0.0114	0.0800	0.0800	7	-	1	0.840	0.840	1	13%	No	--
Groundwater	Herbicides	Total	Dalapon	N/A	ug/L	21	0.0124	2.00	0.0800	2.00	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	Dicamba	N/A	ug/L	21	0.0221	0.100	0.0800	0.100	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	Dichloroprop	N/A	ug/L	21	0.0114	1.00	0.0800	1.00	20	-	1	1.10	1.10	1	5%	No	No
Groundwater	Herbicides	Total	Dinoseb	N/A	ug/L	21	0.0292	0.500	0.0800	0.500	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	MCPA	N/A	ug/L	21	0.0114	50.0	0.0800	50.0	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	MCPP	N/A	ug/L	21	0.0134	50.0	0.0800	50.0	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	Pentachlorophenol	N/A	ug/L	8	0.0259	0.0259	0.0800	0.0800	7	-	1	0.112	0.112	1	13%	No	--
Groundwater	PCB Aroclors	Total	Aroclor 1016	N/A	ug/L	22	0.00199	1.00	0.00992	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	PCB Aroclors	Total	Aroclor 1221	N/A	ug/L	22	0.00496	1.00	0.0198	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	PCB Aroclors	Total	Aroclor 1232	N/A	ug/L	22	0.00236	1.00	0.00992	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	PCB Aroclors	Total	Aroclor 1242	N/A	ug/L	22	0.00327	1.00	0.00992	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	PCB Aroclors	Total	Aroclor 1248	N/A	ug/L	22	0.00155	1.00	0.00992	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	PCB Aroclors	Total	Aroclor 1254	N/A	ug/L	22	0.00199	1.00	0.00992	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	PCB Aroclors	Total	Aroclor 1260	N/A	ug/L	22	0.00109	1.00	0.00992	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	N/A	ug/L	22	-	-	-	-	-	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	4,4'-DDD	N/A	ug/L	22	0.000458	0.100	0.00195	0.100	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	4,4'-DDE	N/A	ug/L	22	0.000380	0.100	0.00195	0.100	21	-	1	0.00246	0.00246	1	5%	No	No
Groundwater	Pesticides	Total	4,4'-DDT	N/A	ug/L	22	0.000486	0.100	0.00195	0.100	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Aldrin	N/A	ug/L	22	0.000111	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	BHC (alpha)	N/A	ug/L	22	0.000358	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	BHC (beta)	N/A	ug/L	22	0.000415	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	BHC (delta)	N/A	ug/L	22	0.000228	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	BHC (gamma) Lindane	N/A	ug/L	22	0.000700	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Chlordane (alpha)	N/A	ug/L	14	0.0470	0.0500	0.0470	0.0500	14	-	-	-	-	0	0%	No	--
Groundwater	Pesticides	Total	Chlordane (gamma)	N/A	ug/L	14	0.0470	0.0500	0.0470	0.0500	14	-	-	-	-	0	0%	No	--
Groundwater	Pesticides	Total	Chlordane (technical)	N/A	ug/L	8	0.00312	0.0114	0.00973	0.0137	8	-	-	-	-	0	0%	No	--
Groundwater	Pesticides	Total	Dieldrin	N/A	ug/L	22	0.000294	0.100	0.00195	0.100	21	1	-	0.000982	0.000982	1	5%	No	No
Groundwater	Pesticides	Total	Endosulfan I	N/A	ug/L	22	0.000485	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Endosulfan II	N/A	ug/L	22	0.000368	0.100	0.00195	0.100	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Endosulfan Sulfate	N/A	ug/L	22	0.000523	0.100	0.00195	0.100	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Endrin Aldehyde	N/A	ug/L	22	0.000947	0.100	0.00195	0.100	22	-	-	-	-	0	0%	No	No

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(17 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Groundwater	Pesticides	Total	Endrin Ketone	N/A	ug/L	22	0.000335	0.100	0.00195	0.100	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Endrin	N/A	ug/L	22	0.000301	0.100	0.00195	0.100	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Heptachlor Epoxide	N/A	ug/L	22	0.000364	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Heptachlor	N/A	ug/L	22	0.000733	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Methoxychlor	N/A	ug/L	22	0.000522	0.500	0.00973	0.500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Toxaphene	N/A	ug/L	22	0.0113	1.00	0.0973	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	NWTPH-Dx	Total	Diesel Range Organics	N/A	ug/L	55	12.0	250	100	250	18	11	26	13.0	1,800	37	67%	No	Yes
Groundwater	NWTPH-Dx	Total	Residual Range Organics	N/A	ug/L	55	21.0	750	100	750	28	7	20	51.0	1,900	27	49%	No	Yes
Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	ug/L	57	13.0	100	100	250	40	14	3	13.0	430	17	30%	No	Yes
Groundwater	SVOCs	Total	1,2,4-Trichlorobenzene	N/A	ug/L	23	0.0100	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	1,2-Dichlorobenzene	N/A	ug/L	23	0.0160	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	1,3-Dichlorobenzene	N/A	ug/L	23	0.0170	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	54	0.0150	10.0	0.0999	10.0	52	2	-	0.0258	0.0601	2	4%	No	No
Groundwater	SVOCs	Total	2,4,5-Trichlorophenol	N/A	ug/L	23	0.0110	48.0	0.0999	48.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2,4,6-Trichlorophenol	N/A	ug/L	23	0.0120	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2,4-Dichlorophenol	N/A	ug/L	23	0.0150	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2,4-Dimethylphenol	N/A	ug/L	23	0.0150	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2,4-Dinitrophenol	N/A	ug/L	23	0.0300	48.0	0.500	48.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2,4-Dinitrotoluene	N/A	ug/L	23	0.0130	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2,6-Dinitrotoluene	N/A	ug/L	23	0.0200	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2-Chloronaphthalene	N/A	ug/L	23	0.00150	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2-Chlorophenol	N/A	ug/L	23	0.0170	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2-Methylnaphthalene	N/A	ug/L	23	0.0150	10.0	0.0999	10.0	19	4	-	0.0385	0.360	4	17%	No	Yes
Groundwater	SVOCs	Total	2-Methylphenol	N/A	ug/L	23	0.0240	10.0	0.0999	10.0	22	-	1	76.0	76.0	1	4%	No	No
Groundwater	SVOCs	Total	2-Nitroaniline	N/A	ug/L	23	0.0180	48.0	0.0999	48.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2-Nitrophenol	N/A	ug/L	23	0.0220	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	3,3'-Dichlorobenzidine	N/A	ug/L	23	0.0360	19.0	0.0999	19.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	3-Nitroaniline	N/A	ug/L	23	0.0330	48.0	0.0999	48.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	4,6-Dinitro-2-methylphenol	N/A	ug/L	23	0.0220	48.0	0.500	48.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	4-Bromophenyl Phenyl Ether	N/A	ug/L	23	0.0120	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	4-Chloro-3-methylphenol	N/A	ug/L	23	0.0539	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	4-Chloroaniline	N/A	ug/L	23	0.0390	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	4-Chlorophenyl Phenyl Ether	N/A	ug/L	23	0.0150	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	4-Nitroaniline	N/A	ug/L	23	0.0210	48.0	0.0999	48.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	4-Nitrophenol	N/A	ug/L	53	0.0290	48.0	0.500	48.0	53	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Acenaphthene	N/A	ug/L	23	0.00160	10.0	0.00999	10.0	21	-	2	0.111	0.239	2	9%	No	Yes
Groundwater	SVOCs	Total	Acenaphthylene	N/A	ug/L	23	0.00150	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Aniline	N/A	ug/L	23	0.0000616	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Anthracene	N/A	ug/L	23	0.00150	10.0	0.00999	10.0	22	-	1	0.0589	0.0589	1	4%	No	No
Groundwater	SVOCs	Total	Benzidine	N/A	ug/L	23	0.0240	100	0.500	100	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Benzo(a)anthracene	N/A	ug/L	23	0.00426	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Benzo(a)pyrene	N/A	ug/L	23	0.00470	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Benzo(b)fluoranthene	N/A	ug/L	14	9.40	10.0	9.40	10.0	14	-	-	-	-	0	0%	No	--
Groundwater	SVOCs	Total	Benzo(g,h,i)perylene	N/A	ug/L	23	0.00340	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Benzo(k)fluoranthene	N/A	ug/L	14	9.40	10.0	9.40	10.0	14	-	-	-	-	0	0%	No	--
Groundwater	SVOCs	Total	Benzofluoranthenes, Total	N/A	ug/L	9	0.00380	0.0540	0.0200	0.284	9	-	-	-	-	0	0%	No	--
Groundwater	SVOCs	Total	Benzoic Acid	N/A	ug/L	23	0.0200	48.0	0.500	48.0	22	-	1	11.0	11.0	1	4%	No	No
Groundwater	SVOCs	Total	Benzyl Alcohol	N/A	ug/L	23	0.0320	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Bis(2-chloroethoxy)methane	N/A	ug/L	23	0.0180	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Bis(2-chloroethyl) Ether	N/A	ug/L	23	0.0190	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Bis(2-chloroisopropyl) Ether	N/A	ug/L	23	0.0210	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	ug/L	23	0.0649	48.0	0.0999	48.0	19	-	4	1.79	19.0	4	17%	No	Yes
Groundwater	SVOCs	Total	Butyl Benzyl Phthalate	N/A	ug/L	23	0.187	10.0	0.500	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Carbazole	N/A	ug/L	23	0.00280	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Chrysene	N/A	ug/L	23	0.00250	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(18 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Groundwater	SVOCs	Total	Dibenz(a,h)anthracene	N/A	ug/L	23	0.00270	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Dibenzofuran	N/A	ug/L	23	0.0140	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Diethyl Phthalate	N/A	ug/L	23	0.0579	10.0	0.0999	10.0	20	1	2	0.192	1.90	3	13%	No	Yes
Groundwater	SVOCs	Total	Dimethyl Phthalate	N/A	ug/L	23	0.0160	10.0	0.100	10.0	22	-	1	0.235	0.235	1	4%	No	No
Groundwater	SVOCs	Total	Di-n-butyl Phthalate	N/A	ug/L	23	0.231	10.0	0.500	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Di-n-octyl Phthalate	N/A	ug/L	23	0.0340	10.0	0.0999	10.0	20	-	3	2.85	7.08	3	13%	No	Yes
Groundwater	SVOCs	Total	Fluoranthene	N/A	ug/L	23	0.00190	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Fluorene	N/A	ug/L	23	0.00140	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Hexachlorobenzene	N/A	ug/L	23	0.0200	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Hexachlorobutadiene	N/A	ug/L	23	0.0290	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Hexachlorocyclopentadiene	N/A	ug/L	23	0.0260	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Hexachloroethane	N/A	ug/L	23	0.0400	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Indeno(1,2,3-cd)pyrene	N/A	ug/L	23	0.00300	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Isophorone	N/A	ug/L	23	0.0180	10.0	0.0999	10.0	21	1	1	0.116	0.282	2	9%	No	Yes
Groundwater	SVOCs	Total	Naphthalene	N/A	ug/L	23	0.00220	10.0	0.00999	10.0	20	-	3	0.0400	0.157	3	13%	No	Yes
Groundwater	SVOCs	Total	Nitrobenzene	N/A	ug/L	23	0.0450	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	N-Nitrosodimethylamine	N/A	ug/L	23	0.00330	10.0	0.500	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	N-Nitrosodi-n-propylamine	N/A	ug/L	23	0.0210	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	N-Nitrosodiphenylamine	N/A	ug/L	23	0.00999	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	p-cresol (4-Methylphenol)	N/A	ug/L	23	0.0230	10.0	0.0999	10.0	22	-	1	29.0	29.0	1	4%	No	No
Groundwater	SVOCs	Total	Pentachlorophenol	N/A	ug/L	23	0.0170	25.0	0.0999	25.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Phenanthrene	N/A	ug/L	54	0.00220	10.0	0.00999	10.0	49	-	5	0.0800	3.90	5	9%	No	Yes
Groundwater	SVOCs	Total	Phenol	N/A	ug/L	54	0.0320	10.0	0.0999	10.0	53	1	-	0.382	0.382	1	2%	No	No
Groundwater	SVOCs	Total	Pyrene	N/A	ug/L	23	0.00140	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,1,1,2-Tetrachloroethane	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,1,2-Trichloroethane	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,1-Dichloroethane	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,1-Dichloroethene	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,1-Dichloropropene	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2,3-Trichlorobenzene	N/A	ug/L	22	0.500	5.00	1.00	5.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2,3-Trichloropropane	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2,4-Trichlorobenzene	N/A	ug/L	22	0.500	5.00	1.00	5.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2,4-Trimethylbenzene	N/A	ug/L	22	0.500	1.00	1.00	1.00	20	-	2	1.00	5.20	2	9%	No	Yes
Groundwater	VOCs	Total	1,2-Dibromo-3-chloropropane	N/A	ug/L	22	0.500	3.00	1.00	3.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2-Dichlorobenzene	N/A	ug/L	22	0.500	2.00	1.00	2.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2-Dichloropropane	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,3,5-Trimethylbenzene	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,3-Dichlorobenzene	N/A	ug/L	22	0.500	2.00	1.00	2.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,3-Dichloropropane	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	22	0.500	2.00	1.00	2.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	2,2-Dichloropropane	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	2-Butanone (MEK)	N/A	ug/L	14	2.50	10.0	5.00	10.0	14	-	-	-	-	0	0%	No	--
Groundwater	VOCs	Total	2-Chloroethylvinylether	N/A	ug/L	13	10.0	10.0	10.0	10.0	13	-	-	-	-	0	0%	No	--
Groundwater	VOCs	Total	2-Chlorotoluene	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	2-Hexanone	N/A	ug/L	22	2.50	10.0	5.00	10.0	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	4-Chlorotoluene	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	4-Isopropyltoluene	N/A	ug/L	22	0.500	2.00	1.00	2.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	ug/L	22	2.50	10.0	5.00	10.0	21	1	-	3.04	3.04	1	5%	No	No
Groundwater	VOCs	Total	Acetone	N/A	ug/L	22	2.50	10.0	5.00	10.0	18	-	4	8.39	15.4	4	18%	No	Yes
Groundwater	VOCs	Total	Benzene	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Bromobenzene	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(19 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Groundwater	VOCs	Total	Bromochloromethane	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Bromodichloromethane	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Bromoform	N/A	ug/L	22	0.500	3.00	1.00	3.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Bromomethane	N/A	ug/L	22	1.00	1.00	1.00	2.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Carbon Disulfide	N/A	ug/L	22	0.500	10.0	1.00	10.0	21	-	1	3.95	3.95	1	5%	No	No
Groundwater	VOCs	Total	Carbon Tetrachloride	N/A	ug/L	22	0.500	1.00	1.00	1.00	21	-	1	1.40	1.40	1	5%	No	No
Groundwater	VOCs	Total	Chlorobenzene	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Chloroethane	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Chloroform	N/A	ug/L	56	0.0820	1.00	0.500	1.00	48	4	4	0.100	3.70	8	14%	No	Yes
Groundwater	VOCs	Total	Chloromethane	N/A	ug/L	22	0.500	5.00	1.00	5.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	ug/L	22	0.500	1.00	1.00	1.00	21	1	-	0.791	0.791	1	5%	No	No
Groundwater	VOCs	Total	cis-1,3-Dichloropropene	N/A	ug/L	22	0.500	3.00	1.00	3.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Dibromochloromethane	N/A	ug/L	22	0.500	2.00	1.00	2.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Dibromomethane	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Dichlorodifluoromethane	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	ug/L	22	0.500	5.00	1.00	5.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Ethylbenzene	N/A	ug/L	22	0.500	1.00	1.00	1.00	21	-	1	1.00	1.00	1	5%	No	No
Groundwater	VOCs	Total	Hexachlorobutadiene	N/A	ug/L	22	0.500	3.00	1.00	3.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Isopropylbenzene	N/A	ug/L	22	0.500	1.00	1.00	1.00	20	-	2	3.20	4.60	2	9%	No	Yes
Groundwater	VOCs	Total	m,p-Xylenes	N/A	ug/L	22	1.00	1.00	1.00	2.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Naphthalene	N/A	ug/L	22	0.500	5.00	1.00	5.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	n-Butylbenzene	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	n-Propylbenzene	N/A	ug/L	22	0.500	1.00	1.00	1.00	20	-	2	1.20	2.00	2	9%	No	Yes
Groundwater	VOCs	Total	o-Xylene	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	sec-Butylbenzene	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Styrene	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	tert-Butylbenzene	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	56	0.0970	1.00	0.500	1.00	43	2	11	0.230	8.78	13	23%	No	Yes
Groundwater	VOCs	Total	Toluene	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	trans-1,2-Dichloroethene	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	trans-1,3-Dichloropropene	N/A	ug/L	22	0.500	3.00	1.00	3.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Trichloroethene (TCE)	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Trichlorofluoromethane	N/A	ug/L	22	0.500	1.00	1.00	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Vinyl Acetate	N/A	ug/L	22	2.50	10.0	5.00	10.0	22	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Vinyl Chloride	N/A	ug/L	56	0.0440	1.00	0.500	1.00	40	13	3	0.160	0.955	16	29%	No	Yes
Seep Water	Metals	Total	Antimony	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	Metals	Total	Arsenic	N/A	ug/L	5	1.01	1.01	1.01	1.01	1	-	4	0.500	12.8	4	80%	Yes	--
Seep Water	Metals	Total	Barium	N/A	ug/L	1	-	-	-	-	0	-	1	74.2	74.2	1	100%	Yes	--
Seep Water	Metals	Total	Beryllium	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	Metals	Total	Cadmium	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	Metals	Total	Chromium	N/A	ug/L	1	-	-	-	-	0	-	1	1.05	1.05	1	100%	Yes	--
Seep Water	Metals	Total	Copper	N/A	ug/L	1	-	-	-	-	0	-	1	2.72	2.72	1	100%	Yes	--
Seep Water	Metals	Total	Iron	N/A	ug/L	5	-	-	-	-	0	-	5	271	121,000	5	100%	Yes	--
Seep Water	Metals	Total	Lead	N/A	ug/L	5	1.00	1.00	1.00	1.00	1	-	4	0.113	25.7	4	80%	Yes	--
Seep Water	Metals	Total	Manganese	N/A	ug/L	5	-	-	-	-	0	-	5	8.90	3,240	5	100%	Yes	--
Seep Water	Metals	Total	Mercury	N/A	ug/L	2	1.00	1.00	0.200	1.00	1	1	-	0.0300	0.0300	1	50%	Yes	--
Seep Water	Metals	Total	Nickel	N/A	ug/L	1	-	-	-	-	0	-	1	2.32	2.32	1	100%	Yes	--
Seep Water	Metals	Total	Selenium	N/A	ug/L	1	-	-	-	-	0	-	1	1.11	1.11	1	100%	Yes	--
Seep Water	Metals	Total	Silver	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	Metals	Total	Thallium	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	Metals	Total	Zinc	N/A	ug/L	1	10.0	10.0	10.0	10.0	1	-	-	-	-	0	0%	Yes	--
Seep Water	Metals	Dissolved	Antimony	N/A	ug/L	1	-	-	-	-	0	-	1	2.28	2.28	1	100%	Yes	--
Seep Water	Metals	Dissolved	Arsenic	N/A	ug/L	5	0.520	1.00	0.520	1.00	2	-	3	0.500	1.00	3	60%	Yes	--
Seep Water	Metals	Dissolved	Barium	N/A	ug/L	1	-	-	-	-	0	-	1	277	277	1	100%	Yes	--
Seep Water	Metals	Dissolved	Beryllium	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(20 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Seep Water	Metals	Dissolved	Cadmium	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	Metals	Dissolved	Calcium	N/A	ug/L	2	-	-	-	-	0	-	2	22,600	76,400	2	100%	Yes	--
Seep Water	Metals	Dissolved	Chromium	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	Metals	Dissolved	Copper	N/A	ug/L	1	-	-	-	-	0	-	1	1.09	1.09	1	100%	Yes	--
Seep Water	Metals	Dissolved	Iron	N/A	ug/L	5	20.0	20.0	20.0	20.0	2	2	1	9.70	3,210	3	60%	Yes	--
Seep Water	Metals	Dissolved	Lead	N/A	ug/L	5	0.0300	1.00	0.0300	1.00	2	2	1	0.00800	0.0650	3	60%	Yes	--
Seep Water	Metals	Dissolved	Magnesium	N/A	ug/L	2	-	-	-	-	0	-	2	5,070	16,600	2	100%	Yes	--
Seep Water	Metals	Dissolved	Manganese	N/A	ug/L	5	0.140	0.160	0.140	0.160	2	-	3	1.99	1,480	3	60%	Yes	--
Seep Water	Metals	Dissolved	Mercury	N/A	ug/L	2	0.0300	1.00	0.200	1.00	2	-	-	-	-	0	0%	Yes	--
Seep Water	Metals	Dissolved	Nickel	N/A	ug/L	1	-	-	-	-	0	-	1	2.22	2.22	1	100%	Yes	--
Seep Water	Metals	Dissolved	Potassium	N/A	ug/L	2	-	-	2,000	2,000	0	1	1	771	4,160	2	100%	Yes	--
Seep Water	Metals	Dissolved	Selenium	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	Metals	Dissolved	Silver	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	Metals	Dissolved	Sodium	N/A	ug/L	2	-	-	-	-	0	-	2	6,680	19,700	2	100%	Yes	--
Seep Water	Metals	Dissolved	Thallium	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	Metals	Dissolved	Zinc	N/A	ug/L	1	-	-	-	-	0	-	1	85.6	85.6	1	100%	Yes	--
Seep Water	Butyltins	Total	Dibutyltin	N/A	ug/L	4	0.00730	0.00810	0.0500	0.0500	4	-	-	-	-	0	0%	Yes	--
Seep Water	Butyltins	Total	Monobutyltin	N/A	ug/L	4	0.0110	0.0290	0.0500	0.0870	4	-	-	-	-	0	0%	Yes	--
Seep Water	Herbicides	Total	2,4,5-T	N/A	ug/L	1	0.400	0.400	0.400	0.400	1	-	-	-	-	0	0%	Yes	--
Seep Water	Herbicides	Total	2,4,5-TP (Silvex)	N/A	ug/L	1	0.400	0.400	0.400	0.400	1	-	-	-	-	0	0%	Yes	--
Seep Water	Herbicides	Total	2,4-D	N/A	ug/L	1	0.400	0.400	0.400	0.400	1	-	-	-	-	0	0%	Yes	--
Seep Water	Herbicides	Total	2,4-DB	N/A	ug/L	1	0.400	0.400	0.400	0.400	1	-	-	-	-	0	0%	Yes	--
Seep Water	Herbicides	Total	Dalapon	N/A	ug/L	1	0.400	0.400	0.400	0.400	1	-	-	-	-	0	0%	Yes	--
Seep Water	Herbicides	Total	Dicamba	N/A	ug/L	1	0.400	0.400	0.400	0.400	1	-	-	-	-	0	0%	Yes	--
Seep Water	Herbicides	Total	Dichloroprop	N/A	ug/L	1	0.400	0.400	0.400	0.400	1	-	-	-	-	0	0%	Yes	--
Seep Water	Herbicides	Total	Dinoseb	N/A	ug/L	1	0.400	0.400	0.400	0.400	1	-	-	-	-	0	0%	Yes	--
Seep Water	Herbicides	Total	MCPA	N/A	ug/L	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
Seep Water	Herbicides	Total	MCPP	N/A	ug/L	1	100	100	100	100	1	-	-	-	-	0	0%	Yes	--
Seep Water	PCB Aroclors	Total	Aroclor 1016	N/A	ug/L	1	0.100	0.100	0.100	0.100	1	-	-	-	-	0	0%	Yes	--
Seep Water	PCB Aroclors	Total	Aroclor 1221	N/A	ug/L	1	0.100	0.100	0.100	0.100	1	-	-	-	-	0	0%	Yes	--
Seep Water	PCB Aroclors	Total	Aroclor 1232	N/A	ug/L	1	0.100	0.100	0.100	0.100	1	-	-	-	-	0	0%	Yes	--
Seep Water	PCB Aroclors	Total	Aroclor 1242	N/A	ug/L	1	0.100	0.100	0.100	0.100	1	-	-	-	-	0	0%	Yes	--
Seep Water	PCB Aroclors	Total	Aroclor 1248	N/A	ug/L	1	0.100	0.100	0.100	0.100	1	-	-	-	-	0	0%	Yes	--
Seep Water	PCB Aroclors	Total	Aroclor 1254	N/A	ug/L	1	0.100	0.100	0.100	0.100	1	-	-	-	-	0	0%	Yes	--
Seep Water	PCB Aroclors	Total	Aroclor 1260	N/A	ug/L	1	0.100	0.100	0.100	0.100	1	-	-	-	-	0	0%	Yes	--
Seep Water	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	N/A	ug/L	1	-	-	-	-	-	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	4,4'-DDD	N/A	ug/L	1	0.0400	0.0400	0.0400	0.0400	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	4,4'-DDE	N/A	ug/L	1	0.0300	0.0300	0.0300	0.0300	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	4,4'-DDT	N/A	ug/L	1	0.0900	0.0900	0.0900	0.0900	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	Aldrin	N/A	ug/L	1	0.0400	0.0400	0.0400	0.0400	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	BHC (alpha)	N/A	ug/L	1	0.0200	0.0200	0.0200	0.0200	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	BHC (beta)	N/A	ug/L	1	0.100	0.100	0.100	0.100	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	BHC (delta)	N/A	ug/L	1	0.0500	0.0500	0.0500	0.0500	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	BHC (gamma) Lindane	N/A	ug/L	1	0.0300	0.0300	0.0300	0.0300	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	Chlordane (alpha)	N/A	ug/L	1	0.0500	0.0500	0.0500	0.0500	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	Chlordane (gamma)	N/A	ug/L	1	0.0200	0.0200	0.0200	0.0200	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	Dieldrin	N/A	ug/L	1	0.0700	0.0700	0.0700	0.0700	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	Endosulfan I	N/A	ug/L	1	0.0300	0.0300	0.0300	0.0300	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	Endosulfan II	N/A	ug/L	1	0.0500	0.0500	0.0500	0.0500	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	Endosulfan Sulfate	N/A	ug/L	1	0.0700	0.0700	0.0700	0.0700	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	Endrin Aldehyde	N/A	ug/L	1	0.100	0.100	0.100	0.100	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	Endrin	N/A	ug/L	1	0.0800	0.0800	0.0800	0.0800	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	Heptachlor Epoxide	N/A	ug/L	1	0.0300	0.0300	0.0300	0.0300	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	Heptachlor	N/A	ug/L	1	0.0300	0.0300	0.0300	0.0300	1	-	-	-	-	0	0%	Yes	--
Seep Water	Pesticides	Total	Methoxychlor	N/A	ug/L	1	0.500	0.500	0.500	0.500	1	-	-	-	-	0	0%	Yes	--

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(21 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Seep Water	Pesticides	Total	Toxaphene	N/A	ug/L	1	1.50	1.50	1.50	1.50	1	-	-	-	-	0	0%	Yes	--
Seep Water	NWTPH-Dx	Total	Diesel Range Organics	N/A	ug/L	5	13.0	250	110	250	3	1	1	29.0	130	2	40%	Yes	--
Seep Water	NWTPH-Dx	Total	Residual Range Organics	N/A	ug/L	5	23.0	500	110	500	4	-	1	130	130	1	20%	Yes	--
Seep Water	NWTPH-Gx	Total	Gasoline Range Organics	N/A	ug/L	5	13.0	250	250	250	5	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	1,2,4-Trichlorobenzene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	1,2-Dichlorobenzene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	1,3-Dichlorobenzene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	5	0.0290	4.76	0.200	4.76	5	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	2,4,5-Trichlorophenol	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	2,4,6-Trichlorophenol	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	2,4-Dichlorophenol	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	2,4-Dimethylphenol	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	2,4-Dinitrophenol	N/A	ug/L	1	9.52	9.52	9.52	9.52	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	2,4-Dinitrotoluene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	2,6-Dinitrotoluene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	2-Chloronaphthalene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	2-Chlorophenol	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	2-Methylnaphthalene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	2-Methylphenol	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	2-Nitroaniline	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	2-Nitrophenol	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	3,3'-Dichlorobenzidine	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	3-Nitroaniline	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	4,6-Dinitro-2-methylphenol	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	4-Bromophenyl Phenyl Ether	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	4-Chloro-3-methylphenol	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	4-Chloroaniline	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	4-Chlorophenyl Phenyl Ether	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	4-Nitroaniline	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	4-Nitrophenol	N/A	ug/L	5	0.280	4.76	2.00	4.76	5	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Acenaphthene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Acenaphthylene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Aniline	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Anthracene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Benzidine	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Benzo(a)anthracene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Benzo(a)pyrene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Benzo(b)fluoranthene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Benzo(g,h,i)perylene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Benzo(k)fluoranthene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Benzoic Acid	N/A	ug/L	1	-	-	-	-	0	-	1	5.88	5.88	1	100%	Yes	--
Seep Water	SVOCs	Total	Benzyl Alcohol	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Bis(2-chloroethoxy)methane	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Bis(2-chloroethyl) Ether	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Bis(2-chloroisopropyl) Ether	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	ug/L	1	23.8	23.8	23.8	23.8	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Butyl Benzyl Phthalate	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Carbazole	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Chrysene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Dibenz(a,h)anthracene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Dibenzofuran	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Diethyl Phthalate	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Dimethyl Phthalate	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Di-n-butyl Phthalate	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Di-n-octyl Phthalate	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(22 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Seep Water	SVOCs	Total	Fluoranthene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Fluorene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Hexachlorobenzene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Hexachlorobutadiene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Hexachlorocyclopentadiene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Hexachloroethane	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Indeno(1,2,3-cd)pyrene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Isophorone	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Naphthalene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Nitrobenzene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	N-Nitrosodimethylamine	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	N-Nitrosodi-n-propylamine	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	N-Nitrosodiphenylamine	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	p-cresol (4-Methylphenol)	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Pentachlorophenol	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Phenanthrene	N/A	ug/L	5	0.0220	4.76	0.200	4.76	5	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Phenol	N/A	ug/L	5	0.0630	4.76	0.490	4.76	5	-	-	-	-	0	0%	Yes	--
Seep Water	SVOCs	Total	Pyrene	N/A	ug/L	1	4.76	4.76	4.76	4.76	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,1,1,2-Tetrachloroethane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,1,2-Trichloroethane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,1-Dichloroethane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,1-Dichloroethene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,1-Dichloropropene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,2,3-Trichlorobenzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,2,3-Trichloropropane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,2,4-Trichlorobenzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,2,4-Trimethylbenzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,2-Dibromo-3-chloropropane	N/A	ug/L	1	5.00	5.00	5.00	5.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,2-Dichlorobenzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,2-Dichloropropane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,3,5-Trimethylbenzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,3-Dichlorobenzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,3-Dichloropropane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	2,2-Dichloropropane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	2-Butanone (MEK)	N/A	ug/L	1	10.0	10.0	10.0	10.0	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	2-Chlorotoluene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	2-Hexanone	N/A	ug/L	1	10.0	10.0	10.0	10.0	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	4-Chlorotoluene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	4-Isopropyltoluene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	ug/L	1	10.0	10.0	10.0	10.0	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Acetone	N/A	ug/L	1	10.0	10.0	10.0	10.0	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Benzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Bromobenzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Bromochloromethane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Bromodichloromethane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Bromoform	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Bromomethane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Carbon Disulfide	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Carbon Tetrachloride	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Chlorobenzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(23 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Seep Water	VOCs	Total	Chloroethane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Chloroform	N/A	ug/L	5	0.0820	1.00	0.500	1.00	3	-	2	0.740	2.80	2	40%	Yes	--
Seep Water	VOCs	Total	Chloromethane	N/A	ug/L	1	5.00	5.00	5.00	5.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	cis-1,2-Dichloroethene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	cis-1,3-Dichloropropene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Dibromochloromethane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Dibromomethane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Dichlorodifluoromethane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	ug/L	1	5.00	5.00	5.00	5.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Ethylbenzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Hexachlorobutadiene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Isopropylbenzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	m,p-Xylenes	N/A	ug/L	1	2.00	2.00	2.00	2.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Naphthalene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	n-Butylbenzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	n-Propylbenzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	o-Xylene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	sec-Butylbenzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Styrene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	tert-Butylbenzene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	5	0.0970	1.00	0.500	1.00	2	1	2	0.150	4.40	3	60%	Yes	--
Seep Water	VOCs	Total	Toluene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	trans-1,2-Dichloroethene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	trans-1,3-Dichloropropene	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Trichloroethene (TCE)	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Trichlorofluoromethane	N/A	ug/L	1	1.00	1.00	1.00	1.00	1	-	-	-	-	0	0%	Yes	--
Seep Water	VOCs	Total	Vinyl Chloride	N/A	ug/L	5	0.0440	1.00	0.500	1.00	5	-	-	-	-	0	0%	Yes	--
Surface Water	Metals	Total	Arsenic	N/A	ug/L	4	1.10	1.10	1.10	1.10	1	-	3	0.800	1.17	3	75%	Yes	--
Surface Water	Metals	Total	Iron	N/A	ug/L	4	-	-	-	-	0	-	4	167	446	4	100%	Yes	--
Surface Water	Metals	Total	Lead	N/A	ug/L	4	-	-	-	-	0	-	4	0.105	0.407	4	100%	Yes	--
Surface Water	Metals	Total	Manganese	N/A	ug/L	4	-	-	-	-	0	-	4	5.90	13.6	4	100%	Yes	--
Surface Water	Metals	Total	Mercury	N/A	ug/L	1	0.0300	0.0300	0.200	0.200	1	-	-	-	-	0	0%	Yes	--
Surface Water	Metals	Dissolved	Arsenic	N/A	ug/L	4	-	-	-	-	0	-	4	0.800	1.01	4	100%	Yes	--
Surface Water	Metals	Dissolved	Calcium	N/A	ug/L	2	-	-	-	-	0	-	2	19,900	20,500	2	100%	Yes	--
Surface Water	Metals	Dissolved	Iron	N/A	ug/L	4	4.00	20.0	20.0	20.0	3	1	-	9.20	9.20	1	25%	Yes	--
Surface Water	Metals	Dissolved	Lead	N/A	ug/L	4	0.00900	0.00900	0.0300	0.0500	1	3	-	0.0100	0.0160	3	75%	Yes	--
Surface Water	Metals	Dissolved	Magnesium	N/A	ug/L	2	-	-	-	-	0	-	2	6,190	6,330	2	100%	Yes	--
Surface Water	Metals	Dissolved	Manganese	N/A	ug/L	4	-	-	-	-	0	-	4	0.490	1.01	4	100%	Yes	--
Surface Water	Metals	Dissolved	Mercury	N/A	ug/L	1	0.0300	0.0300	0.200	0.200	1	-	-	-	-	0	0%	Yes	--
Surface Water	Metals	Dissolved	Potassium	N/A	ug/L	2	-	-	2,000	2,000	0	2	-	1,490	1,510	2	100%	Yes	--
Surface Water	Metals	Dissolved	Sodium	N/A	ug/L	2	-	-	-	-	0	-	2	7,630	7,900	2	100%	Yes	--
Surface Water	Butyltins	Total	Dibutyltin	N/A	ug/L	4	0.00730	0.00810	0.0500	0.0500	4	-	-	-	-	0	0%	Yes	--
Surface Water	Butyltins	Total	Monobutyltin	N/A	ug/L	4	0.0110	0.0290	0.0500	0.0870	4	-	-	-	-	0	0%	Yes	--
Surface Water	NWTPH-Dx	Total	Diesel Range Organics	N/A	ug/L	4	12.0	120	100	120	2	2	-	26.0	30.0	2	50%	Yes	--
Surface Water	NWTPH-Dx	Total	Residual Range Organics	N/A	ug/L	4	20.0	120	100	120	4	-	-	-	-	0	0%	Yes	--
Surface Water	NWTPH-Gx	Total	Gasoline Range Organics	N/A	ug/L	4	13.0	13.0	250	250	4	-	-	-	-	0	0%	Yes	--
Surface Water	SVOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	4	0.0290	0.0310	0.200	0.210	4	-	-	-	-	0	0%	Yes	--
Surface Water	SVOCs	Total	4-Nitrophenol	N/A	ug/L	4	0.280	0.300	2.00	2.10	4	-	-	-	-	0	0%	Yes	--
Surface Water	SVOCs	Total	Phenanthrene	N/A	ug/L	4	0.0220	0.0230	0.200	0.210	4	-	-	-	-	0	0%	Yes	--
Surface Water	SVOCs	Total	Phenol	N/A	ug/L	4	0.0630	0.0660	0.480	0.530	4	-	-	-	-	0	0%	Yes	--
Surface Water	VOCs	Total	Chloroform	N/A	ug/L	4	0.0820	0.0820	0.500	0.500	4	-	-	-	-	0	0%	Yes	--
Surface Water	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	4	0.0970	0.0970	0.500	0.500	4	-	-	-	-	0	0%	Yes	--
Surface Water	VOCs	Total	Vinyl Chloride	N/A	ug/L	4	0.0440	0.0440	0.500	0.500	4	-	-	-	-	0	0%	Yes	--

Notes

Table I-1
Data Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(24 of 24)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]

(1) Only evaluated for analytes with a sample size of 20 or more.
If all samples were NDs (detection rate=0%), or if there was only one distinct detected result, or if there were four or fewer samples and the data set contained NDs, the mean and standard deviation are not shown.
If there were two or more distinct detected results, but not all samples were detected results (i.e., detection rate = <100%), the mean and standard deviation were estimated by the Kaplan-Meier method.
Minimum and maximum detected values are not shown if all samples were NDs.
Minimum and maximum MDLs/MRLs for NDs are not shown if all samples had detected results.
The potentially mass wasting soil subset is comprised of the following samples: BIL01USE through BIL09USE, BIL13SSI, and L-01 through L-04.

'--' = Not evaluated
% = percent
Max = maximum
MDL = method detection limit
mg/kg = milligrams per kilogram
Min = minimum
MRL = methode reporting limit
MW Soil = Mass Wasting Soil
ND = non-detect
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic carbon
VOC = volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	Metals	Total	Aluminum	0-1 ft	N/A	mg/kg	58	-	-	-	-	0	-	58	1,530	24,300	58	100%	No	Yes
Soil	Metals	Total	Aluminum	0-3 ft	N/A	mg/kg	75	-	-	-	-	0	-	75	1,530	24,300	75	100%	No	Yes
Soil	Metals	Total	Aluminum	0-10 ft	N/A	mg/kg	78	-	-	-	-	0	-	78	1,530	24,300	78	100%	No	Yes
Soil	Metals	Total	Aluminum	>10 ft	N/A	mg/kg	6	-	-	-	-	0	-	6	7,460	15,600	6	100%	Yes	--
Soil	Metals	Total	Antimony	0-1 ft	N/A	mg/kg	58	0.160	3.54	0.160	4.12	17	24	17	0.0895	13.7	41	71%	No	Yes
Soil	Metals	Total	Antimony	0-3 ft	N/A	mg/kg	75	0.160	4.01	0.160	4.12	20	35	20	0.0700	13.7	55	73%	No	Yes
Soil	Metals	Total	Antimony	0-10 ft	N/A	mg/kg	78	0.160	4.01	0.160	4.12	20	36	22	0.0700	13.7	58	74%	No	Yes
Soil	Metals	Total	Antimony	>10 ft	N/A	mg/kg	6	-	-	0.245	0.303	0	4	2	0.107	0.433	6	100%	Yes	--
Soil	Metals	Total	Arsenic	0-1 ft	N/A	mg/kg	58	0.159	0.159	0.907	1.08	1	3	54	0.613	80.9	57	98%	No	Yes
Soil	Metals	Total	Arsenic	0-3 ft	N/A	mg/kg	75	0.159	0.159	0.907	1.08	1	3	71	0.613	80.9	74	99%	No	Yes
Soil	Metals	Total	Arsenic	0-10 ft	N/A	mg/kg	78	0.159	0.159	0.907	1.08	1	3	74	0.613	80.9	77	99%	No	Yes
Soil	Metals	Total	Arsenic	>10 ft	N/A	mg/kg	6	-	-	-	-	0	-	6	1.32	9.82	6	100%	Yes	--
Soil	Metals	Total	Barium	0-1 ft	N/A	mg/kg	58	-	-	-	-	0	-	58	10.7	133	58	100%	No	Yes
Soil	Metals	Total	Barium	0-3 ft	N/A	mg/kg	75	-	-	-	-	0	-	75	10.7	138	75	100%	No	Yes
Soil	Metals	Total	Barium	0-10 ft	N/A	mg/kg	78	-	-	-	-	0	-	78	10.7	138	78	100%	No	Yes
Soil	Metals	Total	Barium	>10 ft	N/A	mg/kg	6	-	-	-	-	0	-	6	41.8	97.3	6	100%	Yes	--
Soil	Metals	Total	Beryllium	0-1 ft	N/A	mg/kg	58	0.147	0.191	0.248	1.23	31	24	3	0.0587	0.630	27	47%	No	Yes
Soil	Metals	Total	Beryllium	0-3 ft	N/A	mg/kg	75	0.147	0.191	0.248	1.23	31	36	8	0.0587	0.630	44	59%	No	Yes
Soil	Metals	Total	Beryllium	0-10 ft	N/A	mg/kg	78	0.147	0.191	0.248	1.23	31	36	11	0.0587	0.630	47	60%	No	Yes
Soil	Metals	Total	Beryllium	>10 ft	N/A	mg/kg	6	-	-	-	-	0	-	6	0.258	0.488	6	100%	Yes	--
Soil	Metals	Total	Cadmium	0-1 ft	N/A	mg/kg	58	0.0122	0.0129	0.248	0.540	5	4	49	0.0561	17.3	53	91%	No	Yes
Soil	Metals	Total	Cadmium	0-3 ft	N/A	mg/kg	75	0.0122	0.0153	0.248	0.540	8	4	63	0.0561	17.3	67	89%	No	Yes
Soil	Metals	Total	Cadmium	0-10 ft	N/A	mg/kg	78	0.0122	0.0153	0.248	0.540	11	4	63	0.0561	17.3	67	86%	No	Yes
Soil	Metals	Total	Cadmium	>10 ft	N/A	mg/kg	6	0.0121	0.0150	0.245	0.303	6	-	-	-	-	0	0%	Yes	--
Soil	Metals	Total	Chromium	0-1 ft	N/A	mg/kg	61	-	-	-	-	0	-	61	5.27	2,650	61	100%	No	Yes
Soil	Metals	Total	Chromium	0-3 ft	N/A	mg/kg	78	-	-	-	-	0	-	78	5.27	2,650	78	100%	No	Yes
Soil	Metals	Total	Chromium	0-10 ft	N/A	mg/kg	81	-	-	-	-	0	-	81	5.27	2,650	81	100%	No	Yes
Soil	Metals	Total	Chromium	>10 ft	N/A	mg/kg	6	-	-	-	-	0	-	6	10.5	23.6	6	100%	Yes	--
Soil	Metals	Total	Cobalt	0-1 ft	N/A	mg/kg	58	-	-	-	-	0	-	58	2.52	25.0	58	100%	No	Yes
Soil	Metals	Total	Cobalt	0-3 ft	N/A	mg/kg	75	-	-	-	-	0	-	75	2.52	25.0	75	100%	No	Yes
Soil	Metals	Total	Cobalt	0-10 ft	N/A	mg/kg	78	-	-	-	-	0	-	78	2.52	25.0	78	100%	No	Yes
Soil	Metals	Total	Cobalt	>10 ft	N/A	mg/kg	6	-	-	-	-	0	-	6	11.4	18.7	6	100%	Yes	--
Soil	Metals	Total	Copper	0-1 ft	N/A	mg/kg	58	-	-	-	-	0	-	58	13.2	319	58	100%	No	Yes
Soil	Metals	Total	Copper	0-3 ft	N/A	mg/kg	75	-	-	-	-	0	-	75	13.2	319	75	100%	No	Yes
Soil	Metals	Total	Copper	0-10 ft	N/A	mg/kg	78	-	-	-	-	0	-	78	13.2	319	78	100%	No	Yes
Soil	Metals	Total	Copper	>10 ft	N/A	mg/kg	6	-	-	-	-	0	-	6	26.7	67.6	6	100%	Yes	--
Soil	Metals	Total	Lead	0-1 ft	<250um	mg/kg	8	-	-	-	-	0	-	8	53.9	921	8	100%	No	--
Soil	Metals	Total	Lead	0-1 ft	<2mm	mg/kg	8	-	-	-	-	0	-	8	27.5	768	8	100%	No	--
Soil	Metals	Total	Lead	0-1 ft	N/A	mg/kg	61	-	-	-	-	0	-	61	8.58	3,260	61	100%	No	Yes
Soil	Metals	Total	Lead	0-3 ft	<250um	mg/kg	16	-	-	9.80	10.0	0	4	12	6.60	921	16	100%	No	--
Soil	Metals	Total	Lead	0-3 ft	<2mm	mg/kg	16	-	-	8.20	9.90	0	4	12	6.50	768	16	100%	No	--
Soil	Metals	Total	Lead	0-3 ft	N/A	mg/kg	78	-	-	-	-	0	-	78	8.58	3,260	78	100%	No	Yes
Soil	Metals	Total	Lead	0-10 ft	<250um	mg/kg	16	-	-	9.80	10.0	0	4	12	6.60	921	16	100%	No	--
Soil	Metals	Total	Lead	0-10 ft	<2mm	mg/kg	16	-	-	8.20	9.90	0	4	12	6.50	768	16	100%	No	--
Soil	Metals	Total	Lead	0-10 ft	N/A	mg/kg	81	-	-	-	-	0	-	81	5.24	3,260	81	100%	No	Yes
Soil	Metals	Total	Lead	>10 ft	N/A	mg/kg	6	-	-	-	-	0	-	6	2.60	6.64	6	100%	Yes	--
Soil	Metals	Total	Manganese	0-1 ft	N/A	mg/kg	58	-	-	-	-	0	-	58	167	789	58	100%	No	Yes
Soil	Metals	Total	Manganese	0-3 ft	N/A	mg/kg	75	-	-	-	-	0	-	75	167	816	75	100%	No	Yes
Soil	Metals	Total	Manganese	0-10 ft	N/A	mg/kg	78	-	-	-	-	0	-	78	167	818	78	100%	No	Yes
Soil	Metals	Total	Manganese	>10 ft	N/A	mg/kg	6	-	-	-	-	0	-	6	380	599	6	100%	Yes	--
Soil	Metals	Total	Mercury	0-1 ft	N/A	mg/kg	58	0.00528	0.0306	0.0196	0.0483	15	15	28	0.0114	0.723	43	74%	No	Yes
Soil	Metals	Total	Mercury	0-3 ft	N/A	mg/kg	75	0.00528	0.0338	0.0196	0.0514	17	19	39	0.0114	0.723	58	77%	No	Yes
Soil	Metals	Total	Mercury	0-10 ft	N/A	mg/kg	78	0.00528	0.0338	0.0196	0.0514	17	20	41	0.0114	0.723	61	78%	No	Yes
Soil	Metals	Total	Mercury	>10 ft	N/A	mg/kg	6	-	-	0.0222	0.0233	0	3	3	0.0201	0.0544	6	100%	Yes	--
Soil	Metals	Total	Nickel	0-1 ft	N/A	mg/kg	58	-	-	-	-	0	-	58	4.79	1,060	58	100%	No	Yes
Soil	Metals	Total	Nickel	0-3 ft	N/A	mg/kg	75	-	-	-	-	0	-	75	4.79	1,060	75	100%	No	Yes
Soil	Metals	Total	Nickel	0-10 ft	N/A	mg/kg	78	-	-	-	-	0	-	78	4.79	1,060	78	100%	No	Yes
Soil	Metals	Total	Nickel	>10 ft	N/A	mg/kg	6	-	-	-	-	0	-	6	12.7	24.4	6	100%	Yes	--
Soil	Metals	Total	Selenium	0-1 ft	N/A	mg/kg	58	0.0781	0.500	0.248	4.12	28	27	3	0.175	0.900	30	52%	No	Yes
Soil	Metals	Total	Selenium	0-3 ft	N/A	mg/kg	75	0.0781	0.517	0.248	4.12	32	38	5	0.175	0.900	43	57%	No	Yes

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(2 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	Metals	Total	Selenium	0-10 ft	N/A	mg/kg	78	0.0781	0.517	0.248	4.12	32	38	8	0.175	0.900	46	59%	No	Yes
Soil	Metals	Total	Selenium	>10 ft	N/A	mg/kg	6	-	-	0.245	0.245	0	1	5	0.180	0.602	6	100%	Yes	--
Soil	Metals	Total	Silver	0-1 ft	N/A	mg/kg	58	0.0440	0.0524	0.454	0.687	3	36	19	0.0571	0.431	55	95%	No	Yes
Soil	Metals	Total	Silver	0-3 ft	N/A	mg/kg	75	0.0440	0.0524	0.0680	0.687	3	49	23	0.0450	0.431	72	96%	No	Yes
Soil	Metals	Total	Silver	0-10 ft	N/A	mg/kg	78	0.0440	0.0524	0.0680	0.687	3	51	24	0.0450	0.431	75	96%	No	Yes
Soil	Metals	Total	Silver	>10 ft	N/A	mg/kg	6	-	-	0.245	0.303	0	6	-	0.103	0.158	6	100%	Yes	--
Soil	Metals	Total	Thallium	0-1 ft	N/A	mg/kg	58	0.0429	0.0558	0.248	0.687	12	33	13	0.0288	0.239	46	79%	No	Yes
Soil	Metals	Total	Thallium	0-3 ft	N/A	mg/kg	75	0.0429	0.0558	0.248	0.687	12	45	18	0.0288	0.255	63	84%	No	Yes
Soil	Metals	Total	Thallium	0-10 ft	N/A	mg/kg	78	0.0429	0.0558	0.248	0.687	12	48	18	0.0288	0.255	66	85%	No	Yes
Soil	Metals	Total	Thallium	>10 ft	N/A	mg/kg	6	-	-	0.245	0.303	0	6	-	0.0765	0.180	6	100%	Yes	--
Soil	Metals	Total	Vanadium	0-1 ft	N/A	mg/kg	58	-	-	-	-	0	-	58	6.89	84.7	58	100%	No	Yes
Soil	Metals	Total	Vanadium	0-3 ft	N/A	mg/kg	75	-	-	-	-	0	-	75	6.89	89.1	75	100%	No	Yes
Soil	Metals	Total	Vanadium	0-10 ft	N/A	mg/kg	78	-	-	-	-	0	-	78	6.89	89.1	78	100%	No	Yes
Soil	Metals	Total	Vanadium	>10 ft	N/A	mg/kg	6	-	-	-	-	0	-	6	45.0	60.3	6	100%	Yes	--
Soil	Metals	Total	Zinc	0-1 ft	N/A	mg/kg	58	-	-	-	-	0	-	58	30.3	1,160	58	100%	No	Yes
Soil	Metals	Total	Zinc	0-3 ft	N/A	mg/kg	75	-	-	-	-	0	-	75	30.3	1,160	75	100%	No	Yes
Soil	Metals	Total	Zinc	0-10 ft	N/A	mg/kg	78	-	-	-	-	0	-	78	30.3	1,160	78	100%	No	Yes
Soil	Metals	Total	Zinc	>10 ft	N/A	mg/kg	6	-	-	-	-	0	-	6	35.1	54.1	6	100%	Yes	--
Soil	Butyltins	Total	Dibutyltin	0-1 ft	N/A	ug/kg	47	0.270	0.842	1.20	2.62	29	1	17	0.800	210	18	38%	No	Yes
Soil	Butyltins	Total	Dibutyltin	0-3 ft	N/A	ug/kg	62	0.270	0.887	1.20	2.64	44	1	17	0.800	210	18	29%	No	Yes
Soil	Butyltins	Total	Dibutyltin	0-10 ft	N/A	ug/kg	62	0.270	0.887	1.20	2.64	44	1	17	0.800	210	18	29%	No	Yes
Soil	Butyltins	Total	Dibutyltin	>10 ft	N/A	ug/kg	5	-	-	-	-	0	-	5	3.62	28.3	5	100%	Yes	--
Soil	Butyltins	Total	Monobutyltin	0-1 ft	N/A	ug/kg	47	0.240	1.86	1.20	3.49	25	4	18	0.420	108	22	47%	No	Yes
Soil	Butyltins	Total	Monobutyltin	0-3 ft	N/A	ug/kg	62	0.240	1.87	1.20	3.52	40	4	18	0.420	108	22	35%	No	Yes
Soil	Butyltins	Total	Monobutyltin	0-10 ft	N/A	ug/kg	62	0.240	1.87	1.20	3.52	40	4	18	0.420	108	22	35%	No	Yes
Soil	Butyltins	Total	Monobutyltin	>10 ft	N/A	ug/kg	5	-	-	-	-	0	-	5	6.28	13.0	5	100%	Yes	--
Soil	Butyltins	Total	Tetrabutyltin	0-1 ft	N/A	ug/kg	34	0.445	0.853	1.20	2.27	33	-	1	3.99	3.99	1	3%	No	No
Soil	Butyltins	Total	Tetrabutyltin	0-3 ft	N/A	ug/kg	44	0.445	0.910	1.20	2.42	43	-	1	3.99	3.99	1	2%	No	No
Soil	Butyltins	Total	Tetrabutyltin	0-10 ft	N/A	ug/kg	44	0.445	0.910	1.20	2.42	43	-	1	3.99	3.99	1	2%	No	No
Soil	Butyltins	Total	Tetrabutyltin	>10 ft	N/A	ug/kg	5	0.843	0.930	2.24	2.48	5	-	-	-	-	0	0%	Yes	--
Soil	Butyltins	Total	Tributyltin	0-1 ft	N/A	ug/kg	47	0.340	1.53	1.20	3.49	31	2	14	1.65	1,860	16	34%	No	Yes
Soil	Butyltins	Total	Tributyltin	0-3 ft	N/A	ug/kg	62	0.340	1.53	1.20	3.52	46	2	14	1.65	1,860	16	26%	No	Yes
Soil	Butyltins	Total	Tributyltin	0-10 ft	N/A	ug/kg	62	0.340	1.53	1.20	3.52	46	2	14	1.65	1,860	16	26%	No	Yes
Soil	Butyltins	Total	Tributyltin	>10 ft	N/A	ug/kg	5	1.04	1.14	2.99	3.30	4	1	-	2.58	2.58	1	20%	Yes	--
Soil	Herbicides	Total	2,4,5-T	0-1 ft	N/A	ug/kg	12	1.26	1.58	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4,5-T	0-3 ft	N/A	ug/kg	12	1.26	1.58	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4,5-T	0-10 ft	N/A	ug/kg	12	1.26	1.58	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-1 ft	N/A	ug/kg	12	1.84	2.31	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-3 ft	N/A	ug/kg	12	1.84	2.31	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-10 ft	N/A	ug/kg	12	1.84	2.31	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4-D	0-1 ft	N/A	ug/kg	12	0.476	5.68	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4-D	0-3 ft	N/A	ug/kg	12	0.476	5.68	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4-D	0-10 ft	N/A	ug/kg	12	0.476	5.68	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4-DB	0-1 ft	N/A	ug/kg	12	0.568	1.01	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4-DB	0-3 ft	N/A	ug/kg	12	0.568	1.01	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	2,4-DB	0-10 ft	N/A	ug/kg	12	0.568	1.01	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	4-Nitrophenol	0-1 ft	N/A	ug/kg	12	1.27	1.60	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	4-Nitrophenol	0-3 ft	N/A	ug/kg	12	1.27	1.60	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	4-Nitrophenol	0-10 ft	N/A	ug/kg	12	1.27	1.60	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dalapon	0-1 ft	N/A	ug/kg	12	1.76	2.20	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dalapon	0-3 ft	N/A	ug/kg	12	1.76	2.20	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dalapon	0-10 ft	N/A	ug/kg	12	1.76	2.20	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dicamba	0-1 ft	N/A	ug/kg	12	1.40	1.76	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dicamba	0-3 ft	N/A	ug/kg	12	1.40	1.76	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dicamba	0-10 ft	N/A	ug/kg	12	1.40	1.76	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dichloroprop	0-1 ft	N/A	ug/kg	12	0.614	0.770	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dichloroprop	0-3 ft	N/A	ug/kg	12	0.614	0.770	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dichloroprop	0-10 ft	N/A	ug/kg	12	0.614	0.770	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dinoseb	0-1 ft	N/A	ug/kg	12	0.476	0.596	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Dinoseb	0-3 ft	N/A	ug/kg	12	0.476	0.596	5.77	7.23	12	-	-	-	-	0	0%	No	--

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(3 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	Herbicides	Total	Dinoseb	0-10 ft	N/A	ug/kg	12	0.476	0.596	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	MCPA	0-1 ft	N/A	ug/kg	12	0.868	1.09	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	MCPA	0-3 ft	N/A	ug/kg	12	0.868	1.09	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	MCPA	0-10 ft	N/A	ug/kg	12	0.868	1.09	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	MCPP	0-1 ft	N/A	ug/kg	12	1.58	1.98	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	MCPP	0-3 ft	N/A	ug/kg	12	1.58	1.98	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	MCPP	0-10 ft	N/A	ug/kg	12	1.58	1.98	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Pentachlorophenol	0-1 ft	N/A	ug/kg	12	0.673	0.843	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Pentachlorophenol	0-3 ft	N/A	ug/kg	12	0.673	0.843	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Pentachlorophenol	0-10 ft	N/A	ug/kg	12	0.673	0.843	5.77	7.23	12	-	-	-	-	0	0%	No	--
Soil	Pesticides	Total	4,4'-DDD	0-1 ft	N/A	ug/kg	31	0.110	10.0	0.630	10.0	29	2	-	0.690	0.990	2	6%	No	Yes
Soil	Pesticides	Total	4,4'-DDD	0-3 ft	N/A	ug/kg	37	0.110	10.0	0.630	10.0	35	2	-	0.690	0.990	2	5%	No	Yes
Soil	Pesticides	Total	4,4'-DDD	0-10 ft	N/A	ug/kg	37	0.110	10.0	0.630	10.0	35	2	-	0.690	0.990	2	5%	No	Yes
Soil	Pesticides	Total	4,4'-DDD	>10 ft	N/A	ug/kg	5	0.217	0.250	2.13	2.45	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	4,4'-DDE	0-1 ft	N/A	ug/kg	31	0.110	7.80	0.660	7.80	24	6	1	0.250	2.44	7	23%	No	Yes
Soil	Pesticides	Total	4,4'-DDE	0-3 ft	N/A	ug/kg	37	0.110	7.80	0.660	7.80	30	6	1	0.250	2.44	7	19%	No	Yes
Soil	Pesticides	Total	4,4'-DDE	0-10 ft	N/A	ug/kg	37	0.110	7.80	0.660	7.80	30	6	1	0.250	2.44	7	19%	No	Yes
Soil	Pesticides	Total	4,4'-DDE	>10 ft	N/A	ug/kg	5	0.213	0.245	2.13	2.45	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	4,4'-DDT	0-1 ft	N/A	ug/kg	31	0.230	78.0	1.00	78.0	13	3	15	0.436	140	18	58%	No	Yes
Soil	Pesticides	Total	4,4'-DDT	0-3 ft	N/A	ug/kg	37	0.170	78.0	0.990	78.0	15	3	19	0.436	140	22	59%	No	Yes
Soil	Pesticides	Total	4,4'-DDT	0-10 ft	N/A	ug/kg	37	0.170	78.0	0.990	78.0	15	3	19	0.436	140	22	59%	No	Yes
Soil	Pesticides	Total	4,4'-DDT	>10 ft	N/A	ug/kg	5	0.250	0.288	2.13	2.45	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	Aldrin	0-1 ft	N/A	ug/kg	31	0.101	5.00	0.630	5.00	30	1	-	4.40	4.40	1	3%	No	No
Soil	Pesticides	Total	Aldrin	0-3 ft	N/A	ug/kg	37	0.101	5.00	0.630	5.00	36	1	-	4.40	4.40	1	3%	No	No
Soil	Pesticides	Total	Aldrin	0-10 ft	N/A	ug/kg	37	0.101	5.00	0.630	5.00	36	1	-	4.40	4.40	1	3%	No	No
Soil	Pesticides	Total	Aldrin	>10 ft	N/A	ug/kg	5	0.110	0.126	1.07	1.22	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	BHC (alpha)	0-1 ft	N/A	ug/kg	31	0.0981	1.12	0.630	5.00	31	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	BHC (alpha)	0-3 ft	N/A	ug/kg	37	0.0981	1.12	0.630	5.00	37	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	BHC (alpha)	0-10 ft	N/A	ug/kg	37	0.0981	1.12	0.630	5.00	37	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	BHC (alpha)	>10 ft	N/A	ug/kg	5	0.107	0.122	1.07	1.22	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	BHC (beta)	0-1 ft	N/A	ug/kg	31	0.109	3.78	0.630	5.00	30	1	-	0.952	0.952	1	3%	No	No
Soil	Pesticides	Total	BHC (beta)	0-3 ft	N/A	ug/kg	37	0.109	3.78	0.630	5.00	36	1	-	0.952	0.952	1	3%	No	No
Soil	Pesticides	Total	BHC (beta)	0-10 ft	N/A	ug/kg	37	0.109	3.78	0.630	5.00	36	1	-	0.952	0.952	1	3%	No	No
Soil	Pesticides	Total	BHC (beta)	>10 ft	N/A	ug/kg	5	0.118	0.136	1.07	1.22	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	BHC (delta)	0-1 ft	N/A	ug/kg	31	0.0740	5.00	0.630	5.00	29	1	1	0.0780	3.03	2	6%	No	Yes
Soil	Pesticides	Total	BHC (delta)	0-3 ft	N/A	ug/kg	37	0.0740	5.00	0.630	5.00	35	1	1	0.0780	3.03	2	5%	No	Yes
Soil	Pesticides	Total	BHC (delta)	0-10 ft	N/A	ug/kg	37	0.0740	5.00	0.630	5.00	35	1	1	0.0780	3.03	2	5%	No	Yes
Soil	Pesticides	Total	BHC (delta)	>10 ft	N/A	ug/kg	5	0.107	0.122	1.07	1.22	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	BHC (gamma) Lindane	0-1 ft	N/A	ug/kg	31	0.0800	37.0	0.630	37.0	29	-	2	2.17	9.68	2	6%	No	Yes
Soil	Pesticides	Total	BHC (gamma) Lindane	0-3 ft	N/A	ug/kg	37	0.0800	37.0	0.630	37.0	34	1	2	0.200	9.68	3	8%	No	Yes
Soil	Pesticides	Total	BHC (gamma) Lindane	0-10 ft	N/A	ug/kg	37	0.0800	37.0	0.630	37.0	34	1	2	0.200	9.68	3	8%	No	Yes
Soil	Pesticides	Total	BHC (gamma) Lindane	>10 ft	N/A	ug/kg	5	0.128	0.147	1.07	1.22	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	Chlordane (alpha)	0-1 ft	N/A	ug/kg	19	0.100	5.00	0.630	5.00	16	3	-	0.660	1.50	3	16%	No	--
Soil	Pesticides	Total	Chlordane (alpha)	0-3 ft	N/A	ug/kg	25	0.100	5.00	0.630	5.00	22	3	-	0.660	1.50	3	12%	No	Yes
Soil	Pesticides	Total	Chlordane (alpha)	0-10 ft	N/A	ug/kg	25	0.100	5.00	0.630	5.00	22	3	-	0.660	1.50	3	12%	No	Yes
Soil	Pesticides	Total	Chlordane (alpha)	>10 ft	N/A	ug/kg	5	0.115	0.132	1.07	1.22	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	Chlordane (gamma)	0-1 ft	N/A	ug/kg	19	0.0900	9.90	0.630	9.90	13	-	6	7.60	97.0	6	32%	No	--
Soil	Pesticides	Total	Chlordane (gamma)	0-3 ft	N/A	ug/kg	25	0.0900	9.90	0.630	9.90	15	3	7	0.610	97.0	10	40%	No	Yes
Soil	Pesticides	Total	Chlordane (gamma)	0-10 ft	N/A	ug/kg	25	0.0900	9.90	0.630	9.90	15	3	7	0.610	97.0	10	40%	No	Yes
Soil	Pesticides	Total	Chlordane (gamma)	>10 ft	N/A	ug/kg	5	0.129	0.148	1.07	1.22	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	Chlordane (technical)	0-1 ft	N/A	ug/kg	12	1.34	11.2	9.50	19.8	12	-	-	-	-	0	0%	No	--
Soil	Pesticides	Total	Chlordane (technical)	0-3 ft	N/A	ug/kg	12	1.34	11.2	9.50	19.8	12	-	-	-	-	0	0%	No	--
Soil	Pesticides	Total	Chlordane (technical)	0-10 ft	N/A	ug/kg	12	1.34	11.2	9.50	19.8	12	-	-	-	-	0	0%	No	--
Soil	Pesticides	Total	Dieldrin	0-1 ft	N/A	ug/kg	31	0.140	31.0	0.630	31.0	29	2	-	0.428	0.823	2	6%	No	Yes
Soil	Pesticides	Total	Dieldrin	0-3 ft	N/A	ug/kg	37	0.140	31.0	0.630	31.0	35	2	-	0.428	0.823	2	5%	No	Yes
Soil	Pesticides	Total	Dieldrin	0-10 ft	N/A	ug/kg	37	0.140	31.0	0.630	31.0	35	2	-	0.428	0.823	2	5%	No	Yes
Soil	Pesticides	Total	Dieldrin	>10 ft	N/A	ug/kg	5	0.259	0.298	2.13	2.45	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	Endosulfan I	0-1 ft	N/A	ug/kg	31	0.0630	9.50	0.630	9.50	29	-	2	2.20	6.45	2	6%	No	Yes
Soil	Pesticides	Total	Endosulfan I	0-3 ft	N/A	ug/kg	37	0.0630	9.50	0.630	9.50	32	2	3	0.140	6.45	5	14%	No	Yes
Soil	Pesticides	Total	Endosulfan I	0-10 ft	N/A	ug/kg	37	0.0630	9.50	0.630	9.50	32	2	3	0.140	6.45	5	14%	No	Yes

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(4 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	Pesticides	Total	Endosulfan I	>10 ft	N/A	ug/kg	5	0.119	0.137	1.07	1.22	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	Endosulfan II	0-1 ft	N/A	ug/kg	31	0.140	8.40	0.630	8.40	28	3	-	0.240	1.99	3	10%	No	Yes
Soil	Pesticides	Total	Endosulfan II	0-3 ft	N/A	ug/kg	37	0.140	8.40	0.630	8.40	34	3	-	0.240	1.99	3	8%	No	Yes
Soil	Pesticides	Total	Endosulfan II	0-10 ft	N/A	ug/kg	37	0.140	8.40	0.630	8.40	34	3	-	0.240	1.99	3	8%	No	Yes
Soil	Pesticides	Total	Endosulfan II	>10 ft	N/A	ug/kg	5	0.272	0.312	2.13	2.45	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	Endosulfan Sulfate	0-1 ft	N/A	ug/kg	31	0.110	5.00	0.630	5.00	25	4	2	0.577	3.30	6	19%	No	Yes
Soil	Pesticides	Total	Endosulfan Sulfate	0-3 ft	N/A	ug/kg	37	0.110	5.00	0.630	5.00	31	4	2	0.577	3.30	6	16%	No	Yes
Soil	Pesticides	Total	Endosulfan Sulfate	0-10 ft	N/A	ug/kg	37	0.110	5.00	0.630	5.00	31	4	2	0.577	3.30	6	16%	No	Yes
Soil	Pesticides	Total	Endosulfan Sulfate	>10 ft	N/A	ug/kg	5	0.509	0.585	2.13	2.45	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	Endrin Aldehyde	0-1 ft	N/A	ug/kg	31	0.120	9.60	0.630	9.60	27	2	2	2.02	16.0	4	13%	No	Yes
Soil	Pesticides	Total	Endrin Aldehyde	0-3 ft	N/A	ug/kg	37	0.120	9.60	0.630	9.60	32	2	3	1.90	16.0	5	14%	No	Yes
Soil	Pesticides	Total	Endrin Aldehyde	0-10 ft	N/A	ug/kg	37	0.120	9.60	0.630	9.60	32	2	3	1.90	16.0	5	14%	No	Yes
Soil	Pesticides	Total	Endrin Aldehyde	>10 ft	N/A	ug/kg	5	0.618	0.710	2.13	2.45	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	Endrin Ketone	0-1 ft	N/A	ug/kg	31	0.0930	21.0	0.630	21.0	27	2	2	1.87	13.0	4	13%	No	Yes
Soil	Pesticides	Total	Endrin Ketone	0-3 ft	N/A	ug/kg	37	0.0930	21.0	0.630	21.0	33	2	2	1.87	13.0	4	11%	No	Yes
Soil	Pesticides	Total	Endrin Ketone	0-10 ft	N/A	ug/kg	37	0.0930	21.0	0.630	21.0	33	2	2	1.87	13.0	4	11%	No	Yes
Soil	Pesticides	Total	Endrin Ketone	>10 ft	N/A	ug/kg	5	0.119	0.137	2.13	2.45	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	Endrin	0-1 ft	N/A	ug/kg	31	0.0940	6.80	0.630	6.80	28	1	2	3.00	17.0	3	10%	No	Yes
Soil	Pesticides	Total	Endrin	0-3 ft	N/A	ug/kg	37	0.0940	6.80	0.630	6.80	33	1	3	2.10	17.0	4	11%	No	Yes
Soil	Pesticides	Total	Endrin	0-10 ft	N/A	ug/kg	37	0.0940	6.80	0.630	6.80	33	1	3	2.10	17.0	4	11%	No	Yes
Soil	Pesticides	Total	Endrin	>10 ft	N/A	ug/kg	5	0.133	0.153	2.13	2.45	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	Heptachlor Epoxide	0-1 ft	N/A	ug/kg	31	0.0840	5.00	0.630	5.00	31	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-3 ft	N/A	ug/kg	37	0.0840	5.00	0.630	5.00	36	1	-	0.634	0.634	1	3%	No	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-10 ft	N/A	ug/kg	37	0.0840	5.00	0.630	5.00	36	1	-	0.634	0.634	1	3%	No	No
Soil	Pesticides	Total	Heptachlor Epoxide	>10 ft	N/A	ug/kg	5	0.146	0.168	1.07	1.22	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	Heptachlor	0-1 ft	N/A	ug/kg	31	0.0981	5.00	0.660	5.00	27	4	-	0.180	2.90	4	13%	No	Yes
Soil	Pesticides	Total	Heptachlor	0-3 ft	N/A	ug/kg	37	0.0981	5.00	0.660	5.00	33	4	-	0.180	2.90	4	11%	No	Yes
Soil	Pesticides	Total	Heptachlor	0-10 ft	N/A	ug/kg	37	0.0981	5.00	0.660	5.00	33	4	-	0.180	2.90	4	11%	No	Yes
Soil	Pesticides	Total	Heptachlor	>10 ft	N/A	ug/kg	5	0.107	0.122	1.07	1.22	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	Methoxychlor	0-1 ft	N/A	ug/kg	31	0.141	11.2	0.630	19.8	29	-	2	1.00	1.20	2	6%	No	Yes
Soil	Pesticides	Total	Methoxychlor	0-3 ft	N/A	ug/kg	37	0.141	11.2	0.630	19.8	35	-	2	1.00	1.20	2	5%	No	Yes
Soil	Pesticides	Total	Methoxychlor	0-10 ft	N/A	ug/kg	37	0.141	11.2	0.630	19.8	35	-	2	1.00	1.20	2	5%	No	Yes
Soil	Pesticides	Total	Methoxychlor	>10 ft	N/A	ug/kg	5	0.153	0.176	10.7	12.2	5	-	-	-	-	0	0%	Yes	--
Soil	Pesticides	Total	Toxaphene	0-1 ft	N/A	ug/kg	31	4.80	2,900	43.0	2,900	31	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Toxaphene	0-3 ft	N/A	ug/kg	37	4.80	2,900	43.0	2,900	37	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Toxaphene	0-10 ft	N/A	ug/kg	37	4.80	2,900	43.0	2,900	37	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Toxaphene	>10 ft	N/A	ug/kg	5	10.7	12.2	107	122	5	-	-	-	-	0	0%	Yes	--
Soil	PCB Aroclors	Total	Aroclor 1016	0-1 ft	N/A	ug/kg	58	1.08	11.0	6.30	50.0	58	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1016	0-3 ft	N/A	ug/kg	73	1.08	11.0	6.30	50.0	73	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1016	0-10 ft	N/A	ug/kg	73	1.08	11.0	6.30	50.0	73	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1016	>10 ft	N/A	ug/kg	5	2.61	3.00	8.84	10.2	5	-	-	-	-	0	0%	Yes	--
Soil	PCB Aroclors	Total	Aroclor 1221	0-1 ft	N/A	ug/kg	58	2.10	11.0	9.82	100	58	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1221	0-3 ft	N/A	ug/kg	73	2.10	11.0	9.82	100	73	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1221	0-10 ft	N/A	ug/kg	73	2.10	11.0	9.82	100	73	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1221	>10 ft	N/A	ug/kg	5	2.61	3.00	8.84	10.2	5	-	-	-	-	0	0%	Yes	--
Soil	PCB Aroclors	Total	Aroclor 1232	0-1 ft	N/A	ug/kg	58	2.10	11.0	6.30	50.0	58	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1232	0-3 ft	N/A	ug/kg	73	2.10	11.0	6.30	50.0	73	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1232	0-10 ft	N/A	ug/kg	73	2.10	11.0	6.30	50.0	73	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1232	>10 ft	N/A	ug/kg	5	2.61	3.00	8.84	10.2	5	-	-	-	-	0	0%	Yes	--
Soil	PCB Aroclors	Total	Aroclor 1242	0-1 ft	N/A	ug/kg	58	1.97	11.0	6.30	50.0	58	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1242	0-3 ft	N/A	ug/kg	73	1.97	11.0	6.30	50.0	73	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1242	0-10 ft	N/A	ug/kg	73	1.97	11.0	6.30	50.0	73	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1242	>10 ft	N/A	ug/kg	5	2.61	3.00	8.84	10.2	5	-	-	-	-	0	0%	Yes	--
Soil	PCB Aroclors	Total	Aroclor 1248	0-1 ft	N/A	ug/kg	58	2.10	11.0	6.30	50.0	58	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1248	0-3 ft	N/A	ug/kg	73	2.10	11.0	6.30	50.0	73	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1248	0-10 ft	N/A	ug/kg	73	2.10	11.0	6.30	50.0	73	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1248	>10 ft	N/A	ug/kg	5	2.61	3.00	8.84	10.2	5	-	-	-	-	0	0%	Yes	--
Soil	PCB Aroclors	Total	Aroclor 1254	0-1 ft	N/A	ug/kg	58	1.53	2.10	6.30	13.0	52	-	6	160	1,700	6	10%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1254	0-3 ft	N/A	ug/kg	73	1.53	2.10	6.30	13.2	63	-	10	11.0	1,700	10	14%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1254	0-10 ft	N/A	ug/kg	73	1.53	2.10	6.30	13.2	63	-	10	11.0	1,700	10	14%	No	Yes

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(5 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	PCB Aroclors	Total	Aroclor 1254	>10 ft	N/A	ug/kg	5	1.43	1.65	8.84	10.2	5	-	-	-	-	0	0%	Yes	--
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	N/A	ug/kg	58	1.54	2.10	9.82	13.4	6	15	37	2.00	690	52	90%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1260	0-3 ft	N/A	ug/kg	73	1.54	2.10	9.82	13.4	12	19	42	2.00	690	61	84%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1260	0-10 ft	N/A	ug/kg	73	1.54	2.10	9.82	13.4	12	19	42	2.00	690	61	84%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1260	>10 ft	N/A	ug/kg	5	1.43	1.65	8.84	10.2	5	-	-	-	-	0	0%	Yes	--
Soil	PCB Aroclors	Total	Aroclor 1262	0-1 ft	N/A	ug/kg	13	2.10	11.0	6.30	50.0	13	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1262	0-3 ft	N/A	ug/kg	18	2.10	11.0	6.30	50.0	18	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1262	0-10 ft	N/A	ug/kg	18	2.10	11.0	6.30	50.0	18	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1268	0-1 ft	N/A	ug/kg	13	2.10	11.0	6.30	50.0	13	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1268	0-3 ft	N/A	ug/kg	18	2.10	11.0	6.30	50.0	18	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1268	0-10 ft	N/A	ug/kg	18	2.10	11.0	6.30	50.0	18	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	N/A	ug/kg	58	3.08	4.20	19.7	20.6	-	-	-	3.70	2140	52	90%	No	Yes
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-3 ft	N/A	ug/kg	73	3.08	4.20	19.7	26.4	-	-	-	3.70	2140	61	84%	No	Yes
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-10 ft	N/A	ug/kg	73	3.08	4.20	19.7	26.4	-	-	-	3.70	2140	61	84%	No	Yes
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	>10 ft	N/A	ug/kg	5	2.86	3.30	17.7	20.4	-	-	-	-	-	0	0%	Yes	--
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	N/A	mg/kg	57	5.02	13.6	24.9	36.0	7	13	37	3.60	1,090	50	88%	No	Yes
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-3 ft	N/A	mg/kg	74	5.02	14.9	24.9	36.0	11	21	42	3.60	1,440	63	85%	No	Yes
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-10 ft	N/A	mg/kg	77	5.02	14.9	24.9	36.0	14	21	42	3.60	1,440	63	82%	No	Yes
Soil	NWTPH-Dx	Total	Diesel Range Organics	>10 ft	N/A	mg/kg	6	5.14	5.89	26.9	30.8	6	-	-	-	-	0	0%	Yes	--
Soil	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	N/A	mg/kg	57	10.0	26.9	49.9	140	5	6	46	21.0	2,300	52	91%	No	Yes
Soil	NWTPH-Dx	Total	Residual Range Organics	0-3 ft	N/A	mg/kg	74	10.0	29.7	49.9	140	8	14	52	16.0	2,300	66	89%	No	Yes
Soil	NWTPH-Dx	Total	Residual Range Organics	0-10 ft	N/A	mg/kg	77	10.0	29.7	49.9	140	11	14	52	16.0	2,300	66	86%	No	Yes
Soil	NWTPH-Dx	Total	Residual Range Organics	>10 ft	N/A	mg/kg	6	10.2	11.7	53.8	61.6	6	-	-	-	-	0	0%	Yes	--
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	N/A	mg/kg	36	0.121	4.68	2.60	5.20	28	8	-	1.60	3.49	8	22%	No	Yes
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-3 ft	N/A	mg/kg	44	0.121	5.00	2.60	5.20	34	8	2	1.60	3,960	10	23%	No	Yes
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-10 ft	N/A	mg/kg	47	0.121	5.00	2.60	5.20	37	8	2	1.60	3,960	10	21%	No	Yes
Soil	NWTPH-Gx	Total	Gasoline Range Organics	>10 ft	N/A	mg/kg	6	0.136	4.83	4.32	4.83	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	N/A	ug/kg	31	0.880	75.0	5.18	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-3 ft	N/A	ug/kg	39	0.880	75.0	5.18	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-10 ft	N/A	ug/kg	42	0.880	75.0	5.18	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	>10 ft	N/A	ug/kg	6	0.935	1.04	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-1 ft	N/A	ug/kg	31	0.703	65.0	5.18	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-3 ft	N/A	ug/kg	39	0.703	65.0	5.18	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-10 ft	N/A	ug/kg	42	0.703	65.0	5.18	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2-Dichlorobenzene	>10 ft	N/A	ug/kg	6	0.748	0.836	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-1 ft	N/A	ug/kg	31	0.883	80.0	5.18	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-3 ft	N/A	ug/kg	39	0.883	80.0	5.18	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-10 ft	N/A	ug/kg	42	0.883	80.0	5.18	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,3-Dichlorobenzene	>10 ft	N/A	ug/kg	6	0.939	1.05	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-1 ft	N/A	ug/kg	31	0.871	95.0	5.18	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-3 ft	N/A	ug/kg	39	0.871	95.0	5.18	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-10 ft	N/A	ug/kg	42	0.871	95.0	5.18	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,4-Dichlorobenzene	>10 ft	N/A	ug/kg	6	0.927	1.03	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-1 ft	N/A	ug/kg	31	0.804	150	5.18	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-3 ft	N/A	ug/kg	39	0.804	150	5.18	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-10 ft	N/A	ug/kg	42	0.804	150	5.18	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,5-Trichlorophenol	>10 ft	N/A	ug/kg	6	0.855	0.955	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-1 ft	N/A	ug/kg	31	0.819	90.0	5.18	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-3 ft	N/A	ug/kg	39	0.819	90.0	5.18	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-10 ft	N/A	ug/kg	42	0.819	90.0	5.18	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,6-Trichlorophenol	>10 ft	N/A	ug/kg	6	0.872	0.973	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	2,4-Dichlorophenol	0-1 ft	N/A	ug/kg	31	0.919	90.0	5.18	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dichlorophenol	0-3 ft	N/A	ug/kg	39	0.919	90.0	5.18	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dichlorophenol	0-10 ft	N/A	ug/kg	42	0.919	90.0	5.18	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dichlorophenol	>10 ft	N/A	ug/kg	6	0.977	1.09	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	2,4-Dimethylphenol	0-1 ft	N/A	ug/kg	31	0.793	280	2.07	1,700	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dimethylphenol	0-3 ft	N/A	ug/kg	39	0.793	280	2.07	1,700	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dimethylphenol	0-10 ft	N/A	ug/kg	42	0.793	280	2.07	1,700	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dimethylphenol	>10 ft	N/A	ug/kg	6	0.843	0.941	2.20	2.46	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	2,4-Dinitrophenol	0-1 ft	N/A	ug/kg	31	2.81	1,800	29.3	6,700	31	-	-	-	-	0	0%	No	No

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(6 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	SVOCs	Total	2,4-Dinitrophenol	0-3 ft	N/A	ug/kg	39	2.81	1,800	29.3	6,700	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrophenol	0-10 ft	N/A	ug/kg	42	2.81	1,800	29.3	6,700	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrophenol	>10 ft	N/A	ug/kg	6	7.70	8.60	55.1	61.5	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-1 ft	N/A	ug/kg	31	1.52	140	6.40	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-3 ft	N/A	ug/kg	39	1.52	140	6.40	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-10 ft	N/A	ug/kg	42	1.52	140	6.40	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrotoluene	>10 ft	N/A	ug/kg	6	1.87	2.09	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-1 ft	N/A	ug/kg	31	1.11	140	5.18	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-3 ft	N/A	ug/kg	39	1.11	140	5.18	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-10 ft	N/A	ug/kg	42	1.11	140	5.18	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,6-Dinitrotoluene	>10 ft	N/A	ug/kg	6	1.18	1.32	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	2-Chloronaphthalene	0-1 ft	N/A	ug/kg	31	0.351	180	1.17	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chloronaphthalene	0-3 ft	N/A	ug/kg	39	0.351	180	1.17	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chloronaphthalene	0-10 ft	N/A	ug/kg	42	0.351	180	1.17	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chloronaphthalene	>10 ft	N/A	ug/kg	6	0.744	0.831	2.20	2.46	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	2-Chlorophenol	0-1 ft	N/A	ug/kg	31	0.697	85.0	5.18	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chlorophenol	0-3 ft	N/A	ug/kg	39	0.697	85.0	5.18	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chlorophenol	0-10 ft	N/A	ug/kg	42	0.697	85.0	5.18	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chlorophenol	>10 ft	N/A	ug/kg	6	0.742	0.828	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	2-Methylphenol	0-1 ft	N/A	ug/kg	31	0.978	170	5.18	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Methylphenol	0-3 ft	N/A	ug/kg	39	0.978	170	5.18	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Methylphenol	0-10 ft	N/A	ug/kg	42	0.978	170	5.18	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Methylphenol	>10 ft	N/A	ug/kg	6	1.04	1.16	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	2-Nitroaniline	0-1 ft	N/A	ug/kg	31	0.563	140	2.07	670	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitroaniline	0-3 ft	N/A	ug/kg	39	0.563	140	2.07	670	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitroaniline	0-10 ft	N/A	ug/kg	42	0.563	140	2.07	670	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitroaniline	>10 ft	N/A	ug/kg	6	0.598	0.668	2.20	2.46	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	2-Nitrophenol	0-1 ft	N/A	ug/kg	31	1.18	130	5.18	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitrophenol	0-3 ft	N/A	ug/kg	39	1.18	130	5.18	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitrophenol	0-10 ft	N/A	ug/kg	42	1.18	130	5.18	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitrophenol	>10 ft	N/A	ug/kg	6	1.26	1.40	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-1 ft	N/A	ug/kg	31	1.29	190	11.7	3,400	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-3 ft	N/A	ug/kg	39	1.29	190	11.7	3,400	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-10 ft	N/A	ug/kg	42	1.29	190	11.7	3,400	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	>10 ft	N/A	ug/kg	6	4.78	5.34	22.0	24.6	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	3-Nitroaniline	0-1 ft	N/A	ug/kg	31	1.99	130	10.4	670	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3-Nitroaniline	0-3 ft	N/A	ug/kg	39	1.99	130	10.4	670	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3-Nitroaniline	0-10 ft	N/A	ug/kg	42	1.99	130	10.4	670	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3-Nitroaniline	>10 ft	N/A	ug/kg	6	3.23	3.61	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-1 ft	N/A	ug/kg	31	1.51	85.0	10.4	3,400	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-3 ft	N/A	ug/kg	39	1.51	85.0	10.4	3,400	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-10 ft	N/A	ug/kg	42	1.51	85.0	10.4	3,400	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	>10 ft	N/A	ug/kg	6	1.98	2.22	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-1 ft	N/A	ug/kg	31	1.40	70.0	6.40	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-3 ft	N/A	ug/kg	39	1.40	70.0	6.40	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-10 ft	N/A	ug/kg	42	1.40	70.0	6.40	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	>10 ft	N/A	ug/kg	6	2.03	2.26	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-1 ft	N/A	ug/kg	31	0.925	110	5.18	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-3 ft	N/A	ug/kg	39	0.925	110	5.18	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-10 ft	N/A	ug/kg	42	0.925	110	5.18	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloro-3-methylphenol	>10 ft	N/A	ug/kg	6	0.984	1.10	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	4-Chloroaniline	0-1 ft	N/A	ug/kg	31	0.963	110	6.40	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloroaniline	0-3 ft	N/A	ug/kg	39	0.963	110	6.40	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloroaniline	0-10 ft	N/A	ug/kg	42	0.963	110	6.40	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloroaniline	>10 ft	N/A	ug/kg	6	1.02	1.14	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-1 ft	N/A	ug/kg	31	1.97	100	6.40	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-3 ft	N/A	ug/kg	39	1.97	100	6.40	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-10 ft	N/A	ug/kg	42	1.97	100	6.40	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	>10 ft	N/A	ug/kg	6	2.37	2.65	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	4-Nitroaniline	0-1 ft	N/A	ug/kg	31	1.99	170	11.7	670	31	-	-	-	-	0	0%	No	No

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(7 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	SVOCs	Total	4-Nitroaniline	0-3 ft	N/A	ug/kg	39	1.99	170	11.7	670	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitroaniline	0-10 ft	N/A	ug/kg	42	1.99	170	11.7	670	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitroaniline	>10 ft	N/A	ug/kg	6	4.52	5.05	22.0	24.6	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	4-Nitrophenol	0-1 ft	N/A	ug/kg	31	2.22	1,500	29.3	3,400	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitrophenol	0-3 ft	N/A	ug/kg	39	2.22	1,500	29.3	3,400	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitrophenol	0-10 ft	N/A	ug/kg	42	2.22	1,500	29.3	3,400	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitrophenol	>10 ft	N/A	ug/kg	6	9.02	10.1	55.1	61.5	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Aniline	0-1 ft	N/A	ug/kg	31	1.50	75.0	10.4	670	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Aniline	0-3 ft	N/A	ug/kg	39	1.50	75.0	10.4	670	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Aniline	0-10 ft	N/A	ug/kg	42	1.50	75.0	10.4	670	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Aniline	>10 ft	N/A	ug/kg	6	2.03	2.26	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Benzidine	0-1 ft	N/A	ug/kg	18	2.21	31.8	10.4	366	18	-	-	-	-	0	0%	No	--
Soil	SVOCs	Total	Benzidine	0-3 ft	N/A	ug/kg	21	2.21	31.8	10.4	366	21	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Benzidine	0-10 ft	N/A	ug/kg	24	2.21	31.8	10.4	366	24	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Benzidine	>10 ft	N/A	ug/kg	6	3.11	3.47	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Benzoic Acid	0-1 ft	N/A	ug/kg	31	4.15	4,800	58.5	6,700	19	9	3	15.3	980	12	39%	No	Yes
Soil	SVOCs	Total	Benzoic Acid	0-3 ft	N/A	ug/kg	39	4.15	4,800	58.5	6,700	27	9	3	15.3	980	12	31%	No	Yes
Soil	SVOCs	Total	Benzoic Acid	0-10 ft	N/A	ug/kg	42	4.15	4,800	58.5	6,700	30	9	3	15.3	980	12	29%	No	Yes
Soil	SVOCs	Total	Benzoic Acid	>10 ft	N/A	ug/kg	6	17.6	19.7	66.1	73.8	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Benzyl Alcohol	0-1 ft	N/A	ug/kg	31	2.06	190	5.18	670	30	-	1	7.81	7.81	1	3%	No	No
Soil	SVOCs	Total	Benzyl Alcohol	0-3 ft	N/A	ug/kg	39	2.06	190	5.18	670	38	-	1	7.81	7.81	1	3%	No	No
Soil	SVOCs	Total	Benzyl Alcohol	0-10 ft	N/A	ug/kg	42	2.06	190	5.18	670	41	-	1	7.81	7.81	1	2%	No	No
Soil	SVOCs	Total	Benzyl Alcohol	>10 ft	N/A	ug/kg	6	2.19	2.45	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-1 ft	N/A	ug/kg	31	1.30	65.0	6.40	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-3 ft	N/A	ug/kg	39	1.30	65.0	6.40	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-10 ft	N/A	ug/kg	42	1.30	65.0	6.40	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	>10 ft	N/A	ug/kg	6	2.12	2.36	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-1 ft	N/A	ug/kg	31	1.63	120	6.40	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-3 ft	N/A	ug/kg	39	1.63	120	6.40	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-10 ft	N/A	ug/kg	42	1.63	120	6.40	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	>10 ft	N/A	ug/kg	6	1.73	1.93	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-1 ft	N/A	ug/kg	31	1.20	90.1	6.40	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-3 ft	N/A	ug/kg	39	1.20	90.1	6.40	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-10 ft	N/A	ug/kg	42	1.20	90.1	6.40	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	>10 ft	N/A	ug/kg	6	8.80	9.83	27.5	30.8	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	N/A	ug/kg	31	1.90	366	20.7	366	10	-	21	170	260,000	21	68%	No	Yes
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-3 ft	N/A	ug/kg	40	1.90	366	20.7	366	11	2	27	15.0	260,000	29	73%	No	Yes
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-10 ft	N/A	ug/kg	43	1.90	366	20.7	366	11	3	29	6.67	260,000	32	74%	No	Yes
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	>10 ft	N/A	ug/kg	6	-	-	23.5	23.6	0	2	4	10.9	266	6	100%	Yes	--
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	N/A	ug/kg	31	1.50	75.0	6.40	340	26	4	1	3.67	124	5	16%	No	Yes
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-3 ft	N/A	ug/kg	39	1.50	75.0	6.40	340	33	4	2	3.67	124	6	15%	No	Yes
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-10 ft	N/A	ug/kg	42	1.50	75.0	6.40	340	36	4	2	3.67	124	6	14%	No	Yes
Soil	SVOCs	Total	Butyl Benzyl Phthalate	>10 ft	N/A	ug/kg	6	2.36	2.63	22.0	24.6	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Carbazole	0-1 ft	N/A	ug/kg	31	2.06	57.1	6.40	375	11	8	12	1.40	530	20	65%	No	Yes
Soil	SVOCs	Total	Carbazole	0-3 ft	N/A	ug/kg	39	1.30	57.1	6.40	375	15	10	14	1.40	530	24	62%	No	Yes
Soil	SVOCs	Total	Carbazole	0-10 ft	N/A	ug/kg	42	1.30	57.1	6.40	375	18	10	14	1.40	530	24	57%	No	Yes
Soil	SVOCs	Total	Carbazole	>10 ft	N/A	ug/kg	6	2.19	2.45	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Dibenzofuran	0-1 ft	N/A	ug/kg	31	0.479	65.0	5.18	340	12	16	3	0.996	220	19	61%	No	Yes
Soil	SVOCs	Total	Dibenzofuran	0-3 ft	N/A	ug/kg	40	0.479	65.0	5.18	340	16	19	5	0.996	485	24	60%	No	Yes
Soil	SVOCs	Total	Dibenzofuran	0-10 ft	N/A	ug/kg	43	0.479	65.0	5.18	340	19	19	5	0.996	485	24	56%	No	Yes
Soil	SVOCs	Total	Dibenzofuran	>10 ft	N/A	ug/kg	6	0.509	0.569	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Diethyl Phthalate	0-1 ft	N/A	ug/kg	31	1.99	180	6.40	340	30	1	-	8.80	8.80	1	3%	No	No
Soil	SVOCs	Total	Diethyl Phthalate	0-3 ft	N/A	ug/kg	39	1.99	180	6.40	340	38	1	-	8.80	8.80	1	3%	No	No
Soil	SVOCs	Total	Diethyl Phthalate	0-10 ft	N/A	ug/kg	42	1.99	180	6.40	340	41	1	-	8.80	8.80	1	2%	No	No
Soil	SVOCs	Total	Diethyl Phthalate	>10 ft	N/A	ug/kg	6	3.98	4.44	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Dimethyl Phthalate	0-1 ft	N/A	ug/kg	31	1.29	90.0	6.40	340	28	3	-	30.0	41.0	3	10%	No	Yes
Soil	SVOCs	Total	Dimethyl Phthalate	0-3 ft	N/A	ug/kg	39	1.29	90.0	6.40	340	36	3	-	30.0	41.0	3	8%	No	Yes
Soil	SVOCs	Total	Dimethyl Phthalate	0-10 ft	N/A	ug/kg	42	1.29	90.0	6.40	340	39	3	-	30.0	41.0	3	7%	No	Yes
Soil	SVOCs	Total	Dimethyl Phthalate	>10 ft	N/A	ug/kg	6	2.16	2.41	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	N/A	ug/kg	31	1.89	637	6.40	732	21	5	5	6.10	280	10	32%	No	Yes

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(8 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-3 ft	N/A	ug/kg	39	1.89	637	6.40	732	25	6	8	3.70	280	14	36%	No	Yes
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-10 ft	N/A	ug/kg	42	1.89	637	6.40	732	28	6	8	3.70	280	14	33%	No	Yes
Soil	SVOCs	Total	Di-n-butyl Phthalate	>10 ft	N/A	ug/kg	6	2.14	12.3	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-1 ft	N/A	ug/kg	31	1.20	60.0	6.40	340	26	2	3	11.3	127	5	16%	No	Yes
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-3 ft	N/A	ug/kg	39	1.20	60.0	6.40	340	33	3	3	11.3	127	6	15%	No	Yes
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-10 ft	N/A	ug/kg	42	1.20	60.0	6.40	340	35	3	4	11.3	127	7	17%	No	Yes
Soil	SVOCs	Total	Di-n-octyl Phthalate	>10 ft	N/A	ug/kg	6	2.03	2.26	22.0	24.9	4	2	-	4.40	7.06	2	33%	Yes	--
Soil	SVOCs	Total	Hexachlorobenzene	0-1 ft	N/A	ug/kg	31	0.548	110	2.07	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobenzene	0-3 ft	N/A	ug/kg	39	0.548	110	2.07	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobenzene	0-10 ft	N/A	ug/kg	42	0.548	110	2.07	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobenzene	>10 ft	N/A	ug/kg	6	0.583	0.651	2.20	2.46	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Hexachlorobutadiene	0-1 ft	N/A	ug/kg	31	0.757	70.0	5.18	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobutadiene	0-3 ft	N/A	ug/kg	39	0.757	70.0	5.18	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobutadiene	0-10 ft	N/A	ug/kg	42	0.757	70.0	5.18	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobutadiene	>10 ft	N/A	ug/kg	6	0.805	0.900	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-1 ft	N/A	ug/kg	31	0.822	750	5.18	1,700	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-3 ft	N/A	ug/kg	39	0.822	750	5.18	1,700	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-10 ft	N/A	ug/kg	42	0.822	750	5.18	1,700	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorocyclopentadiene	>10 ft	N/A	ug/kg	6	0.874	0.976	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Hexachloroethane	0-1 ft	N/A	ug/kg	31	1.75	110	5.18	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachloroethane	0-3 ft	N/A	ug/kg	39	1.75	110	5.18	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachloroethane	0-10 ft	N/A	ug/kg	42	1.75	110	5.18	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachloroethane	>10 ft	N/A	ug/kg	6	1.86	2.08	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Isophorone	0-1 ft	N/A	ug/kg	31	0.522	80.0	6.40	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Isophorone	0-3 ft	N/A	ug/kg	39	0.522	80.0	6.40	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Isophorone	0-10 ft	N/A	ug/kg	42	0.522	80.0	6.40	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Isophorone	>10 ft	N/A	ug/kg	6	0.555	0.620	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Nitrobenzene	0-1 ft	N/A	ug/kg	31	1.60	100	6.40	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Nitrobenzene	0-3 ft	N/A	ug/kg	39	1.60	100	6.40	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Nitrobenzene	0-10 ft	N/A	ug/kg	42	1.60	100	6.40	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Nitrobenzene	>10 ft	N/A	ug/kg	6	3.32	3.70	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-1 ft	N/A	ug/kg	31	1.05	310	10.4	1,700	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-3 ft	N/A	ug/kg	39	1.05	310	10.4	1,700	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-10 ft	N/A	ug/kg	42	1.05	310	10.4	1,700	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodimethylamine	>10 ft	N/A	ug/kg	6	3.36	3.75	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-1 ft	N/A	ug/kg	31	1.29	160	5.18	340	31	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-3 ft	N/A	ug/kg	39	1.29	160	5.18	340	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-10 ft	N/A	ug/kg	42	1.29	160	5.18	340	42	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	>10 ft	N/A	ug/kg	6	1.48	1.65	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-1 ft	N/A	ug/kg	31	0.593	110	2.07	340	30	1	-	27.0	27.0	1	3%	No	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-3 ft	N/A	ug/kg	39	0.593	110	2.07	340	38	1	-	27.0	27.0	1	3%	No	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-10 ft	N/A	ug/kg	42	0.593	110	2.07	340	41	1	-	27.0	27.0	1	2%	No	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	>10 ft	N/A	ug/kg	6	0.630	0.704	2.20	2.46	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	N/A	ug/kg	31	1.22	150	5.18	340	30	1	-	2.46	2.46	1	3%	No	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-3 ft	N/A	ug/kg	39	1.22	150	5.18	340	38	1	-	2.46	2.46	1	3%	No	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-10 ft	N/A	ug/kg	42	1.22	150	5.18	340	41	1	-	2.46	2.46	1	2%	No	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	>10 ft	N/A	ug/kg	6	1.30	1.45	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Pentachlorophenol	0-1 ft	N/A	ug/kg	31	2.01	430	10.4	3,400	29	2	-	11.0	32.0	2	6%	No	Yes
Soil	SVOCs	Total	Pentachlorophenol	0-3 ft	N/A	ug/kg	39	2.01	430	10.4	3,400	37	2	-	11.0	32.0	2	5%	No	Yes
Soil	SVOCs	Total	Pentachlorophenol	0-10 ft	N/A	ug/kg	42	2.01	430	10.4	3,400	40	2	-	11.0	32.0	2	5%	No	No
Soil	SVOCs	Total	Pentachlorophenol	>10 ft	N/A	ug/kg	6	2.14	2.39	11.0	12.3	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Phenol	0-1 ft	N/A	ug/kg	31	0.749	95.0	5.18	1,000	29	2	-	2.00	3.70	2	6%	No	Yes
Soil	SVOCs	Total	Phenol	0-3 ft	N/A	ug/kg	39	0.749	95.0	5.18	1,000	34	4	1	2.00	35.0	5	13%	No	Yes
Soil	SVOCs	Total	Phenol	0-10 ft	N/A	ug/kg	42	0.749	95.0	5.18	1,000	37	4	1	2.00	35.0	5	12%	No	Yes
Soil	SVOCs	Total	Phenol	>10 ft	N/A	ug/kg	6	0.797	0.890	5.51	6.15	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	2-Methylnaphthalene	0-1 ft	N/A	ug/kg	31	0.183	60.0	1.17	340	15	9	7	1.29	150	16	52%	No	Yes
Soil	SVOCs	Total	2-Methylnaphthalene	0-3 ft	N/A	ug/kg	40	0.183	60.0	1.17	340	22	10	8	1.29	150	18	45%	No	Yes
Soil	SVOCs	Total	2-Methylnaphthalene	0-10 ft	N/A	ug/kg	43	0.183	60.0	1.17	340	24	10	9	1.29	150	19	44%	No	Yes
Soil	SVOCs	Total	2-Methylnaphthalene	>10 ft	N/A	ug/kg	6	0.573	0.640	2.20	2.46	5	-	1	7.98	7.98	1	17%	Yes	--
Soil	SVOCs	Total	Acenaphthene	0-1 ft	N/A	ug/kg	31	0.531	1.00	1.23	340	6	6	19	1.50	470	25	81%	No	Yes

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(9 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	SVOCs	Total	Acenaphthene	0-3 ft	N/A	ug/kg	40	0.531	1.00	1.23	340	9	9	22	1.10	3,200	31	78%	No	Yes
Soil	SVOCs	Total	Acenaphthene	0-10 ft	N/A	ug/kg	43	0.531	1.00	1.23	340	11	9	23	1.10	3,200	32	74%	No	Yes
Soil	SVOCs	Total	Acenaphthene	>10 ft	N/A	ug/kg	6	0.565	0.631	2.20	2.46	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Acenaphthylene	0-1 ft	N/A	ug/kg	31	0.510	70.0	1.17	340	17	8	6	1.39	87.7	14	45%	No	Yes
Soil	SVOCs	Total	Acenaphthylene	0-3 ft	N/A	ug/kg	40	0.510	70.0	1.17	340	24	8	8	1.39	295	16	40%	No	Yes
Soil	SVOCs	Total	Acenaphthylene	0-10 ft	N/A	ug/kg	43	0.510	70.0	1.17	340	27	8	8	1.39	295	16	37%	No	Yes
Soil	SVOCs	Total	Acenaphthylene	>10 ft	N/A	ug/kg	6	0.649	0.725	2.20	2.46	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Anthracene	0-1 ft	N/A	ug/kg	31	0.356	0.394	1.41	340	2	4	25	1.72	832	29	94%	No	Yes
Soil	SVOCs	Total	Anthracene	0-3 ft	N/A	ug/kg	40	0.356	1.40	1.41	340	5	5	30	1.72	2,040	35	88%	No	Yes
Soil	SVOCs	Total	Anthracene	0-10 ft	N/A	ug/kg	43	0.356	1.40	1.41	340	7	5	31	1.72	2,040	36	84%	No	Yes
Soil	SVOCs	Total	Anthracene	>10 ft	N/A	ug/kg	6	0.419	0.468	2.20	2.46	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Fluorene	0-1 ft	N/A	ug/kg	31	0.573	85.0	1.23	340	8	3	20	1.69	462	23	74%	No	Yes
Soil	SVOCs	Total	Fluorene	0-3 ft	N/A	ug/kg	40	0.573	85.0	1.23	340	12	5	23	1.69	779	28	70%	No	Yes
Soil	SVOCs	Total	Fluorene	0-10 ft	N/A	ug/kg	43	0.573	85.0	1.23	340	15	5	23	1.69	779	28	65%	No	Yes
Soil	SVOCs	Total	Fluorene	>10 ft	N/A	ug/kg	6	0.712	0.795	2.20	2.46	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Phenanthrene	0-1 ft	N/A	ug/kg	31	-	-	-	-	0	-	31	5.64	4,000	31	100%	No	Yes
Soil	SVOCs	Total	Phenanthrene	0-3 ft	N/A	ug/kg	40	0.750	1.30	2.50	6.50	2	1	37	2.47	6,550	38	95%	No	Yes
Soil	SVOCs	Total	Phenanthrene	0-10 ft	N/A	ug/kg	43	0.713	1.30	2.40	6.50	4	1	38	2.47	6,550	39	91%	No	Yes
Soil	SVOCs	Total	Phenanthrene	>10 ft	N/A	ug/kg	6	0.687	0.731	2.20	2.46	5	1	-	1.82	1.82	1	17%	Yes	--
Soil	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	N/A	ug/kg	31	-	-	-	-	-	-	-	8.79	5,687	31	100%	No	Yes
Soil	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	N/A	ug/kg	40	4.56	8.10	15.1	39.0	-	-	-	6.41	13,120	38	95%	No	Yes
Soil	SVOCs	Total	Benzo(a)anthracene	0-1 ft	N/A	ug/kg	31	0.749	1.05	2.07	2.45	2	-	29	3.96	6,440	29	94%	No	Yes
Soil	SVOCs	Total	Benzo(a)anthracene	0-3 ft	N/A	ug/kg	40	0.749	1.40	2.07	6.50	5	-	35	3.96	12,300	35	88%	No	Yes
Soil	SVOCs	Total	Benzo(a)anthracene	0-10 ft	N/A	ug/kg	43	0.749	1.40	2.07	6.50	7	-	36	3.96	12,300	36	84%	No	Yes
Soil	SVOCs	Total	Benzo(a)anthracene	>10 ft	N/A	ug/kg	6	1.11	1.24	2.20	2.46	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Benzo(a)pyrene	0-1 ft	N/A	ug/kg	31	0.656	0.656	2.07	2.07	1	-	30	7.49	6,470	30	97%	No	Yes
Soil	SVOCs	Total	Benzo(a)pyrene	0-3 ft	N/A	ug/kg	40	0.656	1.60	2.07	6.50	4	-	36	7.49	11,700	36	90%	No	Yes
Soil	SVOCs	Total	Benzo(a)pyrene	0-10 ft	N/A	ug/kg	43	0.656	1.60	2.07	6.50	6	-	37	7.49	11,700	37	86%	No	Yes
Soil	SVOCs	Total	Benzo(a)pyrene	>10 ft	N/A	ug/kg	6	0.697	0.779	2.20	2.49	5	1	-	1.32	1.32	1	17%	Yes	--
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	N/A	ug/kg	13	-	-	-	-	0	-	13	25.0	4,100	13	100%	No	--
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-3 ft	N/A	ug/kg	18	2.50	2.50	6.50	6.50	1	-	17	25.0	4,100	17	94%	No	--
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-10 ft	N/A	ug/kg	18	2.50	2.50	6.50	6.50	1	-	17	25.0	4,100	17	94%	No	--
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	N/A	ug/kg	31	0.202	0.498	1.23	2.07	5	-	26	6.89	3,830	26	84%	No	Yes
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-3 ft	N/A	ug/kg	40	0.202	2.30	1.23	6.50	7	-	33	4.33	3,830	33	83%	No	Yes
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-10 ft	N/A	ug/kg	43	0.202	2.30	1.23	6.50	9	-	34	4.33	3,830	34	79%	No	Yes
Soil	SVOCs	Total	Benzo(g,h,i)perylene	>10 ft	N/A	ug/kg	6	0.530	0.592	2.20	2.46	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	N/A	ug/kg	13	-	-	10.0	10.0	0	1	12	8.30	1,400	13	100%	No	--
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-3 ft	N/A	ug/kg	18	2.50	2.50	6.50	10.0	1	1	16	8.30	1,400	17	94%	No	--
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-10 ft	N/A	ug/kg	18	2.50	2.50	6.50	10.0	1	1	16	8.30	1,400	17	94%	No	--
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-1 ft	N/A	ug/kg	18	0.939	0.939	4.14	4.14	1	-	17	10.2	12,100	17	94%	No	--
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-3 ft	N/A	ug/kg	22	0.939	1.14	4.14	5.05	2	-	20	7.70	16,300	20	91%	No	Yes
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-10 ft	N/A	ug/kg	25	0.939	1.14	4.14	5.05	4	-	21	7.70	16,300	21	84%	No	Yes
Soil	SVOCs	Total	Benzofluoranthenes, Total	>10 ft	N/A	ug/kg	6	1.06	1.11	4.41	4.98	4	2	-	2.72	2.97	2	33%	Yes	--
Soil	SVOCs	Total	Chrysene	0-1 ft	N/A	ug/kg	31	0.741	0.741	2.07	2.07	1	-	30	6.36	7,590	30	97%	No	Yes
Soil	SVOCs	Total	Chrysene	0-3 ft	N/A	ug/kg	40	0.741	0.903	2.07	6.50	3	1	36	1.80	12,000	37	93%	No	Yes
Soil	SVOCs	Total	Chrysene	0-10 ft	N/A	ug/kg	43	0.741	0.903	2.07	6.50	5	1	37	1.80	12,000	38	88%	No	Yes
Soil	SVOCs	Total	Chrysene	>10 ft	N/A	ug/kg	6	0.788	0.880	2.20	2.46	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	N/A	ug/kg	31	0.273	3.41	1.17	340	11	3	17	1.23	1,430	20	65%	No	Yes
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-3 ft	N/A	ug/kg	40	0.273	3.41	1.17	340	14	4	22	1.23	1,430	26	65%	No	Yes
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-10 ft	N/A	ug/kg	43	0.273	3.41	1.17	340	17	4	22	1.23	1,430	26	60%	No	Yes
Soil	SVOCs	Total	Dibenz(a,h)anthracene	>10 ft	N/A	ug/kg	6	0.684	0.764	2.20	2.46	6	-	-	-	-	0	0%	Yes	--
Soil	SVOCs	Total	Fluoranthene	0-1 ft	N/A	ug/kg	31	1.05	1.05	2.07	2.07	1	-	30	8.47	20,700	30	97%	No	Yes
Soil	SVOCs	Total	Fluoranthene	0-3 ft	N/A	ug/kg	40	1.05	2.20	2.07	6.50	3	-	37	6.29	28,600	37	93%	No	Yes
Soil	SVOCs	Total	Fluoranthene	0-10 ft	N/A	ug/kg	43	1.05	2.20	2.07	6.50	5	-	38	6.29	28,600	38	88%	No	Yes
Soil	SVOCs	Total	Fluoranthene	>10 ft	N/A	ug/kg	6	1.19	1.24	2.35	2.46	4	-	2	3.53	3.90	2	33%	Yes	--
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	N/A	ug/kg	31	0.286	0.472	1.23	2.07	3	-	28	3.68	3,910	28	90%	No	Yes
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-3 ft	N/A	ug/kg	40	0.286	1.90	1.23	6.50	5	-	35	3.52	4,170	35	88%	No	Yes
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-10 ft	N/A	ug/kg	43	0.286	1.90	1.23	6.50	7	-	36	3.52	4,170	36	84%	No	Yes
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	>10 ft	N/A	ug/kg	6	0.527	0.561	2.20	2.46	5	1	-	0.511	0.511	1	17%	Yes	--
Soil	SVOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	31	0.548	65.0	1.17	340	12	9	10	1.70	227	19	61%	No	Yes

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(10 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	SVOCs	Total	Naphthalene	0-3 ft	N/A	ug/kg	40	0.548	65.0	1.17	340	16	13	11	1.70	256	24	60%	No	Yes
Soil	SVOCs	Total	Naphthalene	0-10 ft	N/A	ug/kg	43	0.548	65.0	1.17	340	19	13	11	1.70	256	24	56%	No	Yes
Soil	SVOCs	Total	Naphthalene	>10 ft	N/A	ug/kg	6	0.976	1.09	2.20	2.46	5	-	1	4.24	4.24	1	17%	Yes	--
Soil	SVOCs	Total	Pyrene	0-1 ft	N/A	ug/kg	31	0.352	0.352	2.07	2.07	1	-	30	10.0	21,900	30	97%	No	Yes
Soil	SVOCs	Total	Pyrene	0-3 ft	N/A	ug/kg	40	0.352	0.429	2.07	6.50	2	1	37	2.10	32,000	38	95%	No	Yes
Soil	SVOCs	Total	Pyrene	0-10 ft	N/A	ug/kg	43	0.352	0.429	2.07	6.50	4	1	38	2.10	32,000	39	91%	No	Yes
Soil	SVOCs	Total	Pyrene	>10 ft	N/A	ug/kg	6	0.400	0.418	2.35	2.46	3	-	3	2.60	3.71	3	50%	Yes	--
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	N/A	ug/kg	31	5.46	5.46	16.6	16.6	-	-	-	37.0	72,270	30	97%	No	Yes
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	N/A	ug/kg	40	5.46	6.66	16.6	20.2	-	-	-	16.5	105,200	38	95%	No	Yes
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-1 ft	N/A	ug/kg	37	0.0443	9.40	1.13	67.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-3 ft	N/A	ug/kg	46	0.0443	1,200	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-10 ft	N/A	ug/kg	49	0.0443	1,200	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	>10 ft	N/A	ug/kg	6	0.0444	0.136	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-1 ft	N/A	ug/kg	37	0.0650	4.30	1.13	27.0	35	2	-	0.490	0.580	2	5%	No	Yes
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-3 ft	N/A	ug/kg	46	0.0650	1,800	1.13	6,200	44	2	-	0.490	0.580	2	4%	No	No
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-10 ft	N/A	ug/kg	49	0.0650	1,800	1.13	6,200	46	3	-	0.0969	0.580	3	6%	No	Yes
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	>10 ft	N/A	ug/kg	6	0.0651	0.199	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-1 ft	N/A	ug/kg	37	0.0638	7.40	1.13	27.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-3 ft	N/A	ug/kg	46	0.0638	2,500	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-10 ft	N/A	ug/kg	49	0.0638	2,500	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	>10 ft	N/A	ug/kg	6	0.0639	0.195	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,1,2-Trichloroethane	0-1 ft	N/A	ug/kg	37	0.0880	7.90	1.13	27.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,2-Trichloroethane	0-3 ft	N/A	ug/kg	46	0.0880	2,500	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,2-Trichloroethane	0-10 ft	N/A	ug/kg	49	0.0880	2,500	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,2-Trichloroethane	>10 ft	N/A	ug/kg	6	0.0901	0.275	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,1-Dichloroethane	0-1 ft	N/A	ug/kg	37	0.0480	9.30	1.13	27.0	36	1	-	0.290	0.290	1	3%	No	No
Soil	VOCs	Total	1,1-Dichloroethane	0-3 ft	N/A	ug/kg	46	0.0480	2,500	1.13	6,200	45	1	-	0.290	0.290	1	2%	No	No
Soil	VOCs	Total	1,1-Dichloroethane	0-10 ft	N/A	ug/kg	49	0.0480	2,500	1.13	6,200	48	1	-	0.290	0.290	1	2%	No	No
Soil	VOCs	Total	1,1-Dichloroethane	>10 ft	N/A	ug/kg	6	0.0573	0.175	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,1-Dichloroethene	0-1 ft	N/A	ug/kg	37	0.0700	7.30	1.13	27.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloroethene	0-3 ft	N/A	ug/kg	46	0.0700	3,000	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloroethene	0-10 ft	N/A	ug/kg	49	0.0700	3,000	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloroethene	>10 ft	N/A	ug/kg	6	0.442	1.35	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,1-Dichloropropene	0-1 ft	N/A	ug/kg	37	0.150	9.40	1.13	67.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloropropene	0-3 ft	N/A	ug/kg	46	0.150	2,500	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloropropene	0-10 ft	N/A	ug/kg	49	0.150	2,500	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloropropene	>10 ft	N/A	ug/kg	6	0.906	2.77	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-1 ft	N/A	ug/kg	37	0.108	12.0	1.13	270	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-3 ft	N/A	ug/kg	46	0.108	2,800	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-10 ft	N/A	ug/kg	49	0.108	2,800	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichlorobenzene	>10 ft	N/A	ug/kg	6	0.108	0.330	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,2,3-Trichloropropane	0-1 ft	N/A	ug/kg	37	0.0756	17.0	1.13	27.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichloropropane	0-3 ft	N/A	ug/kg	46	0.0756	2,800	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichloropropane	0-10 ft	N/A	ug/kg	49	0.0756	2,800	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichloropropane	>10 ft	N/A	ug/kg	6	0.0758	0.232	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	N/A	ug/kg	37	0.110	6.50	1.13	67.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-3 ft	N/A	ug/kg	46	0.110	1,800	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-10 ft	N/A	ug/kg	49	0.110	1,800	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,4-Trichlorobenzene	>10 ft	N/A	ug/kg	6	0.110	0.337	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	N/A	ug/kg	37	0.0478	3.70	1.13	67.0	22	15	-	0.110	0.523	15	41%	No	Yes
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-3 ft	N/A	ug/kg	46	0.0478	3.70	1.13	67.0	25	18	3	0.0980	14,300	21	46%	No	Yes
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-10 ft	N/A	ug/kg	49	0.0478	3.70	1.13	67.0	28	18	3	0.0980	14,300	21	43%	No	Yes
Soil	VOCs	Total	1,2,4-Trimethylbenzene	>10 ft	N/A	ug/kg	6	0.0479	0.146	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-1 ft	N/A	ug/kg	37	0.135	140	1.13	270	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-3 ft	N/A	ug/kg	46	0.135	3,800	1.13	12,000	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-10 ft	N/A	ug/kg	49	0.135	3,800	1.13	12,000	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	>10 ft	N/A	ug/kg	6	0.135	0.413	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-1 ft	N/A	ug/kg	37	0.0575	6.90	1.13	27.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-3 ft	N/A	ug/kg	46	0.0575	1,800	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-10 ft	N/A	ug/kg	49	0.0575	1,800	1.13	6,200	49	-	-	-	-	0	0%	No	No

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(11 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	>10 ft	N/A	ug/kg	6	0.0576	0.176	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,2-Dichlorobenzene	0-1 ft	N/A	ug/kg	37	0.0575	6.60	1.13	27.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichlorobenzene	0-3 ft	N/A	ug/kg	46	0.0575	2,500	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichlorobenzene	0-10 ft	N/A	ug/kg	49	0.0575	2,500	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichlorobenzene	>10 ft	N/A	ug/kg	6	0.0576	0.176	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-1 ft	N/A	ug/kg	37	0.0540	9.70	1.13	27.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-3 ft	N/A	ug/kg	46	0.0540	1,800	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-10 ft	N/A	ug/kg	49	0.0540	1,800	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	>10 ft	N/A	ug/kg	6	0.0879	0.269	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,2-Dichloropropane	0-1 ft	N/A	ug/kg	37	0.0428	11.0	1.13	27.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloropropane	0-3 ft	N/A	ug/kg	46	0.0428	2,500	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloropropane	0-10 ft	N/A	ug/kg	49	0.0428	2,500	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloropropane	>10 ft	N/A	ug/kg	6	0.0429	0.131	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	N/A	ug/kg	37	0.0400	6.50	1.13	67.0	32	5	-	0.0435	0.125	5	14%	No	Yes
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-3 ft	N/A	ug/kg	46	0.0400	6.50	1.13	67.0	38	6	2	0.0435	6,500	8	17%	No	Yes
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-10 ft	N/A	ug/kg	49	0.0400	6.50	1.13	67.0	41	6	2	0.0435	6,500	8	16%	No	Yes
Soil	VOCs	Total	1,3,5-Trimethylbenzene	>10 ft	N/A	ug/kg	6	0.0432	0.132	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,3-Dichlorobenzene	0-1 ft	N/A	ug/kg	37	0.0391	6.10	1.13	27.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3-Dichlorobenzene	0-3 ft	N/A	ug/kg	46	0.0391	1,800	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3-Dichlorobenzene	0-10 ft	N/A	ug/kg	49	0.0391	1,800	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3-Dichlorobenzene	>10 ft	N/A	ug/kg	6	0.0391	0.120	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,3-Dichloropropane	0-1 ft	N/A	ug/kg	37	0.0590	5.30	1.13	67.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3-Dichloropropane	0-3 ft	N/A	ug/kg	46	0.0590	2,500	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3-Dichloropropane	0-10 ft	N/A	ug/kg	49	0.0590	2,500	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3-Dichloropropane	>10 ft	N/A	ug/kg	6	0.0608	0.186	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	N/A	ug/kg	37	0.0551	5.70	1.13	27.0	36	1	-	0.160	0.160	1	3%	No	No
Soil	VOCs	Total	1,4-Dichlorobenzene	0-3 ft	N/A	ug/kg	46	0.0551	2,500	1.13	6,200	44	2	-	0.140	0.160	2	4%	No	No
Soil	VOCs	Total	1,4-Dichlorobenzene	0-10 ft	N/A	ug/kg	49	0.0551	2,500	1.13	6,200	47	2	-	0.140	0.160	2	4%	No	No
Soil	VOCs	Total	1,4-Dichlorobenzene	>10 ft	N/A	ug/kg	6	0.0552	0.169	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	2,2-Dichloropropane	0-1 ft	N/A	ug/kg	37	0.0763	9.50	1.13	67.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2,2-Dichloropropane	0-3 ft	N/A	ug/kg	46	0.0763	1,500	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2,2-Dichloropropane	0-10 ft	N/A	ug/kg	49	0.0763	1,500	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2,2-Dichloropropane	>10 ft	N/A	ug/kg	6	0.0765	0.234	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	2-Butanone (MEK)	0-1 ft	N/A	ug/kg	37	1.60	290	8.89	540	21	10	6	4.90	50.0	16	43%	No	Yes
Soil	VOCs	Total	2-Butanone (MEK)	0-3 ft	N/A	ug/kg	46	1.60	12,000	7.08	31,000	27	13	6	2.30	50.0	19	41%	No	Yes
Soil	VOCs	Total	2-Butanone (MEK)	0-10 ft	N/A	ug/kg	49	1.60	12,000	7.08	31,000	30	13	6	2.30	50.0	19	39%	No	Yes
Soil	VOCs	Total	2-Butanone (MEK)	>10 ft	N/A	ug/kg	6	2.08	6.34	5.67	17.3	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	2-Chlorotoluene	0-1 ft	N/A	ug/kg	37	0.0490	4.90	1.13	270	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2-Chlorotoluene	0-3 ft	N/A	ug/kg	46	0.0490	1,800	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2-Chlorotoluene	0-10 ft	N/A	ug/kg	49	0.0490	1,800	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2-Chlorotoluene	>10 ft	N/A	ug/kg	6	0.0491	0.150	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	2-Hexanone	0-1 ft	N/A	ug/kg	37	0.780	170	5.66	2,700	34	3	-	4.70	8.80	3	8%	No	Yes
Soil	VOCs	Total	2-Hexanone	0-3 ft	N/A	ug/kg	46	0.780	7,500	5.66	31,000	43	3	-	4.70	8.80	3	7%	No	Yes
Soil	VOCs	Total	2-Hexanone	0-10 ft	N/A	ug/kg	49	0.780	7,500	5.66	31,000	46	3	-	4.70	8.80	3	6%	No	Yes
Soil	VOCs	Total	2-Hexanone	>10 ft	N/A	ug/kg	6	1.24	3.78	5.67	17.3	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	4-Chlorotoluene	0-1 ft	N/A	ug/kg	37	0.0920	5.50	1.13	270	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	4-Chlorotoluene	0-3 ft	N/A	ug/kg	46	0.0920	1,800	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	4-Chlorotoluene	0-10 ft	N/A	ug/kg	49	0.0920	1,800	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	4-Chlorotoluene	>10 ft	N/A	ug/kg	6	0.0939	0.287	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	4-Isopropyltoluene	0-1 ft	N/A	ug/kg	37	0.0766	6.10	1.37	270	23	13	1	0.0833	12.0	14	38%	No	Yes
Soil	VOCs	Total	4-Isopropyltoluene	0-3 ft	N/A	ug/kg	46	0.0766	1,800	1.37	6,200	29	15	2	0.0833	161	17	37%	No	Yes
Soil	VOCs	Total	4-Isopropyltoluene	0-10 ft	N/A	ug/kg	49	0.0676	1,800	1.21	6,200	32	15	2	0.0833	161	17	35%	No	Yes
Soil	VOCs	Total	4-Isopropyltoluene	>10 ft	N/A	ug/kg	6	0.0634	0.194	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	N/A	ug/kg	37	0.240	460	5.66	2,700	28	9	-	0.330	1.20	9	24%	No	Yes
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-3 ft	N/A	ug/kg	46	0.240	10,000	5.66	31,000	37	9	-	0.330	1.20	9	20%	No	Yes
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-10 ft	N/A	ug/kg	49	0.240	10,000	5.66	31,000	40	9	-	0.330	1.20	9	18%	No	Yes
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	>10 ft	N/A	ug/kg	6	0.719	2.20	5.67	17.3	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Acetone	0-1 ft	N/A	ug/kg	37	15.0	389	19.0	810	19	1	17	7.90	540	18	49%	No	Yes
Soil	VOCs	Total	Acetone	0-3 ft	N/A	ug/kg	46	15.0	10,000	19.0	31,000	23	4	19	7.90	540	23	50%	No	Yes
Soil	VOCs	Total	Acetone	0-10 ft	N/A	ug/kg	49	7.77	10,000	7.77	31,000	26	4	19	7.90	540	23	47%	No	Yes

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(12 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	VOCs	Total	Acetone	>10 ft	N/A	ug/kg	6	2.93	35.8	5.67	35.8	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Benzene	0-1 ft	N/A	ug/kg	37	0.220	5.70	1.13	27.0	22	15	-	0.160	1.20	15	41%	No	Yes
Soil	VOCs	Total	Benzene	0-3 ft	N/A	ug/kg	46	0.140	2,500	1.13	6,200	29	17	-	0.160	1.20	17	37%	No	Yes
Soil	VOCs	Total	Benzene	0-10 ft	N/A	ug/kg	49	0.140	2,500	1.13	6,200	30	19	-	0.160	1.20	19	39%	No	Yes
Soil	VOCs	Total	Benzene	>10 ft	N/A	ug/kg	6	1.13	3.33	1.13	3.47	5	1	-	0.631	0.631	1	17%	Yes	--
Soil	VOCs	Total	Bromobenzene	0-1 ft	N/A	ug/kg	37	0.0450	8.20	1.13	270	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromobenzene	0-3 ft	N/A	ug/kg	46	0.0450	1,800	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromobenzene	0-10 ft	N/A	ug/kg	49	0.0450	1,800	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromobenzene	>10 ft	N/A	ug/kg	6	0.0450	0.138	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Bromochloromethane	0-1 ft	N/A	ug/kg	37	0.0519	9.40	1.13	67.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromochloromethane	0-3 ft	N/A	ug/kg	46	0.0519	1,900	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromochloromethane	0-10 ft	N/A	ug/kg	49	0.0519	1,900	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromochloromethane	>10 ft	N/A	ug/kg	6	0.0520	0.159	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Bromodichloromethane	0-1 ft	N/A	ug/kg	37	0.0440	6.20	1.13	67.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromodichloromethane	0-3 ft	N/A	ug/kg	46	0.0440	2,500	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromodichloromethane	0-10 ft	N/A	ug/kg	49	0.0440	2,500	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromodichloromethane	>10 ft	N/A	ug/kg	6	0.0701	0.214	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Bromoform	0-1 ft	N/A	ug/kg	37	0.0701	13.0	1.13	67.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromoform	0-3 ft	N/A	ug/kg	46	0.0701	2,500	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromoform	0-10 ft	N/A	ug/kg	49	0.0701	2,500	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromoform	>10 ft	N/A	ug/kg	6	0.0702	0.215	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Bromomethane	0-1 ft	N/A	ug/kg	37	0.397	29.0	1.13	67.0	30	7	-	0.480	5.00	7	19%	No	Yes
Soil	VOCs	Total	Bromomethane	0-3 ft	N/A	ug/kg	46	0.397	6,200	1.13	12,000	38	8	-	0.480	5.00	8	17%	No	Yes
Soil	VOCs	Total	Bromomethane	0-10 ft	N/A	ug/kg	49	0.397	6,200	1.13	12,000	41	8	-	0.480	5.00	8	16%	No	Yes
Soil	VOCs	Total	Bromomethane	>10 ft	N/A	ug/kg	6	0.398	1.22	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Carbon Disulfide	0-1 ft	N/A	ug/kg	37	0.313	7.40	1.13	27.0	18	18	1	0.180	6.90	19	51%	No	Yes
Soil	VOCs	Total	Carbon Disulfide	0-3 ft	N/A	ug/kg	46	0.313	2,500	1.13	6,200	22	23	1	0.180	6.90	24	52%	No	Yes
Soil	VOCs	Total	Carbon Disulfide	0-10 ft	N/A	ug/kg	49	0.313	2,500	1.13	6,200	25	23	1	0.180	6.90	24	49%	No	Yes
Soil	VOCs	Total	Carbon Disulfide	>10 ft	N/A	ug/kg	6	0.313	3.16	1.13	3.47	5	1	-	1.04	1.04	1	17%	Yes	--
Soil	VOCs	Total	Carbon Tetrachloride	0-1 ft	N/A	ug/kg	37	0.0780	11.0	1.13	27.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Carbon Tetrachloride	0-3 ft	N/A	ug/kg	46	0.0780	1,500	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Carbon Tetrachloride	0-10 ft	N/A	ug/kg	49	0.0780	1,500	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Carbon Tetrachloride	>10 ft	N/A	ug/kg	6	0.0955	0.292	1.13	3.47	5	1	-	0.528	0.528	1	17%	Yes	--
Soil	VOCs	Total	Chlorobenzene	0-1 ft	N/A	ug/kg	37	0.0503	6.60	1.13	27.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chlorobenzene	0-3 ft	N/A	ug/kg	46	0.0503	2,500	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chlorobenzene	0-10 ft	N/A	ug/kg	49	0.0503	2,500	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chlorobenzene	>10 ft	N/A	ug/kg	6	0.0504	0.154	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Chloroethane	0-1 ft	N/A	ug/kg	37	0.300	24.0	1.13	67.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chloroethane	0-3 ft	N/A	ug/kg	46	0.300	6,200	1.13	12,000	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chloroethane	0-10 ft	N/A	ug/kg	49	0.300	6,200	1.13	12,000	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chloroethane	>10 ft	N/A	ug/kg	6	0.650	1.99	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Chloroform	0-1 ft	N/A	ug/kg	37	0.0480	1.00	1.13	41.0	34	3	-	0.260	19.0	3	8%	No	Yes
Soil	VOCs	Total	Chloroform	0-3 ft	N/A	ug/kg	46	0.0480	1,800	1.13	6,200	43	3	-	0.260	19.0	3	7%	No	Yes
Soil	VOCs	Total	Chloroform	0-10 ft	N/A	ug/kg	49	0.0480	1,800	1.13	6,200	46	3	-	0.260	19.0	3	6%	No	Yes
Soil	VOCs	Total	Chloroform	>10 ft	N/A	ug/kg	6	0.0603	0.184	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Chloromethane	0-1 ft	N/A	ug/kg	37	0.0570	8.70	1.13	67.0	35	2	-	0.230	0.250	2	5%	No	Yes
Soil	VOCs	Total	Chloromethane	0-3 ft	N/A	ug/kg	46	0.0570	5,000	1.13	12,000	44	2	-	0.230	0.250	2	4%	No	No
Soil	VOCs	Total	Chloromethane	0-10 ft	N/A	ug/kg	49	0.0570	5,000	1.13	12,000	47	2	-	0.230	0.250	2	4%	No	No
Soil	VOCs	Total	Chloromethane	>10 ft	N/A	ug/kg	6	0.397	1.21	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	37	0.0810	2.00	1.13	27.0	36	1	-	12.0	12.0	1	3%	No	No
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-3 ft	N/A	ug/kg	46	0.0810	2,500	1.13	6,200	44	1	1	12.0	120	2	4%	No	No
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-10 ft	N/A	ug/kg	49	0.0810	2,500	1.13	6,200	45	1	3	4.95	120	4	8%	No	Yes
Soil	VOCs	Total	cis-1,2-Dichloroethene	>10 ft	N/A	ug/kg	6	0.102	0.300	1.13	3.47	3	3	-	0.410	1.54	3	50%	Yes	--
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-1 ft	N/A	ug/kg	37	0.0310	8.30	1.13	67.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-3 ft	N/A	ug/kg	46	0.0310	2,500	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-10 ft	N/A	ug/kg	49	0.0310	2,500	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	cis-1,3-Dichloropropene	>10 ft	N/A	ug/kg	6	0.0414	0.127	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Dibromochloromethane	0-1 ft	N/A	ug/kg	37	0.0730	9.10	1.13	67.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dibromochloromethane	0-3 ft	N/A	ug/kg	46	0.0730	2,500	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dibromochloromethane	0-10 ft	N/A	ug/kg	49	0.0730	2,500	1.13	6,200	49	-	-	-	-	0	0%	No	No

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(13 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	VOCs	Total	Dibromochloromethane	>10 ft	N/A	ug/kg	6	0.0732	0.224	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Dibromomethane	0-1 ft	N/A	ug/kg	37	0.0734	18.0	1.13	27.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dibromomethane	0-3 ft	N/A	ug/kg	46	0.0734	2,800	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dibromomethane	0-10 ft	N/A	ug/kg	49	0.0734	2,800	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dibromomethane	>10 ft	N/A	ug/kg	6	0.0735	0.225	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Dichlorodifluoromethane	0-1 ft	N/A	ug/kg	37	0.0463	1.00	1.13	10.0	33	2	2	0.260	94.0	4	11%	No	Yes
Soil	VOCs	Total	Dichlorodifluoromethane	0-3 ft	N/A	ug/kg	46	0.0463	4,200	1.13	12,000	42	2	2	0.260	94.0	4	9%	No	Yes
Soil	VOCs	Total	Dichlorodifluoromethane	0-10 ft	N/A	ug/kg	49	0.0463	4,200	1.13	12,000	44	3	2	0.0850	94.0	5	10%	No	Yes
Soil	VOCs	Total	Dichlorodifluoromethane	>10 ft	N/A	ug/kg	6	0.129	0.142	1.13	3.54	2	4	-	0.0630	0.467	4	67%	Yes	--
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	N/A	ug/kg	37	0.140	5.38	1.47	14.0	25	11	1	0.240	460	12	32%	No	Yes
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-3 ft	N/A	ug/kg	46	0.140	1,200	1.47	6,200	29	16	1	0.240	460	17	37%	No	Yes
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-10 ft	N/A	ug/kg	49	0.140	1,200	1.47	6,200	32	16	1	0.240	460	17	35%	No	Yes
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	>10 ft	N/A	ug/kg	6	0.186	2.50	1.13	3.47	4	1	1	1.14	13.8	2	33%	Yes	--
Soil	VOCs	Total	Ethylbenzene	0-1 ft	N/A	ug/kg	37	0.0410	6.10	1.13	27.0	29	8	-	0.0720	0.320	8	22%	No	Yes
Soil	VOCs	Total	Ethylbenzene	0-3 ft	N/A	ug/kg	46	0.0410	1,800	1.13	6,200	36	9	1	0.0720	37.4	10	22%	No	Yes
Soil	VOCs	Total	Ethylbenzene	0-10 ft	N/A	ug/kg	49	0.0384	1,800	1.13	6,200	39	9	1	0.0720	37.4	10	20%	No	Yes
Soil	VOCs	Total	Ethylbenzene	>10 ft	N/A	ug/kg	6	1.13	3.47	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Hexachlorobutadiene	0-1 ft	N/A	ug/kg	37	0.0664	15.0	1.13	67.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Hexachlorobutadiene	0-3 ft	N/A	ug/kg	46	0.0664	1,800	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Hexachlorobutadiene	0-10 ft	N/A	ug/kg	49	0.0664	1,800	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Hexachlorobutadiene	>10 ft	N/A	ug/kg	6	0.0665	0.203	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Isopropylbenzene	0-1 ft	N/A	ug/kg	37	0.0310	6.10	1.13	67.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Isopropylbenzene	0-3 ft	N/A	ug/kg	46	0.0310	3,000	1.13	6,200	45	-	1	47.3	47.3	1	2%	No	No
Soil	VOCs	Total	Isopropylbenzene	0-10 ft	N/A	ug/kg	49	0.0310	3,000	1.13	6,200	48	-	1	47.3	47.3	1	2%	No	No
Soil	VOCs	Total	Isopropylbenzene	>10 ft	N/A	ug/kg	6	0.0423	0.129	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	m,p-Xylenes	0-1 ft	N/A	ug/kg	37	0.0930	13.0	2.26	54.0	29	8	-	0.140	0.440	8	22%	No	Yes
Soil	VOCs	Total	m,p-Xylenes	0-3 ft	N/A	ug/kg	46	0.0930	13.0	2.26	54.0	35	9	2	0.140	7,400	11	24%	No	Yes
Soil	VOCs	Total	m,p-Xylenes	0-10 ft	N/A	ug/kg	49	0.0930	13.0	2.26	54.0	38	9	2	0.140	7,400	11	22%	No	Yes
Soil	VOCs	Total	m,p-Xylenes	>10 ft	N/A	ug/kg	6	0.281	6.93	2.27	6.93	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	37	0.320	7.90	1.13	270	29	8	-	0.450	1.50	8	22%	No	Yes
Soil	VOCs	Total	Naphthalene	0-3 ft	N/A	ug/kg	46	0.320	2,500	1.13	6,200	35	10	1	0.450	19.5	11	24%	No	Yes
Soil	VOCs	Total	Naphthalene	0-10 ft	N/A	ug/kg	49	0.320	2,500	1.13	6,200	38	10	1	0.450	19.5	11	22%	No	Yes
Soil	VOCs	Total	Naphthalene	>10 ft	N/A	ug/kg	6	0.467	1.43	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	n-Butylbenzene	0-1 ft	N/A	ug/kg	37	0.0880	6.50	1.13	270	36	1	-	0.0920	0.0920	1	3%	No	No
Soil	VOCs	Total	n-Butylbenzene	0-3 ft	N/A	ug/kg	46	0.0880	1,800	1.13	6,200	45	1	-	0.0920	0.0920	1	2%	No	No
Soil	VOCs	Total	n-Butylbenzene	0-10 ft	N/A	ug/kg	49	0.0880	1,800	1.13	6,200	48	1	-	0.0920	0.0920	1	2%	No	No
Soil	VOCs	Total	n-Butylbenzene	>10 ft	N/A	ug/kg	6	0.105	0.321	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	n-Propylbenzene	0-1 ft	N/A	ug/kg	37	0.0531	5.70	1.13	270	36	1	-	0.150	0.150	1	3%	No	No
Soil	VOCs	Total	n-Propylbenzene	0-3 ft	N/A	ug/kg	46	0.0531	2,800	1.13	6,200	43	2	1	0.150	122	3	7%	No	Yes
Soil	VOCs	Total	n-Propylbenzene	0-10 ft	N/A	ug/kg	49	0.0531	2,800	1.13	6,200	46	2	1	0.150	122	3	6%	No	Yes
Soil	VOCs	Total	n-Propylbenzene	>10 ft	N/A	ug/kg	6	0.0532	0.163	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	o-Xylene	0-1 ft	N/A	ug/kg	37	0.0411	6.90	1.13	27.0	35	2	-	0.170	0.180	2	5%	No	Yes
Soil	VOCs	Total	o-Xylene	0-3 ft	N/A	ug/kg	46	0.0411	6.90	1.13	6,200	41	4	1	0.170	3,200	5	11%	No	Yes
Soil	VOCs	Total	o-Xylene	0-10 ft	N/A	ug/kg	49	0.0411	6.90	1.13	6,200	44	4	1	0.170	3,200	5	10%	No	Yes
Soil	VOCs	Total	o-Xylene	>10 ft	N/A	ug/kg	6	1.13	3.33	1.13	3.47	5	1	-	0.184	0.184	1	17%	Yes	--
Soil	VOCs	Total	sec-Butylbenzene	0-1 ft	N/A	ug/kg	37	0.0442	6.50	1.13	270	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	sec-Butylbenzene	0-3 ft	N/A	ug/kg	46	0.0442	1,800	1.13	6,200	44	1	1	0.435	90.2	2	4%	No	No
Soil	VOCs	Total	sec-Butylbenzene	0-10 ft	N/A	ug/kg	49	0.0442	1,800	1.13	6,200	47	1	1	0.435	90.2	2	4%	No	No
Soil	VOCs	Total	sec-Butylbenzene	>10 ft	N/A	ug/kg	6	0.0442	0.135	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Styrene	0-1 ft	N/A	ug/kg	37	0.0403	6.10	1.13	27.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Styrene	0-3 ft	N/A	ug/kg	46	0.0340	2,500	1.13	12,000	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Styrene	0-10 ft	N/A	ug/kg	49	0.0340	2,500	1.13	12,000	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Styrene	>10 ft	N/A	ug/kg	6	0.0272	2.32	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	tert-Butylbenzene	0-1 ft	N/A	ug/kg	37	0.0273	4.30	1.13	270	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	tert-Butylbenzene	0-3 ft	N/A	ug/kg	46	0.0273	1,800	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	tert-Butylbenzene	0-10 ft	N/A	ug/kg	49	0.0273	1,800	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	tert-Butylbenzene	>10 ft	N/A	ug/kg	6	0.0273	0.0836	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	N/A	ug/kg	37	0.114	8.30	1.13	67.0	35	2	-	0.162	3.10	2	5%	No	Yes
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-3 ft	N/A	ug/kg	46	0.114	8.30	1.13	67.0	41	2	3	0.162	420,000	5	11%	No	Yes
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-10 ft	N/A	ug/kg	49	0.114	8.30	1.13	67.0	41	3	5	0.162	420,000	8	16%	No	Yes

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(14 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	VOCs	Total	Tetrachloroethene (PCE)	>10 ft	N/A	ug/kg	6	0.234	0.350	1.13	3.47	4	2	-	0.235	0.437	2	33%	Yes	--
Soil	VOCs	Total	Toluene	0-1 ft	N/A	ug/kg	37	0.0440	6.10	1.13	27.0	19	18	-	0.240	5.80	18	49%	No	Yes
Soil	VOCs	Total	Toluene	0-3 ft	N/A	ug/kg	46	0.0440	6.10	1.13	27.0	20	24	2	0.110	39,000	26	57%	No	Yes
Soil	VOCs	Total	Toluene	0-10 ft	N/A	ug/kg	49	0.0440	6.10	1.13	27.0	23	24	2	0.110	39,000	26	53%	No	Yes
Soil	VOCs	Total	Toluene	>10 ft	N/A	ug/kg	6	1.13	3.33	1.13	3.33	5	-	1	5.20	5.20	1	17%	Yes	--
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	37	0.0480	9.90	1.13	27.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-3 ft	N/A	ug/kg	46	0.0480	3,000	1.13	6,200	45	-	1	2.28	2.28	1	2%	No	No
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-10 ft	N/A	ug/kg	49	0.0480	3,000	1.13	6,200	48	-	1	2.28	2.28	1	2%	No	No
Soil	VOCs	Total	trans-1,2-Dichloroethene	>10 ft	N/A	ug/kg	6	0.284	0.867	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-1 ft	N/A	ug/kg	37	0.0513	12.0	1.13	67.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-3 ft	N/A	ug/kg	46	0.0513	1,800	1.13	6,200	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-10 ft	N/A	ug/kg	49	0.0513	1,800	1.13	6,200	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	trans-1,3-Dichloropropene	>10 ft	N/A	ug/kg	6	0.0514	0.157	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Trichloroethene (TCE)	0-1 ft	N/A	ug/kg	37	0.0440	13.0	1.13	27.0	33	4	-	0.0614	0.171	4	11%	No	Yes
Soil	VOCs	Total	Trichloroethene (TCE)	0-3 ft	N/A	ug/kg	46	0.0440	13.0	1.13	6,200	39	6	1	0.0614	6,080	7	15%	No	Yes
Soil	VOCs	Total	Trichloroethene (TCE)	0-10 ft	N/A	ug/kg	49	0.0440	13.0	1.13	6,200	39	7	3	0.0450	6,080	10	20%	No	Yes
Soil	VOCs	Total	Trichloroethene (TCE)	>10 ft	N/A	ug/kg	6	-	-	1.13	3.54	0	6	-	0.0809	0.374	6	100%	Yes	--
Soil	VOCs	Total	Trichlorofluoromethane	0-1 ft	N/A	ug/kg	37	0.0540	11.0	1.13	67.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Trichlorofluoromethane	0-3 ft	N/A	ug/kg	46	0.0540	1,800	1.13	12,000	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Trichlorofluoromethane	0-10 ft	N/A	ug/kg	49	0.0540	1,800	1.13	12,000	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Trichlorofluoromethane	>10 ft	N/A	ug/kg	6	0.397	1.21	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Vinyl Acetate	0-1 ft	N/A	ug/kg	37	0.600	52.0	5.66	670	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Vinyl Acetate	0-3 ft	N/A	ug/kg	46	0.600	6,200	5.66	12,000	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Vinyl Acetate	0-10 ft	N/A	ug/kg	49	0.600	6,200	5.66	12,000	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Vinyl Acetate	>10 ft	N/A	ug/kg	6	1.15	3.50	5.67	17.3	6	-	-	-	-	0	0%	Yes	--
Soil	VOCs	Total	Vinyl Chloride	0-1 ft	N/A	ug/kg	37	0.0570	13.0	1.13	27.0	37	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Vinyl Chloride	0-3 ft	N/A	ug/kg	46	0.0570	3,800	1.13	12,000	46	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Vinyl Chloride	0-10 ft	N/A	ug/kg	49	0.0570	3,800	1.13	12,000	49	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Vinyl Chloride	>10 ft	N/A	ug/kg	6	0.211	0.645	1.13	3.47	6	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	Metals	Total	Aluminum	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	8,050	13,000	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Antimony	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	0.220	0.340	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Arsenic	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	5.91	5.94	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Barium	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	75.8	108	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Beryllium	0-1 ft	N/A	mg/kg	2	-	-	0.740	1.23	0	2	-	0.240	0.350	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Cadmium	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	0.458	1.06	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Chromium	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	108	162	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Cobalt	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	10.9	13.4	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Copper	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	46.4	71.6	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Lead	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	302	319	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Manganese	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	369	479	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Mercury	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	0.0330	0.0390	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Nickel	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	57.5	74.9	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Selenium	0-1 ft	N/A	mg/kg	2	-	-	1.50	2.50	0	2	-	0.500	0.650	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Silver	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	0.127	0.175	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Thallium	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	0.0670	0.117	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Vanadium	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	59.3	69.8	2	100%	Yes	--
Erodible Soil Subset	Metals	Total	Zinc	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	123	203	2	100%	Yes	--
Erodible Soil Subset	Butyltins	Total	Dibutyltin	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	6.70	9.10	2	100%	Yes	--
Erodible Soil Subset	Butyltins	Total	Monobutyltin	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	3.20	8.25	2	100%	Yes	--
Erodible Soil Subset	Butyltins	Total	Tributyltin	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	3.20	12.8	2	100%	Yes	--
Erodible Soil Subset	Pesticides	Total	4,4'-DDD	0-1 ft	N/A	ug/kg	2	0.110	0.300	0.630	0.660	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	Pesticides	Total	4,4'-DDE	0-1 ft	N/A	ug/kg	2	-	-	0.660	0.710	0	2	-	0.250	0.440	2	100%	Yes	--
Erodible Soil Subset	Pesticides	Total	4,4'-DDT	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	4.40	10.0	2	100%	Yes	--
Erodible Soil Subset	Pesticides	Total	Aldrin	0-1 ft	N/A	ug/kg	2	0.160	0.160	0.630	0.660	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	Pesticides	Total	BHC (alpha)	0-1 ft	N/A	ug/kg	2	0.110	0.110	0.630	0.660	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	Pesticides	Total	BHC (beta)	0-1 ft	N/A	ug/kg	2	0.180	0.660	0.630	0.660	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	Pesticides	Total	BHC (delta)	0-1 ft	N/A	ug/kg	2	0.140	0.140	0.630	0.660	1	1	-	0.0780	0.0780	1	50%	Yes	--
Erodible Soil Subset	Pesticides	Total	BHC (gamma) Lindane	0-1 ft	N/A	ug/kg	2	0.0800	1.30	0.630	1.30	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	Pesticides	Total	Chlordane (alpha)	0-1 ft	N/A	ug/kg	2	0.100	0.100	0.630	0.660	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	Pesticides	Total	Chlordane (gamma)	0-1 ft	N/A	ug/kg	2	0.630	0.660	0.630	0.660	2	-	-	-	-	0	0%	Yes	--

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(15 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Erodible Soil Subset	Pesticides	Total	Dieldrin	0-1 ft	N/A	ug/kg	2	0.140	0.810	0.630	0.810	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	Pesticides	Total	Endosulfan I	0-1 ft	N/A	ug/kg	2	0.110	0.660	0.630	0.660	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	Pesticides	Total	Endosulfan II	0-1 ft	N/A	ug/kg	2	0.140	0.140	0.630	0.660	1	1	-	0.240	0.240	1	50%	Yes	--
Erodible Soil Subset	Pesticides	Total	Endosulfan Sulfate	0-1 ft	N/A	ug/kg	2	0.110	0.110	0.630	0.630	1	-	1	0.770	0.770	1	50%	Yes	--
Erodible Soil Subset	Pesticides	Total	Endrin Aldehyde	0-1 ft	N/A	ug/kg	2	0.630	0.700	0.630	0.700	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	Pesticides	Total	Endrin Ketone	0-1 ft	N/A	ug/kg	2	0.630	2.90	0.630	2.90	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	Pesticides	Total	Endrin	0-1 ft	N/A	ug/kg	2	0.0940	0.660	0.630	0.660	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	Pesticides	Total	Heptachlor Epoxide	0-1 ft	N/A	ug/kg	2	0.0840	0.180	0.630	0.660	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	Pesticides	Total	Heptachlor	0-1 ft	N/A	ug/kg	2	-	-	0.660	0.710	0	2	-	0.185	0.380	2	100%	Yes	--
Erodible Soil Subset	Pesticides	Total	Methoxychlor	0-1 ft	N/A	ug/kg	2	0.630	1.50	0.630	1.50	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	Pesticides	Total	Toxaphene	0-1 ft	N/A	ug/kg	2	43.0	190	43.0	190	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1016	0-1 ft	N/A	ug/kg	2	2.10	2.10	6.30	6.60	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1221	0-1 ft	N/A	ug/kg	2	2.10	2.10	13.0	14.0	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1232	0-1 ft	N/A	ug/kg	2	2.10	2.10	6.30	6.60	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1242	0-1 ft	N/A	ug/kg	2	2.10	2.10	6.30	6.60	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1248	0-1 ft	N/A	ug/kg	2	2.10	2.10	6.30	6.60	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1254	0-1 ft	N/A	ug/kg	2	2.10	2.10	6.30	6.60	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1260	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	27.0	67.0	2	100%	Yes	--
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1262	0-1 ft	N/A	ug/kg	2	2.10	2.10	6.30	6.60	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1268	0-1 ft	N/A	ug/kg	2	2.10	2.10	6.30	6.60	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	N/A	ug/kg	2	-	-	-	-	-	-	-	29.1	69.1	2	100%	Yes	--
Erodible Soil Subset	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	N/A	mg/kg	2	-	-	36.0	36.0	0	1	1	33.0	69.0	2	100%	Yes	--
Erodible Soil Subset	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	N/A	mg/kg	2	-	-	-	-	0	-	2	400	1,000	2	100%	Yes	--
Erodible Soil Subset	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	N/A	mg/kg	8	1.50	1.50	3.30	5.00	4	4	-	1.80	3.20	4	50%	No	--
Erodible Soil Subset	SVOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	N/A	ug/kg	2	38.0	75.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	1,2-Dichlorobenzene	0-1 ft	N/A	ug/kg	2	33.0	65.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	1,3-Dichlorobenzene	0-1 ft	N/A	ug/kg	2	40.0	80.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	1,4-Dichlorobenzene	0-1 ft	N/A	ug/kg	2	48.0	95.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	2,4,5-Trichlorophenol	0-1 ft	N/A	ug/kg	2	75.0	150	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	2,4,6-Trichlorophenol	0-1 ft	N/A	ug/kg	2	45.0	90.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	2,4-Dichlorophenol	0-1 ft	N/A	ug/kg	2	45.0	90.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	2,4-Dimethylphenol	0-1 ft	N/A	ug/kg	2	140	280	780	1,700	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	2,4-Dinitrophenol	0-1 ft	N/A	ug/kg	2	900	1,800	3,200	6,700	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	2,4-Dinitrotoluene	0-1 ft	N/A	ug/kg	2	70.0	140	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	2,6-Dinitrotoluene	0-1 ft	N/A	ug/kg	2	70.0	140	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	2-Chloronaphthalene	0-1 ft	N/A	ug/kg	2	90.0	180	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	2-Chlorophenol	0-1 ft	N/A	ug/kg	2	43.0	85.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	2-Methylphenol	0-1 ft	N/A	ug/kg	2	85.0	170	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	2-Nitroaniline	0-1 ft	N/A	ug/kg	2	68.0	140	320	670	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	2-Nitrophenol	0-1 ft	N/A	ug/kg	2	65.0	130	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	3,3'-Dichlorobenzidine	0-1 ft	N/A	ug/kg	2	93.0	190	1,600	3,400	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	3-Nitroaniline	0-1 ft	N/A	ug/kg	2	65.0	130	320	670	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-1 ft	N/A	ug/kg	2	43.0	85.0	1,600	3,400	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-1 ft	N/A	ug/kg	2	35.0	70.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	4-Chloro-3-methylphenol	0-1 ft	N/A	ug/kg	2	53.0	110	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	4-Chloroaniline	0-1 ft	N/A	ug/kg	2	53.0	110	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-1 ft	N/A	ug/kg	2	50.0	100	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	4-Nitroaniline	0-1 ft	N/A	ug/kg	2	85.0	170	320	670	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	4-Nitrophenol	0-1 ft	N/A	ug/kg	2	750	1,500	1,600	3,400	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Aniline	0-1 ft	N/A	ug/kg	2	38.0	75.0	320	670	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Benzoic Acid	0-1 ft	N/A	ug/kg	2	2,400	4,800	3,200	6,700	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Benzyl Alcohol	0-1 ft	N/A	ug/kg	2	93.0	190	320	670	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Bis(2-chloroethoxy)methane	0-1 ft	N/A	ug/kg	2	33.0	65.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Bis(2-chloroethyl) Ether	0-1 ft	N/A	ug/kg	2	60.0	120	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-1 ft	N/A	ug/kg	2	30.0	60.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	58,000	260,000	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	N/A	ug/kg	2	38.0	75.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Carbazole	0-1 ft	N/A	ug/kg	2	-	-	180	340	0	2	-	37.5	91.0	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Dibenzofuran	0-1 ft	N/A	ug/kg	2	33.0	65.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Diethyl Phthalate	0-1 ft	N/A	ug/kg	2	88.0	180	160	340	2	-	-	-	-	0	0%	Yes	--

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Erodible Soil Subset	SVOCs	Total	Dimethyl Phthalate	0-1 ft	N/A	ug/kg	2	45.0	90.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	N/A	ug/kg	2	65.0	130	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Di-n-octyl Phthalate	0-1 ft	N/A	ug/kg	2	30.0	60.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Hexachlorobenzene	0-1 ft	N/A	ug/kg	2	53.0	110	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Hexachlorobutadiene	0-1 ft	N/A	ug/kg	2	35.0	70.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Hexachlorocyclopentadiene	0-1 ft	N/A	ug/kg	2	380	750	780	1,700	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Hexachloroethane	0-1 ft	N/A	ug/kg	2	55.0	110	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Isophorone	0-1 ft	N/A	ug/kg	2	40.0	80.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Nitrobenzene	0-1 ft	N/A	ug/kg	2	50.0	100	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	N-Nitrosodimethylamine	0-1 ft	N/A	ug/kg	2	160	310	780	1,700	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	N-Nitrosodi-n-propylamine	0-1 ft	N/A	ug/kg	2	80.0	160	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	N-Nitrosodiphenylamine	0-1 ft	N/A	ug/kg	2	55.0	110	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	N/A	ug/kg	2	73.0	150	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Pentachlorophenol	0-1 ft	N/A	ug/kg	2	220	430	1,600	3,400	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Phenol	0-1 ft	N/A	ug/kg	2	48.0	95.0	470	1,000	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	2-Methylnaphthalene	0-1 ft	N/A	ug/kg	2	30.0	60.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Acenaphthene	0-1 ft	N/A	ug/kg	2	-	-	180	340	0	2	-	34.5	68.0	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Acenaphthylene	0-1 ft	N/A	ug/kg	2	35.0	70.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Anthracene	0-1 ft	N/A	ug/kg	2	-	-	180	340	0	2	-	53.5	150	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Fluorene	0-1 ft	N/A	ug/kg	2	43.0	85.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	2	33.0	65.0	160	340	2	-	-	-	-	0	0%	Yes	--
Erodible Soil Subset	SVOCs	Total	Phenanthrene	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	360	940	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	N/A	ug/kg	2	-	-	-	-	-	-	-	549	1356	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Benzo(a)anthracene	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	455	1,200	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Benzo(a)pyrene	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	435	1,000	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	645	1,600	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	270	590	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	230	570	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Chrysene	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	575	1,500	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	N/A	ug/kg	2	-	-	180	340	0	2	-	95.5	220	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Fluoranthene	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	825	2,100	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	300	690	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Pyrene	0-1 ft	N/A	ug/kg	2	-	-	-	-	0	-	2	775	1,900	2	100%	Yes	--
Erodible Soil Subset	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	N/A	ug/kg	2	-	-	-	-	-	-	-	4606	11370	2	100%	Yes	--
Erodible Soil Subset	VOCs	Total	1,1,1,2-Tetrachloroethane	0-1 ft	N/A	ug/kg	8	0.190	9.40	5.10	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-1 ft	N/A	ug/kg	8	0.160	4.30	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,1,2,2-Tetrachloroethane	0-1 ft	N/A	ug/kg	8	0.0900	7.40	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,1,2-Trichloroethane	0-1 ft	N/A	ug/kg	8	0.0890	7.90	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,1-Dichloroethane	0-1 ft	N/A	ug/kg	8	0.0490	9.30	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,1-Dichloroethene	0-1 ft	N/A	ug/kg	8	0.0710	7.30	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,1-Dichloropropene	0-1 ft	N/A	ug/kg	8	0.160	9.40	5.10	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,2,3-Trichlorobenzene	0-1 ft	N/A	ug/kg	8	0.150	12.0	21.0	270	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,2,3-Trichloropropane	0-1 ft	N/A	ug/kg	8	0.280	17.0	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	N/A	ug/kg	8	0.230	6.50	21.0	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	N/A	ug/kg	8	0.110	3.70	21.0	67.0	2	6	-	0.160	0.280	6	75%	No	--
Erodible Soil Subset	VOCs	Total	1,2-Dibromo-3-chloropropane	0-1 ft	N/A	ug/kg	8	0.790	140	21.0	270	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,2-Dibromoethane (EDB)	0-1 ft	N/A	ug/kg	8	0.200	6.90	21.0	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,2-Dichlorobenzene	0-1 ft	N/A	ug/kg	8	0.0640	6.60	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,2-Dichloroethane (EDC)	0-1 ft	N/A	ug/kg	8	0.0550	9.70	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,2-Dichloropropane	0-1 ft	N/A	ug/kg	8	0.0660	11.0	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	N/A	ug/kg	8	0.0410	6.50	21.0	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,3-Dichlorobenzene	0-1 ft	N/A	ug/kg	8	0.0710	6.10	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,3-Dichloropropane	0-1 ft	N/A	ug/kg	8	0.0600	5.30	5.10	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	N/A	ug/kg	8	0.110	5.70	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	2,2-Dichloropropane	0-1 ft	N/A	ug/kg	8	0.110	9.50	5.10	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	2-Butanone (MEK)	0-1 ft	N/A	ug/kg	8	290	290	21.0	540	1	2	5	5.00	50.0	7	88%	No	--
Erodible Soil Subset	VOCs	Total	2-Chlorotoluene	0-1 ft	N/A	ug/kg	8	0.0520	4.90	21.0	270	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	2-Hexanone	0-1 ft	N/A	ug/kg	8	0.820	170	21.0	2,700	5	3	-	4.70	8.80	3	38%	No	--
Erodible Soil Subset	VOCs	Total	4-Chlorotoluene	0-1 ft	N/A	ug/kg	8	0.0930	5.50	21.0	270	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	4-Isopropyltoluene	0-1 ft	N/A	ug/kg	8	0.0840	6.10	21.0	270	5	3	-	0.480	2.50	3	38%	No	--

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(17 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Erodible Soil Subset	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	N/A	ug/kg	8	0.260	460	21.0	2,700	5	3	-	0.770	1.20	3	38%	No	--
Erodible Soil Subset	VOCs	Total	Acetone	0-1 ft	N/A	ug/kg	8	230	230	810	810	1	-	7	47.0	540	7	88%	No	--
Erodible Soil Subset	VOCs	Total	Benzene	0-1 ft	N/A	ug/kg	8	0.230	5.70	5.10	27.0	4	4	-	0.160	1.00	4	50%	No	--
Erodible Soil Subset	VOCs	Total	Bromobenzene	0-1 ft	N/A	ug/kg	8	0.0930	8.20	5.10	270	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Bromochloromethane	0-1 ft	N/A	ug/kg	8	0.260	9.40	5.10	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Bromodichloromethane	0-1 ft	N/A	ug/kg	8	0.0450	6.20	5.10	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Bromoform	0-1 ft	N/A	ug/kg	8	0.260	13.0	5.10	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Bromomethane	0-1 ft	N/A	ug/kg	8	0.430	29.0	5.10	67.0	6	2	-	1.20	5.00	2	25%	No	--
Erodible Soil Subset	VOCs	Total	Carbon Disulfide	0-1 ft	N/A	ug/kg	8	7.40	7.40	5.10	27.0	1	7	-	0.620	1.00	7	88%	No	--
Erodible Soil Subset	VOCs	Total	Carbon Tetrachloride	0-1 ft	N/A	ug/kg	8	0.0790	11.0	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Chlorobenzene	0-1 ft	N/A	ug/kg	8	0.0550	6.60	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Chloroethane	0-1 ft	N/A	ug/kg	8	0.310	24.0	5.10	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Chloroform	0-1 ft	N/A	ug/kg	8	0.0490	0.0630	5.10	41.0	5	3	-	0.260	19.0	3	38%	No	--
Erodible Soil Subset	VOCs	Total	Chloromethane	0-1 ft	N/A	ug/kg	8	0.0580	8.70	5.10	67.0	6	2	-	0.230	0.250	2	25%	No	--
Erodible Soil Subset	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	8	0.0820	0.110	5.10	27.0	7	1	-	12.0	12.0	1	13%	No	--
Erodible Soil Subset	VOCs	Total	cis-1,3-Dichloropropene	0-1 ft	N/A	ug/kg	8	0.0320	8.30	5.10	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Dibromochloromethane	0-1 ft	N/A	ug/kg	8	0.170	9.10	5.10	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Dibromomethane	0-1 ft	N/A	ug/kg	8	0.190	18.0	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Dichlorodifluoromethane	0-1 ft	N/A	ug/kg	8	0.0730	0.0940	5.10	6.60	7	-	1	94.0	94.0	1	13%	No	--
Erodible Soil Subset	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	N/A	ug/kg	8	0.160	0.190	11.0	14.0	4	3	1	0.330	460	4	50%	No	--
Erodible Soil Subset	VOCs	Total	Ethylbenzene	0-1 ft	N/A	ug/kg	8	0.0430	6.10	5.10	27.0	5	3	-	0.100	0.200	3	38%	No	--
Erodible Soil Subset	VOCs	Total	Hexachlorobutadiene	0-1 ft	N/A	ug/kg	8	0.180	15.0	21.0	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Isopropylbenzene	0-1 ft	N/A	ug/kg	8	0.0320	6.10	21.0	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	m,p-Xylenes	0-1 ft	N/A	ug/kg	8	0.0980	13.0	5.10	54.0	5	3	-	0.190	0.360	3	38%	No	--
Erodible Soil Subset	VOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	8	0.340	7.90	21.0	270	6	2	-	0.450	0.540	2	25%	No	--
Erodible Soil Subset	VOCs	Total	n-Butylbenzene	0-1 ft	N/A	ug/kg	8	0.0890	6.50	21.0	270	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	n-Propylbenzene	0-1 ft	N/A	ug/kg	8	0.0630	5.70	21.0	270	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	o-Xylene	0-1 ft	N/A	ug/kg	8	0.0600	6.90	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	sec-Butylbenzene	0-1 ft	N/A	ug/kg	8	0.0660	6.50	21.0	270	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Styrene	0-1 ft	N/A	ug/kg	8	0.0770	6.10	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	tert-Butylbenzene	0-1 ft	N/A	ug/kg	8	0.0550	4.30	21.0	270	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	N/A	ug/kg	8	0.130	8.30	5.10	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Toluene	0-1 ft	N/A	ug/kg	8	6.10	6.10	5.10	27.0	1	7	-	0.240	1.30	7	88%	No	--
Erodible Soil Subset	VOCs	Total	trans-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	8	0.0490	9.90	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	trans-1,3-Dichloropropene	0-1 ft	N/A	ug/kg	8	0.110	12.0	5.10	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Trichloroethene (TCE)	0-1 ft	N/A	ug/kg	8	0.140	13.0	5.10	27.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Trichlorofluoromethane	0-1 ft	N/A	ug/kg	8	0.0550	11.0	5.10	67.0	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Vinyl Acetate	0-1 ft	N/A	ug/kg	8	0.610	52.0	21.0	670	8	-	-	-	-	0	0%	No	--
Erodible Soil Subset	VOCs	Total	Vinyl Chloride	0-1 ft	N/A	ug/kg	8	0.0580	13.0	5.10	27.0	8	-	-	-	-	0	0%	No	--
Groundwater	Metals	Total	Arsenic	N/A	N/A	ug/L	20	-	-	-	-	0	-	20	0.540	11.6	20	100%	No	Yes
Groundwater	Metals	Total	Iron	N/A	N/A	ug/L	20	20.0	55.6	20.0	55.6	4	2	14	12.9	1,500	16	80%	No	Yes
Groundwater	Metals	Total	Vanadium	N/A	N/A	ug/L	20	0.0700	0.200	0.200	10.0	2	6	12	0.130	5.90	18	90%	No	Yes
Groundwater	Metals	Dissolved	Arsenic	N/A	N/A	ug/L	20	-	-	-	-	0	-	20	0.510	8.99	20	100%	No	Yes
Groundwater	Metals	Dissolved	Calcium	N/A	N/A	ug/L	5	-	-	-	-	0	-	5	6,690	44,300	5	100%	Yes	--
Groundwater	Metals	Dissolved	Iron	N/A	N/A	ug/L	20	4.00	20.0	20.0	20.0	13	3	4	6.40	270	7	35%	No	Yes
Groundwater	Metals	Dissolved	Magnesium	N/A	N/A	ug/L	5	-	-	-	-	0	-	5	883	14,000	5	100%	Yes	--
Groundwater	Metals	Dissolved	Potassium	N/A	N/A	ug/L	5	-	-	2,000	2,000	0	3	2	782	2,610	5	100%	Yes	--
Groundwater	Metals	Dissolved	Sodium	N/A	N/A	ug/L	5	-	-	-	-	0	-	5	6,860	89,400	5	100%	Yes	--
Groundwater	Metals	Dissolved	Vanadium	N/A	N/A	ug/L	20	0.0700	0.800	0.200	10.0	5	5	10	0.145	3.10	15	75%	No	Yes
Groundwater	Butyltins	Total	Monobutyltin	N/A	N/A	ug/L	20	0.0110	0.0290	0.0500	0.0870	18	2	-	0.0140	0.0260	2	10%	No	Yes
Groundwater	NWTPH-Dx	Total	Diesel Range Organics	N/A	N/A	ug/L	20	11.0	120	100	120	18	2	-	17.0	18.0	2	10%	No	Yes
Groundwater	NWTPH-Dx	Total	Residual Range Organics	N/A	N/A	ug/L	20	19.0	120	100	120	20	-	-	-	-	0	0%	No	No
Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	N/A	ug/L	20	13.0	13.0	250	250	17	3	-	13.5	23.5	3	15%	No	Yes
Groundwater	SVOCs	Total	Benzo(b)fluoranthene	N/A	N/A	ug/L	20	0.0170	0.0200	0.190	0.230	19	1	-	0.0180	0.0180	1	5%	No	No
Groundwater	SVOCs	Total	Benzo(k)fluoranthene	N/A	N/A	ug/L	20	0.0240	0.0280	0.190	0.230	20	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Phenanthrene	N/A	N/A	ug/L	20	0.0220	0.0250	0.190	0.230	19	1	-	0.0840	0.0840	1	5%	No	No
Groundwater	VOCs	Total	1,1,1,2-Tetrachloroethane	N/A	N/A	ug/L	5	0.0450	0.0450	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/L	5	0.0620	0.0620	0.500	0.500	3	1	1	0.220	1.90	2	40%	Yes	--
Groundwater	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	N/A	ug/L	5	0.0880	0.0880	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	1,1,2-Trichloroethane	N/A	N/A	ug/L	5	0.0940	0.0940	0.500	0.500	5	-	-	-	-	0	0%	Yes	--

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(18 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Groundwater	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/L	5	0.0590	0.0590	0.500	0.500	3	1	1	0.320	5.00	2	40%	Yes	--
Groundwater	VOCs	Total	1,1-Dichloroethene	N/A	N/A	ug/L	5	0.100	0.100	0.500	0.500	4	-	1	2.10	2.10	1	20%	Yes	--
Groundwater	VOCs	Total	1,1-Dichloropropene	N/A	N/A	ug/L	5	0.0620	0.0620	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	1,2,3-Trichlorobenzene	N/A	N/A	ug/L	5	0.0840	0.0840	2.00	2.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	1,2,3-Trichloropropane	N/A	N/A	ug/L	5	0.240	0.240	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	5	0.180	0.180	2.00	2.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/L	5	0.0620	0.0620	2.00	2.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	1,2-Dibromo-3-chloropropane	N/A	N/A	ug/L	5	0.500	0.500	2.00	2.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	N/A	ug/L	5	0.0720	0.0720	2.00	2.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	1,2-Dichlorobenzene	N/A	N/A	ug/L	5	0.0690	0.0690	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	N/A	ug/L	5	0.0660	0.0660	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	1,2-Dichloropropane	N/A	N/A	ug/L	5	0.0620	0.0620	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	1,3,5-Trimethylbenzene	N/A	N/A	ug/L	5	0.0660	0.0660	5.00	5.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	1,3-Dichlorobenzene	N/A	N/A	ug/L	5	0.0820	0.0820	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	1,3-Dichloropropane	N/A	N/A	ug/L	5	0.0570	0.0570	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/L	5	0.0840	0.0840	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	2,2-Dichloropropane	N/A	N/A	ug/L	20	0.0830	0.420	0.500	2.50	20	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	2-Butanone (MEK)	N/A	N/A	ug/L	5	2.30	2.30	20.0	20.0	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	2-Chlorotoluene	N/A	N/A	ug/L	5	0.0790	0.0790	2.00	2.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	2-Hexanone	N/A	N/A	ug/L	5	2.40	2.40	20.0	20.0	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	4-Chlorotoluene	N/A	N/A	ug/L	5	0.0570	0.0570	4.00	4.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	4-Isopropyltoluene	N/A	N/A	ug/L	5	0.0700	0.0700	2.00	2.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	N/A	ug/L	5	1.40	1.40	20.0	20.0	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Acetone	N/A	N/A	ug/L	5	3.00	3.00	20.0	20.0	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Benzene	N/A	N/A	ug/L	5	0.0620	0.0620	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Bromobenzene	N/A	N/A	ug/L	5	0.0660	0.0660	2.00	2.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Bromochloromethane	N/A	N/A	ug/L	5	0.0990	0.0990	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Bromodichloromethane	N/A	N/A	ug/L	5	0.0550	0.0550	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Bromoform	N/A	N/A	ug/L	5	0.0990	0.0990	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Bromomethane	N/A	N/A	ug/L	5	0.120	0.120	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/L	5	-	-	0.500	0.500	0	5	-	0.120	0.255	5	100%	Yes	--
Groundwater	VOCs	Total	Carbon Tetrachloride	N/A	N/A	ug/L	5	0.0480	0.0480	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Chlorobenzene	N/A	N/A	ug/L	5	0.0640	0.0640	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Chloroethane	N/A	N/A	ug/L	5	0.130	0.130	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Chloroform	N/A	N/A	ug/L	20	0.0820	0.410	0.500	2.50	19	1	-	0.180	0.180	1	5%	No	No
Groundwater	VOCs	Total	Chloromethane	N/A	N/A	ug/L	5	0.110	0.110	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/L	20	0.0660	0.0660	0.500	0.500	5	3	12	0.0800	660	15	75%	No	Yes
Groundwater	VOCs	Total	cis-1,3-Dichloropropene	N/A	N/A	ug/L	5	0.0550	0.0550	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Dibromochloromethane	N/A	N/A	ug/L	5	0.0720	0.0720	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Dibromomethane	N/A	N/A	ug/L	5	0.120	0.120	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Dichlorodifluoromethane	N/A	N/A	ug/L	5	0.0750	0.0750	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	N/A	ug/L	5	0.0840	0.0840	2.00	2.00	4	1	-	0.175	0.175	1	20%	Yes	--
Groundwater	VOCs	Total	Ethylbenzene	N/A	N/A	ug/L	5	0.0680	0.0680	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Hexachlorobutadiene	N/A	N/A	ug/L	5	0.150	0.150	2.00	2.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/L	5	0.0760	0.0760	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	m,p-Xylenes	N/A	N/A	ug/L	5	0.110	0.110	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Naphthalene	N/A	N/A	ug/L	5	0.0960	0.0960	2.00	2.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	n-Butylbenzene	N/A	N/A	ug/L	5	0.0850	0.0850	2.00	2.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	n-Propylbenzene	N/A	N/A	ug/L	5	0.00590	0.00590	2.00	2.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	o-Xylene	N/A	N/A	ug/L	5	0.0680	0.0680	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	sec-Butylbenzene	N/A	N/A	ug/L	5	0.0710	0.0710	2.00	2.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Styrene	N/A	N/A	ug/L	5	0.0770	0.0770	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	tert-Butylbenzene	N/A	N/A	ug/L	5	0.0590	0.0590	2.00	2.00	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/L	20	0.0970	0.0970	0.500	0.500	4	3	13	0.360	6.20	16	80%	No	Yes
Groundwater	VOCs	Total	Toluene	N/A	N/A	ug/L	5	-	-	0.500	0.500	0	2	3	0.230	0.640	5	100%	Yes	--
Groundwater	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/L	5	0.0690	0.0690	0.500	0.500	3	1	1	0.110	1.70	2	40%	Yes	--
Groundwater	VOCs	Total	trans-1,3-Dichloropropene	N/A	N/A	ug/L	5	0.0750	0.0750	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/L	20	0.0730	0.0730	0.500	0.500	5	4	11	0.140	3.40	15	75%	No	Yes
Groundwater	VOCs	Total	Trichlorofluoromethane	N/A	N/A	ug/L	5	0.0990	0.0990	0.500	0.500	5	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Vinyl Acetate	N/A	N/A	ug/L	5	0.910	0.910	5.00	5.00	5	-	-	-	-	0	0%	Yes	--

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(19 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Groundwater	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/L	20	0.0440	0.0440	0.500	2.50	16	2	2	0.480	4.10	4	20%	No	Yes
DP Groundwater	Metals	Total	Aluminum	N/A	N/A	ug/L	10	-	-	100	100	0	2	8	74.2	17,900	10	100%	No	--
DP Groundwater	Metals	Total	Antimony	N/A	N/A	ug/L	10	0.500	0.500	0.500	0.500	1	5	4	0.233	1.57	9	90%	No	--
DP Groundwater	Metals	Total	Arsenic	N/A	N/A	ug/L	10	0.102	0.102	0.500	0.500	2	2	6	0.114	7.70	8	80%	No	--
DP Groundwater	Metals	Total	Barium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	3.76	97.8	10	100%	No	--
DP Groundwater	Metals	Total	Beryllium	N/A	N/A	ug/L	10	0.0782	0.0782	0.500	0.500	6	3	1	0.157	0.785	4	40%	No	--
DP Groundwater	Metals	Total	Cadmium	N/A	N/A	ug/L	10	0.0247	0.0247	0.500	0.500	10	-	-	-	-	0	0%	No	--
DP Groundwater	Metals	Total	Calcium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	18,300	33,700	10	100%	No	--
DP Groundwater	Metals	Total	Chromium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	2.61	31.8	10	100%	No	--
DP Groundwater	Metals	Total	Cobalt	N/A	N/A	ug/L	10	0.770	0.770	5.00	5.00	4	3	3	1.68	13.1	6	60%	No	--
DP Groundwater	Metals	Total	Copper	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	1.38	204	10	100%	No	--
DP Groundwater	Metals	Total	Iron	N/A	N/A	ug/L	10	14.0	14.0	100	100	1	1	8	84.4	25,900	9	90%	No	--
DP Groundwater	Metals	Total	Lead	N/A	N/A	ug/L	10	0.500	0.500	0.500	0.500	3	1	6	0.0580	13.7	7	70%	No	--
DP Groundwater	Metals	Total	Magnesium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	5,130	15,400	10	100%	No	--
DP Groundwater	Metals	Total	Manganese	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	2.10	708	10	100%	No	--
DP Groundwater	Metals	Total	Mercury	N/A	N/A	ug/L	10	0.0530	0.0530	0.200	0.200	8	2	-	0.0760	0.100	2	20%	No	--
DP Groundwater	Metals	Total	Nickel	N/A	N/A	ug/L	10	0.370	0.370	10.0	10.0	1	7	2	1.02	21.4	9	90%	No	--
DP Groundwater	Metals	Total	Potassium	N/A	N/A	ug/L	10	-	-	1,000	1,000	0	2	8	898	3,210	10	100%	No	--
DP Groundwater	Metals	Total	Selenium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	0.815	2.06	10	100%	No	--
DP Groundwater	Metals	Total	Silver	N/A	N/A	ug/L	10	0.0188	0.0188	0.100	0.100	1	6	3	0.0195	0.376	9	90%	No	--
DP Groundwater	Metals	Total	Sodium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	6,350	42,900	10	100%	No	--
DP Groundwater	Metals	Total	Thallium	N/A	N/A	ug/L	10	0.0292	0.0292	0.500	0.500	3	7	-	0.0430	0.146	7	70%	No	--
DP Groundwater	Metals	Total	Vanadium	N/A	N/A	ug/L	10	-	-	10.0	10.0	0	6	4	1.82	77.6	10	100%	No	--
DP Groundwater	Metals	Total	Zinc	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	2.88	44.4	10	100%	No	--
DP Groundwater	Metals	Dissolved	Aluminum	N/A	N/A	ug/L	10	5.88	5.88	100	100	3	5	2	5.88	1,370	7	70%	No	--
DP Groundwater	Metals	Dissolved	Antimony	N/A	N/A	ug/L	10	-	-	0.500	0.500	0	9	1	0.149	1.67	10	100%	No	--
DP Groundwater	Metals	Dissolved	Arsenic	N/A	N/A	ug/L	10	-	-	0.500	0.500	0	1	9	0.262	1.36	10	100%	No	--
DP Groundwater	Metals	Dissolved	Barium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	3.39	20.6	10	100%	No	--
DP Groundwater	Metals	Dissolved	Beryllium	N/A	N/A	ug/L	10	0.0782	0.0782	0.500	0.500	10	-	-	-	-	0	0%	No	--
DP Groundwater	Metals	Dissolved	Cadmium	N/A	N/A	ug/L	10	0.0247	0.0247	0.500	0.500	9	1	-	0.0300	0.0300	1	10%	No	--
DP Groundwater	Metals	Dissolved	Calcium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	10,800	34,100	10	100%	No	--
DP Groundwater	Metals	Dissolved	Chromium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	0.838	4.29	10	100%	No	--
DP Groundwater	Metals	Dissolved	Cobalt	N/A	N/A	ug/L	10	0.770	0.770	5.00	5.00	2	7	1	1.21	5.08	8	80%	No	--
DP Groundwater	Metals	Dissolved	Copper	N/A	N/A	ug/L	10	0.500	1.23	0.500	1.23	3	-	7	0.752	4.38	7	70%	No	--
DP Groundwater	Metals	Dissolved	Iron	N/A	N/A	ug/L	10	14.0	14.0	100	100	6	1	3	37.3	476	4	40%	No	--
DP Groundwater	Metals	Dissolved	Lead	N/A	N/A	ug/L	10	0.0240	0.500	0.500	0.500	4	6	-	0.0260	0.378	6	60%	No	--
DP Groundwater	Metals	Dissolved	Magnesium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	3,310	12,000	10	100%	No	--
DP Groundwater	Metals	Dissolved	Manganese	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	1.71	587	10	100%	No	--
DP Groundwater	Metals	Dissolved	Mercury	N/A	N/A	ug/L	10	0.0530	0.0530	0.200	0.200	8	2	-	0.0550	0.0600	2	20%	No	--
DP Groundwater	Metals	Dissolved	Nickel	N/A	N/A	ug/L	10	0.370	10.0	10.0	10.0	7	3	-	0.403	2.10	3	30%	No	--
DP Groundwater	Metals	Dissolved	Potassium	N/A	N/A	ug/L	10	-	-	1,000	1,000	0	3	7	527	2,210	10	100%	No	--
DP Groundwater	Metals	Dissolved	Selenium	N/A	N/A	ug/L	10	-	-	0.500	0.500	0	3	7	0.235	1.30	10	100%	No	--
DP Groundwater	Metals	Dissolved	Silver	N/A	N/A	ug/L	10	0.0188	0.0188	0.100	0.100	2	8	-	0.0240	0.0790	8	80%	No	--
DP Groundwater	Metals	Dissolved	Sodium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	6,560	47,700	10	100%	No	--
DP Groundwater	Metals	Dissolved	Thallium	N/A	N/A	ug/L	10	0.0292	0.0292	0.500	0.500	7	3	-	0.0310	0.0855	3	30%	No	--
DP Groundwater	Metals	Dissolved	Vanadium	N/A	N/A	ug/L	10	0.488	10.0	10.0	10.0	4	6	-	0.582	2.61	6	60%	No	--
DP Groundwater	Metals	Dissolved	Zinc	N/A	N/A	ug/L	10	2.00	2.00	2.00	2.00	6	-	4	2.00	3.48	4	40%	No	--
DP Groundwater	Butyltins	Total	Dibutyltin	N/A	N/A	ug/L	4	0.000231	0.000287	0.000793	0.000988	4	-	-	-	-	0	0%	Yes	--
DP Groundwater	Butyltins	Total	Monobutyltin	N/A	N/A	ug/L	4	0.000114	0.000142	0.000396	0.000494	2	-	2	0.00520	0.00671	2	50%	Yes	--
DP Groundwater	Butyltins	Total	Tetrabutyltin	N/A	N/A	ug/L	4	0.000600	0.000748	0.00198	0.00247	4	-	-	-	-	0	0%	Yes	--
DP Groundwater	Butyltins	Total	Tributyltin	N/A	N/A	ug/L	4	0.000454	0.000552	0.00142	0.00173	2	-	2	0.00285	0.00435	2	50%	Yes	--
DP Groundwater	Pesticides	Total	4,4'-DDD	N/A	N/A	ug/L	3	0.000453	0.000575	0.00385	0.00488	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	4,4'-DDE	N/A	N/A	ug/L	3	0.000375	0.000476	0.00385	0.00488	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	4,4'-DDT	N/A	N/A	ug/L	3	0.000480	0.000609	0.00385	0.00488	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Aldrin	N/A	N/A	ug/L	3	0.000110	0.000140	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	BHC (alpha)	N/A	N/A	ug/L	3	0.000354	0.000449	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	BHC (beta)	N/A	N/A	ug/L	3	0.000411	0.000521	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	BHC (delta)	N/A	N/A	ug/L	3	0.000226	0.000286	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	BHC (gamma) Lindane	N/A	N/A	ug/L	3	-	-	0.00111	0.00111	0	1	2	0.000930	0.00249	3	100%	Yes	--
DP Groundwater	Pesticides	Total	Chlordane (alpha)	N/A	N/A	ug/L	3	0.000339	0.000429	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(20 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
DP Groundwater	Pesticides	Total	Chlordane (gamma)	N/A	N/A	ug/L	3	0.000461	0.000584	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Dieldrin	N/A	N/A	ug/L	3	0.000290	0.000368	0.00192	0.00244	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Endosulfan I	N/A	N/A	ug/L	3	0.000480	0.000608	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Endosulfan II	N/A	N/A	ug/L	3	0.000411	0.00192	0.00192	0.00244	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Endosulfan Sulfate	N/A	N/A	ug/L	3	0.000517	0.000655	0.00192	0.00244	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Endrin Aldehyde	N/A	N/A	ug/L	3	0.000936	0.00119	0.00192	0.00244	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Endrin Ketone	N/A	N/A	ug/L	3	0.000332	0.000421	0.00192	0.00244	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Endrin	N/A	N/A	ug/L	3	0.000298	0.000378	0.00192	0.00244	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Heptachlor Epoxide	N/A	N/A	ug/L	3	0.000360	0.000456	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Heptachlor	N/A	N/A	ug/L	3	0.000724	0.000919	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Methoxychlor	N/A	N/A	ug/L	3	0.000584	0.000584	0.0109	0.0122	1	2	-	0.000983	0.00521	2	67%	Yes	--
DP Groundwater	Pesticides	Total	Toxaphene	N/A	N/A	ug/L	3	0.0112	0.0142	0.0962	0.122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	PCB Aroclors	Total	Aroclor 1016	N/A	N/A	ug/L	7	0.00206	0.00244	0.00941	0.0112	7	-	-	-	-	0	0%	Yes	--
DP Groundwater	PCB Aroclors	Total	Aroclor 1221	N/A	N/A	ug/L	7	0.00206	0.00244	0.00941	0.0112	7	-	-	-	-	0	0%	Yes	--
DP Groundwater	PCB Aroclors	Total	Aroclor 1232	N/A	N/A	ug/L	7	0.00206	0.00244	0.00941	0.0112	7	-	-	-	-	0	0%	Yes	--
DP Groundwater	PCB Aroclors	Total	Aroclor 1242	N/A	N/A	ug/L	7	0.00206	0.00244	0.00941	0.0112	7	-	-	-	-	0	0%	Yes	--
DP Groundwater	PCB Aroclors	Total	Aroclor 1248	N/A	N/A	ug/L	7	0.00206	0.00244	0.00941	0.0112	7	-	-	-	-	0	0%	Yes	--
DP Groundwater	PCB Aroclors	Total	Aroclor 1254	N/A	N/A	ug/L	7	0.00227	0.00269	0.00941	0.0112	7	-	-	-	-	0	0%	Yes	--
DP Groundwater	PCB Aroclors	Total	Aroclor 1260	N/A	N/A	ug/L	7	0.00227	0.00269	0.00941	0.0112	7	-	-	-	-	0	0%	Yes	--
DP Groundwater	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	N/A	N/A	ug/L	7	-	-	-	-	-	-	-	-	-	0	0%	Yes	--
DP Groundwater	NWTPH-Dx	Total	Diesel Range Organics	N/A	N/A	ug/L	4	74.7	89.7	244	293	4	-	-	-	-	0	0%	Yes	--
DP Groundwater	NWTPH-Dx	Total	Residual Range Organics	N/A	N/A	ug/L	4	92.5	111	487	585	3	1	-	113	113	1	25%	Yes	--
DP Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	N/A	ug/L	6	13.0	13.0	100	100	4	2	-	14.7	20.9	2	33%	Yes	--
DP Groundwater	SVOCs	Total	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	9	0.0117	0.0151	0.190	1.00	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	1,2-Dichlorobenzene	N/A	N/A	ug/L	9	0.0264	0.0340	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	1,3-Dichlorobenzene	N/A	N/A	ug/L	9	0.0349	0.0449	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/L	9	0.0300	0.0387	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	2,4,5-Trichlorophenol	N/A	N/A	ug/L	6	0.0421	0.0542	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	2,4,6-Trichlorophenol	N/A	N/A	ug/L	6	0.0305	0.0393	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	2,4-Dichlorophenol	N/A	N/A	ug/L	6	0.0177	0.0228	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	2,4-Dimethylphenol	N/A	N/A	ug/L	6	0.174	0.224	0.950	1.22	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	2,4-Dinitrophenol	N/A	N/A	ug/L	6	0.197	0.253	0.950	1.22	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	2,4-Dinitrotoluene	N/A	N/A	ug/L	9	0.0545	0.0703	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	2,6-Dinitrotoluene	N/A	N/A	ug/L	9	0.0361	0.0465	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	2-Chloronaphthalene	N/A	N/A	ug/L	9	0.00456	0.00588	0.0190	0.0245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	2-Chlorophenol	N/A	N/A	ug/L	6	0.0400	0.0515	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	2-Methylnaphthalene	N/A	N/A	ug/L	9	0.0142	0.0149	0.0475	0.0553	3	3	3	0.0195	0.153	6	67%	No	--
DP Groundwater	SVOCs	Total	2-Methylphenol	N/A	N/A	ug/L	6	0.0371	0.0479	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	2-Nitroaniline	N/A	N/A	ug/L	9	0.0284	0.0366	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	2-Nitrophenol	N/A	N/A	ug/L	6	0.0406	0.0524	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	3,3'-Dichlorobenzidine	N/A	N/A	ug/L	9	0.178	0.229	0.950	1.22	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	3-Nitroaniline	N/A	N/A	ug/L	9	0.0537	0.0692	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	4,6-Dinitro-2-methylphenol	N/A	N/A	ug/L	6	0.294	0.379	0.950	1.22	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	4-Bromophenyl Phenyl Ether	N/A	N/A	ug/L	9	0.0208	0.0268	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	4-Chloro-3-methylphenol	N/A	N/A	ug/L	6	0.0232	0.0299	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	4-Chloroaniline	N/A	N/A	ug/L	9	0.0687	0.0885	0.285	0.367	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	4-Chlorophenyl Phenyl Ether	N/A	N/A	ug/L	9	0.0306	0.0394	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	4-Nitroaniline	N/A	N/A	ug/L	9	0.0368	0.0475	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	4-Nitrophenol	N/A	N/A	ug/L	6	0.112	0.144	0.950	1.22	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	Acenaphthene	N/A	N/A	ug/L	9	0.00323	0.00356	0.0190	0.0245	4	5	-	0.00547	0.0230	5	56%	No	--
DP Groundwater	SVOCs	Total	Acenaphthylene	N/A	N/A	ug/L	9	0.00228	0.00294	0.0190	0.0245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Aniline	N/A	N/A	ug/L	9	0.0310	0.367	0.285	0.367	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Anthracene	N/A	N/A	ug/L	9	0.00180	0.00209	0.0190	0.0245	8	1	-	0.0126	0.0126	1	11%	No	--
DP Groundwater	SVOCs	Total	Benzidine	N/A	N/A	ug/L	9	0.950	1.22	0.950	1.22	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Benzo(a)anthracene	N/A	N/A	ug/L	9	0.00494	0.00636	0.0190	0.0245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Benzo(a)pyrene	N/A	N/A	ug/L	9	0.00313	0.00363	0.0190	0.0245	8	1	-	0.00895	0.00895	1	11%	No	--
DP Groundwater	SVOCs	Total	Benzo(g,h,i)perylene	N/A	N/A	ug/L	9	0.00484	0.00624	0.0190	0.0245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Benzofluoranthenes, Total	N/A	N/A	ug/L	9	0.0113	0.0131	0.0950	0.122	8	1	-	0.0173	0.0173	1	11%	No	--
DP Groundwater	SVOCs	Total	Benzoic Acid	N/A	N/A	ug/L	6	0.127	0.164	0.950	1.22	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	Benzyl Alcohol	N/A	N/A	ug/L	7	0.0404	0.0520	0.190	0.245	5	2	-	0.0500	0.0523	2	29%	Yes	--

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(21 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
DP Groundwater	SVOCs	Total	Bis(2-chloroethoxy)methane	N/A	N/A	ug/L	9	0.0172	0.0222	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Bis(2-chloroethyl) Ether	N/A	N/A	ug/L	9	0.0308	0.0397	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Bis(2-chloroisopropyl) Ether	N/A	N/A	ug/L	9	0.0407	0.0525	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	N/A	ug/L	9	0.362	0.466	1.42	1.84	8	1	-	0.408	0.408	1	11%	No	--
DP Groundwater	SVOCs	Total	Butyl Benzyl Phthalate	N/A	N/A	ug/L	9	0.102	0.285	0.285	0.367	3	6	-	0.120	0.228	6	67%	No	--
DP Groundwater	SVOCs	Total	Carbazole	N/A	N/A	ug/L	9	0.0206	0.0266	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Chrysene	N/A	N/A	ug/L	9	0.00798	0.0103	0.0190	0.0245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Dibenz(a,h)anthracene	N/A	N/A	ug/L	9	0.00294	0.00341	0.0190	0.0245	8	1	-	0.00671	0.00671	1	11%	No	--
DP Groundwater	SVOCs	Total	Dibenzofuran	N/A	N/A	ug/L	9	0.0195	0.0215	0.190	0.245	7	2	-	0.0237	0.0421	2	22%	No	--
DP Groundwater	SVOCs	Total	Diethyl Phthalate	N/A	N/A	ug/L	9	0.0529	0.0682	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Dimethyl Phthalate	N/A	N/A	ug/L	9	0.0370	0.0477	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Di-n-butyl Phthalate	N/A	N/A	ug/L	9	0.190	0.608	0.190	0.608	3	5	1	0.100	0.239	6	67%	No	--
DP Groundwater	SVOCs	Total	Di-n-octyl Phthalate	N/A	N/A	ug/L	9	0.0259	0.0334	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Fluoranthene	N/A	N/A	ug/L	9	0.00541	0.00626	0.0190	0.0220	8	-	1	0.0311	0.0311	1	11%	No	--
DP Groundwater	SVOCs	Total	Fluorene	N/A	N/A	ug/L	9	0.00161	0.00178	0.0190	0.0221	3	5	1	0.00584	0.0351	6	67%	No	--
DP Groundwater	SVOCs	Total	Hexachlorobenzene	N/A	N/A	ug/L	9	0.0237	0.0306	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Hexachlorobutadiene	N/A	N/A	ug/L	9	0.0140	0.0180	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Hexachlorocyclopentadiene	N/A	N/A	ug/L	9	0.294	0.379	0.950	1.22	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Hexachloroethane	N/A	N/A	ug/L	9	0.0362	0.0466	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Indeno(1,2,3-cd)pyrene	N/A	N/A	ug/L	9	0.00266	0.00308	0.0190	0.0245	8	1	-	0.00797	0.00797	1	11%	No	--
DP Groundwater	SVOCs	Total	Isophorone	N/A	N/A	ug/L	9	0.0278	0.0311	0.190	0.245	7	2	-	0.0486	0.0842	2	22%	No	--
DP Groundwater	SVOCs	Total	Naphthalene	N/A	N/A	ug/L	9	0.0165	0.0191	0.0475	1.00	5	4	-	0.0222	0.0452	4	44%	No	--
DP Groundwater	SVOCs	Total	Nitrobenzene	N/A	N/A	ug/L	9	0.0494	0.0636	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	N-Nitrosodimethylamine	N/A	N/A	ug/L	9	0.950	1.22	0.950	1.22	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	N-Nitrosodi-n-propylamine	N/A	N/A	ug/L	9	0.0350	0.0452	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	N-Nitrosodiphenylamine	N/A	N/A	ug/L	9	0.00807	0.0104	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	p-cresol (4-Methylphenol)	N/A	N/A	ug/L	6	0.0419	0.0540	0.380	0.490	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	Pentachlorophenol	N/A	N/A	ug/L	6	0.190	0.245	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	Phenanthrene	N/A	N/A	ug/L	9	0.00351	0.00351	0.0190	0.0221	1	7	1	0.00759	0.144	8	89%	No	--
DP Groundwater	SVOCs	Total	Phenol	N/A	N/A	ug/L	8	0.00437	0.00563	0.190	0.245	3	5	-	0.0111	0.0291	5	63%	No	--
DP Groundwater	SVOCs	Total	Pyrene	N/A	N/A	ug/L	9	0.00275	0.00319	0.0190	0.0220	6	2	1	0.00317	0.0261	3	33%	No	--
DP Groundwater	SVOCs	Dissolved	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	8	0.0120	0.0139	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	1,2-Dichlorobenzene	N/A	N/A	ug/L	8	0.0272	0.0313	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	1,3-Dichlorobenzene	N/A	N/A	ug/L	8	0.0359	0.0413	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	1,4-Dichlorobenzene	N/A	N/A	ug/L	8	0.0310	0.0356	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	2,4,5-Trichlorophenol	N/A	N/A	ug/L	3	0.0457	0.0499	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	2,4,6-Trichlorophenol	N/A	N/A	ug/L	3	0.0331	0.0361	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	2,4-Dichlorophenol	N/A	N/A	ug/L	3	0.0192	0.0209	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	2,4-Dimethylphenol	N/A	N/A	ug/L	3	0.189	0.206	1.03	1.13	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	2,4-Dinitrophenol	N/A	N/A	ug/L	3	0.214	0.233	1.03	1.13	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	2,4-Dinitrotoluene	N/A	N/A	ug/L	8	0.0562	0.0646	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	2,6-Dinitrotoluene	N/A	N/A	ug/L	8	0.0372	0.0428	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	2-Chloronaphthalene	N/A	N/A	ug/L	8	0.00470	0.00541	0.0196	0.0225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	2-Chlorophenol	N/A	N/A	ug/L	3	0.0434	0.0474	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	2-Methylnaphthalene	N/A	N/A	ug/L	8	0.0147	0.0168	0.0490	0.0563	2	4	2	0.0158	0.280	6	75%	No	--
DP Groundwater	SVOCs	Dissolved	2-Methylphenol	N/A	N/A	ug/L	3	0.0404	0.0440	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	2-Nitroaniline	N/A	N/A	ug/L	8	0.0293	0.0337	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	2-Nitrophenol	N/A	N/A	ug/L	3	0.0442	0.0482	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	3,3'-Dichlorobenzidine	N/A	N/A	ug/L	8	0.183	0.211	0.979	1.13	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	3-Nitroaniline	N/A	N/A	ug/L	8	0.0553	0.0636	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	4,6-Dinitro-2-methylphenol	N/A	N/A	ug/L	3	0.320	0.349	1.03	1.13	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	4-Bromophenyl Phenyl Ether	N/A	N/A	ug/L	8	0.0214	0.0247	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	4-Chloro-3-methylphenol	N/A	N/A	ug/L	3	0.0252	0.0275	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	4-Chloroaniline	N/A	N/A	ug/L	8	0.0708	0.0814	0.294	0.338	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	4-Chlorophenyl Phenyl Ether	N/A	N/A	ug/L	8	0.0315	0.0363	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	4-Nitroaniline	N/A	N/A	ug/L	8	0.0380	0.0437	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	4-Nitrophenol	N/A	N/A	ug/L	3	0.122	0.133	1.03	1.13	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	Acenaphthene	N/A	N/A	ug/L	8	0.00333	0.00345	0.0196	0.0225	3	4	1	0.00491	0.0348	5	63%	No	--
DP Groundwater	SVOCs	Dissolved	Acenaphthylene	N/A	N/A	ug/L	8	0.00235	0.00270	0.0196	0.0225	7	1	-	0.00361	0.00361	1	13%	No	--
DP Groundwater	SVOCs	Dissolved	Anthracene	N/A	N/A	ug/L	8	0.00186	0.00214	0.0196	0.0225	8	-	-	-	-	0	0%	No	--

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(22 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
DP Groundwater	SVOCs	Dissolved	Benzidine	N/A	N/A	ug/L	8	0.979	1.13	0.979	1.13	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Benzo(a)anthracene	N/A	N/A	ug/L	8	0.00509	0.00586	0.0196	0.0225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Benzo(a)pyrene	N/A	N/A	ug/L	8	0.00323	0.00372	0.0196	0.0225	7	1	-	0.00714	0.00714	1	13%	No	--
DP Groundwater	SVOCs	Dissolved	Benzo(g,h,i)perylene	N/A	N/A	ug/L	8	0.00500	0.00574	0.0196	0.0225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Benzofluoranthenes, Total	N/A	N/A	ug/L	8	0.0117	0.0134	0.0979	0.113	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Benzoic Acid	N/A	N/A	ug/L	4	0.138	0.151	1.03	1.21	3	1	-	0.317	0.317	1	25%	Yes	--
DP Groundwater	SVOCs	Dissolved	Benzyl Alcohol	N/A	N/A	ug/L	3	0.0439	0.0479	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	Bis(2-chloroethoxy)methane	N/A	N/A	ug/L	8	0.0177	0.0204	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Bis(2-chloroethyl) Ether	N/A	N/A	ug/L	8	0.0317	0.0365	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Bis(2-chloroisopropyl) Ether	N/A	N/A	ug/L	8	0.0420	0.0483	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Bis(2-ethylhexyl) Phthalate	N/A	N/A	ug/L	8	0.373	0.429	1.47	1.69	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Butyl Benzyl Phthalate	N/A	N/A	ug/L	8	0.327	0.338	0.294	0.363	2	6	-	0.108	0.155	6	75%	No	--
DP Groundwater	SVOCs	Dissolved	Carbazole	N/A	N/A	ug/L	8	0.0213	0.0244	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Chrysene	N/A	N/A	ug/L	8	0.00823	0.00946	0.0196	0.0225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Dibenz(a,h)anthracene	N/A	N/A	ug/L	8	0.00304	0.00349	0.0196	0.0225	7	1	-	0.00381	0.00381	1	13%	No	--
DP Groundwater	SVOCs	Dissolved	Dibenzofuran	N/A	N/A	ug/L	8	0.0201	0.0231	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Diethyl Phthalate	N/A	N/A	ug/L	8	0.0546	0.0584	0.196	0.225	5	3	-	0.0585	0.101	3	38%	No	--
DP Groundwater	SVOCs	Dissolved	Dimethyl Phthalate	N/A	N/A	ug/L	8	0.0382	0.0439	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Di-n-butyl Phthalate	N/A	N/A	ug/L	8	0.218	0.275	0.196	0.275	2	6	-	0.124	0.207	6	75%	No	--
DP Groundwater	SVOCs	Dissolved	Di-n-octyl Phthalate	N/A	N/A	ug/L	8	0.0267	0.0307	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Fluoranthene	N/A	N/A	ug/L	8	0.00558	0.00642	0.0196	0.0225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Fluorene	N/A	N/A	ug/L	8	0.00167	0.00191	0.0196	0.0225	3	5	-	0.00654	0.0116	5	63%	No	--
DP Groundwater	SVOCs	Dissolved	Hexachlorobenzene	N/A	N/A	ug/L	8	0.0245	0.0282	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Hexachlorobutadiene	N/A	N/A	ug/L	8	0.0144	0.0166	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Hexachlorocyclopentadiene	N/A	N/A	ug/L	8	0.304	0.349	0.979	1.13	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Hexachloroethane	N/A	N/A	ug/L	8	0.0373	0.0429	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Indeno(1,2,3-cd)pyrene	N/A	N/A	ug/L	8	0.00274	0.00315	0.0196	0.0225	7	1	-	0.00630	0.00630	1	13%	No	--
DP Groundwater	SVOCs	Dissolved	Isophorone	N/A	N/A	ug/L	8	0.0277	0.0297	0.196	0.225	6	2	-	0.0483	0.0782	2	25%	No	--
DP Groundwater	SVOCs	Dissolved	Naphthalene	N/A	N/A	ug/L	8	0.0190	0.0196	0.0502	0.0605	2	3	3	0.0289	0.200	6	75%	No	--
DP Groundwater	SVOCs	Dissolved	Nitrobenzene	N/A	N/A	ug/L	8	0.0509	0.0586	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	N-Nitrosodimethylamine	N/A	N/A	ug/L	8	0.979	1.13	0.979	1.13	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	N-Nitrosodi-n-propylamine	N/A	N/A	ug/L	8	0.0361	0.0416	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	N-Nitrosodiphenylamine	N/A	N/A	ug/L	8	0.00833	0.00957	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	p-cresol (4-Methylphenol)	N/A	N/A	ug/L	3	0.0455	0.0497	0.413	0.450	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	Pentachlorophenol	N/A	N/A	ug/L	3	0.206	0.225	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	Phenanthrene	N/A	N/A	ug/L	8	0.00403	0.00417	0.0196	0.0225	2	6	-	0.00427	0.0190	6	75%	No	--
DP Groundwater	SVOCs	Dissolved	Phenol	N/A	N/A	ug/L	4	0.00483	0.00483	0.196	0.225	1	3	-	0.00999	0.0248	3	75%	Yes	--
DP Groundwater	SVOCs	Dissolved	Pyrene	N/A	N/A	ug/L	8	0.00284	0.00327	0.0196	0.0225	8	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,1,1,2-Tetrachloroethane	N/A	N/A	ug/L	10	0.0528	0.0528	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/L	10	0.0477	0.0477	1.00	1.00	3	6	1	0.0701	2.22	7	70%	No	--
DP Groundwater	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	N/A	ug/L	10	0.0680	0.0680	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,1,2-Trichloroethane	N/A	N/A	ug/L	10	0.0627	0.0627	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/L	10	0.0360	0.0360	1.00	1.00	5	4	1	0.0555	2.52	5	50%	No	--
DP Groundwater	VOCs	Total	1,1-Dichloroethene	N/A	N/A	ug/L	10	0.0595	0.0595	1.00	1.00	8	1	1	0.0624	1.16	2	20%	No	--
DP Groundwater	VOCs	Total	1,1-Dichloropropene	N/A	N/A	ug/L	10	0.0695	0.0695	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2,3-Trichlorobenzene	N/A	N/A	ug/L	10	0.0605	0.0605	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2,3-Trichloropropane	N/A	N/A	ug/L	10	0.123	0.123	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	10	0.0513	1.00	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/L	10	0.0283	0.0283	1.00	1.00	7	3	-	0.0317	0.0485	3	30%	No	--
DP Groundwater	VOCs	Total	1,2-Dibromo-3-chloropropane	N/A	N/A	ug/L	10	0.222	0.222	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	N/A	ug/L	10	0.0637	0.0637	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2-Dichlorobenzene	N/A	N/A	ug/L	10	0.0383	0.0383	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	N/A	ug/L	10	0.0533	0.0533	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2-Dichloropropane	N/A	N/A	ug/L	10	0.0380	0.0380	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,3,5-Trimethylbenzene	N/A	N/A	ug/L	10	0.0249	0.0249	1.00	1.00	9	1	-	0.0297	0.0297	1	10%	No	--
DP Groundwater	VOCs	Total	1,3-Dichlorobenzene	N/A	N/A	ug/L	10	0.0599	0.0599	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,3-Dichloropropane	N/A	N/A	ug/L	10	0.0738	0.0738	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/L	10	0.0180	0.0180	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	2,2-Dichloropropane	N/A	N/A	ug/L	10	0.0487	0.0487	1.00	1.00	7	3	-	0.117	0.179	3	30%	No	--
DP Groundwater	VOCs	Total	2-Butanone (MEK)	N/A	N/A	ug/L	10	1.71	1.71	5.00	5.00	10	-	-	-	-	0	0%	No	--

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(23 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
DP Groundwater	VOCs	Total	2-Chlorotoluene	N/A	N/A	ug/L	10	0.0857	0.0857	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	2-Hexanone	N/A	N/A	ug/L	10	0.993	0.993	5.00	5.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	4-Chlorotoluene	N/A	N/A	ug/L	10	0.0491	0.0491	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	4-Isopropyltoluene	N/A	N/A	ug/L	10	0.0397	0.0397	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	N/A	ug/L	10	0.309	0.309	5.00	5.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Acetone	N/A	N/A	ug/L	10	1.20	1.20	5.00	5.00	7	3	-	1.22	3.88	3	30%	No	--
DP Groundwater	VOCs	Total	Benzene	N/A	N/A	ug/L	10	0.0417	0.0417	1.00	1.00	4	6	-	0.0545	0.137	6	60%	No	--
DP Groundwater	VOCs	Total	Bromobenzene	N/A	N/A	ug/L	10	0.0475	0.0475	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Bromochloromethane	N/A	N/A	ug/L	10	0.0573	0.0573	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Bromodichloromethane	N/A	N/A	ug/L	10	0.0785	0.0785	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Bromoform	N/A	N/A	ug/L	10	0.0830	0.0830	1.00	1.00	9	1	-	0.151	0.151	1	10%	No	--
DP Groundwater	VOCs	Total	Bromomethane	N/A	N/A	ug/L	10	0.0748	1.00	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/L	10	0.0494	1.00	1.00	1.00	9	1	-	0.0619	0.0619	1	10%	No	--
DP Groundwater	VOCs	Total	Carbon Tetrachloride	N/A	N/A	ug/L	10	0.0970	0.0970	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Chlorobenzene	N/A	N/A	ug/L	10	0.0376	0.0376	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Chloroethane	N/A	N/A	ug/L	10	0.187	0.187	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Chloroform	N/A	N/A	ug/L	10	0.0717	0.0717	1.00	1.00	8	2	-	0.0907	0.174	2	20%	No	--
DP Groundwater	VOCs	Total	Chloromethane	N/A	N/A	ug/L	10	0.110	0.110	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/L	10	0.0433	0.0433	1.00	1.00	1	3	6	0.0948	341	9	90%	No	--
DP Groundwater	VOCs	Total	cis-1,3-Dichloropropene	N/A	N/A	ug/L	10	0.0301	0.0301	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Dibromochloromethane	N/A	N/A	ug/L	10	0.0539	0.0539	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Dibromomethane	N/A	N/A	ug/L	10	0.0864	0.0864	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Dichlorodifluoromethane	N/A	N/A	ug/L	10	0.0575	0.0575	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	N/A	ug/L	10	0.0752	1.00	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Ethylbenzene	N/A	N/A	ug/L	10	0.0226	1.00	1.00	1.00	6	4	-	0.0357	0.0447	4	40%	No	--
DP Groundwater	VOCs	Total	Hexachlorobutadiene	N/A	N/A	ug/L	10	0.152	0.152	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/L	10	0.0165	0.0165	1.00	1.00	9	1	-	0.0197	0.0197	1	10%	No	--
DP Groundwater	VOCs	Total	m,p-Xylenes	N/A	N/A	ug/L	10	0.0718	0.0718	2.00	2.00	6	4	-	0.0823	0.132	4	40%	No	--
DP Groundwater	VOCs	Total	Naphthalene	N/A	N/A	ug/L	10	0.0317	1.00	1.00	1.00	8	2	-	0.0359	0.0452	2	20%	No	--
DP Groundwater	VOCs	Total	n-Butylbenzene	N/A	N/A	ug/L	10	0.0603	0.0603	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	n-Propylbenzene	N/A	N/A	ug/L	10	0.0356	0.0356	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	o-Xylene	N/A	N/A	ug/L	10	0.0265	0.0265	1.00	1.00	6	4	-	0.0304	0.0735	4	40%	No	--
DP Groundwater	VOCs	Total	sec-Butylbenzene	N/A	N/A	ug/L	10	0.0358	0.0358	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Styrene	N/A	N/A	ug/L	10	0.0279	0.0279	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	tert-Butylbenzene	N/A	N/A	ug/L	10	0.0535	0.0535	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/L	10	-	-	1.00	1.00	0	3	7	0.336	54.5	10	100%	No	--
DP Groundwater	VOCs	Total	Toluene	N/A	N/A	ug/L	10	0.0588	1.00	1.00	1.00	4	6	-	0.0917	0.299	6	60%	No	--
DP Groundwater	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/L	10	0.0584	0.0584	1.00	1.00	7	1	2	0.0955	1.80	3	30%	No	--
DP Groundwater	VOCs	Total	trans-1,3-Dichloropropene	N/A	N/A	ug/L	10	0.0539	0.0539	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/L	10	0.0641	0.0641	1.00	1.00	1	5	4	0.0904	43.7	9	90%	No	--
DP Groundwater	VOCs	Total	Trichlorofluoromethane	N/A	N/A	ug/L	10	0.0620	0.0620	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Vinyl Acetate	N/A	N/A	ug/L	10	0.320	1.01	5.00	5.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/L	10	0.0604	0.0604	1.00	1.00	8	2	-	0.132	0.611	2	20%	No	--
Soil Gas	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/m^3	5	-	-	8.30	690	0	4	1	5.20	98.0	5	100%	Yes	--
Soil Gas	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	N/A	ug/m^3	5	1.90	110	10.0	590	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	1,1,2-Trichloroethane	N/A	N/A	ug/m^3	5	2.00	110	8.30	470	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/m^3	5	0.980	56.0	6.10	350	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	1,1-Dichloroethene	N/A	N/A	ug/m^3	5	0.840	48.0	6.00	340	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	1,2,4-Trichlorobenzene	N/A	N/A	ug/m^3	5	12.0	660	45.0	2,600	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/m^3	5	-	-	-	-	0	-	5	95.0	18,500	5	100%	Yes	--
Soil Gas	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	N/A	ug/m^3	5	1.20	66.0	12.0	660	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	1,2-Dichlorobenzene	N/A	N/A	ug/m^3	5	1.60	93.0	9.10	520	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	N/A	ug/m^3	5	0.860	49.0	6.10	350	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	1,2-Dichloropropane	N/A	N/A	ug/m^3	5	0.980	56.0	7.00	400	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	1,3,5-Trimethylbenzene	N/A	N/A	ug/m^3	5	-	-	-	-	0	-	5	30.0	6,250	5	100%	Yes	--
Soil Gas	VOCs	Total	1,3-Butadiene	N/A	N/A	ug/m^3	5	23.0	23.0	4.90	190	1	1	3	2.20	210	4	80%	Yes	--
Soil Gas	VOCs	Total	1,3-Dichlorobenzene	N/A	N/A	ug/m^3	5	1.80	100	9.10	520	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/m^3	5	1.80	100	9.10	520	5	-	-	-	-	0	0%	Yes	--

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(24 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil Gas	VOCs	Total	1,4-Dioxane	N/A	N/A	ug/m^3	5	1.10	43.0	22.0	1,200	4	1	-	1.10	1.10	1	20%	Yes	--
Soil Gas	VOCs	Total	2,2,4-Trimethylpentane	N/A	N/A	ug/m^3	5	1.20	48.0	7.10	400	4	1	-	1.80	1.80	1	20%	Yes	--
Soil Gas	VOCs	Total	2-Butanone (MEK)	N/A	N/A	ug/m^3	5	1.70	66.0	6.50	250	3	-	2	16.0	31.0	2	40%	Yes	--
Soil Gas	VOCs	Total	2-Hexanone	N/A	N/A	ug/m^3	5	2.40	130	25.0	1,400	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	2-Propanol	N/A	N/A	ug/m^3	5	1.50	84.0	15.0	840	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	3-Chloropropene	N/A	N/A	ug/m^3	5	2.60	150	19.0	1,100	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	4-Ethyltoluene	N/A	N/A	ug/m^3	5	-	-	-	-	0	-	5	74.0	9,150	5	100%	Yes	--
Soil Gas	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	N/A	ug/m^3	5	1.10	42.0	6.20	350	4	1	-	2.10	2.10	1	20%	Yes	--
Soil Gas	VOCs	Total	Acetone	N/A	N/A	ug/m^3	5	4.70	86.0	21.0	820	3	-	2	83.0	97.0	2	40%	Yes	--
Soil Gas	VOCs	Total	alpha-Chlorotoluene	N/A	N/A	ug/m^3	5	1.60	89.0	7.80	440	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	Benzene	N/A	N/A	ug/m^3	5	27.0	27.0	7.10	270	1	2	2	2.10	85.0	4	80%	Yes	--
Soil Gas	VOCs	Total	Bromodichloromethane	N/A	N/A	ug/m^3	5	0.610	34.0	10.0	580	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	Bromoform	N/A	N/A	ug/m^3	5	3.10	180	16.0	890	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	Bromomethane	N/A	N/A	ug/m^3	5	1.40	80.0	5.90	330	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/m^3	5	4.70	27.0	4.70	270	2	2	1	1.80	42.0	3	60%	Yes	--
Soil Gas	VOCs	Total	Carbon Tetrachloride	N/A	N/A	ug/m^3	5	1.10	65.0	9.50	540	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	Chlorobenzene	N/A	N/A	ug/m^3	5	1.10	63.0	7.00	400	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	Chloroethane	N/A	N/A	ug/m^3	5	0.640	36.0	4.00	230	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	Chloroform	N/A	N/A	ug/m^3	5	1.10	42.0	7.40	420	4	1	-	0.750	0.750	1	20%	Yes	--
Soil Gas	VOCs	Total	Chloromethane	N/A	N/A	ug/m^3	5	0.940	53.0	12.0	710	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/m^3	5	-	-	19.0	500	0	2	3	8.60	330	5	100%	Yes	--
Soil Gas	VOCs	Total	cis-1,3-Dichloropropene	N/A	N/A	ug/m^3	5	0.550	31.0	6.90	390	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	Cyclohexane	N/A	N/A	ug/m^3	5	0.760	30.0	5.20	300	2	2	1	1.80	24.0	3	60%	Yes	--
Soil Gas	VOCs	Total	Dibromochloromethane	N/A	N/A	ug/m^3	5	1.80	100	13.0	730	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	Dichlorodifluoromethane	N/A	N/A	ug/m^3	5	4.20	76.0	7.50	420	3	2	-	3.00	3.20	2	40%	Yes	--
Soil Gas	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	N/A	ug/m^3	5	1.50	60.0	5.30	300	4	1	-	1.80	1.80	1	20%	Yes	--
Soil Gas	VOCs	Total	Ethanol	N/A	N/A	ug/m^3	5	5.70	100	17.0	650	3	1	1	13.0	13.0	2	40%	Yes	--
Soil Gas	VOCs	Total	Ethylbenzene	N/A	N/A	ug/m^3	5	-	-	-	-	0	-	5	25.0	1,550	5	100%	Yes	--
Soil Gas	VOCs	Total	Freon 113	N/A	N/A	ug/m^3	5	1.20	66.0	12.0	660	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	Freon 114	N/A	N/A	ug/m^3	5	1.50	84.0	10.0	600	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	Heptane	N/A	N/A	ug/m^3	5	9.00	9.00	9.00	520	1	2	2	7.60	87.0	4	80%	Yes	--
Soil Gas	VOCs	Total	Hexachlorobutadiene	N/A	N/A	ug/m^3	5	17.0	970	65.0	3,700	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	Hexane	N/A	N/A	ug/m^3	5	42.0	42.0	7.80	300	1	2	2	1.30	110	4	80%	Yes	--
Soil Gas	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/m^3	5	-	-	7.40	24.0	0	2	3	4.30	675	5	100%	Yes	--
Soil Gas	VOCs	Total	m,p-Xylenes	N/A	N/A	ug/m^3	5	-	-	-	-	0	-	5	61.0	5,850	5	100%	Yes	--
Soil Gas	VOCs	Total	Methyl tert-butyl ether	N/A	N/A	ug/m^3	5	1.40	81.0	5.50	310	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	n-Propylbenzene	N/A	N/A	ug/m^3	5	-	-	24.0	24.0	0	1	4	16.0	2,300	5	100%	Yes	--
Soil Gas	VOCs	Total	o-Xylene	N/A	N/A	ug/m^3	5	-	-	-	-	0	-	5	28.0	2,800	5	100%	Yes	--
Soil Gas	VOCs	Total	Styrene	N/A	N/A	ug/m^3	5	1.30	73.0	6.40	370	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/m^3	5	-	-	-	-	0	-	5	610	34,000	5	100%	Yes	--
Soil Gas	VOCs	Total	Tetrahydrofuran	N/A	N/A	ug/m^3	5	1.10	61.0	4.50	250	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	Toluene	N/A	N/A	ug/m^3	5	-	-	-	-	0	-	5	300	47,500	5	100%	Yes	--
Soil Gas	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/m^3	5	2.60	100	6.00	340	4	1	-	4.00	4.00	1	20%	Yes	--
Soil Gas	VOCs	Total	trans-1,3-Dichloropropene	N/A	N/A	ug/m^3	5	0.960	55.0	6.90	390	5	-	-	-	-	0	0%	Yes	--
Soil Gas	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/m^3	5	-	-	680	680	0	1	4	27.0	610	5	100%	Yes	--
Soil Gas	VOCs	Total	Trichlorofluoromethane	N/A	N/A	ug/m^3	5	1.70	68.0	8.50	480	4	1	-	2.20	2.20	1	20%	Yes	--
Soil Gas	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/m^3	5	0.930	53.0	3.90	220	5	-	-	-	-	0	0%	Yes	--

Notes
(1) Only evaluated for analytes with a sample size of 20 or more.
If all samples were NDs (detection rate=0%), or if there was only one distinct detected result, or if there were four or fewer samples and the data set contained NDs, the mean and standard deviation are not shown.
If there were two or more distinct detected results, but not all samples were detected results (i.e., detection rate = <100%), the mean and standard deviation were estimated by the Kaplan-Meier method.
Minimum and maximum detected values are not shown if all samples were NDs.
Minimum and maximum MDLs/MRLs for NDs are not shown if all samples had detected results.
The erodible soil subset is comprised of the following samples: SB-EUA, SB-EUB, SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, SB-EUB-15, and SB-04.

Table I-2
Data Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(25 of 25)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]

'--' = Not evaluated
% = percent
DP = Direct Push
Max = maximum
MDL = method detection limit
mg/kg = milligrams per kilogram
Min = minimum
MRL = methode reporting limit
ND = non-detect
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic carbon
VOC = volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
ug/m^3 = micrograms per cubic meter

Table I-3
Data Summary for Pistol Range AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 1)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	Metals	Total	Antimony	0-1 ft	mg/kg	5	5.00	6.00	5.00	6.00	5	-	-	-	-	0	0%	Yes	--
Soil	Metals	Total	Arsenic	0-1 ft	mg/kg	5	5.00	6.00	5.00	6.00	5	-	-	-	-	0	0%	Yes	--
Soil	Metals	Total	Copper	0-1 ft	mg/kg	14	-	-	-	-	0	-	14	15.6	53.1	14	100%	No	--
Soil	Metals	Total	Lead	0-1 ft	mg/kg	63	-	-	-	-	0	-	63	7.50	1,110	63	100%	No	Yes
Soil	Metals	Total	Mercury	0-1 ft	mg/kg	14	0.0400	0.0600	0.0400	0.0600	14	-	-	-	-	0	0%	No	--
Soil	Metals	Total	Nickel	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	19.0	32.0	10	100%	No	--
Soil	Metals	Total	Zinc	0-1 ft	mg/kg	10	-	-	-	-	0	-	10	74.0	199	10	100%	No	--
Lagoon Sediment	Metals	Total	Copper	N/A	mg/kg	5	-	-	-	-	0	-	5	20.2	25.4	5	100%	Yes	--
Lagoon Sediment	Metals	Total	Lead	N/A	mg/kg	5	-	-	-	-	0	-	5	20.0	33.0	5	100%	Yes	--
Lagoon Sediment	Metals	Total	Nickel	N/A	mg/kg	5	-	-	-	-	0	-	5	12.9	15.4	5	100%	Yes	--
Lagoon Sediment	Metals	Total	Zinc	N/A	mg/kg	5	-	-	-	-	0	-	5	128	174	5	100%	Yes	--
DP Groundwater	Metals	Total	Copper	N/A	ug/L	2	-	-	-	-	0	-	2	40.0	54.8	2	100%	Yes	--
DP Groundwater	Metals	Total	Lead	N/A	ug/L	2	-	-	-	-	0	-	2	10.5	12.6	2	100%	Yes	--
DP Groundwater	Metals	Total	Nickel	N/A	ug/L	2	-	-	40.0	40.0	0	1	1	21.4	50.1	2	100%	Yes	--
DP Groundwater	Metals	Total	Zinc	N/A	ug/L	2	-	-	-	-	0	-	2	78.1	149	2	100%	Yes	--
DP Groundwater	Metals	Dissolved	Copper	N/A	ug/L	2	-	-	-	-	0	-	2	0.665	0.800	2	100%	Yes	--
DP Groundwater	Metals	Dissolved	Lead	N/A	ug/L	2	0.0200	0.0200	0.0200	0.0200	2	-	-	-	-	0	0%	Yes	--
DP Groundwater	Metals	Dissolved	Nickel	N/A	ug/L	2	2.00	2.00	20.0	20.0	1	1	-	3.90	3.90	1	50%	Yes	--
DP Groundwater	Metals	Dissolved	Zinc	N/A	ug/L	2	-	-	10.0	10.0	0	2	-	2.10	4.10	2	100%	Yes	--

Notes
(1) Only evaluated for analytes with a sample size of 20 or more.
If all samples were NDs (detection rate=0%), or if there was only one distinct detected result, or if there were four or fewer samples and the data set contained NDs, the mean and standard deviation are not shown.
If there were two or more distinct detected results, but not all samples were detected results (i.e., detection rate = <100%), the mean and standard deviation were estimated by the Kaplan-Meier method.
Minimum and maximum detected values are not shown if all samples were NDs.
Minimum and maximum MDLs for NDs are not shown if all samples had detected results.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.
All concentrations are totals.

'--' = Not evaluated
% = percent
DP = Direct Push
Max = maximum
MDL = method detection limit
mg/kg = milligrams per kilogram
Min = minimum
MRL = methode reporting limit
ND = non-detect
ug/kg = micrograms per kilogram
ug/L = micrograms per liter

Table I-4
Data Summary for Bulb Slope AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 1)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	Metals	Total	Lead	0-1 ft	mg/kg	12	-	-	-		0	-	12	25.0	597	12	100%	No	--
Soil	Metals	Total	Mercury	0-1 ft	mg/kg	12	-	-	-		0	-	12	0.0500	1.54	12	100%	No	--
Soil	PCB Aroclors	Total	Aroclor 1016	0-1 ft	ug/kg	12	19.0	67.0	19.0	67.0	12	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1221	0-1 ft	ug/kg	12	38.0	134	38.0	134.0	12	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1232	0-1 ft	ug/kg	12	19.0	67.0	19.0	67.0	12	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1242	0-1 ft	ug/kg	12	19.0	67.0	19.0	67.0	12	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1248	0-1 ft	ug/kg	12	19.0	67.0	19.0	67.0	12	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1254	0-1 ft	ug/kg	12	19.0	67.0	19.0	67.0	12	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	ug/kg	12	19.0	67.0	19.0	67.0	4	-	8	27.0	251	8	67%	No	--
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	ug/kg	12	19.0	67.0	19.0	67.0	-	-	-	27.0	251	8	67%	No	--
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	mg/kg	8	-	-	-		0	-	8	8.30	170	8	100%	No	--
Soil	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	mg/kg	8	-	-	-		0	-	8	44.0	410	8	100%	No	--

Notes
(1) Only evaluated for analytes with a sample size of 20 or more.
If all samples were NDs (detection rate=0%), or if there was only one distinct detected result, or if there were four or fewer samples and the data set contained NDs, the mean and standard deviation are not shown.
If there were two or more distinct detected results, but not all samples were detected results (i.e., detection rate = <100%), the mean and standard deviation were estimated by the Kaplan-Meier method.
Minimum and maximum detected values are not shown if all samples were NDs.
Minimum and maximum MDLs for NDs are not shown if all samples had detected results.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.
All concentrations are totals.

'--' = Not evaluated
% = percent
Max = maximum
MDL = method detection limit
mg/kg = milligrams per kilogram
Min = minimum
MRL = methode reporting limit
ND = non-detect
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
PCB = polychlorinated biphenyl
ug/kg = micrograms per kilogram

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(1 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
Soil	Metals	Total	Aluminum	0-1 ft	N/A	mg/kg	68	-	-	-	-	0	-	68	1,530	24,300	68	100%	No	Yes
Soil	Metals	Total	Aluminum	0-3 ft	N/A	mg/kg	87	-	-	-	-	0	-	87	1,530	24,300	87	100%	No	Yes
Soil	Metals	Total	Aluminum	0-10 ft	N/A	mg/kg	104	-	-	-	-	0	-	104	1,530	24,300	104	100%	No	Yes
Soil	Metals	Total	Antimony	0-1 ft	N/A	mg/kg	83	0.160	6.00	0.160	6.00	38	25	20	0.0895	13.7	45	54%	No	Yes
Soil	Metals	Total	Antimony	0-3 ft	N/A	mg/kg	102	0.160	6.00	0.160	6.00	41	37	24	0.0700	13.7	61	60%	No	Yes
Soil	Metals	Total	Antimony	0-10 ft	N/A	mg/kg	119	0.160	6.00	0.160	6.00	41	40	38	0.0700	13.7	78	66%	No	Yes
Soil	Metals	Total	Arsenic	0-1 ft	N/A	mg/kg	84	0.159	6.00	0.907	6.00	6	3	75	0.613	80.9	78	93%	No	Yes
Soil	Metals	Total	Arsenic	0-3 ft	N/A	mg/kg	103	0.159	6.00	0.907	6.00	6	3	94	0.613	80.9	97	94%	No	Yes
Soil	Metals	Total	Arsenic	0-10 ft	N/A	mg/kg	120	0.159	6.00	0.907	6.00	6	3	111	0.613	80.9	114	95%	No	Yes
Soil	Metals	Total	Barium	0-1 ft	N/A	mg/kg	79	-	-	-	-	0	-	79	10.7	242	79	100%	No	Yes
Soil	Metals	Total	Barium	0-3 ft	N/A	mg/kg	98	-	-	-	-	0	-	98	10.7	242	98	100%	No	Yes
Soil	Metals	Total	Barium	0-10 ft	N/A	mg/kg	115	-	-	-	-	0	-	115	10.7	242	115	100%	No	Yes
Soil	Metals	Total	Beryllium	0-1 ft	N/A	mg/kg	79	0.147	0.280	0.248	1.23	35	24	20	0.0587	0.630	44	56%	No	Yes
Soil	Metals	Total	Beryllium	0-3 ft	N/A	mg/kg	98	0.147	0.280	0.248	1.23	37	36	25	0.0587	0.630	61	62%	No	Yes
Soil	Metals	Total	Beryllium	0-10 ft	N/A	mg/kg	115	0.147	0.280	0.248	1.23	42	45	28	0.0587	0.630	73	63%	No	Yes
Soil	Metals	Total	Cadmium	0-1 ft	N/A	mg/kg	79	0.0122	0.290	0.248	0.540	11	4	64	0.0561	17.3	68	86%	No	Yes
Soil	Metals	Total	Cadmium	0-3 ft	N/A	mg/kg	98	0.0122	0.290	0.248	0.540	14	4	80	0.0561	17.3	84	86%	No	Yes
Soil	Metals	Total	Cadmium	0-10 ft	N/A	mg/kg	115	0.0122	0.290	0.248	0.540	17	4	94	0.0561	17.3	98	85%	No	Yes
Soil	Metals	Total	Chromium	0-1 ft	N/A	mg/kg	82	-	-	-	-	0	-	82	5.27	2,650	82	100%	No	Yes
Soil	Metals	Total	Chromium	0-3 ft	N/A	mg/kg	101	-	-	-	-	0	-	101	5.27	2,650	101	100%	No	Yes
Soil	Metals	Total	Chromium	0-10 ft	N/A	mg/kg	118	-	-	-	-	0	-	118	5.27	2,650	118	100%	No	Yes
Soil	Metals	Total	Cobalt	0-1 ft	N/A	mg/kg	68	-	-	-	-	0	-	68	2.52	25.0	68	100%	No	Yes
Soil	Metals	Total	Cobalt	0-3 ft	N/A	mg/kg	87	-	-	-	-	0	-	87	2.52	41.0	87	100%	No	Yes
Soil	Metals	Total	Cobalt	0-10 ft	N/A	mg/kg	104	-	-	-	-	0	-	104	2.52	42.3	104	100%	No	Yes
Soil	Metals	Total	Copper	0-1 ft	N/A	mg/kg	93	-	-	-	-	0	-	93	13.2	494	93	100%	No	Yes
Soil	Metals	Total	Copper	0-3 ft	N/A	mg/kg	112	-	-	-	-	0	-	112	13.2	494	112	100%	No	Yes
Soil	Metals	Total	Copper	0-10 ft	N/A	mg/kg	129	-	-	-	-	0	-	129	13.2	494	129	100%	No	Yes
Soil	Metals	Total	Lead	0-1 ft	N/A	mg/kg	157	-	-	-	-	0	-	157	5.34	3,260	157	100%	No	Yes
Soil	Metals	Total	Lead	0-3 ft	N/A	mg/kg	182	-	-	-	-	0	-	182	5.34	3,260	182	100%	No	Yes
Soil	Metals	Total	Lead	0-10 ft	N/A	mg/kg	199	-	-	-	-	0	-	199	5.24	3,260	199	100%	No	Yes
Soil	Metals	Total	Manganese	0-1 ft	N/A	mg/kg	79	-	-	-	-	0	-	79	167	789	79	100%	No	Yes
Soil	Metals	Total	Manganese	0-3 ft	N/A	mg/kg	98	-	-	-	-	0	-	98	167	1,710	98	100%	No	Yes
Soil	Metals	Total	Manganese	0-10 ft	N/A	mg/kg	115	-	-	-	-	0	-	115	146	1,710	115	100%	No	Yes
Soil	Metals	Total	Mercury	0-1 ft	N/A	mg/kg	107	0.00528	0.110	0.0196	0.110	34	15	58	0.0114	4.15	73	68%	No	Yes
Soil	Metals	Total	Mercury	0-3 ft	N/A	mg/kg	126	0.00528	0.110	0.0196	0.110	36	19	71	0.0114	4.15	90	71%	No	Yes
Soil	Metals	Total	Mercury	0-10 ft	N/A	mg/kg	143	0.00528	0.110	0.0192	0.110	36	21	86	0.0114	4.15	107	75%	No	Yes
Soil	Metals	Total	Nickel	0-1 ft	N/A	mg/kg	89	-	-	-	-	0	-	89	4.79	1,060	89	100%	No	Yes
Soil	Metals	Total	Nickel	0-3 ft	N/A	mg/kg	108	-	-	-	-	0	-	108	4.79	1,610	108	100%	No	Yes
Soil	Metals	Total	Nickel	0-10 ft	N/A	mg/kg	125	-	-	-	-	0	-	125	4.79	1,760	125	100%	No	Yes
Soil	Metals	Total	Selenium	0-1 ft	N/A	mg/kg	79	0.0781	1.50	0.200	4.12	46	28	5	0.175	0.900	33	42%	No	Yes
Soil	Metals	Total	Selenium	0-3 ft	N/A	mg/kg	98	0.0781	1.50	0.200	4.12	50	41	7	0.175	0.900	48	49%	No	Yes
Soil	Metals	Total	Selenium	0-10 ft	N/A	mg/kg	115	0.0774	1.50	0.200	4.12	58	47	10	0.106	0.900	57	50%	No	Yes
Soil	Metals	Total	Silver	0-1 ft	N/A	mg/kg	79	0.0440	0.570	0.200	0.687	17	36	26	0.0571	1.50	62	78%	No	Yes
Soil	Metals	Total	Silver	0-3 ft	N/A	mg/kg	98	0.0440	0.570	0.0680	2.02	17	51	30	0.0450	1.50	81	83%	No	Yes
Soil	Metals	Total	Silver	0-10 ft	N/A	mg/kg	115	0.0440	0.570	0.0680	2.02	17	63	35	0.0450	1.52	98	85%	No	Yes
Soil	Metals	Total	Thallium	0-1 ft	N/A	mg/kg	79	0.0429	0.300	0.117	0.687	31	34	14	0.0288	0.378	48	61%	No	Yes
Soil	Metals	Total	Thallium	0-3 ft	N/A	mg/kg	98	0.0429	0.300	0.0970	0.687	31	48	19	0.0288	0.378	67	68%	No	Yes
Soil	Metals	Total	Thallium	0-10 ft	N/A	mg/kg	115	0.0429	0.300	0.0970	0.951	31	58	26	0.0288	0.378	84	73%	No	Yes
Soil	Metals	Total	Vanadium	0-1 ft	N/A	mg/kg	68	-	-	-	-	0	-	68	6.89	84.7	68	100%	No	Yes
Soil	Metals	Total	Vanadium	0-3 ft	N/A	mg/kg	87	-	-	-	-	0	-	87	6.89	89.1	87	100%	No	Yes
Soil	Metals	Total	Vanadium	0-10 ft	N/A	mg/kg	104	-	-	-	-	0	-	104	6.89	93.4	104	100%	No	Yes
Soil	Metals	Total	Zinc	0-1 ft	N/A	mg/kg	89	-	-	-	-	0	-	89	30.3	1,160	89	100%	No	Yes
Soil	Metals	Total	Zinc	0-3 ft	N/A	mg/kg	108	-	-	-	-	0	-	108	30.3	1,160	108	100%	No	Yes
Soil	Metals	Total	Zinc	0-10 ft	N/A	mg/kg	125	-	-	-	-	0	-	125	30.3	1,160	125	100%	No	Yes
Soil	Butyltins	Total	Dibutyltin	0-1 ft	N/A	ug/kg	54	0.270	0.899	1.20	2.79	34	1	19	0.800	210	20	37%	No	Yes
Soil	Butyltins	Total	Dibutyltin	0-3 ft	N/A	ug/kg	71	0.270	0.899	1.20	2.79	51	1	19	0.800	210	20	28%	No	Yes
Soil	Butyltins	Total	Dibutyltin	0-10 ft	N/A	ug/kg	84	0.270	7.62	1.20	23.7	64	1	19	0.800	210	20	24%	No	Yes
Soil	Butyltins	Total	Monobutyltin	0-1 ft	N/A	ug/kg	54	0.240	1.98	1.20	3.73	30	4	20	0.420	108	24	44%	No	Yes
Soil	Butyltins	Total	Monobutyltin	0-3 ft	N/A	ug/kg	71	0.240	1.98	1.20	3.73	47	4	20	0.420	108	24	34%	No	Yes
Soil	Butyltins	Total	Monobutyltin	0-10 ft	N/A	ug/kg	84	0.240	16.8	1.20	31.6	60	4	20	0.420	108	24	29%	No	Yes
Soil	Butyltins	Total	Tetrabutyltin	0-1 ft	N/A	ug/kg	41	0.445	0.853	1.20	2.27	40	-	1	3.99	3.99	1	2%	No	No
Soil	Butyltins	Total	Tetrabutyltin	0-3 ft	N/A	ug/kg	53	0.445	0.910	1.20	2.42	52	-	1	3.99	3.99	1	2%	No	No
Soil	Butyltins	Total	Tetrabutyltin	0-10 ft	N/A	ug/kg	66	0.438	5.89	1.18	15.8	65	-	1	3.99	3.99	1	2%	No	No

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(2 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
Soil	Butyltins	Total	Tributyltin	0-1 ft	N/A	ug/kg	54	0.340	1.53	1.20	3.73	35	2	17	1.65	1,860	19	35%	No	Yes
Soil	Butyltins	Total	Tributyltin	0-3 ft	N/A	ug/kg	71	0.340	1.53	1.20	3.73	51	2	18	1.65	1,860	20	28%	No	Yes
Soil	Butyltins	Total	Tributyltin	0-10 ft	N/A	ug/kg	84	0.340	12.1	1.20	31.6	64	2	18	1.65	1,860	20	24%	No	Yes
Soil	Herbicides	Total	2,4,5-T	0-1 ft	N/A	ug/kg	24	1.26	50.0	3.10	50.0	22	-	2	63.0	93.0	2	8%	No	Yes
Soil	Herbicides	Total	2,4,5-T	0-3 ft	N/A	ug/kg	26	1.26	50.0	3.10	50.0	24	-	2	63.0	93.0	2	8%	No	Yes
Soil	Herbicides	Total	2,4,5-T	0-10 ft	N/A	ug/kg	33	1.26	50.0	3.10	50.0	31	-	2	63.0	93.0	2	6%	No	Yes
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-1 ft	N/A	ug/kg	24	1.84	50.0	2.50	50.0	24	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-3 ft	N/A	ug/kg	26	1.84	50.0	2.50	50.0	26	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-10 ft	N/A	ug/kg	33	1.84	50.0	2.50	50.0	33	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	2,4-D	0-1 ft	N/A	ug/kg	24	0.476	50.0	5.77	50.0	24	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	2,4-D	0-3 ft	N/A	ug/kg	26	0.476	50.0	5.77	50.0	26	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	2,4-D	0-10 ft	N/A	ug/kg	33	0.476	50.0	5.77	50.0	33	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	2,4-DB	0-1 ft	N/A	ug/kg	24	0.568	50.0	5.00	50.0	24	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	2,4-DB	0-3 ft	N/A	ug/kg	26	0.568	50.0	5.00	50.0	26	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	2,4-DB	0-10 ft	N/A	ug/kg	33	0.568	50.0	5.00	50.0	33	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	4-Nitrophenol	0-1 ft	N/A	ug/kg	13	1.27	1.81	5.77	8.18	13	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	4-Nitrophenol	0-3 ft	N/A	ug/kg	15	1.27	1.81	5.77	8.18	15	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	4-Nitrophenol	0-10 ft	N/A	ug/kg	22	1.27	1.81	5.77	8.18	22	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	Dalapon	0-1 ft	N/A	ug/kg	24	1.76	50.0	5.77	50.0	24	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	Dalapon	0-3 ft	N/A	ug/kg	26	1.76	50.0	5.77	50.0	26	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	Dalapon	0-10 ft	N/A	ug/kg	33	1.76	50.0	5.77	50.0	33	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	Dicamba	0-1 ft	N/A	ug/kg	24	1.40	50.0	2.10	50.0	24	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	Dicamba	0-3 ft	N/A	ug/kg	26	1.40	50.0	2.10	50.0	26	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	Dicamba	0-10 ft	N/A	ug/kg	33	1.40	50.0	2.10	50.0	33	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	Dichloroprop	0-1 ft	N/A	ug/kg	24	0.614	400	5.77	400	22	-	2	170	180	2	8%	No	Yes
Soil	Herbicides	Total	Dichloroprop	0-3 ft	N/A	ug/kg	26	0.614	400	5.77	400	24	-	2	170	180	2	8%	No	Yes
Soil	Herbicides	Total	Dichloroprop	0-10 ft	N/A	ug/kg	33	0.614	400	5.77	400	31	-	2	170	180	2	6%	No	Yes
Soil	Herbicides	Total	Dinoseb	0-1 ft	N/A	ug/kg	24	0.476	50.0	5.77	50.0	24	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	Dinoseb	0-3 ft	N/A	ug/kg	26	0.476	50.0	5.77	50.0	26	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	Dinoseb	0-10 ft	N/A	ug/kg	33	0.476	50.0	5.77	50.0	33	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	MCPA	0-1 ft	N/A	ug/kg	24	0.868	25,000	5.77	25,000	24	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	MCPA	0-3 ft	N/A	ug/kg	26	0.868	25,000	5.77	25,000	26	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	MCPA	0-10 ft	N/A	ug/kg	33	0.868	25,000	5.77	25,000	33	-	-	-	-	0	0%	No	No
Soil	Herbicides	Total	MCPP	0-1 ft	N/A	ug/kg	24	1.58	38,000	5.77	38,000	22	-	2	9,500	14,000	2	8%	No	Yes
Soil	Herbicides	Total	MCPP	0-3 ft	N/A	ug/kg	26	1.58	38,000	5.77	38,000	24	-	2	9,500	14,000	2	8%	No	Yes
Soil	Herbicides	Total	MCPP	0-10 ft	N/A	ug/kg	33	1.58	38,000	5.77	38,000	31	-	2	9,500	14,000	2	6%	No	Yes
Soil	Herbicides	Total	Pentachlorophenol	0-1 ft	N/A	ug/kg	13	0.673	0.955	5.77	8.18	13	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Pentachlorophenol	0-3 ft	N/A	ug/kg	15	0.673	0.955	5.77	8.18	15	-	-	-	-	0	0%	No	--
Soil	Herbicides	Total	Pentachlorophenol	0-10 ft	N/A	ug/kg	22	0.673	0.955	5.77	8.18	22	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	4,4'-DDD	0-1 ft	N/A	ug/kg	52	0.110	25.0	0.630	25.0	50	2	-	0.690	0.990	2	4%	No	No
Soil	Pesticides	Total	4,4'-DDD	0-3 ft	N/A	ug/kg	60	0.110	25.0	0.630	25.0	58	2	-	0.690	0.990	2	3%	No	No
Soil	Pesticides	Total	4,4'-DDD	0-10 ft	N/A	ug/kg	67	0.110	25.0	0.630	25.0	65	2	-	0.690	0.990	2	3%	No	No
Soil	Pesticides	Total	4,4'-DDE	0-1 ft	N/A	ug/kg	52	0.110	9.40	0.660	9.40	44	6	2	0.250	17.0	8	15%	No	Yes
Soil	Pesticides	Total	4,4'-DDE	0-3 ft	N/A	ug/kg	60	0.110	9.40	0.660	9.40	52	6	2	0.250	17.0	8	13%	No	Yes
Soil	Pesticides	Total	4,4'-DDE	0-10 ft	N/A	ug/kg	67	0.110	9.40	0.660	9.40	59	6	2	0.250	17.0	8	12%	No	Yes
Soil	Pesticides	Total	4,4'-DDT	0-1 ft	N/A	ug/kg	52	0.230	78.0	1.00	78.0	27	3	22	0.436	140	25	48%	No	Yes
Soil	Pesticides	Total	4,4'-DDT	0-3 ft	N/A	ug/kg	60	0.170	78.0	0.990	78.0	31	3	26	0.436	140	29	48%	No	Yes
Soil	Pesticides	Total	4,4'-DDT	0-10 ft	N/A	ug/kg	67	0.170	78.0	0.990	78.0	38	3	26	0.436	140	29	43%	No	Yes
Soil	Pesticides	Total	Aldrin	0-1 ft	N/A	ug/kg	52	0.101	5.00	0.630	5.00	51	1	-	4.40	4.40	1	2%	No	No
Soil	Pesticides	Total	Aldrin	0-3 ft	N/A	ug/kg	60	0.101	5.00	0.630	5.00	59	1	-	4.40	4.40	1	2%	No	No
Soil	Pesticides	Total	Aldrin	0-10 ft	N/A	ug/kg	67	0.101	5.00	0.630	5.00	66	1	-	4.40	4.40	1	1%	No	No
Soil	Pesticides	Total	BHC (alpha)	0-1 ft	N/A	ug/kg	52	0.0981	1.90	0.500	5.00	52	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	BHC (alpha)	0-3 ft	N/A	ug/kg	60	0.0981	1.90	0.500	5.00	59	-	1	2.02	2.02	1	2%	No	No
Soil	Pesticides	Total	BHC (alpha)	0-10 ft	N/A	ug/kg	67	0.0981	1.90	0.500	5.00	66	-	1	2.02	2.02	1	1%	No	No
Soil	Pesticides	Total	BHC (beta)	0-1 ft	N/A	ug/kg	52	0.109	12.0	0.630	12.0	50	1	1	0.952	2.60	2	4%	No	No
Soil	Pesticides	Total	BHC (beta)	0-3 ft	N/A	ug/kg	60	0.109	12.0	0.630	12.0	58	1	1	0.952	2.60	2	3%	No	No
Soil	Pesticides	Total	BHC (beta)	0-10 ft	N/A	ug/kg	67	0.109	12.0	0.630	12.0	65	1	1	0.952	2.60	2	3%	No	No
Soil	Pesticides	Total	BHC (delta)	0-1 ft	N/A	ug/kg	52	0.0740	5.00	0.600	5.00	50	1	1	0.0780	3.03	2	4%	No	No
Soil	Pesticides	Total	BHC (delta)	0-3 ft	N/A	ug/kg	60	0.0740	5.00	0.600	5.00	58	1	1	0.0780	3.03	2	3%	No	No
Soil	Pesticides	Total	BHC (delta)	0-10 ft	N/A	ug/kg	67	0.0740	5.00	0.600	5.00	65	1	1	0.0780	3.03	2	3%	No	No
Soil	Pesticides	Total	BHC (gamma) Lindane	0-1 ft	N/A	ug/kg	52	0.0800	37.0	0.630	37.0	50	-	2	2.17	9.68	2	4%	No	No
Soil	Pesticides	Total	BHC (gamma) Lindane	0-3 ft	N/A	ug/kg	60	0.0800	37.0	0.630	37.0	57	1	2	0.200	9.68	3	5%	No	No
Soil	Pesticides	Total	BHC (gamma) Lindane	0-10 ft	N/A	ug/kg	67	0.0800	37.0	0.630	37.0	64	1	2	0.200	9.68	3	4%	No	No

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(3 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
Soil	Pesticides	Total	Chlordane (alpha)	0-1 ft	N/A	ug/kg	39	0.100	19.0	0.630	19.0	35	3	1	0.660	4.00	4	10%	No	Yes
Soil	Pesticides	Total	Chlordane (alpha)	0-3 ft	N/A	ug/kg	45	0.100	19.0	0.630	19.0	41	3	1	0.660	4.00	4	9%	No	Yes
Soil	Pesticides	Total	Chlordane (alpha)	0-10 ft	N/A	ug/kg	45	0.100	19.0	0.630	19.0	41	3	1	0.660	4.00	4	9%	No	Yes
Soil	Pesticides	Total	Chlordane (gamma)	0-1 ft	N/A	ug/kg	39	0.0900	14.0	0.630	14.0	33	-	6	7.60	97.0	6	15%	No	Yes
Soil	Pesticides	Total	Chlordane (gamma)	0-3 ft	N/A	ug/kg	45	0.0900	14.0	0.630	14.0	35	3	7	0.610	97.0	10	22%	No	Yes
Soil	Pesticides	Total	Chlordane (gamma)	0-10 ft	N/A	ug/kg	45	0.0900	14.0	0.630	14.0	35	3	7	0.610	97.0	10	22%	No	Yes
Soil	Pesticides	Total	Chlordane (technical)	0-1 ft	N/A	ug/kg	13	1.34	11.2	9.50	19.8	12	-	1	1,560	1,560	1	8%	No	--
Soil	Pesticides	Total	Chlordane (technical)	0-3 ft	N/A	ug/kg	15	1.34	11.2	9.50	19.8	12	-	3	65.6	1,560	3	20%	No	--
Soil	Pesticides	Total	Chlordane (technical)	0-10 ft	N/A	ug/kg	22	1.34	11.8	9.50	19.8	16	-	6	49.4	1,560	6	27%	No	Yes
Soil	Pesticides	Total	Dieldrin	0-1 ft	N/A	ug/kg	52	0.140	31.0	0.630	31.0	49	2	1	0.428	2.10	3	6%	No	Yes
Soil	Pesticides	Total	Dieldrin	0-3 ft	N/A	ug/kg	60	0.140	31.0	0.630	31.0	57	2	1	0.428	2.10	3	5%	No	No
Soil	Pesticides	Total	Dieldrin	0-10 ft	N/A	ug/kg	67	0.140	31.0	0.630	31.0	64	2	1	0.428	2.10	3	4%	No	No
Soil	Pesticides	Total	Endosulfan I	0-1 ft	N/A	ug/kg	52	0.0630	9.50	0.630	9.50	50	-	2	2.20	6.45	2	4%	No	No
Soil	Pesticides	Total	Endosulfan I	0-3 ft	N/A	ug/kg	60	0.0630	9.50	0.630	9.50	55	2	3	0.140	6.45	5	8%	No	Yes
Soil	Pesticides	Total	Endosulfan I	0-10 ft	N/A	ug/kg	67	0.0630	9.50	0.630	9.50	62	2	3	0.140	6.45	5	7%	No	Yes
Soil	Pesticides	Total	Endosulfan II	0-1 ft	N/A	ug/kg	52	0.140	8.40	0.630	8.40	48	3	1	0.240	8.84	4	8%	No	Yes
Soil	Pesticides	Total	Endosulfan II	0-3 ft	N/A	ug/kg	60	0.140	8.40	0.630	8.40	56	3	1	0.240	8.84	4	7%	No	Yes
Soil	Pesticides	Total	Endosulfan II	0-10 ft	N/A	ug/kg	67	0.140	8.40	0.630	8.40	63	3	1	0.240	8.84	4	6%	No	Yes
Soil	Pesticides	Total	Endosulfan Sulfate	0-1 ft	N/A	ug/kg	52	0.110	8.00	0.630	8.00	45	4	3	0.577	5.97	7	13%	No	Yes
Soil	Pesticides	Total	Endosulfan Sulfate	0-3 ft	N/A	ug/kg	60	0.110	8.00	0.630	8.00	53	4	3	0.577	5.97	7	12%	No	Yes
Soil	Pesticides	Total	Endosulfan Sulfate	0-10 ft	N/A	ug/kg	67	0.110	8.00	0.630	8.00	60	4	3	0.577	5.97	7	10%	No	Yes
Soil	Pesticides	Total	Endrin Aldehyde	0-1 ft	N/A	ug/kg	52	0.120	13.0	0.630	13.0	48	2	2	2.02	16.0	4	8%	No	Yes
Soil	Pesticides	Total	Endrin Aldehyde	0-3 ft	N/A	ug/kg	60	0.120	13.0	0.630	13.0	55	2	3	1.90	16.0	5	8%	No	Yes
Soil	Pesticides	Total	Endrin Aldehyde	0-10 ft	N/A	ug/kg	67	0.120	13.0	0.630	13.0	62	2	3	1.90	16.0	5	7%	No	Yes
Soil	Pesticides	Total	Endrin Ketone	0-1 ft	N/A	ug/kg	51	0.0930	21.0	0.630	21.0	47	2	2	1.87	13.0	4	8%	No	Yes
Soil	Pesticides	Total	Endrin Ketone	0-3 ft	N/A	ug/kg	59	0.0930	21.0	0.630	21.0	55	2	2	1.87	13.0	4	7%	No	Yes
Soil	Pesticides	Total	Endrin Ketone	0-10 ft	N/A	ug/kg	66	0.0930	21.0	0.630	21.0	62	2	2	1.87	13.0	4	6%	No	Yes
Soil	Pesticides	Total	Endrin	0-1 ft	N/A	ug/kg	52	0.0940	10.0	0.630	10.0	49	1	2	3.00	17.0	3	6%	No	Yes
Soil	Pesticides	Total	Endrin	0-3 ft	N/A	ug/kg	60	0.0940	10.0	0.630	10.0	56	1	3	2.10	17.0	4	7%	No	Yes
Soil	Pesticides	Total	Endrin	0-10 ft	N/A	ug/kg	67	0.0940	10.0	0.630	10.0	63	1	3	2.10	17.0	4	6%	No	Yes
Soil	Pesticides	Total	Heptachlor Epoxide	0-1 ft	N/A	ug/kg	52	0.0840	7.10	0.630	7.10	51	-	1	14.4	14.4	1	2%	No	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-3 ft	N/A	ug/kg	60	0.0840	7.10	0.630	7.10	58	1	1	0.634	14.4	2	3%	No	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-10 ft	N/A	ug/kg	67	0.0840	7.10	0.630	7.10	65	1	1	0.634	14.4	2	3%	No	No
Soil	Pesticides	Total	Heptachlor	0-1 ft	N/A	ug/kg	52	0.0981	5.00	0.660	5.00	47	4	1	0.180	2.90	5	10%	No	Yes
Soil	Pesticides	Total	Heptachlor	0-3 ft	N/A	ug/kg	60	0.0981	5.00	0.660	5.00	54	4	2	0.180	3.07	6	10%	No	Yes
Soil	Pesticides	Total	Heptachlor	0-10 ft	N/A	ug/kg	67	0.0981	5.00	0.660	5.00	61	4	2	0.180	3.07	6	9%	No	Yes
Soil	Pesticides	Total	Methoxychlor	0-1 ft	N/A	ug/kg	52	0.141	19.0	0.630	19.8	50	-	2	1.00	1.20	2	4%	No	No
Soil	Pesticides	Total	Methoxychlor	0-3 ft	N/A	ug/kg	60	0.141	19.0	0.630	19.8	58	-	2	1.00	1.20	2	3%	No	No
Soil	Pesticides	Total	Methoxychlor	0-10 ft	N/A	ug/kg	67	0.141	19.0	0.630	19.8	65	-	2	1.00	1.20	2	3%	No	No
Soil	Pesticides	Total	Toxaphene	0-1 ft	N/A	ug/kg	52	4.80	2,900	34.0	2,900	52	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Toxaphene	0-3 ft	N/A	ug/kg	60	4.80	2,900	34.0	2,900	60	-	-	-	-	0	0%	No	No
Soil	Pesticides	Total	Toxaphene	0-10 ft	N/A	ug/kg	67	4.80	2,900	34.0	2,900	67	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1016	0-1 ft	N/A	ug/kg	97	1.08	67.0	3.80	67.0	97	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1016	0-3 ft	N/A	ug/kg	114	1.08	67.0	3.80	67.0	114	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1016	0-10 ft	N/A	ug/kg	128	1.08	67.0	3.80	67.0	128	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1221	0-1 ft	N/A	ug/kg	97	2.10	134	3.80	134	97	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1221	0-3 ft	N/A	ug/kg	114	2.10	134	3.80	134	114	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1221	0-10 ft	N/A	ug/kg	128	2.10	134	3.80	134	128	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1232	0-1 ft	N/A	ug/kg	97	2.10	67.0	3.80	67.0	97	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1232	0-3 ft	N/A	ug/kg	114	2.10	67.0	3.80	67.0	114	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1232	0-10 ft	N/A	ug/kg	128	2.10	67.0	3.80	67.0	128	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1242	0-1 ft	N/A	ug/kg	97	1.97	67.0	3.80	67.0	97	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1242	0-3 ft	N/A	ug/kg	114	1.97	67.0	3.80	67.0	114	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1242	0-10 ft	N/A	ug/kg	128	1.97	67.0	3.80	67.0	128	-	-	-	-	0	0%	No	No
Soil	PCB Aroclors	Total	Aroclor 1248	0-1 ft	N/A	ug/kg	97	2.10	67.0	3.80	67.0	95	-	2	61.5	968	2	2%	No	No
Soil	PCB Aroclors	Total	Aroclor 1248	0-3 ft	N/A	ug/kg	114	2.10	67.0	3.80	67.0	112	-	2	61.5	968	2	2%	No	No
Soil	PCB Aroclors	Total	Aroclor 1248	0-10 ft	N/A	ug/kg	128	2.10	67.0	3.80	67.0	126	-	2	61.5	968	2	2%	No	No
Soil	PCB Aroclors	Total	Aroclor 1254	0-1 ft	N/A	ug/kg	97	1.53	67.0	4.00	67.0	82	-	15	5.50	1,700	15	15%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1254	0-3 ft	N/A	ug/kg	114	1.53	67.0	4.00	67.0	93	-	21	5.50	1,700	21	18%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1254	0-10 ft	N/A	ug/kg	128	1.53	67.0	4.00	67.0	102	-	26	5.50	1,700	26	20%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	N/A	ug/kg	97	1.54	67.0	9.82	67.0	15	15	67	2.00	690	82	85%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1260	0-3 ft	N/A	ug/kg	114	1.54	67.0	9.82	67.0	21	19	74	2.00	690	93	82%	No	Yes
Soil	PCB Aroclors	Total	Aroclor 1260	0-10 ft	N/A	ug/kg	128	1.54	67.0	9.82	67.0	23	21	84	2.00	690	105	82%	No	Yes

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(4 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
Soil	PCB Aroclors	Total	Aroclor 1262	0-1 ft	N/A	ug/kg	13	2.10	11.0	6.30	50.0	13	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1262	0-3 ft	N/A	ug/kg	18	2.10	11.0	6.30	50.0	18	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1262	0-10 ft	N/A	ug/kg	18	2.10	11.0	6.30	50.0	18	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1268	0-1 ft	N/A	ug/kg	13	2.10	11.0	6.30	50.0	13	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1268	0-3 ft	N/A	ug/kg	18	2.10	11.0	6.30	50.0	18	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Aroclor 1268	0-10 ft	N/A	ug/kg	18	2.10	11.0	6.30	50.0	18	-	-	-	-	0	0%	No	--
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	N/A	ug/kg	97	3.08	150	19.0	150	-	-	-	3.70	2140	82	85%	No	Yes
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-3 ft	N/A	ug/kg	114	3.08	150	19.0	150	-	-	-	3.70	2140	93	82%	No	Yes
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-10 ft	N/A	ug/kg	128	3.08	150	19.0	150	-	-	-	3.70	2140	105	82%	No	Yes
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	N/A	mg/kg	83	5.02	25.0	24.9	36.0	8	13	62	3.60	5,100	75	90%	No	Yes
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-3 ft	N/A	mg/kg	102	5.02	25.0	24.9	36.0	12	21	69	3.60	5,100	90	88%	No	Yes
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-10 ft	N/A	mg/kg	119	5.02	25.0	24.9	36.0	18	22	79	3.60	9,740	101	85%	No	Yes
Soil	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	N/A	mg/kg	83	10.0	100	49.9	140	6	6	71	21.0	23,900	77	93%	No	Yes
Soil	NWTPH-Dx	Total	Residual Range Organics	0-3 ft	N/A	mg/kg	102	10.0	100	49.9	140	9	14	79	16.0	23,900	93	91%	No	Yes
Soil	NWTPH-Dx	Total	Residual Range Organics	0-10 ft	N/A	mg/kg	119	10.0	100	49.9	140	13	15	91	16.0	41,900	106	89%	No	Yes
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	N/A	mg/kg	49	0.121	20.0	2.60	20.0	38	8	3	1.60	586	11	22%	No	Yes
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-3 ft	N/A	mg/kg	59	0.121	20.0	2.60	20.0	45	9	5	1.60	3,960	14	24%	No	Yes
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-10 ft	N/A	mg/kg	69	0.121	20.0	2.60	20.0	53	11	5	1.60	3,960	16	23%	No	Yes
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	N/A	ug/kg	57	0.880	190	5.18	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-3 ft	N/A	ug/kg	67	0.880	190	5.18	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-10 ft	N/A	ug/kg	77	0.880	190	5.18	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-1 ft	N/A	ug/kg	57	0.703	190	5.18	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-3 ft	N/A	ug/kg	67	0.703	190	5.18	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-10 ft	N/A	ug/kg	77	0.703	190	5.18	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-1 ft	N/A	ug/kg	57	0.883	236	5.18	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-3 ft	N/A	ug/kg	67	0.883	236	5.18	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-10 ft	N/A	ug/kg	77	0.883	236	5.18	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-1 ft	N/A	ug/kg	57	0.871	269	5.18	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-3 ft	N/A	ug/kg	67	0.871	269	5.18	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-10 ft	N/A	ug/kg	77	0.871	269	5.18	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-1 ft	N/A	ug/kg	58	0.804	930	5.18	1,680	58	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-3 ft	N/A	ug/kg	68	0.804	930	5.18	1,680	68	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-10 ft	N/A	ug/kg	78	0.804	930	5.18	1,680	78	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-1 ft	N/A	ug/kg	58	0.819	300	5.18	1,680	58	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-3 ft	N/A	ug/kg	68	0.819	300	5.18	1,680	68	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-10 ft	N/A	ug/kg	78	0.819	300	5.18	1,680	78	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dichlorophenol	0-1 ft	N/A	ug/kg	58	0.919	300	5.18	1,680	58	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dichlorophenol	0-3 ft	N/A	ug/kg	68	0.919	300	5.18	1,680	68	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dichlorophenol	0-10 ft	N/A	ug/kg	78	0.919	300	5.18	1,680	78	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dimethylphenol	0-1 ft	N/A	ug/kg	58	0.793	280	2.07	1,700	58	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dimethylphenol	0-3 ft	N/A	ug/kg	68	0.793	280	2.07	1,700	68	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dimethylphenol	0-10 ft	N/A	ug/kg	78	0.793	280	2.07	1,700	78	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrophenol	0-1 ft	N/A	ug/kg	54	2.81	1,800	29.3	6,700	54	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrophenol	0-3 ft	N/A	ug/kg	64	2.81	1,800	29.3	6,700	64	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrophenol	0-10 ft	N/A	ug/kg	74	2.81	1,800	29.3	6,700	74	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-1 ft	N/A	ug/kg	57	1.52	366	6.40	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-3 ft	N/A	ug/kg	67	1.52	366	6.40	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-10 ft	N/A	ug/kg	77	1.52	366	6.40	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-1 ft	N/A	ug/kg	57	1.11	303	5.18	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-3 ft	N/A	ug/kg	67	1.11	303	5.18	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-10 ft	N/A	ug/kg	77	1.11	303	5.18	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chloronaphthalene	0-1 ft	N/A	ug/kg	57	0.351	190	1.17	340	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chloronaphthalene	0-3 ft	N/A	ug/kg	67	0.351	190	1.17	340	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chloronaphthalene	0-10 ft	N/A	ug/kg	77	0.351	190	1.17	340	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chlorophenol	0-1 ft	N/A	ug/kg	58	0.697	252	5.18	1,680	58	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chlorophenol	0-3 ft	N/A	ug/kg	68	0.697	252	5.18	1,680	68	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Chlorophenol	0-10 ft	N/A	ug/kg	78	0.697	252	5.18	1,680	78	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Methylphenol	0-1 ft	N/A	ug/kg	58	0.978	202	5.18	1,680	58	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Methylphenol	0-3 ft	N/A	ug/kg	68	0.978	202	5.18	1,680	68	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Methylphenol	0-10 ft	N/A	ug/kg	78	0.978	202	5.18	1,680	78	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitroaniline	0-1 ft	N/A	ug/kg	57	0.563	930	2.07	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitroaniline	0-3 ft	N/A	ug/kg	67	0.563	930	2.07	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitroaniline	0-10 ft	N/A	ug/kg	77	0.563	930	2.07	1,680	77	-	-	-	-	0	0%	No	No

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(5 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
Soil	SVOCs	Total	2-Nitrophenol	0-1 ft	N/A	ug/kg	58	1.18	300	5.18	1,680	58	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitrophenol	0-3 ft	N/A	ug/kg	68	1.18	300	5.18	1,680	68	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	2-Nitrophenol	0-10 ft	N/A	ug/kg	78	1.18	300	5.18	1,680	78	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-1 ft	N/A	ug/kg	57	1.29	2,490	11.7	3,400	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-3 ft	N/A	ug/kg	67	1.29	2,490	11.7	3,400	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-10 ft	N/A	ug/kg	77	1.29	2,490	11.7	3,400	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3-Nitroaniline	0-1 ft	N/A	ug/kg	57	1.99	930	10.4	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3-Nitroaniline	0-3 ft	N/A	ug/kg	67	1.99	930	10.4	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	3-Nitroaniline	0-10 ft	N/A	ug/kg	77	1.99	930	10.4	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-1 ft	N/A	ug/kg	54	1.51	930	10.4	4,210	54	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-3 ft	N/A	ug/kg	64	1.51	930	10.4	4,210	64	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-10 ft	N/A	ug/kg	74	1.51	930	10.4	4,210	74	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-1 ft	N/A	ug/kg	57	1.40	224	6.40	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-3 ft	N/A	ug/kg	67	1.40	224	6.40	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-10 ft	N/A	ug/kg	77	1.40	224	6.40	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-1 ft	N/A	ug/kg	58	0.925	300	5.18	1,680	58	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-3 ft	N/A	ug/kg	68	0.925	300	5.18	1,680	68	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-10 ft	N/A	ug/kg	78	0.925	300	5.18	1,680	78	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloroaniline	0-1 ft	N/A	ug/kg	57	0.963	300	6.40	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloroaniline	0-3 ft	N/A	ug/kg	67	0.963	300	6.40	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chloroaniline	0-10 ft	N/A	ug/kg	77	0.963	300	6.40	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-1 ft	N/A	ug/kg	57	1.97	283	6.40	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-3 ft	N/A	ug/kg	67	1.97	283	6.40	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-10 ft	N/A	ug/kg	77	1.97	283	6.40	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitroaniline	0-1 ft	N/A	ug/kg	57	1.99	930	11.7	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitroaniline	0-3 ft	N/A	ug/kg	67	1.99	930	11.7	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitroaniline	0-10 ft	N/A	ug/kg	77	1.99	930	11.7	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitrophenol	0-1 ft	N/A	ug/kg	58	2.22	1,500	29.3	4,210	58	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitrophenol	0-3 ft	N/A	ug/kg	68	2.22	1,500	29.3	4,210	68	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	4-Nitrophenol	0-10 ft	N/A	ug/kg	78	2.22	1,500	29.3	4,210	78	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Aniline	0-1 ft	N/A	ug/kg	48	1.50	454	10.4	1,680	48	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Aniline	0-3 ft	N/A	ug/kg	58	1.50	454	10.4	1,680	58	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Aniline	0-10 ft	N/A	ug/kg	68	1.50	454	10.4	1,680	68	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Benzidine	0-1 ft	N/A	ug/kg	34	2.21	1,800	10.4	4,210	34	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Benzidine	0-3 ft	N/A	ug/kg	39	2.21	1,800	10.4	4,210	39	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Benzidine	0-10 ft	N/A	ug/kg	49	2.21	1,800	10.4	4,210	49	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Benzoic Acid	0-1 ft	N/A	ug/kg	54	4.15	4,800	58.5	6,700	35	11	8	15.3	980	19	35%	No	Yes
Soil	SVOCs	Total	Benzoic Acid	0-3 ft	N/A	ug/kg	64	4.15	4,800	58.5	6,700	43	13	8	15.3	980	21	33%	No	Yes
Soil	SVOCs	Total	Benzoic Acid	0-10 ft	N/A	ug/kg	74	4.15	4,800	58.5	6,700	52	14	8	15.3	980	22	30%	No	Yes
Soil	SVOCs	Total	Benzyl Alcohol	0-1 ft	N/A	ug/kg	58	2.06	353	5.18	1,680	56	1	1	7.81	14.0	2	3%	No	No
Soil	SVOCs	Total	Benzyl Alcohol	0-3 ft	N/A	ug/kg	68	2.06	353	5.18	1,680	66	1	1	7.81	14.0	2	3%	No	No
Soil	SVOCs	Total	Benzyl Alcohol	0-10 ft	N/A	ug/kg	78	2.06	353	5.18	1,680	76	1	1	7.81	14.0	2	3%	No	No
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-1 ft	N/A	ug/kg	57	1.30	202	6.40	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-3 ft	N/A	ug/kg	67	1.30	202	6.40	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-10 ft	N/A	ug/kg	77	1.30	202	6.40	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-1 ft	N/A	ug/kg	57	1.63	321	6.40	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-3 ft	N/A	ug/kg	67	1.63	321	6.40	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-10 ft	N/A	ug/kg	77	1.63	321	6.40	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-1 ft	N/A	ug/kg	57	1.20	438	6.40	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-3 ft	N/A	ug/kg	67	1.20	438	6.40	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-10 ft	N/A	ug/kg	77	1.20	438	6.40	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	N/A	ug/kg	58	1.90	690	20.7	4,210	13	-	45	92.0	260,000	45	78%	No	Yes
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-3 ft	N/A	ug/kg	69	1.90	690	20.7	4,210	14	2	53	15.0	260,000	55	80%	No	Yes
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-10 ft	N/A	ug/kg	79	1.90	690	20.7	4,210	14	5	60	6.67	260,000	65	82%	No	Yes
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	N/A	ug/kg	57	1.50	320	6.40	1,680	49	6	2	3.67	124	8	14%	No	Yes
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-3 ft	N/A	ug/kg	67	1.50	320	6.40	1,680	58	6	3	3.67	124	9	13%	No	Yes
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-10 ft	N/A	ug/kg	77	1.50	320	6.40	1,680	66	7	4	3.67	152	11	14%	No	Yes
Soil	SVOCs	Total	Carbazole	0-1 ft	N/A	ug/kg	58	2.06	180	6.40	375	19	11	28	1.40	2,650	39	67%	No	Yes
Soil	SVOCs	Total	Carbazole	0-3 ft	N/A	ug/kg	68	1.30	180	6.40	375	23	13	32	1.40	2,840	45	66%	No	Yes
Soil	SVOCs	Total	Carbazole	0-10 ft	N/A	ug/kg	78	1.30	180	6.40	375	28	13	37	1.40	2,840	50	64%	No	Yes
Soil	SVOCs	Total	Dibenzofuran	0-1 ft	N/A	ug/kg	58	0.479	195	5.18	1,680	28	21	9	0.996	810	30	52%	No	Yes
Soil	SVOCs	Total	Dibenzofuran	0-3 ft	N/A	ug/kg	69	0.479	195	5.18	1,680	32	25	12	0.996	810	37	54%	No	Yes
Soil	SVOCs	Total	Dibenzofuran	0-10 ft	N/A	ug/kg	79	0.479	195	5.18	1,680	37	28	14	0.996	810	42	53%	No	Yes

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
Soil	SVOCs	Total	Diethyl Phthalate	0-1 ft	N/A	ug/kg	57	1.99	286	6.40	1,680	53	2	2	8.80	73.4	4	7%	No	Yes
Soil	SVOCs	Total	Diethyl Phthalate	0-3 ft	N/A	ug/kg	67	1.99	286	6.40	1,680	61	4	2	8.80	73.4	6	9%	No	Yes
Soil	SVOCs	Total	Diethyl Phthalate	0-10 ft	N/A	ug/kg	77	1.99	286	6.40	1,680	70	5	2	8.80	73.4	7	9%	No	Yes
Soil	SVOCs	Total	Dimethyl Phthalate	0-1 ft	N/A	ug/kg	57	1.29	190	6.40	1,680	54	3	-	30.0	41.0	3	5%	No	Yes
Soil	SVOCs	Total	Dimethyl Phthalate	0-3 ft	N/A	ug/kg	67	1.29	190	6.40	1,680	64	3	-	30.0	41.0	3	4%	No	No
Soil	SVOCs	Total	Dimethyl Phthalate	0-10 ft	N/A	ug/kg	77	1.29	190	6.40	1,680	74	3	-	30.0	41.0	3	4%	No	No
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	N/A	ug/kg	57	1.89	1,460	6.40	8,420	43	6	8	6.10	1,800	14	25%	No	Yes
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-3 ft	N/A	ug/kg	67	1.89	1,460	6.40	8,420	49	7	11	3.70	1,800	18	27%	No	Yes
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-10 ft	N/A	ug/kg	77	1.89	1,460	6.40	8,420	59	7	11	3.70	1,800	18	23%	No	Yes
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-1 ft	N/A	ug/kg	57	1.20	730	6.40	1,680	52	2	3	11.3	127	5	9%	No	Yes
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-3 ft	N/A	ug/kg	67	1.20	730	6.40	1,680	61	3	3	11.3	127	6	9%	No	Yes
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-10 ft	N/A	ug/kg	77	1.20	730	6.40	1,680	70	3	4	11.3	127	7	9%	No	Yes
Soil	SVOCs	Total	Hexachlorobenzene	0-1 ft	N/A	ug/kg	57	0.548	190	2.07	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobenzene	0-3 ft	N/A	ug/kg	67	0.548	190	2.07	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobenzene	0-10 ft	N/A	ug/kg	77	0.548	190	2.07	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobutadiene	0-1 ft	N/A	ug/kg	57	0.757	190	5.18	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobutadiene	0-3 ft	N/A	ug/kg	67	0.757	190	5.18	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorobutadiene	0-10 ft	N/A	ug/kg	77	0.757	190	5.18	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-1 ft	N/A	ug/kg	57	0.822	750	5.18	1,700	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-3 ft	N/A	ug/kg	67	0.822	750	5.18	1,700	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-10 ft	N/A	ug/kg	77	0.822	750	5.18	1,700	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachloroethane	0-1 ft	N/A	ug/kg	57	1.75	320	5.18	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachloroethane	0-3 ft	N/A	ug/kg	67	1.75	320	5.18	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Hexachloroethane	0-10 ft	N/A	ug/kg	77	1.75	320	5.18	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Isophorone	0-1 ft	N/A	ug/kg	57	0.522	236	6.40	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Isophorone	0-3 ft	N/A	ug/kg	67	0.522	236	6.40	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Isophorone	0-10 ft	N/A	ug/kg	77	0.522	236	6.40	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Nitrobenzene	0-1 ft	N/A	ug/kg	57	1.60	231	6.40	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Nitrobenzene	0-3 ft	N/A	ug/kg	67	1.60	231	6.40	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	Nitrobenzene	0-10 ft	N/A	ug/kg	77	1.60	231	6.40	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-1 ft	N/A	ug/kg	53	1.05	310	10.4	4,210	53	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-3 ft	N/A	ug/kg	63	1.05	310	10.4	4,210	63	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-10 ft	N/A	ug/kg	73	1.05	310	10.4	4,210	73	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-1 ft	N/A	ug/kg	57	1.29	300	5.18	1,680	57	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-3 ft	N/A	ug/kg	67	1.29	300	5.18	1,680	67	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-10 ft	N/A	ug/kg	77	1.29	300	5.18	1,680	77	-	-	-	-	0	0%	No	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-1 ft	N/A	ug/kg	54	0.593	190	2.07	1,680	53	1	-	27.0	27.0	1	2%	No	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-3 ft	N/A	ug/kg	64	0.593	190	2.07	1,680	63	1	-	27.0	27.0	1	2%	No	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-10 ft	N/A	ug/kg	74	0.593	190	2.07	1,680	73	1	-	27.0	27.0	1	1%	No	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	N/A	ug/kg	58	1.22	249	5.18	1,680	56	2	-	2.46	64.0	2	3%	No	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-3 ft	N/A	ug/kg	68	1.22	249	5.18	1,680	66	2	-	2.46	64.0	2	3%	No	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-10 ft	N/A	ug/kg	78	1.22	249	5.18	1,680	76	2	-	2.46	64.0	2	3%	No	No
Soil	SVOCs	Total	Pentachlorophenol	0-1 ft	N/A	ug/kg	58	2.01	900	10.4	3,400	54	2	2	11.0	201	4	7%	No	Yes
Soil	SVOCs	Total	Pentachlorophenol	0-3 ft	N/A	ug/kg	68	2.01	900	10.4	3,400	64	2	2	11.0	201	4	6%	No	Yes
Soil	SVOCs	Total	Pentachlorophenol	0-10 ft	N/A	ug/kg	78	2.01	900	10.4	3,400	74	2	2	11.0	201	4	5%	No	Yes
Soil	SVOCs	Total	Phenol	0-1 ft	N/A	ug/kg	58	0.749	337	5.18	1,680	56	2	-	2.00	3.70	2	3%	No	No
Soil	SVOCs	Total	Phenol	0-3 ft	N/A	ug/kg	68	0.749	337	5.18	1,680	63	4	1	2.00	35.0	5	7%	No	Yes
Soil	SVOCs	Total	Phenol	0-10 ft	N/A	ug/kg	78	0.749	337	5.18	1,680	73	4	1	2.00	35.0	5	6%	No	Yes
Soil	SVOCs	Total	2-Methylnaphthalene	0-1 ft	N/A	ug/kg	58	0.183	190	1.17	340	34	10	14	1.29	1,530	24	41%	No	Yes
Soil	SVOCs	Total	2-Methylnaphthalene	0-3 ft	N/A	ug/kg	69	0.183	190	1.17	340	42	11	16	1.29	1,530	27	39%	No	Yes
Soil	SVOCs	Total	2-Methylnaphthalene	0-10 ft	N/A	ug/kg	79	0.183	190	1.17	340	48	11	20	1.29	1,530	31	39%	No	Yes
Soil	SVOCs	Total	Acenaphthene	0-1 ft	N/A	ug/kg	58	0.531	180	1.23	340	14	8	36	1.50	2,600	44	76%	No	Yes
Soil	SVOCs	Total	Acenaphthene	0-3 ft	N/A	ug/kg	73	0.531	180	1.23	340	17	11	45	1.10	3,200	56	77%	No	Yes
Soil	SVOCs	Total	Acenaphthene	0-10 ft	N/A	ug/kg	87	0.531	180	1.23	1,440	21	11	55	1.10	3,200	66	76%	No	Yes
Soil	SVOCs	Total	Acenaphthylene	0-1 ft	N/A	ug/kg	58	0.510	190	1.17	340	37	8	13	1.39	87.7	21	36%	No	Yes
Soil	SVOCs	Total	Acenaphthylene	0-3 ft	N/A	ug/kg	73	0.510	190	1.17	340	44	8	21	1.39	295	29	40%	No	Yes
Soil	SVOCs	Total	Acenaphthylene	0-10 ft	N/A	ug/kg	87	0.510	190	1.17	340	52	8	27	1.39	295	35	40%	No	Yes
Soil	SVOCs	Total	Anthracene	0-1 ft	N/A	ug/kg	58	0.356	180	1.41	340	6	5	47	1.72	2,700	52	90%	No	Yes
Soil	SVOCs	Total	Anthracene	0-3 ft	N/A	ug/kg	73	0.356	180	1.41	340	9	6	58	1.72	8,440	64	88%	No	Yes
Soil	SVOCs	Total	Anthracene	0-10 ft	N/A	ug/kg	87	0.356	180	1.41	340	12	6	69	1.72	8,440	75	86%	No	Yes
Soil	SVOCs	Total	Fluorene	0-1 ft	N/A	ug/kg	58	0.573	180	1.23	340	19	6	33	1.69	1,200	39	67%	No	Yes
Soil	SVOCs	Total	Fluorene	0-3 ft	N/A	ug/kg	73	0.573	180	1.23	340	23	8	42	1.69	1,610	50	68%	No	Yes
Soil	SVOCs	Total	Fluorene	0-10 ft	N/A	ug/kg	87	0.573	180	1.23	340	27	8	52	1.69	1,610	60	69%	No	Yes

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(7 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
Soil	SVOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	58	0.548	190	1.17	340	28	9	21	1.70	823	30	52%	No	Yes
Soil	SVOCs	Total	Naphthalene	0-3 ft	N/A	ug/kg	73	0.548	190	1.17	340	32	13	28	1.70	823	41	56%	No	Yes
Soil	SVOCs	Total	Naphthalene	0-10 ft	N/A	ug/kg	87	0.548	190	1.17	340	39	13	35	1.70	1,710	48	55%	No	Yes
Soil	SVOCs	Total	Phenanthrene	0-1 ft	N/A	ug/kg	58	49.8	49.8	49.8	49.8	1	-	57	5.64	12,000	57	98%	No	Yes
Soil	SVOCs	Total	Phenanthrene	0-3 ft	N/A	ug/kg	73	0.750	49.8	2.50	49.8	3	1	69	2.47	21,900	70	96%	No	Yes
Soil	SVOCs	Total	Phenanthrene	0-10 ft	N/A	ug/kg	87	0.713	49.8	2.40	11,400	6	1	80	2.47	21,900	81	93%	No	Yes
Soil	SVOCs	Total	Total LPAHs (KM, capped; Nds at MDL)	0-1 ft	N/A	ug/kg	58	299	299	299	299	-	-	-	8.79	18,674	57	98%	No	Yes
Soil	SVOCs	Total	Total LPAHs (KM, capped; Nds at MDL)	0-3 ft	N/A	ug/kg	73	4.56	299	15.1	299	-	-	-	6.41	34,767	70	96%	No	Yes
Soil	SVOCs	Total	Benzo(a)anthracene	0-1 ft	N/A	ug/kg	58	0.749	92.9	2.07	305	4	-	54	3.96	32,000	54	93%	No	Yes
Soil	SVOCs	Total	Benzo(a)anthracene	0-3 ft	N/A	ug/kg	73	0.749	92.9	2.07	305	7	-	66	3.96	32,000	66	90%	No	Yes
Soil	SVOCs	Total	Benzo(a)anthracene	0-10 ft	N/A	ug/kg	87	0.749	92.9	2.07	305	9	-	78	3.96	32,000	78	90%	No	Yes
Soil	SVOCs	Total	Benzo(a)pyrene	0-1 ft	N/A	ug/kg	58	0.656	49.8	2.07	152	3	-	55	7.49	33,000	55	95%	No	Yes
Soil	SVOCs	Total	Benzo(a)pyrene	0-3 ft	N/A	ug/kg	73	0.656	49.8	2.07	152	6	-	67	7.49	34,000	67	92%	No	Yes
Soil	SVOCs	Total	Benzo(a)pyrene	0-10 ft	N/A	ug/kg	87	0.656	49.8	2.07	152	8	-	79	7.49	34,000	79	91%	No	Yes
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	N/A	ug/kg	37	49.8	49.8	49.8	49.8	1	-	36	25.0	65,000	36	97%	No	Yes
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-3 ft	N/A	ug/kg	46	2.50	49.8	6.50	49.8	2	-	44	25.0	65,000	44	96%	No	Yes
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-10 ft	N/A	ug/kg	46	2.50	49.8	6.50	49.8	2	-	44	25.0	65,000	44	96%	No	Yes
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	N/A	ug/kg	58	0.202	49.8	1.23	168	8	-	50	6.89	18,000	50	86%	No	Yes
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-3 ft	N/A	ug/kg	73	0.202	49.8	1.23	168	10	-	63	4.33	18,000	63	86%	No	Yes
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-10 ft	N/A	ug/kg	87	0.202	49.8	1.23	168	12	-	75	4.33	18,000	75	86%	No	Yes
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	N/A	ug/kg	37	49.8	49.8	10.0	49.8	1	1	35	8.30	65,000	36	97%	No	Yes
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-3 ft	N/A	ug/kg	46	2.50	49.8	6.50	49.8	2	1	43	8.30	65,000	44	96%	No	Yes
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-10 ft	N/A	ug/kg	46	2.50	49.8	6.50	49.8	2	1	43	8.30	65,000	44	96%	No	Yes
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-1 ft	N/A	ug/kg	21	0.939	0.939	4.14	4.14	1	-	20	10.2	14,700	20	95%	No	Yes
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-3 ft	N/A	ug/kg	27	0.939	1.14	4.14	5.05	2	-	25	7.70	31,300	25	93%	No	Yes
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-10 ft	N/A	ug/kg	41	0.939	1.14	4.14	5.05	4	-	37	7.70	31,300	37	90%	No	Yes
Soil	SVOCs	Total	Chrysene	0-1 ft	N/A	ug/kg	58	0.741	49.8	2.07	49.8	2	-	56	6.36	32,000	56	97%	No	Yes
Soil	SVOCs	Total	Chrysene	0-3 ft	N/A	ug/kg	73	0.741	49.8	2.07	49.8	4	1	68	1.80	35,300	69	95%	No	Yes
Soil	SVOCs	Total	Chrysene	0-10 ft	N/A	ug/kg	87	0.741	49.8	2.07	49.8	6	1	80	1.80	35,300	81	93%	No	Yes
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	N/A	ug/kg	58	0.273	1,800	1.17	1,800	16	4	38	1.23	9,900	42	72%	No	Yes
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-3 ft	N/A	ug/kg	73	0.273	1,800	1.17	1,800	19	5	49	1.23	9,900	54	74%	No	Yes
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-10 ft	N/A	ug/kg	87	0.273	1,800	1.17	1,800	25	5	57	1.23	9,900	62	71%	No	Yes
Soil	SVOCs	Total	Fluoranthene	0-1 ft	N/A	ug/kg	58	1.05	71.1	2.07	152	3	-	55	8.47	54,000	55	95%	No	Yes
Soil	SVOCs	Total	Fluoranthene	0-3 ft	N/A	ug/kg	73	1.05	71.1	2.07	152	5	-	68	6.29	54,000	68	93%	No	Yes
Soil	SVOCs	Total	Fluoranthene	0-10 ft	N/A	ug/kg	87	1.05	71.1	2.07	152	7	-	80	6.29	54,000	80	92%	No	Yes
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	N/A	ug/kg	58	0.286	49.8	1.23	168	6	-	52	3.68	19,000	52	90%	No	Yes
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-3 ft	N/A	ug/kg	73	0.286	49.8	1.23	168	8	-	65	3.52	20,000	65	89%	No	Yes
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-10 ft	N/A	ug/kg	87	0.286	49.8	1.23	168	10	-	77	3.52	20,000	77	89%	No	Yes
Soil	SVOCs	Total	Pyrene	0-1 ft	N/A	ug/kg	58	0.352	49.8	2.07	49.8	2	-	56	10.0	40,000	56	97%	No	Yes
Soil	SVOCs	Total	Pyrene	0-3 ft	N/A	ug/kg	73	0.352	49.8	2.07	49.8	3	1	69	2.10	67,100	70	96%	No	Yes
Soil	SVOCs	Total	Pyrene	0-10 ft	N/A	ug/kg	87	0.352	49.8	2.07	49.8	5	1	81	2.10	67,100	82	94%	No	Yes
Soil	SVOCs	Total	Total HPAHs (KM, capped; Nds at MDL)	0-1 ft	N/A	ug/kg	58	5.46	498	16.6	498	-	-	-	37.0	367,900	56	97%	No	Yes
Soil	SVOCs	Total	Total HPAHs (KM, capped; Nds at MDL)	0-3 ft	N/A	ug/kg	73	5.46	498	16.6	498	-	-	-	16.5	367,900	70	96%	No	Yes
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-1 ft	N/A	ug/kg	55	0.0443	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-3 ft	N/A	ug/kg	66	0.0443	2,300	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-10 ft	N/A	ug/kg	76	0.0443	2,300	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-1 ft	N/A	ug/kg	55	0.0650	2,300	0.437	4,600	53	2	-	0.490	0.580	2	4%	No	No
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-3 ft	N/A	ug/kg	66	0.0650	2,300	0.424	6,200	64	2	-	0.490	0.580	2	3%	No	No
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-10 ft	N/A	ug/kg	76	0.0650	2,300	0.349	6,200	73	3	-	0.0969	0.580	3	4%	No	No
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-1 ft	N/A	ug/kg	55	0.0638	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-3 ft	N/A	ug/kg	66	0.0638	2,500	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-10 ft	N/A	ug/kg	76	0.0638	2,500	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,2-Trichloroethane	0-1 ft	N/A	ug/kg	55	0.0880	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,2-Trichloroethane	0-3 ft	N/A	ug/kg	66	0.0880	2,500	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1,2-Trichloroethane	0-10 ft	N/A	ug/kg	76	0.0880	2,500	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloroethane	0-1 ft	N/A	ug/kg	55	0.0480	2,300	0.437	4,600	54	1	-	0.290	0.290	1	2%	No	No
Soil	VOCs	Total	1,1-Dichloroethane	0-3 ft	N/A	ug/kg	66	0.0480	2,500	0.424	6,200	65	1	-	0.290	0.290	1	2%	No	No
Soil	VOCs	Total	1,1-Dichloroethane	0-10 ft	N/A	ug/kg	76	0.0480	2,500	0.349	6,200	75	1	-	0.290	0.290	1	1%	No	No
Soil	VOCs	Total	1,1-Dichloroethene	0-1 ft	N/A	ug/kg	55	0.0700	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloroethene	0-3 ft	N/A	ug/kg	66	0.0700	3,000	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloroethene	0-10 ft	N/A	ug/kg	76	0.0700	3,000	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloropropene	0-1 ft	N/A	ug/kg	55	0.150	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,1-Dichloropropene	0-3 ft	N/A	ug/kg	66	0.150	2,500	0.424	6,200	66	-	-	-	-	0	0%	No	No

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(8 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
Soil	VOCs	Total	1,1-Dichloropropene	0-10 ft	N/A	ug/kg	76	0.150	2,500	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-1 ft	N/A	ug/kg	55	0.108	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-3 ft	N/A	ug/kg	66	0.108	2,800	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-10 ft	N/A	ug/kg	76	0.108	2,800	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichloropropane	0-1 ft	N/A	ug/kg	55	0.0756	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichloropropane	0-3 ft	N/A	ug/kg	66	0.0756	2,800	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,3-Trichloropropane	0-10 ft	N/A	ug/kg	76	0.0756	2,800	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	N/A	ug/kg	55	0.110	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-3 ft	N/A	ug/kg	66	0.110	2,300	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-10 ft	N/A	ug/kg	76	0.110	2,300	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	N/A	ug/kg	55	0.0478	100	0.437	100	37	15	3	0.110	14,300	18	33%	No	Yes
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-3 ft	N/A	ug/kg	66	0.0478	100	0.424	100	42	18	6	0.0980	14,300	24	36%	No	Yes
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-10 ft	N/A	ug/kg	76	0.0478	100	0.349	100	51	19	6	0.0980	14,300	25	33%	No	Yes
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-1 ft	N/A	ug/kg	55	0.135	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-3 ft	N/A	ug/kg	66	0.135	3,800	0.424	12,000	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-10 ft	N/A	ug/kg	76	0.135	3,800	0.349	12,000	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-1 ft	N/A	ug/kg	55	0.0575	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-3 ft	N/A	ug/kg	66	0.0575	2,300	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-10 ft	N/A	ug/kg	76	0.0575	2,300	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichlorobenzene	0-1 ft	N/A	ug/kg	55	0.0575	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichlorobenzene	0-3 ft	N/A	ug/kg	66	0.0575	2,500	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichlorobenzene	0-10 ft	N/A	ug/kg	76	0.0575	2,500	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-1 ft	N/A	ug/kg	55	0.0540	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-3 ft	N/A	ug/kg	66	0.0540	2,300	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-10 ft	N/A	ug/kg	76	0.0540	2,300	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloropropane	0-1 ft	N/A	ug/kg	55	0.0428	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloropropane	0-3 ft	N/A	ug/kg	66	0.0428	2,500	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,2-Dichloropropane	0-10 ft	N/A	ug/kg	76	0.0428	2,500	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	N/A	ug/kg	55	0.0400	100	0.437	509	47	7	1	0.0435	5,410	8	15%	No	Yes
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-3 ft	N/A	ug/kg	66	0.0400	100	0.424	509	55	8	3	0.0435	6,500	11	17%	No	Yes
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-10 ft	N/A	ug/kg	76	0.0400	100	0.349	509	65	8	3	0.0435	6,500	11	14%	No	Yes
Soil	VOCs	Total	1,3-Dichlorobenzene	0-1 ft	N/A	ug/kg	55	0.0391	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3-Dichlorobenzene	0-3 ft	N/A	ug/kg	66	0.0391	2,300	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3-Dichlorobenzene	0-10 ft	N/A	ug/kg	76	0.0391	2,300	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3-Dichloropropane	0-1 ft	N/A	ug/kg	55	0.0590	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3-Dichloropropane	0-3 ft	N/A	ug/kg	66	0.0590	2,500	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,3-Dichloropropane	0-10 ft	N/A	ug/kg	76	0.0590	2,500	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	N/A	ug/kg	55	0.0551	2,300	0.437	4,600	54	1	-	0.160	0.160	1	2%	No	No
Soil	VOCs	Total	1,4-Dichlorobenzene	0-3 ft	N/A	ug/kg	66	0.0551	2,500	0.424	6,200	64	2	-	0.140	0.160	2	3%	No	No
Soil	VOCs	Total	1,4-Dichlorobenzene	0-10 ft	N/A	ug/kg	76	0.0551	2,500	0.349	6,200	74	2	-	0.140	0.160	2	3%	No	No
Soil	VOCs	Total	2,2-Dichloropropane	0-1 ft	N/A	ug/kg	55	0.0763	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2,2-Dichloropropane	0-3 ft	N/A	ug/kg	66	0.0763	2,300	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2,2-Dichloropropane	0-10 ft	N/A	ug/kg	76	0.0763	2,300	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2-Butanone (MEK)	0-1 ft	N/A	ug/kg	55	1.09	11,500	2.18	23,000	39	10	6	4.90	50.0	16	29%	No	Yes
Soil	VOCs	Total	2-Butanone (MEK)	0-3 ft	N/A	ug/kg	66	1.06	12,000	2.12	31,000	47	13	6	2.30	50.0	19	29%	No	Yes
Soil	VOCs	Total	2-Butanone (MEK)	0-10 ft	N/A	ug/kg	76	0.872	12,000	1.74	31,000	57	13	6	2.30	50.0	19	25%	No	Yes
Soil	VOCs	Total	2-Chlorotoluene	0-1 ft	N/A	ug/kg	55	0.0490	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2-Chlorotoluene	0-3 ft	N/A	ug/kg	66	0.0490	2,300	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2-Chlorotoluene	0-10 ft	N/A	ug/kg	76	0.0490	2,300	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	2-Hexanone	0-1 ft	N/A	ug/kg	55	0.780	11,500	2.18	23,000	52	3	-	4.70	8.80	3	5%	No	Yes
Soil	VOCs	Total	2-Hexanone	0-3 ft	N/A	ug/kg	66	0.780	11,500	2.12	31,000	63	3	-	4.70	8.80	3	5%	No	No
Soil	VOCs	Total	2-Hexanone	0-10 ft	N/A	ug/kg	76	0.780	11,500	1.74	31,000	73	3	-	4.70	8.80	3	4%	No	No
Soil	VOCs	Total	4-Chlorotoluene	0-1 ft	N/A	ug/kg	55	0.0920	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	4-Chlorotoluene	0-3 ft	N/A	ug/kg	66	0.0920	2,300	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	4-Chlorotoluene	0-10 ft	N/A	ug/kg	76	0.0920	2,300	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	4-Isopropyltoluene	0-1 ft	N/A	ug/kg	55	0.0766	2,300	0.437	4,600	41	13	1	0.0833	12.0	14	25%	No	Yes
Soil	VOCs	Total	4-Isopropyltoluene	0-3 ft	N/A	ug/kg	66	0.0766	2,300	0.424	6,200	49	15	2	0.0833	161	17	26%	No	Yes
Soil	VOCs	Total	4-Isopropyltoluene	0-10 ft	N/A	ug/kg	76	0.0676	2,300	0.349	6,200	58	15	3	0.0833	161	18	24%	No	Yes
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	N/A	ug/kg	55	0.240	11,500	2.18	23,000	46	9	-	0.330	1.20	9	16%	No	Yes
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-3 ft	N/A	ug/kg	66	0.240	11,500	2.12	31,000	57	9	-	0.330	1.20	9	14%	No	Yes
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-10 ft	N/A	ug/kg	76	0.240	11,500	1.74	31,000	67	9	-	0.330	1.20	9	12%	No	Yes
Soil	VOCs	Total	Acetone	0-1 ft	N/A	ug/kg	55	1.09	11,500	2.18	23,000	37	1	17	7.90	540	18	33%	No	Yes
Soil	VOCs	Total	Acetone	0-3 ft	N/A	ug/kg	66	1.06	11,500	2.12	31,000	43	4	19	7.90	540	23	35%	No	Yes

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(9 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
Soil	VOCs	Total	Acetone	0-10 ft	N/A	ug/kg	76	0.872	11,500	1.74	31,000	53	4	19	7.90	540	23	30%	No	Yes
Soil	VOCs	Total	Benzene	0-1 ft	N/A	ug/kg	55	0.218	2,300	0.437	4,600	40	15	-	0.160	1.20	15	27%	No	Yes
Soil	VOCs	Total	Benzene	0-3 ft	N/A	ug/kg	66	0.140	2,500	0.424	6,200	49	17	-	0.160	1.20	17	26%	No	Yes
Soil	VOCs	Total	Benzene	0-10 ft	N/A	ug/kg	76	0.140	2,500	0.349	6,200	57	19	-	0.160	1.20	19	25%	No	Yes
Soil	VOCs	Total	Bromobenzene	0-1 ft	N/A	ug/kg	55	0.0450	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromobenzene	0-3 ft	N/A	ug/kg	66	0.0450	2,300	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromobenzene	0-10 ft	N/A	ug/kg	76	0.0450	2,300	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromochloromethane	0-1 ft	N/A	ug/kg	55	0.0519	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromochloromethane	0-3 ft	N/A	ug/kg	66	0.0519	2,300	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromochloromethane	0-10 ft	N/A	ug/kg	76	0.0519	2,300	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromodichloromethane	0-1 ft	N/A	ug/kg	55	0.0440	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromodichloromethane	0-3 ft	N/A	ug/kg	66	0.0440	2,500	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromodichloromethane	0-10 ft	N/A	ug/kg	76	0.0440	2,500	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromoform	0-1 ft	N/A	ug/kg	55	0.0701	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromoform	0-3 ft	N/A	ug/kg	66	0.0701	2,500	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromoform	0-10 ft	N/A	ug/kg	76	0.0701	2,500	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Bromomethane	0-1 ft	N/A	ug/kg	55	0.218	2,300	0.437	4,600	48	7	-	0.480	5.00	7	13%	No	Yes
Soil	VOCs	Total	Bromomethane	0-3 ft	N/A	ug/kg	66	0.212	6,200	0.424	12,000	58	8	-	0.480	5.00	8	12%	No	Yes
Soil	VOCs	Total	Bromomethane	0-10 ft	N/A	ug/kg	76	0.174	6,200	0.349	12,000	68	8	-	0.480	5.00	8	11%	No	Yes
Soil	VOCs	Total	Carbon Disulfide	0-1 ft	N/A	ug/kg	55	0.218	2,300	0.437	4,600	36	18	1	0.180	6.90	19	35%	No	Yes
Soil	VOCs	Total	Carbon Disulfide	0-3 ft	N/A	ug/kg	66	0.212	2,500	0.424	6,200	42	23	1	0.180	6.90	24	36%	No	Yes
Soil	VOCs	Total	Carbon Disulfide	0-10 ft	N/A	ug/kg	76	0.174	2,500	0.349	6,200	52	23	1	0.180	6.90	24	32%	No	Yes
Soil	VOCs	Total	Carbon Tetrachloride	0-1 ft	N/A	ug/kg	55	0.0780	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Carbon Tetrachloride	0-3 ft	N/A	ug/kg	66	0.0780	2,300	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Carbon Tetrachloride	0-10 ft	N/A	ug/kg	76	0.0780	2,300	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chlorobenzene	0-1 ft	N/A	ug/kg	55	0.0503	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chlorobenzene	0-3 ft	N/A	ug/kg	66	0.0503	2,500	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chlorobenzene	0-10 ft	N/A	ug/kg	76	0.0503	2,500	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chloroethane	0-1 ft	N/A	ug/kg	55	0.218	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chloroethane	0-3 ft	N/A	ug/kg	66	0.212	6,200	0.424	12,000	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chloroethane	0-10 ft	N/A	ug/kg	76	0.174	6,200	0.349	12,000	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Chloroform	0-1 ft	N/A	ug/kg	55	0.0480	2,300	0.437	4,600	52	3	-	0.260	19.0	3	5%	No	Yes
Soil	VOCs	Total	Chloroform	0-3 ft	N/A	ug/kg	66	0.0480	2,300	0.424	6,200	63	3	-	0.260	19.0	3	5%	No	No
Soil	VOCs	Total	Chloroform	0-10 ft	N/A	ug/kg	76	0.0480	2,300	0.349	6,200	73	3	-	0.260	19.0	3	4%	No	No
Soil	VOCs	Total	Chloromethane	0-1 ft	N/A	ug/kg	55	0.0570	2,300	0.437	4,600	53	2	-	0.230	0.250	2	4%	No	No
Soil	VOCs	Total	Chloromethane	0-3 ft	N/A	ug/kg	66	0.0570	5,000	0.424	12,000	64	2	-	0.230	0.250	2	3%	No	No
Soil	VOCs	Total	Chloromethane	0-10 ft	N/A	ug/kg	76	0.0570	5,000	0.349	12,000	74	2	-	0.230	0.250	2	3%	No	No
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	55	0.0810	2,300	0.437	4,600	54	1	-	12.0	12.0	1	2%	No	No
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-3 ft	N/A	ug/kg	66	0.0810	2,500	0.424	6,200	64	1	1	12.0	120	2	3%	No	No
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-10 ft	N/A	ug/kg	76	0.0810	2,500	0.349	6,200	72	1	3	4.95	120	4	5%	No	Yes
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-1 ft	N/A	ug/kg	55	0.0310	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-3 ft	N/A	ug/kg	66	0.0310	2,500	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-10 ft	N/A	ug/kg	76	0.0310	2,500	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dibromochloromethane	0-1 ft	N/A	ug/kg	55	0.0730	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dibromochloromethane	0-3 ft	N/A	ug/kg	66	0.0730	2,500	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dibromochloromethane	0-10 ft	N/A	ug/kg	76	0.0730	2,500	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dibromomethane	0-1 ft	N/A	ug/kg	55	0.0734	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dibromomethane	0-3 ft	N/A	ug/kg	66	0.0734	2,800	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dibromomethane	0-10 ft	N/A	ug/kg	76	0.0734	2,800	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Dichlorodifluoromethane	0-1 ft	N/A	ug/kg	55	0.0463	2,300	0.437	4,600	51	2	2	0.260	94.0	4	7%	No	Yes
Soil	VOCs	Total	Dichlorodifluoromethane	0-3 ft	N/A	ug/kg	66	0.0463	4,200	0.424	12,000	62	2	2	0.260	94.0	4	6%	No	Yes
Soil	VOCs	Total	Dichlorodifluoromethane	0-10 ft	N/A	ug/kg	76	0.0463	4,200	0.349	12,000	70	4	2	0.0850	94.0	6	8%	No	Yes
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	N/A	ug/kg	55	0.140	2,300	0.674	4,600	42	11	2	0.240	460	13	24%	No	Yes
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-3 ft	N/A	ug/kg	66	0.140	2,300	0.674	6,200	48	16	2	0.240	460	18	27%	No	Yes
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-10 ft	N/A	ug/kg	76	0.140	2,300	0.349	6,200	58	16	2	0.240	460	18	24%	No	Yes
Soil	VOCs	Total	Ethylbenzene	0-1 ft	N/A	ug/kg	55	0.0410	255	0.437	4,600	46	9	-	0.0720	2,700	9	16%	No	Yes
Soil	VOCs	Total	Ethylbenzene	0-3 ft	N/A	ug/kg	66	0.0410	1,800	0.424	6,200	55	10	1	0.0720	2,700	11	17%	No	Yes
Soil	VOCs	Total	Ethylbenzene	0-10 ft	N/A	ug/kg	76	0.0384	1,800	0.349	6,200	64	11	1	0.0720	2,700	12	16%	No	Yes
Soil	VOCs	Total	Hexachlorobutadiene	0-1 ft	N/A	ug/kg	55	0.0664	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Hexachlorobutadiene	0-3 ft	N/A	ug/kg	66	0.0664	2,300	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Hexachlorobutadiene	0-10 ft	N/A	ug/kg	76	0.0664	2,300	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Isopropylbenzene	0-1 ft	N/A	ug/kg	55	0.0310	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Isopropylbenzene	0-3 ft	N/A	ug/kg	66	0.0310	3,000	0.424	6,200	65	-	1	47.3	47.3	1	2%	No	No

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(10 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
Soil	VOCs	Total	Isopropylbenzene	0-10 ft	N/A	ug/kg	76	0.0310	3,000	0.349	6,200	75	-	1	47.3	47.3	1	1%	No	No
Soil	VOCs	Total	m,p-Xylenes	0-1 ft	N/A	ug/kg	55	0.0930	509	0.873	1,020	46	8	1	0.140	9,800	9	16%	No	Yes
Soil	VOCs	Total	m,p-Xylenes	0-3 ft	N/A	ug/kg	66	0.0930	509	0.849	1,020	54	9	3	0.140	9,800	12	18%	No	Yes
Soil	VOCs	Total	m,p-Xylenes	0-10 ft	N/A	ug/kg	76	0.0930	509	0.698	1,020	63	10	3	0.140	9,800	13	17%	No	Yes
Soil	VOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	55	0.218	100	0.437	270	44	8	3	0.450	8,360	11	20%	No	Yes
Soil	VOCs	Total	Naphthalene	0-3 ft	N/A	ug/kg	66	0.212	2,500	0.424	6,200	52	10	4	0.450	8,360	14	21%	No	Yes
Soil	VOCs	Total	Naphthalene	0-10 ft	N/A	ug/kg	76	0.192	2,500	0.383	6,200	62	10	4	0.450	8,360	14	18%	No	Yes
Soil	VOCs	Total	n-Butylbenzene	0-1 ft	N/A	ug/kg	55	0.0880	2,300	0.437	4,600	54	1	-	0.0920	0.0920	1	2%	No	No
Soil	VOCs	Total	n-Butylbenzene	0-3 ft	N/A	ug/kg	66	0.0880	2,300	0.424	6,200	65	1	-	0.0920	0.0920	1	2%	No	No
Soil	VOCs	Total	n-Butylbenzene	0-10 ft	N/A	ug/kg	76	0.0880	2,300	0.349	6,200	75	1	-	0.0920	0.0920	1	1%	No	No
Soil	VOCs	Total	n-Propylbenzene	0-1 ft	N/A	ug/kg	55	0.0531	2,300	0.437	4,600	54	1	-	0.150	0.150	1	2%	No	No
Soil	VOCs	Total	n-Propylbenzene	0-3 ft	N/A	ug/kg	66	0.0531	2,800	0.424	6,200	63	2	1	0.150	122	3	5%	No	No
Soil	VOCs	Total	n-Propylbenzene	0-10 ft	N/A	ug/kg	76	0.0531	2,800	0.349	6,200	73	2	1	0.150	122	3	4%	No	No
Soil	VOCs	Total	o-Xylene	0-1 ft	N/A	ug/kg	55	0.0411	255	0.437	509	53	2	-	0.170	0.180	2	4%	No	No
Soil	VOCs	Total	o-Xylene	0-3 ft	N/A	ug/kg	70	0.0411	255	0.424	6,200	65	4	1	0.170	3,200	5	7%	No	Yes
Soil	VOCs	Total	o-Xylene	0-10 ft	N/A	ug/kg	84	0.0411	255	0.349	6,200	76	6	2	0.170	4,260	8	10%	No	Yes
Soil	VOCs	Total	sec-Butylbenzene	0-1 ft	N/A	ug/kg	55	0.0442	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	sec-Butylbenzene	0-3 ft	N/A	ug/kg	66	0.0442	2,300	0.424	6,200	64	1	1	0.435	90.2	2	3%	No	No
Soil	VOCs	Total	sec-Butylbenzene	0-10 ft	N/A	ug/kg	76	0.0442	2,300	0.349	6,200	74	1	1	0.435	90.2	2	3%	No	No
Soil	VOCs	Total	Styrene	0-1 ft	N/A	ug/kg	55	0.0403	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Styrene	0-3 ft	N/A	ug/kg	66	0.0340	2,500	0.424	12,000	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Styrene	0-10 ft	N/A	ug/kg	76	0.0340	2,500	0.349	12,000	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	tert-Butylbenzene	0-1 ft	N/A	ug/kg	55	0.0273	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	tert-Butylbenzene	0-3 ft	N/A	ug/kg	66	0.0273	2,300	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	tert-Butylbenzene	0-10 ft	N/A	ug/kg	76	0.0273	2,300	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	N/A	ug/kg	55	0.114	255	1.13	509	45	4	6	0.162	65.0	10	18%	No	Yes
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-3 ft	N/A	ug/kg	70	0.114	255	1.13	509	51	5	14	0.162	420,000	19	27%	No	Yes
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-10 ft	N/A	ug/kg	84	0.114	255	1.13	509	51	6	27	0.162	420,000	33	39%	No	Yes
Soil	VOCs	Total	Toluene	0-1 ft	N/A	ug/kg	55	0.0440	255	0.437	509	32	22	1	0.240	5.80	23	42%	No	Yes
Soil	VOCs	Total	Toluene	0-3 ft	N/A	ug/kg	70	0.0440	255	0.424	509	34	33	3	0.110	39,000	36	51%	No	Yes
Soil	VOCs	Total	Toluene	0-10 ft	N/A	ug/kg	84	0.0440	255	0.349	509	39	37	8	0.110	133,000	45	54%	No	Yes
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	55	0.0480	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-3 ft	N/A	ug/kg	66	0.0480	3,000	0.424	6,200	65	-	1	2.28	2.28	1	2%	No	No
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-10 ft	N/A	ug/kg	76	0.0480	3,000	0.349	6,200	75	-	1	2.28	2.28	1	1%	No	No
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-1 ft	N/A	ug/kg	55	0.0513	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-3 ft	N/A	ug/kg	66	0.0513	2,300	0.424	6,200	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-10 ft	N/A	ug/kg	76	0.0513	2,300	0.349	6,200	76	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Trichloroethene (TCE)	0-1 ft	N/A	ug/kg	55	0.0440	2,300	0.437	4,600	51	4	-	0.0614	0.171	4	7%	No	Yes
Soil	VOCs	Total	Trichloroethene (TCE)	0-3 ft	N/A	ug/kg	66	0.0440	2,300	0.424	6,200	59	6	1	0.0614	6,080	7	11%	No	Yes
Soil	VOCs	Total	Trichloroethene (TCE)	0-10 ft	N/A	ug/kg	76	0.0440	2,300	0.349	6,200	66	7	3	0.0450	6,080	10	13%	No	Yes
Soil	VOCs	Total	Trichlorofluoromethane	0-1 ft	N/A	ug/kg	55	0.0540	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Trichlorofluoromethane	0-3 ft	N/A	ug/kg	66	0.0540	2,300	0.424	12,000	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Trichlorofluoromethane	0-10 ft	N/A	ug/kg	76	0.0540	2,300	0.349	12,000	75	1	-	0.325	0.325	1	1%	No	No
Soil	VOCs	Total	Vinyl Acetate	0-1 ft	N/A	ug/kg	54	0.600	11,500	2.18	23,000	54	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Vinyl Acetate	0-3 ft	N/A	ug/kg	65	0.600	11,500	2.12	23,000	65	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Vinyl Acetate	0-10 ft	N/A	ug/kg	75	0.600	11,500	1.74	23,000	75	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Vinyl Chloride	0-1 ft	N/A	ug/kg	55	0.0570	2,300	0.437	4,600	55	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Vinyl Chloride	0-3 ft	N/A	ug/kg	66	0.0570	3,800	0.424	12,000	66	-	-	-	-	0	0%	No	No
Soil	VOCs	Total	Vinyl Chloride	0-10 ft	N/A	ug/kg	76	0.0570	3,800	0.349	12,000	76	-	-	-	-	0	0%	No	No
Groundwater	Metals	Total	Antimony	N/A	N/A	ug/L	19	3.00	50.0	3.00	50.0	11	7	1	0.294	3.89	8	42%	No	--
Groundwater	Metals	Total	Arsenic	N/A	N/A	ug/L	73	0.500	5.00	0.500	5.00	10	6	57	0.138	21.3	63	86%	No	Yes
Groundwater	Metals	Total	Barium	N/A	N/A	ug/L	19	-	-	-	-	0	-	19	7.15	304	19	100%	No	--
Groundwater	Metals	Total	Beryllium	N/A	N/A	ug/L	19	0.0142	5.00	0.500	5.00	12	7	-	0.222	0.435	7	37%	No	--
Groundwater	Metals	Total	Cadmium	N/A	N/A	ug/L	19	0.00710	5.00	0.500	5.00	13	3	3	0.0100	5.60	6	32%	No	--
Groundwater	Metals	Total	Chromium	N/A	N/A	ug/L	19	1.00	10.0	1.00	10.0	12	-	7	3.36	18.5	7	37%	No	--
Groundwater	Metals	Total	Copper	N/A	N/A	ug/L	19	10.0	10.0	10.0	10.0	8	-	11	2.33	201	11	58%	No	--
Groundwater	Metals	Total	Iron	N/A	N/A	ug/L	73	20.0	60.6	20.0	60.6	7	4	62	9.40	42,900	66	90%	No	Yes
Groundwater	Metals	Total	Lead	N/A	N/A	ug/L	53	0.00600	3.00	0.0200	3.00	21	-	32	0.0400	78.2	32	60%	No	Yes
Groundwater	Metals	Total	Manganese	N/A	N/A	ug/L	53	10.0	10.0	5.00	10.0	1	2	50	0.810	5,380	52	98%	No	Yes
Groundwater	Metals	Total	Mercury	N/A	N/A	ug/L	24	0.0500	0.200	0.200	0.200	20	2	2	0.0300	0.330	4	17%	No	Yes
Groundwater	Metals	Total	Nickel	N/A	N/A	ug/L	19	10.0	10.0	1.00	10.0	8	1	10	0.850	116	11	58%	No	--
Groundwater	Metals	Total	Selenium	N/A	N/A	ug/L	19	0.385	5.00	3.00	5.00	12	3	4	0.530	32.9	7	37%	No	--
Groundwater	Metals	Total	Silver	N/A	N/A	ug/L	19	0.100	10.0	0.100	10.0	14	1	4	0.0810	0.658	5	26%	No	--

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(11 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
Groundwater	Metals	Total	Thallium	N/A	N/A	ug/L	19	5.00	5.00	0.500	5.00	10	9	-	0.115	0.323	9	47%	No	--
Groundwater	Metals	Total	Vanadium	N/A	N/A	ug/L	20	0.0700	0.200	0.200	10.0	2	6	12	0.130	5.90	18	90%	No	Yes
Groundwater	Metals	Total	Zinc	N/A	N/A	ug/L	19	10.0	10.0	10.0	10.0	4	-	15	4.27	2,660	15	79%	No	--
Groundwater	Metals	Dissolved	Antimony	N/A	N/A	ug/L	3	50.0	50.0	50.0	50.0	3	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Arsenic	N/A	N/A	ug/L	56	0.500	5.00	0.500	5.00	7	3	46	0.220	19.3	49	88%	No	Yes
Groundwater	Metals	Dissolved	Barium	N/A	N/A	ug/L	3	-	-	-	-	0	-	3	21.2	134	3	100%	Yes	--
Groundwater	Metals	Dissolved	Beryllium	N/A	N/A	ug/L	3	5.00	5.00	5.00	5.00	3	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Cadmium	N/A	N/A	ug/L	3	5.00	5.00	5.00	5.00	3	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Calcium	N/A	N/A	ug/L	14	-	-	-	-	0	-	14	6,690	172,000	14	100%	No	--
Groundwater	Metals	Dissolved	Chromium	N/A	N/A	ug/L	3	10.0	10.0	10.0	10.0	3	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Copper	N/A	N/A	ug/L	3	10.0	10.0	10.0	10.0	3	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Iron	N/A	N/A	ug/L	56	4.00	50.0	20.0	50.0	24	9	23	5.80	35,400	32	57%	No	Yes
Groundwater	Metals	Dissolved	Lead	N/A	N/A	ug/L	36	0.00600	3.00	0.0200	3.00	20	7	9	0.0120	3.50	16	44%	No	Yes
Groundwater	Metals	Dissolved	Magnesium	N/A	N/A	ug/L	14	-	-	-	-	0	-	14	883	25,800	14	100%	No	--
Groundwater	Metals	Dissolved	Manganese	N/A	N/A	ug/L	36	0.400	0.400	0.400	5.00	2	2	32	0.120	5,540	34	94%	No	Yes
Groundwater	Metals	Dissolved	Mercury	N/A	N/A	ug/L	8	0.0300	0.200	0.200	0.200	8	-	-	-	-	0	0%	No	--
Groundwater	Metals	Dissolved	Nickel	N/A	N/A	ug/L	3	10.0	10.0	10.0	10.0	2	-	1	18.6	18.6	1	33%	Yes	--
Groundwater	Metals	Dissolved	Potassium	N/A	N/A	ug/L	14	-	-	2,000	2,000	0	4	10	782	12,900	14	100%	No	--
Groundwater	Metals	Dissolved	Selenium	N/A	N/A	ug/L	3	5.00	5.00	5.00	5.00	3	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Silver	N/A	N/A	ug/L	3	10.0	10.0	10.0	10.0	3	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Sodium	N/A	N/A	ug/L	14	-	-	-	-	0	-	14	4,040	740,000	14	100%	No	--
Groundwater	Metals	Dissolved	Thallium	N/A	N/A	ug/L	3	5.00	5.00	5.00	5.00	3	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Vanadium	N/A	N/A	ug/L	20	0.0700	0.800	0.200	10.0	5	5	10	0.145	3.10	15	75%	No	Yes
Groundwater	Metals	Dissolved	Zinc	N/A	N/A	ug/L	3	10.0	10.0	10.0	10.0	2	-	1	196	196	1	33%	Yes	--
Groundwater	Butyltins	Total	Dibutyltin	N/A	N/A	ug/L	39	0.00111	0.00810	0.00302	0.0500	28	2	9	0.00501	0.447	11	28%	No	Yes
Groundwater	Butyltins	Total	Monobutyltin	N/A	N/A	ug/L	59	0.00105	0.0290	0.00302	0.0870	50	3	6	0.00449	0.240	9	15%	No	Yes
Groundwater	Butyltins	Total	Tetrabutyltin	N/A	N/A	ug/L	8	0.00110	0.00119	0.00300	0.00325	8	-	-	-	-	0	0%	No	--
Groundwater	Butyltins	Total	Tributyltin	N/A	N/A	ug/L	8	0.00156	0.00163	0.00402	0.00419	2	-	6	0.0171	0.0601	6	75%	No	--
Groundwater	Herbicides	Total	2,4,5-T	N/A	N/A	ug/L	21	0.0566	0.150	0.100	0.160	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	2,4,5-TP (Silvex)	N/A	N/A	ug/L	21	0.0227	0.100	0.0800	0.100	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	2,4-D	N/A	N/A	ug/L	21	0.0296	1.00	0.0800	1.00	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	2,4-DB	N/A	N/A	ug/L	21	0.0557	1.00	0.160	1.00	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	4-Nitrophenol	N/A	N/A	ug/L	8	0.0114	0.0114	0.0800	0.0800	7	-	1	0.840	0.840	1	13%	No	--
Groundwater	Herbicides	Total	Dalapon	N/A	N/A	ug/L	21	0.0124	2.00	0.0800	2.00	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	Dicamba	N/A	N/A	ug/L	21	0.0221	0.100	0.0800	0.100	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	Dichloroprop	N/A	N/A	ug/L	21	0.0114	1.00	0.0800	1.00	20	-	1	1.10	1.10	1	5%	No	No
Groundwater	Herbicides	Total	Dinoseb	N/A	N/A	ug/L	21	0.0292	0.500	0.0800	0.500	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	MCPA	N/A	N/A	ug/L	21	0.0114	50.0	0.0800	50.0	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	MCPP	N/A	N/A	ug/L	21	0.0134	50.0	0.0800	50.0	21	-	-	-	-	0	0%	No	No
Groundwater	Herbicides	Total	Pentachlorophenol	N/A	N/A	ug/L	8	0.0259	0.0259	0.0800	0.0800	7	-	1	0.112	0.112	1	13%	No	--
Groundwater	Pesticides	Total	4,4'-DDD	N/A	N/A	ug/L	22	0.000458	0.100	0.00195	0.100	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	4,4'-DDE	N/A	N/A	ug/L	22	0.000380	0.100	0.00195	0.100	21	-	1	0.00246	0.00246	1	5%	No	No
Groundwater	Pesticides	Total	4,4'-DDT	N/A	N/A	ug/L	22	0.000486	0.100	0.00195	0.100	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Aldrin	N/A	N/A	ug/L	22	0.000111	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	BHC (alpha)	N/A	N/A	ug/L	22	0.000358	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	BHC (beta)	N/A	N/A	ug/L	22	0.000415	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	BHC (delta)	N/A	N/A	ug/L	22	0.000228	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	BHC (gamma) Lindane	N/A	N/A	ug/L	22	0.000700	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Chlordane (alpha)	N/A	N/A	ug/L	14	0.0470	0.0500	0.0470	0.0500	14	-	-	-	-	0	0%	No	--
Groundwater	Pesticides	Total	Chlordane (gamma)	N/A	N/A	ug/L	14	0.0470	0.0500	0.0470	0.0500	14	-	-	-	-	0	0%	No	--
Groundwater	Pesticides	Total	Chlordane (technical)	N/A	N/A	ug/L	8	0.00312	0.0114	0.00973	0.0137	8	-	-	-	-	0	0%	No	--
Groundwater	Pesticides	Total	Dieldrin	N/A	N/A	ug/L	22	0.000294	0.100	0.00195	0.100	21	1	-	0.000982	0.000982	1	5%	No	No
Groundwater	Pesticides	Total	Endosulfan I	N/A	N/A	ug/L	22	0.000485	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Endosulfan II	N/A	N/A	ug/L	22	0.000368	0.100	0.00195	0.100	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Endosulfan Sulfate	N/A	N/A	ug/L	22	0.000523	0.100	0.00195	0.100	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Endrin Aldehyde	N/A	N/A	ug/L	22	0.000947	0.100	0.00195	0.100	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Endrin Ketone	N/A	N/A	ug/L	22	0.000335	0.100	0.00195	0.100	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Endrin	N/A	N/A	ug/L	22	0.000301	0.100	0.00195	0.100	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Heptachlor Epoxide	N/A	N/A	ug/L	22	0.000364	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Heptachlor	N/A	N/A	ug/L	22	0.000733	0.0500	0.000973	0.0500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Methoxychlor	N/A	N/A	ug/L	22	0.000522	0.500	0.00973	0.500	22	-	-	-	-	0	0%	No	No
Groundwater	Pesticides	Total	Toxaphene	N/A	N/A	ug/L	22	0.0113	1.00	0.0973	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	PCB Aroclors	Total	Aroclor 1016	N/A	N/A	ug/L	22	0.00199	1.00	0.00992	1.00	22	-	-	-	-	0	0%	No	No

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(12 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
Groundwater	PCB Aroclors	Total	Aroclor 1221	N/A	N/A	ug/L	22	0.00496	1.00	0.0198	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	PCB Aroclors	Total	Aroclor 1232	N/A	N/A	ug/L	22	0.00236	1.00	0.00992	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	PCB Aroclors	Total	Aroclor 1242	N/A	N/A	ug/L	22	0.00327	1.00	0.00992	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	PCB Aroclors	Total	Aroclor 1248	N/A	N/A	ug/L	22	0.00155	1.00	0.00992	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	PCB Aroclors	Total	Aroclor 1254	N/A	N/A	ug/L	22	0.00199	1.00	0.00992	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	PCB Aroclors	Total	Aroclor 1260	N/A	N/A	ug/L	22	0.00109	1.00	0.00992	1.00	22	-	-	-	-	0	0%	No	No
Groundwater	NWTPH-Dx	Total	Diesel Range Organics	N/A	N/A	ug/L	75	11.0	250	100	250	36	13	26	13.0	1,800	39	52%	No	Yes
Groundwater	NWTPH-Dx	Total	Residual Range Organics	N/A	N/A	ug/L	75	19.0	750	100	750	48	7	20	51.0	1,900	27	36%	No	Yes
Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	N/A	ug/L	77	13.0	100	100	250	57	17	3	13.0	430	20	26%	No	Yes
Groundwater	SVOCs	Total	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	23	0.0100	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	1,2-Dichlorobenzene	N/A	N/A	ug/L	23	0.0160	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	1,3-Dichlorobenzene	N/A	N/A	ug/L	23	0.0170	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/L	54	0.0150	10.0	0.0999	10.0	52	2	-	0.0258	0.0601	2	4%	No	No
Groundwater	SVOCs	Total	2,4,5-Trichlorophenol	N/A	N/A	ug/L	23	0.0110	48.0	0.0999	48.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2,4,6-Trichlorophenol	N/A	N/A	ug/L	23	0.0120	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2,4-Dichlorophenol	N/A	N/A	ug/L	23	0.0150	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2,4-Dimethylphenol	N/A	N/A	ug/L	23	0.0150	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2,4-Dinitrophenol	N/A	N/A	ug/L	23	0.0300	48.0	0.500	48.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2,4-Dinitrotoluene	N/A	N/A	ug/L	23	0.0130	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2,6-Dinitrotoluene	N/A	N/A	ug/L	23	0.0200	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2-Chloronaphthalene	N/A	N/A	ug/L	23	0.00150	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2-Chlorophenol	N/A	N/A	ug/L	23	0.0170	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2-Methylnaphthalene	N/A	N/A	ug/L	23	0.0150	10.0	0.0999	10.0	19	4	-	0.0385	0.360	4	17%	No	Yes
Groundwater	SVOCs	Total	2-Methylphenol	N/A	N/A	ug/L	23	0.0240	10.0	0.0999	10.0	22	-	1	76.0	76.0	1	4%	No	No
Groundwater	SVOCs	Total	2-Nitroaniline	N/A	N/A	ug/L	23	0.0180	48.0	0.0999	48.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	2-Nitrophenol	N/A	N/A	ug/L	23	0.0220	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	3,3'-Dichlorobenzidine	N/A	N/A	ug/L	23	0.0360	19.0	0.0999	19.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	3-Nitroaniline	N/A	N/A	ug/L	23	0.0330	48.0	0.0999	48.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	4,6-Dinitro-2-methylphenol	N/A	N/A	ug/L	23	0.0220	48.0	0.500	48.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	4-Bromophenyl Phenyl Ether	N/A	N/A	ug/L	23	0.0120	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	4-Chloro-3-methylphenol	N/A	N/A	ug/L	23	0.0539	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	4-Chloroaniline	N/A	N/A	ug/L	23	0.0390	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	4-Chlorophenyl Phenyl Ether	N/A	N/A	ug/L	23	0.0150	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	4-Nitroaniline	N/A	N/A	ug/L	23	0.0210	48.0	0.0999	48.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	4-Nitrophenol	N/A	N/A	ug/L	53	0.0290	48.0	0.500	48.0	53	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Acenaphthene	N/A	N/A	ug/L	23	0.00160	10.0	0.00999	10.0	21	-	2	0.111	0.239	2	9%	No	Yes
Groundwater	SVOCs	Total	Acenaphthylene	N/A	N/A	ug/L	23	0.00150	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Aniline	N/A	N/A	ug/L	23	0.0000616	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Anthracene	N/A	N/A	ug/L	23	0.00150	10.0	0.00999	10.0	22	-	1	0.0589	0.0589	1	4%	No	No
Groundwater	SVOCs	Total	Benzidine	N/A	N/A	ug/L	23	0.0240	100	0.500	100	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Benzo(a)anthracene	N/A	N/A	ug/L	23	0.00426	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Benzo(a)pyrene	N/A	N/A	ug/L	23	0.00470	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Benzo(b)fluoranthene	N/A	N/A	ug/L	34	0.0170	10.0	0.190	10.0	33	1	-	0.0180	0.0180	1	3%	No	No
Groundwater	SVOCs	Total	Benzo(g,h,i)perylene	N/A	N/A	ug/L	23	0.00340	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Benzo(k)fluoranthene	N/A	N/A	ug/L	34	0.0240	10.0	0.190	10.0	34	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Benzofluoranthenes, Total	N/A	N/A	ug/L	9	0.00380	0.0540	0.0200	0.284	9	-	-	-	-	0	0%	No	--
Groundwater	SVOCs	Total	Benzoic Acid	N/A	N/A	ug/L	23	0.0200	48.0	0.500	48.0	22	-	1	11.0	11.0	1	4%	No	No
Groundwater	SVOCs	Total	Benzyl Alcohol	N/A	N/A	ug/L	23	0.0320	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Bis(2-chloroethoxy)methane	N/A	N/A	ug/L	23	0.0180	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Bis(2-chloroethyl) Ether	N/A	N/A	ug/L	23	0.0190	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Bis(2-chloroisopropyl) Ether	N/A	N/A	ug/L	23	0.0210	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	N/A	ug/L	23	0.0649	48.0	0.0999	48.0	19	-	4	1.79	19.0	4	17%	No	Yes
Groundwater	SVOCs	Total	Butyl Benzyl Phthalate	N/A	N/A	ug/L	23	0.187	10.0	0.500	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Carbazole	N/A	N/A	ug/L	23	0.00280	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Chrysene	N/A	N/A	ug/L	23	0.00250	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Dibenz(a,h)anthracene	N/A	N/A	ug/L	23	0.00270	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Dibenzofuran	N/A	N/A	ug/L	23	0.0140	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Diethyl Phthalate	N/A	N/A	ug/L	23	0.0579	10.0	0.0999	10.0	20	1	2	0.192	1.90	3	13%	No	Yes
Groundwater	SVOCs	Total	Dimethyl Phthalate	N/A	N/A	ug/L	23	0.0160	10.0	0.100	10.0	22	-	1	0.235	0.235	1	4%	No	No
Groundwater	SVOCs	Total	Di-n-butyl Phthalate	N/A	N/A	ug/L	23	0.231	10.0	0.500	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Di-n-octyl Phthalate	N/A	N/A	ug/L	23	0.0340	10.0	0.0999	10.0	20	-	3	2.85	7.08	3	13%	No	Yes
Groundwater	SVOCs	Total	Fluoranthene	N/A	N/A	ug/L	23	0.00190	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Fluorene	N/A	N/A	ug/L	23	0.00140	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(13 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
Groundwater	SVOCs	Total	Hexachlorobenzene	N/A	N/A	ug/L	23	0.0200	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Hexachlorobutadiene	N/A	N/A	ug/L	23	0.0290	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Hexachlorocyclopentadiene	N/A	N/A	ug/L	23	0.0260	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Hexachloroethane	N/A	N/A	ug/L	23	0.0400	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Indeno(1,2,3-cd)pyrene	N/A	N/A	ug/L	23	0.00300	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Isophorone	N/A	N/A	ug/L	23	0.0180	10.0	0.0999	10.0	21	1	1	0.116	0.282	2	9%	No	Yes
Groundwater	SVOCs	Total	Naphthalene	N/A	N/A	ug/L	23	0.00220	10.0	0.00999	10.0	20	-	3	0.0400	0.157	3	13%	No	Yes
Groundwater	SVOCs	Total	Nitrobenzene	N/A	N/A	ug/L	23	0.0450	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	N-Nitrosodimethylamine	N/A	N/A	ug/L	23	0.00330	10.0	0.500	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	N-Nitrosodi-n-propylamine	N/A	N/A	ug/L	23	0.0210	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	N-Nitrosodiphenylamine	N/A	N/A	ug/L	23	0.00999	10.0	0.0999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	p-cresol (4-Methylphenol)	N/A	N/A	ug/L	23	0.0230	10.0	0.0999	10.0	22	-	1	29.0	29.0	1	4%	No	No
Groundwater	SVOCs	Total	Pentachlorophenol	N/A	N/A	ug/L	23	0.0170	25.0	0.0999	25.0	23	-	-	-	-	0	0%	No	No
Groundwater	SVOCs	Total	Phenanthrene	N/A	N/A	ug/L	74	0.00220	10.0	0.00999	10.0	68	1	5	0.0800	3.90	6	8%	No	Yes
Groundwater	SVOCs	Total	Phenol	N/A	N/A	ug/L	54	0.0320	10.0	0.0999	10.0	53	1	-	0.382	0.382	1	2%	No	No
Groundwater	SVOCs	Total	Pyrene	N/A	N/A	ug/L	23	0.00140	10.0	0.00999	10.0	23	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,1,1,2-Tetrachloroethane	N/A	N/A	ug/L	27	0.0450	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/L	27	0.0620	1.00	0.500	1.00	25	1	1	0.220	1.90	2	7%	No	Yes
Groundwater	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	N/A	ug/L	27	0.0880	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,1,2-Trichloroethane	N/A	N/A	ug/L	27	0.0940	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/L	27	0.0590	1.00	0.500	1.00	25	1	1	0.320	5.00	2	7%	No	Yes
Groundwater	VOCs	Total	1,1-Dichloroethene	N/A	N/A	ug/L	27	0.100	1.00	0.500	1.00	26	-	1	2.10	2.10	1	4%	No	No
Groundwater	VOCs	Total	1,1-Dichloropropene	N/A	N/A	ug/L	27	0.0620	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2,3-Trichlorobenzene	N/A	N/A	ug/L	27	0.0840	5.00	1.00	5.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2,3-Trichloropropane	N/A	N/A	ug/L	27	0.240	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	27	0.180	5.00	1.00	5.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/L	27	0.0620	1.00	1.00	2.00	25	-	2	1.00	5.20	2	7%	No	Yes
Groundwater	VOCs	Total	1,2-Dibromo-3-chloropropane	N/A	N/A	ug/L	27	0.500	3.00	1.00	3.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	N/A	ug/L	27	0.0720	1.00	1.00	2.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2-Dichlorobenzene	N/A	N/A	ug/L	27	0.0690	2.00	0.500	2.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	N/A	ug/L	27	0.0660	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,2-Dichloropropane	N/A	N/A	ug/L	27	0.0620	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,3,5-Trimethylbenzene	N/A	N/A	ug/L	27	0.0660	1.00	1.00	5.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,3-Dichlorobenzene	N/A	N/A	ug/L	27	0.0820	2.00	0.500	2.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,3-Dichloropropane	N/A	N/A	ug/L	27	0.0570	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/L	27	0.0840	2.00	0.500	2.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	2,2-Dichloropropane	N/A	N/A	ug/L	42	0.0830	1.00	0.500	2.50	42	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	2-Butanone (MEK)	N/A	N/A	ug/L	19	2.30	10.0	5.00	20.0	19	-	-	-	-	0	0%	No	--
Groundwater	VOCs	Total	2-Chloroethylvinylether	N/A	N/A	ug/L	13	10.0	10.0	10.0	10.0	13	-	-	-	-	0	0%	No	--
Groundwater	VOCs	Total	2-Chlorotoluene	N/A	N/A	ug/L	27	0.0790	1.00	1.00	2.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	2-Hexanone	N/A	N/A	ug/L	27	2.40	10.0	5.00	20.0	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	4-Chlorotoluene	N/A	N/A	ug/L	27	0.0570	1.00	1.00	4.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	4-Isopropyltoluene	N/A	N/A	ug/L	27	0.0700	2.00	1.00	2.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	N/A	ug/L	27	1.40	10.0	5.00	20.0	26	1	-	3.04	3.04	1	4%	No	No
Groundwater	VOCs	Total	Acetone	N/A	N/A	ug/L	27	2.50	10.0	5.00	20.0	23	-	4	8.39	15.4	4	15%	No	Yes
Groundwater	VOCs	Total	Benzene	N/A	N/A	ug/L	27	0.0620	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Bromobenzene	N/A	N/A	ug/L	27	0.0660	1.00	1.00	2.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Bromochloromethane	N/A	N/A	ug/L	27	0.0990	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Bromodichloromethane	N/A	N/A	ug/L	27	0.0550	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Bromoform	N/A	N/A	ug/L	27	0.0990	3.00	0.500	3.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Bromomethane	N/A	N/A	ug/L	27	0.120	1.00	0.500	2.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/L	27	0.500	10.0	0.500	10.0	21	5	1	0.120	3.95	6	22%	No	Yes
Groundwater	VOCs	Total	Carbon Tetrachloride	N/A	N/A	ug/L	27	0.0480	1.00	0.500	1.00	26	-	1	1.40	1.40	1	4%	No	No
Groundwater	VOCs	Total	Chlorobenzene	N/A	N/A	ug/L	27	0.0640	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Chloroethane	N/A	N/A	ug/L	27	0.130	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Chloroform	N/A	N/A	ug/L	76	0.0820	1.00	0.500	2.50	67	5	4	0.100	3.70	9	12%	No	Yes
Groundwater	VOCs	Total	Chloromethane	N/A	N/A	ug/L	27	0.110	5.00	0.500	5.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/L	42	0.0660	1.00	0.500	1.00	26	4	12	0.0800	660	16	38%	No	Yes
Groundwater	VOCs	Total	cis-1,3-Dichloropropene	N/A	N/A	ug/L	27	0.0550	3.00	0.500	3.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Dibromochloromethane	N/A	N/A	ug/L	27	0.0720	2.00	0.500	2.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Dibromomethane	N/A	N/A	ug/L	27	0.120	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Dichlorodifluoromethane	N/A	N/A	ug/L	27	0.0750	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	N/A	ug/L	27	0.0840	5.00	1.00	5.00	26	1	-	0.175	0.175	1	4%	No	No

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(14 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
Groundwater	VOCs	Total	Ethylbenzene	N/A	N/A	ug/L	27	0.0680	1.00	0.500	1.00	26	-	1	1.00	1.00	1	4%	No	No
Groundwater	VOCs	Total	Hexachlorobutadiene	N/A	N/A	ug/L	27	0.150	3.00	1.00	3.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/L	27	0.0760	1.00	0.500	1.00	25	-	2	3.20	4.60	2	7%	No	Yes
Groundwater	VOCs	Total	m,p-Xylenes	N/A	N/A	ug/L	27	0.110	1.00	0.500	2.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Naphthalene	N/A	N/A	ug/L	27	0.0960	5.00	1.00	5.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	n-Butylbenzene	N/A	N/A	ug/L	27	0.0850	1.00	1.00	2.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	n-Propylbenzene	N/A	N/A	ug/L	27	0.00590	1.00	1.00	2.00	25	-	2	1.20	2.00	2	7%	No	Yes
Groundwater	VOCs	Total	o-Xylene	N/A	N/A	ug/L	27	0.0680	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	sec-Butylbenzene	N/A	N/A	ug/L	27	0.0710	1.00	1.00	2.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Styrene	N/A	N/A	ug/L	27	0.0770	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	tert-Butylbenzene	N/A	N/A	ug/L	27	0.0590	1.00	1.00	2.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/L	76	0.0970	1.00	0.500	1.00	47	5	24	0.230	8.78	29	38%	No	Yes
Groundwater	VOCs	Total	Toluene	N/A	N/A	ug/L	27	0.500	1.00	0.500	1.00	22	2	3	0.230	0.640	5	19%	No	Yes
Groundwater	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/L	27	0.0690	1.00	0.500	1.00	25	1	1	0.110	1.70	2	7%	No	Yes
Groundwater	VOCs	Total	trans-1,3-Dichloropropene	N/A	N/A	ug/L	27	0.0750	3.00	0.500	3.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/L	42	0.0730	1.00	0.500	1.00	27	4	11	0.140	3.40	15	36%	No	Yes
Groundwater	VOCs	Total	Trichlorofluoromethane	N/A	N/A	ug/L	27	0.0990	1.00	0.500	1.00	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Vinyl Acetate	N/A	N/A	ug/L	27	0.910	10.0	5.00	10.0	27	-	-	-	-	0	0%	No	No
Groundwater	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/L	76	0.0440	1.00	0.500	2.50	56	15	5	0.160	4.10	20	26%	No	Yes
DP Groundwater	Metals	Total	Aluminum	N/A	N/A	ug/L	10	-	-	100	100	0	2	8	74.2	17,900	10	100%	No	--
DP Groundwater	Metals	Total	Antimony	N/A	N/A	ug/L	10	0.500	0.500	0.500	0.500	1	5	4	0.233	1.57	9	90%	No	--
DP Groundwater	Metals	Total	Arsenic	N/A	N/A	ug/L	10	0.102	0.102	0.500	0.500	2	2	6	0.114	7.70	8	80%	No	--
DP Groundwater	Metals	Total	Barium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	3.76	97.8	10	100%	No	--
DP Groundwater	Metals	Total	Beryllium	N/A	N/A	ug/L	10	0.0782	0.0782	0.500	0.500	6	3	1	0.157	0.785	4	40%	No	--
DP Groundwater	Metals	Total	Cadmium	N/A	N/A	ug/L	10	0.0247	0.0247	0.500	0.500	10	-	-	-	-	0	0%	No	--
DP Groundwater	Metals	Total	Calcium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	18,300	33,700	10	100%	No	--
DP Groundwater	Metals	Total	Chromium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	2.61	31.8	10	100%	No	--
DP Groundwater	Metals	Total	Cobalt	N/A	N/A	ug/L	10	0.770	0.770	5.00	5.00	4	3	3	1.68	13.1	6	60%	No	--
DP Groundwater	Metals	Total	Copper	N/A	N/A	ug/L	12	-	-	-	-	0	-	12	1.38	204	12	100%	No	--
DP Groundwater	Metals	Total	Iron	N/A	N/A	ug/L	10	14.0	14.0	100	100	1	1	8	84.4	25,900	9	90%	No	--
DP Groundwater	Metals	Total	Lead	N/A	N/A	ug/L	12	0.500	0.500	0.500	0.500	3	1	8	0.0580	13.7	9	75%	No	--
DP Groundwater	Metals	Total	Magnesium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	5,130	15,400	10	100%	No	--
DP Groundwater	Metals	Total	Manganese	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	2.10	708	10	100%	No	--
DP Groundwater	Metals	Total	Mercury	N/A	N/A	ug/L	10	0.0530	0.0530	0.200	0.200	8	2	-	0.0760	0.100	2	20%	No	--
DP Groundwater	Metals	Total	Nickel	N/A	N/A	ug/L	12	0.370	0.370	10.0	40.0	1	8	3	1.02	50.1	11	92%	No	--
DP Groundwater	Metals	Total	Potassium	N/A	N/A	ug/L	10	-	-	1,000	1,000	0	2	8	898	3,210	10	100%	No	--
DP Groundwater	Metals	Total	Selenium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	0.815	2.06	10	100%	No	--
DP Groundwater	Metals	Total	Silver	N/A	N/A	ug/L	10	0.0188	0.0188	0.100	0.100	1	6	3	0.0195	0.376	9	90%	No	--
DP Groundwater	Metals	Total	Sodium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	6,350	42,900	10	100%	No	--
DP Groundwater	Metals	Total	Thallium	N/A	N/A	ug/L	10	0.0292	0.0292	0.500	0.500	3	7	-	0.0430	0.146	7	70%	No	--
DP Groundwater	Metals	Total	Vanadium	N/A	N/A	ug/L	10	-	-	10.0	10.0	0	6	4	1.82	77.6	10	100%	No	--
DP Groundwater	Metals	Total	Zinc	N/A	N/A	ug/L	12	-	-	-	-	0	-	12	2.88	149	12	100%	No	--
DP Groundwater	Metals	Dissolved	Aluminum	N/A	N/A	ug/L	10	5.88	5.88	100	100	3	5	2	5.88	1,370	7	70%	No	--
DP Groundwater	Metals	Dissolved	Antimony	N/A	N/A	ug/L	10	-	-	0.500	0.500	0	9	1	0.149	1.67	10	100%	No	--
DP Groundwater	Metals	Dissolved	Arsenic	N/A	N/A	ug/L	10	-	-	0.500	0.500	0	1	9	0.262	1.36	10	100%	No	--
DP Groundwater	Metals	Dissolved	Barium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	3.39	20.6	10	100%	No	--
DP Groundwater	Metals	Dissolved	Beryllium	N/A	N/A	ug/L	10	0.0782	0.0782	0.500	0.500	10	-	-	-	-	0	0%	No	--
DP Groundwater	Metals	Dissolved	Cadmium	N/A	N/A	ug/L	10	0.0247	0.0247	0.500	0.500	9	1	-	0.0300	0.0300	1	10%	No	--
DP Groundwater	Metals	Dissolved	Calcium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	10,800	34,100	10	100%	No	--
DP Groundwater	Metals	Dissolved	Chromium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	0.838	4.29	10	100%	No	--
DP Groundwater	Metals	Dissolved	Cobalt	N/A	N/A	ug/L	10	0.770	0.770	5.00	5.00	2	7	1	1.21	5.08	8	80%	No	--
DP Groundwater	Metals	Dissolved	Copper	N/A	N/A	ug/L	12	0.500	1.23	0.500	1.23	3	-	9	0.665	4.38	9	75%	No	--
DP Groundwater	Metals	Dissolved	Iron	N/A	N/A	ug/L	10	14.0	14.0	100	100	6	1	3	37.3	476	4	40%	No	--
DP Groundwater	Metals	Dissolved	Lead	N/A	N/A	ug/L	12	0.0200	0.500	0.0200	0.500	6	6	-	0.0260	0.378	6	50%	No	--
DP Groundwater	Metals	Dissolved	Magnesium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	3,310	12,000	10	100%	No	--
DP Groundwater	Metals	Dissolved	Manganese	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	1.71	587	10	100%	No	--
DP Groundwater	Metals	Dissolved	Mercury	N/A	N/A	ug/L	10	0.0530	0.0530	0.200	0.200	8	2	-	0.0550	0.0600	2	20%	No	--
DP Groundwater	Metals	Dissolved	Nickel	N/A	N/A	ug/L	12	0.370	10.0	10.0	20.0	8	4	-	0.403	3.90	4	33%	No	--
DP Groundwater	Metals	Dissolved	Potassium	N/A	N/A	ug/L	10	-	-	1,000	1,000	0	3	7	527	2,210	10	100%	No	--
DP Groundwater	Metals	Dissolved	Selenium	N/A	N/A	ug/L	10	-	-	0.500	0.500	0	3	7	0.235	1.30	10	100%	No	--
DP Groundwater	Metals	Dissolved	Silver	N/A	N/A	ug/L	10	0.0188	0.0188	0.100	0.100	2	8	-	0.0240	0.0790	8	80%	No	--
DP Groundwater	Metals	Dissolved	Sodium	N/A	N/A	ug/L	10	-	-	-	-	0	-	10	6,560	47,700	10	100%	No	--
DP Groundwater	Metals	Dissolved	Thallium	N/A	N/A	ug/L	10	0.0292	0.0292	0.500	0.500	7	3	-	0.0310	0.0855	3	30%	No	--

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(15 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
DP Groundwater	Metals	Dissolved	Vanadium	N/A	N/A	ug/L	10	0.488	10.0	10.0	10.0	4	6	-	0.582	2.61	6	60%	No	--
DP Groundwater	Metals	Dissolved	Zinc	N/A	N/A	ug/L	12	2.00	2.00	2.00	10.0	6	2	4	2.00	4.10	6	50%	No	--
DP Groundwater	Butyltins	Total	Dibutyltin	N/A	N/A	ug/L	4	0.000231	0.000287	0.000793	0.000988	4	-	-	-	-	0	0%	Yes	--
DP Groundwater	Butyltins	Total	Monobutyltin	N/A	N/A	ug/L	4	0.000114	0.000142	0.000396	0.000494	2	-	2	0.00520	0.00671	2	50%	Yes	--
DP Groundwater	Butyltins	Total	Tetrabutyltin	N/A	N/A	ug/L	4	0.000600	0.000748	0.00198	0.00247	4	-	-	-	-	0	0%	Yes	--
DP Groundwater	Butyltins	Total	Tributyltin	N/A	N/A	ug/L	4	0.000454	0.000552	0.00142	0.00173	2	-	2	0.00285	0.00435	2	50%	Yes	--
DP Groundwater	PCB Aroclors	Total	Aroclor 1016	N/A	N/A	ug/L	7	0.00206	0.00244	0.00941	0.0112	7	-	-	-	-	0	0%	Yes	--
DP Groundwater	PCB Aroclors	Total	Aroclor 1221	N/A	N/A	ug/L	7	0.00206	0.00244	0.00941	0.0112	7	-	-	-	-	0	0%	Yes	--
DP Groundwater	PCB Aroclors	Total	Aroclor 1232	N/A	N/A	ug/L	7	0.00206	0.00244	0.00941	0.0112	7	-	-	-	-	0	0%	Yes	--
DP Groundwater	PCB Aroclors	Total	Aroclor 1242	N/A	N/A	ug/L	7	0.00206	0.00244	0.00941	0.0112	7	-	-	-	-	0	0%	Yes	--
DP Groundwater	PCB Aroclors	Total	Aroclor 1248	N/A	N/A	ug/L	7	0.00206	0.00244	0.00941	0.0112	7	-	-	-	-	0	0%	Yes	--
DP Groundwater	PCB Aroclors	Total	Aroclor 1254	N/A	N/A	ug/L	7	0.00227	0.00269	0.00941	0.0112	7	-	-	-	-	0	0%	Yes	--
DP Groundwater	PCB Aroclors	Total	Aroclor 1260	N/A	N/A	ug/L	7	0.00227	0.00269	0.00941	0.0112	7	-	-	-	-	0	0%	Yes	--
DP Groundwater	NWTPH-Dx	Total	Diesel Range Organics	N/A	N/A	ug/L	4	74.7	89.7	244	293	4	-	-	-	-	0	0%	Yes	--
DP Groundwater	NWTPH-Dx	Total	Residual Range Organics	N/A	N/A	ug/L	4	92.5	111	487	585	3	1	-	113	113	1	25%	Yes	--
DP Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	N/A	ug/L	6	13.0	13.0	100	100	4	2	-	14.7	20.9	2	33%	Yes	--
DP Groundwater	Pesticides	Total	4,4'-DDD	N/A	N/A	ug/L	3	0.000453	0.000575	0.00385	0.00488	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	4,4'-DDE	N/A	N/A	ug/L	3	0.000375	0.000476	0.00385	0.00488	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	4,4'-DDT	N/A	N/A	ug/L	3	0.000480	0.000609	0.00385	0.00488	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Aldrin	N/A	N/A	ug/L	3	0.000110	0.000140	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	BHC (alpha)	N/A	N/A	ug/L	3	0.000354	0.000449	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	BHC (beta)	N/A	N/A	ug/L	3	0.000411	0.000521	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	BHC (delta)	N/A	N/A	ug/L	3	0.000226	0.000286	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	BHC (gamma) Lindane	N/A	N/A	ug/L	3	-	-	0.00111	0.00111	0	1	2	0.000930	0.00249	3	100%	Yes	--
DP Groundwater	Pesticides	Total	Chlordane (alpha)	N/A	N/A	ug/L	3	0.000339	0.000429	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Chlordane (gamma)	N/A	N/A	ug/L	3	0.000461	0.000584	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Dieldrin	N/A	N/A	ug/L	3	0.000290	0.000368	0.00192	0.00244	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Endosulfan I	N/A	N/A	ug/L	3	0.000480	0.000608	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Endosulfan II	N/A	N/A	ug/L	3	0.000411	0.00192	0.00192	0.00244	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Endosulfan Sulfate	N/A	N/A	ug/L	3	0.000517	0.000655	0.00192	0.00244	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Endrin Aldehyde	N/A	N/A	ug/L	3	0.000936	0.00119	0.00192	0.00244	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Endrin Ketone	N/A	N/A	ug/L	3	0.000332	0.000421	0.00192	0.00244	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Endrin	N/A	N/A	ug/L	3	0.000298	0.000378	0.00192	0.00244	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Heptachlor Epoxide	N/A	N/A	ug/L	3	0.000360	0.000456	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Heptachlor	N/A	N/A	ug/L	3	0.000724	0.000919	0.000962	0.00122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	Pesticides	Total	Methoxychlor	N/A	N/A	ug/L	3	0.000584	0.000584	0.0109	0.0122	1	2	-	0.000983	0.00521	2	67%	Yes	--
DP Groundwater	Pesticides	Total	Toxaphene	N/A	N/A	ug/L	3	0.0112	0.0142	0.0962	0.122	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	9	0.0117	0.0151	0.190	1.00	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	1,2-Dichlorobenzene	N/A	N/A	ug/L	9	0.0264	0.0340	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	1,3-Dichlorobenzene	N/A	N/A	ug/L	9	0.0349	0.0449	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/L	9	0.0300	0.0387	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	2,4,5-Trichlorophenol	N/A	N/A	ug/L	6	0.0421	0.0542	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	2,4,6-Trichlorophenol	N/A	N/A	ug/L	6	0.0305	0.0393	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	2,4-Dichlorophenol	N/A	N/A	ug/L	6	0.0177	0.0228	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	2,4-Dimethylphenol	N/A	N/A	ug/L	6	0.174	0.224	0.950	1.22	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	2,4-Dinitrophenol	N/A	N/A	ug/L	6	0.197	0.253	0.950	1.22	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	2,4-Dinitrotoluene	N/A	N/A	ug/L	9	0.0545	0.0703	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	2,6-Dinitrotoluene	N/A	N/A	ug/L	9	0.0361	0.0465	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	2-Chloronaphthalene	N/A	N/A	ug/L	9	0.00456	0.00588	0.0190	0.0245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	2-Chlorophenol	N/A	N/A	ug/L	6	0.0400	0.0515	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	2-Methylnaphthalene	N/A	N/A	ug/L	9	0.0142	0.0149	0.0475	0.0553	3	3	3	0.0195	0.153	6	67%	No	--
DP Groundwater	SVOCs	Total	2-Methylphenol	N/A	N/A	ug/L	6	0.0371	0.0479	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	2-Nitroaniline	N/A	N/A	ug/L	9	0.0284	0.0366	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	2-Nitrophenol	N/A	N/A	ug/L	6	0.0406	0.0524	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	3,3'-Dichlorobenzidine	N/A	N/A	ug/L	9	0.178	0.229	0.950	1.22	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	3-Nitroaniline	N/A	N/A	ug/L	9	0.0537	0.0692	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	4,6-Dinitro-2-methylphenol	N/A	N/A	ug/L	6	0.294	0.379	0.950	1.22	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	4-Bromophenyl Phenyl Ether	N/A	N/A	ug/L	9	0.0208	0.0268	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	4-Chloro-3-methylphenol	N/A	N/A	ug/L	6	0.0232	0.0299	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	4-Chloroaniline	N/A	N/A	ug/L	9	0.0687	0.0885	0.285	0.367	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	4-Chlorophenyl Phenyl Ether	N/A	N/A	ug/L	9	0.0306	0.0394	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	4-Nitroaniline	N/A	N/A	ug/L	9	0.0368	0.0475	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	4-Nitrophenol	N/A	N/A	ug/L	6	0.112	0.144	0.950	1.22	6	-	-	-	-	0	0%	Yes	--

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(16 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
DP Groundwater	SVOCs	Total	Acenaphthene	N/A	N/A	ug/L	9	0.00323	0.00356	0.0190	0.0245	4	5	-	0.00547	0.0230	5	56%	No	--
DP Groundwater	SVOCs	Total	Acenaphthylene	N/A	N/A	ug/L	9	0.00228	0.00294	0.0190	0.0245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Aniline	N/A	N/A	ug/L	9	0.0310	0.367	0.285	0.367	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Anthracene	N/A	N/A	ug/L	9	0.00180	0.00209	0.0190	0.0245	8	1	-	0.0126	0.0126	1	11%	No	--
DP Groundwater	SVOCs	Total	Benzidine	N/A	N/A	ug/L	9	0.950	1.22	0.950	1.22	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Benzo(a)anthracene	N/A	N/A	ug/L	9	0.00494	0.00636	0.0190	0.0245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Benzo(a)pyrene	N/A	N/A	ug/L	9	0.00313	0.00363	0.0190	0.0245	8	1	-	0.00895	0.00895	1	11%	No	--
DP Groundwater	SVOCs	Total	Benzo(g,h,i)perylene	N/A	N/A	ug/L	9	0.00484	0.00624	0.0190	0.0245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Benzofluoranthenes, Total	N/A	N/A	ug/L	9	0.0113	0.0131	0.0950	0.122	8	1	-	0.0173	0.0173	1	11%	No	--
DP Groundwater	SVOCs	Total	Benzoic Acid	N/A	N/A	ug/L	6	0.127	0.164	0.950	1.22	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	Benzyl Alcohol	N/A	N/A	ug/L	7	0.0404	0.0520	0.190	0.245	5	2	-	0.0500	0.0523	2	29%	Yes	--
DP Groundwater	SVOCs	Total	Bis(2-chloroethoxy)methane	N/A	N/A	ug/L	9	0.0172	0.0222	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Bis(2-chloroethyl) Ether	N/A	N/A	ug/L	9	0.0308	0.0397	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Bis(2-chloroisopropyl) Ether	N/A	N/A	ug/L	9	0.0407	0.0525	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	N/A	ug/L	9	0.362	0.466	1.42	1.84	8	1	-	0.408	0.408	1	11%	No	--
DP Groundwater	SVOCs	Total	Butyl Benzyl Phthalate	N/A	N/A	ug/L	9	0.102	0.285	0.285	0.367	3	6	-	0.120	0.228	6	67%	No	--
DP Groundwater	SVOCs	Total	Carbazole	N/A	N/A	ug/L	9	0.0206	0.0266	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Chrysene	N/A	N/A	ug/L	9	0.00798	0.0103	0.0190	0.0245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Dibenz(a,h)anthracene	N/A	N/A	ug/L	9	0.00294	0.00341	0.0190	0.0245	8	1	-	0.00671	0.00671	1	11%	No	--
DP Groundwater	SVOCs	Total	Dibenzofuran	N/A	N/A	ug/L	9	0.0195	0.0215	0.190	0.245	7	2	-	0.0237	0.0421	2	22%	No	--
DP Groundwater	SVOCs	Total	Diethyl Phthalate	N/A	N/A	ug/L	9	0.0529	0.0682	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Dimethyl Phthalate	N/A	N/A	ug/L	9	0.0370	0.0477	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Di-n-butyl Phthalate	N/A	N/A	ug/L	9	0.190	0.608	0.190	0.608	3	5	1	0.100	0.239	6	67%	No	--
DP Groundwater	SVOCs	Total	Di-n-octyl Phthalate	N/A	N/A	ug/L	9	0.0259	0.0334	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Fluoranthene	N/A	N/A	ug/L	9	0.00541	0.00626	0.0190	0.0220	8	-	1	0.0311	0.0311	1	11%	No	--
DP Groundwater	SVOCs	Total	Fluorene	N/A	N/A	ug/L	9	0.00161	0.00178	0.0190	0.0221	3	5	1	0.00584	0.0351	6	67%	No	--
DP Groundwater	SVOCs	Total	Hexachlorobenzene	N/A	N/A	ug/L	9	0.0237	0.0306	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Hexachlorobutadiene	N/A	N/A	ug/L	9	0.0140	0.0180	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Hexachlorocyclopentadiene	N/A	N/A	ug/L	9	0.294	0.379	0.950	1.22	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Hexachloroethane	N/A	N/A	ug/L	9	0.0362	0.0466	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	Indeno(1,2,3-cd)pyrene	N/A	N/A	ug/L	9	0.00266	0.00308	0.0190	0.0245	8	1	-	0.00797	0.00797	1	11%	No	--
DP Groundwater	SVOCs	Total	Isophorone	N/A	N/A	ug/L	9	0.0278	0.0311	0.190	0.245	7	2	-	0.0486	0.0842	2	22%	No	--
DP Groundwater	SVOCs	Total	Naphthalene	N/A	N/A	ug/L	9	0.0165	0.0191	0.0475	1.00	5	4	-	0.0222	0.0452	4	44%	No	--
DP Groundwater	SVOCs	Total	Nitrobenzene	N/A	N/A	ug/L	9	0.0494	0.0636	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	N-Nitrosodimethylamine	N/A	N/A	ug/L	9	0.950	1.22	0.950	1.22	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	N-Nitrosodi-n-propylamine	N/A	N/A	ug/L	9	0.0350	0.0452	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	N-Nitrosodiphenylamine	N/A	N/A	ug/L	9	0.00807	0.0104	0.190	0.245	9	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Total	p-cresol (4-Methylphenol)	N/A	N/A	ug/L	6	0.0419	0.0540	0.380	0.490	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	Pentachlorophenol	N/A	N/A	ug/L	6	0.190	0.245	0.190	0.245	6	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Total	Phenanthrene	N/A	N/A	ug/L	9	0.00351	0.00351	0.0190	0.0221	1	7	1	0.00759	0.144	8	89%	No	--
DP Groundwater	SVOCs	Total	Phenol	N/A	N/A	ug/L	8	0.00437	0.00563	0.190	0.245	3	5	-	0.0111	0.0291	5	63%	No	--
DP Groundwater	SVOCs	Total	Pyrene	N/A	N/A	ug/L	9	0.00275	0.00319	0.0190	0.0220	6	2	1	0.00317	0.0261	3	33%	No	--
DP Groundwater	SVOCs	Dissolved	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	8	0.0120	0.0139	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	1,2-Dichlorobenzene	N/A	N/A	ug/L	8	0.0272	0.0313	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	1,3-Dichlorobenzene	N/A	N/A	ug/L	8	0.0359	0.0413	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	1,4-Dichlorobenzene	N/A	N/A	ug/L	8	0.0310	0.0356	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	2,4,5-Trichlorophenol	N/A	N/A	ug/L	3	0.0457	0.0499	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	2,4,6-Trichlorophenol	N/A	N/A	ug/L	3	0.0331	0.0361	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	2,4-Dichlorophenol	N/A	N/A	ug/L	3	0.0192	0.0209	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	2,4-Dimethylphenol	N/A	N/A	ug/L	3	0.189	0.206	1.03	1.13	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	2,4-Dinitrophenol	N/A	N/A	ug/L	3	0.214	0.233	1.03	1.13	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	2,4-Dinitrotoluene	N/A	N/A	ug/L	8	0.0562	0.0646	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	2,6-Dinitrotoluene	N/A	N/A	ug/L	8	0.0372	0.0428	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	2-Chloronaphthalene	N/A	N/A	ug/L	8	0.00470	0.00541	0.0196	0.0225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	2-Chlorophenol	N/A	N/A	ug/L	3	0.0434	0.0474	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	2-Methylnaphthalene	N/A	N/A	ug/L	8	0.0147	0.0168	0.0490	0.0563	2	4	2	0.0158	0.280	6	75%	No	--
DP Groundwater	SVOCs	Dissolved	2-Methylphenol	N/A	N/A	ug/L	3	0.0404	0.0440	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	2-Nitroaniline	N/A	N/A	ug/L	8	0.0293	0.0337	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	2-Nitrophenol	N/A	N/A	ug/L	3	0.0442	0.0482	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	3,3'-Dichlorobenzidine	N/A	N/A	ug/L	8	0.183	0.211	0.979	1.13	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	3-Nitroaniline	N/A	N/A	ug/L	8	0.0553	0.0636	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	4,6-Dinitro-2-methylphenol	N/A	N/A	ug/L	3	0.320	0.349	1.03	1.13	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	4-Bromophenyl Phenyl Ether	N/A	N/A	ug/L	8	0.0214	0.0247	0.196	0.225	8	-	-	-	-	0	0%	No	--

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(17 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
DP Groundwater	SVOCs	Dissolved	4-Chloro-3-methylphenol	N/A	N/A	ug/L	3	0.0252	0.0275	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	4-Chloroaniline	N/A	N/A	ug/L	8	0.0708	0.0814	0.294	0.338	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	4-Chlorophenyl Phenyl Ether	N/A	N/A	ug/L	8	0.0315	0.0363	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	4-Nitroaniline	N/A	N/A	ug/L	8	0.0380	0.0437	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	4-Nitrophenol	N/A	N/A	ug/L	3	0.122	0.133	1.03	1.13	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	Acenaphthene	N/A	N/A	ug/L	8	0.00333	0.00345	0.0196	0.0225	3	4	1	0.00491	0.0348	5	63%	No	--
DP Groundwater	SVOCs	Dissolved	Acenaphthylene	N/A	N/A	ug/L	8	0.00235	0.00270	0.0196	0.0225	7	1	-	0.00361	0.00361	1	13%	No	--
DP Groundwater	SVOCs	Dissolved	Anthracene	N/A	N/A	ug/L	8	0.00186	0.00214	0.0196	0.0225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Benzidine	N/A	N/A	ug/L	8	0.979	1.13	0.979	1.13	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Benzo(a)anthracene	N/A	N/A	ug/L	8	0.00509	0.00586	0.0196	0.0225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Benzo(a)pyrene	N/A	N/A	ug/L	8	0.00323	0.00372	0.0196	0.0225	7	1	-	0.00714	0.00714	1	13%	No	--
DP Groundwater	SVOCs	Dissolved	Benzo(g,h,i)perylene	N/A	N/A	ug/L	8	0.00500	0.00574	0.0196	0.0225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Benzofluoranthenes, Total	N/A	N/A	ug/L	8	0.0117	0.0134	0.0979	0.113	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Benzoic Acid	N/A	N/A	ug/L	4	0.138	0.151	1.03	1.21	3	1	-	0.317	0.317	1	25%	Yes	--
DP Groundwater	SVOCs	Dissolved	Benzyl Alcohol	N/A	N/A	ug/L	3	0.0439	0.0479	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	Bis(2-chloroethoxy)methane	N/A	N/A	ug/L	8	0.0177	0.0204	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Bis(2-chloroethyl) Ether	N/A	N/A	ug/L	8	0.0317	0.0365	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Bis(2-chloroisopropyl) Ether	N/A	N/A	ug/L	8	0.0420	0.0483	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Bis(2-ethylhexyl) Phthalate	N/A	N/A	ug/L	8	0.373	0.429	1.47	1.69	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Butyl Benzyl Phthalate	N/A	N/A	ug/L	8	0.327	0.338	0.294	0.363	2	6	-	0.108	0.155	6	75%	No	--
DP Groundwater	SVOCs	Dissolved	Carbazole	N/A	N/A	ug/L	8	0.0213	0.0244	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Chrysene	N/A	N/A	ug/L	8	0.00823	0.00946	0.0196	0.0225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Dibenz(a,h)anthracene	N/A	N/A	ug/L	8	0.00304	0.00349	0.0196	0.0225	7	1	-	0.00381	0.00381	1	13%	No	--
DP Groundwater	SVOCs	Dissolved	Dibenzofuran	N/A	N/A	ug/L	8	0.0201	0.0231	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Diethyl Phthalate	N/A	N/A	ug/L	8	0.0546	0.0584	0.196	0.225	5	3	-	0.0585	0.101	3	38%	No	--
DP Groundwater	SVOCs	Dissolved	Dimethyl Phthalate	N/A	N/A	ug/L	8	0.0382	0.0439	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Di-n-butyl Phthalate	N/A	N/A	ug/L	8	0.218	0.275	0.196	0.275	2	6	-	0.124	0.207	6	75%	No	--
DP Groundwater	SVOCs	Dissolved	Di-n-octyl Phthalate	N/A	N/A	ug/L	8	0.0267	0.0307	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Fluoranthene	N/A	N/A	ug/L	8	0.00558	0.00642	0.0196	0.0225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Fluorene	N/A	N/A	ug/L	8	0.00167	0.00191	0.0196	0.0225	3	5	-	0.00654	0.0116	5	63%	No	--
DP Groundwater	SVOCs	Dissolved	Hexachlorobenzene	N/A	N/A	ug/L	8	0.0245	0.0282	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Hexachlorobutadiene	N/A	N/A	ug/L	8	0.0144	0.0166	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Hexachlorocyclopentadiene	N/A	N/A	ug/L	8	0.304	0.349	0.979	1.13	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Hexachloroethane	N/A	N/A	ug/L	8	0.0373	0.0429	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	Indeno(1,2,3-cd)pyrene	N/A	N/A	ug/L	8	0.00274	0.00315	0.0196	0.0225	7	1	-	0.00630	0.00630	1	13%	No	--
DP Groundwater	SVOCs	Dissolved	Isophorone	N/A	N/A	ug/L	8	0.0277	0.0297	0.196	0.225	6	2	-	0.0483	0.0782	2	25%	No	--
DP Groundwater	SVOCs	Dissolved	Naphthalene	N/A	N/A	ug/L	8	0.0190	0.0196	0.0502	0.0605	2	3	3	0.0289	0.200	6	75%	No	--
DP Groundwater	SVOCs	Dissolved	Nitrobenzene	N/A	N/A	ug/L	8	0.0509	0.0586	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	N-Nitrosodimethylamine	N/A	N/A	ug/L	8	0.979	1.13	0.979	1.13	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	N-Nitrosodi-n-propylamine	N/A	N/A	ug/L	8	0.0361	0.0416	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	N-Nitrosodiphenylamine	N/A	N/A	ug/L	8	0.00833	0.00957	0.196	0.225	8	-	-	-	-	0	0%	No	--
DP Groundwater	SVOCs	Dissolved	p-cresol (4-Methylphenol)	N/A	N/A	ug/L	3	0.0455	0.0497	0.413	0.450	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	Pentachlorophenol	N/A	N/A	ug/L	3	0.206	0.225	0.206	0.225	3	-	-	-	-	0	0%	Yes	--
DP Groundwater	SVOCs	Dissolved	Phenanthrene	N/A	N/A	ug/L	8	0.00403	0.00417	0.0196	0.0225	2	6	-	0.00427	0.0190	6	75%	No	--
DP Groundwater	SVOCs	Dissolved	Phenol	N/A	N/A	ug/L	4	0.00483	0.00483	0.196	0.225	1	3	-	0.00999	0.0248	3	75%	Yes	--
DP Groundwater	SVOCs	Dissolved	Pyrene	N/A	N/A	ug/L	8	0.00284	0.00327	0.0196	0.0225	8	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,1,1,2-Tetrachloroethane	N/A	N/A	ug/L	10	0.0528	0.0528	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/L	10	0.0477	0.0477	1.00	1.00	3	6	1	0.0701	2.22	7	70%	No	--
DP Groundwater	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	N/A	ug/L	10	0.0680	0.0680	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,1,2-Trichloroethane	N/A	N/A	ug/L	10	0.0627	0.0627	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/L	10	0.0360	0.0360	1.00	1.00	5	4	1	0.0555	2.52	5	50%	No	--
DP Groundwater	VOCs	Total	1,1-Dichloroethene	N/A	N/A	ug/L	10	0.0595	0.0595	1.00	1.00	8	1	1	0.0624	1.16	2	20%	No	--
DP Groundwater	VOCs	Total	1,1-Dichloropropene	N/A	N/A	ug/L	10	0.0695	0.0695	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2,3-Trichlorobenzene	N/A	N/A	ug/L	10	0.0605	0.0605	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2,3-Trichloropropane	N/A	N/A	ug/L	10	0.123	0.123	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	10	0.0513	1.00	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/L	10	0.0283	0.0283	1.00	1.00	7	3	-	0.0317	0.0485	3	30%	No	--
DP Groundwater	VOCs	Total	1,2-Dibromo-3-chloropropane	N/A	N/A	ug/L	10	0.222	0.222	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	N/A	ug/L	10	0.0637	0.0637	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2-Dichlorobenzene	N/A	N/A	ug/L	10	0.0383	0.0383	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	N/A	ug/L	10	0.0533	0.0533	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,2-Dichloropropane	N/A	N/A	ug/L	10	0.0380	0.0380	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,3,5-Trimethylbenzene	N/A	N/A	ug/L	10	0.0249	0.0249	1.00	1.00	9	1	-	0.0297	0.0297	1	10%	No	--

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(18 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1
DP Groundwater	VOCs	Total	1,3-Dichlorobenzene	N/A	N/A	ug/L	10	0.0599	0.0599	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,3-Dichloropropane	N/A	N/A	ug/L	10	0.0738	0.0738	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/L	10	0.0180	0.0180	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	2,2-Dichloropropane	N/A	N/A	ug/L	10	0.0487	0.0487	1.00	1.00	7	3	-	0.117	0.179	3	30%	No	--
DP Groundwater	VOCs	Total	2-Butanone (MEK)	N/A	N/A	ug/L	10	1.71	1.71	5.00	5.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	2-Chlorotoluene	N/A	N/A	ug/L	10	0.0857	0.0857	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	2-Hexanone	N/A	N/A	ug/L	10	0.993	0.993	5.00	5.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	4-Chlorotoluene	N/A	N/A	ug/L	10	0.0491	0.0491	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	4-Isopropyltoluene	N/A	N/A	ug/L	10	0.0397	0.0397	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	N/A	ug/L	10	0.309	0.309	5.00	5.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Acetone	N/A	N/A	ug/L	10	1.20	1.20	5.00	5.00	7	3	-	1.22	3.88	3	30%	No	--
DP Groundwater	VOCs	Total	Benzene	N/A	N/A	ug/L	10	0.0417	0.0417	1.00	1.00	4	6	-	0.0545	0.137	6	60%	No	--
DP Groundwater	VOCs	Total	Bromobenzene	N/A	N/A	ug/L	10	0.0475	0.0475	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Bromochloromethane	N/A	N/A	ug/L	10	0.0573	0.0573	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Bromodichloromethane	N/A	N/A	ug/L	10	0.0785	0.0785	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Bromoform	N/A	N/A	ug/L	10	0.0830	0.0830	1.00	1.00	9	1	-	0.151	0.151	1	10%	No	--
DP Groundwater	VOCs	Total	Bromomethane	N/A	N/A	ug/L	10	0.0748	1.00	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/L	10	0.0494	1.00	1.00	1.00	9	1	-	0.0619	0.0619	1	10%	No	--
DP Groundwater	VOCs	Total	Carbon Tetrachloride	N/A	N/A	ug/L	10	0.0970	0.0970	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Chlorobenzene	N/A	N/A	ug/L	10	0.0376	0.0376	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Chloroethane	N/A	N/A	ug/L	10	0.187	0.187	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Chloroform	N/A	N/A	ug/L	10	0.0717	0.0717	1.00	1.00	8	2	-	0.0907	0.174	2	20%	No	--
DP Groundwater	VOCs	Total	Chloromethane	N/A	N/A	ug/L	10	0.110	0.110	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/L	10	0.0433	0.0433	1.00	1.00	1	3	6	0.0948	341	9	90%	No	--
DP Groundwater	VOCs	Total	cis-1,3-Dichloropropene	N/A	N/A	ug/L	10	0.0301	0.0301	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Dibromochloromethane	N/A	N/A	ug/L	10	0.0539	0.0539	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Dibromomethane	N/A	N/A	ug/L	10	0.0864	0.0864	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Dichlorodifluoromethane	N/A	N/A	ug/L	10	0.0575	0.0575	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	N/A	ug/L	10	0.0752	1.00	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Ethylbenzene	N/A	N/A	ug/L	10	0.0226	1.00	1.00	1.00	6	4	-	0.0357	0.0447	4	40%	No	--
DP Groundwater	VOCs	Total	Hexachlorobutadiene	N/A	N/A	ug/L	10	0.152	0.152	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/L	10	0.0165	0.0165	1.00	1.00	9	1	-	0.0197	0.0197	1	10%	No	--
DP Groundwater	VOCs	Total	m,p-Xylenes	N/A	N/A	ug/L	10	0.0718	0.0718	2.00	2.00	6	4	-	0.0823	0.132	4	40%	No	--
DP Groundwater	VOCs	Total	Naphthalene	N/A	N/A	ug/L	10	0.0317	1.00	1.00	1.00	8	2	-	0.0359	0.0452	2	20%	No	--
DP Groundwater	VOCs	Total	n-Butylbenzene	N/A	N/A	ug/L	10	0.0603	0.0603	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	n-Propylbenzene	N/A	N/A	ug/L	10	0.0356	0.0356	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	o-Xylene	N/A	N/A	ug/L	10	0.0265	0.0265	1.00	1.00	6	4	-	0.0304	0.0735	4	40%	No	--
DP Groundwater	VOCs	Total	sec-Butylbenzene	N/A	N/A	ug/L	10	0.0358	0.0358	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Styrene	N/A	N/A	ug/L	10	0.0279	0.0279	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	tert-Butylbenzene	N/A	N/A	ug/L	10	0.0535	0.0535	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/L	10	-	-	1.00	1.00	0	3	7	0.336	54.5	10	100%	No	--
DP Groundwater	VOCs	Total	Toluene	N/A	N/A	ug/L	10	0.0588	1.00	1.00	1.00	4	6	-	0.0917	0.299	6	60%	No	--
DP Groundwater	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/L	10	0.0584	0.0584	1.00	1.00	7	1	2	0.0955	1.80	3	30%	No	--
DP Groundwater	VOCs	Total	trans-1,3-Dichloropropene	N/A	N/A	ug/L	10	0.0539	0.0539	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/L	10	0.0641	0.0641	1.00	1.00	1	5	4	0.0904	43.7	9	90%	No	--
DP Groundwater	VOCs	Total	Trichlorofluoromethane	N/A	N/A	ug/L	10	0.0620	0.0620	1.00	1.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Vinyl Acetate	N/A	N/A	ug/L	10	0.320	1.01	5.00	5.00	10	-	-	-	-	0	0%	No	--
DP Groundwater	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/L	10	0.0604	0.0604	1.00	1.00	8	2	-	0.132	0.611	2	20%	No	--

Notes
(1) Only evaluated for analytes with a sample size of 20 or more.
(2) In the absense of MDLs, number of non-detected where the MRL was used in lieu of an MDL.
If all samples were NDs (detection rate=0%), or if there was only one distinct detected result, or if there were four or fewer samples and the data set contained NDs, the mean and standard deviation are not shown.
If there were two or more distinct detected results, but not all samples were detected results (i.e., detection rate = <100%), the mean and standard deviation were estimated by the Kaplan-Meier method.
Minimum and maximum detected values are not shown if all samples were NDs.
Minimum and maximum MDLs for NDs are not shown if all samples had detected results.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.
All concentrations are totals.

'--' = Not evaluated
% = percent
DP = Direct Push
Max = maximum
MDL = method detection limit

Table I-5
Data Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(19 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?1

mg/kg = milligrams per kilogram
Min = minimum
MRL = methode reporting limit
ND = non-detect
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic carbon
VOC = volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter

Table I-6
Data Summary for Reference Area Samples
Bradford Island - Upland Operable Unit
(1 of 3)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Soil	Metals	Total	Aluminum	0-1 ft	mg/kg	14	-	-	-	-	0	-	14	15,900	33,200	14	100%	No	--
Soil	Metals	Total	Antimony	0-1 ft	mg/kg	14	-	-	0.100	0.100	0	1	13	0.0700	0.180	14	100%	No	--
Soil	Metals	Total	Arsenic	0-1 ft	mg/kg	14	-	-	-	-	0	-	14	1.09	5.18	14	100%	No	--
Soil	Metals	Total	Barium	0-1 ft	mg/kg	14	-	-	-	-	0	-	14	57.4	182	14	100%	No	--
Soil	Metals	Total	Beryllium	0-1 ft	mg/kg	14	-	-	-	-	0	-	14	0.319	0.629	14	100%	No	--
Soil	Metals	Total	Cadmium	0-1 ft	mg/kg	14	-	-	-	-	0	-	14	0.0990	0.340	14	100%	No	--
Soil	Metals	Total	Chromium	0-1 ft	mg/kg	14	-	-	-	-	0	-	14	15.5	27.3	14	100%	No	--
Soil	Metals	Total	Cobalt	0-1 ft	mg/kg	14	-	-	-	-	0	-	14	9.66	19.9	14	100%	No	--
Soil	Metals	Total	Copper	0-1 ft	mg/kg	14	-	-	-	-	0	-	14	22.8	58.2	14	100%	No	--
Soil	Metals	Total	Lead	0-1 ft	mg/kg	14	-	-	-	-	0	-	14	12.5	26.5	14	100%	No	--
Soil	Metals	Total	Manganese	0-1 ft	mg/kg	14	-	-	-	-	0	-	14	415	920	14	100%	No	--
Soil	Metals	Total	Mercury	0-1 ft	mg/kg	14	-	-	0.0400	0.0400	0	1	13	0.0340	0.0680	14	100%	No	--
Soil	Metals	Total	Nickel	0-1 ft	mg/kg	14	-	-	-	-	0	-	14	11.5	26.1	14	100%	No	--
Soil	Metals	Total	Selenium	0-1 ft	mg/kg	14	0.400	0.500	2.10	2.30	14	-	-	-	-	0	0%	No	--
Soil	Metals	Total	Silver	0-1 ft	mg/kg	14	0.0220	0.0230	0.0610	0.0900	2	8	4	0.0270	0.187	12	86%	No	--
Soil	Metals	Total	Thallium	0-1 ft	mg/kg	14	0.0420	0.103	0.0420	0.103	6	-	8	0.128	0.203	8	57%	No	--
Soil	Metals	Total	Vanadium	0-1 ft	mg/kg	14	-	-	-	-	0	-	14	43.0	99.3	14	100%	No	--
Soil	Metals	Total	Zinc	0-1 ft	mg/kg	14	-	-	-	-	0	-	14	45.6	68.5	14	100%	No	--
Soil	SVOCs	Total	Acenaphthene	0-1 ft	ug/kg	14	1.00	1.00	9.90	15.0	5	9	-	1.20	3.40	9	64%	No	--
Soil	SVOCs	Total	Acenaphthylene	0-1 ft	ug/kg	14	1.40	1.40	9.90	10.0	13	1	-	1.60	1.60	1	7%	No	--
Soil	SVOCs	Total	Anthracene	0-1 ft	ug/kg	14	1.40	1.40	9.90	15.0	2	12	-	1.50	4.90	12	86%	No	--
Soil	SVOCs	Total	Fluorene	0-1 ft	ug/kg	14	1.70	1.70	9.90	10.0	13	1	-	3.20	3.20	1	7%	No	--
Soil	SVOCs	Total	Naphthalene	0-1 ft	ug/kg	14	1.30	1.30	9.90	10.0	8	6	-	1.30	2.20	6	43%	No	--
Soil	SVOCs	Total	Phenanthrene	0-1 ft	ug/kg	14	-	-	9.90	10.0	0	6	8	5.50	34.0	14	100%	No	--
Soil	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	14	-	-	-	-	-	-	-	12.30	49.3	14	100%	No	--
Soil	SVOCs	Total	Benzo(a)anthracene	0-1 ft	ug/kg	14	-	-	9.90	10.0	0	4	10	4.60	34.0	14	100%	No	--
Soil	SVOCs	Total	Benzo(a)pyrene	0-1 ft	ug/kg	14	-	-	9.90	10.0	0	2	12	7.70	45.0	14	100%	No	--
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	ug/kg	14	-	-	10.0	10.0	0	1	13	9.10	55.0	14	100%	No	--
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	ug/kg	14	-	-	9.90	10.0	0	4	10	5.80	32.0	14	100%	No	--
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	ug/kg	14	-	-	9.90	15.0	0	13	1	2.70	19.0	14	100%	No	--
Soil	SVOCs	Total	Chrysene	0-1 ft	ug/kg	14	-	-	9.90	10.0	0	2	12	6.40	45.0	14	100%	No	--
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	ug/kg	14	2.20	2.20	9.90	10.0	7	7	-	2.70	6.90	7	50%	No	--
Soil	SVOCs	Total	Fluoranthene	0-1 ft	ug/kg	14	-	-	-	-	0	-	14	10.0	66.0	14	100%	No	--
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	ug/kg	14	-	-	9.90	10.0	0	4	10	5.20	34.0	14	100%	No	--
Soil	SVOCs	Total	Pyrene	0-1 ft	ug/kg	14	-	-	-	-	0	-	14	10.0	64.0	14	100%	No	--
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	14	-	-	-	-	-	-	-	64.5	401	14	100%	No	--
Groundwater	Metals	Total	Aluminum	N/A	ug/L	4	-	-	-	-	0	-	4	6.45	210	4	100%	Yes	--
Groundwater	Metals	Total	Antimony	N/A	ug/L	4	-	-	0.0500	0.0900	0	3	1	0.0250	0.0800	4	100%	Yes	--
Groundwater	Metals	Total	Arsenic	N/A	ug/L	4	1.32	1.32	1.32	1.32	1	-	3	1.22	1.68	3	75%	Yes	--
Groundwater	Metals	Total	Barium	N/A	ug/L	4	-	-	-	-	0	-	4	17.2	26.5	4	100%	Yes	--
Groundwater	Metals	Total	Beryllium	N/A	ug/L	4	0.0200	0.0200	0.0200	0.0200	3	1	-	0.0100	0.0100	1	25%	Yes	--
Groundwater	Metals	Total	Cadmium	N/A	ug/L	4	0.00500	0.0570	0.0200	0.0570	3	-	1	0.0490	0.0490	1	25%	Yes	--
Groundwater	Metals	Total	Calcium	N/A	ug/L	4	-	-	-	-	0	-	4	29,200	31,000	4	100%	Yes	--
Groundwater	Metals	Total	Chromium	N/A	ug/L	4	0.570	0.570	0.200	0.570	1	1	2	0.145	3.98	3	75%	Yes	--
Groundwater	Metals	Total	Cobalt	N/A	ug/L	4	-	-	-	-	0	-	4	0.0710	0.323	4	100%	Yes	--
Groundwater	Metals	Total	Copper	N/A	ug/L	4	0.670	0.670	0.670	0.670	1	-	3	0.125	1.12	3	75%	Yes	--
Groundwater	Metals	Total	Iron	N/A	ug/L	4	37.0	434	37.0	434	2	-	2	116	451	2	50%	Yes	--
Groundwater	Metals	Total	Lead	N/A	ug/L	4	0.363	0.363	0.363	0.363	1	-	3	0.102	0.248	3	75%	Yes	--
Groundwater	Metals	Total	Magnesium	N/A	ug/L	4	-	-	-	-	0	-	4	7,620	8,320	4	100%	Yes	--
Groundwater	Metals	Total	Manganese	N/A	ug/L	4	-	-	-	-	0	-	4	204	258	4	100%	Yes	--
Groundwater	Metals	Total	Mercury	N/A	ug/L	4	0.0300	0.0500	0.200	0.200	4	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Total	Nickel	N/A	ug/L	4	0.500	0.500	20.0	20.0	1	-	3	0.570	6.62	3	75%	Yes	--
Groundwater	Metals	Total	Potassium	N/A	ug/L	4	-	-	-	-	0	-	4	4,700	4,960	4	100%	Yes	--
Groundwater	Metals	Total	Selenium	N/A	ug/L	4	0.400	0.500	1.00	1.20	4	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Total	Silver	N/A	ug/L	4	0.00900	0.0660	0.0200	0.0660	3	1	-	0.00900	0.00900	1	25%	Yes	--

Table I-6
Data Summary for Reference Area Samples
Bradford Island - Upland Operable Unit
(2 of 3)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]
Groundwater	Metals	Total	Sodium	N/A	ug/L	4	-	-	-	-	0	-	4	4,940	5,620	4	100%	Yes	--
Groundwater	Metals	Total	Thallium	N/A	ug/L	4	0.00500	0.00800	0.0200	0.0200	4	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Total	Vanadium	N/A	ug/L	4	0.0700	0.0700	0.200	10.0	1	2	1	0.175	1.55	3	75%	Yes	--
Groundwater	Metals	Total	Zinc	N/A	ug/L	4	-	-	10.0	21.0	0	2	2	1.75	8.28	4	100%	Yes	--
Groundwater	Metals	Dissolved	Aluminum	N/A	ug/L	4	-	-	-	-	0	-	4	2.00	2.60	4	100%	Yes	--
Groundwater	Metals	Dissolved	Antimony	N/A	ug/L	4	0.0100	0.0100	0.0500	0.0900	2	1	1	0.0140	0.0500	2	50%	Yes	--
Groundwater	Metals	Dissolved	Arsenic	N/A	ug/L	4	-	-	-	-	0	-	4	1.13	1.55	4	100%	Yes	--
Groundwater	Metals	Dissolved	Barium	N/A	ug/L	4	-	-	-	-	0	-	4	15.2	22.8	4	100%	Yes	--
Groundwater	Metals	Dissolved	Beryllium	N/A	ug/L	4	0.00800	0.0200	0.0200	0.0200	4	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Cadmium	N/A	ug/L	4	0.00500	0.0200	0.0200	0.0200	2	-	2	0.0310	0.0425	2	50%	Yes	--
Groundwater	Metals	Dissolved	Calcium	N/A	ug/L	4	-	-	-	-	0	-	4	29,000	30,100	4	100%	Yes	--
Groundwater	Metals	Dissolved	Chromium	N/A	ug/L	4	-	-	0.200	0.200	0	3	1	0.0600	0.290	4	100%	Yes	--
Groundwater	Metals	Dissolved	Cobalt	N/A	ug/L	4	0.0790	0.0790	0.0790	0.0790	1	-	3	0.0630	0.139	3	75%	Yes	--
Groundwater	Metals	Dissolved	Copper	N/A	ug/L	4	0.300	0.300	0.100	0.300	1	2	1	0.0800	0.315	3	75%	Yes	--
Groundwater	Metals	Dissolved	Iron	N/A	ug/L	4	20.0	20.0	20.0	20.0	1	2	1	9.80	24.8	3	75%	Yes	--
Groundwater	Metals	Dissolved	Lead	N/A	ug/L	4	0.0300	0.0680	0.0300	0.0680	2	2	-	0.00600	0.0220	2	50%	Yes	--
Groundwater	Metals	Dissolved	Magnesium	N/A	ug/L	4	-	-	-	-	0	-	4	7,360	8,080	4	100%	Yes	--
Groundwater	Metals	Dissolved	Manganese	N/A	ug/L	4	-	-	-	-	0	-	4	187	228	4	100%	Yes	--
Groundwater	Metals	Dissolved	Mercury	N/A	ug/L	4	0.0300	0.0500	0.200	0.200	4	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Nickel	N/A	ug/L	4	0.500	0.500	20.0	20.0	1	-	3	0.660	1.41	3	75%	Yes	--
Groundwater	Metals	Dissolved	Potassium	N/A	ug/L	4	-	-	-	-	0	-	4	4,710	4,880	4	100%	Yes	--
Groundwater	Metals	Dissolved	Selenium	N/A	ug/L	4	0.400	0.500	1.00	1.20	4	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Silver	N/A	ug/L	4	0.00900	0.00900	0.0200	0.0300	3	-	1	0.117	0.117	1	25%	Yes	--
Groundwater	Metals	Dissolved	Sodium	N/A	ug/L	4	5,440	5,440	5,440	5,440	1	-	3	4,820	4,980	3	75%	Yes	--
Groundwater	Metals	Dissolved	Thallium	N/A	ug/L	4	0.00500	0.00800	0.0200	0.0200	4	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Vanadium	N/A	ug/L	4	0.0700	0.800	0.200	10.0	4	-	-	-	-	0	0%	Yes	--
Groundwater	Metals	Dissolved	Zinc	N/A	ug/L	4	10.0	10.0	10.0	21.0	1	1	2	1.15	3.14	3	75%	Yes	--
Groundwater	Butyltins	Total	Dibutyltin	N/A	ug/L	1	0.00810	0.00810	0.0500	0.0500	1	-	-	-	-	0	0%	Yes	--
Groundwater	Butyltins	Total	Monobutyltin	N/A	ug/L	1	-	-	0.0500	0.0500	0	1	-	0.0345	0.0345	1	100%	Yes	--
Groundwater	NWTPH-Dx	Total	Diesel Range Organics	N/A	ug/L	1	14.0	14.0	130	130	1	-	-	-	-	0	0%	Yes	--
Groundwater	NWTPH-Dx	Total	Residual Range Organics	N/A	ug/L	1	24.0	24.0	130	130	1	-	-	-	-	0	0%	Yes	--
Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	ug/L	1	13.0	13.0	250	250	1	-	-	-	-	0	0%	Yes	--
Groundwater	SVOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	1	0.0330	0.0330	0.230	0.230	1	-	-	-	-	0	0%	Yes	--
Groundwater	SVOCs	Total	4-Nitrophenol	N/A	ug/L	1	0.320	0.320	2.30	2.30	1	-	-	-	-	0	0%	Yes	--
Groundwater	SVOCs	Total	Benzo(b)fluoranthene	N/A	ug/L	1	-	-	0.230	0.230	0	1	-	0.0250	0.0250	1	100%	Yes	--
Groundwater	SVOCs	Total	Benzo(k)fluoranthene	N/A	ug/L	1	0.0270	0.0270	0.230	0.230	1	-	-	-	-	0	0%	Yes	--
Groundwater	SVOCs	Total	Phenanthrene	N/A	ug/L	1	0.0250	0.0250	0.230	0.230	1	-	-	-	-	0	0%	Yes	--
Groundwater	SVOCs	Total	Phenol	N/A	ug/L	1	0.0700	0.0700	0.560	0.560	1	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Chloroform	N/A	ug/L	1	0.0820	0.0820	0.500	0.500	1	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	1	0.0970	0.0970	0.500	0.500	1	-	-	-	-	0	0%	Yes	--
Groundwater	VOCs	Total	Vinyl Chloride	N/A	ug/L	1	0.0440	0.0440	0.500	0.500	1	-	-	-	-	0	0%	Yes	--

Notes
(1) Only evaluated for analytes with a sample size of 20 or more.
If all samples were NDs (detection rate=0%), or if there was only one distinct detected result, or if there were four or fewer samples and the data set contained NDs, the mean and standard deviation are not shown.
If there were two or more distinct detected results, but not all samples were detected results (i.e., detection rate = <100%), the mean and standard deviation were estimated by the Kaplan-Meier method.
Minimum and maximum detected values are not shown if all samples were NDs.
Minimum and maximum MDLs for NDs are not shown if all samples had detected results.
For some (older) historial data, the MDLs were not available. In these cases, MRLs were used.
All concentrations are totals.

'--' = Not evaluated
% = percent
Max = maximum
MDL = method detection limit

Table I-6
Data Summary for Reference Area Samples
Bradford Island - Upland Operable Unit
(3 of 3)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Number of Detections Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)	Detection Rate > 5%?[1]

mg/kg = milligrams per kilogram
mg/L = milligrams per liter
Min = minimum
MRL = methode reporting limit
ND = non-detect
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
SVOC = semi-volatile organic carbon
VOC = volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter

Table I-7
Data Summary for Pre-Sediment Removal Forebay Samples
Bradford Island - River Operable Unit
(1 of 3)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Sediment	Metals	Total	Aluminum	mg/kg	Dry	5	-	-	-	-	0	-	5	8,830	13,950	5	100%	Yes
Sediment	Metals	Total	Antimony	mg/kg	Dry	5	-	-	-	-	0	-	5	0.0500	0.170	5	100%	Yes
Sediment	Metals	Total	Arsenic	mg/kg	Dry	5	-	-	-	-	0	-	5	2.00	5.68	5	100%	Yes
Sediment	Metals	Total	Barium	mg/kg	Dry	5	-	-	-	-	0	-	5	89.8	149	5	100%	Yes
Sediment	Metals	Total	Beryllium	mg/kg	Dry	5	-	-	-	-	0	-	5	0.280	0.358	5	100%	Yes
Sediment	Metals	Total	Cadmium	mg/kg	Dry	5	-	-	-	-	0	-	5	0.265	0.608	5	100%	Yes
Sediment	Metals	Total	Chromium	mg/kg	Dry	5	-	-	-	-	0	-	5	14.8	22.1	5	100%	Yes
Sediment	Metals	Total	Cobalt	mg/kg	Dry	5	-	-	-	-	0	-	5	5.87	10.4	5	100%	Yes
Sediment	Metals	Total	Copper	mg/kg	Dry	5	-	-	-	-	0	-	5	15.3	38.9	5	100%	Yes
Sediment	Metals	Total	Lead	mg/kg	Dry	5	-	-	-	-	0	-	5	7.27	18.4	5	100%	Yes
Sediment	Metals	Total	Mercury	mg/kg	Dry	5	-	-	-	-	0	-	5	0.0620	0.366	5	100%	Yes
Sediment	Metals	Total	Nickel	mg/kg	Dry	5	-	-	-	-	0	-	5	9.92	15.9	5	100%	Yes
Sediment	Metals	Total	Thallium	mg/kg	Dry	5	-	-	-	-	0	-	5	0.112	0.171	5	100%	Yes
Sediment	Metals	Total	Vanadium	mg/kg	Dry	5	-	-	-	-	0	-	5	34.6	58.6	5	100%	Yes
Sediment	Metals	Total	Zinc	mg/kg	Dry	5	-	-	-	-	0	-	5	46.0	108	5	100%	Yes
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	5	-	-	31.0	44.0	0	4	1	8.80	35.0	5	100%	Yes
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	5	-	-	130	180	0	5	-	63.5	120	5	100%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	5	2.60	5.80	7.60	17.0	5	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	5	2.60	5.80	16.0	34.0	5	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	5	2.60	5.80	7.60	17.0	5	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	5	2.60	5.80	7.60	17.0	5	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	5	2.60	5.80	7.60	17.0	5	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	5	5.80	5.80	17.0	17.0	1	-	4	13.0	130	4	80%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	5	2.60	5.80	7.60	17.0	5	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1262	ug/kg	Dry	5	2.60	5.80	7.60	17.0	5	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1268	ug/kg	Dry	5	2.60	5.80	7.60	17.0	5	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Dry	5	-	-	-	-	-	-	-	15.8	133	4	80%	Yes
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	5	7.00	7.00	77.0	170	1	3	1	15.5	180	4	80%	Yes
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	5	3.20	3.20	7.70	17.0	4	1	-	10.0	10.0	1	20%	Yes
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	5	1.30	1.30	7.70	17.0	4	1	-	2.60	2.60	1	20%	Yes
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	5	-	-	16.0	34.0	0	5	-	9.10	24.0	5	100%	Yes
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	5	1.70	2.90	7.70	85.0	5	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	5	2.90	4.70	8.40	17.0	3	1	1	4.40	4,100	2	40%	Yes
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	5	1.40	2.40	7.70	17.0	5	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	5	1.40	14.0	8.40	78.0	4	1	-	4.30	4.30	1	20%	Yes
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	5	1.10	1.90	7.70	17.0	5	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	5	-	-	8.10	17.0	0	4	1	2.90	9.10	5	100%	Yes
Sediment	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	ug/kg	Dry	5	-	-	-	-	-	-	-	8.40	19.8	5	100%	Yes
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	5	-	-	7.70	17.0	0	5	-	3.05	5.70	5	100%	Yes
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	5	2.60	16.0	8.40	78.0	2	2	1	6.10	32.0	3	60%	Yes
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	5	-	-	8.10	17.0	0	4	1	4.20	11.0	5	100%	Yes
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	5	-	-	7.70	17.0	0	5	-	3.70	5.40	5	100%	Yes
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	5	-	-	7.70	17.0	0	5	-	2.30	3.40	5	100%	Yes
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	5	-	-	8.10	17.0	0	4	1	4.10	7.90	5	100%	Yes
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	5	1.50	1.50	7.70	17.0	3	2	-	2.50	3.10	2	40%	Yes
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	5	-	-	8.20	17.0	0	3	2	4.40	13.0	5	100%	Yes
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	5	-	-	7.70	17.0	0	5	-	3.90	13.0	5	100%	Yes
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	5	-	-	8.10	17.0	0	4	1	4.50	13.0	5	100%	Yes

Table I-7
Data Summary for Pre-Sediment Removal Forebay Samples
Bradford Island - River Operable Unit
(2 of 3)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Sediment	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	ug/kg	Dry	5	-	-	-	-	-	-	-	46.4	99.0	5	100%	Yes
Sediment	SVOCs	Total	Total PAHs (KM, capped; NDs at MDL)	ug/kg	Dry	5	-	-	-	-	-	-	-	53.8	114	5	100%	Yes
Clam	Metals	Total	Aluminum	mg/kg	Wet	4	-	-	-	-	0	-	4	151	196	4	100%	Yes
Clam	Metals	Total	Antimony	mg/kg	Wet	4	0.00500	0.00500	0.0120	0.0130	4	-	-	-	-	0	0%	Yes
Clam	Metals	Total	Arsenic	mg/kg	Wet	4	-	-	-	-	0	-	4	2.56	3.13	4	100%	Yes
Clam	Metals	Total	Barium	mg/kg	Wet	4	-	-	-	-	0	-	4	2.07	2.68	4	100%	Yes
Clam	Metals	Total	Beryllium	mg/kg	Wet	4	-	-	0.0049	0.005	0	2	2	0.00360	0.00565	4	100%	Yes
Clam	Metals	Total	Cadmium	mg/kg	Wet	4	-	-	-	-	0	-	4	0.340	0.454	4	100%	Yes
Clam	Metals	Total	Chromium	mg/kg	Wet	4	-	-	-	-	0	-	4	0.600	1.20	4	100%	Yes
Clam	Metals	Total	Cobalt	mg/kg	Wet	4	-	-	-	-	0	-	4	0.121	0.172	4	100%	Yes
Clam	Metals	Total	Copper	mg/kg	Wet	4	-	-	-	-	0	-	4	10.1	13.5	4	100%	Yes
Clam	Metals	Total	Lead	mg/kg	Wet	4	-	-	-	-	0	-	4	0.101	0.184	4	100%	Yes
Clam	Metals	Total	Mercury	mg/kg	Wet	4	-	-	-	-	0	-	4	0.0101	0.0132	4	100%	Yes
Clam	Metals	Total	Nickel	mg/kg	Wet	4	-	-	-	-	0	-	4	0.275	0.394	4	100%	Yes
Clam	Metals	Total	Thallium	mg/kg	Wet	4	-	-	-	-	0	-	4	0.0155	0.0193	4	100%	Yes
Clam	Metals	Total	Vanadium	mg/kg	Wet	4	-	-	-	-	0	-	4	0.391	0.540	4	100%	Yes
Clam	Metals	Total	Zinc	mg/kg	Wet	4	-	-	-	-	0	-	4	23.7	28.2	4	100%	Yes
Clam	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	4	2.40	4.70	9.80	20.0	4	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	4	2.60	5.10	20.0	40.0	4	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	4	2.30	4.50	9.80	20.0	4	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	4	2.20	4.40	9.80	20.0	4	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	4	0.510	1.00	9.80	20.0	4	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	4	-	-	-	-	0	-	4	120	355	4	100%	Yes
Clam	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	4	1.90	3.80	9.80	20.0	4	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	4	2.00	4.00	9.80	20.0	4	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Wet	4	-	-	-	-	-	-	-	120	355	4	100%	Yes
Clam	SVOCs	Total	Acenaphthene	ug/kg	Wet	3	-	-	0.490	0.500	0	3	-	0.225	0.250	3	100%	Yes
Clam	SVOCs	Total	Anthracene	ug/kg	Wet	3	-	-	-	-	0	-	3	0.945	1.10	3	100%	Yes
Clam	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	3	-	-	-	-	0	-	3	0.600	1.03	3	100%	Yes
Clam	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	3	0.0810	0.0810	0.490	0.500	3	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	3	0.0700	0.0700	0.490	0.500	3	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	3	0.0730	0.0730	0.490	0.500	3	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	3	0.0560	0.0560	0.490	0.500	3	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	3	66.0	66.0	170	200	3	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	3	7.30	7.30	34.0	40.0	3	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Carbazole	ug/kg	Wet	3	9.10	9.10	34.0	40.0	3	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Chrysene	ug/kg	Wet	3	-	-	-	-	0	-	3	2.10	2.55	3	100%	Yes
Clam	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	3	0.0590	0.0590	0.490	0.500	3	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	3	16.0	16.0	34.0	34.0	1	-	2	59.0	71.0	2	67%	Yes
Clam	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	3	11.0	11.0	34.0	40.0	3	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Fluoranthene	ug/kg	Wet	3	-	-	-	-	0	-	3	12.0	12.5	3	100%	Yes
Clam	SVOCs	Total	Fluorene	ug/kg	Wet	3	-	-	-	-	0	-	3	1.30	1.30	3	100%	Yes
Clam	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	3	0.0640	0.0640	0.490	0.500	3	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	3	7.70	7.70	34.0	40.0	3	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Phenanthrene	ug/kg	Wet	3	-	-	-	-	0	-	3	6.60	7.00	3	100%	Yes
Clam	SVOCs	Total	Pyrene	ug/kg	Wet	3	-	-	-	-	0	-	3	2.70	2.80	3	100%	Yes

Notes

Table I-7
Data Summary for Pre-Sediment Removal Forebay Samples
Bradford Island - River Operable Unit
(3 of 3)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)

% = percent
Dry = Dry weight
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
Max = maximum
MDL = method detection limit
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
Min = minimum
MRL = method reporting limit
ND = non-detect
No. = number
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
Wet = Wet Weight

Table I-8a
Data Summary for Random Forebay Samples
Bradford Island - River Operable Unit
(1 of 7)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Surface Water	Metals	Dissolved	Aluminum	ug/L	Wet	5	20.0	50.0	50.0	50.0	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Dissolved	Antimony	ug/L	Wet	5	7.00	50.0	50.0	50.0	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Dissolved	Arsenic	ug/L	Wet	5	-	-	-	-	0	-	5	0.720	0.940	5	100%	Yes
Surface Water	Metals	Dissolved	Barium	ug/L	Wet	5	-	-	-	-	0	-	5	21.0	24.0	5	100%	Yes
Surface Water	Metals	Dissolved	Beryllium	ug/L	Wet	5	0.0200	0.0200	0.0200	0.0200	3	2	-	0.00300	0.00400	2	40%	Yes
Surface Water	Metals	Dissolved	Cadmium	ug/L	Wet	5	0.00700	0.00800	0.0200	0.0200	3	2	-	0.00800	0.0100	2	40%	Yes
Surface Water	Metals	Dissolved	Chromium	ug/L	Wet	5	2.00	2.00	5.00	5.00	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Dissolved	Cobalt	ug/L	Wet	5	2.00	2.00	10.0	10.0	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Dissolved	Copper	ug/L	Wet	5	-	-	-	-	0	-	5	0.440	0.520	5	100%	Yes
Surface Water	Metals	Dissolved	Lead	ug/L	Wet	5	0.00300	0.00900	0.0200	0.0200	2	1	2	0.0140	0.0360	3	60%	Yes
Surface Water	Metals	Dissolved	Mercury	ug/L	Wet	5	0.0300	0.0300	0.200	0.200	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Dissolved	Nickel	ug/L	Wet	5	2.00	2.00	20.0	20.0	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Dissolved	Thallium	ug/L	Wet	5	-	-	-	-	0	-	5	0.0230	0.0310	5	100%	Yes
Surface Water	Metals	Dissolved	Vanadium	ug/L	Wet	5	5.00	5.00	10.0	10.0	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Dissolved	Zinc	ug/L	Wet	5	7.00	7.00	10.0	10.0	4	1	-	7.50	7.50	1	20%	Yes
Surface Water	Metals	Total	Aluminum	ug/L	Wet	5	145	152	145	152	2	-	3	91.0	141	3	60%	Yes
Surface Water	Metals	Total	Antimony	ug/L	Wet	5	7.00	50.0	50.0	50.0	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Total	Arsenic	ug/L	Wet	5	-	-	-	-	0	-	5	0.810	1.01	5	100%	Yes
Surface Water	Metals	Total	Barium	ug/L	Wet	5	-	-	-	-	0	-	5	22.0	27.0	5	100%	Yes
Surface Water	Metals	Total	Beryllium	ug/L	Wet	5	0.0200	0.0200	0.0200	0.0200	3	2	-	0.00300	0.00900	2	40%	Yes
Surface Water	Metals	Total	Cadmium	ug/L	Wet	5	-	-	0.0200	0.0200	0	5	-	0.00900	0.0190	5	100%	Yes
Surface Water	Metals	Total	Chromium	ug/L	Wet	5	2.00	2.00	5.00	5.00	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Total	Cobalt	ug/L	Wet	5	2.00	2.00	10.0	10.0	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Total	Copper	ug/L	Wet	5	-	-	-	-	0	-	5	0.670	0.790	5	100%	Yes
Surface Water	Metals	Total	Lead	ug/L	Wet	5	-	-	-	-	0	-	5	0.0790	0.175	5	100%	Yes
Surface Water	Metals	Total	Mercury	ug/L	Wet	5	0.0300	0.0300	0.200	0.200	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Total	Nickel	ug/L	Wet	5	2.00	2.00	20.0	20.0	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Total	Thallium	ug/L	Wet	5	-	-	-	-	0	-	5	0.0260	0.0330	5	100%	Yes
Surface Water	Metals	Total	Vanadium	ug/L	Wet	5	5.00	5.00	10.0	10.0	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Total	Zinc	ug/L	Wet	5	7.00	7.00	10.0	10.0	5	-	-	-	-	0	0%	Yes
Surface Water	NWTPH-Dx	Dissolved	Diesel Range Organics	ug/L	Wet	5	-	-	100	120	0	5	-	14.0	46.0	5	100%	Yes
Surface Water	NWTPH-Dx	Dissolved	Residual Range Organics	ug/L	Wet	5	19.0	120	100	120	5	-	-	-	-	0	0%	Yes
Surface Water	NWTPH-Dx	Total	Diesel Range Organics	ug/L	Wet	5	11.0	11.0	100	120	3	2	-	15.0	15.0	2	40%	Yes
Surface Water	NWTPH-Dx	Total	Residual Range Organics	ug/L	Wet	5	19.0	120	100	120	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Acenaphthene	ng/L	Wet	5	-	-	-	-	0	-	5	0.706	1.26	5	100%	Yes
Surface Water	SVOCs	Filter	Acenaphthene	ng/L	Wet	5	0.0150	0.0329	0.0150	0.0329	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Acenaphthene	ng/L	Wet	5	-	-	-	-	-	-	-	0.739	1.28	5	100%	Yes
Surface Water	SVOCs	Column	Anthracene	ng/L	Wet	5	0.0569	0.103	0.0569	0.103	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Anthracene	ng/L	Wet	5	-	-	-	-	0	-	5	0.0181	0.0317	5	100%	Yes
Surface Water	SVOCs	C+F	Anthracene	ng/L	Wet	5	-	-	-	-	-	-	-	0.0857	0.121	5	100%	Yes
Surface Water	SVOCs	Column	Benzo(a)anthracene	ng/L	Wet	5	0.00830	0.0116	0.0116	0.0116	2	-	3	0.00830	0.0152	3	60%	Yes
Surface Water	SVOCs	Filter	Benzo(a)anthracene	ng/L	Wet	5	0.0288	0.0519	0.0288	0.0519	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Benzo(a)anthracene	ng/L	Wet	5	0.0371	0.0635	0.0371	0.0635	-	-	-	0.0451	0.0600	3	60%	Yes
Surface Water	SVOCs	Column	Benzo(a)pyrene	ng/L	Wet	5	0.0131	0.0269	0.0131	0.0269	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Benzo(a)pyrene	ng/L	Wet	5	0.0221	0.0582	0.0221	0.0582	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Benzo(a)pyrene	ng/L	Wet	5	0.0385	0.0726	0.0385	0.0726	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Benzo(b)fluoranthene	ng/L	Wet	5	0.00920	0.0182	0.0107	0.0182	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Benzo(b)fluoranthene	ng/L	Wet	5	0.0333	0.0774	0.0333	0.0422	3	-	2	0.0713	0.0825	2	40%	Yes
Surface Water	SVOCs	C+F	Benzo(b)fluoranthene	ng/L	Wet	5	0.0440	0.0956	0.0440	0.0956	-	-	-	0.0886	0.0917	2	40%	Yes
Surface Water	SVOCs	Column	Benzo(g,h,i)perylene	ng/L	Wet	5	0.00980	0.0195	0.00980	0.0195	5	-	-	-	-	0	0%	Yes

Table I-8a
Data Summary for Random Forebay Samples
Bradford Island - River Operable Unit
(2 of 7)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Surface Water	SVOCs	Filter	Benzo(g,h,i)perylene	ng/L	Wet	5	0.0241	0.0523	0.0241	0.0523	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Benzo(g,h,i)perylene	ng/L	Wet	5	0.0380	0.0605	0.0380	0.0605	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Benzo(j,k)flouranthenes	ng/L	Wet	5	0.0100	0.0208	0.0100	0.0208	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Benzo(j,k)flouranthenes	ng/L	Wet	5	0.0318	0.0497	0.0318	0.0497	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Benzo(j,k)flouranthenes	ng/L	Wet	5	0.0433	0.0705	0.0433	0.0705	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Bis(2-ethylhexyl) Phthalate	ng/L	Wet	5	6.52	11.8	6.52	11.8	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Bis(2-ethylhexyl) Phthalate	ng/L	Wet	5	3.41	4.63	3.41	4.63	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Bis(2-ethylhexyl) Phthalate	ng/L	Wet	5	9.93	16.3	9.93	16.3	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Butyl Benzyl Phthalate	ng/L	Wet	5	0.260	2.29	0.260	2.29	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Butyl Benzyl Phthalate	ng/L	Wet	5	0.150	0.198	0.150	0.198	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Butyl Benzyl Phthalate	ng/L	Wet	5	0.423	2.45	0.423	2.45	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Chrysene	ng/L	Wet	5	-	-	-	-	0	-	5	0.0385	0.0514	5	100%	Yes
Surface Water	SVOCs	Filter	Chrysene	ng/L	Wet	5	0.0626	0.0844	0.0626	0.0844	3	-	2	0.113	0.125	2	40%	Yes
Surface Water	SVOCs	C+F	Chrysene	ng/L	Wet	5	-	-	-	-	-	-	-	0.101	0.171	5	100%	Yes
Surface Water	SVOCs	Column	Dibenz(a,h)anthracene	ng/L	Wet	5	0.0107	0.0212	0.0107	0.0212	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Dibenz(a,h)anthracene	ng/L	Wet	5	0.0187	0.0395	0.0187	0.0395	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Dibenz(a,h)anthracene	ng/L	Wet	5	0.0347	0.0537	0.0347	0.0537	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Di-n-butyl Phthalate	ng/L	Wet	5	0.562	1.97	0.562	1.97	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Di-n-butyl Phthalate	ng/L	Wet	5	0.200	0.303	0.200	0.303	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Di-n-butyl Phthalate	ng/L	Wet	5	0.774	2.24	0.762	2.24	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Di-n-octyl Phthalate	ng/L	Wet	5	0.110	0.852	0.110	0.852	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Di-n-octyl Phthalate	ng/L	Wet	5	0.0960	0.249	0.0960	0.249	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Di-n-octyl Phthalate	ng/L	Wet	5	0.249	1.01	0.249	1.01	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Fluoranthene	ng/L	Wet	5	0.516	0.572	0.516	0.572	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Fluoranthene	ng/L	Wet	5	-	-	-	-	0	-	5	0.112	0.212	5	100%	Yes
Surface Water	SVOCs	C+F	Fluoranthene	ng/L	Wet	5	-	-	-	-	-	-	-	0.658	0.784	5	100%	Yes
Surface Water	SVOCs	Column	Indeno(1,2,3-cd)pyrene	ng/L	Wet	5	0.0101	0.0202	0.0101	0.0202	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Indeno(1,2,3-cd)pyrene	ng/L	Wet	5	0.0293	0.0459	0.0293	0.0459	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Indeno(1,2,3-cd)pyrene	ng/L	Wet	5	0.0456	0.0586	0.0456	0.0586	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Phenanthrene	ng/L	Wet	5	-	-	-	-	0	-	5	1.27	1.50	5	100%	Yes
Surface Water	SVOCs	Filter	Phenanthrene	ng/L	Wet	5	0.0660	0.107	0.0660	0.107	4	-	1	0.188	0.188	1	20%	Yes
Surface Water	SVOCs	C+F	Phenanthrene	ng/L	Wet	5	-	-	-	-	-	-	-	1.35	1.61	5	100%	Yes
Sediment	Metals	Total	Aluminum	mg/kg	Dry	19	-	-	-	-	0	-	19	9,000	22,900	19	100%	No
Sediment	Metals	Total	Antimony	mg/kg	Dry	19	0.0400	0.0400	0.0600	0.0600	1	2	16	0.0400	0.280	18	95%	No
Sediment	Metals	Total	Arsenic	mg/kg	Dry	19	-	-	-	-	0	-	19	1.40	5.39	19	100%	No
Sediment	Metals	Total	Barium	mg/kg	Dry	19	-	-	-	-	0	-	19	53.1	202	19	100%	No
Sediment	Metals	Total	Beryllium	mg/kg	Dry	19	-	-	-	-	0	-	19	0.215	0.597	19	100%	No
Sediment	Metals	Total	Cadmium	mg/kg	Dry	19	0.115	0.121	0.115	0.121	2	-	17	0.175	0.719	17	89%	No
Sediment	Metals	Total	Chromium	mg/kg	Dry	19	-	-	-	-	0	-	19	10.1	33.5	19	100%	No
Sediment	Metals	Total	Cobalt	mg/kg	Dry	19	-	-	-	-	0	-	19	4.82	15.1	19	100%	No
Sediment	Metals	Total	Copper	mg/kg	Dry	19	-	-	-	-	0	-	19	11.3	33.1	19	100%	No
Sediment	Metals	Total	Lead	mg/kg	Dry	19	-	-	-	-	0	-	19	3.30	16.8	19	100%	No
Sediment	Metals	Total	Mercury	mg/kg	Dry	19	-	-	0.02	0.02	0	1	18	0.00800	0.373	19	100%	No
Sediment	Metals	Total	Nickel	mg/kg	Dry	19	-	-	-	-	0	-	19	6.39	51.5	19	100%	No
Sediment	Metals	Total	Thallium	mg/kg	Dry	19	0.108	0.132	0.108	0.132	4	-	15	0.135	0.218	15	79%	No
Sediment	Metals	Total	Vanadium	mg/kg	Dry	19	-	-	-	-	0	-	19	27.5	59.3	19	100%	No
Sediment	Metals	Total	Zinc	mg/kg	Dry	19	-	-	-	-	0	-	19	50.3	113	19	100%	No
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	19	-	-	13.0	18.0	0	12	7	2.60	54.0	19	100%	No
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	19	130	180	130	200	7	12	-	17.0	180	12	63%	No
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	19	1.70	10.0	6.40	10.0	19	-	-	-	-	0	0%	No

Table I-8a
Data Summary for Random Forebay Samples
Bradford Island - River Operable Unit
(3 of 7)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	19	1.70	29.0	13.0	29.0	19	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	19	1.70	18.0	6.40	18.0	19	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	19	1.70	5.70	6.40	10.0	19	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	19	1.70	4.00	6.40	10.0	19	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	19	1.70	2.60	6.40	10.0	17	1	1	4.60	27.0	2	11%	No
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	19	1.70	4.70	6.40	10.0	19	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Aroclor 1262	ug/kg	Dry	19	1.70	1.70	6.40	10.0	19	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Aroclor 1268	ug/kg	Dry	19	1.70	1.70	6.40	10.0	19	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Dry	19	-	-	-	-	-	-	-	6.30	28.7	2	11%	No
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	19	200	200	200	200	16	2	1	38.0	340	3	16%	No
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	19	1.50	10.0	9.80	10.0	19	-	-	-	-	0	0%	No
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	19	1.30	1.30	9.80	10.0	18	1	-	1.40	1.40	1	5%	No
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	19	9.80	19.0	9.80	19.0	19	-	-	-	-	0	0%	No
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	19	1.20	1.20	9.80	10.0	19	-	-	-	-	0	0%	No
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	19	2.90	2.90	9.80	10.0	13	3	3	4.80	21.0	6	32%	No
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	19	1.00	1.00	9.80	10.0	19	-	-	-	-	0	0%	No
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	19	1.40	1.40	9.80	10.0	14	5	-	1.50	2.70	5	26%	No
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	19	1.70	1.70	9.80	10.0	19	-	-	-	-	0	0%	No
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	19	1.30	1.30	9.80	10.0	5	14	-	1.40	7.40	14	74%	No
Sediment	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	ug/kg	Dry	19	-	-	-	-	-	-	-	5.50	12.0	14	74%	No
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	19	1.40	1.40	9.80	10.0	7	11	1	1.60	12.0	12	63%	No
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	19	1.60	1.60	9.80	10.0	8	11	-	1.70	7.50	11	58%	No
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	19	2.50	2.50	9.80	10.0	10	9	-	4.00	9.10	9	47%	No
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	19	2.30	2.30	9.80	10.0	10	9	-	2.60	6.20	9	47%	No
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	19	2.50	2.50	9.80	10.0	14	5	-	2.50	4.90	5	26%	No
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	19	1.40	1.40	9.80	10.0	3	14	2	1.40	20.0	16	84%	No
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	19	2.20	2.20	9.80	10.0	19	-	-	-	-	0	0%	No
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	19	2.20	2.20	9.80	10.0	4	13	2	2.50	12.0	15	79%	No
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	19	1.90	1.90	9.80	10.0	10	9	-	2.20	5.70	9	47%	No
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	19	1.30	1.30	9.80	10.0	3	13	3	1.80	17.0	16	84%	No
Sediment	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	ug/kg	Dry	19	-	-	-	-	-	-	-	15.4	73.9	16	84%	No
Sediment	SVOCs	Total	Total PAHs (KM, capped; NDs at MDL)	ug/kg	Dry	19	-	-	-	-	-	-	-	16.6	83.4	16	84%	No
Crayfish	Metals	Total	Aluminum	mg/kg	Wet	17	-	-	-	-	0	-	17	71.4	157	17	100%	No
Crayfish	Metals	Total	Antimony	mg/kg	Wet	17	-	-	0.0120	0.0130	0	4	13	0.00900	0.133	17	100%	No
Crayfish	Metals	Total	Arsenic	mg/kg	Wet	17	-	-	-	-	0	-	17	0.380	0.680	17	100%	No
Crayfish	Metals	Total	Barium	mg/kg	Wet	17	-	-	-	-	0	-	17	51.7	84.3	17	100%	No
Crayfish	Metals	Total	Beryllium	mg/kg	Wet	17	-	-	0.00420	0.00630	0	17	-	0.00170	0.00410	17	100%	No
Crayfish	Metals	Total	Cadmium	mg/kg	Wet	17	-	-	-	-	0	-	17	0.0610	0.210	17	100%	No
Crayfish	Metals	Total	Chromium	mg/kg	Wet	17	-	-	0.3	0.3	0	1	16	0.200	1.20	17	100%	No
Crayfish	Metals	Total	Cobalt	mg/kg	Wet	17	-	-	-	-	0	-	17	0.192	0.262	17	100%	No
Crayfish	Metals	Total	Copper	mg/kg	Wet	17	-	-	-	-	0	-	17	10.5	36.0	17	100%	No
Crayfish	Metals	Total	Lead	mg/kg	Wet	17	-	-	-	-	0	-	17	0.0980	2.66	17	100%	No
Crayfish	Metals	Total	Mercury	mg/kg	Wet	17	-	-	-	-	0	-	17	0.0157	0.0315	17	100%	No
Crayfish	Metals	Total	Methyl Mercury	mg/kg	Wet	17	-	-	-	-	0	-	17	0.0250	0.0400	17	100%	No
Crayfish	Metals	Total	Nickel	mg/kg	Wet	17	-	-	-	-	0	-	17	4.31	5.35	17	100%	No
Crayfish	Metals	Total	Thallium	mg/kg	Wet	17	-	-	-	-	0	-	17	0.0117	0.0292	17	100%	No
Crayfish	Metals	Total	Vanadium	mg/kg	Wet	17	-	-	-	-	0	-	17	0.300	0.600	17	100%	No
Crayfish	Metals	Total	Zinc	mg/kg	Wet	17	-	-	-	-	0	-	17	16.9	23.2	17	100%	No
Crayfish	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	17	2.40	2.40	9.60	10.0	17	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	17	2.60	2.60	20.0	20.0	17	-	-	-	-	0	0%	No

Table I-8a
Data Summary for Random Forebay Samples
Bradford Island - River Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Crayfish	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	17	2.30	2.30	9.60	10.0	17	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	17	2.20	2.20	9.60	10.0	17	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	17	0.510	0.510	9.60	10.0	17	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	17	1.80	19.0	9.60	19.0	17	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	17	1.90	17.0	9.60	17.0	17	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	17	2.50	10.0	9.60	10.0	17	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	17	2.00	2.00	9.60	10.0	17	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Wet	17	-	-	-	-	-	-	-	-	-	0	0%	No
Crayfish	SVOCs	Total	Acenaphthene	ug/kg	Wet	15	0.110	0.110	0.460	0.500	8	7	-	0.110	0.260	7	47%	No
Crayfish	SVOCs	Total	Anthracene	ug/kg	Wet	15	0.0650	0.0650	0.460	0.500	11	4	-	0.0690	0.160	4	27%	No
Crayfish	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	15	0.0660	0.0660	0.460	0.500	5	10	-	0.230	0.350	10	67%	No
Crayfish	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	15	0.0810	0.0810	0.460	0.500	12	3	-	0.120	0.170	3	20%	No
Crayfish	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	15	0.0700	0.0700	0.460	0.500	8	7	-	0.0960	0.240	7	47%	No
Crayfish	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	15	0.0730	0.0730	0.460	0.500	11	4	-	0.0980	0.390	4	27%	No
Crayfish	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	15	0.0560	0.0560	0.460	0.500	8	7	-	0.0860	0.160	7	47%	No
Crayfish	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	15	66.0	66.0	180	200	11	4	-	67.0	110	4	27%	No
Crayfish	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	15	7.30	7.30	35.0	40.0	15	-	-	-	-	0	0%	No
Crayfish	SVOCs	Total	Carbazole	ug/kg	Wet	15	9.10	9.10	35.0	40.0	15	-	-	-	-	0	0%	No
Crayfish	SVOCs	Total	Chrysene	ug/kg	Wet	15	0.0760	0.0760	0.460	0.500	7	8	-	0.0820	0.310	8	53%	No
Crayfish	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	15	0.0590	0.0590	0.460	0.500	15	-	-	-	-	0	0%	No
Crayfish	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	15	16.0	180	35.0	180	15	-	-	-	-	0	0%	No
Crayfish	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	15	11.0	11.0	35.0	40.0	15	-	-	-	-	0	0%	No
Crayfish	SVOCs	Total	Fluoranthene	ug/kg	Wet	15	-	-	0.460	0.500	0	12	3	0.170	0.750	15	100%	No
Crayfish	SVOCs	Total	Fluorene	ug/kg	Wet	15	0.150	0.150	0.460	0.500	10	5	-	0.150	0.210	5	33%	No
Crayfish	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	15	0.0640	0.0640	0.460	0.500	12	3	-	0.160	0.180	3	20%	No
Crayfish	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	15	7.70	7.70	35.0	40.0	15	-	-	-	-	0	0%	No
Crayfish	SVOCs	Total	Phenanthrene	ug/kg	Wet	15	0.360	0.360	0.460	0.500	5	4	6	0.420	0.860	10	67%	No
Crayfish	SVOCs	Total	Pyrene	ug/kg	Wet	15	-	-	0.460	0.500	0	14	1	0.160	1.20	15	100%	No
Largescale Sucker	Metals	Total	Aluminum	mg/kg	Wet	1	-	-	-	-	0	-	1	19.7	19.7	1	100%	Yes
Largescale Sucker	Metals	Total	Antimony	mg/kg	Wet	1	0.00600	0.00600	0.0160	0.0160	1	-	-	-	-	0	0%	Yes
Largescale Sucker	Metals	Total	Arsenic	mg/kg	Wet	1	-	-	-	-	0	-	1	0.350	0.350	1	100%	Yes
Largescale Sucker	Metals	Total	Barium	mg/kg	Wet	1	-	-	-	-	0	-	1	1.92	1.92	1	100%	Yes
Largescale Sucker	Metals	Total	Beryllium	mg/kg	Wet	1	0.000600	0.000600	0.00640	0.00640	1	-	-	-	-	0	0%	Yes
Largescale Sucker	Metals	Total	Cadmium	mg/kg	Wet	1	-	-	-	-	0	-	1	0.0420	0.0420	1	100%	Yes
Largescale Sucker	Metals	Total	Chromium	mg/kg	Wet	1	-	-	-	-	0	-	1	0.480	0.480	1	100%	Yes
Largescale Sucker	Metals	Total	Cobalt	mg/kg	Wet	1	-	-	-	-	0	-	1	0.0775	0.0775	1	100%	Yes
Largescale Sucker	Metals	Total	Copper	mg/kg	Wet	1	-	-	-	-	0	-	1	0.728	0.728	1	100%	Yes
Largescale Sucker	Metals	Total	Lead	mg/kg	Wet	1	-	-	-	-	0	-	1	0.0440	0.0440	1	100%	Yes
Largescale Sucker	Metals	Total	Mercury	mg/kg	Wet	1	-	-	-	-	0	-	1	0.139	0.139	1	100%	Yes
Largescale Sucker	Metals	Total	Nickel	mg/kg	Wet	1	-	-	-	-	0	-	1	0.343	0.343	1	100%	Yes
Largescale Sucker	Metals	Total	Thallium	mg/kg	Wet	1	-	-	0.0064	0.0064	0	1	-	0.00560	0.00560	1	100%	Yes
Largescale Sucker	Metals	Total	Vanadium	mg/kg	Wet	1	-	-	-	-	0	-	1	0.170	0.170	1	100%	Yes
Largescale Sucker	Metals	Total	Zinc	mg/kg	Wet	1	-	-	-	-	0	-	1	17.5	17.5	1	100%	Yes
Largescale Sucker	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	1	2.40	2.40	10.0	10.0	1	-	-	-	-	0	0%	Yes
Largescale Sucker	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	1	2.60	2.60	20.0	20.0	1	-	-	-	-	0	0%	Yes
Largescale Sucker	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	1	2.30	2.30	10.0	10.0	1	-	-	-	-	0	0%	Yes
Largescale Sucker	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	1	2.20	2.20	10.0	10.0	1	-	-	-	-	0	0%	Yes
Largescale Sucker	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	1	0.510	0.510	10.0	10.0	1	-	-	-	-	0	0%	Yes
Largescale Sucker	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	1	-	-	-	-	0	-	1	160	160	1	100%	Yes
Largescale Sucker	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	1	1.90	1.90	10.0	10.0	1	-	-	-	-	0	0%	Yes

Table I-8a
Data Summary for Random Forebay Samples
Bradford Island - River Operable Unit
(5 of 7)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Largescale Sucker	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	1	2.00	2.00	10.0	10.0	1	-	-	-	-	0	0%	Yes
Largescale Sucker	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Wet	1	-	-	-	-	-	-	-	160	160	1	100%	Yes
Largescale Sucker	SVOCs	Total	Acenaphthene	ug/kg	Wet	1	1.10	1.10	4.60	4.60	1	-	-	-	-	0	0%	Yes
Largescale Sucker	SVOCs	Total	Anthracene	ug/kg	Wet	1	-	-	4.60	4.60	0	1	-	4.50	4.50	1	100%	Yes
Largescale Sucker	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	1	0.660	0.660	4.60	4.60	1	-	-	-	-	0	0%	Yes
Largescale Sucker	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	1	-	-	-	-	0	-	1	6.30	6.30	1	100%	Yes
Largescale Sucker	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	1	0.700	0.700	4.60	4.60	1	-	-	-	-	0	0%	Yes
Largescale Sucker	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	1	-	-	4.60	4.60	0	1	-	2.00	2.00	1	100%	Yes
Largescale Sucker	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	1	-	-	-	-	0	-	1	11.0	11.0	1	100%	Yes
Largescale Sucker	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	1	66.0	66.0	180	180	1	-	-	-	-	0	0%	Yes
Largescale Sucker	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	1	7.30	7.30	35.0	35.0	1	-	-	-	-	0	0%	Yes
Largescale Sucker	SVOCs	Total	Carbazole	ug/kg	Wet	1	9.10	9.10	35.0	35.0	1	-	-	-	-	0	0%	Yes
Largescale Sucker	SVOCs	Total	Chrysene	ug/kg	Wet	1	0.760	0.760	4.60	4.60	1	-	-	-	-	0	0%	Yes
Largescale Sucker	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	1	-	-	4.60	4.60	0	1	-	3.70	3.70	1	100%	Yes
Largescale Sucker	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	1	16.0	16.0	35.0	35.0	1	-	-	-	-	0	0%	Yes
Largescale Sucker	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	1	11.0	11.0	35.0	35.0	1	-	-	-	-	0	0%	Yes
Largescale Sucker	SVOCs	Total	Fluoranthene	ug/kg	Wet	1	-	-	-	-	0	-	1	5.90	5.90	1	100%	Yes
Largescale Sucker	SVOCs	Total	Fluorene	ug/kg	Wet	1	1.50	1.50	4.60	4.60	1	-	-	-	-	0	0%	Yes
Largescale Sucker	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	1	-	-	-	-	0	-	1	6.50	6.50	1	100%	Yes
Largescale Sucker	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	1	7.70	7.70	35.0	35.0	1	-	-	-	-	0	0%	Yes
Largescale Sucker	SVOCs	Total	Phenanthrene	ug/kg	Wet	1	-	-	4.60	4.60	0	1	-	3.80	3.80	1	100%	Yes
Largescale Sucker	SVOCs	Total	Pyrene	ug/kg	Wet	1	-	-	-	-	0	-	1	7.40	7.40	1	100%	Yes
Smallmouth Bass	Metals	Total	Aluminum	mg/kg	Wet	19	-	-	-	-	0	-	19	1.06	15.5	19	100%	No
Smallmouth Bass	Metals	Total	Antimony	mg/kg	Wet	19	0.00500	0.00600	0.0120	0.0150	19	-	-	-	-	0	0%	No
Smallmouth Bass	Metals	Total	Arsenic	mg/kg	Wet	19	-	-	-	-	0	-	19	0.170	0.700	19	100%	No
Smallmouth Bass	Metals	Total	Barium	mg/kg	Wet	19	-	-	-	-	0	-	19	0.720	2.64	19	100%	No
Smallmouth Bass	Metals	Total	Beryllium	mg/kg	Wet	19	0.000500	0.000600	0.00480	0.00590	15	4	-	0.000500	0.000700	4	21%	No
Smallmouth Bass	Metals	Total	Cadmium	mg/kg	Wet	19	-	-	0.005	0.006	0	4	15	0.00400	0.0280	19	100%	No
Smallmouth Bass	Metals	Total	Chromium	mg/kg	Wet	19	0.120	0.150	0.240	0.300	14	2	3	0.190	0.860	5	26%	No
Smallmouth Bass	Metals	Total	Cobalt	mg/kg	Wet	19	-	-	-	-	0	-	19	0.0441	0.0758	19	100%	No
Smallmouth Bass	Metals	Total	Copper	mg/kg	Wet	19	-	-	-	-	0	-	19	0.364	1.42	19	100%	No
Smallmouth Bass	Metals	Total	Lead	mg/kg	Wet	19	-	-	0.005	0.006	0	3	16	0.00400	0.0360	19	100%	No
Smallmouth Bass	Metals	Total	Mercury	mg/kg	Wet	19	-	-	-	-	0	-	19	0.0710	0.512	19	100%	No
Smallmouth Bass	Metals	Total	Nickel	mg/kg	Wet	19	-	-	-	-	0	-	19	0.213	0.399	19	100%	No
Smallmouth Bass	Metals	Total	Thallium	mg/kg	Wet	19	-	-	-	-	0	-	19	0.00790	0.0215	19	100%	No
Smallmouth Bass	Metals	Total	Vanadium	mg/kg	Wet	19	-	-	0.05	0.06	0	7	12	0.0300	0.130	19	100%	No
Smallmouth Bass	Metals	Total	Zinc	mg/kg	Wet	19	-	-	-	-	0	-	19	11.4	18.0	19	100%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	19	2.40	240	9.90	1,000	19	-	-	-	-	0	0%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	19	2.60	260	20.0	2,000	19	-	-	-	-	0	0%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	19	2.30	230	9.90	1,000	19	-	-	-	-	0	0%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	19	2.20	220	9.90	1,000	18	-	1	260	260	1	5%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	19	0.510	68.0	9.90	1,000	19	-	-	-	-	0	0%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	19	11.0	420	11.0	420	12	-	7	51.0	18,000	7	37%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	19	1.90	300	10.0	1,000	19	-	-	-	-	0	0%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	19	2.50	250	10.0	1,000	19	-	-	-	-	0	0%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	19	2.00	200	9.90	1,000	19	-	-	-	-	0	0%	No
Smallmouth Bass	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Wet	19	-	-	-	-	-	-	-	53.2	18110	7	37%	No
Smallmouth Bass	SVOCs	Total	Acenaphthene	ug/kg	Wet	19	0.110	0.110	0.460	5.00	3	16	-	0.160	1.60	16	84%	No
Smallmouth Bass	SVOCs	Total	Anthracene	ug/kg	Wet	19	0.0650	0.0650	0.460	2.50	1	14	4	0.0780	17.0	18	95%	No
Smallmouth Bass	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	19	0.0660	0.660	0.460	5.00	14	-	5	1.00	17.0	5	26%	No

Table I-8a
Data Summary for Random Forebay Samples
Bradford Island - River Operable Unit
(6 of 7)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Smallmouth Bass	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	19	0.0810	0.0810	0.460	1.00	11	3	5	0.720	7.40	8	42%	No
Smallmouth Bass	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	19	0.0700	0.140	0.460	5.00	13	6	-	0.110	4.40	6	32%	No
Smallmouth Bass	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	19	0.0730	0.150	0.460	5.00	13	6	-	0.420	3.30	6	32%	No
Smallmouth Bass	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	19	0.0560	0.0560	0.460	0.490	10	1	8	0.110	7.70	9	47%	No
Smallmouth Bass	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	19	66.0	5,000	170	5,000	12	5	2	89.0	1,600	7	37%	No
Smallmouth Bass	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	19	7.30	7.30	34.0	40.0	17	1	1	33.0	440	2	11%	No
Smallmouth Bass	SVOCs	Total	Carbazole	ug/kg	Wet	19	9.10	9.10	34.0	40.0	19	-	-	-	-	0	0%	No
Smallmouth Bass	SVOCs	Total	Chrysene	ug/kg	Wet	19	0.0760	0.0760	0.460	5.00	11	7	1	0.500	10.0	8	42%	No
Smallmouth Bass	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	19	0.0590	0.120	0.460	5.00	13	6	-	0.410	4.10	6	32%	No
Smallmouth Bass	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	19	16.0	71.0	34.0	71.0	18	-	1	150	150	1	5%	No
Smallmouth Bass	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	19	11.0	11.0	34.0	40.0	19	-	-	-	-	0	0%	No
Smallmouth Bass	SVOCs	Total	Fluoranthene	ug/kg	Wet	19	0.0900	0.0900	0.460	1.00	9	2	8	0.490	6.50	10	53%	No
Smallmouth Bass	SVOCs	Total	Fluorene	ug/kg	Wet	19	0.150	0.150	0.460	5.00	2	12	5	0.300	4.70	17	89%	No
Smallmouth Bass	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	19	0.0640	0.130	0.460	1.00	12	2	5	0.700	6.10	7	37%	No
Smallmouth Bass	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	19	7.70	7.70	34.0	40.0	19	-	-	-	-	0	0%	No
Smallmouth Bass	SVOCs	Total	Phenanthrene	ug/kg	Wet	19	-	-	1.00	4.80	0	3	16	0.540	5.70	19	100%	No
Smallmouth Bass	SVOCs	Total	Pyrene	ug/kg	Wet	19	0.0980	0.490	0.460	2.50	10	5	4	0.110	7.20	9	47%	No
Sculpin	Metals	Total	Arsenic	mg/kg	Wet	17	-	-	-	-	0	-	17	0.184	0.435	17	100%	No
Sculpin	Metals	Total	Cadmium	mg/kg	Wet	17	-	-	-	-	0	-	17	0.00720	0.0453	17	100%	No
Sculpin	Metals	Total	Lead	mg/kg	Wet	17	0.0214	0.0214	0.0214	0.0214	1	-	16	0.0313	0.306	16	94%	No
Sculpin	Metals	Total	Mercury	mg/kg	Wet	17	-	-	-	-	0	-	17	0.0327	0.308	17	100%	No
Sculpin	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	17	2.40	14.0	9.20	50.0	17	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	17	2.60	69.0	19.0	99.0	17	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	17	2.30	62.0	9.20	62.0	17	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	17	2.20	35.0	9.20	50.0	17	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	17	0.510	13.0	9.20	50.0	17	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	17	13.0	130	13.0	130	14	-	3	130	1,700	3	18%	No
Sculpin	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	17	1.90	82.0	9.20	82.0	17	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	17	2.50	13.0	9.20	50.0	17	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	17	2.00	10.0	9.20	50.0	17	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Wet	17	-	-	-	-	-	-	-	130	1,700	3	18%	No
Clam	Metals	Total	Aluminum	mg/kg	Wet	19	-	-	-	-	0	-	19	9.37	83.2	19	100%	No
Clam	Metals	Total	Antimony	mg/kg	Wet	19	0.00200	0.00500	0.00700	0.0120	14	5	-	0.00200	0.00700	5	26%	No
Clam	Metals	Total	Arsenic	mg/kg	Wet	19	-	-	-	-	0	-	19	1.79	2.49	19	100%	No
Clam	Metals	Total	Barium	mg/kg	Wet	19	-	-	-	-	0	-	19	1.18	3.05	19	100%	No
Clam	Metals	Total	Beryllium	mg/kg	Wet	19	-	-	0.00280	0.00460	0	19	-	0.000700	0.00380	19	100%	No
Clam	Metals	Total	Cadmium	mg/kg	Wet	19	-	-	-	-	0	-	19	0.286	0.461	19	100%	No
Clam	Metals	Total	Chromium	mg/kg	Wet	19	-	-	-	-	0	-	19	0.300	0.900	19	100%	No
Clam	Metals	Total	Cobalt	mg/kg	Wet	19	-	-	-	-	0	-	19	0.0670	0.148	19	100%	No
Clam	Metals	Total	Copper	mg/kg	Wet	19	-	-	-	-	0	-	19	7.00	11.4	19	100%	No
Clam	Metals	Total	Lead	mg/kg	Wet	19	-	-	-	-	0	-	19	0.0210	0.0890	19	100%	No
Clam	Metals	Total	Mercury	mg/kg	Wet	19	-	-	-	-	0	-	19	0.00580	0.0341	19	100%	No
Clam	Metals	Total	Methyl Mercury	mg/kg	Wet	19	-	-	-	-	0	-	19	0.00350	0.00650	19	100%	No
Clam	Metals	Total	Nickel	mg/kg	Wet	19	-	-	-	-	0	-	19	0.0950	0.348	19	100%	No
Clam	Metals	Total	Thallium	mg/kg	Wet	19	-	-	-	-	0	-	19	0.00450	0.0119	19	100%	No
Clam	Metals	Total	Vanadium	mg/kg	Wet	19	-	-	-	-	0	-	19	0.0780	0.426	19	100%	No
Clam	Metals	Total	Zinc	mg/kg	Wet	19	-	-	-	-	0	-	19	16.3	26.5	19	100%	No
Clam	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	19	2.40	23.0	9.80	23.0	19	-	-	-	-	0	0%	No
Clam	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	19	2.60	20.0	20.0	20.0	19	-	-	-	-	0	0%	No
Clam	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	19	2.30	40.0	9.80	40.0	19	-	-	-	-	0	0%	No

Table I-8a
Data Summary for Random Forebay Samples
Bradford Island - River Operable Unit
(7 of 7)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Clam	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	19	2.20	48.0	9.80	48.0	19	-	-	-	-	0	0%	No
Clam	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	19	0.510	26.0	9.60	26.0	19	-	-	-	-	0	0%	No
Clam	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	19	28.0	74.0	28.0	74.0	10	-	9	21.0	120	9	47%	No
Clam	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	19	1.90	11.0	9.60	11.0	19	-	-	-	-	0	0%	No
Clam	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	19	2.50	2.50	9.60	10.0	19	-	-	-	-	0	0%	No
Clam	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	19	2.00	2.00	9.60	10.0	19	-	-	-	-	0	0%	No
Clam	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Wet	19	-	-	-	-	-	-	-	21.0	120	9	47%	No
Clam	SVOCs	Total	Acenaphthene	ug/kg	Wet	19	0.110	0.110	0.490	0.500	1	2	16	0.420	4.10	18	95%	No
Clam	SVOCs	Total	Anthracene	ug/kg	Wet	19	0.0650	0.330	0.470	2.50	4	8	7	0.280	2.30	15	79%	No
Clam	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	19	0.0660	22.0	0.470	22.0	11	-	8	0.480	2.10	8	42%	No
Clam	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	19	0.0810	0.860	0.470	2.50	16	2	1	0.380	0.580	3	16%	No
Clam	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	19	0.0700	0.800	0.480	2.50	10	1	8	0.400	0.950	9	47%	No
Clam	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	19	0.0730	2.50	0.470	2.50	11	8	-	0.0900	0.360	8	42%	No
Clam	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	19	0.0560	0.580	0.470	2.50	17	2	-	0.160	0.250	2	11%	No
Clam	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	19	-	-	180	280	0	11	8	67.0	890	19	100%	No
Clam	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	19	7.30	11.0	36.0	56.0	16	3	-	13.0	15.0	3	16%	No
Clam	SVOCs	Total	Carbazole	ug/kg	Wet	19	9.10	13.0	36.0	56.0	19	-	-	-	-	0	0%	No
Clam	SVOCs	Total	Chrysene	ug/kg	Wet	19	0.0760	7.80	0.470	7.80	11	-	8	1.90	4.00	8	42%	No
Clam	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	19	0.0590	0.500	0.470	2.50	19	-	-	-	-	0	0%	No
Clam	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	19	16.0	56.0	36.0	56.0	19	-	-	-	-	0	0%	No
Clam	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	19	11.0	16.0	36.0	56.0	18	1	-	38.0	38.0	1	5%	No
Clam	SVOCs	Total	Fluoranthene	ug/kg	Wet	19	8.60	16.0	8.60	16.0	5	-	14	6.30	16.0	14	74%	No
Clam	SVOCs	Total	Fluorene	ug/kg	Wet	19	-	-	-	-	0	-	19	0.920	3.80	19	100%	No
Clam	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	19	0.0640	0.500	0.470	2.50	13	5	1	0.0800	2.50	6	32%	No
Clam	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	19	7.70	11.0	36.0	56.0	9	10	-	8.60	31.0	10	53%	No
Clam	SVOCs	Total	Phenanthrene	ug/kg	Wet	19	-	-	-	-	0	-	19	4.50	15.0	19	100%	No
Clam	SVOCs	Total	Pyrene	ug/kg	Wet	19	0.0980	7.20	0.470	7.20	12	-	7	1.60	6.30	7	37%	No

Notes
% = percent
Dry = Dry weight
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
Max = maximum
MDL = method detection limit
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
Min = minimum
MRL = methode reporting limit
ND = non-detect
No. = number
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
Wet = Wet Weight

Table I-8b
PCB Congener Data Summary for Random Forebay Samples
Bradford Island - River Operable Unit
(1 of 3)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Number of Samples	Minimum RDL of NDs	Maximum RDL of NDs	Number of NDs below RDL	Minimum EMPC Value	Maximum EMPC Value	Number of EMPC Results	Minimum Detected (not ND or EMPC)	Maximum Detected (not ND or EMPC)	Number of Detections (not ND or EMPC)	Detection Rate	Limited Data Set (<8 Samples)
Surface Water	Column	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	Wet	5	0.0290	0.0330	3	0.0480	0.0770	2	-	-	0	0%	Yes
Surface Water	Filter	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	Wet	5	0.0310	0.0390	2	-	-	-	0.0460	0.0560	3	60%	Yes
Surface Water	C+F	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	Wet	5	0.0640	0.0870	-	-	-	-	0.0790	0.133	3	60%	Yes
Surface Water	Column	81	3,4,4',5-Tetrachlorobiphenyl	pg/L	Wet	5	0.00590	0.00980	5	-	-	-	-	-	0	0%	Yes
Surface Water	Filter	81	3,4,4',5-Tetrachlorobiphenyl	pg/L	Wet	5	0.00450	0.00840	5	-	-	-	-	-	0	0%	Yes
Surface Water	C+F	81	3,4,4',5-Tetrachlorobiphenyl	pg/L	Wet	5	0.0111	0.0160	-	-	-	-	-	-	0	0%	Yes
Surface Water	Column	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.114	0.163	5	100%	Yes
Surface Water	Filter	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.221	0.421	5	100%	Yes
Surface Water	C+F	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.340	0.540	5	100%	Yes
Surface Water	Column	114	2,3,4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	0.00800	0.0150	5	-	-	-	-	-	0	0%	Yes
Surface Water	Filter	114	2,3,4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	0.0170	0.0250	5	-	-	-	-	-	0	0%	Yes
Surface Water	C+F	114	2,3,4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	0.0290	0.0360	-	-	-	-	-	-	0	0%	Yes
Surface Water	Column	118	2,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.325	0.499	5	100%	Yes
Surface Water	Filter	118	2,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.518	1.07	5	100%	Yes
Surface Water	C+F	118	2,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.878	1.57	5	100%	Yes
Surface Water	Column	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/L	Wet	5	0.00370	0.00700	3	0.00900	0.0100	2	-	-	0	0%	Yes
Surface Water	Filter	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/L	Wet	5	0.0130	0.0230	5	-	-	-	-	-	0	0%	Yes
Surface Water	C+F	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/L	Wet	5	0.0200	0.0330	-	-	-	-	-	-	0	0%	Yes
Surface Water	Column	126	3,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	0.00420	0.00600	5	-	-	-	-	-	0	0%	Yes
Surface Water	Filter	126	3,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	0.00410	0.0112	5	-	-	-	-	-	0	0%	Yes
Surface Water	C+F	126	3,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	0.00950	0.0154	-	-	-	-	-	-	0	0%	Yes
Surface Water	Column	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	Wet	5	0.0230	0.0280	4	-	-	-	0.0360	0.0360	1	20%	Yes
Surface Water	Filter	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.0850	0.359	5	100%	Yes
Surface Water	C+F	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.111	0.382	5	100%	Yes
Surface Water	Column	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	5	0.0140	0.0140	1	0.0110	0.0110	1	0.0100	0.0140	3	60%	Yes
Surface Water	Filter	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.0330	0.148	5	100%	Yes
Surface Water	C+F	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.0470	0.158	5	100%	Yes
Surface Water	Column	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	5	0.00140	0.00290	5	-	-	-	-	-	0	0%	Yes
Surface Water	Filter	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	5	0.00170	0.00880	5	-	-	-	-	-	0	0%	Yes
Surface Water	C+F	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	5	0.00420	0.0109	-	-	-	-	-	-	0	0%	Yes
Surface Water	Column	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/L	Wet	5	0.00180	0.00400	5	-	-	-	-	-	0	0%	Yes
Surface Water	Filter	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/L	Wet	5	0.00600	0.00800	3	0.0900	0.0900	1	0.0640	0.0640	1	20%	Yes
Surface Water	C+F	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/L	Wet	5	0.00820	0.0925	-	-	-	-	0.0662	0.0662	1	20%	Yes
Surface Water	Column		Total PCBs As Congeners (KM, capped)	pg/L	Wet	5	-	-	-	-	-	-	95.7	154	5	100%	Yes
Surface Water	Filter		Total PCBs As Congeners (KM, capped)	pg/L	Wet	5	-	-	-	-	-	-	14.7	61.2	5	100%	Yes
Surface Water	C+F		Total PCBs As Congeners (KM, capped)	pg/L	Wet	5	-	-	-	-	-	-	112	209	5	100%	Yes
Sediment	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Dry	19	-	-	-	-	-	-	0.209	7.09	19	100%	No
Sediment	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Dry	19	0.0486	0.140	15	0.103	3.40	4	-	-	0	0%	No
Sediment	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Dry	19	-	-	-	-	-	-	1.30	1,080	19	100%	No
Sediment	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Dry	19	-	-	-	0.0580	1.71	4	0.174	60.3	15	79%	No
Sediment	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	19	-	-	-	-	-	-	2.71	2,650	19	100%	No
Sediment	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Dry	19	0.158	0.201	2	0.0640	1.90	6	0.459	36.3	11	58%	No
Sediment	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	19	0.0479	2.69	8	0.123	0.296	8	0.173	0.238	3	16%	No

Table I-8b
PCB Congener Data Summary for Random Forebay Samples
Bradford Island - River Operable Unit
(2 of 3)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Number of Samples	Minimum RDL of NDs	Maximum RDL of NDs	Number of NDs below RDL	Minimum EMPC Value	Maximum EMPC Value	Number of EMPC Results	Minimum Detected (not ND or EMPC)	Maximum Detected (not ND or EMPC)	Number of Detections (not ND or EMPC)	Detection Rate	Limited Data Set (<8 Samples)
Sediment	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Dry	19	0.935	0.935	1	-	-	-	0.399	380	18	95%	No
Sediment	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	19	0.640	0.710	2	0.173	0.173	1	0.461	113	16	84%	No
Sediment	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	19	0.0454	0.879	18	0.161	0.161	1	-	-	0	0%	No
Sediment	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Dry	19	0.0479	0.814	2	0.127	0.620	8	0.0980	9.01	9	47%	No
Sediment	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Dry	19	-	-	-	-	-	-	0.0611	29.7	19	100%	No
Crayfish	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	15	-	-	-	-	-	-	1.57	20.7	15	100%	No
Crayfish	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	15	0.125	0.361	8	0.239	0.823	3	0.211	1.32	4	27%	No
Crayfish	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	15	-	-	-	3.67	86.3	3	6.36	134	12	80%	No
Crayfish	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	15	-	-	-	2.61	2.61	1	2.14	804	14	93%	No
Crayfish	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	15	-	-	-	-	-	-	82.4	14,000	15	100%	No
Crayfish	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	15	-	-	-	3.11	3.11	1	2.11	460	14	93%	No
Crayfish	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	15	0.397	3.51	8	-	-	-	0.238	7.83	7	47%	No
Crayfish	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	15	-	-	-	-	-	-	13.6	3,910	15	100%	No
Crayfish	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	15	-	-	-	-	-	-	8.53	1,530	15	100%	No
Crayfish	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	15	0.167	2.95	15	-	-	-	-	-	0	0%	No
Crayfish	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	15	-	-	-	1.09	1.62	3	0.923	82.1	12	80%	No
Crayfish	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	15	-	-	-	-	-	-	0.536	42.6	15	100%	No
Largescale Sucker	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	110	110	1	100%	Yes
Largescale Sucker	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	9.02	9.02	1	100%	Yes
Largescale Sucker	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	4,350	4,350	1	100%	Yes
Largescale Sucker	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	289	289	1	100%	Yes
Largescale Sucker	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	10,300	10,300	1	100%	Yes
Largescale Sucker	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	179	179	1	100%	Yes
Largescale Sucker	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	19.1	19.1	1	100%	Yes
Largescale Sucker	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	1,770	1,770	1	100%	Yes
Largescale Sucker	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	565	565	1	100%	Yes
Largescale Sucker	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	11.1	11.1	1	100%	Yes
Largescale Sucker	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	78.0	78.0	1	100%	Yes
Largescale Sucker	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	1	-	-	-	-	-	-	201	201	1	100%	Yes
Smallmouth Bass	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	19	-	-	-	-	-	-	21.7	8,950	19	100%	No
Smallmouth Bass	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	19	6.15	23.1	2	-	-	-	1.21	1,190	17	89%	No
Smallmouth Bass	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	19	-	-	-	-	-	-	717	1,300,000	19	100%	No
Smallmouth Bass	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	19	-	-	-	-	-	-	59.4	89,800	19	100%	No
Smallmouth Bass	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	19	-	-	-	-	-	-	2,420	3,270,000	19	100%	No
Smallmouth Bass	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	19	-	-	-	-	-	-	32.3	55,300	19	100%	No
Smallmouth Bass	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	19	48.0	48.0	1	-	-	-	5.05	3,030	18	95%	No
Smallmouth Bass	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	19	-	-	-	-	-	-	541	486,000	19	100%	No
Smallmouth Bass	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	19	-	-	-	-	-	-	161	140,000	19	100%	No
Smallmouth Bass	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	19	1.29	607	19	-	-	-	-	-	0	0%	No
Smallmouth Bass	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	19	-	-	-	-	-	-	21.6	10,100	19	100%	No
Smallmouth Bass	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	19	-	-	-	-	-	-	32.1	26,505	19	100%	No
Sculpin	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	4.31	443	17	100%	No

Table I-8b
PCB Congener Data Summary for Random Forebay Samples
Bradford Island - River Operable Unit
(3 of 3)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Number of Samples	Minimum RDL of NDs	Maximum RDL of NDs	Number of NDs below RDL	Minimum EMPC Value	Maximum EMPC Value	Number of EMPC Results	Minimum Detected (not ND or EMPC)	Maximum Detected (not ND or EMPC)	Number of Detections (not ND or EMPC)	Detection Rate	Limited Data Set (<8 Samples)
Sculpin	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	17	0.225	295	11	0.382	0.846	5	1.45	1.45	1	6%	No
Sculpin	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	303	269,000	17	100%	No
Sculpin	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	21.2	19,900	17	100%	No
Sculpin	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	870	757,000	17	100%	No
Sculpin	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	17	-	-	-	12.8	12.8	1	19.6	11,800	16	94%	No
Sculpin	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	-	-	-	405	405	1	2.39	54.0	16	94%	No
Sculpin	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	123	118,000	17	100%	No
Sculpin	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	43.2	30,800	17	100%	No
Sculpin	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	17	1.45	164	16	-	-	-	3.65	3.65	1	6%	No
Sculpin	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	5.86	2,480	17	100%	No
Sculpin	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	17	-	-	-	-	-	-	9.87	4773	17	100%	No
Clam	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	26.9	69.0	17	100%	No
Clam	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	17	-	-	-	0.693	3.30	13	1.94	2.46	4	24%	No
Clam	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	361	6,200	17	100%	No
Clam	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	20.2	445	17	100%	No
Clam	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	2,050	64,700	17	100%	No
Clam	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	38.4	1,150	17	100%	No
Clam	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	3.37	11.0	17	100%	No
Clam	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	120	3,610	17	100%	No
Clam	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	125	3,800	17	100%	No
Clam	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	17	0.901	16.5	17	-	-	-	-	-	0	0%	No
Clam	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	1.52	10.1	17	100%	No
Clam	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	17	-	-	-	-	-	-	24.5	312	17	100%	No

Notes
For C+F RDL values, the values shown are the sum of the RDLs and/or EMPCs for the ND column and filter results.

% = percent
Dry = Dry weight
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
ND = non-detect
PCB = polychlorinated biphenyl
pg/kg = picograms per kilogram
pg/L = picograms per liter
RDL = reported detection limit
Wet = Wet Weight

Table I-9a
Data Summary for Targeted Forebay Samples
Bradford Island - River Operable Unit
(1 of 5)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Forebay - Eagle Creek																		
Sediment	Metals	Total	Aluminum	mg/kg	Dry	2	-	-	-	-	0	-	2	16,300	18,000	2	100%	Yes
Sediment	Metals	Total	Antimony	mg/kg	Dry	2	-	-	0.0500	0.0500	0	1	1	0.0400	0.0800	2	100%	Yes
Sediment	Metals	Total	Arsenic	mg/kg	Dry	2	-	-	-	-	0	-	2	0.680	3.23	2	100%	Yes
Sediment	Metals	Total	Barium	mg/kg	Dry	2	-	-	-	-	0	-	2	74.4	110	2	100%	Yes
Sediment	Metals	Total	Beryllium	mg/kg	Dry	2	-	-	-	-	0	-	2	0.353	0.371	2	100%	Yes
Sediment	Metals	Total	Cadmium	mg/kg	Dry	2	0.0750	0.131	0.0750	0.131	2	-	-	-	-	0	0%	Yes
Sediment	Metals	Total	Chromium	mg/kg	Dry	2	-	-	-	-	0	-	2	20.2	23.5	2	100%	Yes
Sediment	Metals	Total	Cobalt	mg/kg	Dry	2	-	-	-	-	0	-	2	9.93	11.0	2	100%	Yes
Sediment	Metals	Total	Copper	mg/kg	Dry	2	-	-	-	-	0	-	2	16.6	24.8	2	100%	Yes
Sediment	Metals	Total	Lead	mg/kg	Dry	2	-	-	-	-	0	-	2	4.19	10.9	2	100%	Yes
Sediment	Metals	Total	Mercury	mg/kg	Dry	2	-	-	0.016	0.016	0	1	1	0.00700	0.0290	2	100%	Yes
Sediment	Metals	Total	Nickel	mg/kg	Dry	2	-	-	-	-	0	-	2	15.6	19.9	2	100%	Yes
Sediment	Metals	Total	Thallium	mg/kg	Dry	2	0.0560	0.156	0.0560	0.156	2	-	-	-	-	0	0%	Yes
Sediment	Metals	Total	Vanadium	mg/kg	Dry	2	-	-	-	-	0	-	2	62.5	70.3	2	100%	Yes
Sediment	Metals	Total	Zinc	mg/kg	Dry	2	-	-	-	-	0	-	2	52.7	65.1	2	100%	Yes
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	2	-	-	15.0	15.0	0	2	-	2.90	13.0	2	100%	Yes
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	2	150	150	150	150	2	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	2	1.70	1.70	7.30	7.40	2	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	2	1.70	1.70	15.0	15.0	2	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	2	1.70	1.70	7.30	7.40	2	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	2	1.70	1.70	7.30	7.40	2	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	2	1.70	1.70	7.30	7.30	1	-	1	76.0	76.0	1	50%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	2	1.70	1.70	7.30	7.40	2	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	2	1.70	1.70	7.30	7.40	2	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1262	ug/kg	Dry	2	1.70	1.70	7.30	7.40	2	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1268	ug/kg	Dry	2	1.70	1.70	7.30	7.40	2	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Dry	2	-	-	-	-	-	-	-	77.7	77.7	1	50%	Yes
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	2	200	200	200	200	2	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	2	9.90	9.90	9.90	9.90	2	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	2	1.30	1.30	9.90	9.90	1	1	-	2.20	2.20	1	50%	Yes
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	2	9.90	11.0	9.90	11.0	2	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	2	1.20	1.20	9.90	9.90	2	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	2	2.90	2.90	9.90	9.90	2	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	2	1.00	1.00	9.90	9.90	2	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	2	1.40	1.40	9.90	9.90	1	1	-	2.60	2.60	1	50%	Yes
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	2	1.70	1.70	9.90	9.90	2	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	2	-	-	9.90	9.90	0	2	-	2.30	6.50	2	100%	Yes
Sediment	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	ug/kg	Dry	2	-	-	-	-	-	-	-	6.40	11.8	2	100%	Yes
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	2	1.40	1.40	9.90	9.90	1	1	-	6.60	6.60	1	50%	Yes
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	2	1.60	1.60	9.90	9.90	1	1	-	7.10	7.10	1	50%	Yes
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	2	2.50	2.50	9.90	9.90	1	-	1	11.0	11.0	1	50%	Yes
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	2	2.30	2.30	9.90	9.90	1	1	-	5.00	5.00	1	50%	Yes
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	2	2.50	2.50	9.90	9.90	1	1	-	3.40	3.40	1	50%	Yes
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	2	-	-	9.90	9.90	0	1	1	1.80	13.0	2	100%	Yes
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	2	2.20	2.20	9.90	9.90	2	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	2	2.20	2.20	9.90	9.90	1	-	1	11.0	11.0	1	50%	Yes
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	2	1.90	1.90	9.90	9.90	1	1	-	4.60	4.60	1	50%	Yes

Table I-9a
Data Summary for Targeted Forebay Samples
Bradford Island - River Operable Unit
(2 of 5)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	2	-	-	9.90	9.90	0	1	1	3.40	17.0	2	100%	Yes
Sediment	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	ug/kg	Dry	2	-	-	-	-	-	-	-	17.2	80.9	2	100%	Yes
Sediment	SVOCs	Total	Total PAHs (KM, capped; NDs at MDL)	ug/kg	Dry	2	-	-	-	-	-	-	-	19.5	90.8	2	100%	Yes
Forebay - Goose Island																		
Sediment	Metals	Total	Aluminum	mg/kg	Dry	2	-	-	-	-	0	-	2	17,100	18,800	2	100%	Yes
Sediment	Metals	Total	Antimony	mg/kg	Dry	2	-	-	-	-	0	-	2	0.440	0.580	2	100%	Yes
Sediment	Metals	Total	Arsenic	mg/kg	Dry	2	-	-	-	-	0	-	2	4.00	4.25	2	100%	Yes
Sediment	Metals	Total	Barium	mg/kg	Dry	2	-	-	-	-	0	-	2	112	131	2	100%	Yes
Sediment	Metals	Total	Beryllium	mg/kg	Dry	2	-	-	-	-	0	-	2	0.505	0.561	2	100%	Yes
Sediment	Metals	Total	Cadmium	mg/kg	Dry	2	-	-	-	-	0	-	2	0.887	1.17	2	100%	Yes
Sediment	Metals	Total	Chromium	mg/kg	Dry	2	-	-	-	-	0	-	2	20.6	21.6	2	100%	Yes
Sediment	Metals	Total	Cobalt	mg/kg	Dry	2	-	-	-	-	0	-	2	11.2	11.6	2	100%	Yes
Sediment	Metals	Total	Copper	mg/kg	Dry	2	-	-	-	-	0	-	2	32.6	34.2	2	100%	Yes
Sediment	Metals	Total	Lead	mg/kg	Dry	2	-	-	-	-	0	-	2	13.1	13.6	2	100%	Yes
Sediment	Metals	Total	Mercury	mg/kg	Dry	2	-	-	-	-	0	-	2	0.179	0.181	2	100%	Yes
Sediment	Metals	Total	Nickel	mg/kg	Dry	2	-	-	-	-	0	-	2	18.1	19.4	2	100%	Yes
Sediment	Metals	Total	Thallium	mg/kg	Dry	2	-	-	-	-	0	-	2	0.272	0.435	2	100%	Yes
Sediment	Metals	Total	Vanadium	mg/kg	Dry	2	-	-	-	-	0	-	2	59.3	61.5	2	100%	Yes
Sediment	Metals	Total	Zinc	mg/kg	Dry	2	-	-	-	-	0	-	2	115	148	2	100%	Yes
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	2	-	-	60.0	64.0	0	2	-	49.0	53.0	2	100%	Yes
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	2	-	-	-	-	0	-	2	410	480	2	100%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	2	2.50	2.70	12.0	13.0	2	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	2	2.50	2.70	24.0	26.0	2	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	2	2.50	2.70	12.0	13.0	2	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	2	2.50	2.70	12.0	13.0	2	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	2	2.50	2.70	12.0	13.0	2	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	2	2.50	2.50	12.0	13.0	1	1	-	9.90	9.90	1	50%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	2	2.50	2.70	12.0	13.0	2	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Dry	2	-	-	-	-	-	-	-	12.6	12.6	1	50%	Yes
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	2	-	-	120	130	0	2	-	9.90	13.0	2	100%	Yes
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	2	1.80	1.90	12.0	13.0	2	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	2	1.60	1.70	12.0	13.0	2	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	2	-	-	12.0	13.0	0	2	-	5.60	10.0	2	100%	Yes
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	2	1.50	1.60	12.0	13.0	2	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	2	3.70	3.70	12.0	13.0	1	1	-	8.50	8.50	1	50%	Yes
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	2	1.20	1.30	12.0	13.0	2	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	2	1.70	1.80	12.0	13.0	2	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	2	2.10	2.20	12.0	13.0	2	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	2	-	-	12.0	13.0	0	2	-	3.80	4.60	2	100%	Yes
Sediment	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	ug/kg	Dry	2	-	-	-	-	-	-	-	8.80	9.90	2	100%	Yes
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	2	-	-	12.0	13.0	0	2	-	4.20	7.80	2	100%	Yes
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	2	-	-	12.0	12.0	0	1	1	8.70	13.0	2	100%	Yes
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	2	-	-	12.0	12.0	0	1	1	6.50	15.0	2	100%	Yes
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	2	-	-	12.0	13.0	0	2	-	5.60	9.90	2	100%	Yes
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	2	3.00	3.00	12.0	13.0	1	1	-	4.10	4.10	1	50%	Yes
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	2	-	-	12.0	13.0	0	2	-	5.80	11.0	2	100%	Yes
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	2	2.70	2.80	12.0	13.0	2	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	2	-	-	12.0	13.0	0	2	-	7.30	9.60	2	100%	Yes

Table I-9a
Data Summary for Targeted Forebay Samples
Bradford Island - River Operable Unit
(3 of 5)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	2	-	-	12.0	13.0	0	2	-	5.00	7.10	2	100%	Yes
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	2	-	-	12.0	13.0	0	2	-	7.20	8.80	2	100%	Yes
Sediment	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	ug/kg	Dry	2	-	-	-	-	-	-	-	55.7	89.1	2	100%	Yes
Sediment	SVOCs	Total	Total PAHs (KM, capped; NDs at MDL)	ug/kg	Dry	2	-	-	-	-	-	-	-	60.1	96.1	2	100%	Yes
Crayfish	Metals	Total	Aluminum	mg/kg	Wet	1	-	-	-	-	0	-	1	147	147	1	100%	Yes
Crayfish	Metals	Total	Antimony	mg/kg	Wet	1	-	-	0.0120	0.0120	0	1	-	0.00800	0.00800	1	100%	Yes
Crayfish	Metals	Total	Arsenic	mg/kg	Wet	1	-	-	-	-	0	-	1	0.303	0.303	1	100%	Yes
Crayfish	Metals	Total	Barium	mg/kg	Wet	1	-	-	-	-	0	-	1	57.0	57.0	1	100%	Yes
Crayfish	Metals	Total	Beryllium	mg/kg	Wet	1	-	-	0.00500	0.00500	0	1	-	0.00400	0.00400	1	100%	Yes
Crayfish	Metals	Total	Cadmium	mg/kg	Wet	1	-	-	-	-	0	-	1	0.0769	0.0769	1	100%	Yes
Crayfish	Metals	Total	Chromium	mg/kg	Wet	1	-	-	-	-	0	-	1	0.190	0.190	1	100%	Yes
Crayfish	Metals	Total	Cobalt	mg/kg	Wet	1	-	-	-	-	0	-	1	0.391	0.391	1	100%	Yes
Crayfish	Metals	Total	Copper	mg/kg	Wet	1	-	-	-	-	0	-	1	15.5	15.5	1	100%	Yes
Crayfish	Metals	Total	Lead	mg/kg	Wet	1	-	-	-	-	0	-	1	0.471	0.471	1	100%	Yes
Crayfish	Metals	Total	Mercury	mg/kg	Wet	1	-	-	-	-	0	-	1	0.0359	0.0359	1	100%	Yes
Crayfish	Metals	Total	Nickel	mg/kg	Wet	1	-	-	-	-	0	-	1	1.21	1.21	1	100%	Yes
Crayfish	Metals	Total	Thallium	mg/kg	Wet	1	-	-	-	-	0	-	1	0.0128	0.0128	1	100%	Yes
Crayfish	Metals	Total	Vanadium	mg/kg	Wet	1	-	-	-	-	0	-	1	0.729	0.729	1	100%	Yes
Crayfish	Metals	Total	Zinc	mg/kg	Wet	1	-	-	-	-	0	-	1	20.3	20.3	1	100%	Yes
Crayfish	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	1	2.40	2.40	9.50	9.50	1	-	-	-	-	0	0%	Yes
Crayfish	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	1	2.60	2.60	9.50	9.50	1	-	-	-	-	0	0%	Yes
Crayfish	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	1	2.30	2.30	9.50	9.50	1	-	-	-	-	0	0%	Yes
Crayfish	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	1	2.20	2.20	9.50	9.50	1	-	-	-	-	0	0%	Yes
Crayfish	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	1	0.510	0.510	9.50	9.50	1	-	-	-	-	0	0%	Yes
Crayfish	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	1	1.80	1.80	9.50	9.50	1	-	-	-	-	0	0%	Yes
Crayfish	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	1	1.90	1.90	9.50	9.50	1	-	-	-	-	0	0%	Yes
Crayfish	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	1	2.50	2.50	9.50	9.50	1	-	-	-	-	0	0%	Yes
Crayfish	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	1	2.00	2.00	9.50	9.50	1	-	-	-	-	0	0%	Yes
Crayfish	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Wet	1	-	-	-	-	-	-	-	-	-	0	0%	Yes
Crayfish	SVOCs	Total	Acenaphthene	ug/kg	Wet	1	0.500	0.500	0.500	0.500	1	-	-	-	-	0	0%	Yes
Crayfish	SVOCs	Total	Anthracene	ug/kg	Wet	1	-	-	0.500	0.500	0	1	-	0.430	0.430	1	100%	Yes
Crayfish	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	1	0.500	0.500	0.500	0.500	1	-	-	-	-	0	0%	Yes
Crayfish	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	1	0.0610	0.0610	0.500	0.500	1	-	-	-	-	0	0%	Yes
Crayfish	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	1	-	-	0.500	0.500	0	1	-	0.150	0.150	1	100%	Yes
Crayfish	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	1	-	-	0.500	0.500	0	1	-	0.110	0.110	1	100%	Yes
Crayfish	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	1	-	-	0.500	0.500	0	1	-	0.110	0.110	1	100%	Yes
Crayfish	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	1	66.0	66.0	200	200	1	-	-	-	-	0	0%	Yes
Crayfish	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	1	7.30	7.30	39.0	39.0	1	-	-	-	-	0	0%	Yes
Crayfish	SVOCs	Total	Carbazole	ug/kg	Wet	1	7.70	7.70	39.0	39.0	1	-	-	-	-	0	0%	Yes
Crayfish	SVOCs	Total	Chrysene	ug/kg	Wet	1	0.200	0.200	0.500	0.500	1	-	-	-	-	0	0%	Yes
Crayfish	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	1	0.0450	0.0450	0.500	0.500	1	-	-	-	-	0	0%	Yes
Crayfish	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	1	140	140	140	140	1	-	-	-	-	0	0%	Yes
Crayfish	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	1	11.0	11.0	39.0	39.0	1	-	-	-	-	0	0%	Yes
Crayfish	SVOCs	Total	Fluoranthene	ug/kg	Wet	1	0.500	0.500	0.500	0.500	1	-	-	-	-	0	0%	Yes
Crayfish	SVOCs	Total	Fluorene	ug/kg	Wet	1	-	-	-	-	0	-	1	0.510	0.510	1	100%	Yes
Crayfish	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	1	-	-	0.500	0.500	0	1	-	0.150	0.150	1	100%	Yes
Crayfish	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	1	11.0	11.0	39.0	39.0	1	-	-	-	-	0	0%	Yes
Crayfish	SVOCs	Total	Phenanthrene	ug/kg	Wet	1	-	-	-	-	0	-	1	0.820	0.820	1	100%	Yes

Table I-9a
Data Summary for Targeted Forebay Samples
Bradford Island - River Operable Unit
(4 of 5)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Crayfish	SVOCs	Total	Pyrene	ug/kg	Wet	1	0.500	0.500	0.500	0.500	1	-	-	-	-	0	0%	Yes
Clam	Metals	Total	Aluminum	mg/kg	Wet	1	-	-	-	-	0	-	1	75.5	75.5	1	100%	Yes
Clam	Metals	Total	Antimony	mg/kg	Wet	1	0.00100	0.00100	0.00900	0.00900	1	-	-	-	-	0	0%	Yes
Clam	Metals	Total	Arsenic	mg/kg	Wet	1	-	-	-	-	0	-	1	1.59	1.59	1	100%	Yes
Clam	Metals	Total	Barium	mg/kg	Wet	1	-	-	-	-	0	-	1	1.66	1.66	1	100%	Yes
Clam	Metals	Total	Beryllium	mg/kg	Wet	1	-	-	0.00400	0.00400	0	1	-	0.00200	0.00200	1	100%	Yes
Clam	Metals	Total	Cadmium	mg/kg	Wet	1	-	-	-	-	0	-	1	0.243	0.243	1	100%	Yes
Clam	Metals	Total	Chromium	mg/kg	Wet	1	-	-	-	-	0	-	1	0.492	0.492	1	100%	Yes
Clam	Metals	Total	Cobalt	mg/kg	Wet	1	-	-	-	-	0	-	1	0.0996	0.0996	1	100%	Yes
Clam	Metals	Total	Copper	mg/kg	Wet	1	-	-	-	-	0	-	1	6.75	6.75	1	100%	Yes
Clam	Metals	Total	Lead	mg/kg	Wet	1	-	-	-	-	0	-	1	0.0615	0.0615	1	100%	Yes
Clam	Metals	Total	Mercury	mg/kg	Wet	1	-	-	-	-	0	-	1	0.0163	0.0163	1	100%	Yes
Clam	Metals	Total	Nickel	mg/kg	Wet	1	-	-	-	-	0	-	1	0.221	0.221	1	100%	Yes
Clam	Metals	Total	Thallium	mg/kg	Wet	1	-	-	-	-	0	-	1	0.00650	0.00650	1	100%	Yes
Clam	Metals	Total	Vanadium	mg/kg	Wet	1	-	-	-	-	0	-	1	0.253	0.253	1	100%	Yes
Clam	Metals	Total	Zinc	mg/kg	Wet	1	-	-	-	-	0	-	1	20.5	20.5	1	100%	Yes
Clam	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	1	6.10	6.10	9.70	9.70	1	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	1	5.90	5.90	9.70	9.70	1	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	1	9.70	9.70	9.70	9.70	1	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	1	6.60	6.60	9.70	9.70	1	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	1	5.20	5.20	9.70	9.70	1	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	1	14.0	14.0	14.0	14.0	1	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	1	6.30	6.30	9.70	9.70	1	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	1	3.20	3.20	9.70	9.70	1	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	1	2.00	2.00	9.70	9.70	1	-	-	-	-	0	0%	Yes
Clam	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Wet	1	-	-	-	-	-	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Acenaphthene	ug/kg	Wet	1	-	-	-	-	0	-	1	0.680	0.680	1	100%	Yes
Clam	SVOCs	Total	Anthracene	ug/kg	Wet	1	-	-	-	-	0	-	1	1.20	1.20	1	100%	Yes
Clam	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	1	-	-	-	-	0	-	1	3.40	3.40	1	100%	Yes
Clam	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	1	-	-	-	-	0	-	1	0.750	0.750	1	100%	Yes
Clam	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	1	-	-	-	-	0	-	1	2.20	2.20	1	100%	Yes
Clam	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	1	-	-	-	-	0	-	1	0.740	0.740	1	100%	Yes
Clam	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	1	-	-	-	-	0	-	1	1.30	1.30	1	100%	Yes
Clam	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	1	66.0	66.0	190	190	1	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	1	7.30	7.30	38.0	38.0	1	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Carbazole	ug/kg	Wet	1	7.70	7.70	38.0	38.0	1	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Chrysene	ug/kg	Wet	1	-	-	-	-	0	-	1	2.50	2.50	1	100%	Yes
Clam	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	1	-	-	0.490	0.490	0	1	-	0.480	0.480	1	100%	Yes
Clam	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	1	170	170	170	170	1	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	1	11.0	11.0	38.0	38.0	1	-	-	-	-	0	0%	Yes
Clam	SVOCs	Total	Fluoranthene	ug/kg	Wet	1	-	-	-	-	0	-	1	18.0	18.0	1	100%	Yes
Clam	SVOCs	Total	Fluorene	ug/kg	Wet	1	-	-	-	-	0	-	1	1.80	1.80	1	100%	Yes
Clam	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	1	-	-	-	-	0	-	1	0.890	0.890	1	100%	Yes
Clam	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	1	-	-	38.0	38.0	0	1	-	29.0	29.0	1	100%	Yes
Clam	SVOCs	Total	Phenanthrene	ug/kg	Wet	1	-	-	-	-	0	-	1	10.0	10.0	1	100%	Yes
Clam	SVOCs	Total	Pyrene	ug/kg	Wet	1	-	-	-	-	0	-	1	5.40	5.40	1	100%	Yes

Notes

Table I-9a
Data Summary for Targeted Forebay Samples
Bradford Island - River Operable Unit
(5 of 5)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)

% = percent
Dry = Dry weight
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
Max = maximum
MDL = method detection limit
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
Min = minimum
MRL = methode reporting limit
ND = non-detect
No. = number
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
Wet = Wet Weight

Table I-9b
PCB Congener Data Summary for Targeted Forebay Samples
Bradford Island - River Operable Unit
(1 of 2)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Number of Samples	Minimum RDL of NDs	Maximum RDL of NDs	Number of NDs below RDL	Minimum EMPC Value	Maximum EMPC Value	Number of EMPC Results	Minimum Detected (not ND or EMPC)	Maximum Detected (not ND or EMPC)	Number of Detections (not ND or EMPC)	Detection Rate	Limited Data Set (<8 Samples)
Forebay - Goose Island																	
Sediment	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Dry	2	-	-	-	-	-	-	2.85	3.53	2	100%	Yes
Sediment	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Dry	2	-	-	-	0.150	0.150	1	0.135	0.135	1	50%	Yes
Sediment	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Dry	2	-	-	-	-	-	-	24.9	27.7	2	100%	Yes
Sediment	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Dry	2	-	-	-	-	-	-	1.29	1.37	2	100%	Yes
Sediment	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	2	-	-	-	-	-	-	65.7	69.5	2	100%	Yes
Sediment	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Dry	2	-	-	-	0.970	0.970	1	0.963	0.963	1	50%	Yes
Sediment	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	2	-	-	-	0.255	0.419	2	-	-	0	0%	Yes
Sediment	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Dry	2	-	-	-	-	-	-	8.50	10.4	2	100%	Yes
Sediment	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	2	-	-	-	-	-	-	3.81	4.02	2	100%	Yes
Sediment	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	2	0.241	0.250	2	-	-	-	-	-	0	0%	Yes
Sediment	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Dry	2	-	-	-	-	-	-	0.615	0.869	2	100%	Yes
Sediment	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Dry	2	-	-	-	-	-	-	1.20	1.34	2	100%	Yes
Crayfish	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	2.26	2.26	1	100%	Yes
Crayfish	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	1	0.145	0.145	1	-	-	-	-	-	0	0%	Yes
Crayfish	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	6.24	6.24	1	100%	Yes
Crayfish	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	2.35	2.35	1	100%	Yes
Crayfish	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	87.0	87.0	1	100%	Yes
Crayfish	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	2.56	2.56	1	100%	Yes
Crayfish	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	0.261	0.261	1	-	-	0	0%	Yes
Crayfish	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	13.3	13.3	1	100%	Yes
Crayfish	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	11.2	11.2	1	100%	Yes
Crayfish	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	1	0.164	0.164	1	-	-	-	-	-	0	0%	Yes
Crayfish	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	0.662	0.662	1	100%	Yes
Crayfish	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	1	-	-	-	-	-	-	0.587	0.587	1	100%	Yes
Sculpin	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	7.99	7.99	1	100%	Yes
Sculpin	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	1	-	-	-	0.882	0.882	1	-	-	0	0%	Yes
Sculpin	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	362	362	1	100%	Yes
Sculpin	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	22.0	22.0	1	100%	Yes
Sculpin	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	872	872	1	100%	Yes
Sculpin	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	16.3	16.3	1	100%	Yes
Sculpin	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	3.15	3.15	1	100%	Yes
Sculpin	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	106	106	1	100%	Yes
Sculpin	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	34.8	34.8	1	100%	Yes
Sculpin	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	1	1.31	1.31	1	-	-	-	-	-	0	0%	Yes
Sculpin	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	3.83	3.83	1	100%	Yes
Sculpin	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	1	-	-	-	-	-	-	8.14	8.14	1	100%	Yes
Clam	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	33.7	33.7	1	100%	Yes
Clam	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	1	-	-	-	2.17	2.17	1	-	-	0	0%	Yes
Clam	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	352	352	1	100%	Yes
Clam	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	22.8	22.8	1	100%	Yes
Clam	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	1,590	1,590	1	100%	Yes
Clam	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	28.0	28.0	1	100%	Yes

Table I-9b
PCB Congener Data Summary for Targeted Forebay Samples
Bradford Island - River Operable Unit
(2 of 2)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Number of Samples	Minimum RDL of NDs	Maximum RDL of NDs	Number of NDs below RDL	Minimum EMPC Value	Maximum EMPC Value	Number of EMPC Results	Minimum Detected (not ND or EMPC)	Maximum Detected (not ND or EMPC)	Number of Detections (not ND or EMPC)	Detection Rate	Limited Data Set (<8 Samples)
Clam	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	3.07	3.07	1	100%	Yes
Clam	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	96.9	96.9	1	100%	Yes
Clam	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	92.5	92.5	1	100%	Yes
Clam	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	1	1.08	1.08	1	-	-	-	-	-	0	0%	Yes
Clam	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	1	-	-	-	-	-	-	1.57	1.57	1	100%	Yes
Clam	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	1	-	-	-	-	-	-	21.4	21.4	1	100%	Yes

Notes
% = percent
Dry = Dry weight
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
ND = non-detect
PCB = polychlorinated biphenyl
pg/kg = picograms per kilogram
RDL = reported detection limit
Wet = Wet Weight

Table I-10a
Data Summary for Downstream Samples
Bradford Island - River Operable Unit
(1 of 2)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Sediment	Metals	Total	Aluminum	mg/kg	Dry	6	-	-	-	-	0	-	6	10,600	21,600	6	100%	Yes
Sediment	Metals	Total	Antimony	mg/kg	Dry	6	-	-	-	-	0	-	6	0.0600	0.400	6	100%	Yes
Sediment	Metals	Total	Arsenic	mg/kg	Dry	6	-	-	-	-	0	-	6	2.48	5.84	6	100%	Yes
Sediment	Metals	Total	Barium	mg/kg	Dry	6	-	-	-	-	0	-	6	96.5	172	6	100%	Yes
Sediment	Metals	Total	Beryllium	mg/kg	Dry	6	-	-	-	-	0	-	6	0.286	0.513	6	100%	Yes
Sediment	Metals	Total	Cadmium	mg/kg	Dry	6	-	-	-	-	0	-	6	0.209	0.791	6	100%	Yes
Sediment	Metals	Total	Chromium	mg/kg	Dry	6	-	-	-	-	0	-	6	16.1	29.9	6	100%	Yes
Sediment	Metals	Total	Cobalt	mg/kg	Dry	6	-	-	-	-	0	-	6	6.93	11.5	6	100%	Yes
Sediment	Metals	Total	Copper	mg/kg	Dry	6	-	-	-	-	0	-	6	12.5	24.1	6	100%	Yes
Sediment	Metals	Total	Lead	mg/kg	Dry	6	-	-	-	-	0	-	6	6.67	12.7	6	100%	Yes
Sediment	Metals	Total	Mercury	mg/kg	Dry	6	-	-	-	-	0	-	6	0.0330	0.136	6	100%	Yes
Sediment	Metals	Total	Nickel	mg/kg	Dry	6	-	-	-	-	0	-	6	12.5	15.2	6	100%	Yes
Sediment	Metals	Total	Thallium	mg/kg	Dry	6	0.130	0.130	0.130	0.130	1	-	5	0.163	0.234	5	83%	Yes
Sediment	Metals	Total	Vanadium	mg/kg	Dry	6	-	-	-	-	0	-	6	43.8	73.5	6	100%	Yes
Sediment	Metals	Total	Zinc	mg/kg	Dry	6	-	-	-	-	0	-	6	56.7	117	6	100%	Yes
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	6	-	-	14.0	15.0	0	4	2	5.90	25.0	6	100%	Yes
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	6	140	180	140	180	5	1	-	41.0	41.0	1	17%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	6	1.70	1.70	7.00	8.80	6	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	6	1.70	1.70	14.0	18.0	6	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	6	1.70	1.70	7.00	8.80	6	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	6	1.70	1.70	7.00	8.80	6	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	6	1.70	1.70	7.00	8.80	6	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	6	1.70	1.70	7.00	8.80	6	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	6	1.70	1.70	7.00	8.80	6	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1262	ug/kg	Dry	6	1.70	1.70	7.00	8.80	6	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Aroclor 1268	ug/kg	Dry	6	1.70	1.70	7.00	8.80	6	-	-	-	-	0	0%	Yes
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Dry	6	-	-	-	-	-	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	6	200	200	200	200	6	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	6	1.50	9.90	9.70	10.0	6	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	6	1.30	1.30	9.70	10.0	5	1	-	1.60	1.60	1	17%	Yes
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	6	9.80	14.0	9.80	14.0	6	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	6	1.20	1.20	9.70	10.0	6	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	6	2.90	2.90	9.70	10.0	4	1	1	3.40	130	2	33%	Yes
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	6	1.00	1.00	9.70	10.0	6	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	6	1.40	1.40	9.70	10.0	3	3	-	1.60	3.10	3	50%	Yes
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	6	1.70	1.70	9.70	10.0	6	-	-	-	-	0	0%	Yes
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	6	1.30	1.30	9.70	10.0	2	4	-	2.20	4.90	4	67%	Yes
Sediment	SVOCs	Total	Total LPAHs (KM, cappped; NDs at MDL)	ug/kg	Dry	6	-	-	-	-	-	-	-	6.30	10.7	4	67%	Yes
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	6	-	-	9.70	10.0	0	5	1	1.70	12.0	6	100%	Yes
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	6	1.60	1.60	9.70	9.90	1	3	2	1.90	14.0	5	83%	Yes
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	6	2.50	2.50	9.70	10.0	2	3	1	3.30	16.0	4	67%	Yes
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	6	2.30	2.30	9.70	10.0	3	3	-	2.80	6.80	3	50%	Yes
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	6	2.50	2.50	9.70	10.0	4	2	-	4.20	6.50	2	33%	Yes
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	6	1.40	1.40	9.70	10.0	1	4	1	1.60	18.0	5	83%	Yes
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	6	2.20	2.20	9.70	10.0	5	1	-	2.30	2.30	1	17%	Yes
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	6	2.20	2.20	9.70	9.90	1	3	2	2.90	22.0	5	83%	Yes
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	6	1.90	1.90	9.70	10.0	3	3	-	2.80	8.20	3	50%	Yes
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	6	-	-	9.70	9.90	0	4	2	1.80	21.0	6	100%	Yes

Table I-10a
Data Summary for Downstream Samples
Bradford Island - River Operable Unit
(2 of 2)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Sediment	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	ug/kg	Dry	6	-	-	-	-	-	-	-	16.0	127	6	100%	Yes
Sediment	SVOCs	Total	Total PAHs (KM, capped; NDs at MDL)	ug/kg	Dry	6	-	-	-	-	-	-	-	16.8	137	6	100%	Yes

Notes
% = percent
Dry = Dry weight
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
Max = maximum
MDL = method detection limit
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
Min = minimum
MRL = methode reporting limit
ND = non-detect
No. = number
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
Wet = Wet Weight

Table I-10b
PCB Congener Data Summary for Downstream Samples
Bradford Island - River Operable Unit
(1 of 1)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Number of Samples	Minimum RDL of NDs	Maximum RDL of NDs	Number of NDs below RDL	Minimum EMPC Value	Maximum EMPC Value	Number of EMPC Results	Minimum Detected (not ND or EMPC)	Maximum Detected (not ND or EMPC)	Number of Detections (not ND or EMPC)	Detection Rate	Limited Data Set (<8 Samples)
Sediment	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Dry	6	-	-	-	0.259	0.531	2	0.478	2.01	4	67%	Yes
Sediment	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Dry	6	0.0492	0.100	5	-	-	-	0.260	0.260	1	17%	Yes
Sediment	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Dry	6	-	-	-	-	-	-	1.79	19.7	6	100%	Yes
Sediment	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Dry	6	0.0976	0.0976	1	-	-	-	0.239	0.957	5	83%	Yes
Sediment	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	6	-	-	-	-	-	-	4.09	45.6	6	100%	Yes
Sediment	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Dry	6	-	-	-	0.168	0.168	1	0.130	0.874	5	83%	Yes
Sediment	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	6	0.0787	0.171	5	-	-	-	0.211	0.211	1	17%	Yes
Sediment	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Dry	6	-	-	-	0.604	1.39	2	1.74	6.25	4	67%	Yes
Sediment	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	6	-	-	-	-	-	-	0.320	2.61	6	100%	Yes
Sediment	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	6	0.0630	0.154	6	-	-	-	-	-	0	0%	Yes
Sediment	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Dry	6	0.0733	0.0733	1	0.115	0.115	1	0.0970	0.596	4	67%	Yes
Sediment	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Dry	6	-	-	-	-	-	-	0.0880	0.917	6	100%	Yes

Notes
% = percent
Dry = Dry weight
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
ND = non-detect
PCB = polychlorinated biphenyl
pg/kg = picograms per kilogram
RDL = reported detection limit
Wet = Wet Weight

Table I-11a
Data Summary for Random Reference Samples
Bradford Island - River Operable Unit
(1 of 7)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Surface Water	Metals	Dissolved	Aluminum	ug/L	Wet	5	20.0	20.0	50.0	50.0	4	1	-	27.0	27.0	1	20%	Yes
Surface Water	Metals	Dissolved	Antimony	ug/L	Wet	5	7.00	7.00	50.0	50.0	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Dissolved	Arsenic	ug/L	Wet	5	1.10	1.15	1.10	1.15	3	-	2	0.935	1.26	2	40%	Yes
Surface Water	Metals	Dissolved	Barium	ug/L	Wet	5	-	-	-	-	0	-	5	21.5	23.5	5	100%	Yes
Surface Water	Metals	Dissolved	Beryllium	ug/L	Wet	5	0.00800	0.0200	0.0200	0.0200	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Dissolved	Cadmium	ug/L	Wet	5	0.00500	0.00700	0.0200	0.0200	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Dissolved	Chromium	ug/L	Wet	5	2.00	2.00	5.00	5.00	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Dissolved	Cobalt	ug/L	Wet	5	2.00	2.00	10.0	10.0	4	1	-	2.20	2.20	1	20%	Yes
Surface Water	Metals	Dissolved	Copper	ug/L	Wet	5	-	-	-	-	0	-	5	0.450	0.610	5	100%	Yes
Surface Water	Metals	Dissolved	Lead	ug/L	Wet	5	0.00900	0.00900	0.0200	0.0200	2	2	1	0.0140	0.0240	3	60%	Yes
Surface Water	Metals	Dissolved	Mercury	ug/L	Wet	5	0.0300	0.0300	0.200	0.200	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Dissolved	Nickel	ug/L	Wet	5	2.00	2.00	20.0	20.0	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Dissolved	Thallium	ug/L	Wet	5	0.0200	0.0240	0.0200	0.0240	3	1	1	0.0185	0.020	2	40%	Yes
Surface Water	Metals	Dissolved	Vanadium	ug/L	Wet	5	5.00	5.00	10.0	10.0	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Dissolved	Zinc	ug/L	Wet	5	7.00	7.00	10.0	10.0	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Total	Aluminum	ug/L	Wet	5	-	-	-	-	0	-	5	91.0	123	5	100%	Yes
Surface Water	Metals	Total	Antimony	ug/L	Wet	5	7.00	7.00	50.0	50.0	4	1	-	9.30	9.30	1	20%	Yes
Surface Water	Metals	Total	Arsenic	ug/L	Wet	5	1.05	1.05	1.05	1.05	1	-	4	0.910	1.25	4	80%	Yes
Surface Water	Metals	Total	Barium	ug/L	Wet	5	-	-	-	-	0	-	5	21.0	25.6	5	100%	Yes
Surface Water	Metals	Total	Beryllium	ug/L	Wet	5	0.00800	0.0200	0.0200	0.0200	2	2	1	0.00900	0.0210	3	60%	Yes
Surface Water	Metals	Total	Cadmium	ug/L	Wet	5	0.0200	0.0200	0.0200	0.0200	3	1	1	0.0100	0.0210	2	40%	Yes
Surface Water	Metals	Total	Chromium	ug/L	Wet	5	2.00	2.00	5.00	5.00	4	1	-	2.00	2.00	1	20%	Yes
Surface Water	Metals	Total	Cobalt	ug/L	Wet	5	2.00	2.00	10.0	10.0	4	1	-	2.00	2.00	1	20%	Yes
Surface Water	Metals	Total	Copper	ug/L	Wet	5	-	-	-	-	0	-	5	0.605	0.830	5	100%	Yes
Surface Water	Metals	Total	Lead	ug/L	Wet	5	-	-	-	-	0	-	5	0.0580	0.203	5	100%	Yes
Surface Water	Metals	Total	Mercury	ug/L	Wet	5	0.0300	0.0300	0.200	0.200	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Total	Nickel	ug/L	Wet	5	2.00	2.00	20.0	20.0	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Total	Thallium	ug/L	Wet	5	0.0200	0.0370	0.0200	0.0370	4	-	1	0.0205	0.0205	1	20%	Yes
Surface Water	Metals	Total	Vanadium	ug/L	Wet	5	5.00	5.00	10.0	10.0	5	-	-	-	-	0	0%	Yes
Surface Water	Metals	Total	Zinc	ug/L	Wet	5	7.00	7.00	10.0	10.0	5	-	-	-	-	0	0%	Yes
Surface Water	NWTPH-Dx	Dissolved	Diesel Range Organics	ug/L	Wet	5	11.0	12.0	100	110	4	1	-	13.0	13.0	1	20%	Yes
Surface Water	NWTPH-Dx	Dissolved	Residual Range Organics	ug/L	Wet	5	21.0	100	100	110	2	3	-	20.0	24.0	3	60%	Yes
Surface Water	NWTPH-Dx	Total	Diesel Range Organics	ug/L	Wet	5	11.0	12.0	100	110	2	3	-	13.0	19.0	3	60%	Yes
Surface Water	NWTPH-Dx	Total	Residual Range Organics	ug/L	Wet	5	20.0	100	100	110	2	3	-	22.0	71.0	3	60%	Yes
Surface Water	SVOCs	Column	Acenaphthene	ng/L	Wet	5	-	-	-	-	0	-	5	0.862	2.41	5	100%	Yes
Surface Water	SVOCs	Filter	Acenaphthene	ng/L	Wet	5	0.0141	0.0328	0.0141	0.0328	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Acenaphthene	ng/L	Wet	5	-	-	-	-	-	-	-	0.888	2.43	5	100%	Yes
Surface Water	SVOCs	Column	Anthracene	ng/L	Wet	5	0.0594	0.133	0.0594	0.133	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Anthracene	ng/L	Wet	5	-	-	-	-	0	-	5	0.0109	0.0238	5	100%	Yes
Surface Water	SVOCs	C+F	Anthracene	ng/L	Wet	5	-	-	-	-	-	-	-	0.0832	0.150	5	100%	Yes
Surface Water	SVOCs	Column	Benzo(a)anthracene	ng/L	Wet	5	0.00930	0.0177	0.0177	0.0177	2	-	3	0.0115	0.0162	3	60%	Yes
Surface Water	SVOCs	Filter	Benzo(a)anthracene	ng/L	Wet	5	0.0205	0.0376	0.0205	0.0376	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Benzo(a)anthracene	ng/L	Wet	5	0.0298	0.0438	0.0298	0.0438	-	-	-	0.0491	0.0533	3	60%	Yes
Surface Water	SVOCs	Column	Benzo(a)pyrene	ng/L	Wet	5	0.0131	0.0204	0.0131	0.0204	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Benzo(a)pyrene	ng/L	Wet	5	0.0195	0.0405	0.0195	0.0405	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Benzo(a)pyrene	ng/L	Wet	5	0.0366	0.0564	0.0366	0.0564	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Benzo(b)fluoranthene	ng/L	Wet	5	0.00870	0.0146	0.00870	0.0146	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Benzo(b)fluoranthene	ng/L	Wet	5	0.0230	0.0327	0.0230	0.0327	3	-	2	0.0512	0.0555	2	40%	Yes

Table I-11a
Data Summary for Random Reference Samples
Bradford Island - River Operable Unit
(2 of 7)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Surface Water	SVOCs	C+F	Benzo(b)fluoranthene	ng/L	Wet	5	0.0330	0.0473	0.0330	0.0473	-	-	-	0.0599	0.0669	2	40%	Yes
Surface Water	SVOCs	Column	Benzo(g,h,i)perylene	ng/L	Wet	5	0.0121	0.0203	0.0121	0.0203	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Benzo(g,h,i)perylene	ng/L	Wet	5	0.0174	0.0400	0.0174	0.0400	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Benzo(g,h,i)perylene	ng/L	Wet	5	0.0295	0.0603	0.0295	0.0603	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Benzo(j,k)flouranthenes	ng/L	Wet	5	0.00930	0.0159	0.00930	0.0159	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Benzo(j,k)flouranthenes	ng/L	Wet	5	0.0209	0.0551	0.0209	0.0551	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Benzo(j,k)flouranthenes	ng/L	Wet	5	0.0319	0.0644	0.0319	0.0644	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Bis(2-ethylhexyl) Phthalate	ng/L	Wet	5	5.77	17.0	5.77	17.0	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Bis(2-ethylhexyl) Phthalate	ng/L	Wet	5	2.75	13.0	2.75	13.0	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Bis(2-ethylhexyl) Phthalate	ng/L	Wet	5	11.9	22.3	11.9	22.3	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Butyl Benzyl Phthalate	ng/L	Wet	5	0.263	0.501	0.263	0.501	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Butyl Benzyl Phthalate	ng/L	Wet	5	0.158	5.47	0.158	5.47	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Butyl Benzyl Phthalate	ng/L	Wet	5	0.480	5.97	0.480	5.97	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Chrysene	ng/L	Wet	5	-	-	-	-	0	-	5	0.0393	0.0661	5	100%	Yes
Surface Water	SVOCs	Filter	Chrysene	ng/L	Wet	5	0.0450	0.0930	0.0450	0.0930	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Chrysene	ng/L	Wet	5	-	-	-	-	-	-	-	0.0843	0.149	5	100%	Yes
Surface Water	SVOCs	Column	Dibenz(a,h)anthracene	ng/L	Wet	5	0.0147	0.0215	0.0147	0.0215	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Dibenz(a,h)anthracene	ng/L	Wet	5	0.0182	0.0289	0.0182	0.0289	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Dibenz(a,h)anthracene	ng/L	Wet	5	0.0345	0.0504	0.0345	0.0504	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Di-n-butyl Phthalate	ng/L	Wet	5	0.517	0.733	0.517	0.733	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Di-n-butyl Phthalate	ng/L	Wet	5	0.243	0.595	0.243	0.595	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Di-n-butyl Phthalate	ng/L	Wet	5	0.841	1.22	0.841	1.22	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Di-n-octyl Phthalate	ng/L	Wet	5	0.0910	0.202	0.0910	0.202	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Di-n-octyl Phthalate	ng/L	Wet	5	0.120	1.09	0.120	1.09	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Di-n-octyl Phthalate	ng/L	Wet	5	0.271	1.29	0.271	1.29	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Fluoranthene	ng/L	Wet	5	0.485	0.591	0.485	0.591	2	-	3	0.620	0.630	3	60%	Yes
Surface Water	SVOCs	Filter	Fluoranthene	ng/L	Wet	5	0.0793	0.0793	0.0793	0.0793	1	-	4	0.101	0.163	4	80%	Yes
Surface Water	SVOCs	C+F	Fluoranthene	ng/L	Wet	5	0.564	0.564	0.564	0.564	-	-	-	0.692	0.783	4	80%	Yes
Surface Water	SVOCs	Column	Indeno(1,2,3-cd)pyrene	ng/L	Wet	5	0.0128	0.0222	0.0128	0.0222	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Filter	Indeno(1,2,3-cd)pyrene	ng/L	Wet	5	0.0147	0.0417	0.0147	0.0417	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Indeno(1,2,3-cd)pyrene	ng/L	Wet	5	0.0311	0.0639	0.0311	0.0639	-	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	Column	Phenanthrene	ng/L	Wet	5	-	-	-	-	0	-	5	1.20	1.52	5	100%	Yes
Surface Water	SVOCs	Filter	Phenanthrene	ng/L	Wet	5	0.0571	0.114	0.0571	0.114	5	-	-	-	-	0	0%	Yes
Surface Water	SVOCs	C+F	Phenanthrene	ng/L	Wet	5	-	-	-	-	-	-	-	1.346	1.61	5	100%	Yes
Sediment	Metals	Total	Aluminum	mg/kg	Dry	18	-	-	-	-	0	-	18	7,380	33,500	18	100%	No
Sediment	Metals	Total	Antimony	mg/kg	Dry	18	-	-	-	-	0	-	18	0.150	0.520	18	100%	No
Sediment	Metals	Total	Arsenic	mg/kg	Dry	18	-	-	-	-	0	-	18	3.03	6.04	18	100%	No
Sediment	Metals	Total	Barium	mg/kg	Dry	18	-	-	-	-	0	-	18	86.3	312	18	100%	No
Sediment	Metals	Total	Beryllium	mg/kg	Dry	18	-	-	-	-	0	-	18	0.194	0.748	18	100%	No
Sediment	Metals	Total	Cadmium	mg/kg	Dry	18	-	-	-	-	0	-	18	0.262	0.748	18	100%	No
Sediment	Metals	Total	Chromium	mg/kg	Dry	18	-	-	-	-	0	-	18	12.8	27.3	18	100%	No
Sediment	Metals	Total	Cobalt	mg/kg	Dry	18	-	-	-	-	0	-	18	5.68	15.2	18	100%	No
Sediment	Metals	Total	Copper	mg/kg	Dry	18	-	-	-	-	0	-	18	8.22	47.8	18	100%	No
Sediment	Metals	Total	Lead	mg/kg	Dry	18	-	-	-	-	0	-	18	8.65	15.1	18	100%	No
Sediment	Metals	Total	Mercury	mg/kg	Dry	18	-	-	-	-	0	-	18	0.0410	0.225	18	100%	No
Sediment	Metals	Total	Nickel	mg/kg	Dry	18	-	-	-	-	0	-	18	9.87	25.6	18	100%	No
Sediment	Metals	Total	Thallium	mg/kg	Dry	18	-	-	-	-	0	-	18	0.145	0.360	18	100%	No

Table I-11a
Data Summary for Random Reference Samples
Bradford Island - River Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Sediment	Metals	Total	Vanadium	mg/kg	Dry	18	-	-	-	-	0	-	18	25.7	76.9	18	100%	No
Sediment	Metals	Total	Zinc	mg/kg	Dry	18	-	-	-	-	0	-	18	70.2	109	18	100%	No
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	18	-	-	15.0	21.0	0	12	6	7.00	31.0	18	100%	No
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	18	150	180	150	210	5	13	-	29.0	100	13	72%	No
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	18	1.70	13.0	9.60	13.0	18	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	18	1.70	11.0	20.0	21.0	18	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	18	1.70	12.0	9.60	12.0	18	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	18	1.70	16.0	9.60	16.0	18	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	18	1.70	1.80	9.60	11.0	18	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	18	1.70	1.80	9.60	11.0	18	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	18	1.70	1.80	9.60	11.0	18	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Aroclor 1262	ug/kg	Dry	18	1.70	1.80	9.60	11.0	18	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Aroclor 1268	ug/kg	Dry	18	1.70	1.80	9.60	11.0	18	-	-	-	-	0	0%	No
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Dry	18	-	-	-	-	-	-	-	-	-	0	0%	No
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	18	-	-	190	210	0	18	-	4.90	110	18	100%	No
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	18	1.50	1.60	9.50	11.0	16	2	-	2.50	3.80	2	11%	No
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	18	1.30	1.40	9.50	11.0	18	-	-	-	-	0	0%	No
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	18	2.60	2.60	9.50	11.0	3	14	1	3.50	11.0	15	83%	No
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	18	1.20	1.30	9.50	11.0	18	-	-	-	-	0	0%	No
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	18	2.90	2.90	9.80	10.0	7	7	4	4.50	210	11	61%	No
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	18	1.00	1.10	9.50	11.0	18	-	-	-	-	0	0%	No
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	18	1.40	1.50	9.50	11.0	16	2	-	1.40	2.30	2	11%	No
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	18	1.70	1.80	9.50	11.0	18	-	-	-	-	0	0%	No
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	18	1.30	1.30	9.50	11.0	2	16	-	1.30	5.90	16	89%	No
Sediment	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	ug/kg	Dry	18	-	-	-	-	-	-	-	5.40	10.0	16	89%	No
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	18	1.40	1.40	9.50	11.0	4	13	1	1.60	10.0	14	78%	No
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	18	1.60	1.60	9.50	11.0	9	8	1	1.60	11.0	9	50%	No
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	18	2.50	2.50	9.50	11.0	5	12	1	2.70	17.0	13	72%	No
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	18	2.30	2.30	9.50	11.0	8	10	-	2.30	7.90	10	56%	No
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	18	2.50	2.60	9.50	11.0	17	1	-	5.00	5.00	1	6%	No
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	18	1.40	1.40	9.50	11.0	3	14	1	1.90	9.80	15	83%	No
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	18	2.20	2.30	9.50	11.0	18	-	-	-	-	0	0%	No
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	18	2.20	2.20	9.50	11.0	3	14	1	2.30	31.0	15	83%	No
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	18	1.90	1.90	9.50	11.0	9	9	-	2.00	8.80	9	50%	No
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	18	-	-	9.50	11.0	0	17	1	1.50	23.0	18	100%	No
Sediment	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	ug/kg	Dry	18	-	-	-	-	-	-	-	16.4	125	18	100%	No
Sediment	SVOCs	Total	Total PAHs (KM, capped; NDs at MDL)	ug/kg	Dry	18	-	-	-	-	-	-	-	17.1	133	18	100%	No
Crayfish	Metals	Total	Aluminum	mg/kg	Wet	19	-	-	-	-	0	-	19	71.2	221	19	100%	No
Crayfish	Metals	Total	Antimony	mg/kg	Wet	19	-	-	0.0120	0.0150	0	9	10	0.00600	0.0390	19	100%	No
Crayfish	Metals	Total	Arsenic	mg/kg	Wet	19	-	-	-	-	0	-	19	0.275	0.636	19	100%	No
Crayfish	Metals	Total	Barium	mg/kg	Wet	19	-	-	-	-	0	-	19	40.2	120	19	100%	No
Crayfish	Metals	Total	Beryllium	mg/kg	Wet	19	-	-	0.00490	0.00930	0	19	-	0.00260	0.00610	19	100%	No
Crayfish	Metals	Total	Cadmium	mg/kg	Wet	19	-	-	-	-	0	-	19	0.0460	0.201	19	100%	No
Crayfish	Metals	Total	Chromium	mg/kg	Wet	19	0.130	0.130	0.240	0.290	1	5	13	0.120	1.23	18	95%	No
Crayfish	Metals	Total	Cobalt	mg/kg	Wet	19	-	-	-	-	0	-	19	0.224	0.439	19	100%	No
Crayfish	Metals	Total	Copper	mg/kg	Wet	19	-	-	-	-	0	-	19	12.2	33.2	19	100%	No
Crayfish	Metals	Total	Lead	mg/kg	Wet	19	-	-	-	-	0	-	19	0.0560	1.55	19	100%	No

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Data Summary for Random Reference Samples
Bradford Island - River Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Crayfish	Metals	Total	Mercury	mg/kg	Wet	19	-	-	-	-	0	-	19	0.0105	0.0246	19	100%	No
Crayfish	Metals	Total	Methyl Mercury	mg/kg	Wet	19	-	-	-	-	0	-	19	0.0181	0.0367	19	100%	No
Crayfish	Metals	Total	Nickel	mg/kg	Wet	19	-	-	-	-	0	-	19	0.992	3.44	19	100%	No
Crayfish	Metals	Total	Thallium	mg/kg	Wet	19	-	-	-	-	0	-	19	0.0140	0.0370	19	100%	No
Crayfish	Metals	Total	Vanadium	mg/kg	Wet	19	-	-	-	-	0	-	19	0.261	0.804	19	100%	No
Crayfish	Metals	Total	Zinc	mg/kg	Wet	19	-	-	-	-	0	-	19	18.0	36.5	19	100%	No
Crayfish	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	19	2.40	4.80	9.40	20.0	19	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	19	2.60	5.20	19.0	40.0	19	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	19	2.30	4.60	9.40	20.0	19	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	19	2.20	4.40	9.40	20.0	19	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	19	0.510	1.10	9.40	20.0	19	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	19	1.80	3.60	9.40	20.0	19	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	19	1.90	3.80	9.40	20.0	19	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	19	2.50	5.00	9.40	20.0	19	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	19	2.00	4.00	9.40	20.0	19	-	-	-	-	0	0%	No
Crayfish	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	19	-	-	-	-	-	-	-	-	-	0	0%	No
Crayfish	SVOCs	Total	Acenaphthene	ug/kg	Wet	18	0.110	0.110	0.450	0.500	15	3	-	0.120	0.190	3	17%	No
Crayfish	SVOCs	Total	Anthracene	ug/kg	Wet	18	0.0650	0.0650	0.450	0.500	16	2	-	0.0980	0.190	2	11%	No
Crayfish	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	18	0.0660	0.0660	0.450	0.500	16	2	-	0.310	0.400	2	11%	No
Crayfish	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	18	0.0810	0.0810	0.450	0.500	17	1	-	0.120	0.120	1	6%	No
Crayfish	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	18	0.0700	0.0700	0.450	0.500	14	4	-	0.0820	0.230	4	22%	No
Crayfish	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	18	0.0730	0.500	0.450	0.500	18	-	-	-	-	0	0%	No
Crayfish	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	18	0.0560	0.0560	0.450	0.500	14	4	-	0.0720	0.200	4	22%	No
Crayfish	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	18	66.0	66.0	190	200	14	4	-	69.0	87.0	4	22%	No
Crayfish	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	18	7.30	7.30	38.0	40.0	15	3	-	15.0	31.0	3	17%	No
Crayfish	SVOCs	Total	Carbazole	ug/kg	Wet	18	9.10	9.10	38.0	40.0	18	-	-	-	-	0	0%	No
Crayfish	SVOCs	Total	Chrysene	ug/kg	Wet	18	0.0760	0.0760	0.450	0.500	13	5	-	0.0910	0.270	5	28%	No
Crayfish	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	18	0.0590	0.0590	0.450	0.500	15	3	-	0.0720	0.160	3	17%	No
Crayfish	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	18	16.0	110	38.0	110	18	-	-	-	-	0	0%	No
Crayfish	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	18	11.0	11.0	38.0	40.0	17	1	-	32.0	32.0	1	6%	No
Crayfish	SVOCs	Total	Fluoranthene	ug/kg	Wet	18	0.450	0.500	0.450	0.500	18	-	-	-	-	0	0%	No
Crayfish	SVOCs	Total	Fluorene	ug/kg	Wet	18	0.150	0.150	0.450	0.500	16	2	-	0.180	0.250	2	11%	No
Crayfish	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	18	0.0640	0.0640	0.450	0.500	15	3	-	0.0870	0.180	3	17%	No
Crayfish	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	18	7.70	7.70	38.0	40.0	18	-	-	-	-	0	0%	No
Crayfish	SVOCs	Total	Phenanthrene	ug/kg	Wet	18	0.360	0.360	0.450	0.500	13	2	3	0.450	0.590	5	28%	No
Crayfish	SVOCs	Total	Pyrene	ug/kg	Wet	18	0.450	0.500	0.450	0.500	18	-	-	-	-	0	0%	No
Smallmouth Bass	Metals	Total	Aluminum	mg/kg	Wet	19	-	-	0.582	0.582	0	1	18	0.330	10.1	19	100%	No
Smallmouth Bass	Metals	Total	Antimony	mg/kg	Wet	19	0.00200	0.00600	0.0110	0.0180	15	3	1	0.00300	0.0250	4	21%	No
Smallmouth Bass	Metals	Total	Arsenic	mg/kg	Wet	19	-	-	-	-	0	-	19	0.159	0.761	19	100%	No
Smallmouth Bass	Metals	Total	Barium	mg/kg	Wet	19	-	-	-	-	0	-	19	0.430	1.72	19	100%	No
Smallmouth Bass	Metals	Total	Beryllium	mg/kg	Wet	19	0.000500	0.00200	0.00400	0.00600	19	-	-	-	-	0	0%	No
Smallmouth Bass	Metals	Total	Cadmium	mg/kg	Wet	19	-	-	0.00800	0.00900	0	6	13	0.00400	0.143	19	100%	No
Smallmouth Bass	Metals	Total	Chromium	mg/kg	Wet	19	0.100	0.100	0.230	0.500	7	11	1	0.0400	7.15	12	63%	No
Smallmouth Bass	Metals	Total	Cobalt	mg/kg	Wet	19	0.0248	0.0361	0.0248	0.0361	7	-	12	0.0487	0.0838	12	63%	No
Smallmouth Bass	Metals	Total	Copper	mg/kg	Wet	19	-	-	-	-	0	-	19	0.327	0.730	19	100%	No
Smallmouth Bass	Metals	Total	Lead	mg/kg	Wet	19	0.0130	0.0150	0.0130	0.0150	7	-	12	1.42	1.81	12	63%	No
Smallmouth Bass	Metals	Total	Mercury	mg/kg	Wet	19	-	-	-	-	0	-	19	0.0548	0.333	19	100%	No

Table I-11a
Data Summary for Random Reference Samples
Bradford Island - River Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Smallmouth Bass	Metals	Total	Nickel	mg/kg	Wet	19	0.277	0.306	0.277	0.306	3	-	16	0.324	1.79	16	84%	No
Smallmouth Bass	Metals	Total	Thallium	mg/kg	Wet	19	-	-	-	-	0	-	19	0.0109	0.0261	19	100%	No
Smallmouth Bass	Metals	Total	Vanadium	mg/kg	Wet	19	0.00600	0.00600	0.0500	0.0600	1	9	9	0.0300	0.104	18	95%	No
Smallmouth Bass	Metals	Total	Zinc	mg/kg	Wet	19	-	-	-	-	0	-	19	11.2	15.5	19	100%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	19	2.40	9.90	9.90	10.0	19	-	-	-	-	0	0%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	19	2.60	20.0	20.0	20.0	19	-	-	-	-	0	0%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	19	2.30	11.0	9.90	11.0	19	-	-	-	-	0	0%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	19	2.20	10.0	9.90	10.0	15	3	1	2.40	14.0	4	21%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	19	0.510	33.0	9.90	33.0	19	-	-	-	-	0	0%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	19	9.60	130	10.0	130	3	-	16	27.0	110	16	84%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	19	1.90	140	9.90	140	19	-	-	-	-	0	0%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	19	2.50	110	9.90	110	19	-	-	-	-	0	0%	No
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	19	2.00	10.0	9.90	10.0	19	-	-	-	-	0	0%	No
Smallmouth Bass	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Wet	19	-	-	-	-	-	-	-	29.2	124	16	84%	No
Smallmouth Bass	SVOCs	Total	Acenaphthene	ug/kg	Wet	19	0.110	0.110	0.490	2.00	1	3	15	0.510	1.30	18	95%	No
Smallmouth Bass	SVOCs	Total	Anthracene	ug/kg	Wet	19	0.0650	0.650	0.470	4.80	16	3	-	0.0900	0.380	3	16%	No
Smallmouth Bass	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	19	0.0660	0.660	0.470	4.80	16	-	3	0.560	0.940	3	16%	No
Smallmouth Bass	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	19	0.0810	0.810	0.470	4.80	19	-	-	-	-	0	0%	No
Smallmouth Bass	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	19	0.0700	0.700	0.470	4.80	19	-	-	-	-	0	0%	No
Smallmouth Bass	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	19	0.0730	0.730	0.470	4.80	19	-	-	-	-	0	0%	No
Smallmouth Bass	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	19	0.0560	0.560	0.470	4.80	19	-	-	-	-	0	0%	No
Smallmouth Bass	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	19	66.0	2,500	180	2,500	17	2	-	81.0	150	2	11%	No
Smallmouth Bass	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	19	7.30	7.30	35.0	40.0	19	-	-	-	-	0	0%	No
Smallmouth Bass	SVOCs	Total	Carbazole	ug/kg	Wet	19	7.70	9.10	35.0	40.0	19	-	-	-	-	0	0%	No
Smallmouth Bass	SVOCs	Total	Chrysene	ug/kg	Wet	19	0.0760	0.760	0.470	4.80	18	-	1	0.550	0.550	1	5%	No
Smallmouth Bass	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	19	0.0590	0.590	0.470	4.80	19	-	-	-	-	0	0%	No
Smallmouth Bass	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	19	16.0	280	40.0	280	19	-	-	-	-	0	0%	No
Smallmouth Bass	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	19	11.0	11.0	35.0	40.0	18	1	-	15.0	15.0	1	5%	No
Smallmouth Bass	SVOCs	Total	Fluoranthene	ug/kg	Wet	19	0.0900	1.20	0.470	4.80	8	4	7	0.690	2.50	11	58%	No
Smallmouth Bass	SVOCs	Total	Fluorene	ug/kg	Wet	19	0.150	2.00	0.490	2.00	3	3	13	0.890	2.10	16	84%	No
Smallmouth Bass	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	19	0.0640	0.640	0.470	4.80	19	-	-	-	-	0	0%	No
Smallmouth Bass	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	19	7.70	11.0	35.0	40.0	19	-	-	-	-	0	0%	No
Smallmouth Bass	SVOCs	Total	Phenanthrene	ug/kg	Wet	19	-	-	4.70	4.80	0	2	17	1.40	5.10	19	100%	No
Smallmouth Bass	SVOCs	Total	Pyrene	ug/kg	Wet	19	0.0980	0.980	0.470	4.80	17	2	-	0.380	0.420	2	11%	No
Sculpin	Metals	Total	Arsenic	mg/kg	Wet	18	-	-	-	-	0	-	18	0.239	0.484	18	100%	No
Sculpin	Metals	Total	Cadmium	mg/kg	Wet	18	-	-	-	-	0	-	18	0.00870	0.0264	18	100%	No
Sculpin	Metals	Total	Lead	mg/kg	Wet	18	0.0214	0.0214	0.0214	0.0214	1	-	17	0.0239	0.0758	17	94%	No
Sculpin	Metals	Total	Mercury	mg/kg	Wet	18	-	-	-	-	0	-	18	0.0448	0.141	18	100%	No
Sculpin	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	18	2.40	2.40	9.20	10.0	18	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	18	2.60	2.60	19.0	20.0	18	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	18	2.30	2.30	9.20	10.0	18	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	18	2.20	2.20	9.20	10.0	18	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	18	0.510	45.0	9.20	45.0	18	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	18	1.80	44.0	9.70	44.0	18	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	18	1.90	1.90	9.20	10.0	18	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	18	2.50	2.50	9.20	10.0	18	-	-	-	-	0	0%	No
Sculpin	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	18	2.00	2.00	9.20	10.0	18	-	-	-	-	0	0%	No

Table I-11a
Data Summary for Random Reference Samples
Bradford Island - River Operable Unit
(6 of 7)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)
Sculpin	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Wet	18	-	-	-	-	-	-	-	-	-	0	0%	No
Clam	Metals	Total	Aluminum	mg/kg	Wet	18	-	-	-	-	0	-	18	8.00	83.4	18	100%	No
Clam	Metals	Total	Antimony	mg/kg	Wet	18	0.00400	0.00500	0.00900	0.0110	15	3	-	0.00400	0.00800	3	17%	No
Clam	Metals	Total	Arsenic	mg/kg	Wet	18	-	-	-	-	0	-	18	2.00	2.62	18	100%	No
Clam	Metals	Total	Barium	mg/kg	Wet	18	-	-	-	-	0	-	18	1.71	2.38	18	100%	No
Clam	Metals	Total	Beryllium	mg/kg	Wet	18	0.000400	0.000400	0.00360	0.00450	9	9	-	0.000400	0.00140	9	50%	No
Clam	Metals	Total	Cadmium	mg/kg	Wet	18	-	-	-	-	0	-	18	0.247	0.405	18	100%	No
Clam	Metals	Total	Chromium	mg/kg	Wet	18	-	-	-	-	0	-	18	0.450	0.760	18	100%	No
Clam	Metals	Total	Cobalt	mg/kg	Wet	18	-	-	-	-	0	-	18	0.0902	0.150	18	100%	No
Clam	Metals	Total	Copper	mg/kg	Wet	18	-	-	-	-	0	-	18	8.18	11.6	18	100%	No
Clam	Metals	Total	Lead	mg/kg	Wet	18	-	-	-	-	0	-	18	0.0490	0.0720	18	100%	No
Clam	Metals	Total	Mercury	mg/kg	Wet	18	-	-	-	-	0	-	18	0.00460	0.0179	18	100%	No
Clam	Metals	Total	Methyl Mercury	mg/kg	Wet	18	-	-	0.002	0.002	0	2	16	0.00140	0.00990	18	100%	No
Clam	Metals	Total	Nickel	mg/kg	Wet	18	-	-	-	-	0	-	18	0.273	0.482	18	100%	No
Clam	Metals	Total	Thallium	mg/kg	Wet	18	-	-	-	-	0	-	18	0.00530	0.0105	18	100%	No
Clam	Metals	Total	Vanadium	mg/kg	Wet	18	-	-	-	-	0	-	18	0.0740	0.286	18	100%	No
Clam	Metals	Total	Zinc	mg/kg	Wet	18	-	-	-	-	0	-	18	18.5	23.2	18	100%	No
Clam	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	18	8.40	15.0	9.80	15.0	18	-	-	-	-	0	0%	No
Clam	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	18	6.30	16.0	20.0	20.0	18	-	-	-	-	0	0%	No
Clam	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	18	18.0	35.0	18.0	35.0	18	-	-	-	-	0	0%	No
Clam	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	18	7.90	14.0	9.70	14.0	18	-	-	-	-	0	0%	No
Clam	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	18	5.50	9.90	9.60	10.0	18	-	-	-	-	0	0%	No
Clam	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	18	-	-	-	-	0	-	18	30.0	39.0	18	100%	No
Clam	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	18	5.70	8.10	9.60	10.0	18	-	-	-	-	0	0%	No
Clam	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	18	3.70	9.90	9.60	10.0	18	-	-	-	-	0	0%	No
Clam	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	18	2.00	2.00	9.60	10.0	18	-	-	-	-	0	0%	No
Clam	PCB Aroclors	Total	Total PCBs As Aroclors (NDs at MDL)	ug/kg	Wet	18	-	-	-	-	-	-	-	30.0	39.0	18	100%	No
Clam	SVOCs	Total	Acenaphthene	ug/kg	Wet	18	-	-	0.480	0.500	0	4	14	0.270	1.20	18	100%	No
Clam	SVOCs	Total	Anthracene	ug/kg	Wet	18	1.30	3.20	2.30	3.20	16	2	-	0.850	1.80	2	11%	No
Clam	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	18	3.70	27.0	3.70	27.0	18	-	-	-	-	0	0%	No
Clam	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	18	0.410	0.410	2.30	2.50	18	-	-	-	-	0	0%	No
Clam	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	18	0.350	0.350	2.30	2.50	18	-	-	-	-	0	0%	No
Clam	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	18	0.370	0.370	2.30	2.50	13	5	-	0.500	1.40	5	28%	No
Clam	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	18	0.280	0.280	2.30	2.50	18	-	-	-	-	0	0%	No
Clam	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	18	-	-	-	-	0	-	18	310	680	18	100%	No
Clam	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	18	7.30	7.30	39.0	98.0	15	3	-	57.0	74.0	3	17%	No
Clam	SVOCs	Total	Carbazole	ug/kg	Wet	18	9.10	9.10	35.0	40.0	18	-	-	-	-	0	0%	No
Clam	SVOCs	Total	Chrysene	ug/kg	Wet	18	1.30	13.0	2.50	13.0	18	-	-	-	-	0	0%	No
Clam	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	18	0.300	0.300	2.30	2.50	18	-	-	-	-	0	0%	No
Clam	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	18	16.0	48.0	35.0	48.0	18	-	-	-	-	0	0%	No
Clam	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	18	11.0	11.0	35.0	40.0	18	-	-	-	-	0	0%	No
Clam	SVOCs	Total	Fluoranthene	ug/kg	Wet	18	-	-	-	-	0	-	18	8.50	17.0	18	100%	No
Clam	SVOCs	Total	Fluorene	ug/kg	Wet	18	-	-	-	-	0	-	18	1.50	3.10	18	100%	No
Clam	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	18	0.320	0.320	2.30	2.50	11	7	-	0.800	2.00	7	39%	No
Clam	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	18	-	-	35.0	39.0	0	6	12	13.0	110	18	100%	No
Clam	SVOCs	Total	Phenanthrene	ug/kg	Wet	18	-	-	-	-	0	-	18	6.70	14.0	18	100%	No
Clam	SVOCs	Total	Pyrene	ug/kg	Wet	18	2.00	5.60	2.50	5.60	18	-	-	-	-	0	0%	No

Table I-11a
Data Summary for Random Reference Samples
Bradford Island - River Operable Unit
(7 of 7)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Minimum MDL of NDs	Maximum MDL of NDs	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Number of Detects Above MRL	Min Detected Value	Max Detected Value	Number of Detections	Detection Rate	Limited Data Set (< 8 samples)

Notes

% = percent
Dry = Dry weight
Max = maximum
MDL = method detection limit
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
Min = minimum
MRL = methode reporting limit
ND = non-detect
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
No. = number
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
Wet = Wet Weight

Table I-11b
PCB Congener Data Summary for Random Reference Samples
Bradford Island - River Operable Unit
(1 of 3)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Number of Samples	Minimum RDL of NDs	Maximum RDL of NDs	Number of NDs below RDL	Minimum EMPC Value	Maximum EMPC Value	Number of EMPC Results	Minimum Detected (not ND or EMPC)	Maximum Detected (not ND or EMPC)	Number of Detections (not ND or EMPC)	Detection Rate	Limited Data Set (<8 Samples)
Surface Water	Column	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	Wet	5	0.0410	0.0430	2	-	-	-	0.0470	0.0920	3	60%	Yes
Surface Water	Filter	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	Wet	5	0.0320	0.0390	2	-	-	-	0.0470	0.0710	3	60%	Yes
Surface Water	C+F	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	Wet	5	0.0820	0.0820	-	-	-	-	0.0790	0.151	4	80%	Yes
Surface Water	Column	81	3,4,4',5-Tetrachlorobiphenyl	pg/L	Wet	5	0.00620	0.00730	5	-	-	-	-	-	0	0%	Yes
Surface Water	Filter	81	3,4,4',5-Tetrachlorobiphenyl	pg/L	Wet	5	0.00430	0.00570	5	-	-	-	-	-	0	0%	Yes
Surface Water	C+F	81	3,4,4',5-Tetrachlorobiphenyl	pg/L	Wet	5	0.0109	0.0128	-	-	-	-	-	-	0	0%	Yes
Surface Water	Column	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.125	0.178	5	100%	Yes
Surface Water	Filter	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.262	0.403	5	100%	Yes
Surface Water	C+F	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.387	0.563	5	100%	Yes
Surface Water	Column	114	2,3,4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	0.00900	0.0170	5	-	-	-	-	-	0	0%	Yes
Surface Water	Filter	114	2,3,4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	0.0140	0.0220	5	-	-	-	-	-	0	0%	Yes
Surface Water	C+F	114	2,3,4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	0.0250	0.0340	-	-	-	-	-	-	0	0%	Yes
Surface Water	Column	118	2,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.378	0.593	5	100%	Yes
Surface Water	Filter	118	2,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.743	1.22	5	100%	Yes
Surface Water	C+F	118	2,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	1.12	1.77	5	100%	Yes
Surface Water	Column	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/L	Wet	5	0.00700	0.0140	5	-	-	-	-	-	0	0%	Yes
Surface Water	Filter	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/L	Wet	5	0.0170	0.0260	5	-	-	-	-	-	0	0%	Yes
Surface Water	C+F	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/L	Wet	5	0.0240	0.0400	-	-	-	-	-	-	0	0%	Yes
Surface Water	Column	126	3,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	0.00390	0.00700	5	-	-	-	-	-	0	0%	Yes
Surface Water	Filter	126	3,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	0.00550	0.00800	5	-	-	-	-	-	0	0%	Yes
Surface Water	C+F	126	3,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	0.0102	0.0150	-	-	-	-	-	-	0	0%	Yes
Surface Water	Column	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	Wet	5	0.0260	0.0360	5	-	-	-	-	-	0	0%	Yes
Surface Water	Filter	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.0850	0.115	5	100%	Yes
Surface Water	C+F	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.111	0.145	5	100%	Yes
Surface Water	Column	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	5	0.0130	0.0180	5	-	-	-	-	-	0	0%	Yes
Surface Water	Filter	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.0410	0.0700	5	100%	Yes
Surface Water	C+F	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	5	-	-	-	-	-	-	0.0540	0.0860	5	100%	Yes
Surface Water	Column	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	5	0.00100	0.00300	5	-	-	-	-	-	0	0%	Yes
Surface Water	Filter	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	5	0.00170	0.00340	5	-	-	-	-	-	0	0%	Yes
Surface Water	C+F	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	5	0.00300	0.00580	-	-	-	-	-	-	0	0%	Yes
Surface Water	Column	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/L	Wet	5	0.00140	0.00360	5	-	-	-	-	-	0	0%	Yes
Surface Water	Filter	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/L	Wet	5	0.00400	0.00600	5	-	-	-	-	-	0	0%	Yes
Surface Water	C+F	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/L	Wet	5	0.00600	0.00860	-	-	-	-	-	-	0	0%	Yes
Surface Water	Column		Total PCBs As Congeners (KM, capped)	pg/L	Wet	5	-	-	-	-	-	-	109	154	5	100%	Yes
Surface Water	Filter		Total PCBs As Congeners (KM, capped)	pg/L	Wet	5	-	-	-	-	-	-	21.2	26.7	5	100%	Yes
Surface Water	C+F		Total PCBs As Congeners (KM, capped)	pg/L	Wet	5	-	-	-	-	-	-	130	178	5	100%	Yes
Sediment	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Dry	18	-	-	-	-	-	-	0.434	2.01	18	100%	No
Sediment	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Dry	18	0.0556	0.0988	12	0.0490	0.100	4	0.0580	0.143	2	11%	No
Sediment	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Dry	18	-	-	-	-	-	-	2.96	27.5	18	100%	No
Sediment	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Dry	18	-	-	-	0.337	0.352	2	0.154	1.63	16	89%	No
Sediment	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	18	-	-	-	-	-	-	8.31	70.5	18	100%	No
Sediment	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Dry	18	0.309	0.446	7	0.172	0.235	2	0.272	1.22	9	50%	No
Sediment	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	18	0.0583	0.139	2	0.0930	0.185	7	0.0840	0.337	9	50%	No

Table I-11b
PCB Congener Data Summary for Random Reference Samples
Bradford Island - River Operable Unit
(2 of 3)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Number of Samples	Minimum RDL of NDs	Maximum RDL of NDs	Number of NDs below RDL	Minimum EMPC Value	Maximum EMPC Value	Number of EMPC Results	Minimum Detected (not ND or EMPC)	Maximum Detected (not ND or EMPC)	Number of Detections (not ND or EMPC)	Detection Rate	Limited Data Set (<8 Samples)
Sediment	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Dry	18	-	-	-	-	-	-	0.930	8.50	18	100%	No
Sediment	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	18	1.01	1.10	2	0.482	0.482	1	0.761	3.84	15	83%	No
Sediment	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	18	0.0542	0.200	17	0.0860	0.0860	1	-	-	0	0%	No
Sediment	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Dry	18	-	-	-	0.159	0.357	4	0.0720	0.573	14	78%	No
Sediment	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Dry	18	-	-	-	-	-	-	0.161	1.20	18	100%	No
Crayfish	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	1.30	4.66	17	100%	No
Crayfish	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	17	0.104	0.401	11	0.146	0.250	4	0.167	0.176	2	12%	No
Crayfish	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	1.97	24.8	17	100%	No
Crayfish	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	2.36	8.15	17	100%	No
Crayfish	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	52.6	323	17	100%	No
Crayfish	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	1.93	7.36	17	100%	No
Crayfish	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	0.207	1.96	9	0.243	0.261	2	0.377	0.530	6	35%	No
Crayfish	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	12.3	39.1	17	100%	No
Crayfish	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	17	-	-	-	-	-	-	8.16	30.1	17	100%	No
Crayfish	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	17	0.0911	0.325	17	-	-	-	-	-	0	0%	No
Crayfish	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	17	-	-	-	1.14	1.14	1	0.767	2.20	16	94%	No
Crayfish	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	17	-	-	-	-	-	-	0.366	1.94	17	100%	No
Smallmouth Bass	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	19	-	-	-	-	-	-	25.4	195	19	100%	No
Smallmouth Bass	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	19	2.53	20.5	7	-	-	-	2.02	15.9	12	63%	No
Smallmouth Bass	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	19	-	-	-	-	-	-	498	23,400	19	100%	No
Smallmouth Bass	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	19	-	-	-	68.4	85.6	2	29.2	2,910	17	89%	No
Smallmouth Bass	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	19	-	-	-	-	-	-	1,330	98,600	19	100%	No
Smallmouth Bass	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	19	-	-	-	43.5	47.0	2	24.8	1,830	17	89%	No
Smallmouth Bass	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	19	10.7	30.1	5	11.6	11.6	1	5.61	74.6	13	68%	No
Smallmouth Bass	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	19	-	-	-	-	-	-	194	20,000	19	100%	No
Smallmouth Bass	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	19	-	-	-	-	-	-	84.3	6,540	19	100%	No
Smallmouth Bass	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	19	1.30	10.9	19	-	-	-	-	-	0	0%	No
Smallmouth Bass	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	19	-	-	-	16.5	23.2	4	13.3	532	15	79%	No
Smallmouth Bass	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	19	-	-	-	-	-	-	22.1	499	19	100%	No
Sculpin	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	18	-	-	-	-	-	-	5.19	25.9	18	100%	No
Sculpin	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	18	0.711	0.711	1	0.689	2.21	17	-	-	0	0%	No
Sculpin	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	18	-	-	-	-	-	-	358	1,040	18	100%	No
Sculpin	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	18	-	-	-	-	-	-	25.0	82.1	18	100%	No
Sculpin	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	18	-	-	-	-	-	-	1,050	3,870	18	100%	No
Sculpin	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	18	-	-	-	32.0	32.0	1	15.3	47.0	17	94%	No
Sculpin	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	18	-	-	-	3.35	3.35	1	2.54	5.93	17	94%	No
Sculpin	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	18	-	-	-	-	-	-	140	464	18	100%	No
Sculpin	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	18	-	-	-	-	-	-	51.9	175	18	100%	No
Sculpin	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	18	2.14	9.29	18	-	-	-	-	-	0	0%	No
Sculpin	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	18	0.318	0.318	1	11.0	11.0	1	5.20	17.2	16	89%	No
Sculpin	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	18	-	-	-	-	-	-	12.2	38.3	18	100%	No
Clam	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	18	-	-	-	-	-	-	33.2	46.8	18	100%	No

Table I-11b
PCB Congener Data Summary for Random Reference Samples
Bradford Island - River Operable Unit
(3 of 3)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Number of Samples	Minimum RDL of NDs	Maximum RDL of NDs	Number of NDs below RDL	Minimum EMPC Value	Maximum EMPC Value	Number of EMPC Results	Minimum Detected (not ND or EMPC)	Maximum Detected (not ND or EMPC)	Number of Detections (not ND or EMPC)	Detection Rate	Limited Data Set (<8 Samples)
Clam	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	18	-	-	-	0.961	2.23	8	1.80	2.75	10	56%	No
Clam	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	18	-	-	-	-	-	-	350	556	18	100%	No
Clam	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	18	-	-	-	-	-	-	21.3	33.0	18	100%	No
Clam	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	18	-	-	-	-	-	-	1,910	2,820	18	100%	No
Clam	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	18	-	-	-	-	-	-	36.8	54.0	18	100%	No
Clam	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	18	5.88	5.88	1	-	-	-	4.03	5.64	17	94%	No
Clam	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	18	-	-	-	-	-	-	123	166	18	100%	No
Clam	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	18	-	-	-	-	-	-	123	170	18	100%	No
Clam	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	18	0.698	1.73	18	-	-	-	-	-	0	0%	No
Clam	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	18	-	-	-	1.51	1.51	1	1.44	2.41	17	94%	No
Clam	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	18	-	-	-	-	-	-	26.9	34.5	18	100%	No

Notes
For C+F RDL values, the values shown are the sum of the RDLs and/or EMPCs for the ND column and filter results.

% = percent
Dry = Dry weight
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
ND = non-detect
PCB = polychlorinated biphenyl
pg/kg = picograms per kilogram
pg/L = picograms per liter
RDL = reported detection limit
Wet = Wet Weight

Table I-12
Statistical Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 6)

											Statistics - ND censored at the MDL				Statistics - ND censored at the MRL			
Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	Metals	Total	Aluminum	0-1 ft	mg/kg	10	10	14,000	15,200	19,100	-	-	16,200	Use 95% Student's-t UCL	-	-	16,200	Use 95% Student's-t UCL
Soil	Metals	Total	Aluminum	0-3 ft	mg/kg	12	12	13,000	13,000	19,100	-	-	15,200	Use 95% Student's-t UCL	-	-	15,200	Use 95% Student's-t UCL
Soil	Metals	Total	Aluminum	0-10 ft	mg/kg	26	26	10,700	10,600	23,100	-	-	12,500	Use 95% Student's-t UCL	-	-	12,500	Use 95% Student's-t UCL
Soil	Metals	Total	Antimony	0-1 ft	mg/kg	20	4	2.80	3.35	4.20	0.815	1.21	1.36	95% KM (t) UCL	0.815	1.21	1.36	95% KM (t) UCL
Soil	Metals	Total	Antimony	0-3 ft	mg/kg	22	6	2.44	2.71	4.20	0.958	1.23	1.48	95% KM (t) UCL	0.958	1.23	1.48	95% KM (t) UCL
Soil	Metals	Total	Antimony	0-10 ft	mg/kg	36	20	2.29	1.22	8.19	1.50	1.86	2.05	95% KM (t) UCL	1.50	1.86	2.05	95% KM (t) UCL
Soil	Metals	Total	Arsenic	0-1 ft	mg/kg	21	21	5.33	3.70	30.1	-	-	11.1	Use 95% Chebyshev (Mean, Sd) UCL	-	-	11.1	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Arsenic	0-3 ft	mg/kg	23	23	5.30	3.70	30.1	-	-	10.5	Use 95% Chebyshev (Mean, Sd) UCL	-	-	10.5	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Arsenic	0-10 ft	mg/kg	37	37	4.73	3.70	30.1	-	-	8.11	Use 95% Chebyshev (Mean, Sd) UCL	-	-	8.11	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Barium	0-1 ft	mg/kg	21	21	116	111	242	-	-	132	Use 95% Approximate Gamma UCL	-	-	132	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Barium	0-3 ft	mg/kg	23	23	114	111	242	-	-	130	Use 95% Approximate Gamma UCL	-	-	130	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Barium	0-10 ft	mg/kg	37	37	104	108	242	-	-	117	Use 95% Approximate Gamma UCL	-	-	117	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Beryllium	0-1 ft	mg/kg	21	17	0.396	0.400	0.576	0.378	0.0842	0.411	95% KM (t) UCL	0.380	0.0834	0.413	95% KM (t) UCL
Soil	Metals	Total	Beryllium	0-3 ft	mg/kg	23	17	0.396	0.400	0.576	0.371	0.0834	0.402	95% KM (t) UCL	0.376	0.0820	0.406	95% KM (t) UCL
Soil	Metals	Total	Beryllium	0-10 ft	mg/kg	37	26	0.344	0.300	0.576	0.298	0.111	0.332	95% KM (Percentile Bootstrap) UCL	0.321	0.0987	0.351	95% KM (t) UCL
Soil	Metals	Total	Cadmium	0-1 ft	mg/kg	21	15	0.940	0.670	2.09	0.769	0.524	0.974	95% KM (Percentile Bootstrap) UCL	0.769	0.524	0.985	95% KM (Percentile Bootstrap) UCL
Soil	Metals	Total	Cadmium	0-3 ft	mg/kg	23	17	1.08	0.720	3.54	0.888	0.756	1.17	95% KM (Percentile Bootstrap) UCL	0.888	0.756	1.19	95% KM (Percentile Bootstrap) UCL
Soil	Metals	Total	Cadmium	0-10 ft	mg/kg	37	31	1.28	1.23	3.54	1.13	0.783	1.37	95% KM (BCA) UCL	1.13	0.783	1.38	95% KM (BCA) UCL
Soil	Metals	Total	Chromium	0-1 ft	mg/kg	21	21	77.2	23.0	801	-	-	242	Use 95% Chebyshev (Mean, Sd) UCL	-	-	242	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Chromium	0-3 ft	mg/kg	23	23	190	23.1	1,950	-	-	594	Use 95% Chebyshev (Mean, Sd) UCL	-	-	594	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Chromium	0-10 ft	mg/kg	37	37	242	27.0	2,300	-	-	656	Use 95% Chebyshev (Mean, Sd) UCL	-	-	656	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Cobalt	0-1 ft	mg/kg	10	10	11.1	10.2	22.7	-	-	14.2	Use 95% Approximate Gamma UCL	-	-	14.2	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Cobalt	0-3 ft	mg/kg	12	12	14.5	11.0	41.0	-	-	20.2	Use 95% Approximate Gamma UCL	-	-	20.2	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Cobalt	0-10 ft	mg/kg	26	26	15.3	12.0	42.3	-	-	18.6	Use 95% Approximate Gamma UCL	-	-	18.6	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Copper	0-1 ft	mg/kg	21	21	73.6	45.4	494	-	-	170	Use 95% Chebyshev (Mean, Sd) UCL	-	-	170	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Copper	0-3 ft	mg/kg	23	23	85.2	45.4	494	-	-	191	Use 95% Chebyshev (Mean, Sd) UCL	-	-	191	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Copper	0-10 ft	mg/kg	37	37	79.0	43.2	494	-	-	152	Use 95% Chebyshev (Mean, Sd) UCL	-	-	152	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Lead	0-1 ft	mg/kg	21	21	211	131	741	-	-	332	Use 95% Approximate Gamma UCL	-	-	332	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Lead	0-3 ft	mg/kg	29	29	342	147	1,660	-	-	511	Use 95% Approximate Gamma UCL	-	-	511	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Lead	0-10 ft	mg/kg	43	43	366	157	1,660	-	-	796	Use 95% H-UCL	-	-	796	Use 95% H-UCL
Soil	Metals	Total	Manganese	0-1 ft	mg/kg	21	21	382	366	720	-	-	437	Use 95% Approximate Gamma UCL	-	-	437	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Manganese	0-3 ft	mg/kg	23	23	462	367	1,710	-	-	585	or 95% Modified-t UCL	-	-	585	or 95% Modified-t UCL
Soil	Metals	Total	Manganese	0-10 ft	mg/kg	37	37	463	372	1,710	-	-	546	or 95% Modified-t UCL	-	-	546	or 95% Modified-t UCL
Soil	Metals	Total	Mercury	0-1 ft	mg/kg	23	18	0.524	0.160	4.15	0.427	0.851	1.57	97.5% KM (Chebyshev) UCL	0.427	0.851	1.57	97.5% KM (Chebyshev) UCL
Soil	Metals	Total	Mercury	0-3 ft	mg/kg	25	20	0.478	0.126	4.15	0.397	0.823	1.45	97.5% KM (Chebyshev) UCL	0.397	0.823	1.45	97.5% KM (Chebyshev) UCL
Soil	Metals	Total	Mercury	0-10 ft	mg/kg	39	34	0.366	0.120	4.15	0.327	0.686	1.02	97.5% KM (Chebyshev) UCL	0.327	0.686	1.02	97.5% KM (Chebyshev) UCL
Soil	Metals	Total	Nickel	0-1 ft	mg/kg	21	21	58.4	20.0	570	-	-	175	Use 95% Chebyshev (Mean, Sd) UCL	-	-	175	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Nickel	0-3 ft	mg/kg	23	23	148	20.2	1,610	-	-	472	Use 95% Chebyshev (Mean, Sd) UCL	-	-	472	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Nickel	0-10 ft	mg/kg	37	37	166	21.0	1,760	-	-	455	Use 95% Chebyshev (Mean, Sd) UCL	-	-	455	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Selenium	0-1 ft	mg/kg	21	3	0.451	0.300	0.848	0.245	0.144	0.315	95% KM (t) UCL	0.245	0.144	0.315	95% KM (t) UCL
Soil	Metals	Total	Selenium	0-3 ft	mg/kg	23	5	0.492	0.300	0.879	0.276	0.192	0.356	95% KM (t) UCL	0.276	0.192	0.356	95% KM (t) UCL
Soil	Metals	Total	Selenium	0-10 ft	mg/kg	37	11	0.332	0.226	0.879	0.190	0.176	0.262	95% KM (% Bootstrap) UCL	0.223	0.167	0.277	95% KM (t) UCL
Soil	Metals	Total	Silver	0-1 ft	mg/kg	21	7	0.548	0.400	1.50	0.346	0.286	0.468	95% KM (t) UCL	0.346	0.286	0.468	95% KM (t) UCL
Soil	Metals	Total	Silver	0-3 ft	mg/kg	23	9	0.523	0.400	1.50	0.327	0.304	0.450	95% KM (t) UCL	0.327	0.304	0.450	95% KM (t) UCL
Soil	Metals	Total	Silver	0-10 ft	mg/kg	37	23	0.503	0.300	1.52	0.387	0.403	0.506	95% KM (Percentile Bootstrap) UCL	0.387	0.403	0.505	95% KM (Percentile Bootstrap) UCL
Soil	Metals	Total	Thallium	0-1 ft	mg/kg	21	2	0.237	0.237	0.378	0.109	0.0602	0.141	95% KM (t) UCL	0.109	0.0602	0.141	95% KM (t) UCL
Soil	Metals	Total	Thallium	0-3 ft	mg/kg	23	4	0.154	0.0891	0.378	0.0917	0.0629	0.122	95% KM (t) UCL	0.0917	0.0629	0.122	95% KM (t) UCL
Soil	Metals	Total	Thallium	0-10 ft	mg/kg	37	18	0.118	0.0974	0.378	0.109	0.0591	0.129	95% KM (t) UCL	0.109	0.0591	0.129	95% KM (t) UCL
Soil	Metals	Total	Vanadium	0-1 ft	mg/kg	10	10	42.3	39.4	56.3	-	-	47.0	Use 95% Student's-t UCL	-	-	47.0	Use 95% Student's-t UCL
Soil	Metals	Total	Vanadium	0-3 ft	mg/kg	12	12	43.2	41.0	56.3	-	-	47.6	Use 95% Student's-t UCL	-	-	47.6	Use 95% Student's-t UCL
Soil	Metals	Total	Vanadium	0-10 ft	mg/kg	26	26	48.0	42.6	93.4	-	-	54.4	Use 95% Approximate Gamma UCL	-	-	54.4	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Zinc	0-1 ft	mg/kg	21	21	164	144	635	-	-	207	Use 95% Approximate Gamma UCL	-	-	207	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Zinc	0-3 ft	mg/kg	23	23	204	144	1,140	-	-	417	Use 95% Chebyshev (Mean, Sd) UCL	-	-	417	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Zinc	0-10 ft	mg/kg	37	37	204	151	1,140	-	-	245	Use 95% H-UCL	-	-	245	Use 95% H-UCL
Soil	Butyltins	Total	Dibutyltin	0-1 ft	ug/kg	7	2	20.1	20.1	20.2	20.0	0.0700	-	-	20.0	0.0700	-	-
Soil	Butyltins	Total	Dibutyltin	0-3 ft	ug/kg	9	2	20.1	20.1	20.2	20.0	0.0629	20.1	95% KM (t) UCL	20.0	0.0629	20.1	95% KM (t) UCL
Soil	Butyltins	Total	Dibutyltin	0-10 ft	ug/kg	22	2	20.1	20.1	20.2	20.0	0.0417	20.0	95% KM (t) UCL	20.0	0.0426	20.0	95% KM (t) UCL
Soil	Butyltins	Total	Monobutyltin	0-1 ft	ug/kg	7	2	23.5	23.5	38.0	13.2	10.1	-	-	13.2	10.1	-	-
Soil	Butyltins	Total	Monobutyltin	0-3 ft	ug/kg	9	2	23.5	23.5	38.0	12.3	9.09	38.0	95% KM (BCA) UCL	12.3	9.09	38.0	95% KM (BCA) UCL
Soil	Butyltins	Total	Monobutyltin	0-10 ft	ug/kg	22	2	23.5	23.5	38.0	10.4	6.02	-	-	10.4	6.02	38.0	95% KM (BCA) UCL
Soil	Butyltins	Total	Tributyltin	0-1 ft	ug/kg	7	3	59.7	9.01	165	28.5	55.7	-	-	28.5	55.7	-	-
Soil	Butyltins	Total	Tributyltin	0-3 ft	ug/kg	9	4	48.6	12.2	165	24.5	49.8	60.1	95% KM (t) UCL	24.5	49.8	60.1	95% KM (t) UCL
Soil	Butyltins	Total	Tributyltin	0-10 ft	ug/kg	22	4	48.6	12.2	165	13.0	33.2	27.1	95% KM (t) UCL	13.1	33.2	27.2	95% KM (t) UCL
Soil	Herbicides	Total	2,4,5-T	0-1 ft	ug/kg	12	2	78.0	78.0	93.0	65.5	8.29	71.6	95% KM (t) UCL	65.5	8.29	71.6	95% KM (t) UCL
Soil	Herbicides	Total	2,4,5-T	0-3 ft	ug/kg	14	2	78.0	78.0	93.0	65.1	7.73	70.3	95% KM (t) UCL	65.1	7.73	70.3	95% KM (t) UCL
Soil	Herbicides	Total	2,4,5-T	0-10 ft	ug/kg	21	2	78.0	78.0	93.0	64.4	6.39	67.8	95% KM (t) UCL	64.4	6.39	67.8	95% KM (t) UCL
Soil	Herbicides	Total	Dichloroprop	0-1 ft	ug/kg	12	2	175	175	180	171	3.50	175	95% KM (t) UCL	171	3.50	175	95% KM (t) UCL

Table I-12
Statistical Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(2 of 6)

Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	Herbicides	Total	Dichloroprop	0-3 ft	ug/kg	14	2	175	175	180	171	3.14	174	95% KM (t) UCL	171	3.14	174	95% KM (t) UCL
Soil	Herbicides	Total	Dichloroprop	0-10 ft	ug/kg	21	2	175	175	180	171	2.42	172	95% KM (t) UCL	171	2.42	172	95% KM (t) UCL
Soil	Herbicides	Total	MCPP	0-1 ft	ug/kg	12	2	11,800	11,800	14,000	10,100	1,580	11,700	95% KM (t) UCL	10,100	1,580	11,700	95% KM (t) UCL
Soil	Herbicides	Total	MCPP	0-3 ft	ug/kg	14	2	11,800	11,800	14,000	10,000	1,410	11,200	95% KM (t) UCL	10,000	1,410	11,200	95% KM (t) UCL
Soil	Herbicides	Total	MCPP	0-10 ft	ug/kg	21	2	11,800	11,800	14,000	9,780	1,090	10,400	95% KM (t) UCL	9,780	1,090	10,400	95% KM (t) UCL
Soil	Pesticides	Total	4,4'-DDT	0-1 ft	ug/kg	21	7	16.5	14.0	28.0	9.76	6.08	12.2	95% KM (t) UCL	9.76	6.08	12.2	95% KM (t) UCL
Soil	Pesticides	Total	4,4'-DDT	0-3 ft	ug/kg	23	7	16.5	14.0	28.0	9.47	5.89	11.8	95% KM (t) UCL	9.47	5.89	11.8	95% KM (t) UCL
Soil	Pesticides	Total	4,4'-DDT	0-10 ft	ug/kg	30	7	16.5	14.0	28.0	8.75	5.32	10.5	95% KM (t) UCL	8.75	5.32	10.5	95% KM (t) UCL
Soil	Pesticides	Total	Chlordane (technical)	0-1 ft	ug/kg	1	1	1,560	1,560	1,560	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Chlordane (technical)	0-3 ft	ug/kg	3	3	573	92.7	1,560	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Chlordane (technical)	0-10 ft	ug/kg	10	6	372	79.2	1,560	243	452	1,220	97.5% KM (Chebyshev) UCL	243	452	1,220	97.5% KM (Chebyshev) UCL
Soil	Pesticides	Total	Heptachlor	0-1 ft	ug/kg	21	1	2.83	2.83	2.83	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Heptachlor	0-3 ft	ug/kg	23	2	2.95	2.95	3.07	2.84	0.0489	2.86	95% KM (t) UCL	2.84	0.0489	2.86	95% KM (t) UCL
Soil	Pesticides	Total	Heptachlor	0-10 ft	ug/kg	30	2	2.95	2.95	3.07	2.84	0.0431	2.86	95% KM (t) UCL	2.84	0.0431	2.86	95% KM (t) UCL
Soil	PCB Aroclors	Total	Aroclor 1248	0-1 ft	ug/kg	27	2	515	515	968	95.1	171	386	97.5% KM (Chebyshev) UCL	95.1	171	386	97.5% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Aroclor 1248	0-3 ft	ug/kg	29	2	515	515	968	92.8	165	364	97.5% KM (Chebyshev) UCL	92.8	165	364	97.5% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Aroclor 1248	0-10 ft	ug/kg	43	2	515	515	968	82.6	137	-	-	82.6	137	-	-
Soil	PCB Aroclors	Total	Aroclor 1254	0-1 ft	ug/kg	27	9	29.0	24.0	78.6	16.2	16.5	22.5	95% KM (t) UCL	16.5	16.3	22.8	95% KM (t) UCL
Soil	PCB Aroclors	Total	Aroclor 1254	0-3 ft	ug/kg	29	11	37.6	26.0	104	20.4	23.2	31.1	95% KM (Percentile Bootstrap) UCL	20.7	23.0	31.7	95% KM (Percentile Bootstrap) UCL
Soil	PCB Aroclors	Total	Aroclor 1254	0-10 ft	ug/kg	43	16	67.9	32.1	499	30.0	75.6	60.4	95% KM (BCA) UCL	30.5	75.4	60.8	95% KM (BCA) UCL
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	ug/kg	27	22	94.6	47.2	660	81.2	138	251	97.5% KM (Chebyshev) UCL	81.2	138	251	97.5% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Aroclor 1260	0-3 ft	ug/kg	29	24	92.1	47.2	660	80.1	133	190	95% KM (Chebyshev) UCL	80.1	133	190	95% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Aroclor 1260	0-10 ft	ug/kg	43	36	87.6	44.2	660	75.5	127	161	95% KM (Chebyshev) UCL	75.7	127	161	95% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	ug/kg	27	22	177	97.5	996	154	224	429	97.5% KM (Chebyshev) UCL	158	224	350	95% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-3 ft	ug/kg	29	24	175	104	996	154	216	410	97.5% KM (Chebyshev) UCL	158	216	337	95% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-10 ft	ug/kg	43	36	164	82.0	996	143	207	283	95% KM (Chebyshev) UCL	150	207	289	95% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	mg/kg	18	17	650	126	5,100	615	1,260	3,670	99% KM (Chebyshev) UCL	615	1,260	3,670	99% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-3 ft	mg/kg	20	19	609	126	5,100	579	1,210	3,340	99% KM (Chebyshev) UCL	579	1,210	3,340	99% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-10 ft	mg/kg	34	30	1,280	194	9,740	1,130	2,390	5,270	99% KM (Chebyshev) UCL	1,130	2,390	5,270	99% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	mg/kg	18	17	3,280	676	23,900	3,110	6,020	17,700	99% KM (Chebyshev) UCL	3,110	6,020	17,700	99% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Residual Range Organics	0-3 ft	mg/kg	20	19	3,020	676	23,900	2,880	5,750	16,000	99% KM (Chebyshev) UCL	2,880	5,750	16,000	99% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Residual Range Organics	0-10 ft	mg/kg	34	32	5,740	690	41,900	5,410	11,100	24,700	99% KM (Chebyshev) UCL	5,410	11,100	24,700	99% KM (Chebyshev) UCL
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	mg/kg	13	3	356	267	586	247	99.0	307	95% KM (t) UCL	247	99.0	307	95% KM (t) UCL
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-3 ft	mg/kg	15	4	268	240	586	73.8	159	157	95% KM (t) UCL	73.8	159	157	95% KM (t) UCL
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-10 ft	mg/kg	22	6	179	109	586	50.9	135	105	95% KM (t) UCL	50.9	135	105	95% KM (t) UCL
Soil	SVOCs	Total	Benzoic Acid	0-1 ft	ug/kg	23	7	173	130	553	123	142	200	95% KM (t) UCL	126	146	206	95% KM (t) UCL
Soil	SVOCs	Total	Benzoic Acid	0-3 ft	ug/kg	25	9	189	140	553	148	139	218	95% KM (t) UCL	150	142	222	95% KM (t) UCL
Soil	SVOCs	Total	Benzoic Acid	0-10 ft	ug/kg	32	10	200	166	553	114	134	176	95% KM (Percentile Bootstrap) UCL	152	133	214	95% KM (t) UCL
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	ug/kg	27	24	2,010	425	21,000	1,800	4,030	9,680	99% KM (Chebyshev) UCL	1,840	4,020	9,730	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-3 ft	ug/kg	29	26	1,970	595	21,000	1,780	3,890	6,380	97.5% KM (Chebyshev) UCL	1,820	3,880	6,430	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-10 ft	ug/kg	36	33	1,800	770	21,000	1,670	3,510	4,260	95% KM (Chebyshev) UCL	1,700	3,510	4,300	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	ug/kg	26	3	52.6	67.2	68.7	28.1	15.6	36.6	95% KM (t) UCL	29.1	16.6	38.7	95% KM (t) UCL
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-3 ft	ug/kg	28	3	52.6	67.2	68.7	27.4	14.8	34.9	95% KM (t) UCL	29.1	16.6	38.7	95% KM (t) UCL
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-10 ft	ug/kg	35	5	69.0	67.2	152	31.8	28.1	42.7	95% KM (t) UCL	35.5	30.4	48.8	95% KM (t) UCL
Soil	SVOCs	Total	Carbazole	0-1 ft	ug/kg	27	19	384	144	2,650	279	547	751	95% KM (Chebyshev) UCL	280	547	752	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Carbazole	0-3 ft	ug/kg	29	21	510	210	2,840	378	706	964	95% KM (Chebyshev) UCL	379	706	964	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Carbazole	0-10 ft	ug/kg	36	26	546	215	2,840	402	684	909	95% KM (Chebyshev) UCL	403	684	910	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Dibenzofuran	0-1 ft	ug/kg	27	11	160	67.7	810	84.0	159	152	95% KM (BCA) UCL	87.3	165	162	95% KM (BCA) UCL
Soil	SVOCs	Total	Dibenzofuran	0-3 ft	ug/kg	29	13	174	76.0	810	96.2	165	164	95% KM (BCA) UCL	99.9	170	171	95% KM (BCA) UCL
Soil	SVOCs	Total	Dibenzofuran	0-10 ft	ug/kg	36	18	154	79.5	810	93.4	152	138	95% KM (t) UCL	97.8	155	144	95% KM (t) UCL
Soil	SVOCs	Total	Diethyl Phthalate	0-1 ft	ug/kg	26	3	55.8	50.0	73.4	46.2	7.17	50.0	95% KM (t) UCL	46.8	7.86	51.3	95% KM (t) UCL
Soil	SVOCs	Total	Diethyl Phthalate	0-3 ft	ug/kg	28	5	45.6	44.0	73.4	33.8	11.3	38.9	95% KM (t) UCL	34.8	12.2	40.9	95% KM (t) UCL
Soil	SVOCs	Total	Diethyl Phthalate	0-10 ft	ug/kg	35	6	43.1	37.9	73.4	32.4	9.79	36.1	95% KM (t) UCL	34.5	11.8	40.1	95% KM (t) UCL
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	ug/kg	26	4	496	84.5	1,800	98.5	342	232	95% KM (t) UCL	104	355	248	95% KM (t) UCL
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-3 ft	ug/kg	28	4	496	84.5	1,800	93.6	330	217	95% KM (t) UCL	98.5	342	231	95% KM (t) UCL
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-10 ft	ug/kg	35	4	496	84.5	1,800	81.0	296	180	95% KM (t) UCL	84.1	305	189	95% KM (t) UCL
Soil	SVOCs	Total	Pentachlorophenol	0-1 ft	ug/kg	27	2	136	136	201	81.2	33.2	103	95% KM (t) UCL	81.2	33.2	103	95% KM (t) UCL
Soil	SVOCs	Total	Pentachlorophenol	0-3 ft	ug/kg	29	2	136	136	201	80.1	31.2	98.8	95% KM (t) UCL	80.1	31.2	98.8	95% KM (t) UCL
Soil	SVOCs	Total	Pentachlorophenol	0-10 ft	ug/kg	36	2	136	136	201	77.6	26.3	90.7	95% KM (t) UCL	77.6	26.3	90.7	95% KM (t) UCL
Soil	SVOCs	Total	2-Methylnaphthalene	0-1 ft	ug/kg	27	8	320	66.5	1,530	106	304	213	95% KM (t) UCL	106	304	213	95% KM (t) UCL
Soil	SVOCs	Total	2-Methylnaphthalene	0-3 ft	ug/kg	29	9	290	57.0	1,530	101	294	199	95% KM (t) UCL	101	294	199	95% KM (t) UCL
Soil	SVOCs	Total	2-Methylnaphthalene	0-10 ft	ug/kg	36	12	224	42.7	1,530	85.0	266	170	95% KM (BCA) UCL	85.0	266	186	95% KM (BCA) UCL
Soil	SVOCs	Total	Acenaphthene	0-1 ft	ug/kg	27	19	353	168	2,600	261	523	713	95% KM (Chebyshev) UCL	262	523	713	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Acenaphthene	0-3 ft	ug/kg	33	25	507	171	2,600	395	669	913	95% KM (Chebyshev) UCL	395	669	914	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Acenaphthene	0-10 ft	ug/kg	44	34	553	243	3,040	436	719	915	95% KM (Chebyshev) UCL	441	718	921	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Acenaphthylene	0-1 ft	ug/kg	27	7	32.1	19.0	78.1	19.9	20.1	29.2	95% KM (t) UCL	20.7	21.0	30.8	95% KM (t) UCL
Soil	SVOCs	Total	Acenaphthylene	0-3 ft	ug/kg	33	13	36.0	19.0	111	25.5	25.9	34.9	95% KM (t) UCL	26.2	26.7	36.2	95% KM (t) UCL
Soil	SVOCs	Total	Acenaphthylene	0-10 ft	ug/kg	44	19	37.4	22.0	111	23.9	26.1	31.7	95% KM (t) UCL	26.7	25.2	34.5	95% KM (t) UCL

Table I-12
Statistical Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(3 of 6)

Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	SVOCs	Total	Anthracene	0-1 ft	ug/kg	27	23	458	110	2,700	398	613	924	95% KM (Chebyshev) UCL	398	613	924	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Anthracene	0-3 ft	ug/kg	33	29	859	400	8,440	761	1,510	1,930	95% KM (Chebyshev) UCL	761	1,510	1,930	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Anthracene	0-10 ft	ug/kg	44	39	1,240	503	8,440	1,100	1,900	2,370	95% KM (Chebyshev) UCL	1,100	1,900	2,370	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Fluorene	0-1 ft	ug/kg	27	16	197	102	1,200	130	239	222	95% KM (BCA) UCL	133	239	217	95% KM (BCA) UCL
Soil	SVOCs	Total	Fluorene	0-3 ft	ug/kg	33	22	287	142	1,610	203	343	324	95% KM (BCA) UCL	205	342	315	95% KM (BCA) UCL
Soil	SVOCs	Total	Fluorene	0-10 ft	ug/kg	44	32	330	178	1,610	249	375	500	95% KM (Chebyshev) UCL	251	374	501	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Naphthalene	0-1 ft	ug/kg	27	11	213	78.1	823	98.5	212	172	95% KM (t) UCL	98.5	212	172	95% KM (t) UCL
Soil	SVOCs	Total	Naphthalene	0-3 ft	ug/kg	33	17	166	57.0	823	98.7	193	157	95% KM (BCA) UCL	98.7	193	158	95% KM (BCA) UCL
Soil	SVOCs	Total	Naphthalene	0-10 ft	ug/kg	44	24	203	56.6	1,710	120	296	319	95% KM (Chebyshev) UCL	120	296	319	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Phenanthrene	0-1 ft	ug/kg	27	26	1,600	360	12,000	1,540	2,480	3,660	95% KM (Chebyshev) UCL	1,540	2,480	3,660	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Phenanthrene	0-3 ft	ug/kg	33	32	2,580	1,360	21,900	2,500	4,260	5,780	95% KM (Chebyshev) UCL	2,500	4,260	5,780	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Phenanthrene	0-10 ft	ug/kg	44	42	2,930	1,490	21,900	2,800	4,370	5,700	95% KM (Chebyshev) UCL	2,840	4,360	5,750	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	27	26	3,813	1,452	18,674	2,549	3,812	5,810	95% KM (Chebyshev) UCL	2,566	3,828	5,841	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	ug/kg	33	32	4,992	2,616	34,767	4,065	6,694	9,226	95% KM (Chebyshev) UCL	4,079	6,699	9,243	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)anthracene	0-1 ft	ug/kg	27	25	3,200	960	32,000	2,970	6,280	8,340	95% KM (Chebyshev) UCL	2,970	6,280	8,350	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)anthracene	0-3 ft	ug/kg	33	31	4,600	1,400	32,000	4,330	7,300	9,960	95% KM (Chebyshev) UCL	4,330	7,300	9,960	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)anthracene	0-10 ft	ug/kg	44	42	5,920	3,560	32,000	5,650	8,160	11,100	95% KM (Chebyshev) UCL	5,650	8,160	11,100	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)pyrene	0-1 ft	ug/kg	27	25	3,440	1,200	33,000	3,180	6,450	8,700	95% KM (Chebyshev) UCL	3,180	6,450	8,700	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)pyrene	0-3 ft	ug/kg	33	31	5,200	1,600	34,000	4,890	8,130	11,200	95% KM (Chebyshev) UCL	4,890	8,130	11,200	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)pyrene	0-10 ft	ug/kg	44	42	5,890	3,240	34,000	5,620	7,740	10,800	95% KM (Chebyshev) UCL	5,620	7,730	10,800	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	ug/kg	24	23	4,520	680	65,000	4,330	12,900	16,000	95% KM (Chebyshev) UCL	4,330	12,900	16,000	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-3 ft	ug/kg	28	27	5,210	1,200	65,000	5,030	12,100	15,200	95% KM (Chebyshev) UCL	5,030	12,100	15,200	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-10 ft	ug/kg	28	27	5,210	1,200	65,000	5,030	12,100	15,200	95% KM (Chebyshev) UCL	5,030	12,100	15,200	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	ug/kg	27	24	1,780	470	18,000	1,580	3,510	4,590	95% KM (Chebyshev) UCL	1,580	3,510	4,590	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-3 ft	ug/kg	33	30	2,740	830	18,000	2,490	4,320	5,820	95% KM (Chebyshev) UCL	2,490	4,320	5,830	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-10 ft	ug/kg	44	41	3,050	1,800	18,000	2,850	4,040	5,540	95% KM (Chebyshev) UCL	2,850	4,040	5,540	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	ug/kg	24	23	3,610	340	65000	3,460	12,900	30,200	99% KM (Chebyshev) UCL	3,460	12,900	30,200	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-3 ft	ug/kg	28	27	3,560	990	65000	3,440	11,900	26,300	99% KM (Chebyshev) UCL	3,440	11,900	26,300	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-10 ft	ug/kg	28	27	3,560	990	65000	3,440	11,900	26,300	99% KM (Chebyshev) UCL	3,440	11,900	26,300	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-1 ft	ug/kg	3	3	6,960	5,100	14,700	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-3 ft	ug/kg	5	5	12,100	8,490	31,300	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-10 ft	ug/kg	16	16	9,810	8,460	31,300	-	-	13,100	Use 95% Student's-t UCL	-	-	13,100	Use 95% Student's-t UCL
Soil	SVOCs	Total	Chrysene	0-1 ft	ug/kg	27	26	3,230	1,250	32,000	3,110	6,180	8,400	95% KM (Chebyshev) UCL	3,110	6,180	8,400	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Chrysene	0-3 ft	ug/kg	33	32	4,930	1,620	35,300	4,780	8,050	11,000	95% KM (Chebyshev) UCL	4,780	8,050	11,000	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Chrysene	0-10 ft	ug/kg	44	43	5,820	2,990	35,300	5,680	8,030	11,000	95% KM (Chebyshev) UCL	5,680	8,030	11,000	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	ug/kg	27	22	732	150	9,900	612	1,850	4,230	99% KM (Chebyshev) UCL	615	1,850	4,230	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-3 ft	ug/kg	33	28	854	345	9,900	739	1,710	2,060	95% KM (Chebyshev) UCL	742	1,710	2,060	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-10 ft	ug/kg	44	36	783	474	9,900	653	1,500	2,080	97.5% KM (Chebyshev) UCL	655	1,500	2,090	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Fluoranthene	0-1 ft	ug/kg	27	25	5,740	1,300	54,000	5,320	10,800	14,500	95% KM (Chebyshev) UCL	5,320	10,800	14,600	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Fluoranthene	0-3 ft	ug/kg	33	31	8,240	2,700	54,000	7,750	12,600	17,500	95% KM (Chebyshev) UCL	7,750	12,600	17,500	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Fluoranthene	0-10 ft	ug/kg	44	42	10,000	6,920	54,000	9,600	12,600	17,900	95% KM (Chebyshev) UCL	9,600	12,600	17,900	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	ug/kg	27	24	2,010	520	19,000	1,790	3,790	5,040	95% KM (Chebyshev) UCL	1,790	3,790	5,040	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-3 ft	ug/kg	33	30	3,230	800	20,000	2,940	5,000	6,800	95% KM (Chebyshev) UCL	2,940	5,000	6,800	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-10 ft	ug/kg	44	41	3,620	1,990	20,000	3,370	4,710	6,510	95% KM (Chebyshev) UCL	3,380	4,710	6,510	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Pyrene	0-1 ft	ug/kg	27	26	5,130	1,900	40,000	4,940	8,640	12,300	95% KM (Chebyshev) UCL	4,940	8,640	12,300	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Pyrene	0-3 ft	ug/kg	33	32	8,470	2,720	67,100	8,220	13,700	18,800	95% KM (Chebyshev) UCL	8,220	13,700	18,800	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Pyrene	0-10 ft	ug/kg	44	43	10,800	6,700	67,100	10,600	13,900	19,800	95% KM (Chebyshev) UCL	10,600	13,900	19,800	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	27	26	37,211	13,060	367,900	30,467	69,775	90,158	95% KM (Chebyshev) UCL	30,511	69,770	90,198	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	ug/kg	33	32	47,894	16,735	367,900	43,348	75,465	101,525	95% KM (Chebyshev) UCL	43,384	75,455	101,554	95% KM (Chebyshev) UCL
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	ug/kg	18	3	5,420	1,280	14,300	1,460	3,120	3,030	95% KM (t) UCL	1,460	3,120	3,030	95% KM (t) UCL
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-3 ft	ug/kg	20	3	5,420	1,280	14,300	1,380	2,970	2,790	95% KM (t) UCL	1,380	2,970	2,790	95% KM (t) UCL
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-10 ft	ug/kg	27	4	4,060	976	14300	602	2,700	1,620	95% KM (t) UCL	602	2,700	1,620	95% KM (t) UCL
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	ug/kg	18	3	2,080	493	5,410	618	1,160	1,200	95% KM (t) UCL	618	1,160	1,200	95% KM (t) UCL
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-3 ft	ug/kg	20	3	2,080	493	5,410	589	1,110	1,110	95% KM (t) UCL	589	1,110	1,110	95% KM (t) UCL
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-10 ft	ug/kg	27	3	2,080	493	5,410	520	959	906	95% KM (t) UCL	520	959	906	95% KM (t) UCL
Soil	VOCs	Total	Ethylbenzene	0-1 ft	ug/kg	18	1	2,700	2,700	2,700	-	-	-	-	-	-	-	-
Soil	VOCs	Total	Ethylbenzene	0-3 ft	ug/kg	20	1	2,700	2,700	2,700	-	-	-	-	-	-	-	-
Soil	VOCs	Total	Ethylbenzene	0-10 ft	ug/kg	27	2	1,350	1,350	2,700	100	510	1,480	99% KM (Chebyshev) UCL	100	510	1,480	99% KM (Chebyshev) UCL
Soil	VOCs	Total	m,p-Xylenes	0-1 ft	ug/kg	18	1	9,800	9,800	9,800	-	-	-	-	-	-	-	-
Soil	VOCs	Total	m,p-Xylenes	0-3 ft	ug/kg	20	1	9,800	9,800	9,800	-	-	-	-	-	-	-	-
Soil	VOCs	Total	m,p-Xylenes	0-10 ft	ug/kg	27	2	4,900	4,900	9,800	364	1,850	5,380	99% KM (Chebyshev) UCL	364	1,850	5,380	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Naphthalene	0-1 ft	ug/kg	18	3	3,140	542	8,360	943	1,800	4,190	97.5% KM (Chebyshev) UCL	943	1,800	4,190	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	Naphthalene	0-3 ft	ug/kg	20	3	3,140	542	8,360	899	1,710	3,830	97.5% KM (Chebyshev) UCL	899	1,710	3,830	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	Naphthalene	0-10 ft	ug/kg	27	3	3,140	542	8,360	796	1,480	2,980	97.5% KM (Chebyshev) UCL	796	1,480	2,980	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	o-Xylene	0-1 ft	ug/kg	18	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	o-Xylene	0-3 ft	ug/kg	24	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	o-Xylene	0-10 ft	ug/kg	35	3	1,420	0.735	4,260	122	710	1,580	99% KM (Chebyshev) UCL	122	710	1,580	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	ug/kg	18	8	15.5	7.80	65.0	8.87	16.2	16.7	95% KM (t) UCL	8.87	16.2	16.7	95% KM (t) UCL

Table I-12
Statistical Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(4 of 6)

Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-3 ft	ug/kg	24	14	14.4	7.80	65.0	9.98	15.1	16.5	95% KM (BCA) UCL	9.98	15.1	16.4	95% KM (BCA) UCL
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-10 ft	ug/kg	35	25	16,100	5.19	403,000	11,500	67,100	127,000	99% KM (Chebyshev) UCL	11,500	67,100	127,000	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Toluene	0-1 ft	ug/kg	18	5	1.82	1.30	5.30	1.13	1.20	1.80	95% KM (t) UCL	1.13	1.20	1.80	95% KM (t) UCL
Soil	VOCs	Total	Toluene	0-3 ft	ug/kg	24	10	1.61	1.10	5.30	1.09	1.28	1.64	95% KM (t) UCL	1.11	1.27	1.65	95% KM (t) UCL
Soil	VOCs	Total	Toluene	0-10 ft	ug/kg	35	19	7,000	0.900	133,000	3,800	22,200	42,100	99% KM (Chebyshev) UCL	3,800	22,200	42,100	99% KM (Chebyshev) UCL
MW Soil Subset	Metals	Total	Aluminum	0-1 ft	mg/kg	9	9	14,700	15,500	19,100	-	-	16,700	95% Student's-t UCL	-	-	16,700	95% Student's-t UCL
MW Soil Subset	Metals	Total	Arsenic	0-1 ft	mg/kg	10	10	4.18	3.85	6.20	-	-	4.95	95% Student's-t UCL	-	-	4.95	95% Student's-t UCL
MW Soil Subset	Metals	Total	Barium	0-1 ft	mg/kg	10	10	126	115	242	-	-	151	95% Approximate Gamma UCL	-	-	151	95% Approximate Gamma UCL
MW Soil Subset	Metals	Total	Beryllium	0-1 ft	mg/kg	10	10	0.388	0.400	0.576	-	-	0.447	95% Approximate Gamma UCL	-	-	0.447	95% Approximate Gamma UCL
MW Soil Subset	Metals	Total	Cadmium	0-1 ft	mg/kg	10	10	0.801	0.665	1.70	-	-	1.04	95% Student's-t UCL	-	-	1.04	95% Student's-t UCL
MW Soil Subset	Metals	Total	Chromium	0-1 ft	mg/kg	10	10	109	23.0	801	-	-	447	95% Chebyshev (Mean, Sd) UCL	-	-	447	95% Chebyshev (Mean, Sd) UCL
MW Soil Subset	Metals	Total	Cobalt	0-1 ft	mg/kg	9	9	11.1	9.60	22.7	-	-	14.3	95% Student's-t UCL	-	-	14.3	95% Student's-t UCL
MW Soil Subset	Metals	Total	Copper	0-1 ft	mg/kg	10	10	45.0	45.6	60.5	-	-	52.1	95% Student's-t UCL	-	-	52.1	95% Student's-t UCL
MW Soil Subset	Metals	Total	Lead	0-1 ft	mg/kg	10	10	163	129	680	-	-	324	95% Approximate Gamma UCL	-	-	324	95% Approximate Gamma UCL
MW Soil Subset	Metals	Total	Manganese	0-1 ft	mg/kg	10	10	387	398	614	-	-	447	95% Student's-t UCL	-	-	447	95% Student's-t UCL
MW Soil Subset	Metals	Total	Mercury	0-1 ft	mg/kg	10	10	0.162	0.120	0.320	-	-	0.214	95% Student's-t UCL	-	-	0.214	95% Student's-t UCL
MW Soil Subset	Metals	Total	Nickel	0-1 ft	mg/kg	10	10	79.9	20.6	570	-	-	318	95% Chebyshev (Mean, Sd) UCL	-	-	318	95% Chebyshev (Mean, Sd) UCL
MW Soil Subset	Metals	Total	Selenium	0-1 ft	mg/kg	10	2	0.574	0.574	0.848	0.355	0.164	0.490	95% KM (t) UCL	0.355	0.164	0.490	95% KM (t) UCL
MW Soil Subset	Metals	Total	Silver	0-1 ft	mg/kg	10	5	0.340	0.300	0.500	0.270	0.100	0.335	95% KM (t) UCL	0.270	0.100	0.335	95% KM (t) UCL
MW Soil Subset	Metals	Total	Vanadium	0-1 ft	mg/kg	9	9	43.2	42.6	56.3	-	-	48.2	95% Student's-t UCL	-	-	48.2	95% Student's-t UCL
MW Soil Subset	Metals	Total	Zinc	0-1 ft	mg/kg	10	10	156	154	221	-	-	184	95% Student's-t UCL	-	-	184	95% Student's-t UCL
MW Soil Subset	Pesticides	Total	4,4'-DDT	0-1 ft	ug/kg	10	7	16.5	14.0	28.0	13.5	7.18	18.0	95% KM (t) UCL	13.5	7.18	18.0	95% KM (t) UCL
MW Soil Subset	PCB Aroclors	Total	Aroclor 1254	0-1 ft	ug/kg	10	7	22.7	24.0	49.0	19.0	13.6	28.0	95% KM (t) UCL	19.0	13.6	28.0	95% KM (t) UCL
MW Soil Subset	PCB Aroclors	Total	Aroclor 1260	0-1 ft	ug/kg	10	9	41.9	33.0	92.0	40.4	24.2	55.4	95% KM (t) UCL	40.4	24.2	55.4	95% KM (t) UCL
MW Soil Subset	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	ug/kg	10	9	66.0	54.9	127	66.0	34.3	88.2	95% KM (t) UCL	66.0	34.3	88.2	95% KM (t) UCL
MW Soil Subset	SVOCs	Total	Benzoic Acid	0-1 ft	ug/kg	10	3	190	140	300	153	52.1	193	95% KM (t) UCL	153	52.1	193	95% KM (t) UCL
MW Soil Subset	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	ug/kg	10	9	181	140	420	172	97.6	229	95% KM (BCA) UCL	172	97.6	228	95% KM (BCA) UCL
MW Soil Subset	SVOCs	Total	Carbazole	0-1 ft	ug/kg	10	8	51.6	21.0	210	44.9	58.0	81.5	95% KM (BCA) UCL	44.9	58.0	79.0	95% KM (BCA) UCL
MW Soil Subset	SVOCs	Total	Dibenzofuran	0-1 ft	ug/kg	10	2	33.5	33.5	36.0	31.6	1.57	32.9	95% KM (t) UCL	31.6	1.57	32.9	95% KM (t) UCL
MW Soil Subset	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	ug/kg	10	4	496	84.5	1,800	207	532	563	95% KM (t) UCL	207	532	563	95% KM (t) UCL
MW Soil Subset	SVOCs	Total	Acenaphthene	0-1 ft	ug/kg	14	11	247	66.0	1,160	198	323	592	95% KM (Chebyshev) UCL	198	323	592	95% KM (Chebyshev) UCL
MW Soil Subset	SVOCs	Total	Acenaphthylene	0-1 ft	ug/kg	14	4	12.6	14.0	19.0	12.6	5.73	18.5	95% KM (t) UCL	12.6	5.73	18.5	95% KM (t) UCL
MW Soil Subset	SVOCs	Total	Anthracene	0-1 ft	ug/kg	14	13	303	99.0	1,070	283	362	722	95% KM (Chebyshev) UCL	283	362	722	95% KM (Chebyshev) UCL
MW Soil Subset	SVOCs	Total	Fluorene	0-1 ft	ug/kg	14	10	128	53.0	510	95.4	145	273	95% KM (Chebyshev) UCL	95.4	145	273	95% KM (Chebyshev) UCL
MW Soil Subset	SVOCs	Total	Naphthalene	0-1 ft	ug/kg	14	5	33.4	20.0	79.0	18.7	20.4	30.6	95% KM (t) UCL	18.7	20.4	30.6	95% KM (t) UCL
MW Soil Subset	SVOCs	Total	Phenanthrene	0-1 ft	ug/kg	14	13	1,240	350	4,200	1,150	1,380	2,820	95% KM (Chebyshev) UCL	1,150	1,380	2,820	95% KM (Chebyshev) UCL
MW Soil Subset	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	14	13	1,896	556	7,043	1,778	2,188	4,431	95% KM (Chebyshev) UCL	1,778	2,188	4,431	95% KM (Chebyshev) UCL
MW Soil Subset	SVOCs	Total	Benzo(a)anthracene	0-1 ft	ug/kg	14	13	1,740	960	4,500	1,620	1,790	3,790	95% KM (Chebyshev) UCL	1,620	1,790	3,790	95% KM (Chebyshev) UCL
MW Soil Subset	SVOCs	Total	Benzo(a)pyrene	0-1 ft	ug/kg	14	13	2,230	1,200	6,200	2,070	2,330	4,890	95% KM (Chebyshev) UCL	2,070	2,330	4,890	95% KM (Chebyshev) UCL
MW Soil Subset	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	ug/kg	14	13	2,600	1,200	8,200	2,420	2,790	5,800	95% KM (Chebyshev) UCL	2,420	2,790	5,800	95% KM (Chebyshev) UCL
MW Soil Subset	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	ug/kg	14	13	1,080	480	3,300	1,000	1,150	2,400	95% KM (Chebyshev) UCL	1,000	1,150	2,400	95% KM (Chebyshev) UCL
MW Soil Subset	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	ug/kg	14	13	1,070	990	2,500	997	887	2,070	95% KM (Chebyshev) UCL	997	887	2,070	95% KM (Chebyshev) UCL
MW Soil Subset	SVOCs	Total	Chrysene	0-1 ft	ug/kg	14	13	2,100	1,200	5,900	1,960	2,120	4,530	95% KM (Chebyshev) UCL	1,960	2,120	4,530	95% KM (Chebyshev) UCL
MW Soil Subset	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	ug/kg	14	13	328	150	1,000	307	345	725	95% KM (Chebyshev) UCL	307	345	725	95% KM (Chebyshev) UCL
MW Soil Subset	SVOCs	Total	Fluoranthene	0-1 ft	ug/kg	14	13	3,810	2,100	14,000	3,550	4,100	8,520	95% KM (Chebyshev) UCL	3,550	4,100	8,520	95% KM (Chebyshev) UCL
MW Soil Subset	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	ug/kg	14	13	1,370	530	4,600	1,280	1,610	3,230	95% KM (Chebyshev) UCL	1,280	1,610	3,230	95% KM (Chebyshev) UCL
MW Soil Subset	SVOCs	Total	Pyrene	0-1 ft	ug/kg	14	13	3,390	2,400	9,100	3,160	3,210	7,050	95% KM (Chebyshev) UCL	3,160	3,210	7,050	95% KM (Chebyshev) UCL
MW Soil Subset	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	14	13	19,712	11,350	55,030	18,367	19,916	42,516	95% KM (Chebyshev) UCL	18,367	19,916	42,516	95% KM (Chebyshev) UCL
MW Soil Subset	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	ug/kg	5	4	5.00	4.40	9.70	5.00	3.14	-	-	5.00	3.14	-	-
MW Soil Subset	VOCs	Total	Toluene	0-1 ft	ug/kg	5	4	0.950	0.995	1.46	0.950	0.450	-	-	0.950	0.450	-	-
Groundwater	Metals	Total	Antimony	N/A	ug/L	19	8	1.53	1.07	3.89	1.49	1.15	2.23	95% KM (t) UCL	1.49	1.15	2.23	95% KM (t) UCL
Groundwater	Metals	Total	Arsenic	N/A	ug/L	53	43	7.73	6.00	21.3	6.48	6.54	10.4	95% KM (Chebyshev) UCL	6.48	6.54	10.4	95% KM (Chebyshev) UCL
Groundwater	Metals	Total	Barium	N/A	ug/L	19	19	111	100	304	-	-	165	95% Approximate Gamma UCL	-	-	165	95% Approximate Gamma UCL
Groundwater	Metals	Total	Beryllium	N/A	ug/L	19	7	0.328	0.324	0.435	0.304	0.0739	0.351	95% KM (t) UCL	0.328	0.0673	0.376	95% KM (t) UCL
Groundwater	Metals	Total	Cadmium	N/A	ug/L	19	6	1.91	0.570	5.60	0.915	1.80	1.91	95% KM (t) UCL	0.932	1.79	1.92	95% KM (t) UCL
Groundwater	Metals	Total	Chromium	N/A	ug/L	19	7	8.03	7.43	18.5	6.23	3.49	8.00	95% KM (t) UCL	6.23	3.49	8.00	95% KM (t) UCL
Groundwater	Metals	Total	Copper	N/A	ug/L	19	11	38.5	17.6	201	23.7	44.5	45.4	95% KM (BCA) UCL	23.7	44.5	45.0	95% KM (BCA) UCL
Groundwater	Metals	Total	Iron	N/A	ug/L	53	50	11,600	3,590	42,900	10,900	13,200	29,100	99% KM (Chebyshev) UCL	10,900	13,200	29,100	99% KM (Chebyshev) UCL
Groundwater	Metals	Total	Lead	N/A	ug/L	53	32	4.89	0.638	78.2	3.06	11.1	12.8	97.5% KM (Chebyshev) UCL	3.06	11.1	12.8	97.5% KM (Chebyshev) UCL
Groundwater	Metals	Total	Manganese	N/A	ug/L	53	52	1,080	229	5,380	1,060	1,410	1,910	95% KM (Chebyshev) UCL	1,060	1,410	1,910	95% KM (Chebyshev) UCL
Groundwater	Metals	Total	Mercury	N/A	ug/L	24	4	0.148	0.115	0.330	0.0496	0.0676	0.0769	95% KM (t) UCL	0.0496	0.0676	0.0769	95% KM (t) UCL
Groundwater	Metals	Total	Nickel	N/A	ug/L	19	11	35.9	7.61	116	22.9	39.0	117	99% KM (Chebyshev) UCL	22.9	39.0	117	99% KM (Chebyshev) UCL
Groundwater	Metals	Total	Selenium	N/A	ug/L	19	7	11.2	5.63	32.9	4.55	9.23	8.52	95% KM (t) UCL	4.78	9.15	8.74	95% KM (t) UCL
Groundwater	Metals	Total	Silver	N/A	ug/L	19	5	0.226	0.131	0.658	0.162	0.177	0.276	95% KM (t) UCL	0.162	0.177	0.276	95% KM (t) UCL
Groundwater	Metals	Total	Thallium	N/A	ug/L	19	9	0.202	0.197	0.323	0.202	0.0582	0.238	95% KM (t) UCL	0.202	0.0582	0.238	95% KM (t) UCL
Groundwater	Metals	Total	Zinc	N/A	ug/L	19	15	416	23.7	2,660	329	736	2,070	99% KM (Chebyshev) UCL	329	736	2,070	99% KM (Chebyshev) UCL
Groundwater	Metals	Dissolved	Arsenic	N/A	ug/L	36	29	6.99	5.65	19.3	5.76	5.67	7.49	95% KM (BCA) UCL	5.76	5.67	7.47	95% KM (BCA) UCL
Groundwater	Metals	Dissolved	Barium	N/A	ug/L	3	3	64.1	37.5	134	-	-	-	-	-	-	-	-

Table I-12
Statistical Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(5 of 6)

Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Groundwater	Metals	Dissolved	Calcium	N/A	ug/L	9	9	59,000	43,100	172,000	-	-	91,600	95% Student's-t UCL	-	-	91,600	95% Student's-t UCL
Groundwater	Metals	Dissolved	Iron	N/A	ug/L	36	25	14,100	18,800	35,400	9,800	12,600	31,000	99% KM (Chebyshev) UCL	9,800	12,600	31,000	99% KM (Chebyshev) UCL
Groundwater	Metals	Dissolved	Lead	N/A	ug/L	36	16	0.622	0.0755	3.50	0.292	0.794	0.524	95% KM (t) UCL	0.293	0.793	0.526	95% KM (t) UCL
Groundwater	Metals	Dissolved	Magnesium	N/A	ug/L	9	9	10,600	7,550	25,800	-	-	16,300	95% Student's-t UCL	-	-	16,300	95% Student's-t UCL
Groundwater	Metals	Dissolved	Manganese	N/A	ug/L	36	34	1,140	205	5,540	1,080	1,440	3,500	99% KM (Chebyshev) UCL	1,080	1,440	3,500	99% KM (Chebyshev) UCL
Groundwater	Metals	Dissolved	Potassium	N/A	ug/L	9	9	5,280	4,620	12,900	-	-	7,470	95% Student's-t UCL	-	-	7,470	95% Student's-t UCL
Groundwater	Metals	Dissolved	Sodium	N/A	ug/L	9	9	140,000	15,400	740,000	-	-	648,000	95% Adjusted Gamma UCL	-	-	648,000	95% Adjusted Gamma UCL
Groundwater	Butyltins	Total	Dibutyltin	N/A	ug/L	39	11	0.112	0.0910	0.447	0.0351	0.0832	0.0586	95% KM (t) UCL	0.0380	0.0822	0.0614	95% KM (t) UCL
Groundwater	Butyltins	Total	Monobutyltin	N/A	ug/L	39	7	0.0515	0.0189	0.240	0.0143	0.0377	0.0254	95% KM (t) UCL	0.0194	0.0383	0.0322	95% KM (t) UCL
Groundwater	Butyltins	Total	Tributyltin	N/A	ug/L	8	6	0.0298	0.0259	0.0601	0.0266	0.0134	0.0364	95% KM (Percentile Bootstrap) UCL	0.0266	0.0134	0.0364	95% KM (Percentile Bootstrap) UCL
Groundwater	NWTPH-Dx	Total	Diesel Range Organics	N/A	ug/L	55	37	409	340	1,800	291	362	388	95% KM (BCA) UCL	294	359	381	95% KM (BCA) UCL
Groundwater	NWTPH-Dx	Total	Residual Range Organics	N/A	ug/L	55	27	425	260	1,900	260	355	344	95% KM (t) UCL	262	354	345	95% KM (t) UCL
Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	ug/L	57	17	95.5	32.0	430	39.9	75.4	60.4	95% KM (BCA) UCL	52.7	74.4	76.4	95% KM (BCA) UCL
Groundwater	SVOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	54	2	0.0430	0.0430	0.0601	0.0267	0.00549	-	-	0.0430	0.0172	-	-
Groundwater	SVOCs	Total	2-Methylnaphthalene	N/A	ug/L	23	4	0.181	0.163	0.360	0.103	0.109	0.175	95% KM (t) UCL	0.124	0.107	0.203	95% KM (t) UCL
Groundwater	SVOCs	Total	Acenaphthene	N/A	ug/L	23	2	0.175	0.175	0.239	0.125	0.0402	0.158	95% KM (t) UCL	0.125	0.0402	0.158	95% KM (t) UCL
Groundwater	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	ug/L	23	4	8.37	6.35	19.0	3.05	3.90	4.70	95% KM (t) UCL	3.05	3.90	4.70	95% KM (t) UCL
Groundwater	SVOCs	Total	Diethyl Phthalate	N/A	ug/L	23	3	1.04	1.03	1.90	0.475	0.568	0.873	95% KM (t) UCL	0.475	0.568	0.873	95% KM (t) UCL
Groundwater	SVOCs	Total	Di-n-octyl Phthalate	N/A	ug/L	23	3	5.07	5.29	7.08	3.59	1.45	4.61	95% KM (t) UCL	3.59	1.45	4.61	95% KM (t) UCL
Groundwater	SVOCs	Total	Isophorone	N/A	ug/L	23	2	0.199	0.199	0.282	0.134	0.0522	0.177	95% KM (t) UCL	0.140	0.0581	0.193	95% KM (t) UCL
Groundwater	SVOCs	Total	Naphthalene	N/A	ug/L	23	3	0.0993	0.101	0.157	0.0598	0.0393	0.0873	95% KM (t) UCL	0.0620	0.0398	0.0913	95% KM (t) UCL
Groundwater	SVOCs	Total	Phenanthrene	N/A	ug/L	54	5	0.940	0.211	3.90	0.188	0.596	0.591	95% KM (BCA) UCL	0.190	0.596	0.615	95% KM (BCA) UCL
Groundwater	VOCs	Total	1,2,4-Trimethylbenzene	N/A	ug/L	22	2	3.10	3.10	5.20	1.19	0.875	-	-	1.19	0.875	-	-
Groundwater	VOCs	Total	Acetone	N/A	ug/L	22	4	13.2	14.6	15.4	9.27	2.22	10.2	95% KM (t) UCL	9.27	2.22	10.2	95% KM (t) UCL
Groundwater	VOCs	Total	Chloroform	N/A	ug/L	56	8	1.59	1.19	3.70	0.320	0.739	0.498	95% KM (t) UCL	0.450	0.715	0.666	95% KM (t) UCL
Groundwater	VOCs	Total	Isopropylbenzene	N/A	ug/L	22	2	3.90	3.90	4.60	3.26	0.292	3.42	95% KM (t) UCL	3.26	0.292	3.42	95% KM (t) UCL
Groundwater	VOCs	Total	n-Propylbenzene	N/A	ug/L	22	2	1.60	1.60	2.00	1.24	0.167	1.32	95% KM (t) UCL	1.24	0.167	1.32	95% KM (t) UCL
Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	56	13	4.18	4.80	8.78	1.15	2.08	2.80	95% KM (Percentile Bootstrap) UCL	1.15	2.08	2.79	95% KM (Percentile Bootstrap) UCL
Groundwater	VOCs	Total	Vinyl Chloride	N/A	ug/L	56	16	0.404	0.335	0.955	0.257	0.189	0.307	95% KM (t) UCL	0.326	0.188	0.389	95% KM (t) UCL
Seep Water	Metals	Total	Arsenic	N/A	ug/L	5	4	3.86	1.07	12.8	3.19	4.81	-	-	3.19	4.81	-	-
Seep Water	Metals	Total	Iron	N/A	ug/L	5	5	27,000	5,300	121,000	-	-	-	-	-	-	-	-
Seep Water	Metals	Total	Lead	N/A	ug/L	5	4	7.10	1.29	25.7	5.72	10.0	-	-	5.72	10.0	-	-
Seep Water	Metals	Total	Manganese	N/A	ug/L	5	5	963	75.0	3,240	-	-	-	-	-	-	-	-
Seep Water	Metals	Dissolved	Arsenic	N/A	ug/L	5	3	0.833	1.00	1.00	0.700	0.245	-	-	0.700	0.245	-	-
Seep Water	Metals	Dissolved	Calcium	N/A	ug/L	2	2	49,500	49,500	76,400	-	-	-	-	-	-	-	-
Seep Water	Metals	Dissolved	Iron	N/A	ug/L	5	3	1,080	14.9	3,210	652	1,280	-	-	652	1,280	-	-
Seep Water	Metals	Dissolved	Lead	N/A	ug/L	5	3	0.0303	0.0180	0.0650	0.0260	0.0229	-	-	0.0260	0.0229	-	-
Seep Water	Metals	Dissolved	Magnesium	N/A	ug/L	2	2	10,800	10,800	16,600	-	-	-	-	-	-	-	-
Seep Water	Metals	Dissolved	Manganese	N/A	ug/L	5	3	496	5.41	1,480	298	591	-	-	298	591	-	-
Seep Water	Metals	Dissolved	Potassium	N/A	ug/L	2	2	2,470	2,470	4,160	-	-	-	-	-	-	-	-
Seep Water	Metals	Dissolved	Sodium	N/A	ug/L	2	2	13,200	13,200	19,700	-	-	-	-	-	-	-	-
Seep Water	NWTPH-Dx	Total	Diesel Range Organics	N/A	ug/L	5	2	79.5	79.5	130	54.2	43.7	-	-	54.2	43.7	-	-
Seep Water	VOCs	Total	Chloroform	N/A	ug/L	5	2	1.77	1.77	2.80	1.15	0.824	-	-	1.15	0.824	-	-
Seep Water	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	5	3	2.08	1.70	4.40	1.31	1.66	-	-	1.31	1.66	-	-
Surface Water	Metals	Total	Arsenic	N/A	ug/L	4	3	0.957	0.900	1.17	-	-	-	-	-	-	-	-
Surface Water	Metals	Total	Iron	N/A	ug/L	4	4	263	220	446	-	-	-	-	-	-	-	-
Surface Water	Metals	Total	Lead	N/A	ug/L	4	4	0.261	0.266	0.407	-	-	-	-	-	-	-	-
Surface Water	Metals	Total	Manganese	N/A	ug/L	4	4	9.24	8.74	13.6	-	-	-	-	-	-	-	-
Surface Water	Metals	Dissolved	Arsenic	N/A	ug/L	4	4	0.870	0.835	1.01	-	-	-	-	-	-	-	-
Surface Water	Metals	Dissolved	Calcium	N/A	ug/L	2	2	20,200	20,200	20,500	-	-	-	-	-	-	-	-
Surface Water	Metals	Dissolved	Lead	N/A	ug/L	4	3	0.0120	0.0100	0.0160	-	-	-	-	-	-	-	-
Surface Water	Metals	Dissolved	Magnesium	N/A	ug/L	2	2	6,260	6,260	6,330	-	-	-	-	-	-	-	-
Surface Water	Metals	Dissolved	Manganese	N/A	ug/L	4	4	0.748	0.745	1.01	-	-	-	-	-	-	-	-
Surface Water	Metals	Dissolved	Potassium	N/A	ug/L	2	2	1,500	1,500	1,510	-	-	-	-	-	-	-	-
Surface Water	Metals	Dissolved	Sodium	N/A	ug/L	2	2	7,760	7,760	7,900	-	-	-	-	-	-	-	-
Surface Water	NWTPH-Dx	Total	Diesel Range Organics	N/A	ug/L	4	2	28.0	28.0	30.0	-	-	-	-	-	-	-	-

Notes
Only those analytes with at least 2 detected results are shown on this table.
If not all samples were detected results (i.e., detection rate = <100%), the mean and standard deviation were estimated by the Kaplan-Meier method.
The potentially mass wasting soil subset is comprised of the following samples: BIL01USE through BIL09USE, BIL13SSI, and L-01 through L-04.

% = percent
KM = Kaplan-Meier
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = method reporting limit
MW Soil = Mass Wasting Soil

Table I-12
Statistical Summary for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(6 of 6)

Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type

ND = non-detect
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SD = standard deviation
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
UCL = upper confidence limit

Table I-13
Statistical Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 9)

												Statistics - ND censored at the MDL				Statistics - ND censored at the MRL			
Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	Metals	Total	Aluminum	0-1 ft	N/A	mg/kg	58	58	6,910	5,630	24,300	-	-	8,060	Use 95% Approximate Gamma UCL	-	-	8,060	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Aluminum	0-3 ft	N/A	mg/kg	75	75	8,260	7,100	24,300	-	-	9,430	Use 95% Approximate Gamma UCL	-	-	9,430	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Aluminum	0-10 ft	N/A	mg/kg	78	78	8,520	7,220	24,300	-	-	9,700	Use 95% Approximate Gamma UCL	-	-	9,700	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Aluminum	>10 ft	N/A	mg/kg	6	6	11,700	12,000	15,600	-	-	-	-	-	-	-	-
Soil	Metals	Total	Antimony	0-1 ft	N/A	mg/kg	58	41	1.90	1.14	13.7	1.62	2.23	2.94	95% KM (Chebyshev) UCL	1.62	2.23	2.94	95% KM (Chebyshev) UCL
Soil	Metals	Total	Antimony	0-3 ft	N/A	mg/kg	75	55	1.57	1.07	13.7	1.38	2.02	2.42	95% KM (Chebyshev) UCL	1.38	2.02	2.42	95% KM (Chebyshev) UCL
Soil	Metals	Total	Antimony	0-10 ft	N/A	mg/kg	78	58	1.52	1.06	13.7	1.35	1.99	2.36	95% KM (Chebyshev) UCL	1.35	1.99	2.36	95% KM (Chebyshev) UCL
Soil	Metals	Total	Antimony	>10 ft	N/A	mg/kg	6	6	0.234	0.211	0.433	-	-	-	-	-	-	-	-
Soil	Metals	Total	Arsenic	0-1 ft	N/A	mg/kg	58	57	7.76	4.81	80.9	7.64	12.9	15.1	95% KM (Chebyshev) UCL	7.64	12.9	15.1	95% KM (Chebyshev) UCL
Soil	Metals	Total	Arsenic	0-3 ft	N/A	mg/kg	75	74	7.24	5.02	80.9	7.15	11.4	9.71	95% KM (BCA) UCL	7.15	11.4	9.69	95% KM (BCA) UCL
Soil	Metals	Total	Arsenic	0-10 ft	N/A	mg/kg	78	77	7.17	4.99	80.9	7.08	11.2	9.86	95% KM (BCA) UCL	7.09	11.2	9.32	95% KM (BCA) UCL
Soil	Metals	Total	Arsenic	>10 ft	N/A	mg/kg	6	6	5.44	5.79	9.82	-	-	-	-	-	-	-	-
Soil	Metals	Total	Barium	0-1 ft	N/A	mg/kg	58	58	67.2	64.0	133	-	-	74.5	Use 95% Student's-t UCL	-	-	74.5	Use 95% Student's-t UCL
Soil	Metals	Total	Barium	0-3 ft	N/A	mg/kg	75	75	71.7	70.4	138	-	-	78.0	Use 95% Student's-t UCL	-	-	78.0	Use 95% Student's-t UCL
Soil	Metals	Total	Barium	0-10 ft	N/A	mg/kg	78	78	73.0	71.4	138	-	-	79.1	Use 95% Student's-t UCL	-	-	79.1	Use 95% Student's-t UCL
Soil	Metals	Total	Barium	>10 ft	N/A	mg/kg	6	6	74.4	83.4	97.3	-	-	-	-	-	-	-	-
Soil	Metals	Total	Beryllium	0-1 ft	N/A	mg/kg	58	27	0.287	0.260	0.630	0.186	0.127	0.223	95% KM (t) UCL	0.269	0.0987	0.298	95% KM (t) UCL
Soil	Metals	Total	Beryllium	0-3 ft	N/A	mg/kg	75	44	0.332	0.319	0.630	0.236	0.153	0.282	95% KM (Percentile Bootstrap) UCL	0.309	0.114	0.335	95% KM (t) UCL
Soil	Metals	Total	Beryllium	0-10 ft	N/A	mg/kg	78	47	0.335	0.349	0.630	0.241	0.152	0.282	95% KM (Percentile Bootstrap) UCL	0.314	0.112	0.339	95% KM (t) UCL
Soil	Metals	Total	Beryllium	>10 ft	N/A	mg/kg	6	6	0.379	0.380	0.488	-	-	-	-	-	-	-	-
Soil	Metals	Total	Cadmium	0-1 ft	N/A	mg/kg	58	53	1.82	1.04	17.3	1.66	2.65	3.20	95% KM (Chebyshev) UCL	1.67	2.64	3.20	95% KM (Chebyshev) UCL
Soil	Metals	Total	Cadmium	0-3 ft	N/A	mg/kg	75	67	1.58	0.963	17.3	1.42	2.38	2.63	95% KM (Chebyshev) UCL	1.43	2.38	2.64	95% KM (Chebyshev) UCL
Soil	Metals	Total	Cadmium	0-10 ft	N/A	mg/kg	78	67	1.58	0.963	17.3	1.37	2.35	2.54	95% KM (Chebyshev) UCL	1.38	2.34	2.55	95% KM (Chebyshev) UCL
Soil	Metals	Total	Cadmium	>10 ft	N/A	mg/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Metals	Total	Chromium	0-1 ft	N/A	mg/kg	61	61	383	94.9	2,650	-	-	720	Use 95% Chebyshev (Mean, Sd) UCL	-	-	720	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Chromium	0-3 ft	N/A	mg/kg	78	78	306	50.6	2,650	-	-	579	Use 95% Chebyshev (Mean, Sd) UCL	-	-	579	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Chromium	0-10 ft	N/A	mg/kg	81	81	296	49.5	2,650	-	-	560	Use 95% Chebyshev (Mean, Sd) UCL	-	-	560	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Chromium	>10 ft	N/A	mg/kg	6	6	19.1	20.1	23.6	-	-	-	-	-	-	-	-
Soil	Metals	Total	Cobalt	0-1 ft	N/A	mg/kg	58	58	12.7	12.6	25.0	-	-	13.6	Use 95% Student's-t UCL	-	-	13.6	Use 95% Student's-t UCL
Soil	Metals	Total	Cobalt	0-3 ft	N/A	mg/kg	75	75	13.2	13.4	25.0	-	-	14.0	Use 95% Student's-t UCL	-	-	14.0	Use 95% Student's-t UCL
Soil	Metals	Total	Cobalt	0-10 ft	N/A	mg/kg	78	78	13.3	13.4	25.0	-	-	14.0	Use 95% Student's-t UCL	-	-	14.0	Use 95% Student's-t UCL
Soil	Metals	Total	Cobalt	>10 ft	N/A	mg/kg	6	6	14.5	14.0	18.7	-	-	-	-	-	-	-	-
Soil	Metals	Total	Copper	0-1 ft	N/A	mg/kg	58	58	64.8	37.3	319	-	-	103	Use 95% Chebyshev (Mean, Sd) UCL	-	-	103	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Copper	0-3 ft	N/A	mg/kg	75	75	62.4	45.7	319	-	-	91.8	Use 95% Chebyshev (Mean, Sd) UCL	-	-	91.8	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Copper	0-10 ft	N/A	mg/kg	78	78	61.8	45.5	319	-	-	70.3	Use 95% H-UCL	-	-	70.3	Use 95% H-UCL
Soil	Metals	Total	Copper	>10 ft	N/A	mg/kg	6	6	49.8	51.8	67.6	-	-	-	-	-	-	-	-
Soil	Metals	Total	Lead	0-1 ft	<250um	mg/kg	8	8	300	160	921	-	-	639	Use 95% Approximate Gamma UCL	-	-	639	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Lead	0-1 ft	<2mm	mg/kg	8	8	233	133	768	-	-	551	Use 95% Approximate Gamma UCL	-	-	551	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Lead	0-1 ft	N/A	mg/kg	61	61	362	272	3,260	-	-	465	Use 95% Approximate Gamma UCL	-	-	465	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Lead	0-3 ft	<250um	mg/kg	16	16	202	72.2	921	-	-	418	Use 95% Approximate Gamma UCL	-	-	418	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Lead	0-3 ft	<2mm	mg/kg	16	16	148	34.9	768	-	-	303	Use 95% Approximate Gamma UCL	-	-	303	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Lead	0-3 ft	N/A	mg/kg	78	78	309	139	3,260	-	-	529	Use 95% Chebyshev (Mean, Sd) UCL	-	-	529	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Lead	0-10 ft	<250um	mg/kg	16	16	202	72.2	921	-	-	418	Use 95% Approximate Gamma UCL	-	-	418	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Lead	0-10 ft	<2mm	mg/kg	16	16	148	34.9	768	-	-	303	Use 95% Approximate Gamma UCL	-	-	303	Use 95% Approximate Gamma UCL
Soil	Metals	Total	Lead	0-10 ft	N/A	mg/kg	81	81	298	128	3,260	-	-	512	Use 95% Chebyshev (Mean, Sd) UCL	-	-	512	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Lead	>10 ft	N/A	mg/kg	6	6	5.37	5.72	6.64	-	-	-	-	-	-	-	-
Soil	Metals	Total	Manganese	0-1 ft	N/A	mg/kg	58	58	416	396	789	-	-	448	Use 95% Student's-t UCL	-	-	448	Use 95% Student's-t UCL
Soil	Metals	Total	Manganese	0-3 ft	N/A	mg/kg	75	75	426	413	816	-	-	454	Use 95% Student's-t UCL	-	-	454	Use 95% Student's-t UCL
Soil	Metals	Total	Manganese	0-10 ft	N/A	mg/kg	78	78	433	416	818	-	-	461	Use 95% Student's-t UCL	-	-	461	Use 95% Student's-t UCL
Soil	Metals	Total	Manganese	>10 ft	N/A	mg/kg	6	6	470	460	599	-	-	-	-	-	-	-	-
Soil	Metals	Total	Mercury	0-1 ft	N/A	mg/kg	58	43	0.104	0.0440	0.723	0.0812	0.130	0.113	95% KM (BCA) UCL	0.0847	0.128	0.112	95% KM (BCA) UCL
Soil	Metals	Total	Mercury	0-3 ft	N/A	mg/kg	75	58	0.0911	0.0433	0.723	0.0741	0.116	0.0976	95% KM (BCA) UCL	0.0771	0.115	0.101	95% KM (BCA) UCL
Soil	Metals	Total	Mercury	0-10 ft	N/A	mg/kg	78	61	0.0882	0.0425	0.723	0.0727	0.114	0.0988	95% KM (BCA) UCL	0.0753	0.113	0.0989	95% KM (BCA) UCL
Soil	Metals	Total	Mercury	>10 ft	N/A	mg/kg	6	6	0.0305	0.0258	0.0544	-	-	-	-	-	-	-	-
Soil	Metals	Total	Nickel	0-1 ft	N/A	mg/kg	58	58	167	50.0	1,060	-	-	353	Use 95% H-UCL	-	-	353	Use 95% H-UCL
Soil	Metals	Total	Nickel	0-3 ft	N/A	mg/kg	75	75	135	33.3	1,060	-	-	251	Use 95% Chebyshev (Mean, Sd) UCL	-	-	251	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Nickel	0-10 ft	N/A	mg/kg	78	78	131	30.6	1,060	-	-	243	Use 95% Chebyshev (Mean, Sd) UCL	-	-	243	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Nickel	>10 ft	N/A	mg/kg	6	6	19.7	20.6	24.4	-	-	-	-	-	-	-	-
Soil	Metals	Total	Selenium	0-1 ft	N/A	mg/kg	58	30	0.558	0.600	0.900	0.411	0.206	0.466	95% KM (Percentile Bootstrap) UCL	0.547	0.191	0.605	95% KM (t) UCL
Soil	Metals	Total	Selenium	0-3 ft	N/A	mg/kg	75	43	0.563	0.600	0.900	0.436	0.207	0.479	95% KM (t) UCL	0.555	0.189	0.603	95% KM (t) UCL
Soil	Metals	Total	Selenium	0-10 ft	N/A	mg/kg	78	46	0.546	0.600	0.900	0.435	0.201	0.476	95% KM (% Bootstrap) UCL	0.539	0.193	0.586	95% KM (t) UCL
Soil	Metals	Total	Selenium	>10 ft	N/A	mg/kg	6	6	0.359	0.333	0.602	-	-	-	-	-	-	-	-
Soil	Metals	Total	Silver	0-1 ft	N/A	mg/kg	58	55	0.145	0.127	0.431	0.141	0.0798	0.187	95% KM (Chebyshev) UCL	0.145	0.0795	0.192	95% KM (Chebyshev) UCL
Soil	Metals	Total	Silver	0-3 ft	N/A	mg/kg	75	72	0.141	0.127	0.431	0.137	0.0758	0.152	95% KM (BCA) UCL	0.141	0.0749	0.156	95% KM (BCA) UCL
Soil	Metals	Total	Silver	0-10 ft	N/A	mg/kg	78	75	0.141	0.128	0.431	0.137	0.0744	0.151	95% KM (BCA) UCL	0.141	0.0735	0.154	95% KM (BCA) UCL
Soil	Metals	Total	Silver	>10 ft	N/A	mg/kg	6	6	0.128	0.125	0.158	-	-	-	-	-	-	-	-
Soil	Metals	Total	Thallium	0-1 ft	N/A	mg/kg	58	46	0.0991	0.0931	0.239	0.0859	0.0471	0.0967	95% KM (Percentile Bootstrap) UCL	0.0991	0.0441	0.110	95% KM (Percentile Bootstrap) UCL
Soil	Metals	Total	Thallium	0-3 ft	N/A	mg/kg	75	63	0.107	0.103	0.255	0.0959	0.0487	0.107	95% KM (BCA) UCL	0.107	0.0445	0.118	95% KM (BCA) UCL
Soil	Metals	Total	Thallium	0-10 ft	N/A	mg/kg	78	66	0.109	0.104	0.255	0.0980	0.0498	0.108	95% KM (BCA) UCL	0.109	0.0456	0.119	95% KM (BCA) UCL
Soil	Metals	Total	Thallium	>10 ft	N/A	mg/kg	6	6	0.130	0.138	0.180	-	-	-	-	-	-	-	-

Table I-13
Statistical Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit

Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	Metals	Total	Vanadium	0-1 ft	N/A	mg/kg	58	58	44.4	42.2	84.7	-	-	49.0	Use 95% Student's-t UCL	-	-	49.0	Use 95% Student's-t UCL
Soil	Metals	Total	Vanadium	0-3 ft	N/A	mg/kg	75	75	48.1	48.2	89.1	-	-	52.1	Use 95% Student's-t UCL	-	-	52.1	Use 95% Student's-t UCL
Soil	Metals	Total	Vanadium	0-10 ft	N/A	mg/kg	78	78	48.9	49.4	89.1	-	-	59.1	Use 95% Chebyshev (Mean, Sd) UCL	-	-	59.1	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Vanadium	>10 ft	N/A	mg/kg	6	6	53.8	53.8	60.3	-	-	-	-	-	-	-	-
Soil	Metals	Total	Zinc	0-1 ft	N/A	mg/kg	58	58	173	110	1,160	-	-	212	Use 95% H-UCL	-	-	212	Use 95% H-UCL
Soil	Metals	Total	Zinc	0-3 ft	N/A	mg/kg	75	75	148	85.4	1,160	-	-	237	Use 95% Chebyshev (Mean, Sd) UCL	-	-	237	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Zinc	0-10 ft	N/A	mg/kg	78	78	145	85.4	1,160	-	-	231	Use 95% Chebyshev (Mean, Sd) UCL	-	-	231	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Zinc	>10 ft	N/A	mg/kg	6	6	49.5	53.6	54.1	-	-	-	-	-	-	-	-
Soil	Butyltins	Total	Dibutyltin	0-1 ft	N/A	ug/kg	47	18	30.8	6.25	210	12.3	34.1	34.6	95% KM (Chebyshev) UCL	12.4	34.0	34.6	95% KM (Chebyshev) UCL
Soil	Butyltins	Total	Dibutyltin	0-3 ft	N/A	ug/kg	62	18	30.8	6.25	210	9.52	30.1	26.6	95% KM (Chebyshev) UCL	9.55	30.1	26.7	95% KM (Chebyshev) UCL
Soil	Butyltins	Total	Dibutyltin	0-10 ft	N/A	ug/kg	62	18	30.8	6.25	210	9.52	30.1	26.6	95% KM (Chebyshev) UCL	9.55	30.1	26.7	95% KM (Chebyshev) UCL
Soil	Butyltins	Total	Dibutyltin	>10 ft	N/A	ug/kg	5	5	12.4	7.75	28.3	-	-	-	-	-	-	-	-
Soil	Butyltins	Total	Monobutyltin	0-1 ft	N/A	ug/kg	47	22	12.2	3.76	108	5.96	17.4	11.0	95% KM (BCA) UCL	6.26	17.3	10.6	95% KM (BCA) UCL
Soil	Butyltins	Total	Monobutyltin	0-3 ft	N/A	ug/kg	62	22	12.2	3.76	108	4.62	15.3	8.62	95% KM (BCA) UCL	4.94	15.2	8.48	95% KM (BCA) UCL
Soil	Butyltins	Total	Monobutyltin	0-10 ft	N/A	ug/kg	62	22	12.2	3.76	108	4.62	15.3	8.94	95% KM (BCA) UCL	4.94	15.2	8.75	95% KM (BCA) UCL
Soil	Butyltins	Total	Monobutyltin	>10 ft	N/A	ug/kg	5	5	9.34	8.89	13.0	-	-	-	-	-	-	-	-
Soil	Butyltins	Total	Tributyltin	0-1 ft	N/A	ug/kg	47	16	186	29.8	1,860	64.3	278	481	99% KM (Chebyshev) UCL	64.4	278	481	99% KM (Chebyshev) UCL
Soil	Butyltins	Total	Tributyltin	0-3 ft	N/A	ug/kg	62	16	186	29.8	1,860	49.2	243	248	97.5% KM (Chebyshev) UCL	49.2	243	248	97.5% KM (Chebyshev) UCL
Soil	Butyltins	Total	Tributyltin	0-10 ft	N/A	ug/kg	62	16	186	29.8	1,860	49.2	243	248	97.5% KM (Chebyshev) UCL	49.2	243	248	97.5% KM (Chebyshev) UCL
Soil	Butyltins	Total	Tributyltin	>10 ft	N/A	ug/kg	5	1	2.58	2.58	2.58	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	4,4'-DDD	0-1 ft	N/A	ug/kg	31	2	0.840	0.840	0.990	0.702	0.0577	0.729	95% KM (t) UCL	0.765	0.130	0.921	95% KM (t) UCL
Soil	Pesticides	Total	4,4'-DDD	0-3 ft	N/A	ug/kg	37	2	0.840	0.840	0.990	0.699	0.0522	0.721	95% KM (t) UCL	0.740	0.112	0.849	95% KM (t) UCL
Soil	Pesticides	Total	4,4'-DDD	0-10 ft	N/A	ug/kg	37	2	0.840	0.840	0.990	0.699	0.0522	0.721	95% KM (t) UCL	0.740	0.112	0.849	95% KM (t) UCL
Soil	Pesticides	Total	4,4'-DDD	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	4,4'-DDE	0-1 ft	N/A	ug/kg	31	7	0.983	0.610	2.44	0.452	0.501	0.632	95% KM (t) UCL	0.756	0.541	1.04	95% KM (t) UCL
Soil	Pesticides	Total	4,4'-DDE	0-3 ft	N/A	ug/kg	37	7	0.983	0.610	2.44	0.418	0.458	0.567	95% KM (t) UCL	0.697	0.485	0.929	95% KM (t) UCL
Soil	Pesticides	Total	4,4'-DDE	0-10 ft	N/A	ug/kg	37	7	0.983	0.610	2.44	0.418	0.458	0.567	95% KM (t) UCL	0.697	0.485	0.929	95% KM (t) UCL
Soil	Pesticides	Total	4,4'-DDE	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	4,4'-DDT	0-1 ft	N/A	ug/kg	31	18	32.3	7.55	140	19.2	40.1	32.3	95% KM (BCA) UCL	19.3	40.0	31.7	95% KM (BCA) UCL
Soil	Pesticides	Total	4,4'-DDT	0-3 ft	N/A	ug/kg	37	22	28.0	4.83	140	17.0	37.2	79.4	99% KM (Chebyshev) UCL	17.2	37.2	79.5	99% KM (Chebyshev) UCL
Soil	Pesticides	Total	4,4'-DDT	0-10 ft	N/A	ug/kg	37	22	28.0	4.83	140	17.0	37.2	79.4	99% KM (Chebyshev) UCL	17.2	37.2	79.5	99% KM (Chebyshev) UCL
Soil	Pesticides	Total	4,4'-DDT	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	BHC (delta)	0-1 ft	N/A	ug/kg	31	2	1.55	1.55	3.03	0.176	0.530	1.54	99% KM (Chebyshev) UCL	0.192	0.568	1.76	99% KM (Chebyshev) UCL
Soil	Pesticides	Total	BHC (delta)	0-3 ft	N/A	ug/kg	37	2	1.55	1.55	3.03	0.160	0.485	1.30	99% KM (Chebyshev) UCL	0.170	0.514	1.45	99% KM (Chebyshev) UCL
Soil	Pesticides	Total	BHC (delta)	0-10 ft	N/A	ug/kg	37	2	1.55	1.55	3.03	0.160	0.485	1.30	99% KM (Chebyshev) UCL	0.170	0.514	1.45	99% KM (Chebyshev) UCL
Soil	Pesticides	Total	BHC (delta)	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	BHC (gamma) Lindane	0-1 ft	N/A	ug/kg	31	2	5.92	5.92	9.68	2.42	1.35	9.68	95% KM (BCA) UCL	2.42	1.35	-	-
Soil	Pesticides	Total	BHC (gamma) Lindane	0-3 ft	N/A	ug/kg	37	3	4.02	2.17	9.68	0.520	1.58	1.06	95% KM (t) UCL	0.525	1.58	1.07	95% KM (t) UCL
Soil	Pesticides	Total	BHC (gamma) Lindane	0-10 ft	N/A	ug/kg	37	3	4.02	2.17	9.68	0.520	1.58	1.06	95% KM (t) UCL	0.525	1.58	1.07	95% KM (t) UCL
Soil	Pesticides	Total	BHC (gamma) Lindane	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Chlordane (alpha)	0-1 ft	N/A	ug/kg	19	3	1.01	0.860	1.50	0.718	0.195	0.815	95% KM (t) UCL	0.759	0.209	0.893	95% KM (t) UCL
Soil	Pesticides	Total	Chlordane (alpha)	0-3 ft	N/A	ug/kg	25	3	1.01	0.860	1.50	0.703	0.171	0.776	95% KM (t) UCL	0.746	0.185	0.860	95% KM (t) UCL
Soil	Pesticides	Total	Chlordane (alpha)	0-10 ft	N/A	ug/kg	25	3	1.01	0.860	1.50	0.703	0.171	0.776	95% KM (t) UCL	0.746	0.185	0.860	95% KM (t) UCL
Soil	Pesticides	Total	Chlordane (alpha)	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Chlordane (gamma)	0-1 ft	N/A	ug/kg	19	6	43.7	29.8	97.0	19.0	26.0	30.3	95% KM (t) UCL	19.0	26.0	30.3	95% KM (t) UCL
Soil	Pesticides	Total	Chlordane (gamma)	0-3 ft	N/A	ug/kg	25	10	27.4	10.6	97.0	11.3	25.2	20.4	95% KM (t) UCL	11.4	25.2	20.5	95% KM (t) UCL
Soil	Pesticides	Total	Chlordane (gamma)	0-10 ft	N/A	ug/kg	25	10	27.4	10.6	97.0	11.3	25.2	20.4	95% KM (t) UCL	11.4	25.2	20.5	95% KM (t) UCL
Soil	Pesticides	Total	Chlordane (gamma)	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Dieldrin	0-1 ft	N/A	ug/kg	31	2	0.626	0.626	0.823	0.446	0.0823	0.488	95% KM (t) UCL	0.527	0.171	0.732	95% KM (t) UCL
Soil	Pesticides	Total	Dieldrin	0-3 ft	N/A	ug/kg	37	2	0.626	0.626	0.823	0.444	0.0789	0.483	95% KM (t) UCL	0.527	0.171	0.731	95% KM (t) UCL
Soil	Pesticides	Total	Dieldrin	0-10 ft	N/A	ug/kg	37	2	0.626	0.626	0.823	0.444	0.0789	0.483	95% KM (t) UCL	0.527	0.171	0.731	95% KM (t) UCL
Soil	Pesticides	Total	Dieldrin	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Endosulfan I	0-1 ft	N/A	ug/kg	31	2	4.32	4.32	6.45	2.35	0.775	2.69	95% KM (t) UCL	2.35	0.775	2.69	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan I	0-3 ft	N/A	ug/kg	37	5	2.21	2.00	6.45	0.447	1.13	0.809	95% KM (t) UCL	0.498	1.12	0.865	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan I	0-10 ft	N/A	ug/kg	37	5	2.21	2.00	6.45	0.447	1.13	0.809	95% KM (t) UCL	0.498	1.12	0.865	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan I	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Endosulfan II	0-1 ft	N/A	ug/kg	31	3	1.06	0.960	1.99	0.341	0.367	0.495	95% KM (t) UCL	0.606	0.529	1.06	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan II	0-3 ft	N/A	ug/kg	37	3	1.06	0.960	1.99	0.322	0.333	0.447	95% KM (t) UCL	0.569	0.484	0.990	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan II	0-10 ft	N/A	ug/kg	37	3	1.06	0.960	1.99	0.322	0.333	0.447	95% KM (t) UCL	0.569	0.484	0.990	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan II	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Endosulfan Sulfate	0-1 ft	N/A	ug/kg	31	6	1.46	1.24	3.30	0.761	0.560	0.953	95% KM (t) UCL	0.928	0.625	1.22	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan Sulfate	0-3 ft	N/A	ug/kg	37	6	1.46	1.24	3.30	0.729	0.515	0.889	95% KM (t) UCL	0.852	0.564	1.07	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan Sulfate	0-10 ft	N/A	ug/kg	37	6	1.46	1.24	3.30	0.729	0.515	0.889	95% KM (t) UCL	0.852	0.564	1.07	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan Sulfate	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Endrin Aldehyde	0-1 ft	N/A	ug/kg	31	4	8.36	7.70	16.0	2.84	2.90	3.87	95% KM (t) UCL	2.85	2.90	3.87	95% KM (t) UCL
Soil	Pesticides	Total	Endrin Aldehyde	0-3 ft	N/A	ug/kg	37	5	7.06	4.40	16.0	2.60	2.70	3.44	95% KM (t) UCL	2.61	2.70	3.45	95% KM (t) UCL
Soil	Pesticides	Total	Endrin Aldehyde	0-10 ft	N/A	ug/kg	37	5	7.06	4.40	16.0	2.60	2.70	3.44	95% KM (t) UCL	2.61	2.70	3.45	95% KM (t) UCL
Soil	Pesticides	Total	Endrin Aldehyde	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Endrin Ketone	0-1 ft	N/A	ug/kg	31	4	5.25	3.07	13.0	2.35	2.04	3.09	95% KM (t) UCL	2.35	2.04	3.09	95% KM (t) UCL
Soil	Pesticides	Total	Endrin Ketone	0-3 ft	N/A	ug/kg	37	4	5.25	3.07	13.0	2.26	1.87	2.88	95% KM (t) UCL	2.26	1.87	2.88	95% KM (t) UCL
Soil	Pesticides	Total	Endrin Ketone	0-10 ft	N/A	ug/kg	37	4	5.25	3.07	13.0	2.26	1.87	2.88	95% KM (t) UCL	2.26	1.87	2.88	95% KM (t) UCL

Table I-13
Statistical Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(3 of 9)

Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	Pesticides	Total	Endrin Ketone	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Endrin	0-1 ft	N/A	ug/kg	31	3	11.7	15.0	17.0	3.84	3.20	5.04	95% KM (t) UCL	3.84	3.20	5.04	95% KM (t) UCL
Soil	Pesticides	Total	Endrin	0-3 ft	N/A	ug/kg	37	4	9.28	9.00	17.0	2.88	3.15	3.89	95% KM (t) UCL	2.88	3.15	3.89	95% KM (t) UCL
Soil	Pesticides	Total	Endrin	0-10 ft	N/A	ug/kg	37	4	9.28	9.00	17.0	2.88	3.15	3.89	95% KM (t) UCL	2.88	3.15	3.89	95% KM (t) UCL
Soil	Pesticides	Total	Endrin	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Heptachlor	0-1 ft	N/A	ug/kg	31	4	0.911	0.283	2.90	0.283	0.496	0.464	95% KM (t) UCL	0.347	0.509	0.561	95% KM (t) UCL
Soil	Pesticides	Total	Heptachlor	0-3 ft	N/A	ug/kg	37	4	0.911	0.283	2.90	0.265	0.453	0.415	95% KM (t) UCL	0.329	0.464	0.513	95% KM (t) UCL
Soil	Pesticides	Total	Heptachlor	0-10 ft	N/A	ug/kg	37	4	0.911	0.283	2.90	0.265	0.453	0.415	95% KM (t) UCL	0.329	0.464	0.513	95% KM (t) UCL
Soil	Pesticides	Total	Heptachlor	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Methoxychlor	0-1 ft	N/A	ug/kg	31	2	1.10	1.10	1.20	1.02	0.0533	1.05	95% KM (t) UCL	1.03	0.0700	1.09	95% KM (t) UCL
Soil	Pesticides	Total	Methoxychlor	0-3 ft	N/A	ug/kg	37	2	1.10	1.10	1.20	1.01	0.0447	1.04	95% KM (t) UCL	1.02	0.0553	1.06	95% KM (t) UCL
Soil	Pesticides	Total	Methoxychlor	0-10 ft	N/A	ug/kg	37	2	1.10	1.10	1.20	1.01	0.0447	1.04	95% KM (t) UCL	1.02	0.0553	1.06	95% KM (t) UCL
Soil	Pesticides	Total	Methoxychlor	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	PCB Aroclors	Total	Aroclor 1254	0-1 ft	N/A	ug/kg	58	6	802	588	1,700	226	273	292	95% KM (t) UCL	226	273	292	95% KM (t) UCL
Soil	PCB Aroclors	Total	Aroclor 1254	0-3 ft	N/A	ug/kg	73	10	510	255	1,700	79.3	276	136	95% KM (t) UCL	79.3	276	136	95% KM (t) UCL
Soil	PCB Aroclors	Total	Aroclor 1254	0-10 ft	N/A	ug/kg	73	10	510	255	1,700	79.3	276	136	95% KM (t) UCL	79.3	276	136	95% KM (t) UCL
Soil	PCB Aroclors	Total	Aroclor 1254	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	N/A	ug/kg	58	52	89.6	24.8	690	80.5	148	203	97.5% KM (Chebyshev) UCL	80.9	148	204	97.5% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Aroclor 1260	0-3 ft	N/A	ug/kg	73	61	79.8	21.7	690	67.0	136	167	97.5% KM (Chebyshev) UCL	67.6	135	167	97.5% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Aroclor 1260	0-10 ft	N/A	ug/kg	73	61	79.8	21.7	690	67.0	136	167	97.5% KM (Chebyshev) UCL	67.6	135	167	97.5% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Aroclor 1260	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	N/A	ug/kg	58	52	255	25.5	2140	165	421	514	97.5% KM (Chebyshev) UCL	174	418	416	95% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-3 ft	N/A	ug/kg	73	61	224	28.7	2140	138	381	419	97.5% KM (Chebyshev) UCL	147	379	342	95% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-10 ft	N/A	ug/kg	73	61	224	28.7	2140	138	381	419	97.5% KM (Chebyshev) UCL	147	379	342	95% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	>10 ft	N/A	ug/kg	5	0	-	-	-	-	-	-	-	-	-	-	-
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	N/A	mg/kg	57	50	121	49.8	1,090	107	210	229	95% KM (Chebyshev) UCL	108	210	230	95% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-3 ft	N/A	mg/kg	74	63	143	45.7	1,440	123	279	266	95% KM (Chebyshev) UCL	124	279	267	95% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-10 ft	N/A	mg/kg	77	63	143	45.7	1,440	118	275	256	95% KM (Chebyshev) UCL	120	274	257	95% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Diesel Range Organics	>10 ft	N/A	mg/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	N/A	mg/kg	57	52	439	311	2,300	402	462	671	95% KM (Chebyshev) UCL	403	461	672	95% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Residual Range Organics	0-3 ft	N/A	mg/kg	74	66	391	247	2,300	351	443	577	95% KM (Chebyshev) UCL	352	442	578	95% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Residual Range Organics	0-10 ft	N/A	mg/kg	77	66	391	247	2,300	338	439	558	95% KM (Chebyshev) UCL	340	438	559	95% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Residual Range Organics	>10 ft	N/A	mg/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	N/A	mg/kg	36	8	2.70	3.00	3.49	2.02	0.687	2.29	95% KM (t) UCL	2.44	0.705	2.83	95% KM (t) UCL
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-3 ft	N/A	mg/kg	44	10	411	3.15	3,960	94.8	590	1,030	99% KM (Chebyshev) UCL	95.2	590	1,030	99% KM (Chebyshev) UCL
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-10 ft	N/A	mg/kg	47	10	411	3.15	3,960	88.9	571	963	99% KM (Chebyshev) UCL	89.2	571	963	99% KM (Chebyshev) UCL
Soil	NWTPH-Gx	Total	Gasoline Range Organics	>10 ft	N/A	mg/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Benzoic Acid	0-1 ft	N/A	ug/kg	31	12	148	69.6	980	81.9	185	166	95% KM (BCA) UCL	95.9	189	183	95% KM (BCA) UCL
Soil	SVOCs	Total	Benzoic Acid	0-3 ft	N/A	ug/kg	39	12	148	69.6	980	66.9	164	132	95% KM (BCA) UCL	81.8	166	141	95% KM (BCA) UCL
Soil	SVOCs	Total	Benzoic Acid	0-10 ft	N/A	ug/kg	42	12	148	69.6	980	62.1	158	130	95% KM (BCA) UCL	77.0	159	137	95% KM (BCA) UCL
Soil	SVOCs	Total	Benzoic Acid	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	N/A	ug/kg	31	21	19,200	1,500	260,000	13,100	46,400	98,000	99% KM (Chebyshev) UCL	13,100	46,400	98,000	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-3 ft	N/A	ug/kg	40	29	15,400	1,040	260,000	11,200	41,200	77,100	99% KM (Chebyshev) UCL	11,200	41,200	77,100	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-10 ft	N/A	ug/kg	43	32	14,000	938	260,000	10,400	39,800	71,800	99% KM (Chebyshev) UCL	10,400	39,800	71,800	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	>10 ft	N/A	ug/kg	6	6	85.1	38.1	266	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	N/A	ug/kg	31	5	38.5	15.7	124	9.59	22.1	17.1	95% KM (t) UCL	12.3	24.7	22.1	95% KM (t) UCL
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-3 ft	N/A	ug/kg	39	6	37.4	23.7	124	9.14	20.2	15.2	95% KM (t) UCL	10.7	22.1	18.0	95% KM (t) UCL
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-10 ft	N/A	ug/kg	42	6	37.4	23.7	124	8.73	19.5	14.3	95% KM (t) UCL	10.2	21.2	16.9	95% KM (t) UCL
Soil	SVOCs	Total	Butyl Benzyl Phthalate	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Carbazole	0-1 ft	N/A	ug/kg	31	20	141	68.5	530	91.8	144	144	95% KM (BCA) UCL	96.4	142	144	95% KM (BCA) UCL
Soil	SVOCs	Total	Carbazole	0-3 ft	N/A	ug/kg	39	24	118	35.0	530	73.7	133	112	95% KM (BCA) UCL	76.8	132	113	95% KM (BCA) UCL
Soil	SVOCs	Total	Carbazole	0-10 ft	N/A	ug/kg	42	24	118	35.0	530	68.5	130	105	95% KM (BCA) UCL	71.5	129	105	95% KM (BCA) UCL
Soil	SVOCs	Total	Carbazole	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Dibenzofuran	0-1 ft	N/A	ug/kg	31	19	41.0	10.0	220	26.0	47.6	42.4	95% KM (BCA) UCL	28.4	48.2	43.6	95% KM (BCA) UCL
Soil	SVOCs	Total	Dibenzofuran	0-3 ft	N/A	ug/kg	40	24	58.1	8.90	485	35.5	85.3	122	97.5% KM (Chebyshev) UCL	37.4	85.3	124	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Dibenzofuran	0-10 ft	N/A	ug/kg	43	24	58.1	8.90	485	33.1	82.7	114	97.5% KM (Chebyshev) UCL	34.9	82.8	116	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Dibenzofuran	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Dimethyl Phthalate	0-1 ft	N/A	ug/kg	31	3	34.3	32.0	41.0	30.5	2.14	31.4	95% KM (t) UCL	30.6	2.26	31.6	95% KM (t) UCL
Soil	SVOCs	Total	Dimethyl Phthalate	0-3 ft	N/A	ug/kg	39	3	34.3	32.0	41.0	30.4	1.88	31.0	95% KM (t) UCL	30.4	1.96	31.2	95% KM (t) UCL
Soil	SVOCs	Total	Dimethyl Phthalate	0-10 ft	N/A	ug/kg	42	3	34.3	32.0	41.0	30.4	1.80	31.0	95% KM (t) UCL	30.4	1.88	31.0	95% KM (t) UCL
Soil	SVOCs	Total	Dimethyl Phthalate	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	N/A	ug/kg	31	10	107	102	280	44.9	66.6	80.4	95% KM (Percentile Bootstrap) UCL	48.8	68.8	82.3	95% KM (Percentile Bootstrap) UCL
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-3 ft	N/A	ug/kg	39	14	82.0	49.0	280	36.5	61.1	54.3	95% KM (t) UCL	39.4	62.6	58.3	95% KM (t) UCL
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-10 ft	N/A	ug/kg	42	14	82.0	49.0	280	33.6	59.5	50.2	95% KM (t) UCL	36.3	60.8	53.9	95% KM (t) UCL
Soil	SVOCs	Total	Di-n-butyl Phthalate	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-1 ft	N/A	ug/kg	31	5	49.4	31.0	127	17.6	22.1	25.1	95% KM (t) UCL	19.9	25.1	29.9	95% KM (t) UCL
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-3 ft	N/A	ug/kg	39	6	45.0	27.0	127	16.6	19.9	22.5	95% KM (t) UCL	18.1	22.0	25.4	95% KM (t) UCL
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-10 ft	N/A	ug/kg	42	7	51.1	31.0	127	18.1	22.1	24.3	95% KM (t) UCL	20.0	24.5	27.7	95% KM (t) UCL
Soil	SVOCs	Total	Di-n-octyl Phthalate	>10 ft	N/A	ug/kg	6	2	5.73	5.73	7.06	4.84	0.991	-	-	5.73	1.33	-	-
Soil	SVOCs	Total	Pentachlorophenol	0-1 ft	N/A	ug/kg	31	2	21.5	21.5	32.0	11.9	4.28	14.1	95% KM (t) UCL	12.2	4.94	15.1	95% KM (t) UCL
Soil	SVOCs	Total	Pentachlorophenol	0-3 ft	N/A	ug/kg	39	2	21.5	21.5	32.0	11.7	3.71	13.3	95% KM (t) UCL	12.0	4.58	14.5	95% KM (t) UCL

Table I-13
Statistical Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(4 of 9)

Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	SVOCs	Total	Pentachlorophenol	0-10 ft	N/A	ug/kg	42	2	21.5	21.5	32.0	11.6	3.55	-	-	11.9	4.28	-	-
Soil	SVOCs	Total	Pentachlorophenol	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Phenol	0-1 ft	N/A	ug/kg	31	2	2.85	2.85	3.70	2.08	0.371	2.28	95% KM (t) UCL	2.85	0.850	4.29	95% KM (t) UCL
Soil	SVOCs	Total	Phenol	0-3 ft	N/A	ug/kg	39	5	9.22	3.00	35.0	3.09	5.57	35.0	95% KM (BCA) UCL	3.93	6.01	6.58	95% KM (BCA) UCL
Soil	SVOCs	Total	Phenol	0-10 ft	N/A	ug/kg	42	5	9.22	3.00	35.0	3.00	5.34	-	-	3.82	5.73	6.14	95% KM (BCA) UCL
Soil	SVOCs	Total	Phenol	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	2-Methylnaphthalene	0-1 ft	N/A	ug/kg	31	16	28.0	25.0	150	15.5	28.4	27.4	95% KM (BCA) UCL	16.2	29.1	26.5	95% KM (BCA) UCL
Soil	SVOCs	Total	2-Methylnaphthalene	0-3 ft	N/A	ug/kg	40	18	32.0	25.0	150	15.4	31.0	23.9	95% KM (t) UCL	16.0	31.6	24.8	95% KM (t) UCL
Soil	SVOCs	Total	2-Methylnaphthalene	0-10 ft	N/A	ug/kg	43	19	30.4	22.9	150	14.4	30.1	22.4	95% KM (t) UCL	14.9	30.6	23.2	95% KM (t) UCL
Soil	SVOCs	Total	2-Methylnaphthalene	>10 ft	N/A	ug/kg	6	1	7.98	7.98	7.98	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Acenaphthene	0-1 ft	N/A	ug/kg	31	25	92.5	29.3	470	74.9	121	172	95% KM (Chebyshev) UCL	75.0	121	172	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Acenaphthene	0-3 ft	N/A	ug/kg	40	31	189	20.0	3,200	147	503	652	97.5% KM (Chebyshev) UCL	147	503	652	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Acenaphthene	0-10 ft	N/A	ug/kg	43	32	183	18.0	3,200	137	486	607	97.5% KM (Chebyshev) UCL	137	486	608	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Acenaphthene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Acenaphthylene	0-1 ft	N/A	ug/kg	31	14	21.6	9.82	87.7	11.2	19.2	17.4	95% KM (t) UCL	12.0	20.1	18.8	95% KM (t) UCL
Soil	SVOCs	Total	Acenaphthylene	0-3 ft	N/A	ug/kg	40	16	37.9	12.1	295	16.4	47.8	29.6	95% KM (t) UCL	17.2	48.5	30.8	95% KM (t) UCL
Soil	SVOCs	Total	Acenaphthylene	0-10 ft	N/A	ug/kg	43	16	37.9	12.1	295	15.4	46.3	27.6	95% KM (t) UCL	16.0	46.9	28.6	95% KM (t) UCL
Soil	SVOCs	Total	Acenaphthylene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Anthracene	0-1 ft	N/A	ug/kg	31	29	158	29.0	832	148	239	338	95% KM (Chebyshev) UCL	148	239	338	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Anthracene	0-3 ft	N/A	ug/kg	40	35	203	21.3	2,040	178	372	772	99% KM (Chebyshev) UCL	178	372	772	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Anthracene	0-10 ft	N/A	ug/kg	43	36	197	19.6	2,040	166	362	723	99% KM (Chebyshev) UCL	166	362	723	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Anthracene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Fluorene	0-1 ft	N/A	ug/kg	31	23	84.2	17.5	462	63.4	113	154	95% KM (Chebyshev) UCL	65.2	113	156	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Fluorene	0-3 ft	N/A	ug/kg	40	28	104	15.2	779	73.3	153	227	97.5% KM (Chebyshev) UCL	74.6	153	229	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Fluorene	0-10 ft	N/A	ug/kg	43	28	104	15.2	779	68.3	149	212	97.5% KM (Chebyshev) UCL	69.4	149	214	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Fluorene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	31	19	38.9	8.90	227	24.8	45.0	108	99% KM (Chebyshev) UCL	25.9	45.6	112	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Naphthalene	0-3 ft	N/A	ug/kg	40	24	42.0	7.72	256	26.1	54.8	81.4	97.5% KM (Chebyshev) UCL	27.0	55.4	83.7	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Naphthalene	0-10 ft	N/A	ug/kg	43	24	42.0	7.72	256	24.4	53.2	76.2	97.5% KM (Chebyshev) UCL	25.2	53.7	78.2	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Naphthalene	>10 ft	N/A	ug/kg	6	1	4.24	4.24	4.24	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Phenanthrene	0-1 ft	N/A	ug/kg	31	31	707	116	4,000	-	-	1,260	Use 95% Adjusted Gamma UCL	-	-	1,260	Use 95% Adjusted Gamma UCL
Soil	SVOCs	Total	Phenanthrene	0-3 ft	N/A	ug/kg	40	38	797	97.0	6,550	757	1,350	2,910	99% KM (Chebyshev) UCL	757	1,350	2,910	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Phenanthrene	0-10 ft	N/A	ug/kg	43	39	777	79.0	6,550	705	1,320	2,730	99% KM (Chebyshev) UCL	705	1,320	2,730	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Phenanthrene	>10 ft	N/A	ug/kg	6	1	1.82	1.82	1.82	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	N/A	ug/kg	31	31	1039	168	5687	1039	1603	1849	95% Adjusted Gamma UCL	1049	1608	1850	95% Adjusted Gamma UCL
Soil	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	N/A	ug/kg	40	38	1268	135	13120	1205	2403	5036	99% KM (Chebyshev) UCL	1214	2405	5048	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)anthracene	0-1 ft	N/A	ug/kg	31	29	787	190	6,440	736	1,270	1,750	95% KM (Chebyshev) UCL	736	1,270	1,750	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)anthracene	0-3 ft	N/A	ug/kg	40	35	1,070	183	12,300	935	2,160	2,450	95% KM (Chebyshev) UCL	935	2,160	2,450	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)anthracene	0-10 ft	N/A	ug/kg	43	36	1,040	148	12,300	870	2,100	4,100	99% KM (Chebyshev) UCL	870	2,100	4,100	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)anthracene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Benzo(a)pyrene	0-1 ft	N/A	ug/kg	31	30	771	180	6,470	746	1,280	1,760	95% KM (Chebyshev) UCL	746	1,280	1,760	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)pyrene	0-3 ft	N/A	ug/kg	40	36	1,030	155	11,700	926	2,090	2,390	95% KM (Chebyshev) UCL	926	2,090	2,390	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)pyrene	0-10 ft	N/A	ug/kg	43	37	1,000	151	11,700	862	2,030	3,980	99% KM (Chebyshev) UCL	862	2,030	3,980	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)pyrene	>10 ft	N/A	ug/kg	6	1	1.32	1.32	1.32	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	N/A	ug/kg	13	13	1,350	1,100	4,100	-	-	1,950	Use 95% Student's-t UCL	-	-	1,950	Use 95% Student's-t UCL
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-3 ft	N/A	ug/kg	18	17	1,050	640	4,100	991	1,150	2,210	95% KM (Chebyshev) UCL	991	1,150	2,210	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-10 ft	N/A	ug/kg	18	17	1,050	640	4,100	991	1,150	2,210	95% KM (Chebyshev) UCL	991	1,150	2,210	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	N/A	ug/kg	31	26	534	180	3,830	449	774	1,070	95% KM (Chebyshev) UCL	449	774	1,070	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-3 ft	N/A	ug/kg	40	33	555	120	3,830	459	843	1,050	95% KM (Chebyshev) UCL	459	843	1,050	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-10 ft	N/A	ug/kg	43	34	540	114	3,830	428	821	982	95% KM (Chebyshev) UCL	428	821	982	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(g,h,i)perylene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	N/A	ug/kg	13	13	469	360	1,400	-	-	676	Use 95% Student's-t UCL	-	-	676	Use 95% Student's-t UCL
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-3 ft	N/A	ug/kg	18	17	365	220	1,400	345	396	764	95% KM (Chebyshev) UCL	345	396	764	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-10 ft	N/A	ug/kg	18	17	365	220	1,400	345	396	764	95% KM (Chebyshev) UCL	345	396	764	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-1 ft	N/A	ug/kg	18	17	1,100	74.2	12,100	1,040	2,780	7,760	99% KM (Chebyshev) UCL	1,040	2,780	7,760	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-3 ft	N/A	ug/kg	22	20	1,900	105	16,300	1,730	4,090	10,600	99% KM (Chebyshev) UCL	1,730	4,090	10,600	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-10 ft	N/A	ug/kg	25	21	1,810	74.2	16,300	1,520	3,880	9,420	99% KM (Chebyshev) UCL	1,520	3,880	9,420	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzofluoranthenes, Total	>10 ft	N/A	ug/kg	6	2	2.84	2.84	2.97	2.76	0.0932	-	-	2.84	0.125	-	-
Soil	SVOCs	Total	Chrysene	0-1 ft	N/A	ug/kg	31	30	904	222	7,590	875	1,500	2,070	95% KM (Chebyshev) UCL	875	1,500	2,070	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Chrysene	0-3 ft	N/A	ug/kg	40	37	1,120	129	12,000	1,030	2,230	4,590	99% KM (Chebyshev) UCL	1,030	2,230	4,590	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Chrysene	0-10 ft	N/A	ug/kg	43	38	1,090	124	12,000	962	2,170	4,290	99% KM (Chebyshev) UCL	962	2,170	4,290	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Chrysene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	N/A	ug/kg	31	20	232	113	1,430	150	280	244	95% KM (BCA) UCL	150	280	246	95% KM (BCA) UCL
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-3 ft	N/A	ug/kg	40	26	235	93.2	1,430	153	295	238	95% KM (BCA) UCL	154	295	237	95% KM (BCA) UCL
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-10 ft	N/A	ug/kg	43	26	235	93.2	1,430	143	287	224	95% KM (BCA) UCL	143	287	224	95% KM (BCA) UCL
Soil	SVOCs	Total	Dibenz(a,h)anthracene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Fluoranthene	0-1 ft	N/A	ug/kg	31	30	1,710	284	20,700	1,660	3,740	4,640	95% KM (Chebyshev) UCL	1,660	3,740	4,640	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Fluoranthene	0-3 ft	N/A	ug/kg	40	37	2,290	216	28,600	2,120	5,420	10,800	99% KM (Chebyshev) UCL	2,120	5,420	10,800	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Fluoranthene	0-10 ft	N/A	ug/kg	43	38	2,230	193	28,600	1,970	5,260	10,100	99% KM (Chebyshev) UCL	1,970	5,260	10,100	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Fluoranthene	>10 ft	N/A	ug/kg	6	2	3.72	3.72	3.90	3.59	0.138	-	-	3.59	0.138	-	-
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	N/A	ug/kg	31	28	530	155	3,910	479	811	1,130	95% KM (Chebyshev) UCL	479	811	1,130	95% KM (Chebyshev) UCL

Table I-13
Statistical Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(5 of 9)

Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-3 ft	N/A	ug/kg	40	35	575	97.8	4,170	503	944	1,160	95% KM (Chebyshev) UCL	503	944	1,160	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-10 ft	N/A	ug/kg	43	36	559	90.7	4,170	469	920	1,880	99% KM (Chebyshev) UCL	469	920	1,880	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	>10 ft	N/A	ug/kg	6	1	0.511	0.511	0.511	-	-	-	-	-	-	-	-
Soil	SVOCs	Total	Pyrene	0-1 ft	N/A	ug/kg	31	30	1,710	338	21,900	1,660	3,920	4,780	95% KM (Chebyshev) UCL	1,660	3,920	4,780	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Pyrene	0-3 ft	N/A	ug/kg	40	38	2,350	184	32,000	2,230	5,950	11,700	99% KM (Chebyshev) UCL	2,230	5,950	11,700	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Pyrene	0-10 ft	N/A	ug/kg	43	39	2,290	150	32,000	2,080	5,770	10,900	99% KM (Chebyshev) UCL	2,080	5,770	10,900	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Pyrene	>10 ft	N/A	ug/kg	6	3	3.21	3.31	3.71	2.90	0.444	-	-	2.90	0.444	-	-
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	N/A	ug/kg	31	30	7765	738	72270	7516	13891	18577	95% KM (Chebyshev) UCL	7517	13891	18578	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	N/A	ug/kg	40	38	9430	926	105200	8959	19945	40758	99% KM (Chebyshev) UCL	8961	19944	40758	99% KM (Chebyshev) UCL
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-1 ft	N/A	ug/kg	37	2	0.535	0.535	0.580	0.494	0.0180	0.503	95% KM (t) UCL	0.535	0.0450	0.611	95% KM (t) UCL
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-3 ft	N/A	ug/kg	46	2	0.535	0.535	0.580	0.493	0.0157	-	-	0.535	0.0450	-	-
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-10 ft	N/A	ug/kg	49	3	0.389	0.490	0.580	0.122	0.102	0.157	95% KM (t) UCL	0.389	0.210	0.638	95% KM (t) UCL
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	N/A	ug/kg	37	15	0.246	0.230	0.523	0.195	0.0993	0.230	95% KM (t) UCL	0.246	0.0942	0.288	95% KM (t) UCL
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-3 ft	N/A	ug/kg	46	21	1,250	0.230	14,300	572	2,690	4,620	99% KM (Chebyshev) UCL	572	2,690	4,620	99% KM (Chebyshev) UCL
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-10 ft	N/A	ug/kg	49	21	1,250	0.230	14,300	537	2,610	4,340	99% KM (Chebyshev) UCL	537	2,610	4,340	99% KM (Chebyshev) UCL
Soil	VOCs	Total	1,2,4-Trimethylbenzene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	N/A	ug/kg	37	5	0.0909	0.0930	0.125	0.0534	0.0227	0.0621	95% KM (t) UCL	0.0909	0.0265	0.113	95% KM (t) UCL
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-3 ft	N/A	ug/kg	46	8	840	0.113	6,500	146	948	1,630	99% KM (Chebyshev) UCL	146	948	1,630	99% KM (Chebyshev) UCL
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-10 ft	N/A	ug/kg	49	8	840	0.113	6,500	137	919	1,530	99% KM (Chebyshev) UCL	137	919	1,530	99% KM (Chebyshev) UCL
Soil	VOCs	Total	1,3,5-Trimethylbenzene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	N/A	ug/kg	37	1	0.160	0.160	0.160	-	-	-	-	-	-	-	-
Soil	VOCs	Total	1,4-Dichlorobenzene	0-3 ft	N/A	ug/kg	46	2	0.150	0.150	0.160	0.141	0.00348	-	-	0.150	0.0100	-	-
Soil	VOCs	Total	1,4-Dichlorobenzene	0-10 ft	N/A	ug/kg	49	2	0.150	0.150	0.160	0.141	0.00333	-	-	0.150	0.0100	-	-
Soil	VOCs	Total	1,4-Dichlorobenzene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	2-Butanone (MEK)	0-1 ft	N/A	ug/kg	37	16	19.6	13.5	50.0	13.2	10.6	16.5	95% KM (t) UCL	14.3	10.3	17.6	95% KM (t) UCL
Soil	VOCs	Total	2-Butanone (MEK)	0-3 ft	N/A	ug/kg	46	19	17.0	13.0	50.0	10.2	11.0	13.3	95% KM (t) UCL	11.8	10.5	14.8	95% KM (t) UCL
Soil	VOCs	Total	2-Butanone (MEK)	0-10 ft	N/A	ug/kg	49	19	17.0	13.0	50.0	9.58	10.8	12.4	95% KM (t) UCL	11.0	10.4	13.8	95% KM (t) UCL
Soil	VOCs	Total	2-Butanone (MEK)	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	2-Hexanone	0-1 ft	N/A	ug/kg	37	3	6.33	5.50	8.80	4.90	0.828	5.25	95% KM (t) UCL	5.51	1.22	6.47	95% KM (t) UCL
Soil	VOCs	Total	2-Hexanone	0-3 ft	N/A	ug/kg	46	3	6.33	5.50	8.80	4.85	0.722	5.12	95% KM (t) UCL	5.47	1.17	6.36	95% KM (t) UCL
Soil	VOCs	Total	2-Hexanone	0-10 ft	N/A	ug/kg	49	3	6.33	5.50	8.80	4.84	0.692	5.08	95% KM (t) UCL	5.38	1.06	6.16	95% KM (t) UCL
Soil	VOCs	Total	2-Hexanone	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	4-Isopropyltoluene	0-1 ft	N/A	ug/kg	37	14	1.63	0.415	12.0	0.749	1.98	1.33	95% KM (t) UCL	1.21	2.26	2.02	95% KM (t) UCL
Soil	VOCs	Total	4-Isopropyltoluene	0-3 ft	N/A	ug/kg	46	17	10.9	0.900	161	4.25	23.7	20.1	95% KM (Chebyshev) UCL	4.85	23.9	21.1	95% KM (Chebyshev) UCL
Soil	VOCs	Total	4-Isopropyltoluene	0-10 ft	N/A	ug/kg	49	17	10.9	0.900	161	3.98	23.0	18.9	95% KM (Chebyshev) UCL	4.53	23.2	19.7	95% KM (Chebyshev) UCL
Soil	VOCs	Total	4-Isopropyltoluene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	N/A	ug/kg	37	9	0.668	0.670	1.20	0.486	0.221	0.574	95% KM (t) UCL	0.668	0.233	0.807	95% KM (t) UCL
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-3 ft	N/A	ug/kg	46	9	0.668	0.670	1.20	0.453	0.207	0.525	95% KM (t) UCL	0.668	0.233	0.806	95% KM (t) UCL
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-10 ft	N/A	ug/kg	49	9	0.668	0.670	1.20	0.449	0.202	0.519	95% KM (t) UCL	0.668	0.233	0.806	95% KM (t) UCL
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	Acetone	0-1 ft	N/A	ug/kg	37	18	190	155	540	104	126	156	95% KM (Percentile Bootstrap) UCL	106	127	158	95% KM (Percentile Bootstrap) UCL
Soil	VOCs	Total	Acetone	0-3 ft	N/A	ug/kg	46	23	154	150	540	90.5	118	122	95% KM (t) UCL	93.0	118	124	95% KM (t) UCL
Soil	VOCs	Total	Acetone	0-10 ft	N/A	ug/kg	49	23	154	150	540	84.8	116	114	95% KM (t) UCL	86.8	116	117	95% KM (t) UCL
Soil	VOCs	Total	Acetone	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	Benzene	0-1 ft	N/A	ug/kg	37	15	0.474	0.450	1.20	0.413	0.278	0.524	95% KM (t) UCL	0.471	0.284	0.598	95% KM (t) UCL
Soil	VOCs	Total	Benzene	0-3 ft	N/A	ug/kg	46	17	0.484	0.470	1.20	0.373	0.265	0.463	95% KM (t) UCL	0.482	0.269	0.593	95% KM (t) UCL
Soil	VOCs	Total	Benzene	0-10 ft	N/A	ug/kg	49	19	0.481	0.470	1.20	0.379	0.257	0.462	95% KM (t) UCL	0.479	0.256	0.579	95% KM (t) UCL
Soil	VOCs	Total	Benzene	>10 ft	N/A	ug/kg	6	1	0.631	0.631	0.631	-	-	-	-	-	-	-	-
Soil	VOCs	Total	Bromomethane	0-1 ft	N/A	ug/kg	37	7	1.81	0.570	5.00	0.870	1.17	1.44	95% KM (BCA) UCL	1.26	1.49	2.08	95% KM (BCA) UCL
Soil	VOCs	Total	Bromomethane	0-3 ft	N/A	ug/kg	46	8	1.69	0.705	5.00	0.785	1.02	1.11	95% KM (t) UCL	1.10	1.26	1.64	95% KM (t) UCL
Soil	VOCs	Total	Bromomethane	0-10 ft	N/A	ug/kg	49	8	1.69	0.705	5.00	0.761	0.982	1.06	95% KM (t) UCL	1.04	1.18	1.51	95% KM (t) UCL
Soil	VOCs	Total	Bromomethane	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	Carbon Disulfide	0-1 ft	N/A	ug/kg	37	19	1.05	0.700	6.90	0.793	1.11	1.14	95% KM (% Bootstrap) UCL	0.876	1.08	1.22	95% KM (% Bootstrap) UCL
Soil	VOCs	Total	Carbon Disulfide	0-3 ft	N/A	ug/kg	46	24	1.07	0.690	6.90	0.828	1.07	1.12	95% KM (t) UCL	0.916	1.04	1.22	95% KM (% Bootstrap) UCL
Soil	VOCs	Total	Carbon Disulfide	0-10 ft	N/A	ug/kg	49	24	1.07	0.690	6.90	0.775	1.04	1.05	95% KM (t) UCL	0.894	1.01	1.16	95% KM (t) UCL
Soil	VOCs	Total	Carbon Disulfide	>10 ft	N/A	ug/kg	6	1	1.04	1.04	1.04	-	-	-	-	-	-	-	-
Soil	VOCs	Total	Chloroform	0-1 ft	N/A	ug/kg	37	3	6.52	0.290	19.0	0.768	3.04	6.86	99% KM (Chebyshev) UCL	0.781	3.04	6.87	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Chloroform	0-3 ft	N/A	ug/kg	46	3	6.52	0.290	19.0	0.677	2.76	5.70	99% KM (Chebyshev) UCL	0.691	2.76	5.71	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Chloroform	0-10 ft	N/A	ug/kg	49	3	6.52	0.290	19.0	0.651	2.68	5.36	99% KM (Chebyshev) UCL	0.665	2.67	5.37	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Chloroform	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	Chloromethane	0-1 ft	N/A	ug/kg	37	2	0.240	0.240	0.250	0.231	0.00458	0.234	95% KM (t) UCL	0.240	0.0100	0.257	95% KM (t) UCL
Soil	VOCs	Total	Chloromethane	0-3 ft	N/A	ug/kg	46	2	0.240	0.240	0.250	0.231	0.00408	-	-	0.240	0.0100	-	-
Soil	VOCs	Total	Chloromethane	0-10 ft	N/A	ug/kg	49	2	0.240	0.240	0.250	0.231	0.00408	-	-	0.240	0.0100	-	-
Soil	VOCs	Total	Chloromethane	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	37	1	12.0	12.0	12.0	-	-	-	-	-	-	-	-
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-3 ft	N/A	ug/kg	46	2	66.0	66.0	120	14.4	15.9	-	-	14.4	15.9	-	-
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-10 ft	N/A	ug/kg	49	4	48.8	35.2	120	8.61	18.0	13.6	95% KM (t) UCL	8.61	18.0	13.6	95% KM (t) UCL
Soil	VOCs	Total	cis-1,2-Dichloroethene	>10 ft	N/A	ug/kg	6	3	0.859	0.628	1.54	0.635	0.413	-	-	0.774	0.452	-	-
Soil	VOCs	Total	Dichlorodifluoromethane	0-1 ft	N/A	ug/kg	37	4	27.7	8.35	94.0	3.24	15.3	8.15	95% KM (t) UCL	3.42	15.3	8.34	95% KM (t) UCL
Soil	VOCs	Total	Dichlorodifluoromethane	0-3 ft	N/A	ug/kg	46	4	27.7	8.35	94.0	2.71	14.0	6.74	95% KM (t) UCL	2.90	13.9	6.94	95% KM (t) UCL

Table I-13
Statistical Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(6 of 9)

Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	VOCs	Total	Dichlorodifluoromethane	0-10 ft	N/A	ug/kg	49	5	22.2	0.695	94.0	2.40	13.6	6.06	95% KM (t) UCL	2.62	13.5	6.29	95% KM (t) UCL
Soil	VOCs	Total	Dichlorodifluoromethane	>10 ft	N/A	ug/kg	6	4	0.206	0.147	0.467	0.162	0.142	-	-	0.206	0.155	-	-
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	N/A	ug/kg	37	12	38.7	0.410	460	12.8	74.5	140	99% KM (Chebyshev) UCL	12.8	74.5	140	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-3 ft	N/A	ug/kg	46	17	27.4	0.390	460	10.6	67.8	56.0	95% KM (Chebyshev) UCL	10.6	67.7	56.0	95% KM (Chebyshev) UCL
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-10 ft	N/A	ug/kg	49	17	27.4	0.390	460	9.93	65.6	52.5	95% KM (Chebyshev) UCL	9.99	65.6	52.6	95% KM (Chebyshev) UCL
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	>10 ft	N/A	ug/kg	6	2	7.47	7.47	13.8	3.25	4.72	-	-	3.25	4.72	-	-
Soil	VOCs	Total	Ethylbenzene	0-1 ft	N/A	ug/kg	37	8	0.145	0.105	0.320	0.104	0.0640	0.132	95% KM (t) UCL	0.145	0.0791	0.195	95% KM (t) UCL
Soil	VOCs	Total	Ethylbenzene	0-3 ft	N/A	ug/kg	46	10	3.86	0.105	37.4	0.926	5.50	4.69	95% KM (Chebyshev) UCL	0.965	5.49	4.73	95% KM (Chebyshev) UCL
Soil	VOCs	Total	Ethylbenzene	0-10 ft	N/A	ug/kg	49	10	3.86	0.105	37.4	0.873	5.33	4.41	95% KM (Chebyshev) UCL	0.913	5.32	4.44	95% KM (Chebyshev) UCL
Soil	VOCs	Total	Ethylbenzene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	m,p-Xylenes	0-1 ft	N/A	ug/kg	37	8	0.271	0.245	0.440	0.198	0.0985	0.240	95% KM (t) UCL	0.271	0.111	0.342	95% KM (t) UCL
Soil	VOCs	Total	m,p-Xylenes	0-3 ft	N/A	ug/kg	46	11	677	0.250	7,400	162	1,080	1,820	99% KM (Chebyshev) UCL	162	1,080	1,820	99% KM (Chebyshev) UCL
Soil	VOCs	Total	m,p-Xylenes	0-10 ft	N/A	ug/kg	49	11	677	0.250	7,400	152	1,050	1,710	99% KM (Chebyshev) UCL	152	1,050	1,710	99% KM (Chebyshev) UCL
Soil	VOCs	Total	m,p-Xylenes	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	37	8	0.675	0.540	1.50	0.529	0.219	0.610	95% KM (t) UCL	0.636	0.287	0.792	95% KM (t) UCL
Soil	VOCs	Total	Naphthalene	0-3 ft	N/A	ug/kg	46	11	2.50	0.540	19.5	0.973	2.81	1.94	95% KM (BCA) UCL	1.30	3.30	2.66	95% KM (BCA) UCL
Soil	VOCs	Total	Naphthalene	0-10 ft	N/A	ug/kg	49	11	2.50	0.540	19.5	0.940	2.72	1.79	95% KM (BCA) UCL	1.23	3.16	2.40	95% KM (BCA) UCL
Soil	VOCs	Total	Naphthalene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	n-Propylbenzene	0-1 ft	N/A	ug/kg	37	1	0.150	0.150	0.150	-	-	-	-	-	-	-	-
Soil	VOCs	Total	n-Propylbenzene	0-3 ft	N/A	ug/kg	46	3	40.8	0.409	122	2.87	18.0	35.5	99% KM (Chebyshev) UCL	3.05	18.1	36.4	99% KM (Chebyshev) UCL
Soil	VOCs	Total	n-Propylbenzene	0-10 ft	N/A	ug/kg	49	3	40.8	0.409	122	2.70	17.4	33.3	99% KM (Chebyshev) UCL	2.87	17.6	34.1	99% KM (Chebyshev) UCL
Soil	VOCs	Total	n-Propylbenzene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	o-Xylene	0-1 ft	N/A	ug/kg	37	2	0.175	0.175	0.180	0.171	0.00223	0.172	95% KM (t) UCL	0.175	0.00500	0.183	95% KM (t) UCL
Soil	VOCs	Total	o-Xylene	0-3 ft	N/A	ug/kg	46	5	652	0.197	3,200	71.0	466	200	95% KM (t) UCL	71.0	466	200	95% KM (t) UCL
Soil	VOCs	Total	o-Xylene	0-10 ft	N/A	ug/kg	49	5	652	0.197	3,200	66.6	452	188	95% KM (t) UCL	66.6	452	188	95% KM (t) UCL
Soil	VOCs	Total	o-Xylene	>10 ft	N/A	ug/kg	6	1	0.184	0.184	0.184	-	-	-	-	-	-	-	-
Soil	VOCs	Total	sec-Butylbenzene	0-1 ft	N/A	ug/kg	37	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	sec-Butylbenzene	0-3 ft	N/A	ug/kg	46	2	45.3	45.3	90.2	2.43	13.2	-	-	2.48	13.4	-	-
Soil	VOCs	Total	sec-Butylbenzene	0-10 ft	N/A	ug/kg	49	2	45.3	45.3	90.2	2.30	12.8	-	-	2.34	13.0	-	-
Soil	VOCs	Total	sec-Butylbenzene	>10 ft	N/A	ug/kg	6	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	N/A	ug/kg	37	2	1.63	1.63	3.10	0.244	0.483	1.38	99% KM (Chebyshev) UCL	0.582	1.03	6.05	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-3 ft	N/A	ug/kg	46	5	85,900	5.84	420,000	9,340	61,200	26,300	95% KM (t) UCL	9,340	61,200	26,300	95% KM (t) UCL
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-10 ft	N/A	ug/kg	49	8	53,700	10.1	420,000	8,760	59,400	99,000	99% KM (Chebyshev) UCL	8,770	59,400	99,000	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Tetrachloroethene (PCE)	>10 ft	N/A	ug/kg	6	2	0.336	0.336	0.437	0.269	0.0753	-	-	0.336	0.101	-	-
Soil	VOCs	Total	Toluene	0-1 ft	N/A	ug/kg	37	18	1.02	0.765	5.80	0.835	0.907	1.11	95% KM (t) UCL	0.861	0.900	1.14	95% KM (t) UCL
Soil	VOCs	Total	Toluene	0-3 ft	N/A	ug/kg	46	26	1,500	0.695	39,000	849	5,690	9,360	99% KM (Chebyshev) UCL	849	5,690	9,360	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Toluene	0-10 ft	N/A	ug/kg	49	26	1,500	0.695	39,000	797	5,510	8,790	99% KM (Chebyshev) UCL	797	5,510	8,790	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Toluene	>10 ft	N/A	ug/kg	6	1	5.20	5.20	5.20	-	-	-	-	-	-	-	-
Soil	VOCs	Total	Trichloroethene (TCE)	0-1 ft	N/A	ug/kg	37	4	0.0912	0.0661	0.171	0.0678	0.0216	0.0766	95% KM (t) UCL	0.0912	0.0461	0.136	95% KM (t) UCL
Soil	VOCs	Total	Trichloroethene (TCE)	0-3 ft	N/A	ug/kg	46	7	1,330	0.171	6,080	202	993	1,780	99% KM (Chebyshev) UCL	202	993	1,780	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Trichloroethene (TCE)	0-10 ft	N/A	ug/kg	49	10	931	0.761	6,080	190	963	1,630	99% KM (Chebyshev) UCL	190	963	1,630	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Trichloroethene (TCE)	>10 ft	N/A	ug/kg	6	6	0.207	0.190	0.374	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Aluminum	0-1 ft	N/A	mg/kg	2	2	10,600	10,600	13,000	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Antimony	0-1 ft	N/A	mg/kg	2	2	0.280	0.280	0.340	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Arsenic	0-1 ft	N/A	mg/kg	2	2	5.92	5.92	5.94	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Barium	0-1 ft	N/A	mg/kg	2	2	91.6	91.6	108	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Beryllium	0-1 ft	N/A	mg/kg	2	2	0.295	0.295	0.350	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Cadmium	0-1 ft	N/A	mg/kg	2	2	0.759	0.759	1.06	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Chromium	0-1 ft	N/A	mg/kg	2	2	135	135	162	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Cobalt	0-1 ft	N/A	mg/kg	2	2	12.1	12.1	13.4	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Copper	0-1 ft	N/A	mg/kg	2	2	59.0	59.0	71.6	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Lead	0-1 ft	N/A	mg/kg	2	2	310	310	319	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Manganese	0-1 ft	N/A	mg/kg	2	2	424	424	479	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Mercury	0-1 ft	N/A	mg/kg	2	2	0.0360	0.0360	0.0390	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Nickel	0-1 ft	N/A	mg/kg	2	2	66.2	66.2	74.9	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Selenium	0-1 ft	N/A	mg/kg	2	2	0.575	0.575	0.650	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Silver	0-1 ft	N/A	mg/kg	2	2	0.151	0.151	0.175	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Thallium	0-1 ft	N/A	mg/kg	2	2	0.0920	0.0920	0.117	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Vanadium	0-1 ft	N/A	mg/kg	2	2	64.5	64.5	69.8	-	-	-	-	-	-	-	-
Erodible Soil Subset	Metals	Total	Zinc	0-1 ft	N/A	mg/kg	2	2	163	163	203	-	-	-	-	-	-	-	-
Erodible Soil Subset	Butyltins	Total	Dibutyltin	0-1 ft	N/A	ug/kg	2	2	7.90	7.90	9.10	-	-	-	-	-	-	-	-
Erodible Soil Subset	Butyltins	Total	Monobutyltin	0-1 ft	N/A	ug/kg	2	2	5.72	5.72	8.25	-	-	-	-	-	-	-	-
Erodible Soil Subset	Butyltins	Total	Tributyltin	0-1 ft	N/A	ug/kg	2	2	8.02	8.02	12.8	-	-	-	-	-	-	-	-
Erodible Soil Subset	Pesticides	Total	4,4'-DDE	0-1 ft	N/A	ug/kg	2	2	0.345	0.345	0.440	-	-	-	-	-	-	-	-
Erodible Soil Subset	Pesticides	Total	4,4'-DDT	0-1 ft	N/A	ug/kg	2	2	7.20	7.20	10.0	-	-	-	-	-	-	-	-
Erodible Soil Subset	Pesticides	Total	Heptachlor	0-1 ft	N/A	ug/kg	2	2	0.283	0.283	0.380	-	-	-	-	-	-	-	-
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1260	0-1 ft	N/A	ug/kg	2	2	47.0	47.0	67.0	-	-	-	-	-	-	-	-
Erodible Soil Subset	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	N/A	ug/kg	2	2	49.1	49.1	69.1	-	-	-	-	-	-	-	-
Erodible Soil Subset	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	N/A	mg/kg	2	2	51.0	51.0	69.0	-	-	-	-	-	-	-	-
Erodible Soil Subset	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	N/A	mg/kg	2	2	700	700	1,000	-	-	-	-	-	-	-	-
Erodible Soil Subset	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	N/A	mg/kg	8	4	2.50	2.50	3.20	2.15	0.534	2.56	95% KM (t) UCL	2.50	0.570	3.12	95% KM (t) UCL

Table I-13
Statistical Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(7 of 9)

Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Erodible Soil Subset	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	N/A	ug/kg	2	2	159,000	159,000	260,000	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Carbazole	0-1 ft	N/A	ug/kg	2	2	64.2	64.2	91.0	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Acenaphthene	0-1 ft	N/A	ug/kg	2	2	51.2	51.2	68.0	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Anthracene	0-1 ft	N/A	ug/kg	2	2	102	102	150	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Phenanthrene	0-1 ft	N/A	ug/kg	2	2	650	650	940	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	N/A	ug/kg	2	2	952	952	1,356	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Benzo(a)anthracene	0-1 ft	N/A	ug/kg	2	2	828	828	1,200	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Benzo(a)pyrene	0-1 ft	N/A	ug/kg	2	2	718	718	1,000	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	N/A	ug/kg	2	2	1,120	1,120	1,600	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	N/A	ug/kg	2	2	430	430	590	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	N/A	ug/kg	2	2	400	400	570	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Chrysene	0-1 ft	N/A	ug/kg	2	2	1,040	1,040	1,500	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	N/A	ug/kg	2	2	158	158	220	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Fluoranthene	0-1 ft	N/A	ug/kg	2	2	1,460	1,460	2,100	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	N/A	ug/kg	2	2	495	495	690	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Pyrene	0-1 ft	N/A	ug/kg	2	2	1,340	1,340	1,900	-	-	-	-	-	-	-	-
Erodible Soil Subset	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	N/A	ug/kg	2	2	7,988	7,988	11,370	-	-	-	-	-	-	-	-
Erodible Soil Subset	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	N/A	ug/kg	8	6	0.218	0.225	0.280	0.210	0.0417	0.243	95% KM (t) UCL	0.218	0.0393	0.252	95% KM (t) UCL
Erodible Soil Subset	VOCs	Total	2-Butanone (MEK)	0-1 ft	N/A	ug/kg	8	7	27.0	32.0	50.0	27.0	14.8	38.4	95% KM (t) UCL	27.0	14.8	38.4	95% KM (t) UCL
Erodible Soil Subset	VOCs	Total	2-Hexanone	0-1 ft	N/A	ug/kg	8	3	6.33	5.50	8.80	5.40	1.42	6.64	95% KM (t) UCL	6.33	1.78	8.71	95% KM (t) UCL
Erodible Soil Subset	VOCs	Total	4-Isopropyltoluene	0-1 ft	N/A	ug/kg	8	3	1.32	0.990	2.50	0.841	0.700	1.46	95% KM (t) UCL	1.32	0.858	2.47	95% KM (t) UCL
Erodible Soil Subset	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	N/A	ug/kg	8	3	0.920	0.790	1.20	0.834	0.149	0.965	95% KM (t) UCL	0.920	0.198	1.18	95% KM (t) UCL
Erodible Soil Subset	VOCs	Total	Acetone	0-1 ft	N/A	ug/kg	8	7	252	270	540	234	153	346	95% KM (t) UCL	252	154	372	95% KM (t) UCL
Erodible Soil Subset	VOCs	Total	Benzene	0-1 ft	N/A	ug/kg	8	4	0.458	0.335	1.00	0.339	0.288	0.578	95% KM (t) UCL	0.458	0.335	0.824	95% KM (t) UCL
Erodible Soil Subset	VOCs	Total	Bromomethane	0-1 ft	N/A	ug/kg	8	2	3.10	3.10	5.00	1.74	1.33	-	-	3.10	1.90	5.00	95% KM (BCA) UCL
Erodible Soil Subset	VOCs	Total	Carbon Disulfide	0-1 ft	N/A	ug/kg	8	7	0.796	0.700	1.00	0.796	0.151	0.912	95% KM (t) UCL	0.796	0.151	0.912	95% KM (t) UCL
Erodible Soil Subset	VOCs	Total	Chloroform	0-1 ft	N/A	ug/kg	8	3	6.52	0.290	19.0	2.61	6.20	29.3	99% KM (Chebyshev) UCL	2.62	6.19	29.3	99% KM (Chebyshev) UCL
Erodible Soil Subset	VOCs	Total	Chloromethane	0-1 ft	N/A	ug/kg	8	2	0.240	0.240	0.250	0.233	0.00700	0.240	95% KM (t) UCL	0.240	0.0100	0.259	95% KM (t) UCL
Erodible Soil Subset	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	N/A	ug/kg	8	4	115	0.470	460	57.8	152	675	99% KM (Chebyshev) UCL	57.9	152	675	99% KM (Chebyshev) UCL
Erodible Soil Subset	VOCs	Total	Ethylbenzene	0-1 ft	N/A	ug/kg	8	3	0.137	0.110	0.200	0.116	0.0346	0.146	95% KM (t) UCL	0.137	0.0450	0.197	95% KM (t) UCL
Erodible Soil Subset	VOCs	Total	m,p-Xylenes	0-1 ft	N/A	ug/kg	8	3	0.263	0.240	0.360	0.221	0.0591	0.273	95% KM (t) UCL	0.263	0.0713	0.359	95% KM (t) UCL
Erodible Soil Subset	VOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	8	2	0.495	0.495	0.540	0.463	0.0315	0.495	95% KM (t) UCL	0.495	0.0450	0.580	95% KM (t) UCL
Erodible Soil Subset	VOCs	Total	Toluene	0-1 ft	N/A	ug/kg	8	7	0.811	0.770	1.30	0.811	0.336	1.07	95% KM (t) UCL	0.811	0.336	1.07	95% KM (t) UCL
Groundwater	Metals	Total	Arsenic	N/A	N/A	ug/L	20	20	1.38	0.773	11.6	-	-	3.74	95% Chebyshev (Mean, Sd) UCL	-	-	3.74	95% Chebyshev (Mean, Sd) UCL
Groundwater	Metals	Total	Iron	N/A	N/A	ug/L	20	16	222	156	1,500	181	316	499	95% KM (Chebyshev) UCL	181	316	499	95% KM (Chebyshev) UCL
Groundwater	Metals	Total	Vanadium	N/A	N/A	ug/L	20	18	1.47	1.35	5.90	1.34	1.20	2.54	95% KM (Chebyshev) UCL	1.34	1.20	2.54	95% KM (Chebyshev) UCL
Groundwater	Metals	Dissolved	Arsenic	N/A	N/A	ug/L	20	20	1.23	0.820	8.99	-	-	3.03	95% Chebyshev (Mean, Sd) UCL	-	-	3.03	95% Chebyshev (Mean, Sd) UCL
Groundwater	Metals	Dissolved	Calcium	N/A	N/A	ug/L	5	5	26,600	28,200	44,300	-	-	-	-	-	-	-	-
Groundwater	Metals	Dissolved	Iron	N/A	N/A	ug/L	20	7	108	52.5	270	42.0	78.4	74.7	95% KM (t) UCL	43.2	77.8	75.8	95% KM (t) UCL
Groundwater	Metals	Dissolved	Magnesium	N/A	N/A	ug/L	5	5	7,320	7,120	14,000	-	-	-	-	-	-	-	-
Groundwater	Metals	Dissolved	Potassium	N/A	N/A	ug/L	5	5	1,660	1,480	2,610	-	-	-	-	-	-	-	-
Groundwater	Metals	Dissolved	Sodium	N/A	N/A	ug/L	5	5	27,100	13,400	89,400	-	-	-	-	-	-	-	-
Groundwater	Metals	Dissolved	Vanadium	N/A	N/A	ug/L	20	15	1.25	1.17	3.10	0.973	0.760	1.33	95% KM (Percentile Bootstrap) UCL	1.02	0.756	1.37	95% KM (Percentile Bootstrap) UCL
Groundwater	Butyltins	Total	Monobutyltin	N/A	N/A	ug/L	20	2	0.0200	0.0200	0.0260	0.0164	0.00480	0.0216	95% KM (t) UCL	0.0200	0.00600	0.0304	95% KM (t) UCL
Groundwater	NWTPH-Dx	Total	Diesel Range Organics	N/A	N/A	ug/L	20	2	17.5	17.5	18.0	17.1	0.266	17.3	95% KM (t) UCL	17.5	0.500	18.4	95% KM (t) UCL
Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	N/A	ug/L	20	3	17.3	15.0	23.5	14.1	2.19	15.1	95% KM (t) UCL	17.3	4.40	22.7	95% KM (t) UCL
Groundwater	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/L	5	2	1.06	1.06	1.90	0.556	0.672	-	-	0.556	0.672	-	-
Groundwater	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/L	5	2	2.66	2.66	5.00	1.26	1.87	-	-	1.26	1.87	-	-
Groundwater	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/L	5	5	0.173	0.170	0.255	-	-	-	-	-	-	-	-
Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/L	20	15	164	2.50	660	123	233	658	99% KM (Chebyshev) UCL	123	233	658	99% KM (Chebyshev) UCL
Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/L	20	16	2.24	1.55	6.20	1.86	1.94	2.66	95% KM (BCA) UCL	1.87	1.93	2.54	95% KM (BCA) UCL
Groundwater	VOCs	Total	Toluene	N/A	N/A	ug/L	5	5	0.444	0.510	0.640	-	-	-	-	-	-	-	-
Groundwater	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/L	5	2	0.905	0.905	1.70	0.428	0.636	-	-	0.428	0.636	-	-
Groundwater	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/L	20	15	1.81	1.90	3.40	1.39	1.35	3.35	97.5% KM (Chebyshev) UCL	1.41	1.34	3.34	97.5% KM (Chebyshev) UCL
Groundwater	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/L	20	4	1.77	1.25	4.10	0.738	0.813	1.10	95% KM (t) UCL	0.738	0.813	1.10	95% KM (t) UCL
DP Groundwater	Metals	Total	Aluminum	N/A	N/A	ug/L	10	10	5,880	1,660	17,900	-	-	21,300	95% Adjusted Gamma UCL	-	-	21,300	95% Adjusted Gamma UCL
DP Groundwater	Metals	Total	Antimony	N/A	N/A	ug/L	10	9	0.650	0.477	1.57	0.623	0.387	0.861	95% KM (t) UCL	0.623	0.387	0.861	95% KM (t) UCL
DP Groundwater	Metals	Total	Arsenic	N/A	N/A	ug/L	10	8	2.40	1.52	7.70	1.94	2.34	3.40	95% KM (t) UCL	1.96	2.33	3.40	95% KM (t) UCL
DP Groundwater	Metals	Total	Barium	N/A	N/A	ug/L	10	10	35.6	20.5	97.8	-	-	67.9	95% Approximate Gamma UCL	-	-	67.9	95% Approximate Gamma UCL
DP Groundwater	Metals	Total	Beryllium	N/A	N/A	ug/L	10	4	0.367	0.263	0.785	0.241	0.187	0.366	95% KM (t) UCL	0.283	0.177	0.414	95% KM (t) UCL
DP Groundwater	Metals	Total	Calcium	N/A	N/A	ug/L	10	10	27,500	28,000	33,700	-	-	30,800	95% Student's-t UCL	-	-	30,800	95% Student's-t UCL
DP Groundwater	Metals	Total	Chromium	N/A	N/A	ug/L	10	10	11.5	8.72	31.8	-	-	16.8	95% Student's-t UCL	-	-	16.8	95% Student's-t UCL
DP Groundwater	Metals	Total	Cobalt	N/A	N/A	ug/L	10	6	5.58	4.73	13.1	4.02	3.47	6.22	95% KM (t) UCL	4.44	3.26	6.57	95% KM (t) UCL
DP Groundwater	Metals	Total	Copper	N/A	N/A	ug/L	10	10	32.3	5.56	204	-	-	113	95% Adjusted Gamma UCL	-	-	113	95% Adjusted Gamma UCL
DP Groundwater	Metals	Total	Iron	N/A	N/A	ug/L	10	9	9,080	3,220	25,900	8,180	9,720	22,400	95% KM (Chebyshev) UCL	8,180	9,720	22,400	95% KM (Chebyshev) UCL
DP Groundwater	Metals	Total	Lead	N/A	N/A	ug/L	10	7	4.27	2.58	13.7	3.01	4.21	5.64	95% KM (t) UCL	3.01	4.21	5.64	95% KM (t) UCL
DP Groundwater	Metals	Total	Magnesium	N/A	N/A	ug/L	10	10	9,540	9,000	15,400	-	-	11,600	95% Student's-t UCL	-	-	11,600	95% Student's-t UCL
DP Groundwater	Metals	Total	Manganese	N/A	N/A	ug/L	10	10	225	128	708	-	-	368	95% Student's-t UCL	-	-	368	95% Student's-t UCL
DP Groundwater	Metals	Total	Mercury	N/A	N/A	ug/L	10	2	0.0880	0.0880	0.100	0.0784	0.00720	0.0843	95% KM (t) UCL	0.0880	0.0120	0.110	95% KM (t) UCL
DP Groundwater	Metals	Total	Nickel	N/A	N/A	ug/L	10	9	6.49	3.27	21.4	5.94	6.22	15.0	95% KM (Chebyshev) UCL	6.21	6.14	15.3	95% KM (Chebyshev) UCL
DP Groundwater	Metals	Total	Potassium	N/A	N/A	ug/L	10	10	1,760	1,800	3,210	-	-	2,190	95% Student's-t UCL	-	-	2,190	95% Student's-t UCL

Table I-13
Statistical Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(8 of 9)

Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
DP Groundwater	Metals	Total	Selenium	N/A	N/A	ug/L	10	10	1.33	1.24	2.06	-	-	1.59	95% Student's-t UCL	-	-	1.59	95% Student's-t UCL
DP Groundwater	Metals	Total	Silver	N/A	N/A	ug/L	10	9	0.112	0.0450	0.376	0.102	0.115	0.271	95% KM (Chebyshev) UCL	0.104	0.114	0.271	95% KM (Chebyshev) UCL
DP Groundwater	Metals	Total	Sodium	N/A	N/A	ug/L	10	10	12,900	8,440	42,900	-	-	28,700	95% Chebyshev (Mean, Sd) UCL	-	-	28,700	95% Chebyshev (Mean, Sd) UCL
DP Groundwater	Metals	Total	Thallium	N/A	N/A	ug/L	10	7	0.0751	0.0570	0.146	0.0655	0.0318	0.0854	95% KM (t) UCL	0.0751	0.0337	0.100	95% KM (t) UCL
DP Groundwater	Metals	Total	Vanadium	N/A	N/A	ug/L	10	10	20.3	7.32	77.6	-	-	47.0	95% Approximate Gamma UCL	-	-	47.0	95% Approximate Gamma UCL
DP Groundwater	Metals	Total	Zinc	N/A	N/A	ug/L	10	10	14.8	7.73	44.4	-	-	27.0	95% Approximate Gamma UCL	-	-	27.0	95% Approximate Gamma UCL
DP Groundwater	Metals	Dissolved	Aluminum	N/A	N/A	ug/L	10	7	245	15.1	1,370	173	407	1,560	99% KM (Chebyshev) UCL	176	406	1,560	99% KM (Chebyshev) UCL
DP Groundwater	Metals	Dissolved	Antimony	N/A	N/A	ug/L	10	10	0.406	0.300	1.67	-	-	1.02	95% Chebyshev (Mean, Sd) UCL	-	-	1.02	95% Chebyshev (Mean, Sd) UCL
DP Groundwater	Metals	Dissolved	Arsenic	N/A	N/A	ug/L	10	10	0.929	1.04	1.36	-	-	1.14	95% Student's-t UCL	-	-	1.14	95% Student's-t UCL
DP Groundwater	Metals	Dissolved	Barium	N/A	N/A	ug/L	10	10	9.43	7.80	20.6	-	-	12.5	95% Student's-t UCL	-	-	12.5	95% Student's-t UCL
DP Groundwater	Metals	Dissolved	Calcium	N/A	N/A	ug/L	10	10	24,700	26,700	34,100	-	-	29,000	95% Student's-t UCL	-	-	29,000	95% Student's-t UCL
DP Groundwater	Metals	Dissolved	Chromium	N/A	N/A	ug/L	10	10	2.74	3.02	4.29	-	-	3.39	95% Student's-t UCL	-	-	3.39	95% Student's-t UCL
DP Groundwater	Metals	Dissolved	Cobalt	N/A	N/A	ug/L	10	8	2.73	2.37	5.08	2.43	1.38	3.28	95% KM (t) UCL	2.66	1.34	3.57	95% KM (t) UCL
DP Groundwater	Metals	Dissolved	Copper	N/A	N/A	ug/L	10	7	1.41	0.958	4.38	1.23	1.06	1.94	95% KM (BCA) UCL	1.23	1.06	1.96	95% KM (BCA) UCL
DP Groundwater	Metals	Dissolved	Iron	N/A	N/A	ug/L	10	4	212	166	476	107	136	198	95% KM (t) UCL	107	136	198	95% KM (t) UCL
DP Groundwater	Metals	Dissolved	Lead	N/A	N/A	ug/L	10	6	0.0988	0.0330	0.378	0.0884	0.120	0.400	97.5% KM (Chebyshev) UCL	0.0988	0.127	0.454	97.5% KM (Chebyshev) UCL
DP Groundwater	Metals	Dissolved	Magnesium	N/A	N/A	ug/L	10	10	7,180	6,850	12,000	-	-	8,730	95% Student's-t UCL	-	-	8,730	95% Student's-t UCL
DP Groundwater	Metals	Dissolved	Manganese	N/A	N/A	ug/L	10	10	91.6	24.0	587	-	-	322	95% Adjusted Gamma UCL	-	-	322	95% Adjusted Gamma UCL
DP Groundwater	Metals	Dissolved	Mercury	N/A	N/A	ug/L	10	2	0.0575	0.0575	0.0600	0.0555	0.00150	0.0567	95% KM (t) UCL	0.0575	0.00250	0.0621	95% KM (t) UCL
DP Groundwater	Metals	Dissolved	Nickel	N/A	N/A	ug/L	10	3	1.13	0.880	2.10	0.714	0.589	1.21	95% KM (t) UCL	1.13	0.715	2.05	95% KM (t) UCL
DP Groundwater	Metals	Dissolved	Potassium	N/A	N/A	ug/L	10	10	1,300	1,170	2,210	-	-	1,660	95% Student's-t UCL	-	-	1,660	95% Student's-t UCL
DP Groundwater	Metals	Dissolved	Selenium	N/A	N/A	ug/L	10	10	0.696	0.630	1.30	-	-	0.904	95% Student's-t UCL	-	-	0.904	95% Student's-t UCL
DP Groundwater	Metals	Dissolved	Silver	N/A	N/A	ug/L	10	8	0.0364	0.0270	0.0790	0.0339	0.0164	0.0446	95% KM (BCA) UCL	0.0364	0.0175	0.0477	95% KM (BCA) UCL
DP Groundwater	Metals	Dissolved	Sodium	N/A	N/A	ug/L	10	10	14,200	8,820	47,700	-	-	32,300	95% Chebyshev (Mean, Sd) UCL	-	-	32,300	95% Chebyshev (Mean, Sd) UCL
DP Groundwater	Metals	Dissolved	Thallium	N/A	N/A	ug/L	10	3	0.0542	0.0460	0.0855	0.0380	0.0165	0.0496	95% KM (t) UCL	0.0542	0.0230	0.0840	95% KM (t) UCL
DP Groundwater	Metals	Dissolved	Vanadium	N/A	N/A	ug/L	10	6	1.35	1.24	2.61	1.24	0.648	1.74	95% KM (t) UCL	1.35	0.637	1.88	95% KM (t) UCL
DP Groundwater	Metals	Dissolved	Zinc	N/A	N/A	ug/L	10	4	2.50	2.26	3.48	2.20	0.449	2.50	95% KM (t) UCL	2.20	0.449	2.50	95% KM (t) UCL
DP Groundwater	Butyltins	Total	Monobutyltin	N/A	N/A	ug/L	4	2	0.00596	0.00596	0.00671	-	-	-	-	-	-	-	-
DP Groundwater	Butyltins	Total	Tributyltin	N/A	N/A	ug/L	4	2	0.00360	0.00360	0.00435	-	-	-	-	-	-	-	-
DP Groundwater	Pesticides	Total	BHC (gamma) Lindane	N/A	N/A	ug/L	3	3	0.00191	0.00232	0.00249	-	-	-	-	-	-	-	-
DP Groundwater	Pesticides	Total	Methoxychlor	N/A	N/A	ug/L	3	2	0.00310	0.00310	0.00521	-	-	-	-	-	-	-	-
DP Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	N/A	ug/L	6	2	17.8	17.8	20.9	15.7	2.31	-	-	17.8	3.10	-	-
DP Groundwater	SVOCs	Total	2-Methylnaphthalene	N/A	N/A	ug/L	9	6	0.0669	0.0471	0.153	0.0511	0.0474	0.0833	95% KM (t) UCL	0.0520	0.0468	0.0838	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Acenaphthene	N/A	N/A	ug/L	9	5	0.0124	0.00812	0.0230	0.00932	0.00604	0.0135	95% KM (t) UCL	0.0112	0.00594	0.0163	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Benzyl Alcohol	N/A	N/A	ug/L	7	2	0.0512	0.0512	0.0523	0.0503	0.000805	-	-	0.0512	0.00115	-	-
DP Groundwater	SVOCs	Total	Butyl Benzyl Phthalate	N/A	N/A	ug/L	9	6	0.161	0.156	0.228	0.150	0.0357	0.176	95% KM (t) UCL	0.161	0.0359	0.190	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Dibenzofuran	N/A	N/A	ug/L	9	2	0.0329	0.0329	0.0421	0.0257	0.00578	0.0308	95% KM (t) UCL	0.0329	0.00920	0.0500	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Di-n-butyl Phthalate	N/A	N/A	ug/L	9	6	0.162	0.161	0.239	0.159	0.0420	0.193	95% KM (t) UCL	0.159	0.0420	0.193	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Fluorene	N/A	N/A	ug/L	9	6	0.0160	0.0128	0.0351	0.0126	0.00940	0.0190	95% KM (t) UCL	0.0140	0.00883	0.0202	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Isophorone	N/A	N/A	ug/L	9	2	0.0664	0.0664	0.0842	0.0526	0.0112	0.0624	95% KM (t) UCL	0.0664	0.0178	0.0995	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Naphthalene	N/A	N/A	ug/L	9	4	0.0322	0.0307	0.0452	0.0266	0.00782	0.0322	95% KM (t) UCL	0.0322	0.00907	0.0419	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Phenanthrene	N/A	N/A	ug/L	9	8	0.0278	0.0104	0.144	0.0256	0.0420	0.0909	95% KM (Chebyshev) UCL	0.0258	0.0419	0.0910	95% KM (Chebyshev) UCL
DP Groundwater	SVOCs	Total	Phenol	N/A	N/A	ug/L	8	5	0.0220	0.0228	0.0291	0.0179	0.00733	0.0234	95% KM (t) UCL	0.0220	0.00647	0.0281	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Pyrene	N/A	N/A	ug/L	9	3	0.0109	0.00329	0.0261	0.00573	0.00720	-	-	0.00577	0.00719	0.0261	95% KM (BCA) UCL
DP Groundwater	SVOCs	Dissolved	2-Methylnaphthalene	N/A	N/A	ug/L	8	6	0.0939	0.0286	0.280	0.0744	0.0963	0.237	95% KM (Chebyshev) UCL	0.0761	0.0954	0.237	95% KM (Chebyshev) UCL
DP Groundwater	SVOCs	Dissolved	Acenaphthene	N/A	N/A	ug/L	8	5	0.0146	0.0104	0.0348	0.0110	0.00992	0.0184	95% KM (t) UCL	0.0127	0.00959	0.0205	95% KM (t) UCL
DP Groundwater	SVOCs	Dissolved	Butyl Benzyl Phthalate	N/A	N/A	ug/L	8	6	0.134	0.136	0.155	0.134	0.0173	0.149	95% KM (t) UCL	0.134	0.0173	0.149	95% KM (t) UCL
DP Groundwater	SVOCs	Dissolved	Diethyl Phthalate	N/A	N/A	ug/L	8	3	0.0761	0.0687	0.101	0.0651	0.0140	0.0766	95% KM (t) UCL	0.0761	0.0181	0.100	95% KM (t) UCL
DP Groundwater	SVOCs	Dissolved	Di-n-butyl Phthalate	N/A	N/A	ug/L	8	6	0.157	0.153	0.207	0.157	0.0282	0.181	95% KM (t) UCL	0.157	0.0282	0.181	95% KM (t) UCL
DP Groundwater	SVOCs	Dissolved	Fluorene	N/A	N/A	ug/L	8	5	0.00790	0.00714	0.0116	0.00739	0.00162	0.00875	95% KM (BCA) UCL	0.00790	0.00187	0.00946	95% KM (BCA) UCL
DP Groundwater	SVOCs	Dissolved	Isophorone	N/A	N/A	ug/L	8	2	0.0633	0.0633	0.0782	0.0520	0.00989	0.0614	95% KM (t) UCL	0.0633	0.0150	0.0916	95% KM (t) UCL
DP Groundwater	SVOCs	Dissolved	Naphthalene	N/A	N/A	ug/L	8	6	0.107	0.0955	0.200	0.0873	0.0722	0.140	95% KM (t) UCL	0.0888	0.0711	0.141	95% KM (t) UCL
DP Groundwater	SVOCs	Dissolved	Phenanthrene	N/A	N/A	ug/L	8	6	0.0113	0.0103	0.0190	0.00952	0.00519	0.0133	95% KM (t) UCL	0.0113	0.00486	0.0154	95% KM (t) UCL
DP Groundwater	SVOCs	Dissolved	Phenol	N/A	N/A	ug/L	4	3	0.0180	0.0192	0.0248	-	-	-	-	-	-	-	-
DP Groundwater	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/L	10	7	0.467	0.127	2.22	0.348	0.638	1.71	97.5% KM (Chebyshev) UCL	0.380	0.632	1.74	97.5% KM (Chebyshev) UCL
DP Groundwater	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/L	10	5	0.604	0.173	2.52	0.330	0.730	0.876	95% KM (BCA) UCL	0.365	0.718	0.863	95% KM (BCA) UCL
DP Groundwater	VOCs	Total	1,1-Dichloroethene	N/A	N/A	ug/L	10	2	0.614	0.614	1.16	0.173	0.331	1.64	99% KM (Chebyshev) UCL	0.173	0.331	1.64	99% KM (Chebyshev) UCL
DP Groundwater	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/L	10	3	0.0406	0.0415	0.0485	0.0344	0.00555	0.0383	95% KM (t) UCL	0.0406	0.00689	0.0495	95% KM (t) UCL
DP Groundwater	VOCs	Total	2,2-Dichloropropane	N/A	N/A	ug/L	10	3	0.142	0.130	0.179	0.125	0.0186	0.138	95% KM (t) UCL	0.142	0.0267	0.177	95% KM (t) UCL
DP Groundwater	VOCs	Total	Acetone	N/A	N/A	ug/L	10	3	2.23	1.59	3.88	1.52	0.793	2.09	95% KM (t) UCL	2.23	1.18	3.76	95% KM (t) UCL
DP Groundwater	VOCs	Total	Benzene	N/A	N/A	ug/L	10	6	0.0744	0.0600	0.137	0.0664	0.0247	0.0821	95% KM (t) UCL	0.0744	0.0293	0.0984	95% KM (t) UCL
DP Groundwater	VOCs	Total	Chloroform	N/A	N/A	ug/L	10	2	0.132	0.132	0.174	0.0990	0.0250	0.119	95% KM (t) UCL	0.132	0.0417	0.209	95% KM (t) UCL
DP Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/L	10	9	57.3	4.54	341	51.6	106	206	95% KM (Chebyshev) UCL	51.6	106	207	95% KM (Chebyshev) UCL
DP Groundwater	VOCs	Total	Ethylbenzene	N/A	N/A	ug/L	10	4	0.0402	0.0402	0.0447	0.0377	0.00307	0.0399	95% KM (t) UCL	0.0402	0.00318	0.0435	95% KM (t) UCL
DP Groundwater	VOCs	Total	m,p-Xylenes	N/A	N/A	ug/L	10	4	0.119	0.132	0.132	0.0971	0.0226	0.112	95% KM (t) UCL	0.119	0.0214	0.142	95% KM (t) UCL
DP Groundwater	VOCs	Total	Naphthalene	N/A	N/A	ug/L	10	2	0.0406	0.0406	0.0452	0.0375	0.00347	0.0411	95% KM (t) UCL	0.0406	0.00465	0.0491	95% KM (t) UCL
DP Groundwater	VOCs	Total	o-Xylene	N/A	N/A	ug/L	10	4	0.0507	0.0495	0.0735	0.0385	0.0139	0.0478	95% KM (t) UCL	0.0507	0.0153	0.0669	95% KM (t) UCL
DP Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/L	10	10	7.80	1.45	54.5	-	-	27.6	95% Adjusted Gamma UCL	-	-	27.6	95% Adjusted Gamma UCL
DP Groundwater	VOCs	Total	Toluene	N/A	N/A	ug/L	10	6	0.205	0.199	0.299	0.189	0.0787	0.249	95% KM (t) UCL	0.205	0.0733	0.265	95% KM (t) UCL
DP Groundwater	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/L	10	3	0.995	1.09	1.80	0.365	0.563	0.765	95% KM (t) UCL	0.365	0.563	0.765	95% KM (t) UCL
DP Groundwater	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/L	10	9	5.83	0.597	43.7	5.26	12.8	48.1	99% KM (Chebyshev) UCL	5.28	12.8	48.1	99% KM (Chebyshev) UCL

Table I-13
Statistical Summary for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(9 of 9)

Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Sieve Size	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
DP Groundwater	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/L	10	2	0.372	0.372	0.611	0.180	0.144	-	-	0.372	0.240	-	-
Soil Gas	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/m^3	5	5	28.1	13.0	98.0	-	-	-	-	-	-	-	-
Soil Gas	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/m^3	5	5	4,360	930	18,500	-	-	-	-	-	-	-	-
Soil Gas	VOCs	Total	1,3,5-Trimethylbenzene	N/A	N/A	ug/m^3	5	5	1,440	240	6,250	-	-	-	-	-	-	-	-
Soil Gas	VOCs	Total	1,3-Butadiene	N/A	N/A	ug/m^3	5	4	58.6	11.0	210	48.4	80.9	-	-	48.4	80.9	-	-
Soil Gas	VOCs	Total	2-Butanone (MEK)	N/A	N/A	ug/m^3	5	2	23.5	23.5	31.0	19.8	6.50	-	-	19.8	6.50	-	-
Soil Gas	VOCs	Total	4-Ethyltoluene	N/A	N/A	ug/m^3	5	5	2,050	260	9,150	-	-	-	-	-	-	-	-
Soil Gas	VOCs	Total	Acetone	N/A	N/A	ug/m^3	5	2	90.0	90.0	97.0	85.8	5.60	-	-	86.5	6.06	-	-
Soil Gas	VOCs	Total	Benzene	N/A	N/A	ug/m^3	5	4	28.0	12.5	85.0	24.2	31.0	-	-	28.0	33.4	-	-
Soil Gas	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/m^3	5	3	16.6	5.90	42.0	10.9	15.6	-	-	12.9	16.9	-	-
Soil Gas	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/m^3	5	5	115	69.0	330	-	-	-	-	-	-	-	-
Soil Gas	VOCs	Total	Cyclohexane	N/A	N/A	ug/m^3	5	3	9.60	3.00	24.0	7.65	9.45	-	-	7.80	9.37	-	-
Soil Gas	VOCs	Total	Dichlorodifluoromethane	N/A	N/A	ug/m^3	5	2	3.10	3.10	3.20	3.10	0.100	-	-	3.10	0.100	-	-
Soil Gas	VOCs	Total	Ethanol	N/A	N/A	ug/m^3	5	2	13.0	13.0	13.0	-	-	-	-	-	-	-	-
Soil Gas	VOCs	Total	Ethylbenzene	N/A	N/A	ug/m^3	5	5	352	78.0	1,550	-	-	-	-	-	-	-	-
Soil Gas	VOCs	Total	Heptane	N/A	N/A	ug/m^3	5	4	49.4	51.5	87.0	41.0	31.8	-	-	41.0	31.8	-	-
Soil Gas	VOCs	Total	Hexane	N/A	N/A	ug/m^3	5	4	33.0	10.3	110	27.8	41.3	-	-	33.0	44.6	-	-
Soil Gas	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/m^3	5	5	148	12.0	675	-	-	-	-	-	-	-	-
Soil Gas	VOCs	Total	m,p-Xylenes	N/A	N/A	ug/m^3	5	5	1,330	310	5,850	-	-	-	-	-	-	-	-
Soil Gas	VOCs	Total	n-Propylbenzene	N/A	N/A	ug/m^3	5	5	513	56.0	2,300	-	-	-	-	-	-	-	-
Soil Gas	VOCs	Total	o-Xylene	N/A	N/A	ug/m^3	5	5	630	120	2,800	-	-	-	-	-	-	-	-
Soil Gas	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/m^3	5	5	7,590	800	34,000	-	-	-	-	-	-	-	-
Soil Gas	VOCs	Total	Toluene	N/A	N/A	ug/m^3	5	5	10,700	2,000	47,500	-	-	-	-	-	-	-	-
Soil Gas	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/m^3	5	5	214	41.0	610	-	-	-	-	-	-	-	-

Notes
Only those analytes with at least 2 detected results are shown on this table.
If not all samples were detected results (i.e., detection rate = <100%), the mean and standard deviation were estimated by the Kaplan-Meier method.
The erodible soil subset is comprised of the following samples: SB-EUA, SB-EUB, SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, SB-EUB-15, and SB-04.

% = percent
DP = Direct Push
KM = Kaplan-Meier
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = method reporting limit
MW Soil = Mass Wasting Soil
ND = non-detect
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SD = standard deviation
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
ug/m^3 = micrograms per cubic meters
UCL = upper confidence limit

Table I-14
Statistical Summary for Pistol Range AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 1)

											Statistics - ND censored at the MDL				Statistics - ND censored at the MRL			
Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	Metals	Total	Copper	0-1 ft	mg/kg	14	14	38.1	46.2	53.1	-	-	44.9	Use 95% Student's-t UCL	-	-	44.9	Use 95% Student's-t UCL
Soil	Metals	Total	Lead	0-1 ft	mg/kg	63	63	208	60.0	1,110	-	-	365	Use 95% Chebyshev (Mean, Sd) UCL	-	-	365	Use 95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Nickel	0-1 ft	mg/kg	10	10	23.7	23.5	32.0	-	-	25.9	Use 95% Student's-t UCL	-	-	25.9	Use 95% Student's-t UCL
Soil	Metals	Total	Zinc	0-1 ft	mg/kg	10	10	124	114	199	-	-	148	Use 95% Student's-t UCL	-	-	148	Use 95% Student's-t UCL
Lagoon Sediment	Metals	Total	Copper	N/A	mg/kg	5	5	23.1	23.9	25.4	-	-	-	-	-	-	-	-
Lagoon Sediment	Metals	Total	Lead	N/A	mg/kg	5	5	27.1	27.5	33.0	-	-	-	-	-	-	-	-
Lagoon Sediment	Metals	Total	Nickel	N/A	mg/kg	5	5	14.2	14.5	15.4	-	-	-	-	-	-	-	-
Lagoon Sediment	Metals	Total	Zinc	N/A	mg/kg	5	5	156	160	174	-	-	-	-	-	-	-	-
DP Groundwater	Metals	Total	Copper	N/A	ug/L	2	2	47.4	47.4	54.8	-	-	-	-	-	-	-	-
DP Groundwater	Metals	Total	Lead	N/A	ug/L	2	2	11.5	11.5	12.6	-	-	-	-	-	-	-	-
DP Groundwater	Metals	Total	Nickel	N/A	ug/L	2	2	35.8	35.8	50.1	-	-	-	-	-	-	-	-
DP Groundwater	Metals	Total	Zinc	N/A	ug/L	2	2	114	114	149	-	-	-	-	-	-	-	-
DP Groundwater	Metals	Dissolved	Copper	N/A	ug/L	2	2	0.733	0.733	0.800	-	-	-	-	-	-	-	-
DP Groundwater	Metals	Dissolved	Zinc	N/A	ug/L	2	2	3.10	3.10	4.10	-	-	-	-	-	-	-	-

Notes
Only those analytes with at least 2 detected results are shown on this table.
If not all samples were detected results (i.e., detection rate = <100%), the mean and standard deviation were estimated by the Kaplan-Meier method.

% = percent
DP = Direct Push
KM = Kaplan-Meier
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = method reporting limit
ND = non-detect
SD = standard deviation
ug/L = micrograms per liter
UCL = upper confidence limit

Table I-15
Statistical Summary for Bulb Slope AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 1)

											Statistics - ND censored at the MDL				Statistics - ND censored at the MRL			
Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	Metals	Total	Lead	0-1 ft	mg/kg	12	12	222	199	597	-	-	307	Use 95% Student's-t UCL	-	-	307	Use 95% Student's-t UCL
Soil	Metals	Total	Mercury	0-1 ft	mg/kg	12	12	0.404	0.280	1.54	-	-	0.720	Use 95% Approximate Gamma UCL	-	-	0.720	Use 95% Approximate Gamma UCL
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	ug/kg	12	8	89.4	63.6	251	69.8	65.8	108	95% KM (Percentile Bootstrap) UCL	69.8	65.8	107	95% KM (Percentile Bootstrap) UCL
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	ug/kg	12	8	89.4	63.6	251	69.8	65.8	104	95% KM (Percentile Bootstrap) UCL	69.8	65.8	107	95% KM (Percentile Bootstrap) UCL
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	mg/kg	8	8	47.7	31.0	170	-	-	102	Use 95% Approximate Gamma UCL	-	-	102	Use 95% Approximate Gamma UCL
Soil	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	mg/kg	8	8	152	130	410	-	-	232	Use 95% Student's-t UCL	-	-	232	Use 95% Student's-t UCL

Notes
Only those analytes with at least 2 detected results are shown on this table.
If not all samples were detected results (i.e., detection rate = <100%), the mean and standard deviation were estimated by the Kaplan-Meier method.

% = percent
KM = Kaplan-Meier
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = method reporting limit
ND = non-detect
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
PCB = polychlorinated biphenyl
SD = standard deviation
ug/kg = micrograms per kilogram
UCL = upper confidence limit

Table I-16
Statistical Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(1 of 8)

											Statistics - ND censored at the MDL				Statistics - ND censored at the MRL			
Medium Group	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	Metals	Total	Aluminum	0-1 ft	mg/kg	68	68	7,950	6,350	24,300	-	-	9,180	95% Approximate Gamma UCL	-	-	9,180	95% Approximate Gamma UCL
Soil	Metals	Total	Aluminum	0-3 ft	mg/kg	87	87	8,910	7,620	24,300	-	-	10,100	95% Approximate Gamma UCL	-	-	10,100	95% Approximate Gamma UCL
Soil	Metals	Total	Aluminum	0-10 ft	mg/kg	104	104	9,070	7,600	24,300	-	-	10,100	95% Approximate Gamma UCL	-	-	10,100	95% Approximate Gamma UCL
Soil	Metals	Total	Antimony	0-1 ft	mg/kg	83	45	1.98	1.28	13.7	1.39	2.02	1.80	95% KM (BCA) UCL	1.39	2.02	1.81	95% KM (BCA) UCL
Soil	Metals	Total	Antimony	0-3 ft	mg/kg	102	61	1.65	1.10	13.7	1.26	1.86	1.64	95% KM (BCA) UCL	1.26	1.86	1.58	95% KM (BCA) UCL
Soil	Metals	Total	Antimony	0-10 ft	mg/kg	119	78	1.72	1.06	13.7	1.36	1.93	1.71	95% KM (BCA) UCL	1.36	1.93	1.67	95% KM (BCA) UCL
Soil	Metals	Total	Arsenic	0-1 ft	mg/kg	84	78	7.11	4.47	80.9	6.79	11.2	9.20	95% KM (BCA) UCL	6.80	11.2	9.01	95% KM (BCA) UCL
Soil	Metals	Total	Arsenic	0-3 ft	mg/kg	103	97	6.78	4.70	80.9	6.55	10.1	8.20	95% KM (BCA) UCL	6.55	10.1	8.18	95% KM (BCA) UCL
Soil	Metals	Total	Arsenic	0-10 ft	mg/kg	120	114	6.38	4.50	80.9	6.20	9.46	7.85	95% KM (BCA) UCL	6.20	9.46	7.94	95% KM (BCA) UCL
Soil	Metals	Total	Barium	0-1 ft	mg/kg	79	79	80.3	77.9	242	-	-	88.0	95% Student's-t UCL	-	-	88.0	95% Student's-t UCL
Soil	Metals	Total	Barium	0-3 ft	mg/kg	98	98	81.6	80.2	242	-	-	88.2	95% Student's-t UCL	-	-	88.2	95% Student's-t UCL
Soil	Metals	Total	Barium	0-10 ft	mg/kg	115	115	83.0	85.1	242	-	-	88.9	95% Student's-t UCL	-	-	88.9	95% Student's-t UCL
Soil	Metals	Total	Beryllium	0-1 ft	mg/kg	79	44	0.329	0.302	0.630	0.228	0.147	0.272	95% KM (Percentile Bootstrap) UCL	0.303	0.108	0.327	95% KM (t) UCL
Soil	Metals	Total	Beryllium	0-3 ft	mg/kg	98	61	0.350	0.350	0.630	0.256	0.156	0.296	95% KM (Percentile Bootstrap) UCL	0.324	0.112	0.346	95% KM (t) UCL
Soil	Metals	Total	Beryllium	0-10 ft	mg/kg	115	73	0.338	0.320	0.630	0.251	0.149	0.288	95% KM (Percentile Bootstrap) UCL	0.317	0.108	0.336	95% KM (t) UCL
Soil	Metals	Total	Cadmium	0-1 ft	mg/kg	79	68	1.62	0.963	17.3	1.41	2.33	1.97	95% KM (BCA) UCL	1.42	2.32	1.93	95% KM (BCA) UCL
Soil	Metals	Total	Cadmium	0-3 ft	mg/kg	98	84	1.48	0.924	17.3	1.28	2.14	1.67	95% KM (BCA) UCL	1.29	2.13	1.67	95% KM (BCA) UCL
Soil	Metals	Total	Cadmium	0-10 ft	mg/kg	115	98	1.49	0.994	17.3	1.28	2.00	1.66	95% KM (BCA) UCL	1.29	1.99	1.62	95% KM (BCA) UCL
Soil	Metals	Total	Chromium	0-1 ft	mg/kg	82	82	305	49.8	2,650	-	-	567	95% Chebyshev (Mean, Sd) UCL	-	-	567	95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Chromium	0-3 ft	mg/kg	101	101	279	35.7	2,650	-	-	510	95% Chebyshev (Mean, Sd) UCL	-	-	510	95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Chromium	0-10 ft	mg/kg	118	118	279	34.6	2,650	-	-	501	95% Chebyshev (Mean, Sd) UCL	-	-	501	95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Cobalt	0-1 ft	mg/kg	68	68	12.4	12.1	25.0	-	-	13.4	95% Student's-t UCL	-	-	13.4	95% Student's-t UCL
Soil	Metals	Total	Cobalt	0-3 ft	mg/kg	87	87	13.4	12.8	41.0	-	-	14.3	95% Student's-t UCL	-	-	14.3	95% Student's-t UCL
Soil	Metals	Total	Cobalt	0-10 ft	mg/kg	104	104	13.8	13.3	42.3	-	-	14.8	95% Student's-t UCL	-	-	14.8	95% Student's-t UCL
Soil	Metals	Total	Copper	0-1 ft	mg/kg	93	93	62.8	43.8	494	-	-	95.0	95% Chebyshev (Mean, Sd) UCL	-	-	95.0	95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Copper	0-3 ft	mg/kg	112	112	64.0	45.7	494	-	-	93.6	95% Chebyshev (Mean, Sd) UCL	-	-	93.6	95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Copper	0-10 ft	mg/kg	129	129	64.1	45.3	494	-	-	91.5	95% Chebyshev (Mean, Sd) UCL	-	-	91.5	95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Lead	0-1 ft	mg/kg	157	157	270	128	3,260	-	-	398	95% Chebyshev (Mean, Sd) UCL	-	-	398	95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Lead	0-3 ft	mg/kg	182	182	274	119	3,260	-	-	396	95% Chebyshev (Mean, Sd) UCL	-	-	396	95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Lead	0-10 ft	mg/kg	199	199	280	124	3,260	-	-	396	95% Chebyshev (Mean, Sd) UCL	-	-	396	95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Manganese	0-1 ft	mg/kg	79	79	407	391	789	-	-	434	95% Student's-t UCL	-	-	434	95% Student's-t UCL
Soil	Metals	Total	Manganese	0-3 ft	mg/kg	98	98	434	396	1,710	-	-	465	95% Approximate Gamma UCL	-	-	465	95% Approximate Gamma UCL
Soil	Metals	Total	Manganese	0-10 ft	mg/kg	115	115	442	399	1,710	-	-	472	95% Approximate Gamma UCL	-	-	472	95% Approximate Gamma UCL
Soil	Metals	Total	Mercury	0-1 ft	mg/kg	107	73	0.257	0.0940	4.15	0.183	0.459	0.378	95% KM (Chebyshev) UCL	0.186	0.458	0.380	95% KM (Chebyshev) UCL
Soil	Metals	Total	Mercury	0-3 ft	mg/kg	126	90	0.219	0.0686	4.15	0.163	0.426	0.330	95% KM (Chebyshev) UCL	0.166	0.425	0.332	95% KM (Chebyshev) UCL
Soil	Metals	Total	Mercury	0-10 ft	mg/kg	143	107	0.212	0.0672	4.15	0.165	0.410	0.315	95% KM (Chebyshev) UCL	0.167	0.409	0.317	95% KM (Chebyshev) UCL
Soil	Metals	Total	Nickel	0-1 ft	mg/kg	89	89	125	26.3	1,060	-	-	227	95% Chebyshev (Mean, Sd) UCL	-	-	227	95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Nickel	0-3 ft	mg/kg	108	108	128	26.2	1,610	-	-	234	95% Chebyshev (Mean, Sd) UCL	-	-	234	95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Nickel	0-10 ft	mg/kg	125	125	133	26.3	1,760	-	-	243	95% Chebyshev (Mean, Sd) UCL	-	-	243	95% Chebyshev (Mean, Sd) UCL
Soil	Metals	Total	Selenium	0-1 ft	mg/kg	79	33	0.548	0.600	0.900	0.355	0.216	0.412	95% KM (Percentile Bootstrap) UCL	0.431	0.232	0.493	95% KM (Percentile Bootstrap) UCL
Soil	Metals	Total	Selenium	0-3 ft	mg/kg	98	48	0.555	0.600	0.900	0.387	0.225	0.431	95% KM (% Bootstrap) UCL	0.464	0.233	0.515	95% KM (% Bootstrap) UCL
Soil	Metals	Total	Selenium	0-10 ft	mg/kg	115	57	0.505	0.511	0.900	0.338	0.237	0.385	95% KM (% Bootstrap) UCL	0.413	0.234	0.459	95% KM (% Bootstrap) UCL
Soil	Metals	Total	Silver	0-1 ft	mg/kg	79	62	0.191	0.139	1.50	0.177	0.185	0.216	95% KM (BCA) UCL	0.182	0.184	0.220	95% KM (BCA) UCL
Soil	Metals	Total	Silver	0-3 ft	mg/kg	98	81	0.183	0.139	1.50	0.172	0.179	0.207	95% KM (BCA) UCL	0.176	0.178	0.212	95% KM (BCA) UCL
Soil	Metals	Total	Silver	0-10 ft	mg/kg	115	98	0.226	0.143	1.52	0.211	0.264	0.255	95% KM (BCA) UCL	0.214	0.263	0.258	95% KM (BCA) UCL
Soil	Metals	Total	Thallium	0-1 ft	mg/kg	79	48	0.105	0.0947	0.378	0.0891	0.0561	0.103	95% KM (BCA) UCL	0.102	0.0541	0.115	95% KM (BCA) UCL
Soil	Metals	Total	Thallium	0-3 ft	mg/kg	98	67	0.110	0.102	0.378	0.0977	0.0551	0.109	95% KM (BCA) UCL	0.109	0.0520	0.120	95% KM (BCA) UCL
Soil	Metals	Total	Thallium	0-10 ft	mg/kg	115	84	0.111	0.103	0.378	0.101	0.0539	0.110	95% KM (BCA) UCL	0.110	0.0513	0.119	95% KM (BCA) UCL
Soil	Metals	Total	Vanadium	0-1 ft	mg/kg	68	68	44.1	42.1	84.7	-	-	48.0	95% Student's-t UCL	-	-	48.0	95% Student's-t UCL
Soil	Metals	Total	Vanadium	0-3 ft	mg/kg	87	87	47.4	47.7	89.1	-	-	50.9	95% Student's-t UCL	-	-	50.9	95% Student's-t UCL
Soil	Metals	Total	Vanadium	0-10 ft	mg/kg	104	104	48.7	47.8	93.4	-	-	51.9	95% Student's-t UCL	-	-	51.9	95% Student's-t UCL
Soil	Metals	Total	Zinc	0-1 ft	mg/kg	89	89	165	121	1,160	-	-	188	95% H-UCL	-	-	188	95% H-UCL
Soil	Metals	Total	Zinc	0-3 ft	mg/kg	108	108	158	99.5	1,160	-	-	172	95% H-UCL	-	-	172	95% H-UCL
Soil	Metals	Total	Zinc	0-10 ft	mg/kg	125	125	161	105	1,160	-	-	175	95% H-UCL	-	-	175	95% H-UCL
Soil	Butyltins	Total	Dibutyltin	0-1 ft	ug/kg	54	20	29.8	7.90	210	11.5	32.0	19.0	95% KM (t) UCL	11.6	32.0	19.1	95% KM (t) UCL
Soil	Butyltins	Total	Dibutyltin	0-3 ft	ug/kg	71	20	29.8	7.90	210	8.96	28.3	14.7	95% KM (t) UCL	8.99	28.3	14.7	95% KM (t) UCL
Soil	Butyltins	Total	Dibutyltin	0-10 ft	ug/kg	84	20	29.8	7.90	210	7.70	26.2	12.6	95% KM (t) UCL	7.75	26.2	12.6	95% KM (t) UCL
Soil	Butyltins	Total	Monobutyltin	0-1 ft	ug/kg	54	24	13.1	4.49	108	6.12	16.9	10.4	95% KM (BCA) UCL	6.43	16.8	11.0	95% KM (BCA) UCL
Soil	Butyltins	Total	Monobutyltin	0-3 ft	ug/kg	71	24	13.1	4.49	108	4.75	14.9	8.72	95% KM (BCA) UCL	5.08	14.8	8.34	95% KM (BCA) UCL
Soil	Butyltins	Total	Monobutyltin	0-10 ft	ug/kg	84	24	13.1	4.49	108	4.12	13.8	7.36	95% KM (BCA) UCL	4.48	13.7	7.49	95% KM (BCA) UCL
Soil	Butyltins	Total	Tributyltin	0-1 ft	ug/kg	54	19	166	23.6	1,860	59.4	260	422	99% KM (Chebyshev) UCL	59.5	260	422	99% KM (Chebyshev) UCL
Soil	Butyltins	Total	Tributyltin	0-3 ft	ug/kg	71	20	158	19.5	1,860	45.8	228	219	97.5% KM (Chebyshev) UCL	45.8	228	219	97.5% KM (Chebyshev) UCL
Soil	Butyltins	Total	Tributyltin	0-10 ft	ug/kg	84	20	158	19.5	1,860	39.0	210	186	97.5% KM (Chebyshev) UCL	39.0	210	186	97.5% KM (Chebyshev) UCL
Soil	Herbicides	Total	2,4,5-T	0-1 ft	ug/kg	24	2	78.0	78.0	93.0	64.2	6.00	67.2	95% KM (t) UCL	64.2	6.00	67.2	95% KM (t) UCL

Table I-16
Statistical Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(2 of 8)

Medium Group	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	Herbicides	Total	2,4,5-T	0-3 ft	ug/kg	26	2	78.0	78.0	93.0	64.2	5.77	66.9	95% KM (t) UCL	64.2	5.77	66.9	95% KM (t) UCL
Soil	Herbicides	Total	2,4,5-T	0-10 ft	ug/kg	33	2	78.0	78.0	93.0	63.9	5.14	66.0	95% KM (t) UCL	63.9	5.14	66.0	95% KM (t) UCL
Soil	Herbicides	Total	Dichloroprop	0-1 ft	ug/kg	24	2	175	175	180	170	2.23	172	95% KM (t) UCL	170	2.23	172	95% KM (t) UCL
Soil	Herbicides	Total	Dichloroprop	0-3 ft	ug/kg	26	2	175	175	180	170	2.13	172	95% KM (t) UCL	170	2.13	172	95% KM (t) UCL
Soil	Herbicides	Total	Dichloroprop	0-10 ft	ug/kg	33	2	175	175	180	170	1.86	171	95% KM (t) UCL	170	1.86	171	95% KM (t) UCL
Soil	Herbicides	Total	MCPP	0-1 ft	ug/kg	24	2	11,800	11,800	14,000	9,740	1,000	10,300	95% KM (t) UCL	9,740	1,000	10,300	95% KM (t) UCL
Soil	Herbicides	Total	MCPP	0-3 ft	ug/kg	26	2	11,800	11,800	14,000	9,710	958	10,200	95% KM (t) UCL	9,710	958	10,200	95% KM (t) UCL
Soil	Herbicides	Total	MCPP	0-10 ft	ug/kg	33	2	11,800	11,800	14,000	9,660	835	10,000	95% KM (t) UCL	9,660	835	10,000	95% KM (t) UCL
Soil	Pesticides	Total	4,4'-DDD	0-1 ft	ug/kg	52	2	0.840	0.840	0.990	0.702	0.0577	-	-	0.765	0.130	-	-
Soil	Pesticides	Total	4,4'-DDD	0-3 ft	ug/kg	60	2	0.840	0.840	0.990	0.699	0.0522	-	-	0.740	0.112	-	-
Soil	Pesticides	Total	4,4'-DDD	0-10 ft	ug/kg	67	2	0.840	0.840	0.990	0.699	0.0514	-	-	0.740	0.112	-	-
Soil	Pesticides	Total	4,4'-DDE	0-1 ft	ug/kg	52	8	2.98	0.723	17.0	0.746	2.32	1.33	95% KM (t) UCL	1.03	2.29	1.64	95% KM (t) UCL
Soil	Pesticides	Total	4,4'-DDE	0-3 ft	ug/kg	60	8	2.98	0.723	17.0	0.676	2.16	1.18	95% KM (t) UCL	0.943	2.14	1.47	95% KM (t) UCL
Soil	Pesticides	Total	4,4'-DDE	0-10 ft	ug/kg	67	8	2.98	0.723	17.0	0.637	2.05	1.09	95% KM (t) UCL	0.908	2.03	1.38	95% KM (t) UCL
Soil	Pesticides	Total	4,4'-DDT	0-1 ft	ug/kg	52	25	27.9	13.0	140	13.9	32.1	21.5	95% KM (t) UCL	14.0	32.0	21.6	95% KM (t) UCL
Soil	Pesticides	Total	4,4'-DDT	0-3 ft	ug/kg	60	29	25.2	10.0	140	12.7	30.2	19.3	95% KM (t) UCL	12.8	30.1	19.4	95% KM (t) UCL
Soil	Pesticides	Total	4,4'-DDT	0-10 ft	ug/kg	67	29	25.2	10.0	140	11.4	28.8	17.3	95% KM (t) UCL	11.5	28.7	17.5	95% KM (t) UCL
Soil	Pesticides	Total	BHC (beta)	0-1 ft	ug/kg	52	2	1.78	1.78	2.60	0.986	0.235	-	-	0.990	0.248	-	-
Soil	Pesticides	Total	BHC (beta)	0-3 ft	ug/kg	60	2	1.78	1.78	2.60	0.981	0.218	-	-	0.984	0.228	-	-
Soil	Pesticides	Total	BHC (beta)	0-10 ft	ug/kg	67	2	1.78	1.78	2.60	0.978	0.206	-	-	0.980	0.215	-	-
Soil	Pesticides	Total	BHC (delta)	0-1 ft	ug/kg	52	2	1.55	1.55	3.03	0.136	0.409	-	-	0.141	0.426	-	-
Soil	Pesticides	Total	BHC (delta)	0-3 ft	ug/kg	60	2	1.55	1.55	3.03	0.128	0.381	-	-	0.132	0.394	-	-
Soil	Pesticides	Total	BHC (delta)	0-10 ft	ug/kg	67	2	1.55	1.55	3.03	0.123	0.361	-	-	0.126	0.372	-	-
Soil	Pesticides	Total	BHC (gamma) Lindane	0-1 ft	ug/kg	52	2	5.92	5.92	9.68	2.32	1.04	-	-	2.32	1.04	-	-
Soil	Pesticides	Total	BHC (gamma) Lindane	0-3 ft	ug/kg	60	3	4.02	2.17	9.68	0.395	1.25	-	-	0.397	1.25	-	-
Soil	Pesticides	Total	BHC (gamma) Lindane	0-10 ft	ug/kg	67	3	4.02	2.17	9.68	0.374	1.18	-	-	0.375	1.18	-	-
Soil	Pesticides	Total	Chlordane (alpha)	0-1 ft	ug/kg	39	4	1.76	1.18	4.00	0.805	0.589	1.01	95% KM (t) UCL	0.842	0.604	1.06	95% KM (t) UCL
Soil	Pesticides	Total	Chlordane (alpha)	0-3 ft	ug/kg	45	4	1.76	1.18	4.00	0.781	0.544	0.952	95% KM (t) UCL	0.817	0.556	1.01	95% KM (t) UCL
Soil	Pesticides	Total	Chlordane (alpha)	0-10 ft	ug/kg	45	4	1.76	1.18	4.00	0.781	0.544	0.952	95% KM (t) UCL	0.817	0.556	1.01	95% KM (t) UCL
Soil	Pesticides	Total	Chlordane (gamma)	0-1 ft	ug/kg	39	6	43.7	29.8	97.0	13.2	19.0	18.8	95% KM (t) UCL	13.2	19.0	18.8	95% KM (t) UCL
Soil	Pesticides	Total	Chlordane (gamma)	0-3 ft	ug/kg	45	10	27.4	10.6	97.0	6.62	19.5	11.8	95% KM (t) UCL	6.66	19.5	11.8	95% KM (t) UCL
Soil	Pesticides	Total	Chlordane (gamma)	0-10 ft	ug/kg	45	10	27.4	10.6	97.0	6.62	19.5	11.8	95% KM (t) UCL	6.66	19.5	11.8	95% KM (t) UCL
Soil	Pesticides	Total	Chlordane (technical)	0-1 ft	ug/kg	13	1	1,560	1,560	1,560	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Chlordane (technical)	0-3 ft	ug/kg	15	3	573	92.7	1,560	167	372	902	97.5% KM (Chebyshev) UCL	167	372	902	97.5% KM (Chebyshev) UCL
Soil	Pesticides	Total	Chlordane (technical)	0-10 ft	ug/kg	22	6	372	79.2	1,560	137	319	329	95% KM (BCA) UCL	137	319	293	95% KM (BCA) UCL
Soil	Pesticides	Total	Dieldrin	0-1 ft	ug/kg	52	3	1.12	0.823	2.10	0.498	0.299	0.608	95% KM (t) UCL	0.598	0.368	0.819	95% KM (t) UCL
Soil	Pesticides	Total	Dieldrin	0-3 ft	ug/kg	60	3	1.12	0.823	2.10	0.489	0.280	-	-	0.587	0.346	-	-
Soil	Pesticides	Total	Dieldrin	0-10 ft	ug/kg	67	3	1.12	0.823	2.10	0.485	0.270	-	-	0.583	0.337	-	-
Soil	Pesticides	Total	Endosulfan I	0-1 ft	ug/kg	52	2	4.32	4.32	6.45	2.28	0.595	-	-	2.28	0.595	-	-
Soil	Pesticides	Total	Endosulfan I	0-3 ft	ug/kg	60	5	2.21	2.00	6.45	0.328	0.890	0.547	95% KM (t) UCL	0.378	0.883	0.608	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan I	0-10 ft	ug/kg	67	5	2.21	2.00	6.45	0.308	0.842	0.504	95% KM (t) UCL	0.359	0.836	0.567	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan II	0-1 ft	ug/kg	52	4	3.01	1.48	8.84	0.502	1.22	0.844	95% KM (t) UCL	0.755	1.24	1.26	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan II	0-3 ft	ug/kg	60	4	3.01	1.48	8.84	0.463	1.14	0.756	95% KM (t) UCL	0.702	1.16	1.17	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan II	0-10 ft	ug/kg	67	4	3.01	1.48	8.84	0.442	1.08	0.706	95% KM (t) UCL	0.679	1.11	1.13	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan Sulfate	0-1 ft	ug/kg	52	7	2.11	1.70	5.97	0.842	0.887	1.08	95% KM (t) UCL	0.992	0.909	1.30	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan Sulfate	0-3 ft	ug/kg	60	7	2.11	1.70	5.97	0.800	0.825	1.01	95% KM (t) UCL	0.914	0.842	1.16	95% KM (t) UCL
Soil	Pesticides	Total	Endosulfan Sulfate	0-10 ft	ug/kg	67	7	2.11	1.70	5.97	0.781	0.784	0.967	95% KM (t) UCL	0.897	0.804	1.13	95% KM (t) UCL
Soil	Pesticides	Total	Endrin Aldehyde	0-1 ft	ug/kg	52	4	8.36	7.70	16.0	2.52	2.28	3.14	95% KM (t) UCL	2.52	2.28	3.14	95% KM (t) UCL
Soil	Pesticides	Total	Endrin Aldehyde	0-3 ft	ug/kg	60	5	7.06	4.40	16.0	2.34	2.16	2.86	95% KM (t) UCL	2.34	2.16	2.87	95% KM (t) UCL
Soil	Pesticides	Total	Endrin Aldehyde	0-10 ft	ug/kg	67	5	7.06	4.40	16.0	2.29	2.04	2.76	95% KM (t) UCL	2.30	2.04	2.76	95% KM (t) UCL
Soil	Pesticides	Total	Endrin Ketone	0-1 ft	ug/kg	51	4	5.25	3.07	13.0	2.16	1.61	2.61	95% KM (t) UCL	2.16	1.61	2.61	95% KM (t) UCL
Soil	Pesticides	Total	Endrin Ketone	0-3 ft	ug/kg	59	4	5.25	3.07	13.0	2.12	1.49	2.50	95% KM (t) UCL	2.12	1.49	2.50	95% KM (t) UCL
Soil	Pesticides	Total	Endrin Ketone	0-10 ft	ug/kg	66	4	5.25	3.07	13.0	2.09	1.41	2.43	95% KM (t) UCL	2.09	1.41	2.43	95% KM (t) UCL
Soil	Pesticides	Total	Endrin	0-1 ft	ug/kg	52	3	11.7	15.0	17.0	3.50	2.51	4.21	95% KM (t) UCL	3.50	2.51	4.21	95% KM (t) UCL
Soil	Pesticides	Total	Endrin	0-3 ft	ug/kg	60	4	9.28	9.00	17.0	2.58	2.50	3.21	95% KM (t) UCL	2.58	2.50	3.21	95% KM (t) UCL
Soil	Pesticides	Total	Endrin	0-10 ft	ug/kg	67	4	9.28	9.00	17.0	2.53	2.37	3.09	95% KM (t) UCL	2.53	2.37	3.09	95% KM (t) UCL
Soil	Pesticides	Total	Heptachlor Epoxide	0-1 ft	ug/kg	52	1	14.4	14.4	14.4	-	-	-	-	-	-	-	-
Soil	Pesticides	Total	Heptachlor Epoxide	0-3 ft	ug/kg	60	2	7.52	7.52	14.4	0.863	1.76	-	-	0.863	1.76	-	-
Soil	Pesticides	Total	Heptachlor Epoxide	0-10 ft	ug/kg	67	2	7.52	7.52	14.4	0.839	1.67	-	-	0.839	1.67	-	-
Soil	Pesticides	Total	Heptachlor	0-1 ft	ug/kg	52	5	1.30	0.380	2.90	0.297	0.526	0.437	95% KM (t) UCL	0.357	0.531	0.529	95% KM (t) UCL
Soil	Pesticides	Total	Heptachlor	0-3 ft	ug/kg	60	6	1.59	1.60	3.07	0.330	0.610	0.477	95% KM (t) UCL	0.392	0.612	0.567	95% KM (t) UCL
Soil	Pesticides	Total	Heptachlor	0-10 ft	ug/kg	67	6	1.59	1.60	3.07	0.314	0.578	0.445	95% KM (t) UCL	0.376	0.579	0.538	95% KM (t) UCL
Soil	Pesticides	Total	Methoxychlor	0-1 ft	ug/kg	52	2	1.10	1.10	1.20	1.02	0.0533	-	-	1.03	0.0700	-	-
Soil	Pesticides	Total	Methoxychlor	0-3 ft	ug/kg	60	2	1.10	1.10	1.20	1.01	0.0447	-	-	1.02	0.0553	-	-
Soil	Pesticides	Total	Methoxychlor	0-10 ft	ug/kg	67	2	1.10	1.10	1.20	1.01	0.0447	-	-	1.02	0.0553	-	-

Table I-16
Statistical Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
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Medium Group	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	PCB Aroclors	Total	Aroclor 1248	0-1 ft	ug/kg	97	2	515	515	968	70.8	91.6	-	-	70.8	91.6	-	-
Soil	PCB Aroclors	Total	Aroclor 1248	0-3 ft	ug/kg	114	2	515	515	968	69.4	84.5	-	-	69.4	84.5	-	-
Soil	PCB Aroclors	Total	Aroclor 1248	0-10 ft	ug/kg	128	2	515	515	968	68.6	79.8	-	-	68.6	79.8	-	-
Soil	PCB Aroclors	Total	Aroclor 1254	0-1 ft	ug/kg	97	15	338	49.0	1,700	57.2	242	99.4	95% KM (t) UCL	57.7	241	99.8	95% KM (t) UCL
Soil	PCB Aroclors	Total	Aroclor 1254	0-3 ft	ug/kg	114	21	262	48.4	1,700	53.1	224	147	95% KM (Chebyshev) UCL	53.6	224	147	95% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Aroclor 1254	0-10 ft	ug/kg	128	26	238	48.7	1,700	53.0	215	138	95% KM (Chebyshev) UCL	53.4	215	138	95% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	ug/kg	97	82	90.9	34.0	690	78.3	138	140	95% KM (Chebyshev) UCL	78.6	138	140	95% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Aroclor 1260	0-3 ft	ug/kg	114	93	83.8	30.6	690	69.6	130	123	95% KM (Chebyshev) UCL	70.0	130	123	95% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Aroclor 1260	0-10 ft	ug/kg	128	105	83.2	33.0	690	69.4	128	119	95% KM (Chebyshev) UCL	69.8	128	119	95% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	ug/kg	97	82	173	48.1	2,140	149	349	304	95% KM (Chebyshev) UCL	155	347	310	95% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-3 ft	ug/kg	114	93	168	43.9	2,140	133	326	325	97.5% KM (Chebyshev) UCL	140	324	273	95% KM (Chebyshev) UCL
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-10 ft	ug/kg	128	105	164	44.9	2,140	132	313	254	95% KM (Chebyshev) UCL	140	312	260	95% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	mg/kg	83	75	233	53.4	5,100	211	650	524	95% KM (Chebyshev) UCL	212	650	525	95% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-3 ft	mg/kg	102	90	233	49.1	5,100	206	614	473	95% KM (Chebyshev) UCL	207	613	474	95% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-10 ft	mg/kg	119	101	473	54.7	9,740	402	1,370	1,190	97.5% KM (Chebyshev) UCL	404	1,370	1,190	97.5% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	mg/kg	83	77	1,040	321	23,900	964	3,050	2,430	95% KM (Chebyshev) UCL	965	3,050	2,430	95% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Residual Range Organics	0-3 ft	mg/kg	102	93	908	276	23,900	830	2,770	2,030	95% KM (Chebyshev) UCL	831	2,770	2,030	95% KM (Chebyshev) UCL
Soil	NWTPH-Dx	Total	Residual Range Organics	0-10 ft	mg/kg	119	106	1,990	311	41,900	1,770	6,390	5,450	97.5% KM (Chebyshev) UCL	1,780	6,390	5,450	97.5% KM (Chebyshev) UCL
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	mg/kg	49	11	99.0	3.20	586	23.7	94.0	164	99% KM (Chebyshev) UCL	24.1	93.9	164	99% KM (Chebyshev) UCL
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-3 ft	mg/kg	59	14	370	3.34	3,960	89.3	516	782	99% KM (Chebyshev) UCL	89.6	516	783	99% KM (Chebyshev) UCL
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-10 ft	mg/kg	69	16	324	3.24	3,960	76.6	478	448	97.5% KM (Chebyshev) UCL	77.0	478	448	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzoic Acid	0-1 ft	ug/kg	54	19	157	88.5	980	89.8	163	133	95% KM (t) UCL	102	167	148	95% KM (t) UCL
Soil	SVOCs	Total	Benzoic Acid	0-3 ft	ug/kg	64	21	165	100	980	85.1	154	122	95% KM (t) UCL	98.1	156	136	95% KM (t) UCL
Soil	SVOCs	Total	Benzoic Acid	0-10 ft	ug/kg	74	22	171	104	980	77.9	146	110	95% KM (t) UCL	95.3	148	129	95% KM (t) UCL
Soil	SVOCs	Total	Benzyl Alcohol	0-1 ft	ug/kg	58	2	10.9	10.9	14.0	8.10	1.32	-	-	8.25	1.59	-	-
Soil	SVOCs	Total	Benzyl Alcohol	0-3 ft	ug/kg	68	2	10.9	10.9	14.0	8.02	1.13	-	-	8.09	1.29	-	-
Soil	SVOCs	Total	Benzyl Alcohol	0-10 ft	ug/kg	78	2	10.9	10.9	14.0	8.00	1.08	-	-	8.06	1.21	-	-
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	ug/kg	58	45	10,000	895	260,000	7,820	34,500	36,400	97.5% KM (Chebyshev) UCL	7,840	34,500	36,400	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-3 ft	ug/kg	69	55	9,040	825	260,000	7,220	31,800	31,300	97.5% KM (Chebyshev) UCL	7,230	31,800	31,400	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-10 ft	ug/kg	79	65	7,790	825	260,000	6,420	29,800	27,500	97.5% KM (Chebyshev) UCL	6,430	29,800	27,500	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	ug/kg	57	8	43.8	30.8	124	11.3	22.2	17.2	95% KM (t) UCL	14.2	24.4	21.7	95% KM (t) UCL
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-3 ft	ug/kg	67	9	42.5	31.7	124	10.4	20.5	15.4	95% KM (t) UCL	12.6	22.7	18.7	95% KM (t) UCL
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-10 ft	ug/kg	77	11	51.8	35.2	152	12.2	25.9	26.1	95% KM (Percentile Bootstrap) UCL	15.1	28.5	28.1	95% KM (Percentile Bootstrap) UCL
Soil	SVOCs	Total	Carbazole	0-1 ft	ug/kg	58	39	259	91.0	2,650	178	399	272	95% KM (BCA) UCL	182	398	284	95% KM (BCA) UCL
Soil	SVOCs	Total	Carbazole	0-3 ft	ug/kg	68	45	301	78.0	2,840	202	496	312	95% KM (BCA) UCL	205	495	316	95% KM (BCA) UCL
Soil	SVOCs	Total	Carbazole	0-10 ft	ug/kg	78	50	341	129	2,840	221	503	322	95% KM (BCA) UCL	224	502	326	95% KM (BCA) UCL
Soil	SVOCs	Total	Dibenzofuran	0-1 ft	ug/kg	58	30	84.6	40.2	810	48.2	119	77.1	95% KM (BCA) UCL	50.9	120	79.0	95% KM (BCA) UCL
Soil	SVOCs	Total	Dibenzofuran	0-3 ft	ug/kg	69	37	98.8	42.4	810	56.6	130	83.4	95% KM (BCA) UCL	59.2	131	88.6	95% KM (BCA) UCL
Soil	SVOCs	Total	Dibenzofuran	0-10 ft	ug/kg	79	42	99.2	43.7	810	56.2	124	81.3	95% KM (BCA) UCL	59.0	125	84.7	95% KM (BCA) UCL
Soil	SVOCs	Total	Diethyl Phthalate	0-1 ft	ug/kg	57	4	44.0	47.0	73.4	12.2	12.6	16.0	95% KM (t) UCL	13.2	14.2	18.0	95% KM (t) UCL
Soil	SVOCs	Total	Diethyl Phthalate	0-3 ft	ug/kg	67	6	39.5	37.9	73.4	12.5	12.0	15.6	95% KM (t) UCL	13.2	13.1	16.9	95% KM (t) UCL
Soil	SVOCs	Total	Diethyl Phthalate	0-10 ft	ug/kg	77	7	38.2	31.8	73.4	12.3	11.4	14.9	95% KM (t) UCL	13.3	12.8	16.7	95% KM (t) UCL
Soil	SVOCs	Total	Dimethyl Phthalate	0-1 ft	ug/kg	57	3	34.3	32.0	41.0	30.3	1.78	30.9	95% KM (t) UCL	30.4	1.96	31.1	95% KM (t) UCL
Soil	SVOCs	Total	Dimethyl Phthalate	0-3 ft	ug/kg	67	3	34.3	32.0	41.0	30.3	1.59	-	-	30.3	1.76	-	-
Soil	SVOCs	Total	Dimethyl Phthalate	0-10 ft	ug/kg	77	3	34.3	32.0	41.0	30.2	1.45	-	-	30.3	1.70	-	-
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	ug/kg	57	14	218	86.4	1,800	68.3	238	124	95% KM (t) UCL	72.5	242	130	95% KM (t) UCL
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-3 ft	ug/kg	67	18	174	61.0	1,800	58.0	221	105	95% KM (t) UCL	62.0	224	110	95% KM (t) UCL
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-10 ft	ug/kg	77	18	174	61.0	1,800	51.2	207	91.9	95% KM (t) UCL	56.3	210	98.5	95% KM (t) UCL
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-1 ft	ug/kg	57	5	49.4	31.0	127	15.8	18.6	21.0	95% KM (t) UCL	17.4	21.4	24.4	95% KM (t) UCL
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-3 ft	ug/kg	67	6	45.0	27.0	127	15.2	16.9	19.4	95% KM (t) UCL	16.5	19.4	22.0	95% KM (t) UCL
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-10 ft	ug/kg	77	7	51.1	31.0	127	15.9	18.1	20.0	95% KM (t) UCL	18.0	21.8	24.0	95% KM (t) UCL
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	ug/kg	58	2	33.2	33.2	64.0	3.96	9.49	-	-	4.38	10.7	-	-
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-3 ft	ug/kg	68	2	33.2	33.2	64.0	3.67	8.53	-	-	4.00	9.61	-	-
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-10 ft	ug/kg	78	2	33.2	33.2	64.0	3.47	7.82	-	-	3.89	9.28	-	-
Soil	SVOCs	Total	Pentachlorophenol	0-1 ft	ug/kg	58	4	79.0	52.0	201	18.7	31.5	28.6	95% KM (t) UCL	20.4	33.2	31.8	95% KM (t) UCL
Soil	SVOCs	Total	Pentachlorophenol	0-3 ft	ug/kg	68	4	79.0	52.0	201	17.0	28.2	24.8	95% KM (t) UCL	18.2	29.5	27.0	95% KM (t) UCL
Soil	SVOCs	Total	Pentachlorophenol	0-10 ft	ug/kg	78	4	79.0	52.0	201	15.9	25.8	22.4	95% KM (t) UCL	17.2	27.1	24.7	95% KM (t) UCL
Soil	SVOCs	Total	Phenol	0-1 ft	ug/kg	58	2	2.85	2.85	3.70	2.08	0.371	-	-	2.85	0.850	-	-
Soil	SVOCs	Total	Phenol	0-3 ft	ug/kg	68	5	9.22	3.00	35.0	2.81	4.71	35.0	95% KM (BCA) UCL	3.67	5.33	-	-
Soil	SVOCs	Total	Phenol	0-10 ft	ug/kg	78	5	9.22	3.00	35.0	2.68	4.30	4.98	95% KM (BCA) UCL	3.60	5.13	5.69	95% KM (BCA) UCL
Soil	SVOCs	Total	2-Methylnaphthalene	0-1 ft	ug/kg	58	24	126	30.4	1,530	55.3	214	180	95% KM (Chebyshev) UCL	55.9	214	181	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	2-Methylnaphthalene	0-3 ft	ug/kg	69	27	118	31.8	1,530	49.1	197	155	95% KM (Chebyshev) UCL	49.6	197	155	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	2-Methylnaphthalene	0-10 ft	ug/kg	79	31	106	29.0	1,530	44.0	185	136	95% KM (Chebyshev) UCL	44.5	185	137	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Acenaphthene	0-1 ft	ug/kg	58	44	205	59.5	2,600	160	380	380	95% KM (Chebyshev) UCL	160	380	380	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Acenaphthene	0-3 ft	ug/kg	73	56	331	83.5	3,200	257	598	564	95% KM (Chebyshev) UCL	257	598	565	95% KM (Chebyshev) UCL

Table I-16
Statistical Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(4 of 8)

Medium Group	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	SVOCs	Total	Acenaphthene	0-10 ft	ug/kg	87	66	374	112	3,200	286	634	584	95% KM (Chebyshev) UCL	288	634	586	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Acenaphthylene	0-1 ft	ug/kg	58	21	25.1	15.0	87.7	12.8	20.5	18.0	95% KM (t) UCL	13.6	21.4	19.2	95% KM (t) UCL
Soil	SVOCs	Total	Acenaphthylene	0-3 ft	ug/kg	73	29	37.0	15.0	295	18.0	39.8	26.2	95% KM (t) UCL	18.9	40.4	27.3	95% KM (t) UCL
Soil	SVOCs	Total	Acenaphthylene	0-10 ft	ug/kg	87	35	37.6	22.0	295	18.2	37.7	25.2	95% KM (t) UCL	19.1	38.1	26.4	95% KM (t) UCL
Soil	SVOCs	Total	Anthracene	0-1 ft	ug/kg	58	52	291	85.2	2,700	263	471	535	95% KM (Chebyshev) UCL	263	471	535	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Anthracene	0-3 ft	ug/kg	73	64	500	99.5	8,440	440	1,090	1,250	97.5% KM (Chebyshev) UCL	440	1,090	1,250	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Anthracene	0-10 ft	ug/kg	87	75	740	150	8,440	640	1,450	1,320	95% KM (Chebyshev) UCL	640	1,450	1,320	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Fluorene	0-1 ft	ug/kg	58	39	131	47.0	1,200	92.7	186	139	95% KM (BCA) UCL	94.8	186	141	95% KM (BCA) UCL
Soil	SVOCs	Total	Fluorene	0-3 ft	ug/kg	73	50	184	74.0	1,610	130	266	191	95% KM (BCA) UCL	132	265	193	95% KM (BCA) UCL
Soil	SVOCs	Total	Fluorene	0-10 ft	ug/kg	87	60	225	96.8	1,610	158	301	211	95% KM (BCA) UCL	160	300	217	95% KM (BCA) UCL
Soil	SVOCs	Total	Naphthalene	0-1 ft	ug/kg	58	30	102	33.9	823	56.9	153	185	97.5% KM (Chebyshev) UCL	57.6	153	186	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Naphthalene	0-3 ft	ug/kg	73	41	93.6	41.0	823	56.1	141	161	97.5% KM (Chebyshev) UCL	56.7	141	162	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Naphthalene	0-10 ft	ug/kg	87	48	122	45.0	1,710	70.7	219	219	97.5% KM (Chebyshev) UCL	71.3	219	220	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Phenanthrene	0-1 ft	ug/kg	58	57	1,110	300	12,000	1,090	1,910	2,200	95% KM (Chebyshev) UCL	1,090	1,910	2,200	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Phenanthrene	0-3 ft	ug/kg	73	70	1,610	322	21,900	1,550	3,150	3,870	97.5% KM (Chebyshev) UCL	1,550	3,150	3,870	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Phenanthrene	0-10 ft	ug/kg	87	81	1,890	360	21,900	1,760	3,410	4,060	97.5% KM (Chebyshev) UCL	1,780	3,410	4,080	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	58	57	2,403	650	18,674	1,740	2,944	3,440	95% KM (Chebyshev) UCL	1,753	2,956	3,460	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	ug/kg	73	70	3,079	826	34,767	2,496	5,046	5,089	95% KM (Chebyshev) UCL	2,507	5,049	5,102	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)anthracene	0-1 ft	ug/kg	58	54	1,900	428	32,000	1,770	4,520	4,390	95% KM (Chebyshev) UCL	1,780	4,520	4,390	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)anthracene	0-3 ft	ug/kg	73	66	2,730	530	32,000	2,470	5,430	5,260	95% KM (Chebyshev) UCL	2,470	5,430	5,260	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)anthracene	0-10 ft	ug/kg	87	78	3,670	825	32,000	3,290	6,450	6,320	95% KM (Chebyshev) UCL	3,290	6,450	6,320	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)pyrene	0-1 ft	ug/kg	58	55	1,980	435	33,000	1,880	4,660	4,570	95% KM (Chebyshev) UCL	1,880	4,660	4,570	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)pyrene	0-3 ft	ug/kg	73	67	2,960	450	34,000	2,720	6,020	7,150	97.5% KM (Chebyshev) UCL	2,720	6,020	7,150	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(a)pyrene	0-10 ft	ug/kg	87	79	3,600	820	34,000	3,270	6,160	7,420	97.5% KM (Chebyshev) UCL	3,270	6,160	7,420	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	ug/kg	37	36	3,380	835	65,000	3,280	10,500	20,700	99% KM (Chebyshev) UCL	3,280	10,500	20,700	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-3 ft	ug/kg	46	44	3,600	835	65,000	3,450	9,690	9,750	95% KM (Chebyshev) UCL	3,450	9,690	9,750	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-10 ft	ug/kg	46	44	3,600	835	65,000	3,450	9,690	9,750	95% KM (Chebyshev) UCL	3,450	9,690	9,750	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	ug/kg	58	50	1,130	280	18,000	976	2,520	2,440	95% KM (Chebyshev) UCL	977	2,520	2,440	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-3 ft	ug/kg	73	63	1,590	290	18,000	1,380	3,140	3,690	97.5% KM (Chebyshev) UCL	1,380	3,140	3,690	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-10 ft	ug/kg	87	75	1,910	480	18,000	1,650	3,170	3,140	95% KM (Chebyshev) UCL	1,650	3,170	3,140	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	ug/kg	37	36	2,480	350	65,000	2,410	10,500	19,800	99% KM (Chebyshev) UCL	2,410	10,500	19,800	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-3 ft	ug/kg	46	44	2,330	350	65,000	2,230	9,420	11,000	97.5% KM (Chebyshev) UCL	2,230	9,420	11,000	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-10 ft	ug/kg	46	44	2,330	350	65,000	2,230	9,420	11,000	97.5% KM (Chebyshev) UCL	2,230	9,420	11,000	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-1 ft	ug/kg	21	20	1,980	155	14,700	1,880	3,950	10,700	99% KM (Chebyshev) UCL	1,880	3,950	10,700	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-3 ft	ug/kg	27	25	3,950	212	31,300	3,650	7,120	17,600	99% KM (Chebyshev) UCL	3,650	7,120	17,600	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-10 ft	ug/kg	41	37	5,270	1,080	31,300	4,760	6,840	9,480	95% KM (Chebyshev) UCL	4,760	6,840	9,480	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Chrysene	0-1 ft	ug/kg	58	56	1,980	520	32,000	1,920	4,500	4,510	95% KM (Chebyshev) UCL	1,920	4,500	4,510	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Chrysene	0-3 ft	ug/kg	73	69	2,880	620	35,300	2,730	5,960	5,790	95% KM (Chebyshev) UCL	2,730	5,960	5,790	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Chrysene	0-10 ft	ug/kg	87	81	3,600	870	35,300	3,350	6,370	6,340	95% KM (Chebyshev) UCL	3,350	6,370	6,340	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	ug/kg	58	42	494	140	9,900	363	1,300	1,120	95% KM (Chebyshev) UCL	364	1,300	1,120	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-3 ft	ug/kg	73	54	556	155	9,900	416	1,210	1,040	95% KM (Chebyshev) UCL	416	1,210	1,040	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-10 ft	ug/kg	87	62	554	230	9,900	398	1,120	924	95% KM (Chebyshev) UCL	399	1,110	924	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Fluoranthene	0-1 ft	ug/kg	58	55	3,540	795	54,000	3,360	8,060	8,020	95% KM (Chebyshev) UCL	3,360	8,060	8,020	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Fluoranthene	0-3 ft	ug/kg	73	68	5,000	816	54,000	4,660	9,770	11,900	97.5% KM (Chebyshev) UCL	4,660	9,770	11,900	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Fluoranthene	0-10 ft	ug/kg	87	80	6,340	1,250	54,000	5,830	10,400	12,800	97.5% KM (Chebyshev) UCL	5,830	10,400	12,800	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	ug/kg	58	52	1,210	285	19,000	1,090	2,730	2,670	95% KM (Chebyshev) UCL	1,090	2,730	2,670	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-3 ft	ug/kg	73	65	1,800	300	20,000	1,600	3,640	3,480	95% KM (Chebyshev) UCL	1,610	3,640	3,480	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-10 ft	ug/kg	87	77	2,190	510	20,000	1,940	3,710	3,680	95% KM (Chebyshev) UCL	1,940	3,710	3,680	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Pyrene	0-1 ft	ug/kg	58	56	3,300	810	40,000	3,190	6,750	7,090	95% KM (Chebyshev) UCL	3,190	6,750	7,090	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Pyrene	0-3 ft	ug/kg	73	70	5,150	897	67,100	4,940	10,600	10,400	95% KM (Chebyshev) UCL	4,940	10,600	10,400	95% KM (Chebyshev) UCL
Soil	SVOCs	Total	Pyrene	0-10 ft	ug/kg	87	82	6,760	1,260	67,100	6,370	11,500	14,100	97.5% KM (Chebyshev) UCL	6,370	11,500	14,100	97.5% KM (Chebyshev) UCL
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	58	56	22,488	4,976	367,900	18,198	50,007	47,078	95% KM (Chebyshev) UCL	18,219	50,008	84,145	99% KM (Chebyshev) UCL
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	ug/kg	73	70	28,142	5,626	367,900	24,503	55,546	53,046	95% KM (Chebyshev) UCL	24,520	55,546	53,062	95% KM (Chebyshev) UCL
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-1 ft	ug/kg	55	2	0.535	0.535	0.580	0.493	0.0167	-	-	0.505	0.0335	-	-
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-3 ft	ug/kg	66	2	0.535	0.535	0.580	0.492	0.0144	-	-	0.501	0.0298	-	-
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-10 ft	ug/kg	76	3	0.389	0.490	0.580	0.115	0.0880	-	-	0.153	0.147	-	-
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	ug/kg	55	18	903	0.240	14300	296	1,920	2,940	99% KM (Chebyshev) UCL	296	1,920	2,940	99% KM (Chebyshev) UCL
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-3 ft	ug/kg	66	24	1,770	0.240	14,300	645	2,830	2,860	97.5% KM (Chebyshev) UCL	645	2,830	2,860	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-10 ft	ug/kg	76	25	1,700	0.240	14,300	560	2,640	2,490	97.5% KM (Chebyshev) UCL	560	2,640	2,490	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	ug/kg	55	8	779	0.113	5,410	113	725	1,150	99% KM (Chebyshev) UCL	113	725	1,150	99% KM (Chebyshev) UCL
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-3 ft	ug/kg	66	11	1,180	1.83	6,500	196	1,020	417	95% KM (t) UCL	196	1,020	417	95% KM (t) UCL
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-10 ft	ug/kg	76	11	1,180	1.83	6,500	170	958	362	95% KM (t) UCL	170	958	362	95% KM (t) UCL
Soil	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	ug/kg	55	1	0.160	0.160	0.160	-	-	-	-	-	-	-	-
Soil	VOCs	Total	1,4-Dichlorobenzene	0-3 ft	ug/kg	66	2	0.150	0.150	0.160	0.141	0.00348	-	-	0.150	0.0100	-	-
Soil	VOCs	Total	1,4-Dichlorobenzene	0-10 ft	ug/kg	76	2	0.150	0.150	0.160	0.141	0.00333	-	-	0.150	0.0100	-	-

Table I-16
Statistical Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
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Medium Group	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	VOCs	Total	2-Butanone (MEK)	0-1 ft	ug/kg	55	16	19.6	13.5	50.0	10.7	9.88	13.2	95% KM (t) UCL	11.2	9.82	13.8	95% KM (t) UCL
Soil	VOCs	Total	2-Butanone (MEK)	0-3 ft	ug/kg	66	19	17.0	13.0	50.0	8.01	10.1	10.4	95% KM (t) UCL	8.71	9.98	11.2	95% KM (t) UCL
Soil	VOCs	Total	2-Butanone (MEK)	0-10 ft	ug/kg	76	19	17.0	13.0	50.0	6.96	9.55	9.00	95% KM (t) UCL	7.38	9.56	9.47	95% KM (t) UCL
Soil	VOCs	Total	2-Hexanone	0-1 ft	ug/kg	55	3	6.33	5.50	8.80	4.88	0.770	5.17	95% KM (t) UCL	5.14	1.10	5.78	95% KM (t) UCL
Soil	VOCs	Total	2-Hexanone	0-3 ft	ug/kg	66	3	6.33	5.50	8.80	4.83	0.665	-	-	5.05	1.00	-	-
Soil	VOCs	Total	2-Hexanone	0-10 ft	ug/kg	76	3	6.33	5.50	8.80	4.80	0.594	-	-	4.91	0.802	-	-
Soil	VOCs	Total	4-Isopropyltoluene	0-1 ft	ug/kg	55	14	1.63	0.415	12.0	0.596	1.71	1.02	95% KM (t) UCL	0.866	1.88	1.40	95% KM (t) UCL
Soil	VOCs	Total	4-Isopropyltoluene	0-3 ft	ug/kg	66	17	10.9	0.900	161	3.14	20.3	14.7	95% KM (Chebyshev) UCL	3.48	20.4	15.2	95% KM (Chebyshev) UCL
Soil	VOCs	Total	4-Isopropyltoluene	0-10 ft	ug/kg	76	18	10.4	0.690	161	2.71	18.8	12.7	95% KM (Chebyshev) UCL	2.98	19.0	13.1	95% KM (Chebyshev) UCL
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	ug/kg	55	9	0.668	0.670	1.20	0.483	0.216	0.566	95% KM (t) UCL	0.668	0.233	0.806	95% KM (t) UCL
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-3 ft	ug/kg	66	9	0.668	0.670	1.20	0.449	0.201	0.518	95% KM (t) UCL	0.668	0.233	0.805	95% KM (t) UCL
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-10 ft	ug/kg	76	9	0.668	0.670	1.20	0.443	0.192	0.507	95% KM (t) UCL	0.668	0.233	0.805	95% KM (t) UCL
Soil	VOCs	Total	Acetone	0-1 ft	ug/kg	55	18	190	155	540	76.0	115	129	95% KM (Percentile Bootstrap) UCL	76.7	116	131	95% KM (Percentile Bootstrap) UCL
Soil	VOCs	Total	Acetone	0-3 ft	ug/kg	66	23	154	150	540	66.8	108	90.8	95% KM (t) UCL	67.5	108	91.8	95% KM (t) UCL
Soil	VOCs	Total	Acetone	0-10 ft	ug/kg	76	23	154	150	540	57.9	102	78.9	95% KM (t) UCL	58.5	102	79.6	95% KM (t) UCL
Soil	VOCs	Total	Benzene	0-1 ft	ug/kg	55	15	0.474	0.450	1.20	0.374	0.267	0.470	95% KM (t) UCL	0.432	0.269	0.540	95% KM (t) UCL
Soil	VOCs	Total	Benzene	0-3 ft	ug/kg	66	17	0.484	0.470	1.20	0.336	0.252	0.412	95% KM (t) UCL	0.427	0.255	0.520	95% KM (t) UCL
Soil	VOCs	Total	Benzene	0-10 ft	ug/kg	76	19	0.481	0.470	1.20	0.311	0.235	0.374	95% KM (t) UCL	0.393	0.231	0.468	95% KM (t) UCL
Soil	VOCs	Total	Bromomethane	0-1 ft	ug/kg	55	7	1.81	0.570	5.00	0.814	1.09	1.29	95% KM (BCA) UCL	1.06	1.35	1.78	95% KM (BCA) UCL
Soil	VOCs	Total	Bromomethane	0-3 ft	ug/kg	66	8	1.69	0.705	5.00	0.737	0.946	1.01	95% KM (t) UCL	0.910	1.14	1.32	95% KM (t) UCL
Soil	VOCs	Total	Bromomethane	0-10 ft	ug/kg	76	8	1.69	0.705	5.00	0.684	0.848	0.902	95% KM (t) UCL	0.781	0.980	1.08	95% KM (t) UCL
Soil	VOCs	Total	Carbon Disulfide	0-1 ft	ug/kg	55	19	1.05	0.700	6.90	0.709	1.07	1.04	95% KM (% Bootstrap) UCL	0.778	1.05	1.10	95% KM (% Bootstrap) UCL
Soil	VOCs	Total	Carbon Disulfide	0-3 ft	ug/kg	66	24	1.07	0.690	6.90	0.722	1.03	1.00	95% KM (% Bootstrap) UCL	0.795	1.01	1.08	95% KM (% Bootstrap) UCL
Soil	VOCs	Total	Carbon Disulfide	0-10 ft	ug/kg	76	24	1.07	0.690	6.90	0.611	0.957	0.858	95% KM (% Bootstrap) UCL	0.684	0.942	0.921	95% KM (% Bootstrap) UCL
Soil	VOCs	Total	Chloroform	0-1 ft	ug/kg	55	3	6.52	0.290	19.0	0.629	2.60	5.06	99% KM (Chebyshev) UCL	0.642	2.60	5.07	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Chloroform	0-3 ft	ug/kg	66	3	6.52	0.290	19.0	0.568	2.38	-	-	0.582	2.38	-	-
Soil	VOCs	Total	Chloroform	0-10 ft	ug/kg	76	3	6.52	0.290	19.0	0.525	2.21	-	-	0.539	2.21	-	-
Soil	VOCs	Total	Chloromethane	0-1 ft	ug/kg	55	2	0.240	0.240	0.250	0.231	0.00417	-	-	0.240	0.0100	-	-
Soil	VOCs	Total	Chloromethane	0-3 ft	ug/kg	66	2	0.240	0.240	0.250	0.231	0.00365	-	-	0.240	0.0100	-	-
Soil	VOCs	Total	Chloromethane	0-10 ft	ug/kg	76	2	0.240	0.240	0.250	0.231	0.00329	-	-	0.240	0.0100	-	-
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	ug/kg	55	1	12.0	12.0	12.0	-	-	-	-	-	-	-	-
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-3 ft	ug/kg	66	2	66.0	66.0	120	13.7	13.6	-	-	13.7	13.6	-	-
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-10 ft	ug/kg	76	4	48.8	35.2	120	7.40	14.8	10.8	95% KM (t) UCL	7.40	14.8	10.8	95% KM (t) UCL
Soil	VOCs	Total	Dichlorodifluoromethane	0-1 ft	ug/kg	55	4	27.7	8.35	94.0	2.42	13.1	5.98	95% KM (t) UCL	2.48	13.1	6.03	95% KM (t) UCL
Soil	VOCs	Total	Dichlorodifluoromethane	0-3 ft	ug/kg	66	4	27.7	8.35	94.0	2.07	12.0	5.04	95% KM (t) UCL	2.11	12.0	5.08	95% KM (t) UCL
Soil	VOCs	Total	Dichlorodifluoromethane	0-10 ft	ug/kg	76	6	18.5	0.478	94.0	1.65	11.2	4.08	95% KM (t) UCL	1.76	11.2	4.19	95% KM (t) UCL
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	ug/kg	55	13	36.7	0.430	460	9.25	62.5	98.2	99% KM (Chebyshev) UCL	9.50	63.1	100	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-3 ft	ug/kg	66	18	26.6	0.410	460	7.84	57.4	40.3	95% KM (Chebyshev) UCL	8.03	57.9	41.0	95% KM (Chebyshev) UCL
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-10 ft	ug/kg	76	18	26.6	0.410	460	6.78	53.4	34.8	95% KM (Chebyshev) UCL	6.96	53.8	35.4	95% KM (Chebyshev) UCL
Soil	VOCs	Total	Ethylbenzene	0-1 ft	ug/kg	55	9	300	0.110	2,700	49.2	361	562	99% KM (Chebyshev) UCL	49.2	361	563	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Ethylbenzene	0-3 ft	ug/kg	66	11	249	0.110	2,700	41.6	330	308	97.5% KM (Chebyshev) UCL	42.3	332	312	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	Ethylbenzene	0-10 ft	ug/kg	76	12	228	0.145	2,700	36.1	308	266	97.5% KM (Chebyshev) UCL	36.7	310	270	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	m,p-Xylenes	0-1 ft	ug/kg	55	9	1,090	0.250	9,800	178	1,310	2,040	99% KM (Chebyshev) UCL	178	1,310	2,040	99% KM (Chebyshev) UCL
Soil	VOCs	Total	m,p-Xylenes	0-3 ft	ug/kg	66	12	1,440	0.305	9,800	261	1,490	1,460	97.5% KM (Chebyshev) UCL	262	1,490	1,460	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	m,p-Xylenes	0-10 ft	ug/kg	76	13	1,330	0.360	9,800	227	1,390	1,260	97.5% KM (Chebyshev) UCL	227	1,390	1,260	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	Naphthalene	0-1 ft	ug/kg	55	11	856	0.550	8,360	172	1,120	1,750	99% KM (Chebyshev) UCL	172	1,120	1,750	99% KM (Chebyshev) UCL
Soil	VOCs	Total	Naphthalene	0-3 ft	ug/kg	66	14	674	0.700	8,360	144	1,020	960	97.5% KM (Chebyshev) UCL	144	1,020	960	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	Naphthalene	0-10 ft	ug/kg	76	14	674	0.700	8,360	125	955	834	97.5% KM (Chebyshev) UCL	125	955	834	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	n-Propylbenzene	0-1 ft	ug/kg	55	1	0.150	0.150	0.150	-	-	-	-	-	-	-	-
Soil	VOCs	Total	n-Propylbenzene	0-3 ft	ug/kg	66	3	40.8	0.409	122	2.12	15.4	-	-	2.28	15.5	-	-
Soil	VOCs	Total	n-Propylbenzene	0-10 ft	ug/kg	76	3	40.8	0.409	122	1.85	14.3	-	-	1.92	14.4	-	-
Soil	VOCs	Total	o-Xylene	0-1 ft	ug/kg	55	2	0.175	0.175	0.180	0.170	0.00204	-	-	0.175	0.00500	-	-
Soil	VOCs	Total	o-Xylene	0-3 ft	ug/kg	70	5	652	0.197	3,200	46.7	380	131	95% KM (t) UCL	46.7	380	131	95% KM (t) UCL
Soil	VOCs	Total	o-Xylene	0-10 ft	ug/kg	84	8	940	0.552	4,260	89.7	574	508	97.5% KM (Chebyshev) UCL	89.8	574	508	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	sec-Butylbenzene	0-1 ft	ug/kg	55	0	-	-	-	-	-	-	-	-	-	-	-
Soil	VOCs	Total	sec-Butylbenzene	0-3 ft	ug/kg	66	2	45.3	45.3	90.2	1.91	11.4	-	-	1.93	11.5	-	-
Soil	VOCs	Total	sec-Butylbenzene	0-10 ft	ug/kg	76	2	45.3	45.3	90.2	1.70	10.6	-	-	1.72	10.6	-	-
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	ug/kg	55	10	12.7	4.50	65.0	2.62	9.59	4.96	95% KM (t) UCL	3.26	9.55	5.67	95% KM (t) UCL
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-3 ft	ug/kg	70	19	22,600	5.90	420,000	6,140	49,800	44,400	97.5% KM (Chebyshev) UCL	6,140	49,800	44,400	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-10 ft	ug/kg	84	33	25,200	5.84	420,000	9,910	62,700	53,300	97.5% KM (Chebyshev) UCL	9,910	62,700	53,300	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	Toluene	0-1 ft	ug/kg	55	23	1.19	0.770	5.80	0.904	1.01	1.17	95% KM (% Bootstrap) UCL	0.928	1.00	1.20	95% KM (% Bootstrap) UCL
Soil	VOCs	Total	Toluene	0-3 ft	ug/kg	70	36	1,080	0.765	39,000	558	4,630	4,060	97.5% KM (Chebyshev) UCL	558	4,630	4,060	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	Toluene	0-10 ft	ug/kg	84	45	3,820	0.760	133,000	2,050	15,000	12,400	97.5% KM (Chebyshev) UCL	2,050	15,000	12,400	97.5% KM (Chebyshev) UCL
Soil	VOCs	Total	Trichloroethene (TCE)	0-1 ft	ug/kg	55	4	0.0912	0.0661	0.171	0.0678	0.0216	0.0765	95% KM (t) UCL	0.0912	0.0461	0.136	95% KM (t) UCL
Soil	VOCs	Total	Trichloroethene (TCE)	0-3 ft	ug/kg	66	7	1,330	0.171	6,080	141	834	833	97.5% KM (Chebyshev) UCL	142	835	836	97.5% KM (Chebyshev) UCL

Table I-16
Statistical Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(6 of 8)

Medium Group	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Soil	VOCs	Total	Trichloroethene (TCE)	0-10 ft	ug/kg	76	10	931	0.761	6,080	123	778	710	97.5% KM (Chebyshev) UCL	123	780	713	97.5% KM (Chebyshev) UCL
Groundwater	Metals	Total	Antimony	N/A	ug/L	19	8	1.53	1.07	3.89	1.49	1.15	2.23	95% KM (t) UCL	1.49	1.15	2.23	95% KM (t) UCL
Groundwater	Metals	Total	Arsenic	N/A	ug/L	73	63	5.72	2.69	21.3	5.06	6.16	8.23	95% KM (Chebyshev) UCL	5.06	6.16	8.23	95% KM (Chebyshev) UCL
Groundwater	Metals	Total	Barium	N/A	ug/L	19	19	111	100	304	-	-	165	95% Approximate Gamma UCL	-	-	165	95% Approximate Gamma UCL
Groundwater	Metals	Total	Beryllium	N/A	ug/L	19	7	0.328	0.324	0.435	0.304	0.0739	0.351	95% KM (t) UCL	0.328	0.0673	0.376	95% KM (t) UCL
Groundwater	Metals	Total	Cadmium	N/A	ug/L	19	6	1.91	0.570	5.60	0.915	1.80	1.91	95% KM (t) UCL	0.932	1.79	1.92	95% KM (t) UCL
Groundwater	Metals	Total	Chromium	N/A	ug/L	19	7	8.03	7.43	18.5	6.23	3.49	8.00	95% KM (t) UCL	6.23	3.49	8.00	95% KM (t) UCL
Groundwater	Metals	Total	Copper	N/A	ug/L	19	11	38.5	17.6	201	23.7	44.5	43.8	95% KM (BCA) UCL	23.7	44.5	45.8	95% KM (BCA) UCL
Groundwater	Metals	Total	Iron	N/A	ug/L	73	66	8,830	582	42,900	7,990	12,200	17,000	97.5% KM (Chebyshev) UCL	7,990	12,200	17,000	97.5% KM (Chebyshev) UCL
Groundwater	Metals	Total	Lead	N/A	ug/L	53	32	4.89	0.638	78.2	3.06	11.1	12.8	97.5% KM (Chebyshev) UCL	3.06	11.1	12.8	97.5% KM (Chebyshev) UCL
Groundwater	Metals	Total	Manganese	N/A	ug/L	53	52	1,080	229	5,380	1,060	1,410	1,910	95% KM (Chebyshev) UCL	1,060	1,410	1,910	95% KM (Chebyshev) UCL
Groundwater	Metals	Total	Mercury	N/A	ug/L	24	4	0.148	0.115	0.330	0.0496	0.0676	0.0769	95% KM (t) UCL	0.0496	0.0676	0.0769	95% KM (t) UCL
Groundwater	Metals	Total	Nickel	N/A	ug/L	19	11	35.9	7.61	116	22.9	39.0	117	99% KM (Chebyshev) UCL	22.9	39.0	117	99% KM (Chebyshev) UCL
Groundwater	Metals	Total	Selenium	N/A	ug/L	19	7	11.2	5.63	32.9	4.55	9.23	8.52	95% KM (t) UCL	4.78	9.15	8.74	95% KM (t) UCL
Groundwater	Metals	Total	Silver	N/A	ug/L	19	5	0.226	0.131	0.658	0.162	0.177	0.276	95% KM (t) UCL	0.162	0.177	0.276	95% KM (t) UCL
Groundwater	Metals	Total	Thallium	N/A	ug/L	19	9	0.202	0.197	0.323	0.202	0.0582	0.238	95% KM (t) UCL	0.202	0.0582	0.238	95% KM (t) UCL
Groundwater	Metals	Total	Vanadium	N/A	ug/L	20	18	1.47	1.35	5.90	1.34	1.20	2.54	95% KM (Chebyshev) UCL	1.34	1.20	2.54	95% KM (Chebyshev) UCL
Groundwater	Metals	Total	Zinc	N/A	ug/L	19	15	416	23.7	2,660	329	736	2,070	99% KM (Chebyshev) UCL	329	736	2,070	99% KM (Chebyshev) UCL
Groundwater	Metals	Dissolved	Arsenic	N/A	ug/L	56	49	4.64	2.30	19.3	4.13	5.16	7.17	95% KM (Chebyshev) UCL	4.13	5.16	7.17	95% KM (Chebyshev) UCL
Groundwater	Metals	Dissolved	Barium	N/A	ug/L	3	3	64.1	37.5	134	-	-	-	-	-	-	-	-
Groundwater	Metals	Dissolved	Calcium	N/A	ug/L	14	14	47,400	36,400	172,000	-	-	75,200	95% Approximate Gamma UCL	-	-	75,200	95% Approximate Gamma UCL
Groundwater	Metals	Dissolved	Iron	N/A	ug/L	56	32	11,000	402	35,400	6,320	11,100	21,300	99% KM (Chebyshev) UCL	6,320	11,100	21,300	99% KM (Chebyshev) UCL
Groundwater	Metals	Dissolved	Lead	N/A	ug/L	36	16	0.622	0.0755	3.50	0.292	0.794	0.524	95% KM (t) UCL	0.293	0.793	0.526	95% KM (t) UCL
Groundwater	Metals	Dissolved	Magnesium	N/A	ug/L	14	14	9,450	7,340	25,800	-	-	13,100	95% Student's-t UCL	-	-	13,100	95% Student's-t UCL
Groundwater	Metals	Dissolved	Manganese	N/A	ug/L	36	34	1,140	205	5,540	1,080	1,440	3,500	99% KM (Chebyshev) UCL	1,080	1,440	3,500	99% KM (Chebyshev) UCL
Groundwater	Metals	Dissolved	Potassium	N/A	ug/L	14	14	3,990	2,940	12,900	-	-	6,020	95% Approximate Gamma UCL	-	-	6,020	95% Approximate Gamma UCL
Groundwater	Metals	Dissolved	Sodium	N/A	ug/L	14	14	99,400	14,400	740,000	-	-	647,000	99% Chebyshev (Mean, Sd) UCL	-	-	647,000	99% Chebyshev (Mean, Sd) UCL
Groundwater	Metals	Dissolved	Vanadium	N/A	ug/L	20	15	1.25	1.17	3.10	0.973	0.760	1.34	95% KM (Percentile Bootstrap) UCL	1.02	0.756	1.37	95% KM (Percentile Bootstrap) UCL
Groundwater	Butyltins	Total	Dibutyltin	N/A	ug/L	39	11	0.112	0.0910	0.447	0.0351	0.0832	0.0586	95% KM (t) UCL	0.0380	0.0822	0.0614	95% KM (t) UCL
Groundwater	Butyltins	Total	Monobutyltin	N/A	ug/L	59	9	0.0445	0.0189	0.240	0.0129	0.0310	0.0203	95% KM (t) UCL	0.0187	0.0317	0.0278	95% KM (t) UCL
Groundwater	Butyltins	Total	Tributyltin	N/A	ug/L	8	6	0.0298	0.0259	0.0601	0.0266	0.0134	0.0357	95% KM (Percentile Bootstrap) UCL	0.0266	0.0134	0.0364	95% KM (Percentile Bootstrap) UCL
Groundwater	NWTPH-Dx	Total	Diesel Range Organics	N/A	ug/L	75	39	389	305	1,800	214	334	278	95% KM (BCA) UCL	223	329	286	95% KM (BCA) UCL
Groundwater	NWTPH-Dx	Total	Residual Range Organics	N/A	ug/L	75	27	425	260	1,900	198	318	261	95% KM (t) UCL	202	316	265	95% KM (t) UCL
Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	ug/L	77	20	83.8	30.0	430	32.5	65.8	47.4	95% KM (BCA) UCL	45.5	66.2	61.8	95% KM (BCA) UCL
Groundwater	SVOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	54	2	0.0430	0.0430	0.0601	0.0267	0.00549	-	-	0.0430	0.0172	-	-
Groundwater	SVOCs	Total	2-Methylnaphthalene	N/A	ug/L	23	4	0.181	0.163	0.360	0.103	0.109	0.175	95% KM (t) UCL	0.124	0.107	0.203	95% KM (t) UCL
Groundwater	SVOCs	Total	Acenaphthene	N/A	ug/L	23	2	0.175	0.175	0.239	0.125	0.0402	0.158	95% KM (t) UCL	0.125	0.0402	0.158	95% KM (t) UCL
Groundwater	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	ug/L	23	4	8.37	6.35	19.0	3.05	3.90	4.70	95% KM (t) UCL	3.05	3.90	4.70	95% KM (t) UCL
Groundwater	SVOCs	Total	Diethyl Phthalate	N/A	ug/L	23	3	1.04	1.03	1.90	0.475	0.568	0.873	95% KM (t) UCL	0.475	0.568	0.873	95% KM (t) UCL
Groundwater	SVOCs	Total	Di-n-octyl Phthalate	N/A	ug/L	23	3	5.07	5.29	7.08	3.59	1.45	4.61	95% KM (t) UCL	3.59	1.45	4.61	95% KM (t) UCL
Groundwater	SVOCs	Total	Isophorone	N/A	ug/L	23	2	0.199	0.199	0.282	0.134	0.0522	0.177	95% KM (t) UCL	0.140	0.0581	0.193	95% KM (t) UCL
Groundwater	SVOCs	Total	Naphthalene	N/A	ug/L	23	3	0.0993	0.101	0.157	0.0598	0.0393	0.0873	95% KM (t) UCL	0.0620	0.0398	0.0913	95% KM (t) UCL
Groundwater	SVOCs	Total	Phenanthrene	N/A	ug/L	74	6	0.798	0.211	3.90	0.152	0.489	0.485	95% KM (BCA) UCL	0.154	0.489	0.458	95% KM (BCA) UCL
Groundwater	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	ug/L	27	2	1.06	1.06	1.90	0.282	0.317	0.821	97.5% KM (Chebyshev) UCL	0.282	0.317	0.821	97.5% KM (Chebyshev) UCL
Groundwater	VOCs	Total	1,1-Dichloroethane	N/A	ug/L	27	2	2.66	2.66	5.00	0.493	0.884	2.00	97.5% KM (Chebyshev) UCL	0.493	0.884	2.00	97.5% KM (Chebyshev) UCL
Groundwater	VOCs	Total	1,2,4-Trimethylbenzene	N/A	ug/L	27	2	3.10	3.10	5.20	1.16	0.793	5.20	95% KM (BCA) UCL	1.16	0.793	-	-
Groundwater	VOCs	Total	Acetone	N/A	ug/L	27	4	13.2	14.6	15.4	9.11	2.03	9.88	95% KM (t) UCL	9.27	2.22	10.2	95% KM (t) UCL
Groundwater	VOCs	Total	Carbon Disulfide	N/A	ug/L	27	6	0.803	0.185	3.95	0.443	0.974	0.988	95% KM (BCA) UCL	0.443	0.974	1.03	95% KM (BCA) UCL
Groundwater	VOCs	Total	Chloroform	N/A	ug/L	76	9	1.43	0.609	3.70	0.262	0.642	0.392	95% KM (t) UCL	0.382	0.626	0.546	95% KM (t) UCL
Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	ug/L	42	16	154	2.45	660	58.6	172	331	99% KM (Chebyshev) UCL	58.7	172	331	99% KM (Chebyshev) UCL
Groundwater	VOCs	Total	Isopropylbenzene	N/A	ug/L	27	2	3.90	3.90	4.60	3.25	0.264	3.38	95% KM (t) UCL	3.25	0.264	3.38	95% KM (t) UCL
Groundwater	VOCs	Total	n-Propylbenzene	N/A	ug/L	27	2	1.60	1.60	2.00	1.23	0.151	1.30	95% KM (t) UCL	1.23	0.151	1.30	95% KM (t) UCL
Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	76	29	3.11	2.10	8.78	1.33	2.07	1.74	95% KM (t) UCL	1.40	2.04	1.80	95% KM (t) UCL
Groundwater	VOCs	Total	Toluene	N/A	ug/L	27	5	0.444	0.510	0.640	0.316	0.139	0.388	95% KM (t) UCL	0.444	0.168	0.587	95% KM (t) UCL
Groundwater	VOCs	Total	trans-1,2-Dichloroethene	N/A	ug/L	27	2	0.905	0.905	1.70	0.169	0.300	0.679	97.5% KM (Chebyshev) UCL	0.169	0.300	0.679	97.5% KM (Chebyshev) UCL
Groundwater	VOCs	Total	Trichloroethene (TCE)	N/A	ug/L	42	15	1.81	1.90	3.40	0.782	1.11	1.14	95% KM (BCA) UCL	0.862	1.08	1.18	95% KM (BCA) UCL
Groundwater	VOCs	Total	Vinyl Chloride	N/A	ug/L	76	20	0.677	0.400	4.10	0.313	0.499	0.413	95% KM (t) UCL	0.399	0.487	0.505	95% KM (t) UCL
DP Groundwater	Metals	Total	Aluminum	N/A	ug/L	10	10	5,880	1,660	17,900	-	-	21,300	95% Adjusted Gamma UCL	-	-	21,300	95% Adjusted Gamma UCL
DP Groundwater	Metals	Total	Antimony	N/A	ug/L	10	9	0.650	0.477	1.57	0.623	0.387	0.861	95% KM (t) UCL	0.623	0.387	0.861	95% KM (t) UCL
DP Groundwater	Metals	Total	Arsenic	N/A	ug/L	10	8	2.40	1.52	7.70	1.94	2.34	3.40	95% KM (t) UCL	1.96	2.33	3.40	95% KM (t) UCL
DP Groundwater	Metals	Total	Barium	N/A	ug/L	10	10	35.6	20.5	97.8	-	-	67.9	95% Approximate Gamma UCL	-	-	67.9	95% Approximate Gamma UCL
DP Groundwater	Metals	Total	Beryllium	N/A	ug/L	10	4	0.367	0.263	0.785	0.241	0.187	0.366	95% KM (t) UCL	0.283	0.177	0.414	95% KM (t) UCL
DP Groundwater	Metals	Total	Calcium	N/A	ug/L	10	10	27,500	28,000	33,700	-	-	30,800	95% Student's-t UCL	-	-	30,800	95% Student's-t UCL
DP Groundwater	Metals	Total	Chromium	N/A	ug/L	10	10	11.5	8.72	31.8	-	-	16.8	95% Student's-t UCL	-	-	16.8	95% Student's-t UCL
DP Groundwater	Metals	Total	Cobalt	N/A	ug/L	10	6	5.58	4.73	13.1	4.02	3.47	6.22	95% KM (t) UCL	4.44	3.26	6.57	95% KM (t) UCL

Table I-16
Statistical Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(7 of 8)

Medium Group	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
DP Groundwater	Metals	Total	Copper	N/A	ug/L	12	12	34.8	13.2	204	-	-	81.1	95% Approximate Gamma UCL	-	-	81.1	95% Approximate Gamma UCL
DP Groundwater	Metals	Total	Iron	N/A	ug/L	10	9	9,080	3,220	25,900	8,180	9,720	22,400	95% KM (Chebyshev) UCL	8,180	9,720	22,400	95% KM (Chebyshev) UCL
DP Groundwater	Metals	Total	Lead	N/A	ug/L	12	9	5.88	5.01	13.7	4.43	5.00	7.18	95% KM (t) UCL	4.43	5.00	7.18	95% KM (t) UCL
DP Groundwater	Metals	Total	Magnesium	N/A	ug/L	10	10	9,540	9,000	15,400	-	-	11,600	95% Student's-t UCL	-	-	11,600	95% Student's-t UCL
DP Groundwater	Metals	Total	Manganese	N/A	ug/L	10	10	225	128	708	-	-	368	95% Student's-t UCL	-	-	368	95% Student's-t UCL
DP Groundwater	Metals	Total	Mercury	N/A	ug/L	10	2	0.0880	0.0880	0.100	0.0784	0.00720	0.0843	95% KM (t) UCL	0.0880	0.0120	0.110	95% KM (t) UCL
DP Groundwater	Metals	Total	Nickel	N/A	ug/L	12	11	11.8	7.94	50.1	10.9	13.8	29.1	95% KM (Chebyshev) UCL	11.1	13.7	29.2	95% KM (Chebyshev) UCL
DP Groundwater	Metals	Total	Potassium	N/A	ug/L	10	10	1,760	1,800	3,210	-	-	2,190	95% Student's-t UCL	-	-	2,190	95% Student's-t UCL
DP Groundwater	Metals	Total	Selenium	N/A	ug/L	10	10	1.33	1.24	2.06	-	-	1.59	95% Student's-t UCL	-	-	1.59	95% Student's-t UCL
DP Groundwater	Metals	Total	Silver	N/A	ug/L	10	9	0.112	0.0450	0.376	0.102	0.115	0.271	95% KM (Chebyshev) UCL	0.104	0.114	0.271	95% KM (Chebyshev) UCL
DP Groundwater	Metals	Total	Sodium	N/A	ug/L	10	10	12,900	8,440	42,900	-	-	28,700	95% Chebyshev (Mean, Sd) UCL	-	-	28,700	95% Chebyshev (Mean, Sd) UCL
DP Groundwater	Metals	Total	Thallium	N/A	ug/L	10	7	0.0751	0.0570	0.146	0.0655	0.0318	0.0854	95% KM (t) UCL	0.0751	0.0337	0.100	95% KM (t) UCL
DP Groundwater	Metals	Total	Vanadium	N/A	ug/L	10	10	20.3	7.32	77.6	-	-	47.0	95% Approximate Gamma UCL	-	-	47.0	95% Approximate Gamma UCL
DP Groundwater	Metals	Total	Zinc	N/A	ug/L	12	12	31.2	14.2	149	-	-	63.7	95% Approximate Gamma UCL	-	-	63.7	95% Approximate Gamma UCL
DP Groundwater	Metals	Dissolved	Aluminum	N/A	ug/L	10	7	245	15.1	1,370	173	407	1,560	99% KM (Chebyshev) UCL	176	406	1,560	99% KM (Chebyshev) UCL
DP Groundwater	Metals	Dissolved	Antimony	N/A	ug/L	10	10	0.406	0.300	1.67	-	-	1.02	95% Chebyshev (Mean, Sd) UCL	-	-	1.02	95% Chebyshev (Mean, Sd) UCL
DP Groundwater	Metals	Dissolved	Arsenic	N/A	ug/L	10	10	0.929	1.04	1.36	-	-	1.14	95% Student's-t UCL	-	-	1.14	95% Student's-t UCL
DP Groundwater	Metals	Dissolved	Barium	N/A	ug/L	10	10	9.43	7.80	20.6	-	-	12.5	95% Student's-t UCL	-	-	12.5	95% Student's-t UCL
DP Groundwater	Metals	Dissolved	Calcium	N/A	ug/L	10	10	24,700	26,700	34,100	-	-	29,000	95% Student's-t UCL	-	-	29,000	95% Student's-t UCL
DP Groundwater	Metals	Dissolved	Chromium	N/A	ug/L	10	10	2.74	3.02	4.29	-	-	3.39	95% Student's-t UCL	-	-	3.39	95% Student's-t UCL
DP Groundwater	Metals	Dissolved	Cobalt	N/A	ug/L	10	8	2.73	2.37	5.08	2.43	1.38	3.28	95% KM (t) UCL	2.66	1.34	3.57	95% KM (t) UCL
DP Groundwater	Metals	Dissolved	Copper	N/A	ug/L	12	9	1.26	0.804	4.38	1.14	0.989	1.72	95% KM (BCA) UCL	1.14	0.989	1.76	95% KM (BCA) UCL
DP Groundwater	Metals	Dissolved	Iron	N/A	ug/L	10	4	212	166	476	107	136	198	95% KM (t) UCL	107	136	198	95% KM (t) UCL
DP Groundwater	Metals	Dissolved	Lead	N/A	ug/L	12	6	0.0988	0.0330	0.378	0.0746	0.109	0.160	95% KM (BCA) UCL	0.0806	0.115	0.168	95% KM (BCA) UCL
DP Groundwater	Metals	Dissolved	Magnesium	N/A	ug/L	10	10	7,180	6,850	12,000	-	-	8,730	95% Student's-t UCL	-	-	8,730	95% Student's-t UCL
DP Groundwater	Metals	Dissolved	Manganese	N/A	ug/L	10	10	91.6	24.0	587	-	-	322	95% Adjusted Gamma UCL	-	-	322	95% Adjusted Gamma UCL
DP Groundwater	Metals	Dissolved	Mercury	N/A	ug/L	10	2	0.0575	0.0575	0.0600	0.0555	0.00150	0.0567	95% KM (t) UCL	0.0575	0.00250	0.0621	95% KM (t) UCL
DP Groundwater	Metals	Dissolved	Nickel	N/A	ug/L	12	4	1.82	1.49	3.90	1.04	1.14	1.83	95% KM (t) UCL	1.82	1.35	3.22	95% KM (t) UCL
DP Groundwater	Metals	Dissolved	Potassium	N/A	ug/L	10	10	1,300	1,170	2,210	-	-	1,660	95% Student's-t UCL	-	-	1,660	95% Student's-t UCL
DP Groundwater	Metals	Dissolved	Selenium	N/A	ug/L	10	10	0.696	0.630	1.30	-	-	0.904	95% Student's-t UCL	-	-	0.904	95% Student's-t UCL
DP Groundwater	Metals	Dissolved	Silver	N/A	ug/L	10	8	0.0364	0.0270	0.0790	0.0339	0.0164	0.0441	95% KM (BCA) UCL	0.0364	0.0175	0.0497	95% KM (BCA) UCL
DP Groundwater	Metals	Dissolved	Sodium	N/A	ug/L	10	10	14,200	8,820	47,700	-	-	32,300	95% Chebyshev (Mean, Sd) UCL	-	-	32,300	95% Chebyshev (Mean, Sd) UCL
DP Groundwater	Metals	Dissolved	Thallium	N/A	ug/L	10	3	0.0542	0.0460	0.0855	0.0380	0.0165	0.0496	95% KM (t) UCL	0.0542	0.0230	0.0840	95% KM (t) UCL
DP Groundwater	Metals	Dissolved	Vanadium	N/A	ug/L	10	6	1.35	1.24	2.61	1.24	0.648	1.74	95% KM (t) UCL	1.35	0.637	1.88	95% KM (t) UCL
DP Groundwater	Metals	Dissolved	Zinc	N/A	ug/L	12	6	2.70	2.28	4.10	2.35	0.669	2.73	95% KM (t) UCL	2.35	0.669	2.73	95% KM (t) UCL
DP Groundwater	Butyltins	Total	Monobutyltin	N/A	ug/L	4	2	0.00596	0.00596	0.00671	-	-	-	-	-	-	-	-
DP Groundwater	Butyltins	Total	Tributyltin	N/A	ug/L	4	2	0.00360	0.00360	0.00435	-	-	-	-	-	-	-	-
DP Groundwater	Pesticides	Total	BHC (gamma) Lindane	N/A	ug/L	3	3	0.00191	0.00232	0.00249	-	-	-	-	-	-	-	-
DP Groundwater	Pesticides	Total	Methoxychlor	N/A	ug/L	3	2	0.00310	0.00310	0.00521	-	-	-	-	-	-	-	-
DP Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	ug/L	6	2	17.8	17.8	20.9	15.7	2.31	-	-	17.8	3.10	-	-
DP Groundwater	SVOCs	Total	2-Methylnaphthalene	N/A	ug/L	9	6	0.0669	0.0471	0.153	0.0511	0.0474	0.0833	95% KM (t) UCL	0.0520	0.0468	0.0838	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Acenaphthene	N/A	ug/L	9	5	0.0124	0.00812	0.0230	0.00932	0.00604	0.0135	95% KM (t) UCL	0.0112	0.00594	0.0163	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Benzyl Alcohol	N/A	ug/L	7	2	0.0512	0.0512	0.0523	0.0503	0.000805	-	-	0.0512	0.00115	-	-
DP Groundwater	SVOCs	Total	Butyl Benzyl Phthalate	N/A	ug/L	9	6	0.161	0.156	0.228	0.150	0.0357	0.176	95% KM (t) UCL	0.161	0.0359	0.190	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Dibenzofuran	N/A	ug/L	9	2	0.0329	0.0329	0.0421	0.0257	0.00578	0.0308	95% KM (t) UCL	0.0329	0.00920	0.0500	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Di-n-butyl Phthalate	N/A	ug/L	9	6	0.162	0.161	0.239	0.159	0.0420	0.193	95% KM (t) UCL	0.159	0.0420	0.193	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Fluorene	N/A	ug/L	9	6	0.0160	0.0128	0.0351	0.0126	0.00940	0.0190	95% KM (t) UCL	0.0140	0.00883	0.0202	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Isophorone	N/A	ug/L	9	2	0.0664	0.0664	0.0842	0.0526	0.0112	0.0624	95% KM (t) UCL	0.0664	0.0178	0.0995	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Naphthalene	N/A	ug/L	9	4	0.0322	0.0307	0.0452	0.0266	0.00782	0.0322	95% KM (t) UCL	0.0322	0.00907	0.0419	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Phenanthrene	N/A	ug/L	9	8	0.0278	0.0104	0.1440	0.0256	0.0420	0.0909	95% KM (Chebyshev) UCL	0.0258	0.0419	0.0910	95% KM (Chebyshev) UCL
DP Groundwater	SVOCs	Total	Phenol	N/A	ug/L	8	5	0.0220	0.0228	0.0291	0.0179	0.00733	0.0234	95% KM (t) UCL	0.0220	0.00647	0.0281	95% KM (t) UCL
DP Groundwater	SVOCs	Total	Pyrene	N/A	ug/L	9	3	0.0109	0.00329	0.0261	0.00573	0.00720	0.0261	95% KM (BCA) UCL	0.00577	0.00719	0.0261	95% KM (BCA) UCL
DP Groundwater	SVOCs	Dissolved	2-Methylnaphthalene	N/A	ug/L	8	6	0.0939	0.0286	0.280	0.0744	0.0963	0.237	95% KM (Chebyshev) UCL	0.0761	0.0954	0.237	95% KM (Chebyshev) UCL
DP Groundwater	SVOCs	Dissolved	Acenaphthene	N/A	ug/L	8	5	0.0146	0.0104	0.0348	0.0110	0.00992	0.0184	95% KM (t) UCL	0.0127	0.00959	0.0205	95% KM (t) UCL
DP Groundwater	SVOCs	Dissolved	Butyl Benzyl Phthalate	N/A	ug/L	8	6	0.134	0.136	0.155	0.134	0.0173	0.149	95% KM (t) UCL	0.134	0.0173	0.149	95% KM (t) UCL
DP Groundwater	SVOCs	Dissolved	Diethyl Phthalate	N/A	ug/L	8	3	0.0761	0.0687	0.101	0.0651	0.0140	0.0766	95% KM (t) UCL	0.0761	0.0181	0.100	95% KM (t) UCL
DP Groundwater	SVOCs	Dissolved	Di-n-butyl Phthalate	N/A	ug/L	8	6	0.157	0.153	0.207	0.157	0.0282	0.181	95% KM (t) UCL	0.157	0.0282	0.181	95% KM (t) UCL
DP Groundwater	SVOCs	Dissolved	Fluorene	N/A	ug/L	8	5	0.00790	0.00714	0.0116	0.00739	0.00162	0.00872	95% KM (BCA) UCL	0.00790	0.00187	0.00957	95% KM (BCA) UCL
DP Groundwater	SVOCs	Dissolved	Isophorone	N/A	ug/L	8	2	0.0633	0.0633	0.0782	0.0520	0.00989	0.0614	95% KM (t) UCL	0.0633	0.0150	0.0916	95% KM (t) UCL
DP Groundwater	SVOCs	Dissolved	Naphthalene	N/A	ug/L	8	6	0.107	0.0955	0.200	0.0873	0.0722	0.140	95% KM (t) UCL	0.0888	0.0711	0.141	95% KM (t) UCL
DP Groundwater	SVOCs	Dissolved	Phenanthrene	N/A	ug/L	8	6	0.0113	0.0103	0.0190	0.00952	0.00519	0.0133	95% KM (t) UCL	0.0113	0.00486	0.0154	95% KM (t) UCL
DP Groundwater	SVOCs	Dissolved	Phenol	N/A	ug/L	4	3	0.0180	0.0192	0.0248	-	-	-	-	-	-	-	-
DP Groundwater	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	ug/L	10	7	0.467	0.127	2.22	0.348	0.638	1.71	97.5% KM (Chebyshev) UCL	0.380	0.632	1.74	97.5% KM (Chebyshev) UCL
DP Groundwater	VOCs	Total	1,1-Dichloroethane	N/A	ug/L	10	5	0.604	0.173	2.52	0.330	0.730	1.06	95% KM (BCA) UCL	0.365	0.718	0.851	95% KM (BCA) UCL
DP Groundwater	VOCs	Total	1,1-Dichloroethene	N/A	ug/L	10	2	0.614	0.614	1.16	0.173	0.331	1.64	99% KM (Chebyshev) UCL	0.173	0.331	1.64	99% KM (Chebyshev) UCL

Table I-16
Statistical Summary for All Four AOPCs Combined
Bradford Island - Upland Operable Unit
(8 of 8)

Medium Group	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
DP Groundwater	VOCs	Total	1,2,4-Trimethylbenzene	N/A	ug/L	10	3	0.0406	0.0415	0.0485	0.0344	0.00555	0.0383	95% KM (t) UCL	0.0406	0.00689	0.0495	95% KM (t) UCL
DP Groundwater	VOCs	Total	2,2-Dichloropropane	N/A	ug/L	10	3	0.142	0.130	0.179	0.125	0.0186	0.138	95% KM (t) UCL	0.142	0.0267	0.177	95% KM (t) UCL
DP Groundwater	VOCs	Total	Acetone	N/A	ug/L	10	3	2.23	1.59	3.88	1.52	0.793	2.09	95% KM (t) UCL	2.23	1.18	3.76	95% KM (t) UCL
DP Groundwater	VOCs	Total	Benzene	N/A	ug/L	10	6	0.0744	0.0600	0.137	0.0664	0.0247	0.0821	95% KM (t) UCL	0.0744	0.0293	0.0984	95% KM (t) UCL
DP Groundwater	VOCs	Total	Chloroform	N/A	ug/L	10	2	0.132	0.132	0.174	0.0990	0.0250	0.119	95% KM (t) UCL	0.132	0.0417	0.209	95% KM (t) UCL
DP Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	ug/L	10	9	57.3	4.54	341	51.6	106	206	95% KM (Chebyshev) UCL	51.6	106	207	95% KM (Chebyshev) UCL
DP Groundwater	VOCs	Total	Ethylbenzene	N/A	ug/L	10	4	0.0402	0.0402	0.0447	0.0377	0.00307	0.0399	95% KM (t) UCL	0.0402	0.00318	0.0435	95% KM (t) UCL
DP Groundwater	VOCs	Total	m,p-Xylenes	N/A	ug/L	10	4	0.119	0.132	0.132	0.0971	0.0226	0.112	95% KM (t) UCL	0.119	0.0214	0.142	95% KM (t) UCL
DP Groundwater	VOCs	Total	Naphthalene	N/A	ug/L	10	2	0.0406	0.0406	0.0452	0.0375	0.00347	0.0411	95% KM (t) UCL	0.0406	0.00465	0.0491	95% KM (t) UCL
DP Groundwater	VOCs	Total	o-Xylene	N/A	ug/L	10	4	0.0507	0.0495	0.0735	0.0385	0.0139	0.0478	95% KM (t) UCL	0.0507	0.0153	0.0669	95% KM (t) UCL
DP Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	10	10	7.80	1.45	54.5	-	-	27.6	95% Adjusted Gamma UCL	-	-	27.6	95% Adjusted Gamma UCL
DP Groundwater	VOCs	Total	Toluene	N/A	ug/L	10	6	0.205	0.199	0.299	0.189	0.0787	0.249	95% KM (t) UCL	0.205	0.0733	0.265	95% KM (t) UCL
DP Groundwater	VOCs	Total	trans-1,2-Dichloroethene	N/A	ug/L	10	3	0.995	1.09	1.80	0.365	0.563	0.765	95% KM (t) UCL	0.365	0.563	0.765	95% KM (t) UCL
DP Groundwater	VOCs	Total	Trichloroethene (TCE)	N/A	ug/L	10	9	5.83	0.597	43.7	5.26	12.8	48.1	99% KM (Chebyshev) UCL	5.28	12.8	48.1	99% KM (Chebyshev) UCL
DP Groundwater	VOCs	Total	Vinyl Chloride	N/A	ug/L	10	2	0.372	0.372	0.611	0.180	0.144	-	-	0.372	0.240	-	-

Notes
Only those analytes with at least 2 detected results are shown on this table.
If not all samples were detected results (i.e., detection rate = <100%), the mean and standard deviation were estimated by the Kaplan-Meier method.

% = percent
DP = Direct Push
KM = Kaplan-Meier
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = method reporting limit
MW Soil = Mass Wasting Soil
ND = non-detect
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SD = standard deviation
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
ug/m^3 = micrograms per cubic meters
UCL = upper confidence limit

Table I-17
Data Summary for Reference Area Samples
Bradford Island - Upland Operable Unit
(1 of 2)

											Upper Prediction Limit (UPL)	
Medium	Analyte Group	Total/ Dissolved	Analyte	Depth Category	Unit	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	Distribution	95% UPL
Soil	Metals	Total	Aluminum	0-1 ft	mg/kg	14	14	22,700	22,000	33,200	Normal	31400
Soil	Metals	Total	Antimony	0-1 ft	mg/kg	14	14	0.128	0.130	0.180	Normal	0.176
Soil	Metals	Total	Arsenic	0-1 ft	mg/kg	14	14	3.10	3.22	5.18	Normal	5.40
Soil	Metals	Total	Barium	0-1 ft	mg/kg	14	14	110	105	182	Normal	169
Soil	Metals	Total	Beryllium	0-1 ft	mg/kg	14	14	0.491	0.498	0.629	Normal	0.659
Soil	Metals	Total	Cadmium	0-1 ft	mg/kg	14	14	0.162	0.156	0.340	Gamma	0.271
Soil	Metals	Total	Chromium	0-1 ft	mg/kg	14	14	21.8	21.8	27.3	Normal	28.1
Soil	Metals	Total	Cobalt	0-1 ft	mg/kg	14	14	16.5	17.4	19.9	Non-parametric	19.9
Soil	Metals	Total	Copper	0-1 ft	mg/kg	14	14	39.0	36.6	58.2	Normal	56.7
Soil	Metals	Total	Lead	0-1 ft	mg/kg	14	14	17.7	16.4	26.5	Normal	25.5
Soil	Metals	Total	Manganese	0-1 ft	mg/kg	14	14	627	624	920	Normal	885
Soil	Metals	Total	Mercury	0-1 ft	mg/kg	14	14	0.0494	0.0480	0.0680	Normal	0.0660
Soil	Metals	Total	Nickel	0-1 ft	mg/kg	14	14	18.7	19.2	26.1	Normal	26.5
Soil	Metals	Total	Selenium	0-1 ft	mg/kg	14	0	-	-	-	Non-parametric	0.500 / 2.30
Soil	Metals	Total	Silver	0-1 ft	mg/kg	14	12	0.0635	0.0483	0.187	Non-parametric	0.187
Soil	Metals	Total	Thallium	0-1 ft	mg/kg	14	8	0.158	0.150	0.203	Non-parametric	0.203
Soil	Metals	Total	Vanadium	0-1 ft	mg/kg	14	14	78.8	80.2	99.3	Normal	104
Soil	Metals	Total	Zinc	0-1 ft	mg/kg	14	14	58.8	57.6	68.5	Normal	71.7
Soil	SVOCs	Total	Acenaphthene	0-1 ft	ug/kg	14	9	1.75	1.60	3.40	Non-parametric	3.40
Soil	SVOCs	Total	Acenaphthylene	0-1 ft	ug/kg	14	1	-	-	1.60	Non-parametric	1.60
Soil	SVOCs	Total	Anthracene	0-1 ft	ug/kg	14	12	2.47	2.05	4.90	Non-parametric	4.90
Soil	SVOCs	Total	Fluorene	0-1 ft	ug/kg	14	1	-	-	3.20	Non-parametric	3.20
Soil	SVOCs	Total	Naphthalene	0-1 ft	ug/kg	14	6	1.70	1.65	2.20	Gamma	29.4
Soil	SVOCs	Total	Phenanthrene	0-1 ft	ug/kg	14	14	13.2	12.0	34.0	Non-parametric	2.20
Soil	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	14	14	21.2	19.8	49.3	Non-parametric	49.3
Soil	SVOCs	Total	Benzo(a)anthracene	0-1 ft	ug/kg	14	14	14.0	12.5	34.0	Gamma	28.7
Soil	SVOCs	Total	Benzo(a)pyrene	0-1 ft	ug/kg	14	14	18.2	16.0	45.0	Gamma	37.0
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	ug/kg	14	14	23.4	21.0	55.0	Gamma	46.4
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	ug/kg	14	14	13.7	12.5	32.0	Gamma	26.5
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	ug/kg	14	14	8.00	7.45	19.0	Gamma	16.2
Soil	SVOCs	Total	Chrysene	0-1 ft	ug/kg	14	14	18.3	16.0	45.0	Gamma	37.4
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	ug/kg	14	7	4.36	4.30	6.90	Non-parametric	6.90
Soil	SVOCs	Total	Fluoranthene	0-1 ft	ug/kg	14	14	27.0	24.0	66.0	Gamma	55.1
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	ug/kg	14	14	14.1	12.0	34.0	Gamma	27.0
Soil	SVOCs	Total	Pyrene	0-1 ft	ug/kg	14	14	26.8	25.0	64.0	Gamma	53.3
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	14	14	167	147	401	Non-parametric	401

Table I-17
Data Summary for Reference Area Samples
Bradford Island - Upland Operable Unit
(2 of 2)

Notes
For analytes with less than 100% detection rate, but at least one detection, the maximum detected value was assessed as the non-parametric UPL.
For analytes with no detections (0% detection rate), the maximum MDL and maximum MRL are shown (MDL/MRL) as the non-paramentric UPL.
UPLs were not calculated when less than 8 samples were available (i.e., groundwater is not shown because there were less than 8 samples).

% = percent
Max = maximum
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = methode reporting limit
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
UPL = upper prediction limit

Table I-18a
Statistical Summary for Random Forebay Samples
Bradford Island - River Operable Unit
(1 of 4)

											Statistics - ND censored at the MDL				Statistics - ND censored at the MRL			
Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Surface Water	Metals	Dissolved	Arsenic	ug/L	Wet	5	5	0.852	0.890	0.940	-	-	-	-	-	-	-	-
Surface Water	Metals	Dissolved	Barium	ug/L	Wet	5	5	22.8	23.0	24.0	-	-	-	-	-	-	-	-
Surface Water	Metals	Dissolved	Beryllium	ug/L	Wet	5	2	0.00350	0.00350	0.00400	0.00350	0.000500	-	-	0.00350	0.000500	-	-
Surface Water	Metals	Dissolved	Cadmium	ug/L	Wet	5	2	0.00900	0.00900	0.0100	0.00840	0.000800	-	-	0.00900	0.00100	-	-
Surface Water	Metals	Dissolved	Copper	ug/L	Wet	5	5	0.470	0.460	0.520	-	-	-	-	-	-	-	-
Surface Water	Metals	Dissolved	Lead	ug/L	Wet	5	3	0.0240	0.0220	0.0360	0.0200	0.00858	-	-	0.0200	0.00858	-	-
Surface Water	Metals	Dissolved	Thallium	ug/L	Wet	5	5	0.0264	0.0240	0.0310	-	-	-	-	-	-	-	-
Surface Water	Metals	Total	Aluminum	ug/L	Wet	5	3	110	99.0	141	110	21.9	-	-	110	21.9	-	-
Surface Water	Metals	Total	Arsenic	ug/L	Wet	5	5	0.910	0.920	1.01	-	-	-	-	-	-	-	-
Surface Water	Metals	Total	Barium	ug/L	Wet	5	5	24.2	24.0	27.0	-	-	-	-	-	-	-	-
Surface Water	Metals	Total	Beryllium	ug/L	Wet	5	2	0.00600	0.00600	0.00900	0.00600	0.00300	-	-	0.00600	0.00300	-	-
Surface Water	Metals	Total	Cadmium	ug/L	Wet	5	5	0.0142	0.0130	0.0190	-	-	-	-	-	-	-	-
Surface Water	Metals	Total	Copper	ug/L	Wet	5	5	0.704	0.670	0.790	-	-	-	-	-	-	-	-
Surface Water	Metals	Total	Lead	ug/L	Wet	5	5	0.118	0.108	0.175	-	-	-	-	-	-	-	-
Surface Water	Metals	Total	Thallium	ug/L	Wet	5	5	0.0292	0.0280	0.0330	-	-	-	-	-	-	-	-
Surface Water	NWTPH-Dx	Dissolved	Diesel Range Organics	ug/L	Wet	5	5	24.2	18.0	46.0	-	-	-	-	-	-	-	-
Surface Water	NWTPH-Dx	Total	Diesel Range Organics	ug/L	Wet	5	2	15.0	15.0	15.0	-	-	-	-	-	-	-	-
Surface Water	SVOCs	Column	Acenaphthene	ng/L	Wet	5	5	1.00	1.03	1.26	-	-	-	-	-	-	-	-
Surface Water	SVOCs	Fiter	Acenaphthene	ng/L	Wet	5	0	-	-	-	-	-	-	-	-	-	-	-
Surface Water	SVOCs	C+F	Acenaphthene	ng/L	Wet	5	5	1.03	1.06	1.28	-	-	-	-	-	-	-	-
Surface Water	SVOCs	Column	Anthracene	ng/L	Wet	5	0	-	-	-	-	-	-	-	-	-	-	-
Surface Water	SVOCs	Filter	Anthracene	ng/L	Wet	5	5	0.0274	0.0288	0.0317	-	-	-	-	-	-	-	-
Surface Water	SVOCs	C+F	Anthracene	ng/L	Wet	5	5	0.106	0.107	0.121	-	-	-	-	-	-	-	-
Surface Water	SVOCs	Column	Benzo(a)anthracene	ng/L	Wet	5	3	0.0118	0.0120	0.0152	0.0104	0.00279	-	-	0.0104	0.00279	-	-
Surface Water	SVOCs	Filter	Benzo(a)anthracene	ng/L	Wet	5	0	-	-	-	-	-	-	-	-	-	-	-
Surface Water	SVOCs	C+F	Benzo(a)anthracene	ng/L	Wet	5	3	0.0536	-	0.0600	0.0515	0.00657	-	-	0.0515	0.00657	-	-
Surface Water	SVOCs	Column	Benzo(b)fluoranthene	ng/L	Wet	5	0	-	-	-	-	-	-	-	-	-	-	-
Surface Water	SVOCs	Filter	Benzo(b)fluoranthene	ng/L	Wet	5	2	0.0769	0.0769	0.0825	0.0735	0.00448	-	-	0.0735	0.00448	-	-
Surface Water	SVOCs	C+F	Benzo(b)fluoranthene	ng/L	Wet	5	2	0.0902	-	0.0917	0.0894	0.00134	-	-	0.0894	0.00134	-	-
Surface Water	SVOCs	Column	Chrysene	ng/L	Wet	5	5	0.0474	0.0494	0.0514	-	-	-	-	-	-	-	-
Surface Water	SVOCs	Filter	Chrysene	ng/L	Wet	5	2	0.119	0.119	0.125	0.115	0.00480	-	-	0.115	0.00480	-	-
Surface Water	SVOCs	C+F	Chrysene	ng/L	Wet	5	5	0.139	0.136	0.171	-	-	-	-	-	-	-	-
Surface Water	SVOCs	Column	Fluoranthene	ng/L	Wet	5	0	-	-	-	-	-	-	-	-	-	-	-
Surface Water	SVOCs	Filter	Fluoranthene	ng/L	Wet	5	5	0.1562	0.143	0.212	-	-	-	-	-	-	-	-
Surface Water	SVOCs	C+F	Fluoranthene	ng/L	Wet	5	5	0.706	0.674	0.784	-	-	-	-	-	-	-	-
Surface Water	SVOCs	Column	Phenanthrene	ng/L	Wet	5	5	1.37	1.39	1.50	-	-	-	-	-	-	-	-
Surface Water	SVOCs	Filter	Phenanthrene	ng/L	Wet	5	1	0.188	0.188	0.188	-	-	-	-	-	-	-	-
Surface Water	SVOCs	C+F	Phenanthrene	ng/L	Wet	5	5	1.48	1.48	1.61	-	-	-	-	-	-	-	-
Sediment	Metals	Total	Aluminum	mg/kg	Dry	19	19	13,279	13,100	22,900	-	-	14,464	95% Approximate Gamma UCL	-	-	14,464	95% Approximate Gamma UCL
Sediment	Metals	Total	Antimony	mg/kg	Dry	19	18	0.161	0.155	0.280	0.155	0.0654	0.182	95% KM (t) UCL	0.155	0.0654	0.182	95% KM (t) UCL
Sediment	Metals	Total	Arsenic	mg/kg	Dry	19	19	3.12	2.93	5.39	-	-	3.55	95% Approximate Gamma UCL	-	-	3.55	95% Approximate Gamma UCL
Sediment	Metals	Total	Barium	mg/kg	Dry	19	19	121	123	202	-	-	135	95% Student's-t UCL	-	-	135	95% Student's-t UCL
Sediment	Metals	Total	Beryllium	mg/kg	Dry	19	19	0.362	0.369	0.597	-	-	0.399	95% Student's-t UCL	-	-	0.399	95% Student's-t UCL
Sediment	Metals	Total	Cadmium	mg/kg	Dry	19	17	0.485	0.460	0.719	0.453	0.181	0.527	95% KM (t) UCL	0.453	0.181	0.528	95% KM (Percentile Bootstrap) UCL
Sediment	Metals	Total	Chromium	mg/kg	Dry	19	19	19.9	18.5	33.5	-	-	22.0	95% Student's-t UCL	-	-	22.0	95% Student's-t UCL
Sediment	Metals	Total	Cobalt	mg/kg	Dry	19	19	8.59	8.31	15.1	-	-	9.45	95% Approximate Gamma UCL	-	-	9.45	95% Approximate Gamma UCL
Sediment	Metals	Total	Copper	mg/kg	Dry	19	19	20.5	19.9	33.1	-	-	22.4	95% Student's-t UCL	-	-	22.4	95% Student's-t UCL
Sediment	Metals	Total	Lead	mg/kg	Dry	19	19	8.93	10.0	16.8	-	-	10.2	95% Student's-t UCL	-	-	10.2	95% Student's-t UCL
Sediment	Metals	Total	Mercury	mg/kg	Dry	19	19	0.132	0.109	0.373	-	-	0.199	95% Approximate Gamma UCL	-	-	0.199	95% Approximate Gamma UCL
Sediment	Metals	Total	Nickel	mg/kg	Dry	19	19	15.5	13.4	51.5	-	-	19.5	95% Modified-t UCL	-	-	19.5	95% Modified-t UCL
Sediment	Metals	Total	Thallium	mg/kg	Dry	19	15	0.183	0.187	0.218	0.173	0.0278	0.186	95% KM (Percentile Bootstrap) UCL	0.173	0.0278	0.186	95% KM (Percentile Bootstrap) UCL
Sediment	Metals	Total	Vanadium	mg/kg	Dry	19	19	40.0	37.4	59.3	-	-	43.2	95% Student's-t UCL	-	-	43.2	95% Student's-t UCL
Sediment	Metals	Total	Zinc	mg/kg	Dry	19	19	81.8	86.1	113	-	-	89.0	95% Student's-t UCL	-	-	89.0	95% Student's-t UCL
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	19	2	15.8	-	27.0	5.78	5.00	27.0	95% KM (BCA) UCL	5.78	5.00	27.0	95% KM (BCA) UCL
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Dry	19	2	17.5	-	28.7	7.48	5.00	28.7	95% KM (BCA) UCL	13.1	5.63	16.3	95% KM (t) UCL
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	19	19	15.7	11.0	54.0	-	-	22.0	95% Approximate Gamma UCL	-	-	22.0	95% Approximate Gamma UCL
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	19	12	108	109	180	95.3	48.8	118	95% KM (t) UCL	95.3	48.8	118	95% KM (t) UCL
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	19	3	173	140	340	102	74.9	180	95% KM (t) UCL	102	74.9	180	95% KM (t) UCL

Table I-18a
Statistical Summary for Random Forebay Samples
Bradford Island - River Operable Unit
(2 of 4)

											Statistics - ND censored at the MDL				Statistics - ND censored at the MRL			
Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	19	6	11.4	9.15	21.0	6.90	4.59	8.9	95% KM (t) UCL	7.85	4.27	9.9	95% KM (t) UCL
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	19	5	2.00	1.90	2.70	1.63	0.297	1.76	95% KM (t) UCL	2.00	0.390	2.34	95% KM (t) UCL
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	19	14	3.59	3.10	7.40	3.01	1.92	3.80	95% KM (t) UCL	3.59	1.93	4.52	95% KM (t) UCL
Sediment	SVOCs	Total	Total LPAHs (KM, capped)	ug/kg	Dry	19	14	-	-	12.0	7.27	2.17	8.16	95% KM (Percentile Bootstrap) UCL	30.5	2.89	31.9	95% KM (t) UCL
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	19	12	4.59	3.30	12.0	3.49	2.80	4.68	95% KM (Percentile Bootstrap) UCL	4.34	2.74	5.60	95% KM (Percentile Bootstrap) UCL
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	19	11	4.69	4.50	7.50	3.43	2.13	4.52	95% KM (Percentile Bootstrap) UCL	4.69	2.02	5.80	95% KM (t) UCL
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	19	9	6.24	6.00	9.10	5.06	1.57	5.73	95% KM (t) UCL	6.24	1.60	7.23	95% KM (t) UCL
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	19	9	4.00	3.90	6.20	3.26	1.01	3.69	95% KM (t) UCL	4.00	1.05	4.65	95% KM (t) UCL
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	19	5	3.40	3.20	4.90	2.74	0.571	2.99	95% KM (t) UCL	3.40	0.800	4.09	95% KM (t) UCL
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	19	16	5.63	3.75	20.0	4.96	4.73	7.03	95% KM (BCA) UCL	5.40	4.63	7.34	95% KM (BCA) UCL
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	19	15	5.16	4.00	12.0	4.60	2.78	5.75	95% KM (Percentile Bootstrap) UCL	4.97	2.73	6.18	95% KM (Percentile Bootstrap) UCL
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	19	9	3.86	3.60	5.70	2.98	1.15	3.47	95% KM (t) UCL	3.86	1.15	4.56	95% KM (t) UCL
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	19	16	5.63	4.05	17.0	5.02	4.13	6.70	95% KM (BCA) UCL	5.34	4.02	7.17	95% KM (BCA) UCL
Sediment	SVOCs	Total	Total HPAHs (KM, capped)	ug/kg	Dry	19	16	-	-	73.9	34.8	20.9	43.0	95% KM (BCA) UCL	42.1	21.9	50.7	95% KM (BCA) UCL
Sediment	SVOCs	Total	Total PAHs (KM, capped)	ug/kg	Dry	19	16	-	-	83.4	39.1	23.5	48.9	95% KM (BCA) UCL	55.3	26.1	67.0	95% KM (t) UCL
Crayfish	Metals	Total	Aluminum	mg/kg	Wet	17	17	105	100	157	-	-	116	95% Approximate Gamma UCL	-	-	116	95% Approximate Gamma UCL
Crayfish	Metals	Total	Antimony	mg/kg	Wet	17	17	0.0288	0.0180	0.133	-	-	0.0420	95% H-UCL	-	-	0.0420	95% H-UCL
Crayfish	Metals	Total	Arsenic	mg/kg	Wet	17	17	0.479	0.460	0.680	-	-	0.519	95% Approximate Gamma UCL	-	-	0.519	95% Approximate Gamma UCL
Crayfish	Metals	Total	Barium	mg/kg	Wet	17	17	65.4	64.8	84.3	-	-	69.5	95% Student's-t UCL	-	-	69.5	95% Student's-t UCL
Crayfish	Metals	Total	Beryllium	mg/kg	Wet	17	17	0.00316	0.00330	0.00410	-	-	0.00342	95% Student's-t UCL	-	-	0.00342	95% Student's-t UCL
Crayfish	Metals	Total	Cadmium	mg/kg	Wet	17	17	0.107	0.0870	0.210	-	-	0.128	95% Approximate Gamma UCL	-	-	0.128	95% Approximate Gamma UCL
Crayfish	Metals	Total	Chromium	mg/kg	Wet	17	17	0.659	0.700	1.20	-	-	0.764	95% Student's-t UCL	-	-	0.764	95% Student's-t UCL
Crayfish	Metals	Total	Cobalt	mg/kg	Wet	17	17	0.233	0.236	0.262	-	-	0.241	95% Student's-t UCL	-	-	0.241	95% Student's-t UCL
Crayfish	Metals	Total	Copper	mg/kg	Wet	17	17	19.6	18.9	36.0	-	-	22.1	95% Student's-t UCL	-	-	22.1	95% Student's-t UCL
Crayfish	Metals	Total	Lead	mg/kg	Wet	17	17	0.603	0.566	2.66	-	-	0.925	95% Approximate Gamma UCL	-	-	0.925	95% Approximate Gamma UCL
Crayfish	Metals	Total	Mercury	mg/kg	Wet	17	17	0.0221	0.0215	0.0315	-	-	0.0237	95% Student's-t UCL	-	-	0.0237	95% Student's-t UCL
Crayfish	Metals	Total	Methyl Mercury	mg/kg	Wet	17	17	0.0311	0.0300	0.0400	-	-	0.0329	95% Student's-t UCL	-	-	0.0329	95% Student's-t UCL
Crayfish	Metals	Total	Nickel	mg/kg	Wet	17	17	4.75	4.72	5.35	-	-	4.88	95% Student's-t UCL	-	-	4.88	95% Student's-t UCL
Crayfish	Metals	Total	Thallium	mg/kg	Wet	17	17	0.0184	0.0167	0.0292	-	-	0.0203	95% Student's-t UCL	-	-	0.0203	95% Student's-t UCL
Crayfish	Metals	Total	Vanadium	mg/kg	Wet	17	17	0.435	0.400	0.600	-	-	0.465	95% Student's-t UCL	-	-	0.465	95% Student's-t UCL
Crayfish	Metals	Total	Zinc	mg/kg	Wet	17	17	20.5	20.8	23.2	-	-	21.2	95% Student's-t UCL	-	-	21.2	95% Student's-t UCL
Crayfish	SVOCs	Total	Acenaphthene	ug/kg	Wet	15	7	0.170	0.140	0.260	0.138	0.0455	0.160	95% KM (t) UCL	0.170	0.0501	0.206	95% KM (t) UCL
Crayfish	SVOCs	Total	Anthracene	ug/kg	Wet	15	4	0.111	0.108	0.160	0.0802	0.0263	0.094	95% KM (t) UCL	0.111	0.0361	0.148	95% KM (t) UCL
Crayfish	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	15	10	0.269	0.265	0.350	0.256	0.0324	0.273	95% KM (Percentile Bootstrap) UCL	0.269	0.0327	0.288	95% KM (t) UCL
Crayfish	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	15	3	0.150	0.160	0.170	0.126	0.0154	0.135	95% KM (t) UCL	0.150	0.0216	0.177	95% KM (t) UCL
Crayfish	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	15	7	0.143	0.110	0.240	0.118	0.0454	0.140	95% KM (t) UCL	0.143	0.0567	0.184	95% KM (t) UCL
Crayfish	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	15	4	0.205	0.165	0.390	0.126	0.0740	0.165	95% KM (t) UCL	0.205	0.111	0.317	95% KM (t) UCL
Crayfish	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	15	7	0.116	0.110	0.160	0.0999	0.0232	0.111	95% KM (t) UCL	0.116	0.0260	0.135	95% KM (t) UCL
Crayfish	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	15	4	83.0	77.5	110	71.3	11.6	77.4	95% KM (t) UCL	83.0	17.8	101	95% KM (t) UCL
Crayfish	SVOCs	Total	Chrysene	ug/kg	Wet	15	8	0.143	0.115	0.310	0.115	0.0610	0.144	95% KM (t) UCL	0.143	0.0722	0.191	95% KM (t) UCL
Crayfish	SVOCs	Total	Fluoranthene	ug/kg	Wet	15	15	0.349	0.300	0.750	-	-	0.426	95% Approximate Gamma UCL	-	-	0.426	95% Approximate Gamma UCL
Crayfish	SVOCs	Total	Fluorene	ug/kg	Wet	15	5	0.170	0.160	0.210	0.157	0.0162	0.165	95% KM (t) UCL	0.170	0.0228	0.190	95% KM (t) UCL
Crayfish	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	15	3	0.173	0.180	0.180	0.163	0.00680	0.166	95% KM (t) UCL	0.173	0.00943	0.185	95% KM (t) UCL
Crayfish	SVOCs	Total	Phenanthrene	ug/kg	Wet	15	10	0.550	0.490	0.860	0.507	0.136	0.576	95% KM (BCA) UCL	0.512	0.133	0.575	95% KM (BCA) UCL
Crayfish	SVOCs	Total	Pyrene	ug/kg	Wet	15	15	0.361	0.290	1.20	-	-	0.468	95% Approximate Gamma UCL	-	-	0.468	95% Approximate Gamma UCL
Smallmouth Bass	Metals	Total	Aluminum	mg/kg	Wet	19	19	5.05	4.00	15.5	-	-	7.11	95% Approximate Gamma UCL	-	-	7.11	95% Approximate Gamma UCL
Smallmouth Bass	Metals	Total	Arsenic	mg/kg	Wet	19	19	0.412	0.410	0.700	-	-	0.472	95% Student's-t UCL	-	-	0.472	95% Student's-t UCL
Smallmouth Bass	Metals	Total	Barium	mg/kg	Wet	19	19	1.51	1.34	2.64	-	-	1.73	95% Student's-t UCL	-	-	1.73	95% Student's-t UCL
Smallmouth Bass	Metals	Total	Beryllium	mg/kg	Wet	19	4	0.000600	0.000600	0.000700	0.000521	0.0000521	0.000545	95% KM (t) UCL	0.000600	0.0000707	0.000671	95% KM (t) UCL
Smallmouth Bass	Metals	Total	Cadmium	mg/kg	Wet	19	19	0.00974	0.00700	0.0280	-	-	0.0126	95% H-UCL	-	-	0.0126	95% H-UCL
Smallmouth Bass	Metals	Total	Chromium	mg/kg	Wet	19	5	0.362	0.270	0.860	0.235	0.150	0.302	95% KM (t) UCL	0.241	0.149	0.307	95% KM (t) UCL
Smallmouth Bass	Metals	Total	Cobalt	mg/kg	Wet	19	19	0.0548	0.0553	0.0758	-	-	0.0579	95% Student's-t UCL	-	-	0.0579	95% Student's-t UCL
Smallmouth Bass	Metals	Total	Copper	mg/kg	Wet	19	19	0.664	0.588	1.42	-	-	0.764	95% Approximate Gamma UCL	-	-	0.764	95% Approximate Gamma UCL
Smallmouth Bass	Metals	Total	Lead	mg/kg	Wet	19	19	0.0109	0.00900	0.0360	-	-	0.0142	95% Approximate Gamma UCL	-	-	0.0142	95% Approximate Gamma UCL
Smallmouth Bass	Metals	Total	Mercury	mg/kg	Wet	19	19	0.265	0.283	0.512	-	-	0.317	95% Student's-t UCL	-	-	0.317	95% Student's-t UCL
Smallmouth Bass	Metals	Total	Nickel	mg/kg	Wet	19	19	0.298	0.295	0.399	-	-	0.319	95% Student's-t UCL	-	-	0.319	95% Student's-t UCL
Smallmouth Bass	Metals	Total	Thallium	mg/kg	Wet	19	19	0.0148	0.0148	0.0215	-	-	0.0162	95% Student's-t UCL	-	-	0.0162	95% Student's-t UCL
Smallmouth Bass	Metals	Total	Vanadium	mg/kg	Wet	19	19	0.0595	0.0500	0.130	-	-	0.0698	95% Approximate Gamma UCL	-	-	0.0698	95% Approximate Gamma UCL

Table I-18a
Statistical Summary for Random Forebay Samples
Bradford Island - River Operable Unit
(3 of 4)

											Statistics - ND censored at the MDL				Statistics - ND censored at the MRL			
Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Smallmouth Bass	Metals	Total	Zinc	mg/kg	Wet	19	19	14.2	14.4	18.0	-	-	14.9	95% Student's-t UCL	-	-	14.9	95% Student's-t UCL
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	19	7	5,197	1,300	18,000	1,948	4,885	4,047	95% KM (t) UCL	1,948	4,885	4,047	95% KM (t) UCL
Smallmouth Bass	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Wet	19	7	-	-	18,110	1,983	4,928	4,100	95% KM (t) UCL	2,062	5,094	4,251	95% KM (t) UCL
Smallmouth Bass	SVOCs	Total	Acenaphthene	ug/kg	Wet	19	16	0.608	0.300	1.60	0.537	0.517	1.07	95% KM (Chebyshev) UCL	0.554	0.506	1.08	95% KM (Chebyshev) UCL
Smallmouth Bass	SVOCs	Total	Anthracene	ug/kg	Wet	19	18	2.27	0.320	17.0	2.16	4.10	11.8	99% KM (Chebyshev) UCL	2.17	4.09	11.8	99% KM (Chebyshev) UCL
Smallmouth Bass	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	19	5	5.08	1.20	17.0	2.07	3.63	3.69	95% KM (t) UCL	2.08	3.63	3.69	95% KM (t) UCL
Smallmouth Bass	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	19	8	4.18	4.95	7.40	2.18	2.53	3.25	95% KM (t) UCL	2.18	2.53	3.25	95% KM (t) UCL
Smallmouth Bass	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	19	6	3.20	4.05	4.40	1.09	1.69	4.21	95% KM (BCA) UCL	1.09	1.69	4.21	95% KM (BCA) UCL
Smallmouth Bass	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	19	6	2.29	2.70	3.30	1.01	1.04	1.46	95% KM (t) UCL	1.01	1.04	1.46	95% KM (t) UCL
Smallmouth Bass	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	19	9	4.22	3.80	7.70	2.06	2.91	3.29	95% KM (t) UCL	2.06	2.91	3.29	95% KM (t) UCL
Smallmouth Bass	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	19	7	338	130	1,600	186	344	338	95% KM (t) UCL	203	340	354	95% KM (t) UCL
Smallmouth Bass	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	19	2	236	236	440	54.4	90.9	239	97.5% KM (Chebyshev) UCL	54.4	90.9	239	97.5% KM (Chebyshev) UCL
Smallmouth Bass	SVOCs	Total	Chrysene	ug/kg	Wet	19	8	3.49	3.40	10.0	1.76	2.47	2.81	95% KM (t) UCL	1.76	2.47	2.81	95% KM (t) UCL
Smallmouth Bass	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	19	6	2.77	3.40	4.10	1.16	1.30	1.72	95% KM (t) UCL	1.16	1.30	1.72	95% KM (t) UCL
Smallmouth Bass	SVOCs	Total	Fluoranthene	ug/kg	Wet	19	10	3.22	2.30	6.50	1.93	2.27	3.03	95% KM (BCA) UCL	1.93	2.27	3.04	95% KM (BCA) UCL
Smallmouth Bass	SVOCs	Total	Fluorene	ug/kg	Wet	19	17	1.31	0.670	4.70	1.20	1.28	2.52	95% KM (Chebyshev) UCL	1.21	1.28	2.53	95% KM (Chebyshev) UCL
Smallmouth Bass	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	19	7	3.89	5.30	6.10	1.88	2.06	2.76	95% KM (t) UCL	1.88	2.06	2.76	95% KM (t) UCL
Smallmouth Bass	SVOCs	Total	Phenanthrene	ug/kg	Wet	19	19	2.09	1.30	5.70	-	-	2.88	95% Approximate Gamma UCL	-	-	2.88	95% Approximate Gamma UCL
Smallmouth Bass	SVOCs	Total	Pyrene	ug/kg	Wet	19	9	2.74	0.720	7.20	1.35	2.24	2.30	95% KM (t) UCL	1.37	2.24	2.31	95% KM (t) UCL
Sculpin	Metals	Total	Arsenic	mg/kg	Wet	17	17	0.312	0.289	0.435	-	-	0.344	95% Student's-t UCL	-	-	0.344	95% Student's-t UCL
Sculpin	Metals	Total	Cadmium	mg/kg	Wet	17	17	0.0201	0.0183	0.0453	-	-	0.0243	95% Approximate Gamma UCL	-	-	0.0243	95% Approximate Gamma UCL
Sculpin	Metals	Total	Lead	mg/kg	Wet	17	16	0.0787	0.0643	0.306	0.0759	0.0640	0.103	95% KM (BCA) UCL	0.0759	0.0640	0.104	95% KM (BCA) UCL
Sculpin	Metals	Total	Mercury	mg/kg	Wet	17	17	0.152	0.131	0.308	-	-	0.187	95% Student's-t UCL	-	-	0.187	95% Student's-t UCL
Sculpin	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	17	3	767	470	1,700	242	373	436	95% KM (t) UCL	242	373	436	95% KM (t) UCL
Sculpin	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Wet	17	3	-	-	1,700	242	373	436	95% KM (t) UCL	242	373	436	95% KM (t) UCL
Clam	Metals	Total	Aluminum	mg/kg	Wet	19	19	32.6	21.7	83.2	-	-	44.7	95% Approximate Gamma UCL	-	-	44.7	95% Approximate Gamma UCL
Clam	Metals	Total	Antimony	mg/kg	Wet	19	5	0.00360	0.00300	0.00700	0.00247	0.00119	0.00302	95% KM (t) UCL	0.00360	0.00185	0.00521	95% KM (t) UCL
Clam	Metals	Total	Arsenic	mg/kg	Wet	19	19	2.22	2.26	2.49	-	-	2.31	95% Student's-t UCL	-	-	2.31	95% Student's-t UCL
Clam	Metals	Total	Barium	mg/kg	Wet	19	19	1.87	1.76	3.05	-	-	2.05	95% Student's-t UCL	-	-	2.05	95% Student's-t UCL
Clam	Metals	Total	Beryllium	mg/kg	Wet	19	19	0.00188	0.00170	0.00380	-	-	0.00218	95% Student's-t UCL	-	-	0.00218	95% Student's-t UCL
Clam	Metals	Total	Cadmium	mg/kg	Wet	19	19	0.363	0.366	0.461	-	-	0.382	95% Student's-t UCL	-	-	0.382	95% Student's-t UCL
Clam	Metals	Total	Chromium	mg/kg	Wet	19	19	0.595	0.600	0.900	-	-	0.670	95% Student's-t UCL	-	-	0.670	95% Student's-t UCL
Clam	Metals	Total	Cobalt	mg/kg	Wet	19	19	0.106	0.110	0.148	-	-	0.117	95% Student's-t UCL	-	-	0.117	95% Student's-t UCL
Clam	Metals	Total	Copper	mg/kg	Wet	19	19	9.15	9.36	11.4	-	-	9.56	95% Student's-t UCL	-	-	9.56	95% Student's-t UCL
Clam	Metals	Total	Lead	mg/kg	Wet	19	19	0.0431	0.0350	0.0890	-	-	0.0520	95% H-UCL	-	-	0.0520	95% H-UCL
Clam	Metals	Total	Mercury	mg/kg	Wet	19	19	0.0111	0.00880	0.0341	-	-	0.0137	95% Modified-t UCL	-	-	0.0137	95% Modified-t UCL
Clam	Metals	Total	Methyl Mercury	mg/kg	Wet	19	19	0.00475	0.00480	0.00650	-	-	0.00507	95% Student's-t UCL	-	-	0.00507	95% Student's-t UCL
Clam	Metals	Total	Nickel	mg/kg	Wet	19	19	0.227	0.238	0.348	-	-	0.261	95% Student's-t UCL	-	-	0.261	95% Student's-t UCL
Clam	Metals	Total	Thallium	mg/kg	Wet	19	19	0.00692	0.00660	0.0119	-	-	0.00768	95% Approximate Gamma UCL	-	-	0.00768	95% Approximate Gamma UCL
Clam	Metals	Total	Vanadium	mg/kg	Wet	19	19	0.177	0.141	0.426	-	-	0.221	95% Approximate Gamma UCL	-	-	0.221	95% Approximate Gamma UCL
Clam	Metals	Total	Zinc	mg/kg	Wet	19	19	21.4	20.8	26.5	-	-	22.5	95% Student's-t UCL	-	-	22.5	95% Student's-t UCL
Clam	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	19	9	33.9	22.0	120	27.7	21.9	37.0	95% KM (t) UCL	27.7	21.9	37.0	95% KM (t) UCL
Clam	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Wet	19	9	-	-	120	27.7	21.9	37.0	95% KM (t) UCL	27.7	21.9	37.0	95% KM (t) UCL
Clam	SVOCs	Total	Acenaphthene	ug/kg	Wet	19	18	1.07	0.955	4.10	1.03	0.755	1.81	95% KM (Chebyshev) UCL	1.03	0.754	1.81	95% KM (Chebyshev) UCL
Clam	SVOCs	Total	Anthracene	ug/kg	Wet	19	15	0.973	0.960	2.30	0.827	0.499	1.06	95% KM (Percentile Bootstrap) UCL	0.905	0.474	1.12	95% KM (Percentile Bootstrap) UCL
Clam	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	19	8	1.07	0.980	2.10	0.829	0.452	1.06	95% KM (t) UCL	0.891	0.462	1.14	95% KM (t) UCL
Clam	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	19	3	0.467	0.440	0.580	0.396	0.0496	0.423	95% KM (t) UCL	0.429	0.0605	0.484	95% KM (t) UCL
Clam	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	19	9	0.663	0.640	0.950	0.533	0.170	0.607	95% KM (t) UCL	0.624	0.164	0.716	95% KM (t) UCL
Clam	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	19	8	0.205	0.185	0.360	0.174	0.0949	0.227	95% KM (t) UCL	0.205	0.0937	0.266	95% KM (t) UCL
Clam	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	19	2	0.205	0.205	0.250	0.168	0.0259	0.187	95% KM (t) UCL	0.205	0.0450	0.283	95% KM (t) UCL
Clam	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	19	19	393	150	890	-	-	717	95% Chebyshev (Mean, Sd) UCL	-	-	717	95% Chebyshev (Mean, Sd) UCL
Clam	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	19	3	14.0	14.0	15.0	13.2	0.488	13.4	95% KM (t) UCL	14.0	0.816	15.0	95% KM (t) UCL
Clam	SVOCs	Total	Chrysene	ug/kg	Wet	19	8	3.04	3.00	4.00	2.55	0.724	2.91	95% KM (t) UCL	2.55	0.724	2.91	95% KM (t) UCL
Clam	SVOCs	Total	Fluoranthene	ug/kg	Wet	19	14	11.1	11.0	16.0	10.5	2.54	11.7	95% KM (t) UCL	10.5	2.54	11.7	95% KM (Percentile Bootstrap) UCL
Clam	SVOCs	Total	Fluorene	ug/kg	Wet	19	19	2.25	2.30	3.80	-	-	2.51	95% Student's-t UCL	-	-	2.51	95% Student's-t UCL
Clam	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	19	6	0.579	0.205	2.50	0.240	0.540	0.476	95% KM (t) UCL	0.316	0.532	0.566	95% KM (t) UCL
Clam	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	19	10	15.9	14.0	31.0	12.4	6.37	15.2	95% KM (Percentile Bootstrap) UCL	15.9	7.24	20.0	95% KM (t) UCL
Clam	SVOCs	Total	Phenanthrene	ug/kg	Wet	19	19	9.45	9.60	15.0	-	-	10.5	95% Student's-t UCL	-	-	10.5	95% Student's-t UCL

Table I-18a
Statistical Summary for Random Forebay Samples
Bradford Island - River Operable Unit
(4 of 4)

											Statistics - ND censored at the MDL				Statistics - ND censored at the MRL			
Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Clam	SVOCs	Total	Pyrene	ug/kg	Wet	19	7	2.96	2.40	6.30	2.23	1.15	2.76	95% KM (t) UCL	2.26	1.14	2.80	95% KM (t) UCL

Notes
Only those analytes with at least 2 detected results are shown on this table.
If not all samples were detected results (i.e., detection rate = <100%), the mean and standard deviation were estimated by the Kaplan-Meier method.

% = percent
Dry = Dry weight
KM = Kaplan-Meier
MDL = method detection limit
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
MRL = method reporting limit
ND = non-detect
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
PCB = polychlorinated biphenyl
SD = standard deviation
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
UCL = upper confidence limit
Wet = Wet Weight

Table I-18b
Statistical Summary for Random Forebay PCB Congener Data
Bradford Island - River Operable Unit
(1 of 3)

											Censoring EMPCs at Reported Value and NDs at the RDL			
Matrix	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Number of Samples	Number of Detections (not ND or EMPC)	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Surface Water	Column	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	Wet	5	0	-	-	-	-	-	-	-
Surface Water	Filter	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	Wet	5	3	0.0510	0.0510	0.0560	0.0490	0.00400	-	-
Surface Water	C+F	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	Wet	5	3	0.0973	-	0.133	0.0901	0.0215	-	-
Surface Water	Column	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/L	Wet	5	5	0.132	0.119	0.163	-	-	-	-
Surface Water	Filter	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/L	Wet	5	5	0.330	0.339	0.421	-	-	-	-
Surface Water	C+F	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/L	Wet	5	5	0.463	0.486	0.540	-	-	-	-
Surface Water	Column	118	2,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	5	0.399	0.361	0.499	-	-	-	-
Surface Water	Filter	118	2,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	5	0.886	0.947	1.07	-	-	-	-
Surface Water	C+F	118	2,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5	5	1.28	1.27	1.57	-	-	-	-
Surface Water	Column	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	Wet	5	1	0.0360	0.0360	0.0360	-	-	-	-
Surface Water	Filter	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	Wet	5	5	0.195	0.110	0.359	-	-	-	-
Surface Water	C+F	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	Wet	5	5	0.222	0.138	0.382	-	-	-	-
Surface Water	Column	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	5	3	0.0123	0.0130	0.0140	0.0116	0.00174	-	-
Surface Water	Filter	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	5	5	0.0826	0.0490	0.148	-	-	-	-
Surface Water	C+F	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	5	5	0.0950	0.0630	0.158	-	-	-	-
Surface Water	Column		Total PCBs As Congeners (KM, capped)	pg/L	Wet	5	5	-	-	154	-	-	-	-
Surface Water	Filter		Total PCBs As Congeners (KM, capped)	pg/L	Wet	5	5	-	-	61.2	-	-	-	-
Surface Water	C+F		Total PCBs As Congeners (KM, capped)	pg/L	Wet	5	5	164	164	209	-	-	-	-
Sediment	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Dry	19	19	1.55	1.32	7.09	-	-	2.23	95% Approximate Gamma UCL
Sediment	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Dry	19	19	74.1	12.5	1,080	-	-	318	95% Chebyshev (Mean, Sd) UCL
Sediment	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Dry	19	15	5.06	0.666	60.3	4.07	13.3	23.8	97.5% KM (Chebyshev) UCL
Sediment	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	19	19	185	38.4	2,650	-	-	783	95% Chebyshev (Mean, Sd) UCL
Sediment	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Dry	19	11	4.16	0.833	36.3	2.62	7.95	14.6	97.5% KM (Chebyshev) UCL
Sediment	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	19	3	0.200	0.189	0.238	0.179	0.0165	0.188	95% KM (t) UCL
Sediment	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Dry	19	18	27.2	5.63	380	25.8	83.6	149	97.5% KM (Chebyshev) UCL
Sediment	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	19	16	9.74	2.71	113	8.27	24.7	44.9	97.5% KM (Chebyshev) UCL
Sediment	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Dry	19	9	1.36	0.452	9.01	0.720	1.97	1.69	95% KM (BCA) UCL
Sediment	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Dry	19	19	-	-	29.7	2.27	6.67	3.59	95% Chebyshev (MVUE) UCL
Crayfish	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	15	15	5.96	4.12	20.7	-	-	8.67	95% Approximate Gamma UCL
Crayfish	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	15	4	0.557	0.348	1.32	0.306	0.278	0.452	95% KM (t) UCL
Crayfish	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	15	12	33.5	13.0	134	28.7	36.7	90.8	97.5% KM (Chebyshev) UCL
Crayfish	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	15	14	123	6.36	804	115	218	697	99% KM (Chebyshev) UCL
Crayfish	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	15	15	2,038	173	14,000	-	-	11,907	99% Chebyshev (Mean, Sd) UCL
Crayfish	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	15	14	75.0	5.44	460	70.2	128	412	99% KM (Chebyshev) UCL
Crayfish	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	15	7	1.96	0.469	7.83	1.11	1.97	2.08	95% KM (t) UCL
Crayfish	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	15	15	593	26.3	3,910	-	-	3,532	99% Chebyshev (Mean, Sd) UCL
Crayfish	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	15	15	254	21.5	1,530	-	-	1,486	99% Chebyshev (Mean, Sd) UCL
Crayfish	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	15	12	18.6	2.14	82.1	15.1	25.8	84.4	99% KM (Chebyshev) UCL
Crayfish	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	15	15	-	-	42.6	6.74	11.6	36.5	99% Chebyshev (Mean, Sd) UCL

Table I-18b
Statistical Summary for Random Forebay PCB Congener Data
Bradford Island - River Operable Unit
(2 of 3)

											Censoring EMPCs at Reported Value and NDs at the RDL			
Matrix	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Number of Samples	Number of Detections (not ND or EMPC)	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Smallmouth Bass	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	19	19	774	77.2	8,950	-	-	5,640	99% Chebyshev (Mean, Sd) UCL
Smallmouth Bass	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	19	17	77.7	4.22	1,190	70.0	264	691	99% KM (Chebyshev) UCL
Smallmouth Bass	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	19	19	129,237	3,910	1,300,000	-	-	887,209	99% Chebyshev (Mean, Sd) UCL
Smallmouth Bass	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	19	19	9,949	337	89,800	-	-	65,614	99% Chebyshev (Mean, Sd) UCL
Smallmouth Bass	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	19	19	347,222	10,800	3,270,000	-	-	2,314,267	99% Chebyshev (Mean, Sd) UCL
Smallmouth Bass	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	19	19	5,690	217	55,300	-	-	38,710	99% Chebyshev (Mean, Sd) UCL
Smallmouth Bass	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	19	18	267	15.1	3,030	254	710	1,922	99% KM (Chebyshev) UCL
Smallmouth Bass	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	19	19	60,870	2,890	486,000	-	-	374,934	99% Chebyshev (Mean, Sd) UCL
Smallmouth Bass	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	19	19	16,980	961	140,000	-	-	107,559	99% Chebyshev (Mean, Sd) UCL
Smallmouth Bass	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	19	19	1,318	113	10,100	-	-	8,145	99% Chebyshev (Mean, Sd) UCL
Smallmouth Bass	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	19	19	-	-	26,505	2941	7173	19,314	99% Chebyshev (Mean, Sd) UCL
Sculpin	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	17	17	49.6	15.4	443	-	-	160	95% Chebyshev (Mean, Sd) UCL
Sculpin	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	17	17	20,177	752	269,000	-	-	176,793	99% Chebyshev (Mean, Sd) UCL
Sculpin	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	17	1,631	73.4	19,900	-	-	13,263	99% Chebyshev (Mean, Sd) UCL
Sculpin	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	17	59,809	3,750	757,000	-	-	500,123	99% Chebyshev (Mean, Sd) UCL
Sculpin	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	17	16	950	44.1	11,800	895	2,758	7,770	99% KM (Chebyshev) UCL
Sculpin	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	16	10.2	5.97	54.0	10.2	12.9	24.7	95% KM (Chebyshev) UCL
Sculpin	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	17	17	10,243	428	118,000	-	-	79,753	99% Chebyshev (Mean, Sd) UCL
Sculpin	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	17	17	2,507	165	30,800	-	-	20,433	99% Chebyshev (Mean, Sd) UCL
Sculpin	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	17	17	219	20.5	2,480	-	-	1,667	99% Chebyshev (Mean, Sd) UCL
Sculpin	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	17	17	-	-	4773	397	1154	3180	99% Chebyshev (Mean, Sd) UCL
Clam	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	17	17	38.1	35.9	69.0	-	-	42.1	95% Approximate Gamma UCL
Clam	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	17	4	2.20	2.20	2.46	2.01	0.163	2.09	95% KM (t) UCL
Clam	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	17	17	920	455	6,200	-	-	2,406	95% Chebyshev (Mean, Sd) UCL
Clam	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	17	62.7	27.4	445	-	-	171	95% Chebyshev (Mean, Sd) UCL
Clam	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	17	8,331	2,730	64,700	-	-	24,313	95% Chebyshev (Mean, Sd) UCL
Clam	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	17	17	157	52.0	1,150	-	-	441	95% Chebyshev (Mean, Sd) UCL
Clam	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	17	4.86	4.57	11.0	-	-	5.65	95% Modified-t UCL
Clam	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	17	17	461	158	3,610	-	-	1,348	95% Chebyshev (Mean, Sd) UCL
Clam	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	17	17	562	201	3,800	-	-	1,514	95% Chebyshev (Mean, Sd) UCL
Clam	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	17	17	2.50	1.81	10.1	-	-	3.44	95% Modified-t UCL
Clam	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	17	17	-	-	312	55.3	68.9	128	95% Chebyshev (Mean, Sd) UCL

Notes
Only those analytes with at least 2 detected results are shown on this table.
If not all samples were detected results (i.e., detection rate = <100%), the mean and standard deviation were estimated by the Kaplan-Meier method.

% = percent
Dry = Dry weight
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
KM = Kaplan-Meier

Table I-18b
Statistical Summary for Random Forebay PCB Congener Data
Bradford Island - River Operable Unit
(3 of 3)

											Censoring EMPCs at Reported Value and NDs at the RDL			
Matrix	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Number of Samples	Number of Detections (not ND or EMPC)	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type

ND = non-detect
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
pg/kg = picrograms per kilogram
pg/L = picrograms per liter
SD = standard deviation
SVOC = semi-volatile organic carbon
RDL = reported detection limit
UCL = upper confidence limit
Wet = Wet Weight

Table I-19a
Statistical Summary for Downstream Samples
Bradford Island - River Operable Unit
(1 of 1)

											Statistics - ND censored at the MDL				Statistics - ND censored at the MRL			
Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Sediment	Metals	Total	Aluminum	mg/kg	Dry	6	6	15,567	14,950	21,600	-	-	-	-	-	-	-	-
Sediment	Metals	Total	Antimony	mg/kg	Dry	6	6	0.188	0.175	0.400	-	-	-	-	-	-	-	-
Sediment	Metals	Total	Arsenic	mg/kg	Dry	6	6	3.97	3.49	5.84	-	-	-	-	-	-	-	-
Sediment	Metals	Total	Barium	mg/kg	Dry	6	6	132	132	172	-	-	-	-	-	-	-	-
Sediment	Metals	Total	Beryllium	mg/kg	Dry	6	6	0.384	0.372	0.513	-	-	-	-	-	-	-	-
Sediment	Metals	Total	Cadmium	mg/kg	Dry	6	6	0.362	0.299	0.791	-	-	-	-	-	-	-	-
Sediment	Metals	Total	Chromium	mg/kg	Dry	6	6	22.3	21.5	29.9	-	-	-	-	-	-	-	-
Sediment	Metals	Total	Cobalt	mg/kg	Dry	6	6	8.70	8.30	11.5	-	-	-	-	-	-	-	-
Sediment	Metals	Total	Copper	mg/kg	Dry	6	6	17.6	17.3	24.1	-	-	-	-	-	-	-	-
Sediment	Metals	Total	Lead	mg/kg	Dry	6	6	9.44	8.75	12.7	-	-	-	-	-	-	-	-
Sediment	Metals	Total	Mercury	mg/kg	Dry	6	6	0.0630	0.0530	0.136	-	-	-	-	-	-	-	-
Sediment	Metals	Total	Nickel	mg/kg	Dry	6	6	13.6	13.4	15.2	-	-	-	-	-	-	-	-
Sediment	Metals	Total	Thallium	mg/kg	Dry	6	5	0.189	0.178	0.234	0.185	0.0265	-	-	0.185	0.0265	-	-
Sediment	Metals	Total	Vanadium	mg/kg	Dry	6	6	54.0	48.6	73.5	-	-	-	-	-	-	-	-
Sediment	Metals	Total	Zinc	mg/kg	Dry	6	6	82.8	75.1	117	-	-	-	-	-	-	-	-
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	6	6	12.8	8.45	25.0	-	-	-	-	-	-	-	-
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	6	2	66.7	66.7	130	24.5	47.2	-	-	24.5	47.2	-	-
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	6	3	2.47	2.70	3.10	2.03	0.624	-	-	2.47	0.634	-	-
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	6	4	3.98	4.40	4.90	3.38	1.22	-	-	3.98	1.08	-	-
Sediment	SVOCs	Total	Total LPAHs	ug/kg	Dry	6	4	-	-	10.7	8.02	1.87	-	-	28.1	2.41	-	-
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	6	6	5.35	3.50	12.0	-	-	-	-	-	-	-	-
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	6	5	7.14	4.50	14.0	6.27	4.61	-	-	6.54	4.41	-	-
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	6	4	8.38	7.10	16.0	6.68	4.74	-	-	6.88	4.62	-	-
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	6	3	5.13	5.80	6.80	3.97	1.68	-	-	5.13	1.70	-	-
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	6	2	5.35	5.35	6.50	4.58	0.857	-	-	5.35	1.15	-	-
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	6	5	7.22	3.50	18.0	6.28	5.89	-	-	6.77	5.73	-	-
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	6	5	11.1	6.20	22.0	9.72	8.08	-	-	9.98	7.89	-	-
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	6	3	5.77	6.30	8.20	4.28	2.17	-	-	5.77	2.24	-	-
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	6	6	9.40	5.50	21.0	-	-	-	-	-	-	-	-
Sediment	SVOCs	Total	Total HPAHs	ug/kg	Dry	6	6	-	-	127	-	-	-	-	-	-	-	-
Sediment	SVOCs	Total	Total PAHs	ug/kg	Dry	6	6	-	-	137	-	-	-	-	-	-	-	-

Notes
Only those analytes with at least 2 detected results are shown on this table.
If not all samples were detected results (i.e., detection rate = <100%), the mean and standard deviation were estimated by the Kaplan-Meier method.

% = percent
Dry = Dry weight
KM = Kaplan-Meier
MDL = method detection limit
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
MRL = method reporting limit
ND = non-detect
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
SD = standard deviation
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
UCL = upper confidence limit
Wet = Wet Weight

Table I-19b
Statistical Summary for Downstream PCB Congener Data
Bradford Island - River Operable Unit
(1 of 1)

											Censoring EMPCs at Reported Value and NDs at the RDL			
Matrix	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Number of Samples	Number of Detections (not ND or EMPC)	Mean of Detects (not ND or EMPC)	Median of Detects (not ND or EMPC)	Maximum Detected Value	KM-Mean	KM-SD	Final 95% UCL	UCL Type
Sediment	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Dry	6	4	1.17	1.09	2.01	0.936	0.627	-	-
Sediment	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Dry	6	6	7.57	5.26	19.7	-	-	-	-
Sediment	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Dry	6	5	0.509	0.383	0.957	0.464	0.261	-	-
Sediment	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	6	6	16.6	12.1	45.6	-	-	-	-
Sediment	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Dry	6	5	0.400	0.271	0.874	0.355	0.263	-	-
Sediment	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Dry	6	4	3.18	2.36	6.25	2.70	1.64	-	-
Sediment	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	6	6	0.996	0.731	2.61	-	-	-	-
Sediment	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Dry	6	4	0.272	0.197	0.596	0.214	0.180	-	-
Sediment	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Dry	6	6	-	-	0.917	-	-	-	-

Notes
Only those analytes with at least 2 detected results are shown on this table.
If not all samples were detected results (i.e., detection rate = <100%), the mean and standard deviation were estimated by the Kaplan-Meier method.

% = percent
Dry = Dry weight
EMPC = The analyte was not positively identified; the associated
numerical value is the Estimated Maximum Potential Concentration.
KM = Kaplan-Meier
ND = non-detect
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
pg/kg = picrograms per kilogram
SD = standard deviation
SVOC = semi-volatile organic carbon
RDL = reported detection limit
UCL = upper confidence limit
Wet = Wet Weight

Table I-20a
Statistical Summary for Random Reference Samples
Bradford Island - River Operable Unit
(1 of 5)

											Upper Prediction Limit (UPL)	
Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	Distribution	95% UPL
Sediment	Metals	Total	Aluminum	mg/kg	Dry	18	18	17,328	13,300	33,500	Lognormal	38,000
Sediment	Metals	Total	Antimony	mg/kg	Dry	18	18	0.264	0.255	0.520	Normal	0.427
Sediment	Metals	Total	Arsenic	mg/kg	Dry	18	18	4.19	3.76	6.04	Lognormal	5.86
Sediment	Metals	Total	Barium	mg/kg	Dry	18	18	167	135	312	Lognormal	315
Sediment	Metals	Total	Beryllium	mg/kg	Dry	18	18	0.437	0.354	0.748	Lognormal	0.847
Sediment	Metals	Total	Cadmium	mg/kg	Dry	18	18	0.476	0.473	0.748	Normal	0.674
Sediment	Metals	Total	Chromium	mg/kg	Dry	18	18	19.8	18.6	27.3	Normal	28.0
Sediment	Metals	Total	Cobalt	mg/kg	Dry	18	18	9.66	8.97	15.2	Normal	15.2
Sediment	Metals	Total	Copper	mg/kg	Dry	18	18	25.6	18.7	47.8	Gamma	55.6
Sediment	Metals	Total	Lead	mg/kg	Dry	18	18	11.6	11.4	15.1	Normal	14.5
Sediment	Metals	Total	Mercury	mg/kg	Dry	18	18	0.129	0.124	0.225	Normal	0.214
Sediment	Metals	Total	Nickel	mg/kg	Dry	18	18	14.6	13.9	25.6	Gamma	21.2
Sediment	Metals	Total	Thallium	mg/kg	Dry	18	18	0.244	0.234	0.360	Normal	0.354
Sediment	Metals	Total	Vanadium	mg/kg	Dry	18	18	45.0	42.3	76.9	Normal	70.6
Sediment	Metals	Total	Zinc	mg/kg	Dry	18	18	87.6	88.5	109	Normal	106
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	18	18	15.7	12.5	31.0	Gamma	31.7
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	18	13	48.9	41.0	100	Non-parametric	100
Sediment	PCB Aroclors	Total	Aroclor 1016	mg/kg	Dry	18	0	-	-	-	Non-parametric	13.0 / 13.0
Sediment	PCB Aroclors	Total	Aroclor 1221	mg/kg	Dry	18	0	-	-	-	Non-parametric	11.0 / 21.0
Sediment	PCB Aroclors	Total	Aroclor 1232	mg/kg	Dry	18	0	-	-	-	Non-parametric	12.0 / 12.0
Sediment	PCB Aroclors	Total	Aroclor 1242	mg/kg	Dry	18	0	-	-	-	Non-parametric	16.0 / 16.0
Sediment	PCB Aroclors	Total	Aroclor 1248	mg/kg	Dry	18	0	-	-	-	Non-parametric	1.80 / 11.0
Sediment	PCB Aroclors	Total	Aroclor 1254	mg/kg	Dry	18	0	-	-	-	Non-parametric	1.80 / 11.0
Sediment	PCB Aroclors	Total	Aroclor 1260	mg/kg	Dry	18	0	-	-	-	Non-parametric	1.80 / 11.0
Sediment	PCB Aroclors	Total	Aroclor 1262	mg/kg	Dry	18	0	-	-	-	Non-parametric	1.80 / 11.0
Sediment	PCB Aroclors	Total	Aroclor 1268	mg/kg	Dry	18	0	-	-	-	Non-parametric	1.80 / 11.0
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	18	18	15.1	7.15	110	Non-parametric	110
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	18	2	3.15	3.15	3.80	Non-parametric	3.80
Sediment	SVOCs	Total	Carbazole	mg/kg	Dry	18	0	-	-	-	Non-parametric	1.40 / 11.0
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	18	15	5.84	5.20	11.0	Non-parametric	11.0
Sediment	SVOCs	Total	Di-n-octyl Phthalate	mg/kg	Dry	18	0	-	-	-	Non-parametric	1.30 / 11.0
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	18	11	61.6	7.90	210	Non-parametric	210
Sediment	SVOCs	Total	Acenaphthene	mg/kg	Dry	18	0	-	-	-	Non-parametric	1.10 / 11.0
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	18	2	1.85	1.85	2.30	Non-parametric	2.30
Sediment	SVOCs	Total	Fluorene	mg/kg	Dry	18	0	-	-	-	Non-parametric	1.80 / 11.0
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	18	16	2.96	2.80	5.90	Non-parametric	5.90
Sediment	SVOCs	Total	Total LPAHs (KM, capped)	ug/kg	Dry	18	16	-	-	10.0	Non-parametric	10.0
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	18	14	3.27	2.95	10.0	Non-parametric	10.0
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	18	9	4.51	3.80	11.0	Non-parametric	11.0
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	18	13	5.80	4.80	17.0	Non-parametric	17.0
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	18	10	4.34	3.60	7.90	Non-parametric	7.90
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	18	1	-	-	5.00	Non-parametric	5.00
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	18	15	4.36	3.70	9.80	Non-parametric	9.80
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	mg/kg	Dry	18	0	-	-	-	Non-parametric	2.30 / 11.0
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	18	15	6.61	5.10	31.0	Non-parametric	31.0
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	18	9	4.20	3.20	8.80	Non-parametric	8.80

Table I-20a
Statistical Summary for Random Reference Samples
Bradford Island - River Operable Unit
(2 of 5)

											Upper Prediction Limit (UPL)	
Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	Distribution	95% UPL
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	18	18	5.02	4.05	23.0	Gamma	12.7
Sediment	SVOCs	Total	Total HPAHs (KM, capped)	ug/kg	Dry	18	18	-	-	125	Non-parametric	125
Sediment	SVOCs	Total	Total PAHs (KM, capped)	ug/kg	Dry	18	18	-	-	133	Non-parametric	133
Crayfish	Metals	Total	Aluminum	mg/kg	Wet	19	19	134	131	221	Normal	204
Crayfish	Metals	Total	Antimony	mg/kg	Wet	19	19	0.0153	0.0120	0.0390	Gamma	0.0327
Crayfish	Metals	Total	Arsenic	mg/kg	Wet	19	19	0.383	0.363	0.636	Gamma	0.535
Crayfish	Metals	Total	Barium	mg/kg	Wet	19	19	68.2	68.6	120	Normal	104
Crayfish	Metals	Total	Beryllium	mg/kg	Wet	19	19	0.00349	0.00330	0.00610	Gamma	0.00489
Crayfish	Metals	Total	Cadmium	mg/kg	Wet	19	19	0.0942	0.0840	0.201	Normal	0.164
Crayfish	Metals	Total	Chromium	mg/kg	Wet	19	18	0.491	0.500	1.23	Non-parametric	1.23
Crayfish	Metals	Total	Cobalt	mg/kg	Wet	19	19	0.331	0.339	0.439	Normal	0.434
Crayfish	Metals	Total	Copper	mg/kg	Wet	19	19	18.2	17.6	33.2	Lognormal	27.4
Crayfish	Metals	Total	Lead	mg/kg	Wet	19	19	0.413	0.317	1.55	Gamma	1.14
Crayfish	Metals	Total	Mercury	mg/kg	Wet	19	19	0.0176	0.0176	0.0246	Normal	0.0231
Crayfish	Metals	Total	Methyl Mercury	mg/kg	Wet	19	19	0.0269	0.0264	0.0367	Normal	0.0370
Crayfish	Metals	Total	Nickel	mg/kg	Wet	19	19	1.80	1.82	3.44	Normal	2.90
Crayfish	Metals	Total	Thallium	mg/kg	Wet	19	19	0.0216	0.0214	0.0370	Gamma	0.0319
Crayfish	Metals	Total	Vanadium	mg/kg	Wet	19	19	0.574	0.593	0.804	Normal	0.860
Crayfish	Metals	Total	Zinc	mg/kg	Wet	19	19	21.6	20.9	36.5	Non-parametric	36.5
Crayfish	PCB Aroclors	Total	Aroclor 1221	mg/kg	Dry	18	0	-	-	-	Non-parametric	5.20 / 40.0
Crayfish	PCB Aroclors	Total	Aroclor 1232	mg/kg	Dry	18	0	-	-	-	Non-parametric	4.60 / 20.0
Crayfish	PCB Aroclors	Total	Aroclor 1242	mg/kg	Dry	18	0	-	-	-	Non-parametric	4.40 / 20.0
Crayfish	PCB Aroclors	Total	Aroclor 1248	mg/kg	Dry	18	0	-	-	-	Non-parametric	1.10 / 20.0
Crayfish	PCB Aroclors	Total	Aroclor 1254	mg/kg	Dry	18	0	-	-	-	Non-parametric	3.60 / 20.0
Crayfish	PCB Aroclors	Total	Aroclor 1260	mg/kg	Dry	18	0	-	-	-	Non-parametric	3.80 / 20.0
Crayfish	PCB Aroclors	Total	Aroclor 1262	mg/kg	Dry	18	0	-	-	-	Non-parametric	5.00 / 20.0
Crayfish	PCB Aroclors	Total	Aroclor 1268	mg/kg	Dry	18	0	-	-	-	Non-parametric	4.00 / 20.0
Crayfish	SVOCs	Total	Acenaphthene	ug/kg	Wet	18	3	0.147	0.130	0.190	Non-parametric	0.190
Crayfish	SVOCs	Total	Anthracene	ug/kg	Wet	18	2	0.144	0.144	0.190	Non-parametric	0.190
Crayfish	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	18	2	0.355	0.355	0.400	Non-parametric	0.400
Crayfish	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	18	1	-	-	0.120	Non-parametric	0.120
Crayfish	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	18	4	0.150	0.143	0.230	Non-parametric	0.230
Crayfish	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	18	0	-	-	-	Non-parametric	0.500 / 0.500
Crayfish	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	18	4	0.136	0.136	0.200	Non-parametric	0.200
Crayfish	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	18	4	75.5	73.0	87.0	Non-parametric	87.0
Crayfish	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	18	3	21.3	18.0	31.0	Non-parametric	31.0
Crayfish	SVOCs	Total	Carbazole	ug/kg	Wet	18	0	-	-	-	Non-parametric	9.10 / 40.0
Crayfish	SVOCs	Total	Chrysene	ug/kg	Wet	18	5	0.170	0.120	0.270	Non-parametric	0.270
Crayfish	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	18	3	0.117	0.120	0.160	Non-parametric	0.160
Crayfish	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	18	0	-	-	-	Non-parametric	110 / 110
Crayfish	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	18	1	-	-	32.0	Non-parametric	32.0
Crayfish	SVOCs	Total	Fluoranthene	ug/kg	Wet	18	0	-	-	-	Non-parametric	0.500 / 0.500
Crayfish	SVOCs	Total	Fluorene	ug/kg	Wet	18	2	0.215	0.215	0.250	Non-parametric	0.250
Crayfish	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	18	3	0.132	0.130	0.180	Non-parametric	0.180
Crayfish	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	18	0	-	-	-	Non-parametric	7.70 / 40.0
Crayfish	SVOCs	Total	Phenanthrene	ug/kg	Wet	18	5	0.518	0.510	0.590	Non-parametric	0.590

Table I-20a
Statistical Summary for Random Reference Samples
Bradford Island - River Operable Unit
(3 of 5)

											Upper Prediction Limit (UPL)	
Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	Distribution	95% UPL
Crayfish	SVOCs	Total	Pyrene	ug/kg	Wet	18	0	-	-	-	Non-parametric	0.500 / 0.500
Smallmouth Bass	Metals	Total	Aluminum	mg/kg	Wet	19	19	2.50	1.55	10.1	Gamma	6.88
Smallmouth Bass	Metals	Total	Antimony	mg/kg	Wet	19	4	0.00850	0.00300	0.0250	Non-parametric	0.0250
Smallmouth Bass	Metals	Total	Arsenic	mg/kg	Wet	19	19	0.354	0.311	0.761	Gamma	0.641
Smallmouth Bass	Metals	Total	Barium	mg/kg	Wet	19	19	1.10	1.06	1.72	Normal	1.78
Smallmouth Bass	Metals	Total	Beryllium	mg/kg	Wet	19	0	-	-	-	Non-parametric	0.00200 / 0.00600
Smallmouth Bass	Metals	Total	Cadmium	mg/kg	Wet	19	19	0.0813	0.112	0.143	Non-parametric	0.143
Smallmouth Bass	Metals	Total	Chromium	mg/kg	Wet	19	12	0.684	0.0850	7.15	Non-parametric	7.15
Smallmouth Bass	Metals	Total	Cobalt	mg/kg	Wet	19	12	0.0608	0.0575	0.0838	Non-parametric	0.0838
Smallmouth Bass	Metals	Total	Copper	mg/kg	Wet	19	19	0.510	0.490	0.730	Normal	0.747
Smallmouth Bass	Metals	Total	Lead	mg/kg	Wet	19	12	1.59	1.61	1.81	Non-parametric	1.81
Smallmouth Bass	Metals	Total	Mercury	mg/kg	Wet	19	19	0.131	0.106	0.333	Gamma	0.268
Smallmouth Bass	Metals	Total	Nickel	mg/kg	Wet	19	16	1.10	1.29	1.79	Non-parametric	1.79
Smallmouth Bass	Metals	Total	Thallium	mg/kg	Wet	19	19	0.0160	0.0152	0.0261	Normal	0.0232
Smallmouth Bass	Metals	Total	Vanadium	mg/kg	Wet	19	18	0.0585	0.0540	0.104	Non-parametric	0.104
Smallmouth Bass	Metals	Total	Zinc	mg/kg	Wet	19	19	13.4	13.1	15.5	Normal	15.5
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	19	0	-	-	-	Non-parametric	9.90 / 10.0
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	19	0	-	-	-	Non-parametric	20.0 / 20.0
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	19	0	-	-	-	Non-parametric	11.0 / 11.0
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	19	4	7.88	7.55	14.0	Non-parametric	14.0
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	19	0	-	-	-	Non-parametric	33.0 / 33.0
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	19	16	52.3	47.0	110	Non-parametric	110
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	19	0	-	-	-	Non-parametric	140 /140
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	19	0	-	-	-	Non-parametric	110 / 110
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	19	0	-	-	-	Non-parametric	10.0 / 10.0
Smallmouth Bass	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Wet	19	16	-	-	124	Non-parametric	124
Smallmouth Bass	SVOCs	Total	Acenaphthene	ug/kg	Wet	19	18	0.813	0.815	1.30	Non-parametric	1.30
Smallmouth Bass	SVOCs	Total	Anthracene	ug/kg	Wet	19	3	0.230	0.220	0.380	Non-parametric	0.380
Smallmouth Bass	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	19	3	0.703	0.610	0.940	Non-parametric	0.940
Smallmouth Bass	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	19	0	-	-	-	Non-parametric	0.810 / 4.80
Smallmouth Bass	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	19	0	-	-	-	Non-parametric	0.700 / 4.80
Smallmouth Bass	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	19	0	-	-	-	Non-parametric	0.730 / 4.80
Smallmouth Bass	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	19	0	-	-	-	Non-parametric	0.560 / 4.80
Smallmouth Bass	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	19	2	116	116	150	Non-parametric	150
Smallmouth Bass	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	19	0	-	-	-	Non-parametric	7.30 / 40.0
Smallmouth Bass	SVOCs	Total	Carbazole	ug/kg	Wet	19	0	-	-	-	Non-parametric	9.10 / 40.0
Smallmouth Bass	SVOCs	Total	Chrysene	ug/kg	Wet	19	1	-	-	0.550	Non-parametric	0.550
Smallmouth Bass	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	19	0	-	-	-	Non-parametric	0.590 / 4.80
Smallmouth Bass	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	19	0	-	-	-	Non-parametric	280 / 280
Smallmouth Bass	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	19	1	-	-	15.0	Non-parametric	15.0
Smallmouth Bass	SVOCs	Total	Fluoranthene	ug/kg	Wet	19	11	1.30	1.20	2.50	Non-parametric	2.50
Smallmouth Bass	SVOCs	Total	Fluorene	ug/kg	Wet	19	16	1.35	1.40	2.10	Non-parametric	2.10
Smallmouth Bass	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	19	0	-	-	-	Non-parametric	0.640 / 4.80
Smallmouth Bass	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	19	0	-	-	-	Non-parametric	11.0 / 40.0
Smallmouth Bass	SVOCs	Total	Phenanthrene	ug/kg	Wet	19	19	3.11	3.00	5.10	Normal	4.97
Smallmouth Bass	SVOCs	Total	Pyrene	ug/kg	Wet	19	2	0.400	0.400	0.420	Non-parametric	0.420

Table I-20a
Statistical Summary for Random Reference Samples
Bradford Island - River Operable Unit
(4 of 5)

											Upper Prediction Limit (UPL)	
Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	Distribution	95% UPL
Sculpin	Metals	Total	Arsenic	mg/kg	Wet	18	18	0.382	0.384	0.484	Normal	0.513
Sculpin	Metals	Total	Cadmium	mg/kg	Wet	18	18	0.0152	0.0144	0.0264	Normal	0.0236
Sculpin	Metals	Total	Lead	mg/kg	Wet	18	17	0.0368	0.0319	0.0758	Non-parametric	0.0758
Sculpin	Metals	Total	Mercury	mg/kg	Wet	18	18	0.0876	0.0885	0.141	Normal	0.134
Sculpin	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	19	0	-	-	-	Non-parametric	2.40 / 10.0
Sculpin	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	19	0	-	-	-	Non-parametric	2.60 / 20.0
Sculpin	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	19	0	-	-	-	Non-parametric	2.30 / 10.0
Sculpin	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	19	0	-	-	-	Non-parametric	2.20 / 10.0
Sculpin	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	19	0	-	-	-	Non-parametric	45.0 / 45.0
Sculpin	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	19	0	-	-	-	Non-parametric	44.0 / 44.0
Sculpin	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	19	0	-	-	-	Non-parametric	1.90 / 10.0
Sculpin	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	19	0	-	-	-	Non-parametric	2.50 / 10.0
Sculpin	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	19	0	-	-	-	Non-parametric	2.00 / 10.0
Clam	Metals	Total	Aluminum	mg/kg	Wet	18	18	29.8	23.7	83.4	Gamma	68.7
Clam	Metals	Total	Antimony	mg/kg	Wet	18	3	0.00567	0.00500	0.00800	Non-parametric	0.00800
Clam	Metals	Total	Arsenic	mg/kg	Wet	18	18	2.30	2.30	2.62	Normal	2.64
Clam	Metals	Total	Barium	mg/kg	Wet	18	18	1.89	1.82	2.38	Non-parametric	2.38
Clam	Metals	Total	Beryllium	mg/kg	Wet	18	9	0.000844	0.000900	0.00140	Non-parametric	0.00140
Clam	Metals	Total	Cadmium	mg/kg	Wet	18	18	0.332	0.338	0.405	Normal	0.410
Clam	Metals	Total	Chromium	mg/kg	Wet	18	18	0.548	0.500	0.760	Non-parametric	0.760
Clam	Metals	Total	Cobalt	mg/kg	Wet	18	18	0.117	0.119	0.150	Normal	0.153
Clam	Metals	Total	Copper	mg/kg	Wet	18	18	9.74	9.66	11.6	Normal	11.2
Clam	Metals	Total	Lead	mg/kg	Wet	18	18	0.0616	0.0625	0.0720	Normal	0.0729
Clam	Metals	Total	Mercury	mg/kg	Wet	18	18	0.00892	0.00740	0.0179	Gamma	0.0160
Clam	Metals	Total	Methyl Mercury	mg/kg	Wet	18	18	0.00534	0.00535	0.00990	Normal	0.00896
Clam	Metals	Total	Nickel	mg/kg	Wet	18	18	0.354	0.347	0.482	Normal	0.447
Clam	Metals	Total	Thallium	mg/kg	Wet	18	18	0.00676	0.00645	0.0105	Lognormal	0.00905
Clam	Metals	Total	Vanadium	mg/kg	Wet	18	18	0.145	0.144	0.286	Normal	0.234
Clam	Metals	Total	Zinc	mg/kg	Wet	18	18	21.0	21.0	23.2	Normal	23.6
Clam	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	18	0	-	-	-	Non-parametric	15.0 / 15.0
Clam	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	18	0	-	-	-	Non-parametric	16.0 / 20.0
Clam	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	18	0	-	-	-	Non-parametric	35.0 / 35.0
Clam	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	18	0	-	-	-	Non-parametric	14.0 / 14.0
Clam	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	18	0	-	-	-	Non-parametric	9.90 / 10.0
Clam	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	18	18	34.9	35.0	39.0	Normal	39.7
Clam	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	18	0	-	-	-	Non-parametric	8.10 / 10.0
Clam	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	18	0	-	-	-	Non-parametric	9.90 / 10.0
Clam	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	18	0	-	-	-	Non-parametric	2.00 / 10.0
Clam	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Wet	18	18	-	-	39.0	Non-parametric	39.0
Clam	SVOCs	Total	Acenaphthene	ug/kg	Wet	18	18	0.647	0.630	1.20	Normal	1.06
Clam	SVOCs	Total	Anthracene	ug/kg	Wet	18	2	1.32	1.32	1.80	Non-parametric	1.80
Clam	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	18	0	-	-	-	Non-parametric	27.0 / 27.0
Clam	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	18	0	-	-	-	Non-parametric	0.410 / 2.50
Clam	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	18	0	-	-	-	Non-parametric	0.350 / 2.50
Clam	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	18	5	0.950	0.850	1.40	Non-parametric	1.40
Clam	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	18	0	-	-	-	Non-parametric	0.280 / 2.50

Table I-20a
Statistical Summary for Random Reference Samples
Bradford Island - River Operable Unit
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											Upper Prediction Limit (UPL)	
Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Number of Samples	Number of Detections	Mean of Detects	Median of Detects	Maximum Detected Value	Distribution	95% UPL
Clam	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	18	18	444	415	680	Gamma	660
Clam	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	18	3	62.7	57.0	74.0	Non-parametric	74.0
Clam	SVOCs	Total	Carbazole	ug/kg	Wet	18	0	-	-	-	Non-parametric	9.10 / 40.0
Clam	SVOCs	Total	Chrysene	ug/kg	Wet	18	0	-	-	-	Non-parametric	13.0 / 13.0
Clam	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	18	0	-	-	-	Non-parametric	0.300 / 2.50
Clam	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	18	0	-	-	-	Non-parametric	48.0 / 48.0
Clam	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	18	0	-	-	-	Non-parametric	11.0 / 40.0
Clam	SVOCs	Total	Fluoranthene	ug/kg	Wet	18	18	12.0	12.0	17.0	Normal	15.6
Clam	SVOCs	Total	Fluorene	ug/kg	Wet	18	18	2.08	2.00	3.10	Normal	2.85
Clam	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	18	7	1.43	1.50	2.00	Non-parametric	2.00
Clam	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	18	18	46.5	44.5	110	Normal	86.6
Clam	SVOCs	Total	Phenanthrene	ug/kg	Wet	18	18	9.6	9.1	14	Normal	13.1
Clam	SVOCs	Total	Pyrene	ug/kg	Wet	18	0	-	-	-	Non-parametric	5.60 / 5.60

Notes
For analytes with less than 100% detection rate, but at least one detection, the maximum detected value was assessed as the non-parametric UPL.
For analytes with no detections (0% detection rate), the maximum MDL and maximum MRL are shown (MDL/MRL) as the non-paramentric UPL.
UPLs were not calculated when less than 8 samples were available (i.e., surface water is not shown because there were less than 8 samples).

% = percent
Dry = Dry weight
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = method reporting limit
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
PCB = polychlorinated biphenyl
SD = standard deviation
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
UPL = upper prediction limit
Wet = Wet Weight

Table I-20b
Statistical Summary for Random Reference PCB Congener Data
Bradford Island - River Operable Unit
(1 of 2)

											Upper Prediction Limit (UPL)	
Matrix	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Number of Samples	Number of Detections (not ND or EMPC)	Mean of Detects	Median of Detects	Maximum Detected Value	Distribution	95% UPL
Sediment	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Dry	18	18	1.02	0.986	2.01	Normal	1.65
Sediment	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Dry	18	2	0.101	0.101	0.143	Non-parametric	0.143
Sediment	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Dry	18	18	8.95	8.02	27.5	Gamma	17.7
Sediment	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Dry	18	16	0.497	0.396	1.63	Non-parametric	1.63
Sediment	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	18	18	25.7	21.5	70.5	Gamma	55.2
Sediment	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Dry	18	9	0.582	0.406	1.22	Non-parametric	1.22
Sediment	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	18	9	0.176	0.175	0.337	Non-parametric	0.337
Sediment	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Dry	18	18	2.93	2.50	8.50	Gamma	5.79
Sediment	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	18	15	1.55	1.25	3.84	Non-parametric	3.84
Sediment	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	18	0	-	-	-	Non-parametric	0.200
Sediment	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Dry	18	14	0.249	0.231	0.573	Non-parametric	0.573
Sediment	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Dry	18	18	-	-	1.20	Non-parametric	1.20
Crayfish	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	17	17	2.75	2.62	4.66	Normal	4.34
Crayfish	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	17	2	0.172	0.172	0.176	Non-parametric	0.176
Crayfish	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	17	17	8.40	7.62	24.8	Gamma	21.4
Crayfish	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	17	3.70	3.51	8.15	Gamma	5.98
Crayfish	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	17	129	111	323	Gamma	261
Crayfish	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	17	17	3.37	3.00	7.36	Gamma	6.10
Crayfish	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	17	6	0.449	0.453	0.530	Non-parametric	0.530
Crayfish	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	17	17	19.2	17.3	39.1	Gamma	31.5
Crayfish	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	17	17	13.8	11.2	30.1	Gamma	25.3
Crayfish	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	17	0	-	-	-	Non-parametric	0.325
Crayfish	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	17	16	1.22	1.25	2.20	Non-parametric	2.20
Crayfish	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	17	17	-	-	1.94	Non-parametric	1.94
Smallmouth Bass	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	19	19	63.3	49.7	195	Non-parametric	195
Smallmouth Bass	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	19	12	4.27	3.19	15.9	Non-parametric	15.9
Smallmouth Bass	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	19	19	2,738	1,320	23,400	Non-parametric	23,400
Smallmouth Bass	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	19	17	281	97.1	2,910	Non-parametric	2,910
Smallmouth Bass	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	19	19	9,619	3,740	98,600	Non-parametric	98,600
Smallmouth Bass	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	19	17	180	69.1	1,830	Non-parametric	1,830
Smallmouth Bass	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	19	13	16.4	10.7	74.6	Non-parametric	74.6
Smallmouth Bass	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	19	19	1,651	490	20,000	Non-parametric	20,000
Smallmouth Bass	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	19	19	574	198	6,540	Non-parametric	6,540
Smallmouth Bass	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	19	0	-	-	-	Non-parametric	10.9
Smallmouth Bass	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	19	15	67.4	29.5	532	Non-parametric	532
Smallmouth Bass	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	19	19	-	-	499	Non-parametric	499
Sculpin	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	18	18	15.1	13.9	25.9	Normal	23.9
Sculpin	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	18	0	-	-	-	Non-parametric	2.21
Sculpin	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	18	18	692	689	1,040	Normal	1,050
Sculpin	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	18	18	48.2	45.5	82.1	Normal	77.5
Sculpin	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	18	18	2,275	2,055	3,870	Normal	3710
Sculpin	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	18	17	30.9	29.8	47.0	Non-parametric	47.0
Sculpin	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	18	17	4.25	3.97	5.93	Non-parametric	5.93
Sculpin	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	18	18	275	248	464	Normal	465

Table I-20b
Statistical Summary for Random Reference PCB Congener Data
Bradford Island - River Operable Unit
(2 of 2)

											Upper Prediction Limit (UPL)	
Matrix	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Number of Samples	Number of Detections (not ND or EMPC)	Mean of Detects	Median of Detects	Maximum Detected Value	Distribution	95% UPL
Sculpin	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	18	18	108	98.0	175	Normal	177
Sculpin	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	18	0	-	-	-	Non-parametric	9.29
Sculpin	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	18	16	9.23	8.40	17.2	Non-parametric	17.2
Sculpin	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	18	18	-	-	38.3	Non-parametric	38.3
Clam	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Wet	18	18	39.1	38.1	46.8	Normal	46.6
Clam	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	18	10	2.20	2.09	2.75	Non-parametric	2.75
Clam	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	18	18	446	436	556	Normal	542
Clam	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	18	18	26.2	25.4	33.0	Normal	31.6
Clam	Total	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	18	18	2,374	2,355	2,820	Normal	2,820
Clam	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	18	18	44.4	43.1	54.0	Normal	53.6
Clam	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	18	17	4.79	4.74	5.64	Non-parametric	5.64
Clam	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Wet	18	18	141	138	166	Normal	165
Clam	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	18	18	143	143	170	Normal	169
Clam	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	18	0	-	-	-	Non-parametric	1.73
Clam	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	18	17	2.00	1.98	2.41	Non-parametric	2.41
Clam	Total		Total PCBs As Congeners (KM, capped)	ug/kg	Wet	18	18	-	-	34.5	Non-parametric	34.5

Notes
For analytes with less than 100% detection rate, but at least one detection, the maximum detected value was assessed as the non-parametric UPL.
For PCB congeners with no detections (0% detection rate), the maximum of the RDL and EMPC was assessed as the non-parametric UPL.
UPLs were not calculated when less than 8 samples were available (i.e., surface water is not shown because there were less than 8 samples).

% = percent
Dry = Dry weight
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
ND = non-detect
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
PCB = polychlorinated biphenyl
pg/kg = picrograms per kilogram
ug/kg = micrograms per kilogram
RDL = reported detection limit
UPL = upper prediction limit
Wet = Wet Weight

APPENDIX J

SCREENING LEVEL VALUES

J.0 Selection of Screening Level Values

For each media, screening level values (SLVs) were selected for human and ecological receptors, based on a hierarchy of sources (Tables J-1 through J-3). These SLVs were developed based on discussions with the United States Army Corps of Engineers (USACE) and the (Oregon) Department of Environmental Quality (DEQ) during the meetings held from December to February, 2010, as documented in Data Sufficiency Report (DSR) Meeting Minutes Memorandum (URS 2010a) and River Operable Unit (OU) and Upland OU DSR Response to Comments (RTC) (URS 2010b,c). The agreed-upon hierarchy of Human Health SLVs is presented in Section J.1 and the hierarchy of Ecological SLVs is presented in Section J.2. Section J.3 presents the SLVs (generally the more conservative of the human health and ecological SLVs, unless only one is applicable) used for identifying preliminary contaminants of potential concern (COPCs) for discussion of nature and extent of contamination (Section 9.0 of the RI Report). Tables J-4 and J-5 present the SLVs for specific human health and ecological receptors, respectively, used to identify COPCs in the human health risk assessment (Appendix M) and contaminants of potential ecological concern (CPECs) in the ecological risk assessment (Appendix N).

J.1 Human Health SLV Hierarchy

Site-specific reference concentrations were used to establish SLVs for inorganic analytes in soil and sediment. The Upland OU reference soil concentrations were established using 14 surface soil samples from an undeveloped portion of Bradford Island (see Figure 6-1 of the RI Report). The River OU reference sediment concentrations were established using 18 sediment samples from an upstream area (see Figure 6-2 of the RI Report). For Upland OU soil and River OU sediment, 95% upper prediction limits (UPLs) were calculated (Appendix I, Tables I-17 and I-20). These site-specific reference area 95% UPLs were used in the selection of SLVs for human and ecological receptors in soil and sediment, as described below.

The following summarizes the human health SLV hierarchy (Tables J-1 and J-4):

J.1.1 Soil

Except for polychlorinated biphenyl (PCB) Aroclors, the SLV is selected as the higher of the 95% UPL of site-specific Reference Area soil concentrations, for inorganic analytes only, and the human health SLVs, in order of preference as follows:

1. .DEQ's occupational, construction, and excavation worker Risk-based Concentrations (RBCs) (2003, updated 2009)
2. USEPA's industrial Regional Screening Levels (RSLs) (2010)

For Total PCBs (as Aroclors) and for individual Aroclors, USEPA's non-residential RSLs were used; DEQ's non-residential RBCs were not used. In the absence of individual Aroclor RSLs, the Total PCBs SLV was used for both individual Aroclors and Total PCBs (as Aroclors).

J.1.2 Sediment and Erodible/Mass Wasting Soil

The highest value of the following:

- 95% UPL of site-specific Reference Area sediment concentrations, for inorganic analytes only.

- DEQ's Sediment Bioaccumulation SLVs protective of humans (general and subsistence) (2007).

J.1.3 Soil Gas

1. DEQ's occupational soil gas RBCs (2003, updated 2009).

2. USEPA's Industrial Ambient Air RSLs multiplied by a factor of 1000 (2010).

J.1.4 Groundwater, Seep Water, and Surface Water

Ingestion and Direct Contact Pathways

Except for PCB Aroclors, the order of preference for Ingestion/Direct Contact SLVs is as follows:

1. DEQ's Groundwater RBCs (all groundwater RBCs) (2003, updated 2009).

2. USEPA's Tapwater RSLs (2010).

3. DEQ's Maximum Contaminant Levels (MCLs) (Accessed 2010; DEQ 2010a).

For Total PCBs (as Aroclors) and for individual Aroclors, USEPA's tapwater RSLs were the first choice; DEQ's Groundwater RBCs were not used since they were not Aroclor-specific values.

Discharge to Surface Water and Bioaccumulation Pathways

1. USEPA's National Ambient Water Quality Criteria (NAWQC) (2009) for freshwater protective of human health (water + organisms, organism only).

2. DEQ's human health-based Water Quality Criteria (WQC), Table 33A (OAR, Section 340-041; DEQ 2009a).

3. DEQ's human health-based WQC, Table 33B (OAR, Section 340-041; DEQ 2009a).

J.1.5 Tissue

1. DEQ's Acceptable Tissue Levels (ATLs), on wet weight basis, protective of humans subsistence/recreational (carcinogens and non-carcinogens) (2007) for subsistence fishers and for recreational fishers.

2. A few additional COIs were detected in crayfish and smallmouth bass tissue for which ATLs were not provided in DEQ (2007). They include a few inorganics, phthalates, and polycyclic aromatic hydrocarbons (PAHs). PAHs are generally considered to exhibit limited bioaccumulation in fish tissue due to the capacity of fish to metabolize PAHs. However, several PAHs were detected in smallmouth bass and crayfish tissue. Therefore, they were categorized into carcinogenic and non-

carcinogenic PAHs. The lower of DEQ's ATLs for fluoranthene and pyrene was applied to the non-carcinogenic PAHs. ATLs were estimated for the phthalates and carcinogenic PAHs by applying DEQ's methodology for ATL development and using cancer potency values from USEPA's IRIS database. The COIs for which ATLs were developed included B2EHP, butylbenzyl phthalate, di-n-butyl phthalate, di-n-octyl phthalate and eight carcinogenic PAHs (benzo(a)anthracene, benzo(b)flouranthene, benzo(g,h,i)perylene, benzo(k)flouranthene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene and indeno (1,2,3-cd)pyrene) (Table J-2).

J.2 Ecological SLV Hierarchy

As was done for the human health SLVs, site-specific reference 95% UPLs were used to establish ecological SLVs for inorganic analytes in soil and sediment. The following summarizes the ecological SLV hierarchy (Tables J-1 and J-5):

For all media, each individual Aroclor was screened against the Aroclor-specific SLV, unless the SLV for total PCBs is more conservative, in which case the SLV for total PCBs was applied to the individual Aroclor. If there is no Aroclor-specific SLV, each Aroclor was screened against the Total PCBs SLV. The Total PCBs (as Aroclors) was also screened against the Total PCBs SLV.

J.2.1 Soil

The SLV is selected as the higher of the 95% UPL of site-specific Reference Area soil concentrations, for inorganic analytes only, and the ecological SLVs, in order of preference as follows:

1. USEPA's Ecological Soil Screening Levels (EcoSSLs) protective of plants, soil invertebrates, birds, and mammals (2005-2008).
2. DEQ's Level II SLVs for soil protective of plants, soil invertebrates, birds, and mammals (DEQ 2001).
3. Oak Ridge National Laboratory's (ORNL's) Preliminary Remediation Goals (PRGs) for ecological endpoints protective of birds and mammals (Efroymson et al. 1997c) and ORNL publications with screening levels for plants and soil invertebrates (Efroymson et al. 1997a,b).
4. USEPA's Toxicity Reference Values (TRVs) protective of plants and invertebrates (1999b).

J.2.2 Sediment and Erodible/Mass Wasting Soil:

The SLV is selected as the higher of the 95% UPL of site-specific Reference Area soil concentrations, for inorganic analytes only, and the lowest of the following ecological SLVs:

- DEQ's Sediment Bioaccumulation SLVs protective of birds, mammals, and fish (2007).
- DEQ's Level II SLVs for freshwater sediments protective of benthic invertebrates (2001).

J.2.3 Groundwater, Seep Water, and Surface Water

1. USEPA's NAWQC for freshwater protective of aquatic life (Criteria Continuous Concentrations; 2009).
2. DEQ's WQC protective of freshwater organisms (Criteria Continuous Concentrations; OAR, Section 340-041, Table 33A; DEQ 2009a).
3. DEQ's Level II SLVs for freshwater protective of aquatic life, birds, and mammals (2001).
4. ORNL's toxicological benchmarks for freshwater protective of aquatic biota (Suter and Tsao 1996).
5. USEPA's Freshwater Chronic Values (FCVs) for PAHs protective of aquatic life (2003b).
6. Canadian Water Quality Guidelines for the Protection of Aquatic Life (Canadian Council of Resource and Environment Ministers 2007).
7. NOAA's Screening Quick Reference Tables (SQuiRTs) for freshwater (Buchman 2008).

J.2.4 Tissue

1. DEQ's ATLs protective of birds and mammals and Critical Tissue Levels (CTLs) protective of fish and shellfish (2007).
2. A few additional COIs were detected in tissue for which ATLs were not provided in DEQ (2007). They include a few inorganics (aluminum, thallium, vanadium, and zinc), phthalates, and PAHs. For the PAHs, the ATLs and CTLs for fluoranthene were used as surrogate screening levels for individual low molecular weight PAHs (LPAHs) detected tissue, and the ATLs/CTLs for pyrene were used to screen individual high molecular weight PAHs (HPAHs) detected in tissue. ATLs and CTLs were estimated for the three phthalates (bis[2-ethyl-hexyl]phthalate, butyl benzyl phthalate, and di-n-butyl phthalate) (Table J-3) by applying DEQ's methodology for ATL and CTL development and using ORNL TRVs (Sample et al 1996) for the mink and great blue heron to be consistent with DEQ's guidance (2007).

   ATLs and CTLs were not developed for the inorganics in tissue for the following reasons**:**

   a. Concentrations of inorganics in Forebay sediment were not elevated above the Reference Area concentrations (Appendix L, Tables L-4 to L-6).
   b. Concentrations of thallium and vanadium in Forebay clams, crayfish, and smallmouth bass were not elevated above Reference Area concentrations (Appendix L, Tables L-4 to L-6).
   c. Concentrations of aluminum and zinc in Forebay clams and crayfish were not elevated above the Reference Area concentrations (Appendix L, Tables L-4 to L-6).
   d. Although aluminum and zinc concentrations in Forebay bass tissue were found to

be statistically higher than the Reference Area bass tissue concentrations in the population-to-population evaluation (Table 8-3 and Appendix L, Tables L-4 to L-6), the Forebay smallmouth bass tissue had 95% UCL concentrations (Appendix I, Table I-18a) lower than the Reference Area maximum detected concentrations:

- Aluminum – Small mouth bass 95% UCL for the Forebay was 7.11 mg/kg compared to the Reference Area maximum concentration of 10.1 mg/kg.
- Zinc – Small mouth bass 95% UCL for the Forebay was 14.9 mg/kg compared to the Reference Area maximum concentration of 15.5 mg/kg.

The tissue SLVs were compared to the types of tissue that correspond to the dietary intake assumptions:

- SLVs protective of fish/shellfish were compared to all tissue data
- SLVs protective of birds were compared to smallmouth bass tissue data
- SLVs protective of mammals were compared to crayfish, sculpin, and smallmouth bass data (as three distinct datasets; no combination of tissues indicating dietary proportions were performed for the Screening Assessment)

J.3 Minimum Potentially Applicable SLVs Used to Identify preliminary COPCs for Nature and Extent

This section summarizes the selected minimum potentially applicable SLVs by media used to identify preliminary COPCs for discussion of nature and extent of contamination (Section 9.0 of the RI Report).

The SLVs used for identification of preliminary COPCs are as follows:

J.3.1 Soil

- Inorganic COIs in Soil (0-1 and 0-3 feet bgs) – The greater of the Reference Area 95% upper prediction limit (UPLs) and the toxicity based SLVs (lower of the human health and ecological SLVs) based on exposure to individual COIs. The 95% UPL was constructed for the next single future observation with a false positive rate for all four AOPCs combined likely greater than 5% due to the multiple comparisons. This is a conservative approach for the four AOPCs combined because skewing the data to a higher false positive rate allows for a lower chance of false negatives.
- Organic COIs in Soil (0-1 and 0-3 feet bgs) – The lower of the human health and ecological toxicity-based SLVs based on exposure to individual COIs.
- Inorganic COIs in Soil (0-10 feet bgs and > 10 feet bgs) – The greater of the Reference Area 95% UPLs and the human health toxicity based SLVs based on exposure to individual COIs. Ecological SLVs are not considered because, as noted in the RI/FS MP (URS 2007a), soil deeper than 3 feet is not relevant for ecological risk assessment and soils shallower than 3 feet bgs have already been considered in the other depth intervals.
- Organic COIs in Soil (0-10 feet bgs and > 10 feet bgs) – The selected human health

toxicity-based SLVs based on exposure to individual COIs. Ecological SLVs are not considered because, as noted in the RI/FS MP (URS 2007a), soil deeper than 3 feet is not relevant for ecological risk assessment and soils shallower than 3 feet bgs have already been considered in the other depth intervals.

J.3.2 Sediment

- Inorganic COIs– The greater of the Reference Area 95% UPLs and the toxicity based SLVs (lower of the human health and ecological SLVs) based on exposure to individual COIs.
- Organic COIs – The lower of the human health and ecological toxicity-based SLVs based on exposure to individual COIs.

J.3.3 Soil Gas

- Inorganic and Organic COIs – The human health toxicity-based SLVs based on exposure to individual COIs.

J.3.4 Groundwater, Seep Water, and Surface Water

- Dissolved metals and all organic COIs – The lower of the selected direct contact and groundwater-to-surface water/bioaccumulative toxicity-based water SLVs established for human and/or ecological receptors based on exposure to individual COIs.
- Total metals – the lower of the selected direct contact and groundwater-to-surface water/bioaccumulation toxicity-based water SLVs established for human health toxicity only (because ecological SLVs are not based on total metals).

J.3.5 Tissue

- Inorganic and Organic COIs – The lower of the human health and ecological toxicity-based SLVs based on exposure to individual COIs for crayfish and smallmouth bass.
- Inorganic and Organic COIs – The lowest ecological toxicity-based SLVs based on exposure to individual COIs for clam and sculpin (these tissues are not relevant for the human health pathway).

J.3.6 References

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Table J-1a - Miniumum Potentially Applicable Soil SLVs for Identification of Preliminary COPCs
Bradford Island, Upland Operable Unit
(1 of 3)

		Candidate Human Health Soil Screening Level Values (mg/kg)								Candidate Ecological Soil Screening Level Values (mg/kg)																							
										USEPA Eco SSL[sm-be]					DEQ Level II SLV[bf]					ORNL					USEPA TRVs[Bi]								
Analyte	CAS #	DEQ Soil Ingest Occupational RBC [u]	DEQ Soil Ingest Construction RBC [u]	DEQ Soil Ingest Excavation RBC [u]	DEQ Soil Volatilize Outdoor Occupational RBC [u]	DEQ Soil Vapor Intrusion Occupational RBC [u]	USEPA Soil Indust RSL [v]	Selected Human Health Soil SLV [w]	Selected Human Health Soil SLV with Surrogates [w]	Plant Eco SSL	Inverte-brate Eco SSL	Avian Eco SSL	Mammal Eco SSL	Lowest USEPA Eco SSL	Plant Level II SLV	Inverte-brate Level II SLV	Avian Level II SLV	Mammal Level II SLV	Lowest DEQ Level II SLV	Plant ORNL[bg]	Inverte-brate ORNL[bh]	Avian ORNL PRG [bi]	Mammal ORNL PRG [bi]	Lowest ORNL	Plant TRV	Inverte-brate TRV	Lowest USEPA TRV	Selected Soil Ecological SLV [bk]	Selected Ecological Soil SLV with Surrogates [bk]	Site-Specific Reference UPL	Selected Min. Potentially Applicable Soil SLV (0-1 & 0-3 ft bgs) [bl]	SLV (0-1 & 0-3 ft bgs): HH or Eco	Selected Min. Potentially Applicable Soil SLV (0-10 ft bgs) [bl]	SLV (0-10 ft bgs): HH
1,1,1,2-Tetrachloroethane	630-20-6	-	-	-	-	-	9.3	9.3	9.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.3	HH	9.3	HH
1,1,1-Trichloroethane (TCA)	71-55-6	-	-	-	-	-	38000	38000	38000	-	-	-	-	-	-	-	-	55550	55550	-	-	-	-	-	-	-	-	55550	55550	-	38000	HH	38000	HH
1,1,2,2-Tetrachloroethane	79-34-5	-	-	-	-	-	2.8	2.8	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.8	HH	2.8	HH
1,1,2-Trichloroethane	79-00-5	25	290	8100	24	2.7	5.3	2.7	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.7	HH	2.7	HH
1,1-Dichloroethane	75-34-3	250	2900	81000	240	5.9	17	5.9	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70 [ai]	-	5.9	HH	5.9	HH
1,1-Dichloroethene	75-35-4	27000	12000	-	-	680	1100	680	680	-	-	-	-	-	-	-	-	3750	3750	-	-	-	-	-	-	-	-	3750	3750	-	680	HH	680	HH
1,1-Dichloropropene	563-58-6	-	-	-	-	-	8.1	8.1	8.1 [e]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.1 [e]	HH	8.1 [e]	HH
1,2,3-Trichlorobenzene	87-61-6	-	-	-	-	-	490	490	490	-	-	-	-	-	-	20	-	-	20	-	20	-	-	20	-	-	-	20	20	-	20	Eco	490	HH
1,2,3-Trichloropropane	96-18-4	-	-	-	-	-	0.095	0.095	0.095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.095	HH	0.095	HH
1,2,4-Trichlorobenzene	120-82-1	-	-	-	-	-	99	99	99	-	-	-	-	-	-	20	-	-	20	-	20	-	-	20	-	-	-	20	20	-	20	Eco	99	HH
1,2,4-Trimethylbenzene	95-63-6	2000	2000	54000	980	1000	260	980	980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200 [x]	-	200 [x]	Eco	980	HH
1,2-Dibromo-3-chloropropane	96-12-8	-	-	-	-	-	0.069	0.069	0.069	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.069	HH	0.069	HH
1,2-Dibromoethane (EDB)	106-93-4	0.68	8.1	230	0.65	0.14	0.17	0.14	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14	HH	0.14	HH
1,2-Dichlorobenzene	95-50-1	35000	19000	-	-	-	9800	19000	19000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.26 [ah]	-	2.26 [ah]	Eco	19000	HH
1,2-Dichloroethane (EDC)	107-06-2	15	180	5000	15	0.59	2.2	0.59	0.59	-	-	-	-	-	-	-	70	2780	70	-	-	-	-	-	-	-	-	70	70	-	0.59	HH	0.59	HH
1,2-Dichloropropane	78-87-5	-	-	-	-	-	4.5	4.5	4.5	-	-	-	-	-	-	700	-	-	700	-	700	-	-	700	-	-	-	700	700	-	4.5	HH	4.5	HH
1,3,5-Trimethylbenzene	108-67-8	1600	1500	42000	-	150	10000	150	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200 [x]	-	150	HH	150	HH
1,3-Dichlorobenzene	541-73-1	-	-	-	-	-	-	-	17 [m]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.26	2.26	2.26	2.26	-	2.26	Eco	17 [m]	HH
1,3-Dichloropropane	142-28-9	-	-	-	-	-	20000	20000	20000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20000	HH	20000	HH
1,4-Dichlorobenzene	106-46-7	63	1200	34000	36	17	12	17	17	-	-	-	-	-	-	20	-	-	20	-	20	-	-	20	-	-	-	20	20	-	17	HH	17	HH
2,2-Dichloropropane	594-20-7	-	-	-	-	-	-	-	4.5 [n]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5 [n]	HH	4.5 [n]	HH
2,4,5-T	93-76-5	-	-	-	-	-	6200	6200	6200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.021 [aj]	-	0.021 [aj]	Eco	6200	HH
2,4,5-TP (Silvex)	93-72-1	-	-	-	-	-	4900	4900	4900	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.021 [aj]	-	0.021 [aj]	Eco	4900	HH
2,4,5-Trichlorophenol	95-95-4	-	-	-	-	-	62000	62000	62000	-	-	-	-	-	4	9	-	-	4	4	9	-	-	4	-	-	-	4	4	-	4	Eco	62000	HH
2,4,6-Trichlorophenol	88-06-2	200	240	6600	-	-	160	200	200	-	-	-	-	-	10	10	-	-	10	-	10	-	-	10	-	-	-	10	10	-	10	Eco	200	HH
2,4-D	94-75-7	7700	2400	66000	-	-	7700	2400	2400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.021 [aj]	-	0.021 [aj]	Eco	2400	HH
2,4-DB	94-82-6	-	-	-	-	-	4900	4900	4900	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.021 [aj]	-	0.021 [aj]	Eco	4900	HH
2,4-Dichlorophenol	120-83-2	-	-	-	-	-	1800	1800	1800	-	-	-	-	-	20	-	-	-	20	-	-	-	-	-	-	-	-	20	20	-	20	Eco	1800	HH
2,4-Dimethylphenol	105-67-9	-	-	-	-	-	12000	12000	12000	-	-	-	-	-	20	-	-	-	20	-	-	-	-	-	-	-	-	20	20	-	20	Eco	12000	HH
2,4-Dinitrophenol	51-28-5	-	-	-	-	-	1200	1200	1200	-	-	-	-	-	20	-	-	-	20	20	-	-	-	20	-	-	-	20	20	-	20	Eco	1200	HH
2,4-Dinitrotoluene	121-14-2	-	-	-	-	-	5.5	5.5	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.5	HH	5.5	HH
2,6-Dinitrotoluene	606-20-2	770	240	6600	-	-	620	240	240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	240	HH	240	HH
2-Butanone (MEK)	78-93-3	-	-	-	-	-	200000	200000	200000	-	-	-	-	-	-	-	-	200000	200000	-	-	-	-	-	-	-	-	200000	200000	-	200000	HH	200000	HH
2-Chloronaphthalene	91-58-7	-	-	-	-	-	82000	82000	82000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	82000	HH	82000	HH
2-Chlorophenol	95-57-8	-	-	-	-	-	5100	5100	5100	-	-	-	-	-	60	-	-	-	60	-	-	-	-	-	-	-	-	60	60	-	5100	Eco	5100	HH
2-Chlorotoluene	95-49-8	-	-	-	-	-	20000	20000	20000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20000	HH	20000	HH
2-Hexanone	591-78-6	-	-	-	-	-	1400	1400	1400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1250 [z]	-	1250 [z]	Eco	1400	HH
2-Methylnaphthalene	91-57-6	-	-	-	-	-	4100	4100	4100	-	***	-	***	***	-	-	-	-	-	-	-	-	-	-	-	-	-	***	***	-	4100	HH	4100	HH
2-Methylphenol	95-48-7	-	-	-	-	-	31000	31000	31000	-	-	-	-	-	50	-	-	16000	50	-	-	-	-	-	-	-	-	50	50	-	50	Eco	31000	HH
2-Nitroaniline	88-74-4	-	-	-	-	-	6000	6000	6000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6000	HH	6000	HH
2-Nitrophenol	88-75-5	-	-	-	-	-	-	-	180000 [o]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	180000 [o]	HH	180000 [o]	HH
3,3'-Dichlorobenzidine	91-94-1	4.8	37	1000	-	-	3.8	4.8	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.8	HH	4.8	HH
3-Nitroaniline	99-09-2	-	-	-	-	-	-	-	6000 [q]	-	-	-	-	-	70	-	-	-	70	-	-	-	-	-	-	-	-	70	70	-	70	Eco	6000 [q]	HH
4,4'-DDD	72-54-8	11	83	2300	-	-	7.2	11	11	-	-	0.093	0.021	0.021	-	-	0.01	100	0.01	-	-	-	-	-	-	-	-	0.021	0.021	-	0.021	Eco	11	HH
4,4'-DDE	72-55-9	7.7	58	1600	-	-	5.1	7.7	7.7	-	-	0.093	0.021	0.021	-	-	0.01	100	0.01	-	-	-	-	-	-	-	-	0.021	0.021	-	0.021	Eco	7.7	HH
4,4'-DDT	50-29-3	7.7	58	1600	-	-	7	7.7	7.7	-	-	0.093	0.021	0.021	-	-	0.01	100	0.01	-	-	-	-	-	-	-	-	0.021	0.021	-	0.021	Eco	7.7	HH
4,6-Dinitro-2-methylphenol	534-52-1	-	-	-	-	-	49	49	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49	HH	49	HH
4-Bromophenyl Phenyl Ether	101-55-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	59-50-7	-	-	-	-	-	62000	62000	62000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	62000	HH	62000	HH
4-Chloroaniline	106-47-8	-	-	-	-	-	8.6	8.6	8.6	-	-	-	-	-	40	-	-	-	40	-	-	-	-	-	-	-	-	40	40	-	8.6	HH	8.6	HH
4-Chlorophenyl Phenyl Ether	7005-72-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorotoluene	106-43-4	-	-	-	-	-	72000	72000	72000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72000	HH	72000	HH
4-Isopropyltoluene	99-87-6	-	-	-	-	-	-	-	24000 [bu]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200 [x]	-	200 [x]	Eco	24000 [bu]	HH
4-Methyl-2-pentanone (MIBK)	108-10-1	-	-	-	-	-	53000	53000	53000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1250 [z]	-	1250 [z]	Eco	53000	HH
4-Nitroaniline	100-01-6	-	-	-	-	-	86	86	86	-	-	-	-	-	40	-	-	-	40	-	-	-	-	-	-	-	-	40	40	-	40	Eco	86	HH
4-Nitrophenol	100-02-7	-	-	-	-	-	-	-	180000 [o]	-	-	-	-	-	10	7	-	-	7	-	7	-	-	7	-	-	-	7	7	-	7	Eco	180000 [o]	HH
Acenaphthene	83-32-9	61000	19000	-	-	-	33000	19000	19000	-	***	-	***	***	20	-	-	-	20	20	-	-	-	20	-	-	-	***	***	-	19000	HH	19000	HH
Acenaphthylene	208-96-8	-	-	-	-	-	-	-	23 [g]	-	***	-	***	***	-	-	-	-	-	-	-	-	-	-	-	-	-	***	***	-	23 [g]	HH	23 [g]	HH
Acetone	67-64-1	-	-	-	-	-	630000	630000	630000	-	-	-	-	-	-	-	-	1250	1250	-	-	-	-	-	-	-	-	1250	1250	-	1250	Eco	630000	HH
Aldrin	309-00-2	0.13	0.98	27	-	-	0.1	0.13	0.13	-	-	0.022	0.0049	0.0049	-	-	-	25	25	-	-	-	-	-	-	-	-	0.0049	0.0049	-	0.0049	Eco	0.13	HH
Aluminum	7429-90-5	-	-	-	-	-	990000	990000	990000	*	-	-	-	-	50	600	450	107	50	50	-	-	-	50	5	-	5	50	50	31400	31400	UPL	990000	HH
Aniline	62-53-3	-	-	-	-	-	300	300	300	*	-	-	-	-	200	-	-	-	200	-	-	-	-	-	-	-	-	200	200	-	200	Eco	300	HH
Anthracene	120-12-7	-	93000	-	-	-	170000	93000	93000	-	***	-	***	***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	***	-	93000	HH	93000	HH
Antimony	7440-36-0	-	-	-	-	-	410	410	410	-	78	-	0.27	0.27	5	-	-	15	5	5	-	-	-	5	0.5	-	0.5	0.27	0.27	0.176	0.27	Eco	410	HH
Aroclor 1016	12674-11-2	-	-	-	-	-	21	21	21	-	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	2.51	2.51	100	0.371 [aa]	-	0.371 [aa]	Eco	21	HH
Aroclor 1221	11104-28-2	-	-	-	-	-	0.54	0.54	0.54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.371 [aa]	-	0.371 [aa]	Eco	0.54	HH
Aroclor 1232	11141-16-5	-	-	-	-	-	0.54	0.54	0.54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.371 [aa]	-	0.371 [aa]	Eco	0.54	HH
Aroclor 1242	53469-21-9	-	-	-	-	-	0.74	0.74	0.74	-	-	-	-	-	-	-	1.5	5	1.5	-	-	-	-	-	-	-	-	1.5	0.371 [aa]	-	0.371 [aa]	Eco	0.74	HH
Aroclor 1248	12672-29-6	-	-	-	-	-	0.74	0.74	0.74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.371 [aa]	-	0.371 [aa]	Eco	0.74	HH
Aroclor 1254	11097-69-1	-	-	-	-	-	0.74	0.74	0.74	-	-	-	-	-	-	-	0.7	4	0.7	40	-	-	-	40	10	2.51	2.51	0.7	0.371 [aa]	-	0.371 [aa]	Eco	0.74	HH
Aroclor 1260	11096-82-5	-	-	-	-	-	0.74	0.74	0.74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.371 [aa]	-	0.371 [aa]	Eco	0.74	HH
Aroclor 1262	37324-23-5	-	-	-	-	-	-	-	0.54 [a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.371 [aa]	-	0.371 [aa]	Eco	0.54 [a]	HH
Aroclor 1268	11100-14-4	-	-	-	-	-	-	-	0.54 [a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.371 [aa]	-	0.371 [aa]	Eco	0.54 [a]	HH
Arsenic	7440-38-2	1.7	13	370	-	-	1.6	1.7	1.7	18	-	43	46	18	10	60	10	29	10	10	60	102	9.9	9.9	1	0.25	0.25	18	18	5.40	5.40	UPL	5.40	UPL
Barium	7440-39-3	-	60000	-	-	-	190000	60000	60000	-	330	-	2000	330	500	3000	85	638	85	500	-	283	329	283	5	-	5	330	330	169	330	Eco	60000	HH
Benzo(a)anthracene	56-55-3	2.7	21	590	-	-	2.1	2.7	2.7	-	***	-	***	***	-	-	-	-	-	-	-	-	-	-	1.2	25	1.2	***	***	-	2.7	HH	2.7	HH
Benzene	71-43-2	34	340	9500	50	1.2	5.4	1.2	1.2	-	-	-	-	-	-	-	-	3300	3300	-	-	-	-	-	-	-	-	3300	3300	-	1.2	HH	1.2	HH
Benzidine	92-87-5	55	510	14000	-	-	0.0075	55	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55	HH	55	HH
Benzo(a)pyrene	50-32-8	0.27	2.1	59	-	-	0.21	0.27	0.27	-	***	-	***	***	-	-	-	125	125	-	-	-	-	-	1.2	25	1.2	***	***	-	0.27	HH	0.27	HH
Benzo(b)fluoranthene	205-99-2	2.7	21	590	-	-	2.1	2.7	2.7	-	***	-	***	***	-	-	-	-	-	-	-	-	-	-	1.2	25	1.2	***	***	-	2.7	HH	2.7	HH
Benzo(g,h,i)perylene	191-24-2	-	-	-	-	-	-	-	27 [b]	-	***	-	***	***	-	-	-	-	-	-	-	-	-	-	-	-	-	***	***	-	27 [b]	HH	27 [b]	HH
Benzo(j,k)flouranthenes	205-82-3 & 207-08-9	-	-	-	-	-	-	-	27 [bv]	-	***	-	***	***	-	-	-	-	-	-	-	-	-	-	-	-	-	***	***	-	27 [bv]	HH	27 [bv]	HH
Benzo(k)fluoranthene	207-08-9	27	210	5900	-	-	21	27	27	-	***	-	***	***	-	-	-	-	-	-	-	-	-	-	1.2	25	1.2	***	***	-	27	HH	27	HH
Benzofluoranthenes, Total	56832-73-6	-	-	-	-	-	-	-	2.7 [bx]	-	***	-	***	***	-	-	-	-	-	-	-	-	-	-	-	-	-	***	***	-	2.7 [bx]	HH	2.7 [bx]	HH
Benzoic Acid	65-85-0	-	-	-	-	-	2500000	2500000	2500000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200 [x]	-	200 [x]	Eco	2500000	HH
Benzyl Alcohol	100-51-6	-	-	-	-	-	62000	62000	62000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.26 [ah]	-	2.26 [ah]	Eco	62000	HH
Beryllium	7440-41-7	2000	610	17000	-	-	2000	610	610	-	40	-	21	21	10	-	-	83	10	10	-	-	-	10	0.1	-	0.1	21	21	0.659	21	Eco	610	HH
BHC (alpha)	319-84-6	0.34	2.6	74	-	-	0.27	0.34	0.34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8 [ac]	-	0.34	HH	0.34	HH
BHC (beta)	319-85-7	-	-	-	-	-	0.96	0.96	0.96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8 [ac]	-	0.96	HH	0.96	HH
BHC (delta)	319-86-8	-	-	-	-	-	-	-	0.34 [c]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8 [ac]	-	0.34 [c]	HH	0.34 [c]	HH
BHC (gamma) Lindane	58-89-9	2	15	420	-	-	2.1	2	2	-	-	-	-	-	-	-	8	1000	8	-	-	-	-	-	-	-	-	8	8	-	2	HH	2	HH
Bis(2-chloroethoxy)methane	111-91-1	-	-	-	-	-	1800	1800	1800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730 [ak]	-	730 [ak]	Eco	1800	HH
Bis(2-chloroethyl) Ether	111-44-4	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	HH	1	HH
Bis(2-chloroisopropyl) Ether	39638-32-9 or 108-60-1	-	-	-	-	-	-	-	1 [f]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 [f]	HH	1 [f]	HH
Bis(2-ethylhexyl) Phthalate	117-81-7	150	1200	33000	-	-	120	150	150	-	-	-	-	-	-	-	4.5	1020	4.5	-	-	-	-	-	-	-	-	4.5	4.5	-	4.5	Eco	150	HH
Bromobenzene	108-86-1	-	-	-	-	-	1800	1800	1800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1800	HH	1800	HH
Bromochloromethane	74-97-5	-	-	-	-	-	-	-	1.9 [s]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730 [ak]	-	1.9 [s]	HH	1.9 [s]	HH

Table J-1a - Miniumum Potentially Applicable Soil SLVs for Identification of Preliminary COPCs
Bradford Island, Upland Operable Unit
(2 of 3)

		Candidate Human Health Soil Screening Level Values (mg/kg)								Candidate Ecological Soil Screening Level Values (mg/kg)																							
										USEPA Eco SSL[am-be]					DEQ Level II SLV[br]						ORNL					USEPA TRVs[Bi]								
Analyte	CAS #	DEQ Soil Ingest Occupational RBC [s]	DEQ Soil Ingest Construction RBC [u]	DEQ Soil Ingest Excavation RBC [u]	DEQ Soil Volatilize Outdoor Occupational RBC [u]	DEQ Soil Vapor Intrusion Occupational RBC [u]	USEPA Soil Indust RSL [v]	Selected Human Health Soil SLV [w]	Selected Human Health Soil SLV with Surrogates [w]	Plant Eco SSL	Inverte-brate Eco SSL	Avian Eco SSL	Mammal Eco SSL	Lowest USEPA Eco SSL	Plant Level II SLV	Inverte-brate Level II SLV	Avian Level II SLV	Mammal Level II SLV	Lowest DEQ Level II SLV	Plant ORNL[bg]	Inverte-brate ORNL[bh]	Avian ORNL PRG [bi]	Mammal ORNL PRG [bi]	Lowest ORNL	Plant TRV	Inverte-brate TRV	Lowest USEPA TRV	Selected Soil Ecological SLV [bk]	Selected Ecological Soil SLV with Surrogates [bk]	Site-Specific Reference UPL	Selected Min. Potentially Applicable Soil SLV (0-1 & 0-3 ft bgs) [bl]	SLV (0-1 & 0-3 ft bgs): HH or Eco	Selected Min. Potentially Applicable Soil SLV (0-10 ft bgs) [bl]	SLV (0-10 ft bgs): HH
Bromodichloromethane	75-27-4	15	210	5800	11	1.9	1.4	1.9	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730 [ak]	-	1.9	HH	1.9	HH
Bromoform	75-25-2	360	2700	76000	-	-	220	360	360	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	360	HH	360	HH
Bromomethane	74-83-9	710	330	9200	700	17	32	17	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730 [ak]	-	17	HH	17	HH
Butyl Benzyl Phthalate	85-68-7	-	-	-	-	-	910	910	910	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.45 [ad]	-	0.45 [ad]	Eco	910	HH
Cadmium	7440-43-9	500	150	4300	-	-	800 [s]	150	150	32	140	0.77	0.36	0.36	4	20	6	125	4	4	20	4.2	6	4	0.2	10	0.2	0.36	0.36	0.271	0.36	Eco	150	HH
Calcium	7440-70-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10400	10400	UPL	10400	UPL
Carbazole	86-74-8	-	-	-	-	-	-	-	1000 [bs]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.26 [ah]	-	2.26 [ah]	Eco	1000 [bs]	HH
Carbon Disulfide	75-15-0	-	-	-	-	-	3700	3700	3700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000 [al]	-	1000 [al]	Eco	3700	HH
Carbon Tetrachloride	56-23-5	15	150	4100	26	0.63	3	0.63	0.63	-	-	-	-	-	-	1000	-	2000	1000	-	-	-	-	-	-	-	-	1000	1000	-	0.63	HH	0.63	HH
Carbon, Total Organic	7440-44-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlordane (alpha)	5103-71-9	-	-	-	-	-	-	-	7.2 [d]	-	-	-	-	-	-	-	9	250	9	-	-	-	-	-	-	-	-	9	9 [ae]	-	7.2 [d]	HH	7.2 [d]	HH
Chlordane (gamma)	5103-74-2	-	-	-	-	-	-	-	7.2 [d]	-	-	-	-	-	-	-	9	250	9	-	-	-	-	-	-	-	-	9	9 [ae]	-	7.2 [d]	HH	7.2 [d]	HH
Chlordane (technical)	12789-03-6	7.2	55	1500	-	-	6.5	7.2	7.2	-	-	-	-	-	-	-	9	250	9	-	-	-	-	-	-	-	-	9	9 [ae]	-	7.2	HH	7.2	HH
Chlorobenzene	108-90-7	8300	4300	-	-	-	1400	4300	4300	-	-	-	-	-	-	40	-	-	40	-	40	-	-	40	-	-	-	40	40	-	40	Eco	4300	HH
Chloroethane	75-00-3	-	-	-	-	-	61000	61000	61000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61000	HH	61000	HH
Chloroform	67-66-3	25	380	11000	17	0.41	1.5	0.41	0.41	-	-	-	-	-	-	-	-	1875	1875	-	-	-	-	-	-	-	-	1875	1875	-	0.41	HH	0.41	HH
Chloromethane	74-87-3	25000	25000	-	-	300	500	300	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730 [ak]	-	300	HH	300	HH
Chromium	7440-47-3	190	920	26000	-	-	5.6	190	190 [bv]	-	-	26	34	26	-	-	-	410	410	1	0.4	16.1	110	0.4	0.018	-	0.018	26	26	28.1	28.1	UPL	190 [bv]	HH
Chrysene	218-01-9	270	2100	59000	-	-	210	270	270	-	***	-	***	***	-	-	-	-	-	-	-	-	-	-	1.2	25	1.2	***	***	-	270	HH	270	HH
cis-1,2-Dichloroethene	156-59-2	10000	3100	86000	-	-	10000	3100	3100	-	-	-	-	-	-	-	-	2500	2500	-	-	-	-	-	-	-	-	2500	2500	-	2500	Eco	3100	HH
cis-1,3-Dichloropropene	10061-01-5	-	-	-	-	-	8.1	8.1	8.1 [e]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.1 [e]	HH	8.1 [e]	HH
Cobalt	7440-48-4	-	-	-	-	-	300	300	300	13	-	120	230	13	20	1000	-	150	20	20	-	-	-	20	-	-	-	13	13	19.9	19.9	UPL	300	HH
Copper	7440-50-8	41000	12000	-	-	-	41000	12000	12000	70	80	28	49	28	100	50	190	390	50	100	50	515	370	50	1	32	1	28	28	56.7	56.7	UPL	12000	HH
Dalapon	75-99-0	-	-	-	-	-	18000	18000	18000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18000	HH	18000	HH
Dibenz(a,h)anthracene	53-70-3	0.27	2.1	59	-	-	0.21	0.27	0.27	-	***	-	***	***	-	-	-	-	-	-	-	-	-	-	1.2	25	1.2	***	***	-	0.27	HH	0.27	HH
Dibenzofuran	132-64-9	-	-	-	-	-	1000	1000	1000	-	-	-	-	-	-	-	-	0.002	0.002	-	-	-	-	-	-	-	-	0.002	0.002	-	0.002	Eco	1000	HH
Dibromochloromethane	124-48-1	34	260	7200	-	-	3.3	34	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730 [ak]	-	34	HH	34	HH
Dibromomethane	74-95-3	-	-	-	-	-	110	110	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730 [ak]	-	110	HH	110	HH
Dibutyltin	1002-53-5	-	-	-	-	-	180	180	180	-	-	-	-	-	-	-	28	1300	28	-	-	-	-	-	-	-	-	28	28 [ag]	-	28 [ag]	Eco	180	HH
Dicamba	1918-00-9	-	-	-	-	-	18000	18000	18000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18000	HH	18000	HH
Dichlorodifluoromethane	75-71-8	-	-	-	-	-	780	780	780	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730 [ak]	-	730 [ak]	Eco	780	HH
Dichloromethane (Methylene Chloride)	75-09-2	310	2700	75000	830	20	53	20	20	-	-	-	-	-	-	-	-	730	730	-	-	-	-	-	-	-	-	730	730	-	20	HH	20	HH
Dichlorprop	120-36-5	-	-	-	-	-	-	-	4900 [br]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.021 [aj]	-	0.021 [aj]	Eco	4900 [br]	HH
Dieldrin	60-57-1	0.13	1	29	-	-	0.11	0.13	0.13	-	-	0.022	0.0049	0.0049	-	-	0.3	3	0.3	-	-	-	-	-	-	-	-	0.0049	0.0049	-	0.0049	Eco	0.13	HH
Diesel Range Organics	68334-30-5	70000	23000	-	-	-	-	23000	23000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23000	HH	23000	HH
Diethyl Phthalate	84-66-2	-	-	-	-	-	490000	490000	490000	-	-	-	-	-	100	-	-	250000	100	100	-	-	-	100	-	-	-	100	100	-	100	Eco	490000	HH
Dimethyl Phthalate	131-11-3	-	-	-	-	-	-	-	150 [i]	-	-	-	-	-	-	200	-	-	200	-	200	-	-	200	-	-	-	200	200	-	150 [i]	HH	150 [i]	HH
Di-n-butyl Phthalate	84-74-2	-	-	-	-	-	62000	62000	62000	-	-	-	-	-	200	-	0.45	30000	0.45	200	-	-	-	200	-	-	-	0.45	0.45	-	0.45	Eco	62000	HH
Di-n-octyl Phthalate	117-84-0	-	-	-	-	-	-	-	150 [i]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.45 [ad]	-	0.45 [ad]	Eco	150 [i]	HH
Dinoseb	88-85-7	-	-	-	-	-	620	620	620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	620	HH	620	HH
Endosulfan I	959-98-8	4600	1400	40000	-	-	3700	1400	1400 [f]	-	-	-	-	-	-	-	42	20	20	-	-	-	-	-	-	-	-	20	20 [f]	-	20 [f]	Eco	1400 [f]	HH
Endosulfan II	33213-65-9	4600	1400	40000	-	-	3700	1400	1400 [f]	-	-	-	-	-	-	-	42	20	20	-	-	-	-	-	-	-	-	20	20 [f]	-	20 [f]	Eco	1400 [f]	HH
Endosulfan Sulfate	1031-07-8	4600	1400	40000	-	-	3700	1400	1400 [f]	-	-	-	-	-	-	-	42	20	20	-	-	-	-	-	-	-	-	20	20 [f]	-	20 [f]	Eco	1400 [f]	HH
Endrin	72-20-8	230	71	2000	-	-	180	71	71	-	-	-	-	-	-	-	0.04	5	0.04	-	-	-	-	-	-	-	-	0.04	0.0049 [bm]	-	0.0049 [bm]	Eco	71	HH
Endrin Aldehyde	7421-93-4	-	-	-	-	-	-	-	71 [t]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0049 [bm]	-	0.0049 [bm]	Eco	71 [t]	HH
Endrin Ketone	53494-70-5	-	-	-	-	-	-	-	71 [t]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0049 [bm]	-	0.0049 [bm]	Eco	71 [t]	HH
Ethylbenzene	100-41-4	140	1600	44000	160	12	27	12	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.26 [ah]	-	2.26 [ah]	Eco	12	HH
Fluoranthene	206-44-0	29000	8900	-	-	-	22000	8900	8900	-	***	-	***	***	-	-	-	-	-	-	-	-	-	-	-	-	-	***	***	-	8900	HH	8900	HH
Fluorene	86-73-7	41000	12000	-	-	-	22000	12000	12000	-	***	-	***	***	-	30	-	-	30	-	30	-	-	30	-	-	-	***	***	-	12000	HH	12000	HH
Gasoline Range Organics	8006-61-9	22000	13000	-	100000	-	-	13000	13000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13000	HH	13000	HH
Heptachlor	76-44-8	0.48	3.7	100	-	-	0.38	0.48	0.48	-	-	-	-	-	-	-	-	15	15	-	-	-	-	-	1	-	1	15	15	-	0.48	HH	0.48	HH
Heptachlor Epoxide	1024-57-3	0.24	1.8	51	-	-	0.19	0.24	0.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15 [y]	-	0.24	HH	0.24	HH
Hexachlorobenzene	118-74-1	1.8	14	380	-	-	1.1	1.8	1.8	-	-	-	-	-	-	1000	-	-	1000	-	-	-	-	-	-	-	-	1000	1000	-	1.8	HH	1.8	HH
Hexachlorobutadiene	87-68-3	-	-	-	-	-	22	22	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	HH	22	HH
Hexachlorocyclopentadiene	77-47-4	-	-	-	-	-	3700	3700	3700	-	-	-	-	-	10	-	-	-	10	10	-	-	-	10	0.1	-	0.1	10	10	-	10	Eco	3700	HH
Hexachloroethane	67-72-1	150	240	6600	-	-	120	150	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	150	HH	150	HH
Indeno(1,2,3-cd)pyrene	193-39-5	2.7	21	590	-	-	2.1	2.7	2.7	-	***	-	***	***	-	-	-	-	-	-	-	-	-	-	1.2	25	1.2	***	***	-	2.7	HH	2.7	HH
Iron	7439-89-6	-	-	-	-	-	720000	720000	720000	**	**	**	**	-	10	200	-	-	10	-	-	-	-	-	-	-	-	10	10	36900	36900	UPL	720000	HH
Isophorone	78-59-1	-	-	-	-	-	1800	1800	1800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1800	HH	1800	HH
Isopropylbenzene	98-82-8	53000	24000	-	-	-	11000	24000	24000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.26 [ah]	-	2.26 [ah]	Eco	24000	HH
Lead	7439-92-1	800	800	800	-	-	800	800	800	120	1700	11	56	11	50	500	16	4000	16	50	500	40.5	740	40.5	4.6	100	4.6	11	11	25.5	25.5	UPL	800	HH
m,p-Xylenes	179601-23-1	25000	19000	-	-	-	-	19000	2700 [h]	-	-	-	-	-	-	-	-	120	120	-	-	-	-	-	-	-	-	120	120 [bq]	-	120 [bq]	Eco	2700 [h]	HH
Magnesium	7439-95-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12400	12400	UPL	12400	UPL
Manganese	7439-96-5	23000	7200	-	-	-	23000 [l]	7200	7200	220	450	4300	4000	220	500	100	4125	11000	100	500	-	-	-	500	-	-	-	220	220	885	885	UPL	7200	HH
MCPA	94-74-6	380	120	3300	-	-	310	120	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.021 [aj]	-	0.021 [aj]	Eco	120	HH
MCPP	93-65-2	-	-	-	-	-	620	620	620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.021 [aj]	-	0.021 [aj]	Eco	620	HH
Mercury	7439-97-6	310	93	2600	-	-	34	93	93	-	-	-	-	-	0.3	0.1	1.5	73	0.1	0.3	0.1	0.00051	0.146	0.00051	-	2.5	2.5	0.1	0.00051 [bn]	0.0660	0.066	UPL	93	HH
Methoxychlor	72-43-5	-	-	-	-	-	3100	3100	3100	-	-	-	-	-	-	-	-	500	500	-	-	-	-	-	-	-	-	500	500	-	500	Eco	3100	HH
Monobutyltin	78763-54-9	-	-	-	-	-	-	-	180 [bo]	-	-	-	-	-	-	-	28	1300	28	-	-	-	-	-	-	-	-	28	28 [ag]	-	28 [ag]	Eco	180 [bo]	HH
Naphthalene	91-20-3	23	580	16000	27	99	18	23	23	-	***	-	***	***	10	-	-	3900	10	-	-	-	-	-	-	-	-	***	***	-	23	HH	23	HH
n-Butylbenzene	104-51-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	7440-02-0	20000	6100	-	-	-	20000	6100	6100	38	280	210	130	38	30	200	320	625	30	30	200	121	246	30	25	100	25	38	38	26.5	38	Eco	6100	HH
Nitrobenzene	98-95-3	-	-	-	-	-	24	24	24	-	-	-	-	-	8	40	-	-	8	-	40	-	-	40	-	2.26	2.26	8	8	-	8	Eco	24	HH
N-Nitrosodimethylamine	62-75-9	-	-	-	-	-	0.034	0.034	0.034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.034	HH	0.034	HH
N-Nitrosodi-n-propylamine	621-64-7	-	-	-	-	-	0.25	0.25	0.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.25	HH	0.25	HH
N-Nitrosodiphenylamine	86-30-6	-	-	-	-	-	350	350	350	-	-	-	-	-	-	20	-	-	20	-	20	-	-	20	-	-	-	20	20	-	20	Eco	350	HH
n-Propylbenzene	103-65-1	-	-	-	-	-	21000	21000	21000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.26 [ah]	-	2.26 [ah]	Eco	21000	HH
o-Xylene	95-47-6	-	-	-	-	-	19000	19000	19000	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	1	1	-	1	Eco	19000	HH
p-cresol (4-Methylphenol)	106-44-5	-	-	-	-	-	3100	3100	3100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50 [p]	-	50 [p]	Eco	3100	HH
Pentachlorophenol	87-86-5	13	100	2900	-	-	9	13	13	5	31	2.1	2.8	2.1	3	4	-	30	3	3	6	-	-	3	1.73	10	1.73	2.1	2.1	-	2.1	Eco	13	HH
Phenanthrene	85-01-8	-	-	-	-	-	-	-	93000 [bt]	-	***	-	***	***	-	-	-	-	-	-	-	-	-	-	-	-	-	***	***	-	93000 [bt]	HH	93000 [bt]	HH
Phenol	108-95-2	-	-	-	-	-	180000	180000	180000	-	-	-	-	-	70	30	-	-	30	70	30	-	-	30	-	-	-	30	30	-	30	Eco	180000	HH
Potassium	7440-09-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2050	2050	UPL	2050	UPL
Pyrene	129-00-0	21000	6700	-	-	-	17000	6700	6700	-	***	-	***	***	-	-	-	-	-	-	-	-	-	-	-	-	-	***	***	-	6700	HH	6700	HH
Residual Range Organics	RRO	-	40000	-	-	-	-	40000	40000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40000	HH	40000	HH
sec-Butylbenzene	135-98-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.26 [ah]	-	2.26 [ah]	Eco	-	-
Selenium	7782-49-2	-	-	-	-	-	5100	5100	5100	0.52	4.1	1.2	0.63	0.52	1	70	2	25	1	1	70	0.000001	0.000001	0.000001	0.05	7.7	0.05	0.52	0.52	0.500	0.52	Eco	5100	HH
Silver	7440-22-4	5100	1500	43000	-	-	5100	1500	1500	560	-	4.2	14	4.2	2	50	-	-	2	2	-	-	-	2	0.02	-	0.02	4.2	4.2	0.187	4.2	Eco	1500	HH
Sodium	7440-23-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	341	341	UPL	341	UPL
Solids, Total	TS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	100-42-5	-	51000	-	-	-	36000	51000	51000	-	-	-	-	-	300	-	-	-	300	300	-	-	-	300	-	-	-	300	300	-	300	Eco	51000	HH
tert-Butylbenzene	98-06-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.26 [ah]	-	2.26 [ah]	Eco	-	-
Tetrabutyltin	1461-25-2	-	-	-	-	-	-	-	180 [bo]	-	-	-	-	-	-	-	28	1300	28	-	-	-	-	-	-	-	-	28	28 [ag]	-	28 [ag]	Eco	180 [bo]	HH
Tetrachloroethene (PCE)	127-18-4	5.1	40	1100	66	1.6	2.6	1.6	1.6	-	-	-	-	-	10	-	-	80	10	-	-	-	-	-	-	-	-	10	10	-	1.6	HH	1.6	HH
Thallium	7440-28-0	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	1	1	-	-	2.1	1	0.01	-	0.01	1	1	0.203	1	Eco	0.203	UPL
Toluene	108-88-3	77000	24000	-	-	-	45000	24000	24000	-	-	-	-	-	200	-	-	1440	200	200	-	-	-	200	-	-	-	200	200	-	200	Eco	24000	HH
Total PCBs		0.98	4.4	120	-	-	0.74	0.74	0.74 [bp]	-	-	-	-	-	40	-	-	4	4	40	-	0.655	0.371	0.371	-	-	-	4	0.371 [aa]	-	0.371 [aa]	Eco	0.74 [bp]	HH

Table J-1a - Miniumum Potentially Applicable Soil SLVs for Identification of Preliminary COPCs
Bradford Island, Upland Operable Unit
(3 of 3)

		Candidate Human Health Soil Screening Level Values (mg/kg)								Candidate Ecological Soil Screening Level Values (mg/kg)																						
										USEPA Eco SSL[am-be]					DEQ Level II SLV[bf]					ORNL					USEPA TRVs[Bi]							
Analyte	CAS #	DEQ Soil Ingest Occupational RBC [u]	DEQ Soil Ingest Construction RBC [u]	DEQ Soil Ingest Excavation RBC [u]	DEQ Soil Volatilize Outdoor Occupational RBC [u]	DEQ Soil Vapor Intrusion Occupational RBC [u]	USEPA Soil Indust RSL [v]	Selected Human Health Soil SLV [w]	Selected Human Health Soil SLV with Surrogates [w]	Plant Eco SSL	Inverte-brate Eco SSL	Avian Eco SSL	Mammal Eco SSL	Lowest USEPA Eco SSL	Plant Level II SLV	Inverte-brate Level II SLV	Avian Level II SLV	Mammal Level II SLV	Lowest DEQ Level II SLV	Plant ORNL[bg]	Inverte-brate ORNL[bh]	Avian ORNL PRG [bi]	Mammal ORNL PRG [bi]	Lowest ORNL	Plant TRV	Inverte-brate TRV	Lowest USEPA TRV	Selected Soil Ecological SLV [bk]	Selected Ecological Soil SLV with Surrogates [bk]	Site-Specific Reference UPL	Selected Min. Potentially Applicable Soil SLV (0-1 & 0-3 ft bgs) [bl]	SLV (0-1 & 0-3 ft bgs): HH or Eco	Selected Min. Potentially Applicable Soil SLV (0-10 ft bgs) [bl]	SLV (0-10 ft bgs): HH
Total PAH		-	-	-	-	-	-	-	-	-	***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total LPAH		-	-	-	-	-	-	-	-	-	29	-	100	29	-	-	-	-	-	-	-	-	-	-	-	-	-	29	29	-	29	Eco	-	-
Total HPAH		-	-	-	-	-	-	-	-	-	18	-	1.1	1.1	-	-	-	-	-	-	-	-	-	-	1.2	25	1.2	1.1	1.1	-	1.1	Eco	-	-
Toxaphene	8001-35-2	2	15	420	-	-	1.6	2	2	-	-	-	-	-	-	-	-	1000	1000	-	-	-	-	-	-	-	-	1000	1000	-	2	HH	2	HH
trans-1,2-Dichloroethene	156-60-5	9200	4500	-	-	200	690	200	200	-	-	-	-	-	-	-	-	2500	2500	-	-	-	-	-	-	-	-	2500	2500	-	200	HH	200	HH
trans-1,3-Dichloropropene	10061-02-6	-	-	-	-	-	8.1	8.1	8.1 [e]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.1 [e]	HH	8.1 [e]	HH
Tributyltin	688-73-3	-	-	-	-	-	180	180	180	-	-	-	-	-	-	-	28	1300	28	-	-	-	-	-	-	-	-	28	28 [aj]	-	28 [aj]	Eco	180	HH
Trichloroethene (TCE)	79-01-6	3.9	43	1200	4.3	0.13	14	0.13	0.13	-	-	-	-	-	-	-	-	40	40	-	-	-	-	-	-	-	-	40	40	-	0.13	HH	0.13	HH
Trichlorofluoromethane	75-69-4	-	63000	-	-	-	3400	63000	63000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730 [ak]	-	730 [ak]	Eco	63000	HH
Vanadium	7440-62-2	-	-	-	-	-	72	72	72	-	-	7.8	280	7.8	2	-	47	25	2	2	-	-	55	2	-	-	-	7.8	7.8	104	104	UPL	104	UPL
Vinyl Acetate	108-05-4	-	-	-	-	-	4100	4100	4100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4100	HH	4100	HH
Vinyl Chloride	75-01-4	3.9	30	830	89	2.2	1.7	2.2	2.2	-	-	-	-	-	-	-	-	20	20	-	-	-	-	-	-	-	-	20	20	-	2.2	HH	2.2	HH
Zinc	7440-66-6	-	-	-	-	-	310000	310000	310000	160	120	46	79	46	50	200	60	20000	50	50	200	8.5	1600	8.5	0.9	199	0.9	46	46	71.7	71.7	UPL	310000	HH

Note

Human Health Screening Levels correspond to a target risk of 1E-06 for carcinogens and target hazard quotient of 1.0 for non-carcinogens for the selected receptor and pathway.
MCLs incorporate considerations of risk as well as feasibility in attaining target level.
- = No benchmark available
DEQ = Oregon Department of Environmental Quality
Eco SSL = Ecological Soil Screening Level
USEPA = US Environmental Protection Agency
HMW = High Molecular Weight
LMW = Low Molecular Weight
MCL = Maximum Contaminant Level
mg/kg = milligram per kilogram dry weight
ORNL = Oak Ridge National Laboratory
PAH = Polycyclic Aromatic Hydrocarbons
PRG = Preliminary Remediation Goal
RBC = Risk Based Concentrations
RI = Remedial Investigation
RSL = Regional Screening Level
SLV = Screening Level Value
TRV = Toxicity Reference Value
UPL = Upper Prediction Limit

* = Eco SSL is dependent on pH.
** = Eco SSL is a determination of the geochemical conditions (i.e., pH and Eh at a minimum) of the environmental setting, as well as the presence of iron floc and the toxic metals, is critical to the determination of the relative importance of iron at a site.
*** = PAH Eco SSLs are based on Total LMW PAHs (Invert. Eco SSL = 29 mg/kg and Mammal Eco SSL = 100 mg/kg) and Total HMW PAHs (Invert. Eco SSL = 18 mg/kg and Mammal Eco SSL = 1.1 mg/kg).
LMW PAHs include: 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Fluorene, Naphthalene, and Phenanthrene.
HWM PAHs include : Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(j,k)flouranthenes, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, and Pyrene.

[a] Aroclor 1221 was used as a surrogate because there was no chemical specific SLV.
[b] Toxic Equivalency Factors for Benzo(g,h,i)perylene (0.01) was applied to the Benzo(a)pyrene SLV because there was no chemical specific SLV.
[c] BHC alpha was used as a surrogate, because there was no chemical-specific SLV, and BHC alpha was the lowest BHC.
[d] Chlordane (technical) was used as a surrogate because there was no chemical specific SLV.
[e] 1,3- Dichloropropene was used as a surrogate because there was no chemical specific SLV.
[f] Endosulfan was used as a surrogate because there was no chemical specific SLV.
[g] The SLV for naphthalene was used as a surrogate because there was no chemical-specific SLV.
[h] Xylene (mixed) was used as a surrogate because there was no chemical specific SLV.
[i] Dibutyltin compounds was used as a surrogate because there was no chemical specific SLV.
[j] Manganese (water) was used as opposed to Manganese (diet).
[k] Cadmium (diet) was used as opposed to Cadmium (water).
[l] Bis(2-ethylhexyl) Phthalate was used as a surrogate, because there was no chemical-specific SLV, and Bis(2-ethylhexyl) Phthalate was the lowest phthalate.
[m] 1,4- Dichlorobenzene was used as a surrogate because there was no chemical specific SLV.
[n] 1,2- Dichloropropane was used as a surrogate because there was no chemical specific SLV.
[o] Phenol was used as a surrogate because there was no chemical specific SLV.
[p] 2-Methylphenol was used as a surrogate because there was no chemical specific SLV.
[q] 2-Nitroaniline was used as a surrogate because there was no chemical specific SLV.
[r] Bis(2-chloroethyl) ether was used as a surrogate because there was no chemical specific SLV.
[s] Bromodichloromethane was used as a surrogate because there was no chemical specific SLV.
[t] Endrin was used as a surrogate because there was no chemical specific SLV.
[u] DEQ 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
[v] US Environmental Protection Agency (USEPA) 2009. Regional Screening Level. December.
[w] Human Health Hierarchical SLV Selection: 1. DEQ RBCs (the minimum of Ingest Occupational, Ingest Construction, Ingest Excavation, Volatize Outdoor, and Vapor Intrusion) and 2. USEPA Soil RSL.
[x] Toluene was used as a surrogate because there was no chemical specific SLV.
[y] Heptachlor was used as a surrogate because there was no chemical specific SLV.
[z] Acetone was used as a surrogate because there was no chemical specific SLV.
[ab] The lowest PRG (mammal) for Total PCBs was used as a surrogate because the SLV is based on bioaccumulation and is more conservative than the DEQ Level II individual aroclor SLVs and Total PCB SLV, which do not take into account bioaccumulation.
[ab] Benzo(a)anthracene was used as a surrogate because there was no chemical-specific SLV, and benzo(a)anthracene had the lowest SLV of the HMW PAHs.
[ac] BHC gamma was used as a surrogate, because there was no chemical-specific SLV, and BHC gamma was the lowest BHC.
[ad] di-n-butyl Phthalate was used as a surrogate because there was no chemical specific SLV, and di-n-butyl Phthalate was the lowest of the phthaltes.
[ae] Chlordane (CAS # 57-74-9) was used as a surrogate.
[af] Naphthalene was used as a surrogate because there was no chemical-specific SLV, and naphthalene had the lowest SLV of the LMW PAHs.
[ag] Tributyltin oxide was used as a surrogate, because there was no chemical-specific SLV.
[ah] 1,3- Dichlorobenzene was used as a surrogate because there was no chemical specific SLV, and it had the SLV lowest of the non-methylbenzenes.
[ai] 1,2- Dichloroethane was used as a surrogate because there was no chemical specific SLV.
[aj] DDT (and metabolites) was used as a surrogate because there was no chemical specific SLV, and DDT was the lowest of the herbicides/pesticides.
[ak] Dichloromethane was used as a surrogate because there was no chemical specific SLV.
[al] Carbon tetrachloride was used as a surrogate because there was no chemical specific SLV.
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[an] USEPA 2005. Ecological Soil Screening Levels for Arsenic. Interim Final. March. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-62.
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[ap] USEPA 2005. Ecological Soil Screening Levels for Beryllium. Interim Final. February. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7- 64.
[aq] USEPA 2005. Ecological Soil Screening Levels for Cadmium. Interim Final. March. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-65.
[ar] USEPA 2005. Ecological Soil Screening Levels for Chromium. Interim Final. March. Revised April 2008. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7- 66.
[as] USEPA 2005. Ecological Soil Screening Levels for Cobalt. Interim Final. March. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-67.
[at] USEPA 2006. Ecological Soil Screening Levels for Copper. Interim Final. July. Revised February 2007. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-68.
[au] USEPA 2005. Ecological Soil Screening Levels for Dieldrin. Interim Final. March. Revised April 2007. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-56.
[av] USEPA 2007. Ecological Soil Screening Levels for DDT and Metabolites. April. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-57.
[aw] USEPA 2005. Ecological Soil Screening Levels for Lead. Interim Final. March. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-70.
[ax] USEPA 2007. Ecological Soil Screening Levels for Manganese Interim Final. April. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-71.
[ay] USEPA 2007. Ecological Soil Screening Levels for Nickel. Interim Final. March. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-76.
[az] USEPA 2007. Ecological Soil Screening Levels for Polycyclic Aromatic Hydrocarbons (PAHs). June. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-78.
[ba] USEPA 2005. Ecological Soil Screening Levels for Pentachlorophenol. Interim Final. March. Revised April 2007. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-58.
[bb] USEPA 2007. Ecological Soil Screening Levels for Selenium. Interim Final. July. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72.
[bc] USEPA 2006. Ecological Soil Screening Levels for Silver. Interim Final. September U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-77.
[bd] USEPA 2005. Ecological Soil Screening Levels for Vanadium. Interim Final. April. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-75.
[be] USEPA 2007. Ecological Soil Screening Levels for Zinc. Interim Final. June. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-73.
[bf] DEQ 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001
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[bk] Ecological Hierarchical SLV Selection: 1. USEPA Eco SSL, 2. DEQ Level II SLV, 3. ORNL, 4. USEPA TRV (Plants and Soil Invertebrates Only).
[bl] The Soil SLV Selection for Preliminary COPC Screening: <u>For 0-1 and 0-3 ft bgs</u> - Most conservative of the Selected Human Health and Ecological SLVs with Surrogates. <u>For 0-10 ft bgs</u> - Selected Human Health SLV with Surrogates.
[bm] The lowest Eco SSL (mammal) for Dieldrin was used as a surrogate because the SLV is based on bioaccumulation and is more conservative than the DEQ Level II Endrin SLV, which does not take into account bioaccumulation.
[bn] The lowest PRG (avian) for Mercury was used as a surrogate because the SLV is based on bioaccumulation and is more conservative than the DEQ Level II Mercury SLV, which does not take into account bioaccumulation.
[bo] Tributyltin was used as a surrogate because there was no chemical specific SLV.
[bp] The RSL for Total PCBs was selected as the SLV per DEQ.
[bq] The SLV for Xylenes (mixed) was selected as a surrogate because there was no chemical specific SLV.
[br] The SLV for 2,4,5-TP (Silvex) was selected as a surrogate because there was no chemical specific SLV.
[bs] The SLV for dibenzofuran was selected as a surrogate because there was no chemical specific SLV.
[bt] The SLV for anthracene was selected as a surrogate because there was no chemical specific SLV.
[bu] The SLV for isopropylbenzene (cumene) was selected as a surrogate because there was no chemical specific SLV.
[bv] The SLV for chromium IV was used for total chromium, as a worst case scenario
[bw] Benzo(k)fluoranthene was used as a surrogate because there was no chemical-specific SLV.
[bx] Benzo(b)fluoranthene was used as a surrogate because there was no chemical-specific SLV and benzo(b)fluoranthene had the lowest SLV of the benzofluoranthenes.

Table J-1b - Miniumum Potentially Applicable Direct Contact Water SLVs for Identification of Preliminary COPCs
Bradford Island, Upland Operable Unit

		Candidate Human Health Water Screening Level Values for Direct Contact (ug/L)									Canidate Ecological Water Screening Level Values (ug/L)															
Analyte	CAS #	DEQ GW Ingest Residential RBC [m]	DEQ GW Ingest Occupational RBC [m]	DEQ GW Volatilize Outdoor Air Occupational RBC [m]	DEQ GW Vapor Intrusion Occupational RBC [m]	DEQ GW Excavation Construct/Exca RBC [m]	USEPA Tapwater RSL [n]	DEQ MCL [o]	Direct Contact Selected HH SLV [s]	Direct Contact Selected HH Water SLV w/ Surrogates [s]	USEPA Freshwater NRWQC [p]	DEQ Freshwater Table 33A WQC[q]	DEQ Level II Aquatic SLV[af]	DEQ Level II Bird SLV[af]	DEQ Level II Mammal SLV[af]	Lowest DEQ Level II SLV[af]	ORNL Tier II Chronic Value[ag]	USEPA PAH FCV[ah]	Canadian WQG[ai]	NOAA SQuiRTs Freshwater Chronic [aj]	Selected Ecological SLV [ak]	Selected Ecological Water SLV with Surrogates [ak]	Selected Min. Potentially Applicable Water SLV (Total) [al]	SLV (Total): HH or Eco	Selected Min. Potentially Applicable Water SLV (Dissolved) [am]	SLV (Dissolved): HH or Eco
2-Chlorobiphenyl	2051-60-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Chlorobiphenyl	2051-61-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorobiphenyl	2051-62-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2'-Dichlorobiphenyl	13029-08-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3-Dichlorobiphenyl	16605-91-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3'-Dichlorobiphenyl	25569-80-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorobiphenyl	33284-50-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4'-Dichlorobiphenyl	34883-43-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,5-Dichlorobiphenyl	34883-39-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dichlorobiphenyl	33146-45-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobiphenyl	2050-67-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4-Dichlorobiphenyl	2974-92-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4'-Dichlorobiphenyl	2974-90-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,5-Dichlorobiphenyl	34883-41-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-Dichlorobiphenyl	2050-68-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3-Trichlorobiphenyl	38444-78-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4-Trichlorobiphenyl	37680-66-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',5-Trichlorobiphenyl	37680-65-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',6-Trichlorobiphenyl	38444-73-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3'-Trichlorobiphenyl	38444-84-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4-Trichlorobiphenyl	55702-46-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4'-Trichlorobiphenyl	38444-85-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,5-Trichlorobiphenyl	55720-44-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,6-Trichlorobiphenyl	55702-45-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4-Trichlorobiphenyl	55712-37-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',5-Trichlorobiphenyl	38444-81-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',6-Trichlorobiphenyl	38444-76-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,4'-Trichlorobiphenyl	7012-37-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorobiphenyl	15862-07-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorobiphenyl	35693-92-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4',5-Trichlorobiphenyl	16606-02-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4',6-Trichlorobiphenyl	38444-77-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4'-Trichlorobiphenyl	38444-86-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',5'-Trichlorobiphenyl	37680-68-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4-Trichlorobiphenyl	37680-69-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',5-Trichlorobiphenyl	38444-87-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4,4'-Trichlorobiphenyl	38444-90-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4,5-Trichlorobiphenyl	53555-66-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4',5-Trichlorobiphenyl	38444-88-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3'-Tetrachlorobiphenyl	38444-93-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4-Tetrachlorobiphenyl	52663-59-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4'-Tetrachlorobiphenyl	36559-22-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5-Tetrachlorobiphenyl	70362-46-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5'-Tetrachlorobiphenyl	41464-39-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,6-Tetrachlorobiphenyl	70362-45-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,6'-Tetrachlorobiphenyl	41464-47-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4'-Tetrachlorobiphenyl	2437-79-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,5-Tetrachlorobiphenyl	70362-47-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,5'-Tetrachlorobiphenyl	41464-40-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,6-Tetrachlorobiphenyl	62796-65-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,6'-Tetrachlorobiphenyl	68194-04-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',5,5'-Tetrachlorobiphenyl	35693-99-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',5,6'-Tetrachlorobiphenyl	41464-41-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',6,6'-Tetrachlorobiphenyl	15968-05-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4-Tetrachlorobiphenyl	74338-24-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4'-Tetrachlorobiphenyl	41464-43-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5-Tetrachlorobiphenyl	70424-67-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5'-Tetrachlorobiphenyl	41464-49-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',6-Tetrachlorobiphenyl	74472-33-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,4'-Tetrachlorobiphenyl	33025-41-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,5-Tetrachlorobiphenyl	33284-53-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,6-Tetrachlorobiphenyl	54230-22-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4',5-Tetrachlorobiphenyl	74472-34-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4',6-Tetrachlorobiphenyl	52663-58-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,5,6-Tetrachlorobiphenyl	33284-54-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,4'-Tetrachlorobiphenyl	32598-10-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,5-Tetrachlorobiphenyl	73575-53-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,5'-Tetrachlorobiphenyl	73575-52-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,6-Tetrachlorobiphenyl	60233-24-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4',5-Tetrachlorobiphenyl	32598-11-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4',6-Tetrachlorobiphenyl	41464-46-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',5,5'-Tetrachlorobiphenyl	41464-42-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',5',6-Tetrachlorobiphenyl	74338-23-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,4',5-Tetrachlorobiphenyl	32690-93-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,4',6-Tetrachlorobiphenyl	32598-12-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4',5'-Tetrachlorobiphenyl	70362-48-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	-	-	-	-	-	0.0052	-	0.0052	0.0052	-	-	-	-	-	-	-	-	-	-	-	-	0.0052	HH	0.0052	HH
3,3',4,5-Tetrachlorobiphenyl	70362-49-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4,5'-Tetrachlorobiphenyl	41464-48-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',5,5'-Tetrachlorobiphenyl	33284-52-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	-	-	-	-	-	0.0052	-	0.0052	0.0052	-	-	-	-	-	-	-	-	-	-	-	-	0.0052	HH	0.0052	HH
2,2',3,3',4-Pentachlorobiphenyl	52663-62-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5-Pentachlorobiphenyl	60145-20-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',6-Pentachlorobiphenyl	52663-60-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4'-Pentachlorobiphenyl	65510-45-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5-Pentachlorobiphenyl	55312-69-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5'-Pentachlorobiphenyl	38380-02-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table J-1b - Miniumum Potentially Applicable Direct Contact Water SLVs for Identification of Preliminary COPCs
Bradford Island, Upland Operable Unit
(2 of 6)

		Candidate Human Health Water Screening Level Values for Direct Contact (ug/L)									Canidate Ecological Water Screening Level Values (ug/L)															
Analyte	CAS #	DEQ GW Ingest Residential RBC [m]	DEQ GW Ingest Occupational RBC [m]	DEQ GW Volatilize Outdoor Air Occupational RBC [m]	DEQ GW Vapor Intrusion Occupational RBC [m]	DEQ GW Excavation Construct/Exca RBC [m]	USEPA Tapwater RSL [n]	DEQ MCL [o]	Direct Contact Selected HH SLV [s]	Direct Contact Selected HH Water SLV w/ Surrogates [s]	USEPA Freshwater NRWQC [p]	DEQ Freshwater Table 33A WQC[q]	DEQ Level II Aquatic SLV[af]	DEQ Level II Bird SLV[af]	DEQ Level II Mammal SLV[af]	Lowest DEQ Level II SLV[af]	ORNL Tier II Chronic Value[ag]	USEPA PAH FCV[ah]	Canadian WQG[ai]	NOAA SQuiRTs Freshwater Chronic [aj]	Selected Ecological SLV [ak]	Selected Ecological Water SLV with Surrogates [ak]	Selected Min. Potentially Applicable Water SLV (Total) [al]	SLV (Total): HH or Eco	Selected Min. Potentially Applicable Water SLV (Dissolved) [am]	SLV (Dissolved): HH or Eco
2,2',3,4,6-Pentachlorobiphenyl	55215-17-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,6'-Pentachlorobiphenyl	73575-57-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5-Pentachlorobiphenyl	68194-07-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',6-Pentachlorobiphenyl	68194-05-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5,5'-Pentachlorobiphenyl	52663-61-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5,6-Pentachlorobiphenyl	73575-56-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5,6'-Pentachlorobiphenyl	73575-55-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5',6-Pentachlorobiphenyl	38379-99-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,6,6'-Pentachlorobiphenyl	73575-54-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5'-Pentachlorobiphenyl	41464-51-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',6'-Pentachlorobiphenyl	60233-25-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4',5-Pentachlorobiphenyl	38380-01-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4',6-Pentachlorobiphenyl	39485-83-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,5,5'-Pentachlorobiphenyl	37680-73-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,5,6'-Pentachlorobiphenyl	68194-06-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,5',6-Pentachlorobiphenyl	60145-21-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,6,6'-Pentachlorobiphenyl	56558-16-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	-	-	-	-	-	0.0052	-	0.0052	0.0052	-	-	-	-	-	-	-	-	-	-	-	-	0.0052	HH	0.0052	HH
2,3,3',4,5-Pentachlorobiphenyl	70424-69-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5-Pentachlorobiphenyl	70424-68-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5'-Pentachlorobiphenyl	70362-41-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,6-Pentachlorobiphenyl	74472-35-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',6-Pentachlorobiphenyl	38380-03-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5,5'-Pentachlorobiphenyl	39635-32-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5,6-Pentachlorobiphenyl	74472-36-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5',6-Pentachlorobiphenyl	68194-10-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	-	-	-	-	-	0.0001	-	0.0001	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	0.0001	HH	0.0001	HH
2,3,4,4',6-Pentachlorobiphenyl	74472-38-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,5,6-Pentachlorobiphenyl	18259-05-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4',5,6-Pentachlorobiphenyl	68194-11-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	-	-	-	-	-	0.0052	-	0.0052	0.0052	-	-	-	-	-	-	-	-	-	-	-	-	0.0052	HH	0.0052	HH
2,3',4,4',6-Pentachlorobiphenyl	56558-17-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,5,5'-Pentachlorobiphenyl	68194-12-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,5',6-Pentachlorobiphenyl	56558-18-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5'-Pentachlorobiphenyl	76842-07-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,4',5'-Pentachlorobiphenyl	65510-44-3	-	-	-	-	-	0.0052	-	0.0052	0.0052	-	-	-	-	-	-	-	-	-	-	-	-	0.0052	HH	0.0052	HH
2,3',4',5,5'-Pentachlorobiphenyl	70424-70-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4',5',6-Pentachlorobiphenyl	74472-39-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	-	-	-	-	-	0.0000052	-	0.0000052	0.0000052	-	-	-	-	-	-	-	-	-	-	-	-	0.0000052	HH	0.0000052	HH
3,3',4,5,5'-Pentachlorobiphenyl	39635-33-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4'-Hexachlorobiphenyl	38380-07-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5-Hexachlorobiphenyl	55215-18-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5'-Hexachlorobiphenyl	52663-66-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,6-Hexachlorobiphenyl	61798-70-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,6'-Hexachlorobiphenyl	38380-05-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,5'-Hexachlorobiphenyl	35694-04-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,6-Hexachlorobiphenyl	52704-70-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,6'-Hexachlorobiphenyl	52744-13-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',6,6'-Hexachlorobiphenyl	38411-22-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5-Hexachlorobiphenyl	35694-06-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5'-Hexachlorobiphenyl	35065-28-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',6-Hexachlorobiphenyl	56030-56-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',6'-Hexachlorobiphenyl	59291-64-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5,5'-Hexachlorobiphenyl	52712-04-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5,6-Hexachlorobiphenyl	41411-61-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5,6'-Hexachlorobiphenyl	68194-15-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5',6-Hexachlorobiphenyl	68194-14-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,6,6'-Hexachlorobiphenyl	74472-40-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5,5'-Hexachlorobiphenyl	51908-16-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5,6-Hexachlorobiphenyl	68194-13-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5,6'-Hexachlorobiphenyl	74472-41-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5',6-Hexachlorobiphenyl	38380-04-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',6,6'-Hexachlorobiphenyl	68194-08-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5,5',6-Hexachlorobiphenyl	52663-63-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5,6,6'-Hexachlorobiphenyl	68194-09-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4',5,5'-Hexachlorobiphenyl	35065-27-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4',5,6'-Hexachlorobiphenyl	60145-22-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4',6,6'-Hexachlorobiphenyl	33979-03-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	-	-	-	-	-	0.001	-	0.001	0.001	-	-	-	-	-	-	-	-	-	-	-	-	0.001	HH	0.001	HH
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	-	-	-	-	-	0.001	-	0.001	0.001	-	-	-	-	-	-	-	-	-	-	-	-	0.001	HH	0.001	HH
2,3,3',4,4',6-Hexachlorobiphenyl	74472-42-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5,5'-Hexachlorobiphenyl	39635-35-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5,6-Hexachlorobiphenyl	41411-62-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5',6-Hexachlorobiphenyl	74472-43-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5,5'-Hexachlorobiphenyl	39635-34-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5,6-Hexachlorobiphenyl	74472-44-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5',6-Hexachlorobiphenyl	74472-45-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5,5',6-Hexachlorobiphenyl	74472-46-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,4',5,6-Hexachlorobiphenyl	41411-63-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	-	-	-	-	-	0.052	-	0.052	0.052	-	-	-	-	-	-	-	-	-	-	-	-	0.052	HH	0.052	HH
2,3',4,4',5',6-Hexachlorobiphenyl	59291-65-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	-	-	-	-	-	0.000052	-	0.000052	0.000052	-	-	-	-	-	-	-	-	-	-	-	-	0.000052	HH	0.000052	HH
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',6-Heptachlorobiphenyl	52663-71-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,5'-Heptachlorobiphenyl	52663-74-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,6-Heptachlorobiphenyl	68194-16-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,6'-Heptachlorobiphenyl	38411-25-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table J-1b - Miniumum Potentially Applicable Direct Contact Water SLVs for Identification of Preliminary COPCs
Bradford Island, Upland Operable Unit
(3 of 6)

		Candidate Human Health Water Screening Level Values for Direct Contact (ug/L)									Canidate Ecological Water Screening Level Values (ug/L)															
Analyte	CAS #	DEQ GW Ingest Residential RBC [m]	DEQ GW Ingest Occupational RBC [m]	DEQ GW Volatilize Outdoor Air Occupational RBC [m]	DEQ GW Vapor Intrusion Occupational RBC [m]	DEQ GW Excavation Construct/Exca RBC [m]	USEPA Tapwater RSL [n]	DEQ MCL [o]	Direct Contact Selected HH SLV [s]	Direct Contact Selected HH Water SLV w/ Surrogates [s]	USEPA Freshwater NRWQC [p]	DEQ Freshwater Table 33A WQC[q]	DEQ Level II Aquatic SLV[af]	DEQ Level II Bird SLV[af]	DEQ Level II Mammal SLV[af]	Lowest DEQ Level II SLV[af]	ORNL Tier II Chronic Value[ag]	USEPA PAH FCV[ah]	Canadian WQG[ai]	NOAA SQuiRTs Freshwater Chronic [aj]	Selected Ecological SLV [ak]	Selected Ecological Water SLV with Surrogates [ak]	Selected Min. Potentially Applicable Water SLV (Total) [al]	SLV (Total): HH or Eco	Selected Min. Potentially Applicable Water SLV (Dissolved) [am]	SLV (Dissolved): HH or Eco
2,2',3,3',4,5',6-Heptachlorobiphenyl	40186-70-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,6,6'-Heptachlorobiphenyl	52663-65-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5',6'-Heptachlorobiphenyl	52663-70-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,5',6-Heptachlorobiphenyl	52663-67-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,6,6'-Heptachlorobiphenyl	52663-64-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5,6-Heptachlorobiphenyl	74472-47-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5,6'-Heptachlorobiphenyl	60145-23-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5',6-Heptachlorobiphenyl	52663-69-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',6,6'-Heptachlorobiphenyl	74472-48-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5,5',6-Heptachlorobiphenyl	52712-05-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5,6,6'-Heptachlorobiphenyl	74472-49-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5,5',6-Heptachlorobiphenyl	52663-68-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5,6,6'-Heptachlorobiphenyl	74487-85-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	-	-	-	-	-	0.0052	-	0.0052	0.0052	-	-	-	-	-	-	-	-	-	-	-	-	0.0052	HH	0.0052	HH
2,3,3',4,4',5,6-Heptachlorobiphenyl	41411-64-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4',5',6-Heptachlorobiphenyl	74472-50-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5,5',6-Heptachlorobiphenyl	74472-51-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5,5',6-Heptachlorobiphenyl	69782-91-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5,5'-Octachlorobiphenyl	35694-08-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5,6-Octachlorobiphenyl	52663-78-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5,6'-Octachlorobiphenyl	42740-50-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',6,6'-Octachlorobiphenyl	33091-17-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,5',6-Octachlorobiphenyl	68194-17-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,5',6'-Octachlorobiphenyl	52663-75-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,6,6'-Octachlorobiphenyl	52663-73-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5',6,6'-Octachlorobiphenyl	40186-71-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,5',6,6'-Octachlorobiphenyl	2136-99-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5,5',6-Octachlorobiphenyl	52663-76-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5,6,6'-Octachlorobiphenyl	74472-52-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4',5,5',6-Octachlorobiphenyl	74472-53-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	40186-72-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl	52663-79-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	52663-77-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Decachlorobiphenyl	2051-24-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	630-20-6	-	-	-	-	-	0.52	-	0.52	0.52	-	-	186	-	-	186	-	-	-	-	186	186	0.52	HH	0.52	HH
1,1,1-Trichloroethane (TCA)	71-55-6	9100	38000	-	-	1100000	9100	200	9100	9100	-	-	11	-	4000000	11	11	-	-	11	11	11	11	Eco	11	Eco
1,1,2,2-Tetrachloroethane	79-34-5	-	-	-	-	-	0.067	-	0.067	0.067	-	-	2400	-	-	2400	610	-	-	111	2400	2400	0.067	HH	0.067	HH
1,1,2-Trichloroethane	79-00-5	0.23	1.3	19000	8800	990	0.24	5	0.23	0.23	-	-	9400	-	-	9400	1200	-	-	500	9400	9400	0.23	HH	0.23	HH
1,1-Dichloroethane	75-34-3	2.3	13	73000	16000	10000	2.4	-	2.3	2.3	-	-	47	-	-	47	47	-	-	47	47	47	2.3	HH	2.3	HH
1,1-Dichloroethene	75-35-4	340	1400	-	340000	43000	340	7	340	340	-	-	25	-	230000	25	25	-	-	25	25	25	25	Eco	25	Eco
1,1-Dichloropropene	563-58-6	-	-	-	-	-	0.43	-	0.43	0.43 [e]	-	-	-	-	-	-	-	-	-	-	-	-	0.43 [e]	HH	0.43 [e]	HH
1,2,3-Trichlorobenzene	87-61-6	-	-	-	-	-	29	-	29	29	-	-	-	-	-	-	-	-	8.0	8	8	8	8	Eco	8	Eco
1,2,3-Trichloropropane	96-18-4	-	-	-	-	-	0.00072	-	0.00072	0.00072	-	-	-	-	-	-	-	-	-	-	-	-	0.00072	HH	0.00072	HH
1,2,4-Trichlorobenzene	120-82-1	-	-	-	-	-	2.3	0	2.3	2.3	-	-	110	-	-	110	110	-	24	24	110	110	2.3	HH	2.3	HH
1,2,4-Trimethylbenzene	95-63-6	15	61	-	-	1700	15	-	15	15	-	-	-	-	-	-	-	-	-	-	-	7.3 [y]	7.3 [y]	Eco	7.3 [y]	Eco
1,2-Dibromo-3-chloropropane	96-12-8	-	-	-	-	-	0.00032	-	0.00032	0.00032	-	-	-	-	-	-	-	-	-	-	-	-	0.00032	HH	0.00032	HH
1,2-Dibromoethane (EDB)	106-93-4	0.0063	0.034	960	690	28	0.0065	-	0.0063	0.0063	-	-	-	-	-	-	-	-	-	-	-	-	0.0063	HH	0.0063	HH
1,2-Dichlorobenzene	95-50-1	370	1500	-	-	37000	370	600	370	370	-	-	14	-	-	14	14	-	0.7	0.7	14	14	14	Eco	14	Eco
1,2-Dichloroethane (EDC)	107-06-2	0.14	0.78	9500	3800	630	0.15	5	0.14	0.14	-	-	20000	125000	200000	20000	910	-	100	100	20000	20000	0.14	HH	0.14	HH
1,2-Dichloropropane	78-87-5	-	-	-	-	-	0.39	5	0.39	0.39	-	-	5700	-	-	5700	-	-	-	5700	5700	5700	0.39	HH	0.39	HH
1,3,5-Trimethylbenzene	108-67-8	12	52	-	41000	1400	370	-	12	12	-	-	-	-	-	-	-	-	-	-	-	7.3 [y]	7.3 [y]	Eco	7.3 [y]	Eco
1,3-Dichlorobenzene	541-73-1	-	-	-	-	-	-	-	-	0.42 [ap]	-	-	71	-	-	71	71	-	150	38	71	71	0.42 [ap]	HH	0.42 [ap]	HH
1,3-Dichloropropane	142-28-9	-	-	-	-	-	730	-	730	730	-	-	-	-	-	-	-	-	-	-	-	5700	730	HH	730	HH
1,4-Dichlorobenzene	106-46-7	0.42	2.2	20000	5700	1500	0.43	75	0.42	0.42	-	-	15	-	-	15	15	-	26	9.4	15	15	0.42	HH	0.42	HH
2,2-Dichloropropane	594-20-7	-	-	-	-	-	-	-	-	0.39 [t]	-	-	-	-	-	-	-	-	-	-	-	5700 [t]	0.39 [t]	HH	0.39 [t]	HH
2,4,5-T	93-76-5	-	-	-	-	-	370	-	370	370	-	-	-	-	-	-	-	-	-	36	36	36	36	Eco	36	Eco
2,4,5-TP (Silvex)	93-72-1	-	-	-	-	-	290	50	290	290	-	-	-	-	-	-	-	-	-	-	-	-	290	HH	290	HH
2,4,5-Trichlorophenol	95-95-4	-	-	-	-	-	3700	-	3700	3700	-	-	-	-	-	-	-	-	18	63	18	18	18	Eco	18	Eco
2,4,6-Trichlorophenol	88-06-2	5.2	37	-	-	1600	6.1	-	5.2	5.2	-	-	970	-	-	970	-	-	18	4.9	970	970	5.2	HH	5.2	HH
2,4-D	94-75-7	370	1500	-	-	72000	370	70	370	370	-	-	-	-	-	-	-	-	-	4	4	4	4	Eco	4	Eco
2,4-DB	94-82-6	-	-	-	-	-	290	-	290	290	-	-	-	-	-	-	-	-	-	-	-	-	290	HH	290	HH
2,4-Dichlorophenol	120-83-2	-	-	-	-	-	110	-	110	110	-	-	3650	-	-	3650	-	-	0.2	11	3650	3650	110	HH	110	HH
2,4-Dimethylphenol	105-67-9	-	-	-	-	-	730	-	730	730	-	-	42	-	-	42	-	-	-	100	42	42	42	Eco	42	Eco
2,4-Dinitrophenol	51-28-5	-	-	-	-	-	73	-	73	73	-	-	-	-	-	-	-	-	-	19	19	19	19	Eco	19	Eco
2,4-Dinitrotoluene	121-14-2	-	-	-	-	-	0.22	-	0.22	0.22	-	-	230	-	-	230	-	-	-	44	230	230	0.22	HH	0.22	HH
2,6-Dinitrotoluene	606-20-2	37	150	-	-	29000	37	-	37	37	-	-	230	-	-	230	-	-	-	-	230	230	37	HH	37	HH
2-Butanone (MEK)	78-93-3	-	-	-	-	-	7100	-	7100	7100	-	-	14000	-	-	14000	14000	-	-	14000	14000	14000	7100	HH	7100	HH
2-Chloroethylvinylether	110-75-8	-	-	-	-	-	-	-	-	-	-	-	4760	-	-	4760	-	-	-	-	4760	4760	4760	Eco	4760	Eco
2-Chloronaphthalene	91-58-7	-	-	-	-	-	2900	-	2900	2900	-	-	32	-	-	32	-	-	-	0.396	32	32	32	Eco	32	Eco
2-Chlorophenol	95-57-8	-	-	-	-	-	180	-	180	180	-	-	2000	-	-	2000	-	-	7	24	2000	2000	180	HH	180	HH
2-Chlorotoluene	95-49-8	-	-	-	-	-	730	-	730	730	-	-	-	-	-	-	-	-	-	-	-	-	730	HH	730	HH
2-Hexanone	591-78-6	-	-	-	-	-	47	-	47	47	-	-	99	-	-	99	99	-	-	99	99	99	47	HH	47	HH
2-Methylnaphthalene	91-57-6	-	-	-	-	-	150	-	150	150	-	-	-	-	-	-	-	72.16	-	330	72.16	72.16	72.16	Eco	72.16	Eco
2-Methylphenol	95-48-7	-	-	-	-	-	1800	-	1800	1800	-	-	13	-	2200000	13	13	-	-	13	13	13	13	Eco	13	Eco
2-Nitroaniline	88-74-4	-	-	-	-	-	370	-	370	370	-	-	-	-	-	-	-	-	-	-	-	-	370	HH	370	HH
2-Nitrophenol	88-75-5	-	-	-	-	-	-	-	-	11000 [u]	-	-	-	-	-	-	-	-	-	-	-	-	11000 [u]	HH	11000 [u]	HH
3,3'-Dichlorobenzidine	91-94-1	0.13	0.91	-	-	460	0.15	-	0.13	0.13	-	-	-	-	-	-	-	-	-	4.5	4.5	4.5	0.13	HH	0.13	HH
3-Nitroaniline	99-09-2	-	-	-	-	-	-	-	-	3.4 [w]	-	-	-	-	-	-	-	-	-	-	-	-	3.4 [w]	HH	3.4 [w]	HH
4,4'-DDD	72-54-8	0.24	1.7	-	-	40	0.28	-	0.24	0.24	-	-	0.001	20	6000	0.001	0.011	-	-	0.011	0.001	0.001	0.001	Eco	0.001	Eco
4,4'-DDE	72-55-9	0.17	1.2	-	-	32	0.2	-	0.17	0.17	-	-	-	20	6000	20	-	-	-	105	20	0.001	0.001	Eco	0.001	Eco
4,4'-DDT	50-29-3	0.17	1.2	-	-	15	0.2	-	0.17	0.17	0.001	0.001	0.001	20	6000	0.001	0.013	-	-	0.0005	0.001	0.001	0.001	Eco	0.001	Eco
4,6-Dinitro-2-methylphenol	534-52-1	-	-	-	-	-	2.9	-	2.9	2.9	-	-	-	-	-	-	-	-	-	-	-	-	2.9	HH	2.9	HH
4-Bromophenyl Phenyl Ether	101-55-3	-	-	-	-	-	-	-	-	-	-	-	1.5	-	-	1.5	1.5	-	-	-	1.5	1.5	1.5	Eco	1.5	Eco
4-Chloro-3-methylphenol	59-50-7	-	-	-	-	-	3700	-	3700	3700	-	-	-	-	-	-	-	-	-	-	-	-	3700	HH	3700	HH
4-Chloroaniline	106-47-8	-	-	-	-	-	0.34	-	0.34	0.34	-	-	-	-	-	-	-	-	-	50	50	50	0.34	HH	0.34	HH
4-Chlorophenyl Phenyl Ether	7005-72-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table J-1b - Miniumum Potentially Applicable Direct Contact Water SLVs for Identification of Preliminary COPCs
Bradford Island, Upland Operable Unit
(4 of 6)

		Candidate Human Health Water Screening Level Values for Direct Contact (ug/L)									Canidate Ecological Water Screening Level Values (ug/L)															
Analyte	CAS #	DEQ GW Ingest Residential RBC [m]	DEQ GW Ingest Occupational RBC [m]	DEQ GW Volatilize Outdoor Air Occupational RBC [m]	DEQ GW Vapor Intrusion Occupational RBC [m]	DEQ GW Excavation Construct/Exca RBC [m]	USEPA Tapwater RSL [n]	DEQ MCL [o]	Direct Contact Selected HH SLV [s]	Direct Contact Selected HH Water SLV w/ Surrogates [s]	USEPA Freshwater NRWQC [p]	DEQ Freshwater Table 33A WQC[q]	DEQ Level II Aquatic SLV[af]	DEQ Level II Bird SLV[af]	DEQ Level II Mammal SLV[af]	Lowest DEQ Level II SLV[af]	ORNL Tier II Chronic Value[ag]	USEPA PAH FCV[ah]	Canadian WQG[ai]	NOAA SQuiRTs Freshwater Chronic [aj]	Selected Ecological SLV [ak]	Selected Ecological Water SLV with Surrogates [ak]	Selected Min. Potentially Applicable Water SLV (Total) [al]	SLV (Total): HH or Eco	Selected Min. Potentially Applicable Water SLV (Dissolved) [am]	SLV (Dissolved): HH or Eco
4-Chlorotoluene	106-43-4	-	-	-	-	-	2600	-	2600	2600	-	-	-	-	-	-	-	-	-	-	-	-	2600	HH	2600	HH
4-Isopropyltoluene	99-87-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (MIBK)	108-10-1	-	-	-	-	-	2000	-	2000	2000	-	-	170	-	-	170	170	-	-	170	170	170	170	Eco	170	Eco
4-Nitroaniline	100-01-6	-	-	-	-	-	3.4	-	3.4	3.4	-	-	-	-	-	-	-	-	-	-	-	-	3.4	HH	3.4	HH
4-Nitrophenol	100-02-7	-	-	-	-	-	-	-	-	11000 [u]	-	-	150	-	-	150	300	-	-	60	150	150	150	Eco	150	Eco
Acenaphthene	83-32-9	2200	-	-	-	-	2200	-	2200	2200	-	-	520	-	-	520	-	55.85	5.8	5.8	55.85	55.85 [ay]	55.85 [ay]	Eco	55.85 [ay]	Eco
Acenaphthylene	208-96-8	-	-	-	-	-	-	-	-	0.14 [l]	-	-	-	-	-	-	-	306.9	-	4840	306.9	306.9	0.14 [l]	HH	0.14 [l]	HH
Acetone	67-64-1	-	-	-	-	-	22000	-	22000	22000	-	-	1500	-	76000	1500	1500	-	-	1500	1500	1500	1500	Eco	1500	Eco
Aldrin	309-00-2	0.0033	0.024	-	-	-	0.004	-	0.0033	0.0033	-	-	0.06	-	1500	0.06	-	-	-	0.017	0.06	0.06	0.0033	HH	0.0033	HH
Aniline	62-53-3	-	-	-	-	-	12	-	12	12	-	-	-	-	-	-	-	-	-	2.2	2.2	2.2	2.2	Eco	2.2	Eco
Anthracene	120-12-7	-	-	-	-	-	11000	-	11000	11000	-	-	13	-	-	13	0.73	20.73	0.012	0.012	13	13	13	Eco	13	Eco
Aroclor 1016	12674-11-2	-	-	-	-	-	0.96	-	0.96	0.96	-	-	-	-	13000	13000	-	-	-	-	13000	0.014 [an]	0.014 [an]	Eco	0.014 [an]	Eco
Aroclor 1221	11104-28-2	-	-	-	-	-	0.0068	-	0.0068	0.0068	-	-	0.28	-	-	0.28	0.28	-	-	-	0.28	0.014 [an]	0.0068	HH	0.0068	HH
Aroclor 1232	11141-16-5	-	-	-	-	-	0.0068	-	0.0068	0.0068	-	-	0.58	-	-	0.58	0.58	-	-	-	0.58	0.014 [an]	0.0068	HH	0.0068	HH
Aroclor 1242	53469-21-9	-	-	-	-	-	0.034	-	0.034	0.034	-	-	0.053	3000	700	0.053	0.053	-	-	-	0.053	0.014 [an]	0.014 [an]	Eco	0.014 [an]	Eco
Aroclor 1248	12672-29-6	-	-	-	-	-	0.034	-	0.034	0.034	-	-	0.081	-	-	0.081	0.081	-	-	-	0.081	0.014 [an]	0.014 [an]	Eco	0.014 [an]	Eco
Aroclor 1254	11097-69-1	-	-	-	-	-	0.034	-	0.034	0.034	-	-	0.033	1300	300	0.033	0.033	-	-	-	0.033	0.014 [an]	0.014 [an]	Eco	0.014 [an]	Eco
Aroclor 1260	11096-82-5	-	-	-	-	-	0.034	-	0.034	0.034	-	-	94	-	-	94	94	-	-	-	94	0.014 [an]	0.014 [an]	Eco	0.014 [an]	Eco
Benzene	71-43-2	0.39	2.2	14000	2800	1700	0.41	5	0.39	0.39	-	-	130	-	200000	130	130	-	370	46	130	130	0.39	HH	0.39	HH
Benzidine	92-87-5	0.72	14	-	-	130000	0.000094	-	0.72	0.72	-	-	3.9	-	-	3.9	3.9	-	-	3.9	3.9	3.9	0.72	HH	0.72	HH
Benzo(a)anthracene	56-55-3	0.029	0.56	-	-	9.1	0.029	-	0.029	0.029	-	-	0.027	-	-	0.027	0.027	2.227	0.018	0.027	0.027	0.027	0.027	Eco	0.027	Eco
Benzo(a)pyrene	50-32-8	0.0029	0.056	-	-	0.53	0.0029	0.2	0.0029	0.0029	-	-	0.014	-	8000	0.014	0.014	0.9573	0.015	0.014	0.014	0.014	0.0029	HH	0.0029	HH
Benzo(b)fluoranthene	205-99-2	0.029	0.56	-	-	-	0.029	-	0.029	0.029	-	-	-	-	-	-	-	0.6774	-	9.07	0.6774	0.6774	0.029	HH	0.029	HH
Benzo(g,h,i)perylene	191-24-2	-	-	-	-	-	-	-	-	0.29 [au]	-	-	-	-	-	-	-	0.4391	-	7.64	0.4391	0.4391	0.29 [au]	HH	0.29 [au]	HH
Benzo(j,k)flouranthenes	205-82-3 & 207-08-9	-	-	-	-	-	-	-	-	0.29 [av]	-	-	-	-	-	-	-	-	-	-	-	0.014 [b]	0.014 [b]	Eco	0.014 [b]	Eco
Benzo(k)fluoranthene	207-08-9	0.29	-	-	-	-	0.29	-	0.29	0.29	-	-	-	-	-	-	-	0.6415	-	-	0.6415	0.6415	0.29	HH	0.29	HH
Benzofluoranthenes, Total	56832-73-6	-	-	-	-	-	-	-	-	0.029 [aw]	-	-	-	-	-	-	-	-	-	-	-	0.014 [b]	0.014 [b]	Eco	0.014 [b]	Eco
Benzoic Acid	65-85-0	-	-	-	-	-	150000	-	150000	150000	-	-	42	-	-	42	42	-	-	42	42	42	42	Eco	42	Eco
Benzyl Alcohol	100-51-6	-	-	-	-	-	3700	-	3700	3700	-	-	8.6	-	-	8.6	8.6	-	-	8.6	8.6	8.6	8.6	Eco	8.6	Eco
BHC (alpha)	319-84-6	0.009	0.065	-	-	28	0.011	-	0.009	0.009	-	-	2.2	-	-	2.2	2.2	-	-	2.2	2.2	2.2	0.009	HH	0.009	HH
BHC (beta)	319-85-7	-	-	-	-	-	0.037	-	0.037	0.037	-	-	2.2	-	-	2.2	2.2	-	-	0.495	2.2	2.2	0.037	HH	0.037	HH
BHC (delta)	319-86-8	-	-	-	-	-	-	-	-	0.009 [c]	-	-	-	-	-	-	2.2	-	-	2.2	2.2	2.2	0.009 [c]	HH	0.009 [c]	HH
BHC (gamma) Lindane	58-89-9	0.052	0.37	-	-	170	0.061	0.2	0.052	0.052	-	0.08	0.08	14500	62000	0.08	-	-	0.01	0.08	0.08	0.08	0.052	HH	0.052	HH
Bicarbonate as CaCO3	71-52-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biological Oxygen Demand	BOD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloroethoxy)methane	111-91-1	-	-	-	-	-	110	-	110	110	-	-	-	-	-	-	-	-	-	-	-	-	110	HH	110	HH
Bis(2-chloroethyl) Ether	111-44-4	-	-	-	-	-	0.012	-	0.012	0.012	-	-	-	-	-	-	-	-	-	1900	1900	1900	0.012	HH	0.012	HH
Bis(2-chloroisopropyl) Ether	39638-32-9 or 108-60-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	117-81-7	4.1	29	-	-	-	4.8	-	4.1	4.1	-	-	3	8000	73000	3	3.0	-	-	0.3	3	3	3	Eco	3	Eco
Bromobenzene	108-86-1	-	-	-	-	-	88	-	88	88	-	-	-	-	-	-	-	-	-	-	-	-	88	HH	88	HH
Bromochloromethane	74-97-5	-	-	-	-	-	-	-	-	0.12 [x]	-	-	-	-	-	-	-	-	-	-	-	-	0.12 [x]	HH	0.12 [x]	HH
Bromodichloromethane	75-27-4	0.12	0.6	9300	5600	450	0.12	-	0.12	0.12	-	-	-	-	-	-	-	-	-	-	-	-	0.12	HH	0.12	HH
Bromoform	75-25-2	7.2	52	-	-	150000	8.5	-	7.2	7.2	-	-	-	-	-	-	-	-	-	320	320	320	7.2	HH	7.2	HH
Bromomethane	74-83-9	8.7	36	170000	36000	1200	8.7	-	8.7	8.7	-	-	-	-	-	-	-	-	-	16	16	16	8.7	HH	8.7	HH
Butyl Benzyl Phthalate	85-68-7	-	-	-	-	-	35	-	35	35	-	-	19	-	-	19	19	-	-	19	19	19	19	Eco	19	Eco
Carbazole	86-74-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulfide	75-15-0	-	-	-	-	-	1000	-	1000	1000	-	-	0.92	-	-	0.92	0.92	-	-	0.92	0.92	0.92	0.92	Eco	0.92	Eco
Carbon Tetrachloride	56-23-5	0.19	1.1	2200	320	770	0.44	5	0.19	0.19	-	-	74	-	123000	74	9.8	-	13.3	9.8	74	74	0.19	HH	0.19	HH
Chlordane (alpha)	5103-71-9	-	-	-	-	-	-	-	-	0.16 [d]	-	-	0.0043	15500	18000	0.0043	-	-	-	-	0.0043	0.0043 [ac]	0.0043 [ac]	Eco	0.0043 [ac]	Eco
Chlordane (gamma)	5103-74-2	-	-	-	-	-	-	-	-	0.16 [d]	-	-	0.0043	15500	18000	0.0043	-	-	-	-	0.0043	0.0043 [ac]	0.0043 [ac]	Eco	0.0043 [ac]	Eco
Chlordane (technical)	12789-03-6	0.16	1.2	-	-	-	0.19	2	0.16	0.16	-	-	0.0043	15500	18000	0.0043	-	-	-	-	0.0043	0.0043 [ac]	0.0043 [ac]	Eco	0.0043 [ac]	Eco
Chlorobenzene	108-90-7	91	380	-	-	10000	91	100	91	91	-	-	50	-	-	50	64	-	-	1.3	50	50	50	Eco	50	Eco
Chloroethane	75-00-3	21000	88000	-	-	2400000	21000	-	21000	21000	-	-	-	-	-	-	-	-	-	-	-	-	21000	HH	21000	HH
Chloroform	67-66-3	0.19	0.99	5500	1200	720	0.19	-	0.19	0.19	-	-	1240	-	115000	1240	28	-	1.8	1.8	1240	1240	0.19	HH	0.19	HH
Chloromethane	74-87-3	190	790	2100000	320000	22000	190	-	190	190	-	-	-	-	-	-	-	-	-	-	-	-	190	HH	190	HH
Chrysene	218-01-9	-	-	-	-	-	2.9	-	2.9	2.9	-	-	-	-	-	-	-	2.042	-	-	2.042	2.042	2.042	Eco	2.042	Eco
cis-1,2-Dichloroethene	156-59-2	360	1500	-	-	120000	370	70	360	360	-	-	590	-	180000	590	-	-	-	590	590	590	360	HH	360	HH
cis-1,3-Dichloropropene	10061-01-5	-	-	-	-	-	0.43	-	0.43	0.43 [e]	-	-	-	-	-	-	-	-	-	<0.055	<0.055	0.055	0.055	Eco	0.055	Eco
Dalapon	75-99-0	-	-	-	-	-	1100	200	1100	1100	-	-	-	-	-	-	-	-	-	-	-	-	1100	HH	1100	HH
Dibenz(a,h)anthracene	53-70-3	0.0029	0.056	-	-	0.21	0.0029	-	0.0029	0.0029	-	-	-	-	-	-	-	0.2825	-	-	0.2825	0.2825	0.0029	HH	0.0029	HH
Dibenzofuran	132-64-9	-	-	-	-	-	37	-	37	37	-	-	3.7	-	-	3.7	3.7	-	-	3.7	3.7	3.7	3.7	Eco	3.7	Eco
Dibromochloromethane	124-48-1	0.68	4.9	-	-	13000	0.15	-	0.68	0.68	-	-	-	-	-	-	-	-	-	-	-	-	0.68	HH	0.68	HH
Dibromomethane	74-95-3	-	-	-	-	-	8.2	-	8.2	8.2	-	-	-	-	-	-	-	-	-	-	-	-	8.2	HH	8.2	HH
Dibutyltin	1002-53-5	-	-	-	-	-	11	-	11	11 [k]	-	-	-	-	-	-	-	-	-	-	-	0.063 [ab]	0.063 [ab]	Eco	0.063 [ab]	Eco
Dicamba	1918-00-9	-	-	-	-	-	1100	-	1100	1100	-	-	-	-	-	-	-	-	10	10	10	10	10	Eco	10	Eco
Dichlorodifluoromethane	75-71-8	-	-	-	-	-	390	-	390	390	-	-	-	-	-	-	-	-	-	-	-	-	390	HH	390	HH
Dichloromethane (Methylene Chloride)	75-09-2	4.4	27	330000	99000	32000	4.8	5	4.4	4.4	-	-	2200	-	45000	2200	2200	-	98.1	98.1	2200	2200	4.4	HH	4.4	HH
Dichlorprop	120-36-5	-	-	-	-	-	290	-	290	290 [ao]	-	-	-	-	-	-	-	-	-	-	-	4 [ae]	4 [ae]	Eco	4 [ae]	Eco
Dieldrin	60-57-1	0.0035	0.026	-	-	6.1	0.0042	-	0.0035	0.0035	0.056	-	0.056	600	150	0.056	-	-	-	0.056	0.056	0.056	0.0035	HH	0.0035	HH
Diesel Range Organics	68334-30-5	90	360	-	-	-	-	-	90	90	-	-	-	-	-	-	-	-	-	-	-	-	90	HH	90	HH
Diethyl Phthalate	84-66-2	-	-	-	-	-	29000	-	29000	29000	-	-	210	-	18000000	210	210	-	-	110	210	210	210	Eco	210	Eco
Dimethyl Phthalate	131-11-3	-	-	-	-	-	-	-	-	29000 [ar]	-	-	3	-	-	3	-	-	-	3	3	3	3	Eco	3	Eco
Di-n-butyl Phthalate	84-74-2	-	-	-	-	-	3700	-	3700	3700	-	-	35	800	2200000	35	35	-	19	9.7	35	35	35	Eco	35	Eco
Di-n-octyl Phthalate	117-84-0	-	-	-	-	-	-	-	-	4.1 [z]	-	-	708	-	-	708	-	-	-	3	708	708	4.1 [z]	HH	4.1 [z]	HH
Dinoseb	88-85-7	-	-	-	-	-	37	7	37	37	-	-	-	-	-	-	-	-	0.05	0.05	0.05	0.05	0.05	Eco	0.05	Eco
Endosulfan I	959-98-8	-	-	-	-	-	220	-	220	220 [as]	0.056	0.056	-	-	-	-	0.051	-	0.02	0.028	0.056	0.056	0.056	Eco	0.056	Eco
Endosulfan II	33213-65-9	-	-	-	-	-	220	-	220	220 [as]	0.056	0.056	-	-	-	-	0.051	-	0.02	0.028	0.056	0.056	0.056	Eco	0.056	Eco
Endosulfan Sulfate	1031-07-8	-	-	-	-	-	220	-	220	220 [as]	-	-	-	-	-	-	0.051	-	0.02	2.22	0.051	0.051	0.051	Eco	0.051	Eco
Endrin	72-20-8	11	44	-	-	-	11	2	11	11	0.036	-	0.036	70	300	0.036	-	-	-	0.036	0.036	0.036	0.036	Eco	0.036	Eco
Endrin Aldehyde	7421-93-4	-	-	-	-	-	-	-	-	11 [aa]	-	-	-	-	-	-	-	-	-	0.15	0.15	0.15	0.15	Eco	0.15	Eco
Endrin Ketone	53494-70-5	-	-	-	-	-	-	-	-	11 [aa]	-	-	-	-	-	-	-	-	-	-	-	-	11 [aa]	HH	11 [aa]	HH
Ethylbenzene	100-41-4	1.4	7.8	41000	7400	4400	1.5	700	1.4	1.4	-	-	7.3	-	-	7.3	7.3	-	90	7.3	7.3	7.3	1.4	HH	1.4	HH
Fluoranthene	206-44-0	-	-	-	-	-	1500	-	1500	1500	-	-	6.16	-	-	6.16	-	7.109	0.04	0.04	6.16	6.16	6.16	Eco	6.16	Eco
Fluorene	86-73-7	1500	-	-	-	-	1500	-	1500	1500	-	-	3.9	-	-	3.9	3.9	39.3	3	3.9	3.9	3.9	3.9	Eco	3.9	Eco
Gasoline Range Organics	8006-61-9	100	420	-	-	13000	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	-	100	HH	100	HH

Table J-1b - Miniumum Potentially Applicable Direct Contact Water SLVs for Identification of Preliminary COPCs
Bradford Island, Upland Operable Unit

		Candidate Human Health Water Screening Level Values for Direct Contact (ug/L)									Canidate Ecological Water Screening Level Values (ug/L)														
Analyte	CAS #	DEQ GW Ingest Residential RBC [m]	DEQ GW Ingest Occupational RBC [m]	DEQ GW Volatilize Outdoor Air Occupational RBC [m]	DEQ GW Vapor Intrusion Occupational RBC [m]	DEQ GW Excavation Construct/Exca RBC [m]	USEPA Tapwater RSL [n]	DEQ MCL [o]	Direct Contact Selected HH SLV [s]	Direct Contact Selected HH Water SLV w/ Surrogates [s]	USEPA Freshwater NRWQC [p]	DEQ Freshwater Table 33A WQC[q]	DEQ Level II Aquatic SLV[af]	DEQ Level II Bird SLV[af]	DEQ Level II Mammal SLV[af]	Lowest DEQ Level II SLV[af]	ORNL Tier II Chronic Value[ag]	USEPA PAH FCV[ah]	Canadian WQG[ai]	NOAA SQuiRTs Freshwater Chronic [aj]	Selected Ecological SLV [ak]	Selected Ecological Water SLV with Surrogates [ak]	Selected Min. Potentially Applicable Water SLV (Total) [al]	SLV (Total): HH or Eco	Selected Min. Potentially Applicable Water SLV (Dissolved) [am]	SLV (Dissolved): HH or Eco
Heptachlor	76-44-8	0.013	0.091	-	-	32	0.015	0.4	0.013	0.013	0.0038	0.0038	0.0038	-	2000	0.0038	0.0069	-	-	0.0019	0.0038	0.0038	0.0038	Eco	0.0038	Eco
Heptachlor Epoxide	1024-57-3	0.0062	0.045	-	-	3.2	0.0074	0.2	0.0062	0.0062	0.0038	0.0038	0.0038	-	-	0.0038	-	-	-	0.0019	0.0038	0.0038	0.0038	Eco	0.0038	Eco
Hexachlorobenzene	118-74-1	0.035	0.26	-	-	10	0.042	1	0.035	0.035	-	-	-	-	-	-	-	-	-	0.0003	0.0003	0.0003	0.0003	Eco	0.0003	Eco
Hexachlorobutadiene	87-68-3	-	-	-	-	-	0.86	-	0.86	0.86	-	-	9.3	-	-	9.3	-	-	1.3	0.053	9.3	9.3	0.86	HH	0.86	HH
Hexachlorocyclopentadiene	77-47-4	-	-	-	-	-	220	50	220	220	-	-	5.2	-	-	5.2	-	-	-	5.2	5.2	5.2	5.2	Eco	5.2	Eco
Hexachloroethane	67-72-1	4.1	29	-	-	1400	4.8	-	4.1	4.1	-	-	540	-	-	540	12	-	-	8	540	540	4.1	HH	4.1	HH
Indeno(1,2,3-cd)pyrene	193-39-5	-	-	-	-	-	0.029	-	0.029	0.029	-	-	-	-	-	-	-	0.275	-	4.31	0.275	0.275	0.029	HH	0.029	HH
Isophorone	78-59-1	-	-	-	-	-	71	-	71	71	-	-	2340	-	-	2340	-	-	-	920	2340	2340	71	HH	71	HH
Isopropylbenzene	98-82-8	-	-	-	-	-	680	-	680	680	-	-	-	-	-	-	-	-	-	-	-	7.3 [y]	7.3 [y]	Eco	7.3 [y]	Eco
m,p-Xylenes	179601-23-1	-	-	200	850	2300	200	10000	200	200 [h]	-	-	13	-	8000	13	13	-	-	-	13	13 [h]	13 [h]	Eco	13 [h]	Eco
MCPA	94-74-6	18	73	-	-	6600	18	-	18	18	-	-	-	-	-	-	-	-	2.6	2.6	2.6	2.6	2.6	Eco	2.6	Eco
MCPP	93-65-2	-	-	-	-	-	37	-	37	37	-	-	-	-	-	-	-	-	-	-	-	-	37	HH	37	HH
Methoxychlor	72-43-5	-	-	-	-	-	180	40	180	180	-	0.03	0.03	-	30000	0.03	0.019	-	-	0.03	0.03	0.03	0.03	Eco	0.03	Eco
Monobutyltin	78763-54-9	-	-	-	-	-	-	-	-	11 [g]	-	-	-	-	-	-	-	-	-	-	-	0.063 [ab]	0.063 [ab]	Eco	0.063 [ab]	Eco
Naphthalene	91-20-3	0.14	0.72	16000	10000	500	0.14	-	0.14	0.14	-	-	620	-	284000	620	12	193.5	1.1	1.1	193.5	193.5 [ay]	0.14	HH	0.14	HH
n-Butylbenzene	104-51-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	98-95-3	-	-	-	-	-	0.12	-	0.12	0.12	-	-	540	-	-	540	-	-	-	220	540	540	0.12	HH	0.12	HH
N-Nitrosodimethylamine	62-75-9	-	-	-	-	-	0.00042	-	0.00042	0.00042	-	-	117	-	-	117	-	-	-	-	117	117	0.00042	HH	0.00042	HH
N-Nitrosodi-n-propylamine	621-64-7	-	-	-	-	-	0.0096	-	0.0096	0.0096	-	-	117	-	-	117	-	-	-	-	117	117	0.0096	HH	0.0096	HH
N-Nitrosodiphenylamine	86-30-6	-	-	-	-	-	14	-	14	14	-	-	210	-	-	210	210	-	-	210	210	210	14	HH	14	HH
n-Propylbenzene	103-65-1	-	-	-	-	-	1300	-	1300	1300	-	-	-	-	-	-	-	-	-	-	-	7.3 [y]	7.3 [y]	Eco	7.3 [y]	Eco
o-Xylene	95-47-6	-	-	-	-	-	1200	-	1200	1200	-	-	-	-	-	-	-	-	-	350	350	350	350	Eco	350	Eco
p-cresol (4-Methylphenol)	106-44-5	-	-	-	-	-	180	-	180	180	-	-	-	-	-	-	-	-	-	-	-	13 [v]	13 [v]	Eco	13 [v]	Eco
Pentachlorophenol	87-86-5	0.47	3.4	-	-	52	0.56	1	0.47	0.47	15	-	15	-	1800	15	-	-	0.5	15	15	15	0.47	HH	0.47	HH
Phenanthrene	85-01-8	-	-	-	-	-	-	-	-	11000 [aq]	-	-	6.3	-	-	6.3	-	19.13	0.4	3.6	6.3	6.3	6.3	Eco	6.3	Eco
Phenol	108-95-2	-	-	-	-	-	11000	-	11000	11000	-	-	110	-	-	110	-	-	4	180	110	110	110	Eco	110	Eco
Pyrene	129-00-0	-	-	-	-	-	1100	-	1100	1100	-	-	-	-	-	-	-	10.11	0.025	0.025	10.11	10.11	10.11	Eco	10.11	Eco
Residual Range Organics	RRO	290	1100	-	-	-	-	-	290	290	-	-	-	-	-	-	-	-	-	-	-	-	290	HH	290	HH
sec-Butylbenzene	135-98-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solids, Total Dissolved	TDS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	100-42-5	1600	6700	-	-	160000	1600	100	1600	1600	-	-	-	-	-	-	-	-	72	32	72	72	72	Eco	72	Eco
Sulfate	14808-79-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
tert-Butylbenzene	98-06-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrabutyltin	1461-25-2	-	-	-	-	-	-	-	-	11 [g]	-	-	-	-	-	-	-	-	-	-	-	0.063 [ab]	0.063 [ab]	Eco	0.063 [ab]	Eco
Tetrachloroethene (PCE)	127-18-4	0.093	0.64	9200	1400	240	0.11	5	0.093	0.093	-	-	840	-	6000	840	98	-	111	45	840	840	0.093	HH	0.093	HH
Toluene	108-88-3	2300	9200	-	-	210000	2300	1000	2300	2300	-	-	9.8	-	104000	9.8	9.8	-	2	2	9.8	9.8	9.8	Eco	9.8	Eco
Total PCBs	1336-36-3	0.028	0.2	-	-	1.9	0.17	0.5	0.17	0.17 [ae]	0.014	0.014	0.014	-	270	0.014	0.14	-	-	0.014	0.014	0.014	0.014	Eco	0.014	Eco
Total PAH		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total LPAH		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total HPAH		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toxaphene	8001-35-2	0.052	0.37	-	-	71	0.061	3	0.052	0.052	0.002	0.0002	0.0002	-	60000	0.0002	-	-	-	0.0002	0.002	0.002	0.002	Eco	0.002	Eco
trans-1,2-Dichloroethene	156-60-5	110	450	1800000	350000	14000	110	100	110	110	-	-	590	-	180000	590	-	-	-	1160	590	590	110	HH	110	HH
trans-1,3-Dichloropropene	10061-02-6	-	-	-	-	-	0.43	-	0.43	0.43 [g]	-	-	-	-	-	-	-	-	-	<0.055	<0.055	0.055	0.055	Eco	0.055	Eco
Tributyltin	688-73-3	-	-	-	-	-	11	-	11	11 [g]	-	-	0.063	-	-	0.063	-	-	0.008	-	0.063	0.063	0.063	Eco	0.063	Eco
Trichloroethylene (TCE)	79-01-6	0.039	0.22	870	150	160	2	5	0.039	0.039	-	-	21900	-	3000	3000	47	-	21	<21	3000	3000	0.039	HH	0.039	HH
Trichlorofluoromethane	75-69-4	1300	5400	-	340000	160000	1300	-	1300	1300	-	-	-	-	-	-	-	-	-	-	-	-	1300	HH	1300	HH
Vinyl Acetate	108-05-4	-	-	-	-	-	410	-	410	410	-	-	16	-	-	16	16	-	-	16	16	16	16	Eco	16	Eco
Vinyl Chloride	75-01-4	0.025	0.52	6800	910	1200	0.016	2	0.025	0.025	-	-	-	-	1300	1300	-	-	-	930	1300	1300	0.025	HH	0.025	HH
Ammonia	7664-41-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide	24959-67-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon, Dissolved Organic	DOC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon, Total Organic	7440-44-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbonate as CaCO3	3812-32-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chemical Oxygen Demand	COD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	16887-00-6	-	-	-	-	-	-	-	-	-	-	230000	-	-	-	-	-	-	-	-	230000	230000	230000	Eco	230000	Eco
Cyanide (Hydrogen Cyanide)	74-90-8	730	2900	-	-	2500000	6.2	-	730	730	5.2	5.2	5.2	-	-	5.2	-	-	5	5.2	5.2	5.2	5.2	Eco	5.2	Eco
Fluoride	16984-48-8	-	-	-	-	-	1500	4000	1500	1500	-	-	-	-	-	-	-	-	-	-	-	-	1500	HH	1500	HH
Hardness (by Calculation)	HARDNESS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as Nitrogen	14797-55-8	-	-	-	-	-	58000	10000	58000	58000	-	-	-	-	-	-	-	-	13000	-	13000	13000	13000	Eco	13000	Eco
Nitrate+Nitrite as Nitrogen	NOx-N	-	-	-	-	-	-	10000	10000	10000	-	-	-	-	-	-	-	-	-	-	-	-	10000	HH	10000	HH
Total Suspended Solids	TSS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	TURB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (Soluble)	7429-90-5	-	-	-	-	-	37000	-	37000	37000	-	-	87	797000	8000	87	-	-	5-100	87	87	87	37000	HH	87	Eco
Antimony	7440-36-0	-	-	-	-	-	15	6	15	15	-	-	1600	-	1000	1000	30	-	-	30	1000	1000	15	HH	15	HH
Arsenic	7440-38-2	0.038	0.27	-	-	5800	0.045	10	0.038	0.038	150	-	150	18000	6000	150	-	-	5	150	150	150	0.038	HH	0.038	HH
Barium	7440-39-3	7300	29000	-	-	25000000	7300	2000	7300	7300	-	-	4	150000	39000	4	4	-	-	3.9	4	4	7300	HH	4	Eco
Beryllium	7440-41-7	73	290	-	-	250000	73	4	73	73	-	-	5.3	-	5000	5.3	0.66	-	-	0.66	5.3	5.3	73	HH	5.3	Eco
Cadmium	7440-43-9	18	73	-	-	57000	18 [i]	5	18	18	0.25	-	2.2	10000	8000	2.2	-	-	0.017	0.25	0.25	0.17 [ax]	18	HH	0.17 [ax]	Eco
Calcium	7440-70-2	-	-	-	-	-	-	-	-	-	-	-	116000	-	-	116000	-	-	-	-	116000	116000	-	-	116000	Eco
Chromium	7440-47-3	55000	220000	-	-	-	-	100	55000	55000	-	-	74	7200	21000000	74	-	-	8.9	74	74	54 [ax]	55000	HH	54 [ax]	Eco
Cobalt	7440-48-4	-	-	-	-	-	11	-	11	11	-	-	23	-	9000	23	23	-	-	3	23	23	11	HH	11	HH
Copper	7440-50-8	1500	5800	-	-	5000000	1500	1300	1500	1500	9	-	9	341000	53000	9	-	-	2-4	9	9	5.8 [ax]	1500	HH	5.8 [ax]	Eco
Iron	7439-89-6	-	-	-	-	-	26000	-	26000	26000	-	1000	1000	-	-	1000	-	-	300	1000	1000	1000	26000	HH	1000	Eco
Lead	7439-92-1	15	15	-	-	-	-	15	15	15	2.5	-	2.5	28000	323000	2.5	-	-	1-7	2.5	2.5	1.44 [ax]	15	HH	1.44 [ax]	Eco
Magnesium	7439-95-4	-	-	-	-	-	-	-	-	-	-	-	82000	-	-	82000	-	-	-	-	82000	82000	-	-	82000	Eco
Manganese	7439-96-5	880	3500	-	-	3000000	880 [i]	-	880	880	-	-	120	7242000	676000	120	120	-	-	80	120	120	880	HH	120	Eco
Mercury	7439-97-6	11	44	-	-	-	0.57	2	11	11	0.77	0.012	0.77	3300	10000	0.77	1.3	-	0.026, 0.004	0.77	0.77	0.77	11	HH	0.77	Eco
Nickel	7440-02-0	730	2900	-	-	12000000	730	-	730	730	52	-	52	562000	38000	52	-	-	25-150	52	52	34 [ax]	730	HH	34 [ax]	Eco
Potassium	7440-09-7	-	-	-	-	-	-	-	-	-	-	-	53000	-	-	53000	-	-	-	-	53000	53000	-	-	53000	Eco
Selenium	7782-49-2	-	-	-	-	-	180	50	180	180	5	-	5	3600	1500	5	-	-	1	5	5	5	180	HH	5	Eco
Silver	7440-22-4	180	730	-	-	1000000	180	-	180	180	-	-	0.12	-	-	0.12	0.36	-	0.1	0.36	0.12	0.12	180	HH	0.12	Eco
Sodium	7440-23-5	-	-	-	-	-	-	-	-	-	-	-	680000	-	-	680000	-	-	-	-	680000	680000	-	-	680000	Eco
Thallium	7440-28-0	-	-	-	-	-	-	2	2	2	-	-	40	-	60	40	12	-	0.8	0.03	40	40	2	HH	2	HH
Vanadium	7440-62-2	-	-	-	-	-	2.6 [a]	-	2.6	2.6	-	-	20	82000	1600	20	20	-	-	19	20	20	2.6	HH	2.6	HH
Zinc	7440-66-6	-	-	-	-	-	11000	-	11000	11000	120	-	120	105000	1230000	120	-	-	30	120	120	77 [ax]	11000	HH	77 [ax]	Eco

Table J-1b - Miniumum Potentially Applicable Direct Contact Water SLVs for Identification of Preliminary COPCs
Bradford Island, Upland Operable Unit
(6 of 6)

		Candidate Human Health Water Screening Level Values for Direct Contact (ug/L)									Canidate Ecological Water Screening Level Values (ug/L)														
Analyte	CAS #	DEQ GW Ingest Residential RBC [m]	DEQ GW Ingest Occupational RBC [m]	DEQ GW Volatilize Outdoor Air Occupational RBC [m]	DEQ GW Vapor Intrusion Occupational RBC [m]	DEQ GW Excavation Construct/Exca RBC [m]	USEPA Tapwater RSL [n]	DEQ MCL [o]	Direct Contact Selected HH SLV [s]	Direct Contact Selected HH Water SLV w/ Surrogates [s]	USEPA Freshwater NRWQC [p]	DEQ Freshwater Table 33A WQC[q]	DEQ Level II Aquatic SLV[af]	DEQ Level II Bird SLV[af]	DEQ Level II Mammal SLV[af]	Lowest DEQ Level II SLV[af]	ORNL Tier II Chronic Value[ag]	USEPA PAH FCV[ah]	Canadian WQG[ai]	NOAA SQuiRTs Freshwater Chronic [aj]	Selected Ecological SLV [ak]	Selected Ecological Water SLV with Surrogates [ak]	Selected Min. Potentially Applicable Water SLV (Total) [al]	SLV (Total): HH or Eco	Selected Min. Potentially Applicable Water SLV (Dissolved) [am]	SLV (Dissolved): HH or Eco

Note:

Human Health Screening Levels correspond to a target risk of 1E-06 for carcinogens and target hazard quotient of 1.0 for non-carcinogens for the selected receptor and pathway. MCLs incorporate considerations of risk as well as feasibility in attaining target level.
- = No benchmark available or available benchmark not needed, based on hierarchy of sources
DEQ = Oregon Department of Environmental Quality
USEPA = US Environmental Protection Agency
GW = groundwater
MCL = Maximum Contaminant Level
ug/L = microgram per liter
NOAA = National Oceanic and Atmospheric Administration
NRWQC = National Recommended Water Quality Criteria
ORNL = Oak Ridge National Laboratory
PAH = Polycyclic aromatic hydrocarbon
RBC = Risk Based Concentrations
RI = Remedial Investigation
RSL = Regional Screening Level
SLV = Screening Level Value
SQuiRTs = Screening Quick Reference Tables
WQC = Water Quality Criteria

[a] Vanadium, Metallic was used.
[b] Benzo(a)pyrene was used as a surrogate because there was no chemical-specific SLV.
[c] BHC alpha was used as a surrogate, because there was no chemical-specific SLV, and BHC alpha was the lowest BHC.
[d] Chlordane was used as a surrogate.
[e] Dichloropropene, 1,3- was used as a surrogate.
[f] 4,4'-DDT was used as a surrogate because the Aquatic Level II SLV is for DDT and its metabolites and is more conservative than the Avian Level II SLV for DDE.
[g] Tributyltin compounds was used as a surrogate because there was no chemical specific SLV.
[h] Xylene (mixed) was used as a surrogate because there was no chemical specific SLV.
[i] Manganese (water) was used as opposed to Manganese (diet).
[j] Naphthalene was used as a surrogate because there was no chemical-specific SLV.
[k] Dibutyltin compounds was used as a surrogate because there was no chemical specific SLV.
[l] Cadmium (water) was used.
[m] DEQ. DEQ 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2005
[n] US Environmental Protection Agency (USEPA) 2009. Regional Screening Level. December.
[o] DEQ. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf.
[p] USEPA 2009. National Recommended Water Quality Criteria. Office of Water and Office of Science and Technology.
[q] DEQ. Water Quality Criteria for freshwater organisms (Oregon Administrative rules, section 340-041, Table 33A).
[r] 1,2,4- Trichlorobenzene was used as a surrogate because there was no chemical specific SLV.
[s] Groundwater HH Hierarchical SLV Selection for Direct Contact: 1. DEQ RBCs (the minimum of Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA RSL, and 3. DEQ MCL. Surface Water HH Hierarchical SLV Selection for Direct Contact: 1) DEQ RBCs (the minimum of Ingest Residential and Ingest Occupational) and 2-6 same as groundwater; this does not result in a change of the selected SLV.
[t] 1,2- Dichloropropane was used as a surrogate because there was no chemical specific SLV.
[u] Phenol was used as a surrogate because there was no chemical specific SLV.
[v] 2- Methylphenol was used as a surrogate because there was no chemical specific SLV.
[w] 2- Nitroaniline was used as a surrogate because there was no chemical specific SLV.
[x] Bromodichloromethane was used as a surrogate because there was no chemical specific SLV.
[y] Ethylbenzene was used as a surrogate because there was no chemical specific SLV.
[z] Bis(2-ethyl hexyl) phthalate was used as a surrogate because there was no chemical specific SLV, and Bis(2-ethyl hexyl) phthalate was the lowest of the pthalates.
[aa] Endrin was used as a surrogate because there was no chemical specific SLV.
[ab] Tributyltin was used as a surrogate because there was no chemical specific SLV.
[ac] Chlordane (CAS # 57749) was used as a surrogate because there was no chemical specific SLV.
[ad] Chromium (III) was used as a surrogate because there was no chemical specific SLV.
[ae] 2,4-D was used as a surrogate because there was no chemical specific SLV.
[af] Oregon Department of Environmental Quality (ODEQ) 1998. Updated 2001. Guidance for Ecological risk Assessment: Levels I,II,III,IV. Waste Management and Cleanup Division.
[ag] Suter GW II, and CL Tsao. 1996. Toxicological Benchmarks for Screening of Potential Contaminants of Concern for Effects on Aquatic Biota on Oak Ridge Reservation: 1996 Revision. ORNL, Oak Ridge, TN. 104pp. ES/ER/TM-96/R2.
[ah] USEPA 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. November. EPA-600-R-02-013
[ai] Canadian Council of Resource and Environment Ministers. 2007. Canadian Water Quality Guidelines for the Protection of Aquatic Life. December Accessed on 1/20/10 at http://ceqg-rcqe.ccme.ca/.
[aj] Buchman, M.F., 2008. NOAA Screening Quick Reference Tables, NOAA OR&R Report 08-1, Seattle WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration, 34 pages.
[ak] Ecological Hierarchical SLV Selection: 1. USEPA Freshwater NAWQC, 2. ODEQ Freshwater Table 33A WQC, 3. DEQ Level II SLVs (lowest), 4. ORNL Tier II Value, 5. USEPA PAH FCV, 6. Canadian Freshwater WQG, 7. NOAA SQuiRTs Freshwater Chronic.
[al] For organic analytes, most conservative of Human Health and Ecological Selected Water Screening Levels with Surrogates. For inorganic analytes, selected Human Health Selected Screening Level.
[am] For all analytes, most conservative of Human Health and Ecological Selected Water Screening Levels with Surrogates.
[an] Total PCBs was used as a surrogate because the SLV is more conservative than the individual aroclor SLVs.
[ao] 4-(2,4-Dichlorophenoxy)butyric Acid was used as a surrogate because there was no chemical specific SLV.
[ap] 1,4-Dichlorobenzene was used as a surogate because there was no chemical specific SLV.
[aq] The SLV for anthracene was used as a surogate because there was no chemical specific SLV.
[ar] Diethyl Phthalate was used as a surrogate because there was no chemical specific SLV.
[as] Endosulfan was used as a surrogate because there was no chemical specific SLV.
[at] The RSL for Total PCBs was selected as the SLV per DEQ.
[au] Toxic Equivalency Factors for Benzo(g,h,i)perylene (0.01) was applied to the Benzo(a)pyrene SLV because there was no chemical specific SLV.
[av] Benzo(k)fluoranthene was used as a surrogate because there was no chemical-specific SLV.
[aw] Benzo(b)fluoranthene was used as a surrogate because there was no chemical-specific SLV and benzo(b)fluoranthene had the lowest SLV of the benzofluoranthenes.
[ax] As per EPA guidance, certain NRWQC were adjusted for hardness based on a site-specific hardness value of 60 mg/L (minimum value of 54 mg/L and maximum value of 64 mg/L).
[ay] For these two PAHs, the ecological SLV hierarchy presented in footnote "ak" was not followed. As per the response to DEQ's Specific Comment #26 (see Appendix P), EPA's FCVs were used instead (EPA 2003).

Table J-1c - Miniumum Potentially Applicable Discharge to Surface Water and Bioaccumulation Water SLVs for Identification of Preliminary COPCs
Bradford Island, Upland and River Operable Units
(1 of 6)

		Candidate Human Health Water Screening Level Values for Discharge to Surface Water/Bioaccumulation (ug/L)								Canidate Ecological Water Screening Level Values (ug/L)															
Analyte	CAS #	USEPA NRWQC (Water + Organism) p	USEPA NRWQC (Organism Only) p	DEQ Table 33A WQC (Water+ Organism)[q]	DEQ Table 33A WQC (Organism Only)[q]	DEQ Table 33B WQC (Water+ Organism)[q]	DEQ Table 33B WQC (Organism Only)[q]	Selected HH SLV [s]	Selected HH Water SLV with Surrogates [s]	USEPA Freshwater NRWQC p	DEQ Freshwater Table 33A WQC[q]	DEQ Level II Aquatic SLV[af]	DEQ Level II Bird SLV[af]	DEQ Level II Mammal SLV[af]	Lowest DEQ Level II SLV[af]	ORNL Tier II Chronic Value[bg]	USEPA PAH FCV[ah]	Canadian WQG[ai]	NOAA SQuiRTs Freshwater Chronic [aj]	Selected Ecological SLV [ak]	Selected Ecological Water SLV with Surrogates [ak]	Selected Min. Potentially Applicable Water SLV (Total) [al]	SLV (Total): HH or Eco	Selected Min. Potentially Applicable Water SLV (Dissolved) [am]	SLV (Dissolved): HH or Eco
2-Chlorobiphenyl	2051-60-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Chlorobiphenyl	2051-61-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorobiphenyl	2051-62-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2'-Dichlorobiphenyl	13029-08-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3-Dichlorobiphenyl	16605-91-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3'-Dichlorobiphenyl	25569-80-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorobiphenyl	33284-50-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4'-Dichlorobiphenyl	34883-43-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,5-Dichlorobiphenyl	34883-39-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dichlorobiphenyl	33146-45-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobiphenyl	2050-67-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4-Dichlorobiphenyl	2974-92-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4'-Dichlorobiphenyl	2974-90-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,5-Dichlorobiphenyl	34883-41-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-Dichlorobiphenyl	2050-68-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3-Trichlorobiphenyl	38444-78-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4-Trichlorobiphenyl	37680-66-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',5-Trichlorobiphenyl	37680-65-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',6-Trichlorobiphenyl	38444-73-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3'-Trichlorobiphenyl	38444-84-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4-Trichlorobiphenyl	55702-46-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4'-Trichlorobiphenyl	38444-85-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,5-Trichlorobiphenyl	55720-44-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,6-Trichlorobiphenyl	55702-45-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4-Trichlorobiphenyl	55712-37-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',5-Trichlorobiphenyl	38444-81-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',6-Trichlorobiphenyl	38444-76-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,4'-Trichlorobiphenyl	7012-37-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorobiphenyl	15862-07-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorobiphenyl	35693-92-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4',5-Trichlorobiphenyl	16606-02-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4',6-Trichlorobiphenyl	38444-77-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4'-Trichlorobiphenyl	38444-86-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',5'-Trichlorobiphenyl	37680-68-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4-Trichlorobiphenyl	37680-69-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',5-Trichlorobiphenyl	38444-87-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4,4'-Trichlorobiphenyl	38444-90-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4,5-Trichlorobiphenyl	53555-66-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4',5-Trichlorobiphenyl	38444-88-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3'-Tetrachlorobiphenyl	38444-93-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4-Tetrachlorobiphenyl	52663-59-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4'-Tetrachlorobiphenyl	36559-22-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5-Tetrachlorobiphenyl	70362-46-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5'-Tetrachlorobiphenyl	41464-39-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,6-Tetrachlorobiphenyl	70362-45-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,6'-Tetrachlorobiphenyl	41464-47-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4'-Tetrachlorobiphenyl	2437-79-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,5-Tetrachlorobiphenyl	70362-47-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,5'-Tetrachlorobiphenyl	41464-40-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,6-Tetrachlorobiphenyl	62796-65-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,6'-Tetrachlorobiphenyl	68194-04-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',5,5'-Tetrachlorobiphenyl	35693-99-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',5,6'-Tetrachlorobiphenyl	41464-41-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',6,6'-Tetrachlorobiphenyl	15968-05-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4-Tetrachlorobiphenyl	74338-24-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4'-Tetrachlorobiphenyl	41464-43-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5-Tetrachlorobiphenyl	70424-67-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5'-Tetrachlorobiphenyl	41464-49-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',6-Tetrachlorobiphenyl	74472-33-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,4'-Tetrachlorobiphenyl	33025-41-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,5-Tetrachlorobiphenyl	33284-53-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,6-Tetrachlorobiphenyl	54230-22-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4',5-Tetrachlorobiphenyl	74472-34-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4',6-Tetrachlorobiphenyl	52663-58-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,5,6-Tetrachlorobiphenyl	33284-54-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,4'-Tetrachlorobiphenyl	32598-10-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,5-Tetrachlorobiphenyl	73575-53-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,5'-Tetrachlorobiphenyl	73575-52-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,6-Tetrachlorobiphenyl	60233-24-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4',5-Tetrachlorobiphenyl	32598-11-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4',6-Tetrachlorobiphenyl	41464-46-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',5,5'-Tetrachlorobiphenyl	41464-42-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',5',6-Tetrachlorobiphenyl	74338-23-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,4',5-Tetrachlorobiphenyl	32690-93-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,4',6-Tetrachlorobiphenyl	32598-12-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4',5'-Tetrachlorobiphenyl	70362-48-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4,5-Tetrachlorobiphenyl	70362-49-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4,5'-Tetrachlorobiphenyl	41464-48-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',5,5'-Tetrachlorobiphenyl	33284-52-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4-Pentachlorobiphenyl	52663-62-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table J-1c - Miniumum Potentially Applicable Discharge to Surface Water and Bioaccumulation Water SLVs for Identification of Preliminary COPCs
Bradford Island, Upland and River Operable Units
(2 of 6)

Analyte	CAS #	Candidate Human Health Water Screening Level Values for Discharge to Surface Water/Bioaccumulation (ug/L)								Canidate Ecological Water Screening Level Values (ug/L)															
		USEPA NRWQC (Water + Organism) p	USEPA NRWQC (Organism Only) p	DEQ Table 33A WQC (Water+ Organism)[q]	DEQ Table 33A WQC (Organism Only)[q]	DEQ Table 33B WQC (Water+ Organism)[q]	DEQ Table 33B WQC (Organism Only)[q]	Selected HH SLV [s]	Selected HH Water SLV with Surrogates [s]	USEPA Freshwater NRWQC p	DEQ Freshwater Table 33A WQC[q]	DEQ Level II Aquatic SLV[af]	DEQ Level II Bird SLV[af]	DEQ Level II Mammal SLV[af]	Lowest DEQ Level II SLV[af]	ORNL Tier II Chronic Value[bg]	USEPA PAH FCV[ah]	Canadian WQG[ai]	NOAA SQuiRTs Freshwater Chronic [aj]	Selected Ecological SLV [ak]	Selected Ecological Water SLV with Surrogates [ak]	Selected Min. Potentially Applicable Water SLV (Total) [al]	SLV (Total): HH or Eco	Selected Min. Potentially Applicable Water SLV (Dissolved) [am]	SLV (Dissolved): HH or Eco
2,2',3,3',5-Pentachlorobiphenyl	60145-20-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',6-Pentachlorobiphenyl	52663-60-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4'-Pentachlorobiphenyl	65510-45-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5-Pentachlorobiphenyl	55312-69-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5'-Pentachlorobiphenyl	38380-02-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,6-Pentachlorobiphenyl	55215-17-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,6'-Pentachlorobiphenyl	73575-57-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5-Pentachlorobiphenyl	68194-07-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',6-Pentachlorobiphenyl	68194-05-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5,5'-Pentachlorobiphenyl	52663-61-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5,6-Pentachlorobiphenyl	73575-56-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5,6'-Pentachlorobiphenyl	73575-55-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5',6-Pentachlorobiphenyl	38379-99-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,6,6'-Pentachlorobiphenyl	73575-54-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5'-Pentachlorobiphenyl	41464-51-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',6'-Pentachlorobiphenyl	60233-25-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4',5-Pentachlorobiphenyl	38380-01-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4',6-Pentachlorobiphenyl	39485-83-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,5,5'-Pentachlorobiphenyl	37680-73-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,5,6'-Pentachlorobiphenyl	68194-06-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,5',6-Pentachlorobiphenyl	60145-21-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,6,6'-Pentachlorobiphenyl	56558-16-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5-Pentachlorobiphenyl	70424-69-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5-Pentachlorobiphenyl	70424-68-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5'-Pentachlorobiphenyl	70362-41-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,6-Pentachlorobiphenyl	74472-35-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',6-Pentachlorobiphenyl	38380-03-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5,5'-Pentachlorobiphenyl	39635-32-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5,6-Pentachlorobiphenyl	74472-36-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5',6-Pentachlorobiphenyl	68194-10-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,4',6-Pentachlorobiphenyl	74472-38-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,5,6-Pentachlorobiphenyl	18259-05-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4',5,6-Pentachlorobiphenyl	68194-11-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,4',6-Pentachlorobiphenyl	56558-17-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,5,5'-Pentachlorobiphenyl	68194-12-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,5',6-Pentachlorobiphenyl	56558-18-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5'-Pentachlorobiphenyl	76842-07-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,4',5'-Pentachlorobiphenyl	65510-44-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4',5,5'-Pentachlorobiphenyl	70424-70-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4',5',6-Pentachlorobiphenyl	74472-39-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4,5,5'-Pentachlorobiphenyl	39635-33-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4'-Hexachlorobiphenyl	38380-07-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5-Hexachlorobiphenyl	55215-18-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5'-Hexachlorobiphenyl	52663-66-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,6-Hexachlorobiphenyl	61798-70-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,6'-Hexachlorobiphenyl	38380-05-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,5'-Hexachlorobiphenyl	35694-04-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,6-Hexachlorobiphenyl	52704-70-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,6'-Hexachlorobiphenyl	52744-13-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',6,6'-Hexachlorobiphenyl	38411-22-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5-Hexachlorobiphenyl	35694-06-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5'-Hexachlorobiphenyl	35065-28-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',6-Hexachlorobiphenyl	56030-56-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',6'-Hexachlorobiphenyl	59291-64-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5,5'-Hexachlorobiphenyl	52712-04-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5,6-Hexachlorobiphenyl	41411-61-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5,6'-Hexachlorobiphenyl	68194-15-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5',6-Hexachlorobiphenyl	68194-14-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,6,6'-Hexachlorobiphenyl	74472-40-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5,5'-Hexachlorobiphenyl	51908-16-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5,6-Hexachlorobiphenyl	68194-13-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5,6'-Hexachlorobiphenyl	74472-41-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5',6-Hexachlorobiphenyl	38380-04-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',6,6'-Hexachlorobiphenyl	68194-08-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5,5',6-Hexachlorobiphenyl	52663-63-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5,6,6'-Hexachlorobiphenyl	68194-09-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4',5,5'-Hexachlorobiphenyl	35065-27-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4',5,6'-Hexachlorobiphenyl	60145-22-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4',6,6'-Hexachlorobiphenyl	33979-03-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4',6-Hexachlorobiphenyl	74472-42-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5,5'-Hexachlorobiphenyl	39635-35-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5,6-Hexachlorobiphenyl	41411-62-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5',6-Hexachlorobiphenyl	74472-43-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5,5'-Hexachlorobiphenyl	39635-34-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5,6-Hexachlorobiphenyl	74472-44-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5',6-Hexachlorobiphenyl	74472-45-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table J-1c - Miniumum Potentially Applicable Discharge to Surface Water and Bioaccumulation Water SLVs for Identification of Preliminary COPCs
Bradford Island, Upland and River Operable Units
(3 of 6)

Analyte	CAS #	Candidate Human Health Water Screening Level Values for Discharge to Surface Water/Bioaccumulation (ug/L)								Canidate Ecological Water Screening Level Values (ug/L)															
		USEPA NRWQC (Water + Organism) p	USEPA NRWQC (Organism Only) p	DEQ Table 33A WQC (Water+ Organism)[q]	DEQ Table 33A WQC (Organism Only)[q]	DEQ Table 33B WQC (Water+ Organism)[q]	DEQ Table 33B WQC (Organism Only)[q]	Selected HH SLV [s]	Selected HH Water SLV with Surrogates [s]	USEPA Freshwater NRWQC p	DEQ Freshwater Table 33A WQC[q]	DEQ Level II Aquatic SLV[af]	DEQ Level II Bird SLV[af]	DEQ Level II Mammal SLV[af]	Lowest DEQ Level II SLV[af]	ORNL Tier II Chronic Value[ag]	USEPA PAH FCV[ah]	Canadian WQG[ai]	NOAA SQuiRTs Freshwater Chronic [aj]	Selected Ecological SLV [ak]	Selected Ecological Water SLV with Surrogates [ak]	Selected Min. Potentially Applicable Water SLV (Total) [al]	SLV (Total): HH or Eco	Selected Min. Potentially Applicable Water SLV (Dissolved) [am]	SLV (Dissolved): HH or Eco
2,3,3',5,5',6-Hexachlorobiphenyl	74472-46-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,4',5,6-Hexachlorobiphenyl	41411-63-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,4',5',6-Hexachlorobiphenyl	59291-65-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',6-Heptachlorobiphenyl	52663-71-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,5'-Heptachlorobiphenyl	52663-74-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,6-Heptachlorobiphenyl	68194-16-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,6'-Heptachlorobiphenyl	38411-25-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5',6-Heptachlorobiphenyl	40186-70-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,6,6'-Heptachlorobiphenyl	52663-65-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5',6'-Heptachlorobiphenyl	52663-70-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,5',6-Heptachlorobiphenyl	52663-67-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,6,6'-Heptachlorobiphenyl	52663-64-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5,6-Heptachlorobiphenyl	74472-47-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5,6'-Heptachlorobiphenyl	60145-23-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5',6-Heptachlorobiphenyl	52663-69-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',6,6'-Heptachlorobiphenyl	74472-48-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5,5',6-Heptachlorobiphenyl	52712-05-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5,6,6'-Heptachlorobiphenyl	74472-49-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5,5',6-Heptachlorobiphenyl	52663-68-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5,6,6'-Heptachlorobiphenyl	74487-85-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4',5,6-Heptachlorobiphenyl	41411-64-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4',5',6-Heptachlorobiphenyl	74472-50-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5,5',6-Heptachlorobiphenyl	74472-51-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5,5',6-Heptachlorobiphenyl	69782-91-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5,5'-Octachlorobiphenyl	35694-08-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5,6-Octachlorobiphenyl	52663-78-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5,6'-Octachlorobiphenyl	42740-50-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',6,6'-Octachlorobiphenyl	33091-17-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,5',6-Octachlorobiphenyl	68194-17-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,5',6'-Octachlorobiphenyl	52663-75-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,6,6'-Octachlorobiphenyl	52663-73-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5',6,6'-Octachlorobiphenyl	40186-71-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,5',6,6'-Octachlorobiphenyl	2136-99-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5,5',6-Octachlorobiphenyl	52663-76-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5,6,6'-Octachlorobiphenyl	74472-52-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4',5,5',6-Octachlorobiphenyl	74472-53-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	40186-72-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl	52663-79-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	52663-77-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Decachlorobiphenyl	2051-24-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	630-20-6	-	-	-	-	-	-	-	-	-	-	186	-	-	186	-	-	-	-	186	186	186	Eco	186	Eco
1,1,1-Trichloroethane (TCA)	71-55-6	-	-	-	-	-	-	-	-	-	-	11	-	4000000	11	11	-	-	11	11	11	11	Eco	11	Eco
1,1,2,2-Tetrachloroethane	79-34-5	0.17	4	0.17	4	-	-	0.17	0.17	-	-	2400	-	-	2400	610	-	-	111	2400	2400	0.17	HH	0.17	HH
1,1,2-Trichloroethane	79-00-5	0.59	16	0.59	16	-	-	0.59	0.59	-	-	9400	-	-	9400	1200	-	-	500	9400	9400	0.59	HH	0.59	HH
1,1-Dichloroethane	75-34-3	-	-	-	-	-	-	-	-	-	-	47	-	-	47	47	-	-	47	47	47	47	Eco	47	Eco
1,1-Dichloroethene	75-35-4	330	7100	330	7100	-	-	330	330	-	-	25	-	230000	25	25	-	-	25	25	25	25	Eco	25	Eco
1,1-Dichloropropene	563-58-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	87-61-6	-	-	-	-	-	-	-	35 [r]	-	-	-	-	-	-	-	-	8.0	8	8	8	8	Eco	8	Eco
1,2,3-Trichloropropane	96-18-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	120-82-1	35	70	35	70	-	-	35	35	-	-	110	-	-	110	110	-	24	24	110	110	35	HH	35	HH
1,2,4-Trimethylbenzene	95-63-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.3 [y]	7.3 [y]	Eco	7.3 [y]	Eco
1,2-Dibromo-3-chloropropane	96-12-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (EDB)	106-93-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	95-50-1	420	1300	420	1300	-	-	420	420	-	-	14	-	-	14	14	-	0.7	0.7	14	14	14	Eco	14	Eco
1,2-Dichloroethane (EDC)	107-06-2	0.38	37	0.38	37	-	-	0.38	0.38	-	-	20000	125000	200000	20000	910	-	100	100	20000	20000	0.38	HH	0.38	HH
1,2-Dichloropropane	78-87-5	0.5	15	0.5	15	-	-	0.5	0.5	-	-	5700	-	-	5700	-	-	-	5700	5700	5700	0.5	HH	0.5	HH
1,3,5-Trimethylbenzene	108-67-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.3 [y]	7.3 [y]	Eco	7.3 [y]	Eco
1,3-Dichlorobenzene	541-73-1	320	960	320	960	-	-	320	320	-	-	71	-	-	71	71	-	150	38	71	71	71	Eco	71	Eco
1,3-Dichloropropane	142-28-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5700	5700	Eco	5700	Eco
1,4-Dichlorobenzene	106-46-7	63	190	63	190	-	-	63	63	-	-	15	-	-	15	15	-	26	9.4	15	15	15	Eco	15	Eco
2,2-Dichloropropane	594-20-7	-	-	-	-	-	-	-	0.5 [t]	-	-	-	-	-	-	-	-	-	-	-	5700 [t]	0.5 [t]	HH	0.5 [t]	HH
2,4,5-T	93-76-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	36	36	36	Eco	36	Eco
2,4,5-TP (Silvex)	93-72-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	95-95-4	-	-	1800	3600	-	-	1800	1800	-	-	-	-	-	-	-	-	18	63	18	18	18	Eco	18	Eco
2,4,6-Trichlorophenol	88-06-2	1.4	2.4	-	2.4	1.4	-	1.4	1.4	-	-	970	-	-	970	-	-	18	4.9	970	970	1.4	HH	1.4	HH
2,4-D	94-75-7	-	-	100	-	-	-	100	100	-	-	-	-	-	-	-	-	-	4	4	4	4	Eco	4	Eco
2,4-DB	94-82-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	120-83-2	77	290	77	290	-	-	77	77	-	-	3650	-	-	3650	-	-	0.2	11	3650	3650	77	HH	77	HH
2,4-Dimethylphenol	105-67-9	380	850	380	850	-	-	380	380	-	-	42	-	-	42	-	-	-	100	42	42	42	Eco	42	Eco
2,4-Dinitrophenol	51-28-5	69	5300	69	5300	-	-	69	69	-	-	-	-	-	-	-	-	-	19	19	19	19	Eco	19	Eco
2,4-Dinitrotoluene	121-14-2	0.11	3.4	0.11	3.4	-	-	0.11	0.11	-	-	230	-	-	230	-	-	-	44	230	230	0.11	HH	0.11	HH
2,6-Dinitrotoluene	606-20-2	-	-	-	-	-	-	-	-	-	-	230	-	-	230	-	-	-	-	230	230	230	Eco	230	Eco
2-Butanone (MEK)	78-93-3	-	-	-	-	-	-	-	-	-	-	14000	-	-	14000	14000	-	-	14000	14000	14000	14000	Eco	14000	Eco
2-Chloroethylvinylether	110-75-8	-	-	-	-	-	-	-	-	-	-	4760	-	-	4760	-	-	-	-	4760	4760	4760	Eco	4760	Eco
2-Chloronaphthalene	91-58-7	1000	1600	1000	1600	-	-	1000	1000	-	-	32	-	-	32	-	-	-	0.396	32	32	32	Eco	32	Eco
2-Chlorophenol	95-57-8	81	150	81	150	-	-	81	81	-	-	2000	-	-	2000	-	-	7	24	2000	2000	81	HH	81	HH
2-Chlorotoluene	95-49-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table J-1c - Miniumum Potentially Applicable Discharge to Surface Water and Bioaccumulation Water SLVs for Identification of Preliminary COPCs
Bradford Island, Upland and River Operable Units
(4 of 6)

		Candidate Human Health Water Screening Level Values for Discharge to Surface Water/Bioaccumulation (ug/L)								Canidate Ecological Water Screening Level Values (ug/L)															
Analyte	CAS #	USEPA NRWQC (Water + Organism) p	USEPA NRWQC (Organism Only) p	DEQ Table 33A WQC (Water+ Organism)[q]	DEQ Table 33A WQC (Organism Only)[q]	DEQ Table 33B WQC (Water+ Organism)[q]	DEQ Table 33B WQC (Organism Only)[q]	Selected HH SLV [s]	Selected HH Water SLV with Surrogates [s]	USEPA Freshwater NRWQC p	DEQ Freshwater Table 33A WQC[q]	DEQ Level II Aquatic SLV[af]	DEQ Level II Bird SLV[af]	DEQ Level II Mammal SLV[af]	Lowest DEQ Level II SLV[af]	ORNL Tier II Chronic Value[ag]	USEPA PAH FCV[ah]	Canadian WQG[ai]	NOAA SQuiRTs Freshwater Chronic [aj]	Selected Ecological SLV [ak]	Selected Ecological Water SLV with Surrogates [ak]	Selected Min. Potentially Applicable Water SLV (Total) [al]	SLV (Total): HH or Eco	Selected Min. Potentially Applicable Water SLV (Dissolved) [am]	SLV (Dissolved): HH or Eco
2-Hexanone	591-78-6	-	-	-	-	-	-	-	-	-	-	99	-	-	99	99	-	-	99	99	99	99	Eco	99	Eco
2-Methylnaphthalene	91-57-6	-	-	-	-	-	-	-	670 [j]	-	-	-	-	-	-	-	72.16	-	330	72.16	72.16	72.16	Eco	72.16	Eco
2-Methylphenol	95-48-7	-	-	-	-	-	-	-	10000 [u]	-	-	13	-	2200000	13	13	-	-	13	13	13	13	Eco	13	Eco
2-Nitroaniline	88-74-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	88-75-5	-	-	-	-	-	-	-	10000 [u]	-	-	-	-	-	-	-	-	-	-	-	-	10000 [u]	HH	10000 [u]	HH
3,3'-Dichlorobenzidine	91-94-1	0.021	0.028	0.021	0.028	-	-	0.021	0.021	-	-	-	-	-	-	-	-	-	4.5	4.5	4.5	0.021	HH	0.021	HH
3-Nitroaniline	99-09-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDD	72-54-8	0.00031	0.00031	0.00031	0.00031	-	-	0.00031	0.00031	-	-	0.001	20	6000	0.001	0.011	-	-	0.011	0.001	0.001	0.00031	HH	0.00031	HH
4,4'-DDE	72-55-9	0.00022	0.00022	0.00022	0.00022	-	-	0.00022	0.00022	-	-	-	20	6000	20	-	-	-	105	20	0.001 [i]	0.00022	HH	0.00022	HH
4,4'-DDT	50-29-3	0.00022	0.00022	-	-	0.00022	0.00022	0.00022	0.00022	0.001	0.001	0.001	20	6000	0.001	0.013	-	-	0.0005	0.001	0.001	0.00022	HH	0.00022	HH
4,6-Dinitro-2-methylphenol	534-52-1	13	280	13	280	-	-	13	13	-	-	-	-	-	-	-	-	-	-	-	-	13	HH	13	HH
4-Bromophenyl Phenyl Ether	101-55-3	-	-	-	-	-	-	-	-	-	-	1.5	-	-	1.5	1.5	-	-	-	1.5	1.5	1.5	Eco	1.5	Eco
4-Chloro-3-methylphenol	59-50-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	106-47-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	50	50	50	Eco	50	Eco
4-Chlorophenyl Phenyl Ether	7005-72-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorotoluene	106-43-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Isopropyltoluene	99-87-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (MIBK)	108-10-1	-	-	-	-	-	-	-	-	-	-	170	-	-	170	170	-	-	170	170	170	170	Eco	170	Eco
4-Nitroaniline	100-01-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	100-02-7	-	-	-	-	-	-	-	10000 [u]	-	-	150	-	-	150	300	-	-	60	150	150	150	Eco	150	Eco
Acenaphthene	83-32-9	670	990	670	990	-	-	670	670	-	-	520	-	-	520	-	55.85	5.8	5.8	55.85	55.85 [ao]	55.85 [ao]	Eco	55.85 [ao]	Eco
Acenaphthylene	208-96-8	-	-	-	-	-	-	-	670 [j]	-	-	-	-	-	-	-	306.9	-	4840	306.9	306.9	306.9	Eco	306.9	Eco
Acetone	67-64-1	-	-	-	-	-	-	-	-	-	-	1500	-	76000	1500	1500	-	-	1500	1500	1500	1500	Eco	1500	Eco
Aldrin	309-00-2	0.000049	0.00005	0.000049	0.00005	-	-	0.000049	0.000049	-	-	0.06	-	1500	0.06	-	-	-	0.017	0.06	0.06	0.000049	HH	0.000049	HH
Aniline	62-53-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2	2.2	2.2	2.2	Eco	2.2	Eco
Anthracene	120-12-7	8300	40000	8300	40000	-	-	8300	8300	-	-	13	-	-	13	0.73	20.73	0.012	0.012	13	13	13	Eco	13	Eco
Aroclor 1016	12674-11-2	-	-	-	-	-	-	-	0.000064 [a]	-	-	-	-	13000	13000	-	-	-	-	13000	0.014 [e]	0.000064 [a]	HH	0.000064 [a]	HH
Aroclor 1221	11104-28-2	-	-	-	-	-	-	-	0.000064 [a]	-	-	0.28	-	-	0.28	0.28	-	-	-	0.28	0.014 [e]	0.000064 [a]	HH	0.000064 [a]	HH
Aroclor 1232	11141-16-5	-	-	-	-	-	-	-	0.000064 [a]	-	-	0.58	-	-	0.58	0.58	-	-	-	0.58	0.014 [e]	0.000064 [a]	HH	0.000064 [a]	HH
Aroclor 1242	53469-21-9	-	-	-	-	-	-	-	0.000064 [a]	-	-	0.053	3000	700	0.053	0.053	-	-	-	0.053	0.014 [e]	0.000064 [a]	HH	0.000064 [a]	HH
Aroclor 1248	12672-29-6	-	-	-	-	-	-	-	0.000064 [a]	-	-	0.081	-	-	0.081	0.081	-	-	-	0.081	0.014 [e]	0.000064 [a]	HH	0.000064 [a]	HH
Aroclor 1254	11097-69-1	-	-	-	-	-	-	-	0.000064 [a]	-	-	0.033	1300	300	0.033	0.033	-	-	-	0.033	0.014 [e]	0.000064 [a]	HH	0.000064 [a]	HH
Aroclor 1260	11096-82-5	-	-	-	-	-	-	-	0.000064 [a]	-	-	94	-	-	94	94	-	-	-	94	0.014 [e]	0.000064 [a]	HH	0.000064 [a]	HH
Benzene	71-43-2	2.2	51	-	-	2.2	51	2.2	2.2	-	-	130	-	200000	130	130	-	370	46	130	130	2.2	HH	2.2	HH
Benzidine	92-87-5	0.000086	0.0002	0.000086	0.0002	-	-	0.000086	0.000086	-	-	3.9	-	-	3.9	3.9	-	-	3.9	3.9	3.9	0.000086	HH	0.000086	HH
Benzo(a)anthracene	56-55-3	0.0038	0.018	0.0038	0.018	-	-	0.0038	0.0038	-	-	0.027	-	-	0.027	0.027	2.227	0.018	0.027	0.027	0.027	0.0038	HH	0.0038	HH
Benzo(a)pyrene	50-32-8	0.0038	0.018	0.0038	0.018	-	-	0.0038	0.0038	-	-	0.014	-	8000	0.014	0.014	0.9573	0.015	0.014	0.014	0.014	0.0038	HH	0.0038	HH
Benzo(b)fluoranthene	205-99-2	0.0038	0.018	0.0038	0.018	-	-	0.0038	0.0038	-	-	-	-	-	-	-	0.6774	-	9.07	0.6774	0.6774	0.0038	HH	0.0038	HH
Benzo(g,h,i)perylene	191-24-2	-	-	-	-	-	-	-	0.38 [k]	-	-	-	-	-	-	-	0.4391	-	7.64	0.4391	0.4391	0.38 [k]	HH	0.38 [k]	HH
Benzo(j,k)flouranthenes	205-82-3 & 207-08-9	-	-	-	-	-	-	-	0.0038 [l]	-	-	-	-	-	-	-	-	-	-	-	0.014 [b]	0.0038 [l]	HH	0.0038 [l]	HH
Benzo(k)fluoranthene	207-08-9	0.0038	0.018	0.0038	0.018	-	-	0.0038	0.0038	-	-	-	-	-	-	-	0.6415	-	-	0.6415	0.6415	0.0038	HH	0.0038	HH
Benzofluoranthenes, Total	56832-73-6	-	-	-	-	-	-	-	0.0038 [m]	-	-	-	-	-	-	-	-	-	-	-	0.014 [b]	0.0038 [m]	HH	0.0038 [m]	HH
Benzoic Acid	65-85-0	-	-	-	-	-	-	-	-	-	-	42	-	-	42	42	-	-	42	42	42	42	Eco	42	Eco
Benzyl Alcohol	100-51-6	-	-	-	-	-	-	-	-	-	-	8.6	-	-	8.6	8.6	-	-	8.6	8.6	8.6	8.6	Eco	8.6	Eco
BHC (alpha)	319-84-6	0.0026	0.0049	0.0026	0.0049	-	-	0.0026	0.0026	-	-	2.2	-	-	2.2	2.2	-	-	2.2	2.2	2.2	0.0026	HH	0.0026	HH
BHC (beta)	319-85-7	0.0091	0.017	0.0091	0.017	-	-	0.0091	0.0091	-	-	2.2	-	-	2.2	2.2	-	-	0.495	2.2	2.2	0.0091	HH	0.0091	HH
BHC (delta)	319-86-8	-	-	-	-	-	-	-	0.0026 [c]	-	-	-	-	-	-	2.2	-	-	2.2	2.2	2.2	0.0026 [c]	HH	0.0026 [c]	HH
BHC (gamma) Lindane	58-89-9	0.98	1.8	-	-	0.98	1.8	0.98	0.98	-	0.08	0.08	14500	62000	0.08	-	-	0.01	0.08	0.08	0.08	0.08	Eco	0.08	Eco
Bicarbonate as CaCO3	71-52-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biological Oxygen Demand	BOD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloroethoxy)methane	111-91-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloroethyl) Ether	111-44-4	0.03	0.53	0.03	0.53	-	-	0.03	0.03	-	-	-	-	-	-	-	-	-	1900	1900	1900	0.03	HH	0.03	HH
Bis(2-chloroisopropyl) Ether	39638-32-9 or 108-60-1	1400	65000	-	-	1400	65000	1400	1400	-	-	-	-	-	-	-	-	-	-	-	-	1400	HH	1400	HH
Bis(2-ethylhexyl) Phthalate	117-81-7	1.2	2.2	1.2	2.2	-	-	1.2	1.2	-	-	3	8000	73000	3	3.0	-	-	0.3	3	3	1.2	HH	1.2	HH
Bromobenzene	108-86-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromochloromethane	74-97-5	-	-	-	-	-	-	-	0.55 [x]	-	-	-	-	-	-	-	-	-	-	-	-	0.55 [x]	HH	0.55 [x]	HH
Bromodichloromethane	75-27-4	0.55	17	0.55	17	-	-	0.55	0.55	-	-	-	-	-	-	-	-	-	-	-	-	0.55	HH	0.55	HH
Bromoform	75-25-2	4.3	140	4.3	140	-	-	4.3	4.3	-	-	-	-	-	-	-	-	-	320	320	320	4.3	HH	4.3	HH
Bromomethane	74-83-9	47	1500	47	1500	-	-	47	47	-	-	-	-	-	-	-	-	-	16	16	16	16	Eco	16	Eco
Butyl Benzyl Phthalate	85-68-7	1500	1900	1500	1900	-	-	1500	1500	-	-	19	-	-	19	19	-	-	19	19	19	19	Eco	19	Eco
Carbazole	86-74-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulfide	75-15-0	-	-	-	-	-	-	-	-	-	-	0.92	-	-	0.92	0.92	-	-	0.92	0.92	0.92	0.92	Eco	0.92	Eco
Carbon Tetrachloride	56-23-5	0.23	1.6	0.23	1.6	-	-	0.23	0.23	-	-	74	-	123000	74	9.8	-	13.3	9.8	74	74	0.23	HH	0.23	HH
Chlordane (alpha)	5103-71-9	-	-	-	-	-	-	-	0.0008 [d]	-	-	0.0043	15500	18000	0.0043	-	-	-	-	0.0043	0.0043 [ac]	0.0008 [d]	HH	0.0008 [d]	HH
Chlordane (gamma)	5103-74-2	-	-	-	-	-	-	-	0.0008 [d]	-	-	0.0043	15500	18000	0.0043	-	-	-	-	0.0043	0.0043 [ac]	0.0008 [d]	HH	0.0008 [d]	HH
Chlordane (technical)	12789-03-6	0.0008	0.00081	-	-	0.0008	0.00081	0.0008	0.0008	-	-	0.0043	15500	18000	0.0043	-	-	-	-	0.0043	0.0043 [ac]	0.0008	HH	0.0008	HH
Chlorobenzene	108-90-7	130	1600	130	1600	-	-	130	130	-	-	50	-	-	50	64	-	-	1.3	50	50	50	Eco	50	Eco
Chloroethane	75-00-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	67-66-3	5.7	470	-	-	5.7	470	5.7	5.7	-	-	1240	-	115000	1240	28	-	1.8	1.8	1240	1240	5.7	HH	5.7	HH
Chloromethane	74-87-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	218-01-9	0.0038	0.018	0.0038	0.018	-	-	0.0038	0.0038	-	-	-	-	-	-	-	2.042	-	-	2.042	2.042	0.0038	HH	0.0038	HH
cis-1,2-Dichloroethene	156-59-2	-	-	-	-	-	-	-	-	-	-	590	-	180000	590	-	-	-	590	590	590	590	Eco	590	Eco
cis-1,3-Dichloropropene	10061-01-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.055	<0.055	0.055	0.055	Eco	0.055	Eco
Dalapon	75-99-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	53-70-3	0.038	0.018	0.0038	0.018	-	-	0.018	0.018	-	-	-	-	-	-	-	0.2825	-	-	0.2825	0.2825	0.018	HH	0.018	HH
Dibenzofuran	132-64-9	-	-	-	-	-	-	-	37	-	-	3.7	-	-	3.7	3.7	-	-	3.7	3.7	3.7	3.7	Eco	3.7	Eco
Dibromochloromethane	124-48-1	0.4	13	0.4	13	-	-	0.4	0.4	-	-	-	-	-	-	-	-	-	-	-	-	0.4	HH	0.4	HH
Dibromomethane	74-95-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibutyltin	1002-53-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.063 [ab]	0.063 [ab]	Eco	0.063 [ab]	Eco
Dicamba	1918-00-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	10	10	10	10	Eco	10	Eco

Table J-1c - Miniumum Potentially Applicable Discharge to Surface Water and Bioaccumulation Water SLVs for Identification of Preliminary COPCs
Bradford Island, Upland and River Operable Units
(5 of 6)

		Candidate Human Health Water Screening Level Values for Discharge to Surface Water/Bioaccumulation (ug/L)								Canidate Ecological Water Screening Level Values (ug/L)															
Analyte	CAS #	USEPA NRWQC (Water + Organism) p	USEPA NRWQC (Organism Only) p	DEQ Table 33A WQC (Water+ Organism)[q]	DEQ Table 33A WQC (Organism Only)[q]	DEQ Table 33B WQC (Water+ Organism)[q]	DEQ Table 33B WQC (Organism Only)[q]	Selected HH SLV [s]	Selected HH Water SLV with Surrogates [s]	USEPA Freshwater NRWQC p	DEQ Freshwater Table 33A WQC[q]	DEQ Level II Aquatic SLV[af]	DEQ Level II Bird SLV[af]	DEQ Level II Mammal SLV[af]	Lowest DEQ Level II SLV[af]	ORNL Tier II Chronic Value[bg]	USEPA PAH FCV[ah]	Canadian WQG[ai]	NOAA SQuiRTs Freshwater Chronic [aj]	Selected Ecological SLV [ak]	Selected Ecological Water SLV with Surrogates [ak]	Selected Min. Potentially Applicable Water SLV (Total) [al]	SLV (Total): HH or Eco	Selected Min. Potentially Applicable Water SLV (Dissolved) [am]	SLV (Dissolved): HH or Eco
Dichlorodifluoromethane	75-71-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (Methylene Chloride)	75-09-2	4.6	590	4.6	590	-	-	4.6	4.6	-	-	2200	-	45000	2200	2200	-	98.1	98.1	2200	2200	4.6	HH	4.6	HH
Dichlorprop	120-36-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4 [ae]	4 [ae]	Eco	4 [ae]	Eco
Dieldrin	60-57-1	0.000052	0.000054	0.000052	0.000054	-	-	0.000052	0.000052	0.056	-	0.056	600	150	0.056	-	-	-	0.056	0.056	0.056	0.000052	HH	0.000052	HH
Diesel Range Organics	68334-30-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl Phthalate	84-66-2	17000	44000	17000	44000	-	-	17000	17000	-	-	210	-	18000000	210	210	-	-	110	210	210	210	Eco	210	Eco
Dimethyl Phthalate	131-11-3	270000	1100000	270000	1100000	-	-	270000	270000	-	-	3	-	-	3	-	-	-	3	3	3	3	Eco	3	Eco
Di-n-butyl Phthalate	84-74-2	2000	4500	2000	4500	-	-	2000	2000	-	-	35	800	2200000	35	35	-	19	9.7	35	35	35	Eco	35	Eco
Di-n-octyl Phthalate	117-84-0	-	-	-	-	-	-	-	1.2 [z]	-	-	708	-	-	708	-	-	-	3	708	708	1.2 [z]	HH	1.2 [z]	HH
Dinoseb	88-85-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.05	0.05	0.05	0.05	0.05	Eco	0.05	Eco
Endosulfan I	959-98-8	62	89	62	89	-	-	62	62 [f]	0.056	0.056	-	-	-	-	0.051	-	0.02	0.028	0.056	0.056	0.056	Eco	0.056	Eco
Endosulfan II	33213-65-9	62	89	62	89	-	-	62	62 [f]	0.056	0.056	-	-	-	-	0.051	-	0.02	0.028	0.056	0.056	0.056	Eco	0.056	Eco
Endosulfan Sulfate	1031-07-8	62	89	62	89	-	-	62	62 [f]	-	-	-	-	-	-	0.051	-	0.02	2.22	0.051	0.051	0.051	Eco	0.051	Eco
Endrin	72-20-8	0.059	0.06	0.059	0.06	-	-	0.059	0.059	0.036	-	0.036	70	300	0.036	-	-	-	0.036	0.036	0.036	0.036	Eco	0.036	Eco
Endrin Aldehyde	7421-93-4	0.29	0.3	0.29	0.3	-	-	0.29	0.29	-	-	-	-	-	-	-	-	-	0.15	0.15	0.15	0.15	Eco	0.15	Eco
Endrin Ketone	53494-70-5	-	-	-	-	-	-	-	0.059 [aa]	-	-	-	-	-	-	-	-	-	-	-	-	0.059 [aa]	HH	0.059 [aa]	HH
Ethylbenzene	100-41-4	530	2100	530	2100	-	-	530	530	-	-	7.3	-	-	7.3	7.3	-	90	7.3	7.3	7.3	7.3	Eco	7.3	Eco
Fluoranthene	206-44-0	130	140	-	-	130	140	130	130	-	-	6.16	-	-	6.16	-	7.109	0.04	0.04	6.16	6.16	6.16	Eco	6.16	Eco
Fluorene	86-73-7	1100	5300	1100	5300	-	-	1100	1100	-	-	3.9	-	-	3.9	3.9	39.3	3	3.9	3.9	3.9	3.9	Eco	3.9	Eco
Gasoline Range Organics	8006-61-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	76-44-8	0.000079	0.000079	0.000079	0.000079	-	-	0.000079	0.000079	0.0038	0.0038	0.0038	-	2000	0.0038	0.0069	-	-	0.0019	0.0038	0.0038	0.000079	HH	0.000079	HH
Heptachlor Epoxide	1024-57-3	0.000039	0.000039	0.000039	0.000039	-	-	0.000039	0.000039	0.0038	0.0038	0.0038	-	-	0.0038	-	-	-	0.0019	0.0038	0.0038	0.000039	HH	0.000039	HH
Hexachlorobenzene	118-74-1	0.00028	0.00029	0.00028	0.00029	-	-	0.00028	0.00028	-	-	-	-	-	-	-	-	-	0.0003	0.0003	0.0003	0.00028	HH	0.00028	HH
Hexachlorobutadiene	87-68-3	0.44	18	0.44	18	-	-	0.44	0.44	-	-	9.3	-	-	9.3	-	-	1.3	0.053	9.3	9.3	0.44	HH	0.44	HH
Hexachlorocyclopentadiene	77-47-4	40	1100	40	1100	-	-	40	40	-	-	5.2	-	-	5.2	-	-	-	5.2	5.2	5.2	5.2	Eco	5.2	Eco
Hexachloroethane	67-72-1	1.4	3.3	1.4	3.3	-	-	1.4	1.4	-	-	540	-	-	540	12	-	-	8	540	540	1.4	HH	1.4	HH
Indeno(1,2,3-cd)pyrene	193-39-5	0.0038	0.018	0.0038	0.018	-	-	0.0038	0.0038	-	-	-	-	-	-	-	0.275	-	4.31	0.275	0.275	0.0038	HH	0.0038	HH
Isophorone	78-59-1	35	960	35	960	-	-	35	35	-	-	2340	-	-	2340	-	-	-	920	2340	2340	35	HH	35	HH
Isopropylbenzene	98-82-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.3 [y]	7.3 [y]	Eco	7.3 [y]	Eco
m,p-Xylenes	179601-23-1	-	-	-	-	-	-	-	-	-	-	13	-	8000	13	13	-	-	-	13	13 [h]	13 [h]	Eco	13 [h]	Eco
MCPA	94-74-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.6	2.6	2.6	2.6	2.6	Eco	2.6	Eco
MCPP	93-65-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methoxychlor	72-43-5	100	-	100	-	-	-	100	100	-	0.03	0.03	-	30000	0.03	0.019	-	-	0.03	0.03	0.03	0.03	Eco	0.03	Eco
Monobutyltin	78763-54-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.063 [ab]	0.063 [ab]	Eco	0.063 [ab]	Eco
Naphthalene	91-20-3	-	-	-	-	-	-	-	670 [j]	-	-	620	-	284000	620	12	193.5	1.1	1.1	193.5	193.5 [ao]	193.5 [ao]	Eco	193.5 [ao]	Eco
n-Butylbenzene	104-51-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	98-95-3	17	690	17	690	-	-	17	17	-	-	540	-	-	540	-	-	-	220	540	540	17	HH	17	HH
N-Nitrosodimethylamine	62-75-9	0.00069	3	0.00069	3	-	-	0.00069	0.00069	-	-	117	-	-	117	-	-	-	-	117	117	0.00069	HH	0.00069	HH
N-Nitrosodi-n-propylamine	621-64-7	0.005	0.51	0.005	0.51	-	-	0.005	0.005	-	-	117	-	-	117	-	-	-	-	117	117	0.005	HH	0.005	HH
N-Nitrosodiphenylamine	86-30-6	3.3	6	3.3	6	-	-	3.3	3.3	-	-	210	-	-	210	210	-	-	210	210	210	3.3	HH	3.3	HH
n-Propylbenzene	103-65-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.3 [y]	7.3 [y]	Eco	7.3 [y]	Eco
o-Xylene	95-47-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	350	350	350	350	Eco	350	Eco
p-cresol (4-Methylphenol)	106-44-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13 [v]	13 [v]	Eco	13 [v]	Eco
Pentachlorophenol	87-86-5	0.27	3	0.27	3	-	-	0.27	0.27	15	-	15	-	1800	15	-	-	0.5	15	15	15	0.27	HH	0.27	HH
Phenanthrene	85-01-8	-	-	-	-	-	-	-	8300 [g]	-	-	6.3	-	-	6.3	-	19.13	0.4	3.6	6.3	6.3	6.3	Eco	6.3	Eco
Phenol	108-95-2	10000	860000	-	1700000	21000	-	10000	10000	-	-	110	-	-	110	-	-	4	180	110	110	110	Eco	110	Eco
Pyrene	129-00-0	830	4000	830	4000	-	-	830	830	-	-	-	-	-	-	-	10.11	0.025	0.025	10.11	10.11	10.11	Eco	10.11	Eco
Residual Range Organics	RRO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
sec-Butylbenzene	135-98-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solids, Total Dissolved	TDS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	100-42-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	32	72	72	72	Eco	72	Eco
Sulfate	14808-79-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
tert-Butylbenzene	98-06-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrabutyltin	1461-25-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.063 [ab]	0.063 [ab]	Eco	0.063 [ab]	Eco
Tetrachloroethene (PCE)	127-18-4	0.69	3.3	0.69	3.3	-	-	0.69	0.69	-	-	840	-	6000	840	98	-	111	45	840	840	0.69	HH	0.69	HH
Toluene	108-88-3	1300	15000	1300	15000	-	-	1300	1300	-	-	9.8	-	104000	9.8	9.8	-	2	2	9.8	9.8	9.8	Eco	9.8	Eco
Total PCBs	1336-36-3	0.000064	0.000064	0.000064	0.000064	-	-	0.000064	0.000064	0.014	0.014	0.014	-	270	0.014	0.14	-	-	0.014	0.014	0.014	0.000064	HH	0.000064	HH
Total PAH		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total LPAH		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total HPAH		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toxaphene	8001-35-2	0.00028	0.00028	-	-	-	-	0.00028	0.00028	0.002	0.0002	0.0002	-	60000	0.0002	-	-	-	0.0002	0.002	0.002	0.00028	HH	0.00028	HH
trans-1,2-Dichloroethene	156-60-5	140	10000	140	10000	-	-	140	140	-	-	590	-	180000	590	-	-	-	1160	590	590	140	HH	140	HH
trans-1,3-Dichloropropene	10061-02-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.055	<0.055	0.055	0.055	Eco	0.055	Eco
Tributyltin	688-73-3	-	-	-	-	-	-	-	-	-	-	0.063	-	-	0.063	-	-	0.008	-	0.063	0.063	0.063	Eco	0.063	Eco
Trichloroethylene (TCE)	79-01-6	2.5	30	2.5	30	-	-	2.5	2.5	-	-	21900	-	3000	3000	47	-	21	<21	3000	3000	2.5	HH	2.5	HH
Trichlorofluoromethane	75-69-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Acetate	108-05-4	-	-	-	-	-	-	-	-	-	-	16	-	-	16	16	-	-	16	16	16	16	Eco	16	Eco
Vinyl Chloride	75-01-4	0.025	2.4	0.025	2.4	-	-	0.025	0.025	-	-	-	-	1300	1300	-	-	-	930	1300	1300	0.025	HH	0.025	HH
Ammonia	7664-41-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide	24959-67-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon, Dissolved Organic	DOC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon, Total Organic	7440-44-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbonate as CaCO3	3812-32-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chemical Oxygen Demand	COD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	16887-00-6	-	-	-	-	-	-	-	-	-	230000	-	-	-	-	-	-	-	-	230000	230000	230000	Eco	230000	Eco
Cyanide (Hydrogen Cyanide)	74-90-8	140	140	140	140	-	-	140	140	5.2	5.2	5.2	-	-	5.2	-	-	5	5.2	5.2	5.2	5.2	Eco	5.2	Eco
Fluoride	16984-48-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hardness (by Calculation)	HARDNESS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as Nitrogen	14797-55-8	-	-	10000	-	-	-	10000	10000	-	-	-	-	-	-	-	-	13000	-	13000	13000	10000	HH	10000	HH
Nitrate+Nitrite as Nitrogen	NOx-N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Suspended Solids	TSS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity	TURB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table J-1c - Miniumum Potentially Applicable Discharge to Surface Water and Bioaccumulation Water SLVs for Identification of Preliminary COPCs
Bradford Island, Upland and River Operable Units
(6 of 6)

		Candidate Human Health Water Screening Level Values for Discharge to Surface Water/Bioaccumulation (ug/L)								Canidate Ecological Water Screening Level Values (ug/L)															
Analyte	CAS #	USEPA NRWQC (Water + Organism) p	USEPA NRWQC (Organism Only) p	DEQ Table 33A WQC (Water+ Organism)[q]	DEQ Table 33A WQC (Organism Only)[q]	DEQ Table 33B WQC (Water+ Organism)[q]	DEQ Table 33B WQC (Organism Only)[q]	Selected HH SLV [s]	Selected HH Water SLV with Surrogates [s]	USEPA Freshwater NRWQC p	DEQ Freshwater Table 33A WQC[q]	DEQ Level II Aquatic SLV[af]	DEQ Level II Bird SLV[af]	DEQ Level II Mammal SLV[af]	Lowest DEQ Level II SLV[af]	ORNL Tier II Chronic Value[bg]	USEPA PAH FCV[ah]	Canadian WQG[ai]	NOAA SQuiRTs Freshwater Chronic [aj]	Selected Ecological SLV [ak]	Selected Ecological Water SLV with Surrogates [ak]	Selected Min. Potentially Applicable Water SLV (Total) [al]	SLV (Total): HH or Eco	Selected Min. Potentially Applicable Water SLV (Dissolved) [am]	SLV (Dissolved): HH or Eco
Aluminum (Soluble)	7429-90-5	-	-	-	-	-	-	-	-	-	-	87	797000	8000	87	-	-	5-100	87	87	87	-	-	87	Eco
Antimony	7440-36-0	5.6	640	5.6	640	-	-	5.6	5.6	-	-	1600	-	1000	1000	30	-	-	30	1000	1000	5.6	HH	5.6	HH
Arsenic	7440-38-2	0.018	0.14	-	-	0.018	0.14	0.018	0.018	150	-	150	18000	6000	150	-	-	5	150	150	150	0.018	HH	0.018	HH
Barium	7440-39-3	-	-	1000	-	-	-	1000	1000	-	-	4	150000	39000	4	4	-	-	3.9	4	4	1000	HH	4	Eco
Beryllium	7440-41-7	-	-	-	-	-	-	-	-	-	-	5.3	-	5000	5.3	0.66	-	-	0.66	5.3	5.3	-	-	5.3	Eco
Cadmium	7440-43-9	-	-	-	-	-	-	-	-	0.25	-	2.2	10000	8000	2.2	-	-	0.017	0.25	0.25	0.17 [an]	-	-	0.17 [an]	Eco
Calcium	7440-70-2	-	-	-	-	-	-	-	-	-	-	116000	-	-	116000	-	-	-	-	116000	116000	-	-	116000	Eco
Chromium	7440-47-3	-	-	-	-	-	-	-	-	-	-	74	7200	21000000	74	-	-	8.9	74	74	54 [ad, an]	-	-	54 [ad, an]	Eco
Cobalt	7440-48-4	-	-	-	-	-	-	-	-	-	-	23	-	9000	23	23	-	-	3	23	23	-	-	23	Eco
Copper	7440-50-8	1300	-	1300	-	-	-	1300	1300	9	-	9	341000	53000	9	-	-	2-4	9	9	5.8 [an]	1300	HH	5.8 [an]	Eco
Iron	7439-89-6	-	-	-	-	300	-	300	300	-	1000	1000	-	-	1000	-	-	300	1000	1000	1000	300	HH	300	HH
Lead	7439-92-1	-	-	-	-	-	-	-	-	2.5	-	2.5	28000	323000	2.5	-	-	1-7	2.5	2.5	1.44 [an]	-	-	1.44 [an]	Eco
Magnesium	7439-95-4	-	-	-	-	-	-	-	-	-	-	82000	-	-	82000	-	-	-	-	82000	82000	-	-	82000	Eco
Manganese	7439-96-5	-	-	-	-	50	100	50	50	-	-	120	7242000	676000	120	120	-	-	80	120	120	50	HH	50	HH
Mercury	7439-97-6	-	-	-	-	-	-	-	-	0.77	0.012	0.77	3300	10000	0.77	1.3	-	0.026, 0.004	0.77	0.77	0.77	-	-	0.77	Eco
Nickel	7440-02-0	610	4600	-	-	610	4600	610	610	52	-	52	562000	38000	52	-	-	25-150	52	52	34 [an]	610	HH	34 [an]	Eco
Potassium	7440-09-7	-	-	-	-	-	-	-	-	-	-	53000	-	-	53000	-	-	-	-	53000	53000	-	-	53000	Eco
Selenium	7782-49-2	170	4200	-	4200	170	-	170	170	5	-	5	3600	1500	5	-	-	1	5	5	5	170	HH	5	Eco
Silver	7440-22-4	-	-	-	-	-	-	-	-	-	-	0.12	-	-	0.12	0.36	-	0.1	0.36	0.12	0.12	-	-	0.12	Eco
Sodium	7440-23-5	-	-	-	-	-	-	-	-	-	-	680000	-	-	680000	-	-	-	-	680000	680000	-	-	680000	Eco
Thallium	7440-28-0	0.24	0.47	0.24	0.47	-	-	0.24	0.24	-	-	40	-	60	40	12	-	0.8	0.03	40	40	0.24	HH	0.24	HH
Vanadium	7440-62-2	-	-	-	-	-	-	-	-	-	-	20	82000	1600	20	20	-	-	19	20	20	-	-	20	Eco
Zinc	7440-66-6	7400	26000	7400	26000	-	-	7400	7400	120	-	120	105000	1230000	120	-	-	30	120	120	77 [an]	7400	HH	77 [an]	Eco

Note:

Human Health Screening Levels correspond to a target risk of 1E-06 for carcinogens and target hazard quotient of 1.0 for non-carcinogens for the selected receptor and pathway. MCLs incorporate considerations of risk as well as feasibility in attaining target level.

- = No benchmark available or available benchmark not needed, based on hierarchy of sources

DEQ = Oregon Department of Environmental Quality
USEPA = US Environmental Protection Agency
GW = groundwater
MCL = Maximum Contaminant Level
ug/L = microgram per liter
NOAA = National Oceanic and Atmospheric Administration
NRWQC = National Recommended Water Quality Criteria
ORNL = Oak Ridge National Laboratory
PAH = Polycyclic aromatic hydrocarbon
RBC = Risk Based Concentrations
RI = Remedial Investigation
RSL = Regional Screening Level
SLV = Screening Level Value
SQuiRTs = Screening Quick Reference Tables
WQC = Water Quality Criteria

[a] Total PCBs was used as a surrogate because there was no aroclor-specific SLV.
[b] Benzo(a)pyrene was used as a surrogate because there was no chemical-specific SLV, and benzo(a)pyrene had the lowest SLV of the high-molecular-weight PAHs.
[c] BHC alpha was used as a surrogate, because there was no chemical-specific SLV, and BHC alpha was the lowest BHC.
[d] Chlordane was used as a surrogate.
[e] Total PCBs was used as a surrogate because the SLV is more conservative than the individual aroclor SLVs.
[f] Endosulfan was used as a surrogate.
[g] Anthracene was used as a surrogate, because there was no chemical-specific SLV.
[h] Xylene (mixed) was used as a surrogate because there was no chemical specific SLV.
[i] 4,4'-DDT was used as a surrogate because the Aquatic Level II SLV is for DDT and its metabolites and is more conservative than the Avian Level II SLV for DDE.
[j] Acenaphthene was used as a surrogate because there was no chemical-specific SLV.
[k] Toxic Equivalency Factors for Benzo(g,h,i)perylene (0.01) was applied to the Benzo(a)pyrene SLV because there was no chemical specific SLV.
[l] Benzo(k)fluoranthene was used as a surrogate because there was no chemical-specific SLV.
[m] Benzo(b)fluoranthene was used as a surrogate because there was no chemical-specific SLV and benzo(b)fluoranthene had the lowest SLV of the benzofluoranthenes
[p] USEPA 2009. National Recommended Water Quality Criteria. Office of Water and Office of Science and Technology.
[q] DEQ. Water Quality Criteria for freshwater organisms (Oregon Administrative rules, section 340-041, Tables 33A and 33B).
[r] 1,2,4- Trichlorobenzene was used as a surrogate because there was no chemical specific SLV.
[s] Groundwater and Surface Water HH Hierarchical SLV Selection for Groundwater Discharge to Surface Water/Surface Water Bioaccumulation: 1. USEPA NRWQC (minimum of Water+organism and Organism Only), 2. DEQ Table 33A (minimum of Water+organism and Organism Only), and 3. DEQ (minimum of Water+organism and Organism Only).
[t] 1,2- Dichloropropane was used as a surrogate because there was no chemical specific SLV.
[u] Phenol was used as a surrogate because there was no chemical specific SLV.
[v] 2- Methylphenol was used as a surrogate because there was no chemical specific SLV.
[x] Bromodichloromethane was used as a surrogate because there was no chemical specific SLV.
[y] Ethylbenzene was used as a surrogate because there was no chemical specific SLV.
[z] Bis(2-ethyl hexyl) phthalate was used as a surrogate because there was no chemical specific SLV, and Bis(2-ethyl hexyl) phthalate was the lowest of the pthalates.
[aa] Endrin was used as a surrogate because there was no chemical specific SLV.
[ab] Tributyltin was used as a surrogate because there was no chemical specific SLV.
[ac] Chlordane (CAS # 57749) was used as a surrogate because there was no chemical specific SLV.
[ad] Chromium (III) was used as a surrogate because there was no chemical specific SLV.
[ae] 2,4-D was used as a surrogate because there was no chemical specific SLV.
[af] Oregon Department of Environmental Quality (ODEQ) 1998. Updated 2001. Guidance for Ecological risk Assessment: Levels I,II,III,IV. Waste Management and Cleanup Division.
[ag] Suter GW II, and CL Tsao. 1996. Toxicological Benchmarks for Screening of Potential Contaminants of Concern for Effects on Aquatic Biota on Oak Ridge Reservation: 1996 Revision. ORNL, Oak Ridge, TN. 104pp. ES/ER/TM-96/R2.
[ah] USEPA 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. November. EPA-600-R-02-013
[ai] Canadian Council of Resource and Environment Ministers. 2007. Canadian Water Quality Guidelines for the Protection of Aquatic Life. December Accessed on 1/20/10 at http://ceqg-rcqe.ccme.ca/.
[aj] Buchman, M.F., 2008. NOAA Screening Quick Reference Tables, NOAA OR&R Report 08-1, Seattle WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration, 34 pages.

[ak] Ecological Hierarchical SLV Selection: 1. USEPA Freshwater NAWQC, 2. ODEQ Freshwater Table 33A WQC, 3. DEQ Level II SLVs (lowest), 4. ORNL Tier II Value, 5. USEPA PAH FCV, 6. Canadian Freshwater WQG, 7. NOAA SQuiRTs Freshwater Chronic.
[al] For organic analytes, most conservative of Human Health and Ecological Selected Water Screening Levels with Surrogates. For inorganic analytes, selected Human Health Selected Screening Level.
[am] For all analytes, most conservative of Human Health and Ecological Selected Water Screening Levels with Surrogates.
[an] As per EPA guidance, certain NRWQC were adjusted for hardness based on a site-specific hardness value of 60 mg/L (minimum value of 54 mg/L and maximum value of 64 mg/L).
[ao] For these two PAHs, the ecological SLV hierarchy presented in footnote "ak" was not followed. As per the response to DEQ's Specific Comment #26 (see Appendix P), EPA's FCVs were used instead (EPA 2003).

Table J-1d - Miniumum Potentially Applicable Soil Gas SLVs for Identification of Preliminary COPCs
Bradford Island, Upland Operable Unit
(1 of 1)

Analyte	CAS #	Candidate Soil Gas Screening Level Values (ug/m3)			Selected Soil Gas SLV [h]	Selected Min. Potentially Applicable Soil Gas SLV with Surrogates [h]
		DEQ Vapor Intru Occup RBC [c]	USEPA Industrial Air RSL[d]	Adjusted USEPA Industrial Air RSL[d]		
1,1,1-Trichloroethane (TCA)	71-55-6	22,000,000	22,000	22,000,000	22,000,000	22,000,000
1,1,2,2-Tetrachloroethane	79-34-5	-	0.21	210	210	210
1,1,2-Trichloroethane	79-00-5	770	0.77	770	770	770
1,1-Dichloroethane	75-34-3	7,700	7.7	7,700	7,700	7,700
1,1-Dichloroethene	75-35-4	880,000	880	880,000	880,000	880,000
1,2,4-Trichlorobenzene	120-82-1	-	8.8	8,800	8,800	8,800
1,2,4-Trimethylbenzene	95-63-6	31,000	31	31,000	31,000	31,000
1,2-Dibromoethane (EDB)	106-93-4	20	0.020	20	20	20
1,2-Dichlorobenzene	95-50-1	880,000	880	880,000	880,000	880,000
1,2-Dichloroethane (EDC)	107-06-2	470	0.47	470	470	470
1,2-Dichloropropane	78-87-5	-	1.2	1,200	1,200	1,200
1,3,5-Trimethylbenzene	108-67-8	26,000	-	-	26,000	26,000
1,3-Butadiene	106-99-0	-	0.41	410	410	410
1,3-Dichlorobenzene	541-73-1	-	-	-	-	1,100 [e]
1,4-Dichlorobenzene	106-46-7	1,100	1.1	1,100	1,100	1,100
1,4-Dioxane	123-91-1	-	1.6	1,600	1,600	1,600
2,2,4-Trimethylpentane	540-84-1	-	-	-	-	31,000 [i]
2-Butanone (MEK)	78-93-3	-	22,000	22,000,000	22,000,000	22,000,000
2-Hexanone	591-78-6	-	130	130,000	130,000	130,000
2-Propanol	67-63-0	-	31,000	31,000,000	31,000,000	31,000,000
3-Chloropropene	107-05-1	-	2.0	2,000	2,000	2,000
4-Ethyltoluene	622-96-8	-	-	-	-	22,000,000 [k]
4-Methyl-2-pentanone (MIBK)	108-10-1	-	13,000	13,000,000	13,000,000	13,000,000
Acetone	67-64-1	-	140,000	140,000,000	140,000,000	140,000,000
alpha-Chlorotoluene	100-44-7	-	0.25	250	250	250
Benzene	71-43-2	1,600	1.6	1,600	1,600	1,600
Bromodichloromethane	75-27-4	330	0.33	330	330	330
Bromoform	75-25-2	-	11	11,000	11,000	11,000
Bromomethane	74-83-9	22,000	22	22,000	22,000	22,000
Carbon Disulfide	75-15-0	-	3,100	3,100,000	3,100,000	3,100,000
Carbon Tetrachloride	56-23-5	820	2.00	2,000	820	820
Chlorobenzene	108-90-7	220,000	220	220,000	220,000	220,000
Chloroethane	75-00-3	44,000,000	44,000	44,000,000	44,000,000	44,000,000
Chloroform	67-66-3	530	0.53	530	530	530
Chloromethane	74-87-3	390,000	390	390,000	390,000	390,000
cis-1,2-Dichloroethene	156-59-2	-	-	-	-	260,000 [f]
cis-1,3-Dichloropropene	10061-01-5	-	3.1	3,100	3,100	3,100 [a]
Cyclohexane	110-82-7	-	26,000	26,000,000	26,000,000	26,000,000
Dibromochloromethane	124-48-1	-	0.45	450	450	450.0
Dichlorodifluoromethane	75-71-8	-	880	880,000	880,000	880,000
Dichloromethane (Methylene Chloride)	75-09-2	26,000	26	26,000	26,000	26,000
Ethanol	64-17-5	-	-	-	-	-
Ethylbenzene	100-41-4	4,900	4.9	4,900	4,900	4,900
Freon 113	76-13-1	-	130,000	130,000,000	130,000,000	130,000,000
Freon 114	76-14-2	-	-	-	-	130,000,000 [g]
Heptane	142-82-5	-	-	-	-	3,100,000 [j]
Hexachlorobutadiene	87-68-3	-	0.56	560	560	560
Hexane	110-54-3	-	3,100	3,100,000	3,100,000	3,100,000
Isopropylbenzene	98-82-8	1,800,000	1,800	1,800,000	1,800,000	1,800,000
m,p-Xylenes	179601-23-1	440,000	440	440,000	440,000	440,000 [b]
Methyl tert-butyl ether	1634-04-4	47,000	47	47,000	47,000	47,000
n-Propylbenzene	103-65-1	-	4,400	4,400,000	4,400,000	4,400,000
o-Xylene	95-47-6	-	3,100	3,100,000	3,100,000	3,100,000
Styrene	100-42-5	4,400,000	4,400	4,400,000	4,400,000	4,400,000
Tetrachloroethene (PCE)	127-18-4	2,100	2.1	2,100	2,100	2,100
Tetrahydrofuran	109-99-9	-	-	-	-	-
Toluene	108-88-3	22,000,000	22,000	22,000,000	22,000,000	22,000,000
trans-1,2-Dichloroethene	156-60-5	260,000	260	260,000	260,000	260,000
trans-1,3-Dichloropropene	10061-02-6	-	3.1	3,100	3,100	3,100 [a]
Trichloroethene (TCE)	79-01-6	140	6.1	6,100	140	140
Trichlorofluoromethane	75-69-4	3,100,000	3,100	3,100,000	3,100,000	3,100,000
Vinyl Chloride	75-01-4	2,800	2.8	2,800	2,800	2,800

Note
- = No benchmark available
DEQ = Oregon Department of Environmental Quality
USEPA = US Environmental Protection Agency
ESL = Environmental Screening Level
RBC = Risk Based Concentrations
RWQCB = Regional Water Quality Control Board
SG = soil gas
ug/m3 = microgram per cubic meter
Ecological-based Screening Levels were not available for soil gas. The selected Human Health Soil Gas Screening Level will be used for the RI report.
[a] Dichloropropene, 1,3- was used as a surrogate.
[b] Xylene (mixed) was used as a surrogate.
[c] DEQ 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
[d] USEPA 2009. Regional Screening Level. December. EPA Industrial Air RSL adjusted by multiplying by 1000.
[e] 1,4-Dichlorobenzene was used as a surrogate.
[f] trans-1,2-Dichloroethene was used as a surrogate.
[g] Freon 113 was used as a surrogate.
[h] Soil Gas HH SLV Hierarchy: 1. DEQ Vapor Intrusion Occupational RBC, 2. Adjusted USEPA Industrial Air RSL
[i] 1,2,4-trimethylbenzene was used as a surrogate.
[j] Hexane was used as a surrogate.
[k] Toluene was used as a surrogate.

Table J-1e - Miniumum Potentially Applicable Sedimet SLVs for Identification of Preliminary COPCs
Bradford Island, Upland and River Operable Units
(1 of 3)

Analyte	CAS #	Candidate Sediment Screening levels (mg/kg)											Selected Selected Min. Potentially Applicable Sediment SLV [o]	SLV: HH, Eco, or UPL
		DEQ Level II SLV [j]	DEQ Bioaccumulation SLV [k]					Lowest Eco	Lowest HH	Screening Levels with Surrogates		Site-Specific Reference UPL[n]		
			Birds Individual	Mammals Individual	Fish Freshwater	Humans General	Humans Subsistence			Lowest Eco [l]	Lowest HH [m]			
2-Chlorobiphenyl	2051-60-7	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Chlorobiphenyl	2051-61-8	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorobiphenyl	2051-62-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2'-Dichlorobiphenyl	13029-08-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3-Dichlorobiphenyl	16605-91-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3'-Dichlorobiphenyl	25569-80-6	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorobiphenyl	33284-50-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4'-Dichlorobiphenyl	34883-43-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,5-Dichlorobiphenyl	34883-39-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dichlorobiphenyl	33146-45-1	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobiphenyl	2050-67-1	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4-Dichlorobiphenyl	2974-92-7	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4'-Dichlorobiphenyl	2974-90-5	-	-	-	-	-	-	-	-	-	-	-	-	-
3,5-Dichlorobiphenyl	34883-41-5	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-Dichlorobiphenyl	2050-68-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3-Trichlorobiphenyl	38444-78-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4-Trichlorobiphenyl	37680-66-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',5-Trichlorobiphenyl	37680-65-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',6-Trichlorobiphenyl	38444-73-4	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3'-Trichlorobiphenyl	38444-84-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4-Trichlorobiphenyl	55702-46-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4'-Trichlorobiphenyl	38444-85-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,5-Trichlorobiphenyl	55720-44-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,6-Trichlorobiphenyl	55702-45-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4-Trichlorobiphenyl	55712-37-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',5-Trichlorobiphenyl	38444-81-4	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',6-Trichlorobiphenyl	38444-76-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,4'-Trichlorobiphenyl	7012-37-5	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorobiphenyl	15862-07-4	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorobiphenyl	35693-92-6	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4',5-Trichlorobiphenyl	16606-02-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4',6-Trichlorobiphenyl	38444-77-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4'-Trichlorobiphenyl	38444-86-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',5'-Trichlorobiphenyl	37680-68-5	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4-Trichlorobiphenyl	37680-69-6	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',5-Trichlorobiphenyl	38444-87-0	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4,4'-Trichlorobiphenyl	38444-90-5	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4,5-Trichlorobiphenyl	53555-66-1	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4',5-Trichlorobiphenyl	38444-88-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3'-Tetrachlorobiphenyl	38444-93-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4-Tetrachlorobiphenyl	52663-59-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4'-Tetrachlorobiphenyl	36559-22-5	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5-Tetrachlorobiphenyl	70362-46-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5'-Tetrachlorobiphenyl	41464-39-5	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,6-Tetrachlorobiphenyl	70362-45-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,6'-Tetrachlorobiphenyl	41464-47-5	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4'-Tetrachlorobiphenyl	2437-79-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,5-Tetrachlorobiphenyl	70362-47-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,5'-Tetrachlorobiphenyl	41464-40-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,6-Tetrachlorobiphenyl	62796-65-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,6'-Tetrachlorobiphenyl	68194-04-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',5,5'-Tetrachlorobiphenyl	35693-99-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',5,6'-Tetrachlorobiphenyl	41464-41-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',6,6'-Tetrachlorobiphenyl	15968-05-5	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4-Tetrachlorobiphenyl	74338-24-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4'-Tetrachlorobiphenyl	41464-43-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5-Tetrachlorobiphenyl	70424-67-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5'-Tetrachlorobiphenyl	41464-49-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',6-Tetrachlorobiphenyl	74472-33-6	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,4'-Tetrachlorobiphenyl	33025-41-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,5-Tetrachlorobiphenyl	33284-53-6	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,6-Tetrachlorobiphenyl	54230-22-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4',5-Tetrachlorobiphenyl	74472-34-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4',6-Tetrachlorobiphenyl	52663-58-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,5,6-Tetrachlorobiphenyl	33284-54-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,4'-Tetrachlorobiphenyl	32598-10-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,5-Tetrachlorobiphenyl	73575-53-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,5'-Tetrachlorobiphenyl	73575-52-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,6-Tetrachlorobiphenyl	60233-24-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4',5-Tetrachlorobiphenyl	32598-11-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4',6-Tetrachlorobiphenyl	41464-46-4	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',5,5'-Tetrachlorobiphenyl	41464-42-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',5',6-Tetrachlorobiphenyl	74338-23-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,4',5-Tetrachlorobiphenyl	32690-93-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,4',6-Tetrachlorobiphenyl	32598-12-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4',5'-Tetrachlorobiphenyl	70362-48-0	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	-	0.000008	0.0003	0.0032	0.000052	0.0000064	0.000008	0.0000064	0.000008	0.0000064	-	0.0000064	HH
3,3',4,5-Tetrachlorobiphenyl	70362-49-1	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4,5'-Tetrachlorobiphenyl	41464-48-6	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',5,5'-Tetrachlorobiphenyl	33284-52-5	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	-	0.000004	0.000098	0.00065	0.000017	0.0000021	0.000004	0.0000021	0.000004	0.0000021	-	0.0000021	HH
2,2',3,3',4-Pentachlorobiphenyl	52663-62-4	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5-Pentachlorobiphenyl	60145-20-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',6-Pentachlorobiphenyl	52663-60-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4'-Pentachlorobiphenyl	65510-45-4	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5-Pentachlorobiphenyl	55312-69-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5'-Pentachlorobiphenyl	38380-02-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,6-Pentachlorobiphenyl	55215-17-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,6'-Pentachlorobiphenyl	73575-57-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5-Pentachlorobiphenyl	68194-07-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',6-Pentachlorobiphenyl	68194-05-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5,5'-Pentachlorobiphenyl	52663-61-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5,6-Pentachlorobiphenyl	73575-56-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5,6'-Pentachlorobiphenyl	73575-55-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5',6-Pentachlorobiphenyl	38379-99-6	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,6,6'-Pentachlorobiphenyl	73575-54-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5'-Pentachlorobiphenyl	41464-51-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',6'-Pentachlorobiphenyl	60233-25-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4',5-Pentachlorobiphenyl	38380-01-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4',6-Pentachlorobiphenyl	39485-83-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,5,5'-Pentachlorobiphenyl	37680-73-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,5,6'-Pentachlorobiphenyl	68194-06-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,5',6-Pentachlorobiphenyl	60145-21-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,6,6'-Pentachlorobiphenyl	56558-16-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	-	0.0039	0.00094	0.062	0.00017	0.000021	0.00094	0.000021	0.00094	0.000021	-	0.000021	HH
2,3,3',4,5-Pentachlorobiphenyl	70424-69-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5-Pentachlorobiphenyl	70424-68-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5'-Pentachlorobiphenyl	70362-41-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,6-Pentachlorobiphenyl	74472-35-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',6-Pentachlorobiphenyl	38380-03-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5,5'-Pentachlorobiphenyl	39635-32-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5,6-Pentachlorobiphenyl	74472-36-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5',6-Pentachlorobiphenyl	68194-10-5	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	-	0.04	0.00098	0.065	0.00017	0.000021	0.00098	0.000021	0.00098	0.000021	-	0.000021	HH
2,3,4,4',6-Pentachlorobiphenyl	74472-38-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,5,6-Pentachlorobiphenyl	18259-05-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4',5,6-Pentachlorobiphenyl	68194-11-6	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	-	0.049	0.0012	0.079	0.00012	0.000026	0.0012	0.000026	0.0012	0.000026	-	0.000026	HH
2,3',4,4',6-Pentachlorobiphenyl	56558-17-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,5,5'-Pentachlorobiphenyl	68194-12-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,5',6-Pentachlorobiphenyl	56558-18-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5'-Pentachlorobiphenyl	76842-07-4	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,4',5'-Pentachlorobiphenyl	65510-44-3	-	0.049	0.0012	0.079	0.00021	0.000026	0.0012	0.000026	0.0012	0.000026	-	0.000026	HH
2,3',4',5,5'-Pentachlorobiphenyl	70424-70-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4',5',6-Pentachlorobiphenyl	74472-39-2	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	-	0.0000039	0.00000028	0.000062	0.00000005	6.2E-09	0.00000028	6.2E-09	0.00000028	6.2E-09	-	6.2E-09	HH
3,3',4,5,5'-Pentachlorobiphenyl	39635-33-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4'-Hexachlorobiphenyl	38380-07-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5-Hexachlorobiphenyl	55215-18-4	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5'-Hexachlorobiphenyl	52663-66-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,6-Hexachlorobiphenyl	61798-70-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,6'-Hexachlorobiphenyl	38380-05-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,5'-Hexachlorobiphenyl	35694-04-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,6-Hexachlorobiphenyl	52704-70-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,6'-Hexachlorobiphenyl	52744-13-5	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',6,6'-Hexachlorobiphenyl	38411-22-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5-Hexachlorobiphenyl	35694-06-5	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5'-Hexachlorobiphenyl	35065-28-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',6-Hexachlorobiphenyl	56030-56-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',6'-Hexachlorobiphenyl	59291-64-4	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5,5'-Hexachlorobiphenyl	52712-04-6	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5,6-Hexachlorobiphenyl	41411-61-4	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5,6'-Hexachlorobiphenyl	68194-15-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5',6-Hexachlorobiphenyl	68194-14-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,6,6'-Hexachlorobiphenyl	74472-40-5	-	-	-	-	-	-	-	-	-	-	-	-	-

Table J-1e - Miniumum Potentially Applicable Sedimet SLVs for Identification of Preliminary COPCs
Bradford Island, Upland and River Operable Units
(2 of 3)

Analyte	CAS #	Candidate Sediment Screening levels (mg/kg)											Selected Selected Min. Potentially Applicable Sediment SLV [o]	SLV: HH, Eco, or UPL
		DEQ Level II SLV [j]	DEQ Bioaccumulation SLV [k]					Lowest Eco	Lowest HH	Screening Levels with Surrogates		Site-Specific Reference UPL[n]		
			Birds Individual	Mammals Individual	Fish Freshwater	Humans General	Humans Subsistence			Lowest Eco [l]	Lowest HH [m]			
2,2',3,4',5,5'-Hexachlorobiphenyl	51908-16-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5,6-Hexachlorobiphenyl	68194-13-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5,6'-Hexachlorobiphenyl	74472-41-6	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5',6-Hexachlorobiphenyl	38380-04-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',6,6'-Hexachlorobiphenyl	68194-08-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5,5',6-Hexachlorobiphenyl	52663-63-5	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,5,6,6'-Hexachlorobiphenyl	68194-09-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4',5,5'-Hexachlorobiphenyl	35065-27-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4',5,6'-Hexachlorobiphenyl	60145-22-4	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',4,4',6,6'-Hexachlorobiphenyl	33979-03-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	-	0.0049	0.0012	0.079	0.00021	0.000026	0.0012	0.000026	0.0012	0.000026	-	0.000026	HH
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	-	0.0049	0.0012	0.079	0.00021	0.000026	0.0012	0.000026	0.0012	0.000026	-	0.000026	HH
2,3,3',4,4',6-Hexachlorobiphenyl	74472-42-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5,5'-Hexachlorobiphenyl	39635-35-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5,6-Hexachlorobiphenyl	41411-62-5	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5',6-Hexachlorobiphenyl	74472-43-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5,5'-Hexachlorobiphenyl	39635-34-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5,6-Hexachlorobiphenyl	74472-44-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5',6-Hexachlorobiphenyl	74472-45-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',5,5',6-Hexachlorobiphenyl	74472-46-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,4',5,6-Hexachlorobiphenyl	41411-63-6	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	-	0.049	0.0012	0.079	0.00021	0.000026	0.0012	0.000026	0.0012	0.000026	-	0.000026	HH
2,3',4,4',5',6-Hexachlorobiphenyl	59291-65-5	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	-	0.00049	0.0000012	0.079	0.00021	0.000000021	0.0000012	0.000000021	0.0000012	0.000000021	-	0.000000021	HH
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',6-Heptachlorobiphenyl	52663-71-5	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,5'-Heptachlorobiphenyl	52663-74-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,6-Heptachlorobiphenyl	68194-16-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,6'-Heptachlorobiphenyl	38411-25-5	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5',6-Heptachlorobiphenyl	40186-70-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,6,6'-Heptachlorobiphenyl	52663-65-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5',6'-Heptachlorobiphenyl	52663-70-4	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,5',6-Heptachlorobiphenyl	52663-67-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,6,6'-Heptachlorobiphenyl	52663-64-6	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5,6-Heptachlorobiphenyl	74472-47-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5,6'-Heptachlorobiphenyl	60145-23-5	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5',6-Heptachlorobiphenyl	52663-69-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',6,6'-Heptachlorobiphenyl	74472-48-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5,5',6-Heptachlorobiphenyl	52712-05-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,5,6,6'-Heptachlorobiphenyl	74472-49-4	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5,5',6-Heptachlorobiphenyl	52663-68-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4',5,6,6'-Heptachlorobiphenyl	74487-85-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	-	0.27	0.0066	0.43	0.0012	0.00014	0.0066	0.00014	0.0066	0.00014	-	0.00014	HH
2,3,3',4,4',5,6-Heptachlorobiphenyl	41411-64-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4',5',6-Heptachlorobiphenyl	74472-50-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,5,5',6-Heptachlorobiphenyl	74472-51-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4',5,5',6-Heptachlorobiphenyl	69782-91-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5,5'-Octachlorobiphenyl	35694-08-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5,6-Octachlorobiphenyl	52663-78-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5,6'-Octachlorobiphenyl	42740-50-1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',6,6'-Octachlorobiphenyl	33091-17-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,5',6-Octachlorobiphenyl	68194-17-2	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,5',6'-Octachlorobiphenyl	52663-75-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,6,6'-Octachlorobiphenyl	52663-73-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5',6,6'-Octachlorobiphenyl	40186-71-8	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',5,5',6,6'-Octachlorobiphenyl	2136-99-4	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5,5',6-Octachlorobiphenyl	52663-76-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,4,4',5,6,6'-Octachlorobiphenyl	74472-52-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,3',4,4',5,5',6-Octachlorobiphenyl	74472-53-0	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	40186-72-9	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl	52663-79-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	52663-77-1	-	-	-	-	-	-	-	-	-	-	-	-	-
Decachlorobiphenyl	2051-24-3	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane (TCA)	71-55-6	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	75-34-3	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	95-63-6	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	108-67-8	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	106-46-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2-Dichloropropane	594-20-7	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-T	93-76-5	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (MEK)	78-93-3	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	591-78-6	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	91-57-6	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDD	72-54-8	0.004	9.50E-05	0.0049	0.00039	0.00033	4.00E-05	0.000095	0.00004	0.000095 [f]	0.00004 [f]	-	0.00004 [f]	HH
4,4'-DDE	72-55-9	0.0015	9.50E-05	0.0049	0.00039	0.00033	4.00E-05	0.000095	0.00004	0.000095 [f]	0.00004 [f]	-	0.00004 [f]	HH
4,4'-DDT	50-29-3	0.004	9.50E-05	0.0049	0.00039	0.00033	4.00E-05	0.000095	0.00004	0.000095 [f]	0.00004 [f]	-	0.00004 [f]	HH
4-Isopropyltoluene	99-87-6	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (MIBK)	108-10-1	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	83-32-9	0.29	-	-	-	-	-	0.29	-	0.29	62 [g]	-	0.29	Eco
Acenaphthylene	208-96-8	0.16	-	-	-	-	-	0.16	-	0.16	62 [g]	-	0.16	Eco
Acetone	67-64-1	-	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin	309-00-2	0.04	-	-	-	-	-	0.04	-	0.04	-	-	0.04	Eco
Aluminum	7429-90-5	-	-	-	-	-	-	-	-	-	-	38000	38000	UPL
Anthracene	120-12-7	0.057	-	-	-	-	-	0.057	-	0.057	62 [g]	-	0.057	Eco
Antimony	7440-36-0	3	-	-	-	-	-	3	-	3	-	0.427	3	Eco
Aroclor 1016	12674-11-2	-	-	-	-	-	-	-	-	0.0018 [c]	0.000048 [i]	-	0.000048 [i]	HH
Aroclor 1221	11104-28-2	-	-	-	-	-	-	-	-	0.0018 [c]	0.000048 [i]	-	0.000048 [i]	HH
Aroclor 1232	11141-16-5	-	-	-	-	-	-	-	-	0.0018 [c]	0.000048 [i]	-	0.000048 [i]	HH
Aroclor 1242	53469-21-9	-	-	-	-	-	-	-	-	0.0018 [c]	0.000048 [i]	-	0.000048 [i]	HH
Aroclor 1248	12672-29-6	0.021	-	-	-	-	-	0.021	-	0.0018 [c]	0.000048 [i]	-	0.000048 [i]	HH
Aroclor 1254	11097-69-1	0.007	-	-	-	-	-	0.007	-	0.0018 [c]	0.000048 [i]	-	0.000048 [i]	HH
Aroclor 1260	11096-82-5	-	-	-	-	-	-	-	-	0.0018 [c]	0.000048 [i]	-	0.000048 [i]	HH
Aroclor 1262	37324-23-5	-	-	-	-	-	-	-	-	0.0018 [c]	0.000048 [i]	-	0.000048 [i]	HH
Aroclor 1268	11100-14-4	-	-	-	-	-	-	-	-	0.0018 [c]	0.000048 [i]	-	0.000048 [i]	HH
Arsenic	7440-38-2	6	-	-	-	-	-	6	-	6	-	5.86	6	Eco
Barium	7440-39-3	-	-	-	-	-	-	-	-	-	-	315	315	UPL
Benzo(a)anthracene	56-55-3	0.032	-	-	-	-	-	0.032	-	0.032	47 [h]	-	0.032	Eco
Benzene	71-43-2	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	50-32-8	0.032	-	-	-	-	-	0.032	-	0.032	47 [h]	-	0.032	Eco
Benzo(b)fluoranthene	205-99-2	-	-	-	-	-	-	-	-	0.027 [a]	47 [h]	-	0.027 [a]	Eco
Benzo(g,h,i)perylene	191-24-2	0.3	-	-	-	-	-	0.3	-	0.3	47 [h]	-	0.3	Eco
Benzo(k)fluoranthene	207-08-9	0.027	-	-	-	-	-	0.027	-	0.027	47 [h]	-	0.027	Eco
Benzofluoranthenes, Total	56832-73-6	-	-	-	-	-	-	-	-	0.027 [a]	47 [h]	-	0.027 [a]	Eco
Benzoic Acid	65-85-0	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzyl Alcohol	100-51-6	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	7440-41-7	-	-	-	-	-	-	-	-	-	-	0.847	0.847	UPL
BHC (alpha)	319-84-6	-	-	-	-	-	-	-	-	0.0009 [e]	0.0023 [q]	-	0.0009 [e]	Eco
BHC (beta)	319-85-7	-	-	-	-	-	-	-	-	0.0009 [e]	0.0023 [q]	-	0.0009 [e]	Eco
BHC (delta)	319-86-8	-	-	-	-	-	-	-	-	0.0009 [e]	0.0023 [q]	-	0.0009 [e]	Eco
BHC (gamma) Lindane	58-89-9	0.0009	-	-	-	-	-	0.0009	-	0.0009	0.0023 [q]	-	0.0009	Eco
Bis(2-ethylhexyl) Phthalate	117-81-7	0.75	-	-	-	-	-	0.75	-	0.75	-	-	0.75	Eco
Bromobenzene	108-86-1	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl Benzyl Phthalate	85-68-7	-	-	-	-	-	-	-	-	0.11 [b]	-	-	0.11 [b]	Eco
Cadmium	7440-43-9	0.6	-	-	-	-	-	0.6	-	0.6	-	0.674	0.674	UPL
Calcium	7440-70-2	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	86-74-8	0.14	-	-	-	-	-	0.14	-	0.14	-	-	0.14	Eco
Carbon Disulfide	75-15-0	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	56-23-5	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon, Total Organic	7440-44-0	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlordane (alpha)	5103-71-9	-	-	-	-	-	-	-	-	0.00050 [d]	0.000046 [d]	-	0.000046 [d]	HH
Chlordane (gamma)	5103-74-2	-	-	-	-	-	-	-	-	0.00050 [d]	0.000046 [d]	-	0.000046 [d]	HH
Chlordane (technical)	12789-03-6	0.0045	0.010	0.028	0.00050	0.00037	0.000046	0.0005	0.000046	0.00050	0.000046	-	0.000046	HH
Chloroform	67-66-3	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane	74-87-3	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	7440-47-3	37	-	-	-	-	-	37	-	37	-	28.0	37	Eco
Chrysene	218-01-9	0.057	-	-	-	-	-	0.057	-	0.057	47 [h]	-	0.057	Eco
cis-1,2-Dichloroethene	156-59-2	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	7440-48-4	-	-	-	-	-	-	-	-	-	-	15.2	15.2	UPL
Copper	7440-50-8	36	-	-	-	-	-	36	-	36	-	55.6	55.6	UPL
Dibenz(a,h)anthracene	53-70-3	0.033	-	-	-	-	-	0.033	-	0.033	47 [h]	-	0.033	Eco
Dibenzofuran	132-64-9	5.1	-	-	-	-	-	5.1	-	5.1	-	-	5.1	Eco
Dibutyltin	1002-53-5	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	75-71-8	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane (Methylene Chloride)	75-09-2	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorprop	120-36-5	-	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	60-57-1	0.003	0.00037	0.0012	0.0022	8.10E-06	0.000001	0.00037	0.000001	0.00037	0.000001	-	0.000001	HH
Diesel Range Organics	68334-30-5	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl Phthalate	84-66-2	-	-	-	-	-	-	-	-	0.11 [b]	-	-	0.11 [b]	Eco
Dimethyl Phthalate	131-11-3	-	-	-	-	-	-	-	-	0.11 [b]	-	-	0.11 [b]	Eco
Di-n-butyl Phthalate	84-74-2	0.11	-	-	-	-	-	0.11	-	0.11 [b]	-	-	0.11 [b]	Eco
Di-n-octyl Phthalate	117-84-0	-	-	-	-	-	-	-	-	0.11 [b]	-	-	0.11 [b]	Eco
Endosulfan I	959-98-8	-	-	-	-	-	-	-	-	-	0.000001 [r]	-	0.000001 [r]	HH
Endosulfan II	33213-65-9	-	-	-	-	-	-	-	-	-	0.000001 [r]	-	0.000001 [r]	HH
Endosulfan Sulfate	1031-07-8	-	-	-	-	-	-	-	-	-	0.000001 [r]	-	0.000001 [r]	HH

Table J-1e - Miniumum Potentially Applicable Sedimet SLVs for Identification of Preliminary COPCs
Bradford Island, Upland and River Operable Units
(3 of 3)

Analyte	CAS #	Candidate Sediment Screening levels (mg/kg)											Selected Selected Min. Potentially Applicable Sediment SLV [o]	SLV: HH, Eco, or UPL
		DEQ Level II SLV [j]	DEQ Bioaccumulation SLV [k]					Lowest Eco	Lowest HH	Screening Levels with Surrogates		Site-Specific Reference UPL[n]		
			Birds Individual	Mammals Individual	Fish Freshwater	Humans General	Humans Subsistence			Lowest Eco [l]	Lowest HH [m]			
Endrin	72-20-8	0.003	-	-	-	-	-	0.003	-	0.003	-	-	0.003	Eco
Endrin Aldehyde	7421-93-4	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin Ketone	53494-70-5	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	100-41-4	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	206-44-0	0.111	-	360	37	510	62	0.111	62	0.111	62	-	0.111	Eco
Fluorene	86-73-7	0.077	-	-	-	-	-	0.077	-	0.077	62 [g]	-	0.077	Eco
Gasoline Range Organics	8006-61-9	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	76-44-8	0.01	-	-	-	-	-	0.01	-	0.01	0.000001 [r]	-	0.000001 [r]	HH
Heptachlor Epoxide	1024-57-3	0.0006	-	-	-	-	-	0.0006	-	0.0006	-	-	0.0006	Eco
Hexachlorobenzene	118-74-1	0.1	-	-	61	0.019	0.0023	0.1	0.0023	0.1	0.0023	-	0.0023	HH
Indeno(1,2,3-cd)pyrene	193-39-5	0.017	-	-	-	-	-	0.017	-	0.017	47 [h]	-	0.017	Eco
Iron	7439-89-6	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene	98-82-8	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	7439-92-1	35	-	-	-	-	-	35	-	35	-	14.5	35	Eco
m,p-Xylenes	179601-23-1	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	7439-95-4	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	7439-96-5	1100	-	-	-	-	-	1100	-	1100	-	-	1100	Eco
MCPP	93-65-2	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	7439-97-6	0.2	-	-	-	-	-	0.2	-	0.2	-	0.214	0.214	UPL
Methoxychlor	72-43-5	-	-	-	-	-	-	-	-	-	-	-	-	-
Monobutyltin	78763-54-9	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	91-20-3	0.176	-	-	-	-	-	0.176	-	0.176	62 [g]	-	0.176	Eco
n-Butylbenzene	104-51-8	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	7440-02-0	18	-	-	-	-	-	18	-	18	-	21.2	21.2	UPL
N-Nitrosodiphenylamine	86-30-6	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Propylbenzene	103-65-1	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	95-47-6	-	-	-	-	-	-	-	-	-	-	-	-	-
p-cresol (4-Methylphenol)	106-44-5	-	-	-	-	-	-	-	-	0.048 [p]	-	-	0.048 [p]	Eco
Pentachlorophenol	87-86-5	-	-	0.33	0.31	0.25	0.03	0.31	0.03	0.31	0.03	-	0.03	HH
Phenanthrene	85-01-8	0.042	-	-	-	-	-	0.042	-	0.042	62 [g]	-	0.042	Eco
Phenol	108-95-2	0.048	-	-	-	-	-	0.048	-	0.048	-	-	0.048	Eco
Total Polychlorinated biphenyl (PCB)	1336-36-3	0.034	0.0018	0.044	0.022	0.00039	0.000048	0.0018	0.000048	0.0018	0.000048	-	0.000048	HH
Total PAH		1.61	-	-	-	-	-	1.61	-	1.61	-	-	1.61	Eco
Total LPAH		0.076	-	-	-	-	-	0.076	-	0.076	-	-	0.076	Eco
Total HPAH		0.193	-	-	-	-	-	0.193	-	0.193	-	-	0.193	Eco
Potassium	7440-09-7	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	129-00-0	0.053	-	18000	1.9	380	47	0.053	47	0.053	47	-	0.053	Eco
Residual Range Organics	RRO	-	-	-	-	-	-	-	-	-	-	-	-	-
sec-Butylbenzene	135-98-8	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	7782-49-2	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	7440-22-4	4.5	-	-	-	-	-	4.5	-	4.5	-	-	4.5	Eco
Sodium	7440-23-5	-	-	-		-	-	-	-	-	-	-	-	-
Solids, Total	TS	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	100-42-5	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene (PCE)	127-18-4	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	7440-28-0	-	-	-	-	-	-	-	-	-	-	0.354	0.354	UPL
Toluene	108-88-3	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	156-60-5	-	-	-	-	-	-	-	-	-	-	-	-	-
Tributyltin	688-73-3	-	1.6	0.73	0.0023	0.085	0.01	0.0023	0.01	0.0023	0.01	-	0.0023	Eco
Trichloroethene (TCE)	79-01-6	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	75-69-4	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	7440-62-2	-	-	-	-	-	-	-	-	-	-	70.6	70.6	UPL
Zinc	7440-66-6	123	-	-	-	-	-	123	-	123	-	106	123	Eco

Note
- = No benchmark available
DEQ = Oregon Department of Environmental Quality
Eco = ecological
HH = human health
mg/kg = milligram per kilogram
SLV = screening level value
UPL = Upper Prediction Limit

[a] Eco SLV Sediment: Benzo(k)fluoranthene was used as a surrogate because there was no chemical specific SLV.
[b] Eco SLV Sediment: Di-n-butyl phthalate was used as a surrogate because there was no chemical specific SLV and di-n-butyl phthalate had the lowest SLV of the phthalates.
[c] Eco SLV Sediment: Total PCBs was used as a surrogate because the SLV is based on bioaccumulation and is more conservative than the DEQ Level II individual aroclor SLVs, which do not take into account bioaccumulation.
[d] Eco and HH SLV Sediment: Chlordane (technical) was used as a surrogate because there was no chemical specific SLV and chlordane (technical) was the lowest of the chlordanes.
[e] Eco SLV Sediment: BHC (gamma) Lindane was used as a surrogate because there was no chemical specific SLV and BHC (gamma) was the lowest of the BHCs.
[f] Eco and HH SLV Sediment: DDT (Total) was used as a surrogate because there was no chemical specific SLVs.
[g] HH SLV Sediment: Fluoranthene was used as a surrogate because there was no chemical specific SLV and fluoranthene had the lowest SLV of the low Molecular Weight PAHs.
[h] HH SLV Sediment: Pyrene was used as a surrogate because there was no chemical specific SLV and pyrene had the lowest SLV of the High Molecular Weight PAHs.
[i] HH SLV Sediment: Total Aroclors was used as a surrogate because there was no individual aroclor chemical specific SLV.
[j] DEQ. 1998. Updated 2001. Guidance for Ecological Risk Assessment: Levels I,II,III,IV. Waste Management and Cleanup Division.
[k] DEQ 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31
[l] The lowest of the Eco Screening levels (DEQ II SLV, Birds Individual, Mammals Individual, and Fish Freshwater) was selected.
[m] Human Subsistence was used
[n] Site-Specific Reference UPLs are based are not based on toxicity values.
[o] For organics, the lower of the Lowest Eco and Lowest HH SLV was selected as the RI SLV.
For inorganics, the Lowest Eco and HH SLV was selected, unless the Site-Specific Reference UPL was greater, then the Site-Specific Reference UPL was selected as the RI SLV.
[p] Eco Sediment: Phenol was used as a surrogate because there was no chemical specific SLV and phenol had the lowest SLV of the phenols.
[q] HH SLV Sediment: Hexachlorobenzene was used as a surrogate because there was no chemical specific SLV.
[r] HH SLV Sediment: Dieldrin was used as a surrogate because there was no chemical specific SLV.

Table J-1f - Miniumum Potentially Applicable Tissue SLVs for Identification of Preliminary COPCs
Bradford Island, River Operable Unit
(1 of 2)

Analyte	CAS #	Candidate Tissue Screening levels (mg/kg wet wt.)									Selected Min. Potentially Applicable Tissue SLV [h]	SLV: HH or Eco
		DEQ ATLs [d]				DEQ Fish CTLs Freshwater[d]	Lowest Eco SLV	Lowest HH SLV	SLVs with Surrogates			
		Birds	Mammals	Humans Subsistence/Tribal								
		Individual	Individual	Carcinogens	Non-carcinogens				Lowest Eco [e]	Lowest HH [f]		
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	0.00016	0.0058	0.000076	-	-	0.00016	0.000076	0.00016	0.000076	0.000076	HH
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	0.00008	0.002	0.000025	-	-	0.00008	0.000025	0.00008	0.000025	0.000025	HH
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	0.08	0.02	0.00025	-	-	0.02	0.00025	0.02	0.00025	0.00025	HH
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	0.8	0.02	0.00025	-	-	0.02	0.00025	0.02	0.00025	0.00025	HH
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	0.8	0.02	0.00025	-	-	0.02	0.00025	0.02	0.00025	0.00025	HH
2,3',4,4',5'-Pentachlorobiphenyl	65510-44-3	0.8	0.02	0.00025	-	-	0.02	0.00025	0.02	0.00025	0.00025	HH
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	0.00008	0.0000058	0.000000076	-	-	0.0000058	0.000000076	0.0000058	0.000000076	0.000000076	HH
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	0.08	0.02	0.00025	-	-	0.02	0.00025	0.02	0.00025	0.00025	HH
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	0.08	0.02	0.00025	-	-	0.02	0.00025	0.02	0.00025	0.00025	HH
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	0.8	0.02	0.00025	-	-	0.02	0.00025	0.02	0.00025	0.00025	HH
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	0.008	0.00002	0.00000025	-	-	0.00002	0.00000025	0.00002	0.00000025	0.00000025	HH
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	0.8	0.02	0.00025	-	-	0.02	0.00025	0.02	0.00025	0.00025	HH
Acenaphthene	83-32-9	-	-	-	-	-	-	-	19 [g]	15 [h]	15 [h]	HH
Acenaphthylene	208-96-8	-	-	-	-	-	-	-	19 [g]	15 [h]	15 [h]	HH
Aluminum	7429-90-5	-	-	-	-	-	-	-	-	-	-	-
Anthracene	120-12-7	-	-	-	-	-	-	-	19 [g]	15 [h]	15 [h]	HH
Antimony	7440-36-0	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1016	12674-11-2	-	-	-	-	-	-	-	0.035 [b]	0.00057 [b]	0.00057 [b]	HH
Aroclor 1221	11104-28-2	-	-	-	-	-	-	-	0.035 [b]	0.00057 [b]	0.00057 [b]	HH
Aroclor 1232	11141-16-5	-	-	-	-	-	-	-	0.035 [b]	0.00057 [b]	0.00057 [b]	HH
Aroclor 1242	53469-21-9	-	-	-	-	-	-	-	0.035 [b]	0.00057 [b]	0.00057 [b]	HH
Aroclor 1248	12672-29-6	-	-	-	-	-	-	-	0.035 [b]	0.00057 [b]	0.00057 [b]	HH
Aroclor 1254	11097-69-1	-	-	-	-	-	-	-	0.035 [b]	0.00057 [b]	0.00057 [b]	HH
Aroclor 1260	11096-82-5	-	-	-	-	-	-	-	0.035 [b]	0.00057 [b]	0.00057 [b]	HH
Aroclor 1262	37324-23-5	-	-	-	-	-	-	-	0.035 [b]	0.00057 [b]	0.00057 [b]	HH
Aroclor 1268	11100-14-4	-	-	-	-	-	-	-	0.035 [b]	0.00057 [b]	0.00057 [b]	HH
Arsenic	7440-38-2	13	7.6	0.00076	0.15	6.6	6.6	0.00076	6.6	0.00076	0.00076	HH
Barium	7440-39-3	-	-	-	-	-	-	-	-	-	-	-
Benz(a)anthracene	56-55-3	-	-	0.00157	-	-	-	0.00157	1 [h]	0.00157 [i]	0.00157 [i]	HH
Benzo(a)pyrene	50-32-8	-	-	0.000157	-	-	-	0.000157	1 [h]	0.000157 [i]	0.000157 [i]	HH
Benzo(b)fluoranthene	205-99-2	-	-	0.00157	-	-	-	0.00157	1 [h]	0.00157 [i]	0.00157 [i]	HH
Benzo(g,h,i)perylene	191-24-2	-	-	0.0157	-	-	-	0.0157	1 [h]	0.0157 [i]	0.0157 [i]	HH
Benzo(k)fluoranthene	207-08-9	-	-	0.0157	-	-	-	0.0157	1 [h]	0.0157 [i]	0.0157 [i]	HH
Beryllium	7440-41-7	-	-	-	-	-	-	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	117-81-7	6.26	55.5	0.0819	-	1.76	1.76	0.0819	1.76 [i]	0.0819 [i]	0.0819 [i]	HH
Butyl Benzyl Phthalate	85-68-7	6.26	55.5	0.604	-	0.310	0.310	0.604	0.310 [i]	0.604 [i]	0.310 [i]	Eco
Cadmium	7440-43-9	8.4	5.6	-	0.49	0.15	0.15	0.49	0.15	0.49	0.15	Eco
Carbazole	86-74-8	-	-	-	-	-	-	-	-	-	-	-
Chromium	7440-47-3	-	-	-	-	-	-	-	-	-	-	-
Chrysene	218-01-9	-	-	0.157	-	-	-	0.157	1 [h]	0.157 [i]	0.157 [i]	HH
Cobalt	7440-48-4	-	-	-	-	-	-	-	-	-	-	-
Copper	7440-50-8	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	53-70-3	-	-	0.000157	-	-	-	0.000157	1 [h]	0.000157 [i]	0.000157 [i]	HH
Di-n-butyl Phthalate	84-74-2	0.626	1672	-	49.2	3.12	0.626	49.2	0.626 [i]	49.2 [i]	0.626 [i]	Eco
Di-n-octyl Phthalate	117-84-0	0.626	1672	-	49.2	63.0	0.626	49.2	0.626 [i]	49.2 [i]	0.626 [i]	Eco

Table J-1f - Miniumum Potentially Applicable Tissue SLVs for Identification of Preliminary COPCs
Bradford Island, River Operable Unit
(2 of 2)

Analyte	CAS #	Candidate Tissue Screening levels (mg/kg wet wt.)									Selected Min. Potentially Applicable Tissue SLV [h]	SLV: HH or Eco
		DEQ ATLs [d]				DEQ Fish CTLs Freshwater[d]	Lowest Eco SLV	Lowest HH SLV	SLVs with Surrogates			
		Birds	Mammals	Humans Subsistence/Tribal								
		Individual	Individual	Carcinogens	Non-carcinogens				Lowest Eco [e]	Lowest HH [f]		
Fluoranthene	206-44-0	-	190	-	20	19	19	20	19	20	19	Eco
Fluorene	86-73-7	-	-	-	-	-	-	-	19 [g]	15 [h]	15 [h]	HH
Indeno(1,2,3-cd)pyrene	193-39-5	-	-	0.00157	-	-	-	0.00157	1 [h]	0.00157 [i]	0.00157 [i]	HH
Lead	7439-92-1	9.3	34	-	0.5	0.12	0.12	0.5	0.12	0.5	0.12	Eco
Mercury	7439-97-6	0.074	0.12	-	0.049	0.088	0.074	0.049	0.074	0.049	0.049	HH
Nickel	7440-02-0	-	-	-	-	-	-	-	-	-	-	-
p-cresol (4-Methylphenol)	106-44-5	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	85-01-8	-	-	-	-	-	-	-	19 [g]	15 [h]	15 [h]	HH
Pyrene	129-00-0	-	9500	-	15	1	1	15	1	15	1	Eco
Selenium	7782-49-2	0.23	0.036	-	2.5	0.024	0.024	2.5	0.024	2.5	0.024	Eco
Silver	7440-22-4	-	-	-	-	-	-	-	-	-	-	-
Thallium	7440-28-0	-	-	-	-	-	-	-	-	-	-	-
Total Polychlorinated biphenyl (PCB)	1336-36-3	0.035	0.88	0.00057	0.0098	0.43	0.035	0.00057	0.035	0.00057	0.00057	HH
Total PAH		-	-	-	-	-	-	-	-	-	-	-
Total LPAH		-	-	-	-	-	-	-	-	-	-	-
Total HPAH		-	-	-	-	-	-	-	-	-	-	-
Vanadium	7440-62-2	-	-	-	-	-	-	-	-	-	-	-
Zinc	7440-66-6	-	-	-	-	-	-	-	-	-	-	-

Note
- = No benchmark available
ATL = Acceptable tissue level
CTL = Critical tissue level (for fish)
DEQ = Oregon Department of Environmental Quality
Eco = ecological
HH = human health
mg/kg = milligram per kilogram
RI = Remedial Investigation
SLV = screening level value
UPL = Upper Prediction Limit

[b] Eco & HH SLV: Total Aroclors was used as a surrogate because there was no individual aroclor chemical specific SLV.
[d] DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31
[e] The lowest of the Eco SLVs (DEQ Bird ATL, DEQ Mammal ATL, and DEQ Fish Freshwater CTL) was selected.
[f] The lowest of the HH SLVs (DEQ Subsistence/Tribal Carcinogen ATL and DEQ Subsistence/Tribal Non-Carcinogen ATL) was selected.
[g] The SLV for fluoranthene was selected as a surrogate because there was no chemical-specific SLV.
[h] The SLV for pyrene was selected as a surrogate because there was no chemical-specific SLV.
[i] The ATLs and CTLs were developed based on the procedures outlined in DEQ 2007; see Appendices L-2 and L-3.

Table J-2a
Calculation of Acceptable Tissue Levels Protective of Human Health for Selected SVOCs - Subsistence Fisher
Bradford Island, River Operable Unit
(1 of 1)

Chemical Class	Chemical Name		ARLc	ARLn	BW (kg)	AT (yrs)	Sfo (mg/kg-day)-1	IRp (Kg/day)	ED (yrs)	RfD (mg/kg-day)	HH ATL (mg/kg ww)	
											carcinogens	noncarcin
SVOCs	Bis(2-ethylhexyl) Phthalate	c	1.00E-06	1	70	70	0.014	0.1424	30	0.02	0.0819	-
SVOCs	Butyl Benzyl Phthalate	c	1.00E-06	1	70	70	0.0019	0.1424	30	0.2	0.604	-
SVOCs	Di-n-butyl Phthalate	n	1.00E-06	1	70	30	-	0.1424	30	0.1	-	49.2
SVOCs	Di-n-octyl Phthalate	n	1.00E-06	1	70	30	-	0.1424	30	0.1	-	49.2
cPAHs	Benzo(a)anthracene	c	1.00E-06	1	70	70	0.73	0.1424	30	-	0.00157	-
cPAHs	Benzo(a)pyrene	c	1.00E-06	1	70	70	7.3	0.1424	30	-	1.57E-04	-
cPAHs	Benzo(b)fluoranthene	c	1.00E-06	1	70	70	0.73	0.1424	30	-	0.00157	-
cPAHs	Benzo(g,h,i)perylene	c	1.00E-06	1	70	70	0.073	0.1424	30	-	0.0157	-
cPAHs	Benzo(k)fluoranthene	c	1.00E-06	1	70	70	0.073	0.1424	30	-	0.0157	-
cPAHs	Chrysene	c	1.00E-06	1	70	70	0.0073	0.1424	30	-	0.157	-
cPAHs	Dibenz(a,h)anthracene	c	1.00E-06	1	70	70	7.3	0.1424	30	-	1.57E-04	-
cPAHs	Indeno(1,2,3-cd)pyrene	c	1.00E-06	1	70	70	0.73	0.1424	30	-	0.00157	-

- = no data
ARL_c = Acceptable Risk Level for Carcinogens
ARL_n = Acceptable Risk Level for Non - Carcinogens
AT = Averaging Time
ATL = Acceptable Tissue Level
BW = Body Weight
c = carcinogen
ED = Exposure Duration
IRp = Fish consumption rate for exposed population
kg = kilogram
kg/day = kilograms per day
mg/kg-day = milligrams per kilogram per day
mg/kg ww = milligrams per kilogram wet weight
n = noncarcinogen
RfD = Reference Dose
SFo = Cancer Slope Factor
yrs = years

Notes
$HH\ ATL_{carcinogen}$ = (ARLc*BW*AT)/(SFo*IRp*ED)
$HH\ ATL_{noncarcin}$ = (ARLn*BW*RfD)/IRp
Di-n-butylphthalate RfDo used as surrogate for di-n-octyl phthalate.
Hierarchy of SFo and RfD; 1. DEQ 2007 2. USEPA 2009
Exposure parameters come from DEQ 2007 table A-2.
Oregon Department of Environmental Quality (DEQ) 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment.
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Table. May.

Table J-2b
Calculation of Acceptable Tissue Levels Protective of Human Health for Selected SVOCs - Recreational Fisher
Bradford Island, River Operable Unit
(1 of 1)

Chemical Class	Chemical Name		ARLc	ARLn	BW (kg)	AT (yrs)	Sfo (mg/kg-day)-1	IRp (Kg/day)	ED (yrs)	RfD (mg/kg-day)	HH ATL (mg/kg ww)	
											carcinogens	noncarcin
SVOCs	Bis(2-ethylhexyl) Phthalate	c	1.00E-06	1	70	70	0.014	0.0175	30	0.02	0.667	-
SVOCs	Butyl Benzyl Phthalate	c	1.00E-06	1	70	70	0.0019	0.0175	30	0.2	4.91	-
SVOCs	Di-n-butyl Phthalate	n	1.00E-06	1	70	30	-	0.0175	30	0.1	-	400
SVOCs	Di-n-octyl Phthalate	n	1.00E-06	1	70	30	-	0.0175	30	0.1	-	400
cPAHs	Benzo(a)anthracene	c	1.00E-06	1	70	70	0.73	0.0175	30	-	0.0128	-
cPAHs	Benzo(a)pyrene	c	1.00E-06	1	70	70	7.3	0.0175	30	-	0.00128	-
cPAHs	Benzo(b)fluoranthene	c	1.00E-06	1	70	70	0.73	0.0175	30	-	0.0128	-
cPAHs	Benzo(g,h,i)perylene	c	1.00E-06	1	70	70	0.073	0.0175	30	-	0.128	-
cPAHs	Benzo(k)fluoranthene	c	1.00E-06	1	70	70	0.073	0.0175	30	-	0.128	-
cPAHs	Chrysene	c	1.00E-06	1	70	70	0.0073	0.0175	30	-	1.28	-
cPAHs	Dibenz(a,h)anthracene	c	1.00E-06	1	70	70	7.3	0.0175	30	-	0.00128	-
cPAHs	Indeno(1,2,3-cd)pyrene	c	1.00E-06	1	70	70	0.73	0.0175	30	-	0.0128	-

- = no data
ARL_c = Acceptable Risk Level for Carcinogens
ARL_n = Acceptable Risk Level for Non - Carcinogens
AT = Averaging Time
ATL = Acceptable Tissue Level
BW = Body Weight
c = carcinogen
ED = Exposure Duration
IRp = Fish consumption rate for exposed population
kg = kilogram
kg/day = kilograms per day
mg/kg-day = milligrams per kilogram per day
mg/kg ww = milligrams per kilogram wet weight
n = noncarcinogen
RfD = Reference Dose
SFo = Cancer Slope Factor
yrs = years

Notes
$HH\ ATL_{carcinogen}$ = (ARLc*BW*AT)/(SFo*IRp*ED)
$HH\ ATL_{noncarcin}$ = (ARLn*BW*RfD)/IRp
Di-n-butyl phthalate RfDo used as surrogate for di-n-octyl phthalate.
Hierarchy of SFo and RfD; 1. DEQ 2007 2. USEPA 2009
Exposure parameters come from DEQ 2007 table A-2.
Oregon Department of Environmental Quality (DEQ) 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment.
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Table. May.

Table J-3
Calculated Acceptable Tissue Levels and Critical Tissue Levels Protective of Wildlife and Fish for Selected SVOCs
Bradford Island, River Operable Unit
(1 of 1)

Chemical Class	Chemical Name	TRV NOAEL AVIAN	TRV LOAEL AVIAN	TRV NOAEL MAMMAL	TRV LOAEL MAMMAL	IRw Heron (kg/day)	IRw Mink (Kg/day)	BW Heron (Kg)	BW Mink (Kg)	BCF (L/kg)	WQC (mg/L)	Tissue Levels for Ecological Receptors (mg/kg wet wt)				
												$ATL_{birdindiv}$	$ATL_{birdpop}$	$ATL_{mamalindiv}$	$ATL_{mamalpop}$	CTL_{fish}
SVOCs	Bis(2-ethylhexyl) Phthalate	1.1	5.5	7.6	76	0.42	0.137	2.39	1	588	0.003	6.26	31.3	55.5	555	1.76
SVOCs	Butyl Benzyl Phthalate	1.1	5.5	7.6	76	0.42	0.137	2.39	1	16.3	0.019	6.26	31.3	55.5	555	0.310
SVOCs	Di-n-butyl Phthalate	0.11	1.1	229	763	0.42	0.137	2.39	1	89	0.035	0.626	6.26	1,672	5,569	3.12
SVOCs	Di-n-octyl Phthalate	0.11	1.1	229	763	0.42	0.137	2.39	1	89	0.708	0.626	6.26	1,672	5,569	63.0

Notes:

ATL = Acceptable Tissue Level (developed to protect birds and mammals at the individual level as well as the population level)
CTL = Critical Tissue Level
TRV = Toxicity Reference Value
NOAEL = No-Observable-Adverse-Effects-Level
LOAEL = Lowest-Observable-Adverse-Effects-Level
IRw = Food ingestion rate for wildlife
BW = Body Weight
BCF = Water to Fish Bioconcentration Factor
WQC = Water Quality Criteria
$ATL_{wildlife}$ = TRV/(IR/BW)
CTL_{fish} = BCF*WQC
Bis(2-ethylhexyl) phthalate TRVs were used as a surrogate for butyl benzyl phthalate. The chronic LOAEL for bis(2-ethylhexyl) phthalate was estimated by applying a factor of 5.
Di-n-butyl phthalate TRVs and BCF were used as a surrogate for di-n-octyl phthalate.
TRVs come from Sample et al 1996. Mink and great blue heron were used as endpoint species to be consistent with the ATLs used from DEQ's guidance (2007).
Water to fish BCFs for bis(2-ethylhexyl) phthalate and butyl benzyl phthalate from: Oak Ridge National Laboratory's Risk Assessment Information System (RAIS) database URL:http://rais.ornl.gov/ (last updated 2009). BCF for di-n-butyl phthalate and di-n-octyl phthalate from WDOE URL:http://fortess.wa.gov/ecy/clarc/Reporting/CLARCReporting.aspx
WQC presented in Table H-3 (Appendix H) - criterion continuous concentrations protective of aquatic biota.
Sample, B.E., D.M. Opresko, and G.W Suter II. 1996. Toxicological Benchmarks for Wildlife: 1996 Revision. Oak Ridge National Laboratory, Oak Ridge, Tennessee. 227 pages. ES/ER/ TM-86/R3.
Oregon Department of Environmental Quality (DEQ) 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment.

Table J-4a - Human Health Soil SLVs
Bradford Island, Upland Operable Unit
(1 of 5)

		Candidate Human Health Soil Screening Level Values (mg/kg)					Selected Soil SLVs (mg/kg)			
Analyte	CAS #	DEQ Soil Direct Contact Occupational RBC	DEQ Soil Direct Contact Construction RBC	DEQ Soil Direct Contact Excavation RBC	DEQ Soil Volatilize Outdoor Occupational RBC	USEPA Soil Indust RSL	Outdoor Worker	Construction Worker	Excavation Worker	Site-Specific Reference UPL
1,1,1,2-Tetrachloroethane	630-20-6	-	-	-	-	9.3	9.3	9.3	9.3	-
1,1,1-Trichloroethane (TCA)	71-55-6	-	-	-	-	38,000	38,000	38,000	38,000	-
1,1,2,2-Tetrachloroethane	79-34-5	-	-	-	-	2.8	2.8	2.8	2.8	-
1,1,2-Trichloroethane	79-00-5	25	290	8,100	24	5.3	24	290	8,100	-
1,1-Dichloroethane	75-34-3	250	2,900	81,000	240	17	240	2,900	81,000	-
1,1-Dichloroethene	75-35-4	27,000	12,000	-	-	1,100	27,000	12,000	1,100	-
1,1-Dichloropropene	563-58-6	-	-	-	-	-	8.1 [a]	8.1 [a]	8.1 [a]	-
1,2,3-Trichlorobenzene	87-61-6	-	-	-	-	490	490	490	490	-
1,2,3-Trichloropropane	96-18-4	-	-	-	-	0.095	0.095	0.095	0.095	-
1,2,4-Trichlorobenzene	120-82-1	-	-	-	-	99	99	99	99	-
1,2,4-Trimethylbenzene	95-63-6	2,000	2,000	54,000	980	260	980	2,000	54,000	-
1,2-Dibromo-3-chloropropane	96-12-8	-	-	-	-	0.069	0.069	0.069	0.069	-
1,2-Dibromoethane (EDB)	106-93-4	0.68	8.1	230	0.65	0.17	0.65	8.1	230	-
1,2-Dichlorobenzene	95-50-1	35,000	19,000	-	-	9,800	35,000	19,000	9,800	-
1,2-Dichloroethane (EDC)	107-06-2	15	180	5,000	15	2.2	15	180	5,000	-
1,2-Dichloropropane	78-87-5	-	-	-	-	4.5	4.5	4.5	4.5	-
1,3,5-Trimethylbenzene	108-67-8	1,600	1,500	42,000	-	10,000	1,600	1,500	42,000	-
1,3-Dichlorobenzene	541-73-1	-	-	-	-	-	36 [b]	1,200 [b]	34,000 [b]	-
1,3-Dichloropropane	142-28-9	-	-	-	-	20,000	20,000	20,000	20,000	-
1,4-Dichlorobenzene	106-46-7	63	1,200	34,000	36	12	36	1,200	34,000	-
2,2-Dichloropropane	594-20-7	-	-	-	-	-	4.5 [c]	4.5 [c]	4.5 [c]	-
2,4,5-T	93-76-5	-	-	-	-	6,200	6,200	6,200	6,200	-
2,4,5-TP (Silvex)	93-72-1	-	-	-	-	4,900	4,900	4,900	4,900	-
2,4,5-Trichlorophenol	95-95-4	-	-	-	-	62,000	62,000	62,000	62,000	-
2,4,6-Trichlorophenol	88-06-2	200	240	6,600	-	160	200	240	6,600	-
2,4-D	94-75-7	7,700	2,400	66,000	-	7,700	7,700	2,400	66,000	-
2,4-DB	94-82-6	-	-	-	-	4,900	4,900	4,900	4,900	-
2,4-Dichlorophenol	120-83-2	-	-	-	-	1,800	1,800	1,800	1,800	-
2,4-Dimethylphenol	105-67-9	-	-	-	-	12,000	12,000	12,000	12,000	-
2,4-Dinitrophenol	51-28-5	-	-	-	-	1,200	1,200	1,200	1,200	-
2,4-Dinitrotoluene	121-14-2	-	-	-	-	5.5	5.5	5.5	5.5	-
2,6-Dinitrotoluene	606-20-2	770	240	6,600	-	620	770	240	6,600	-
2-Butanone (MEK)	78-93-3	-	-	-	-	200,000	200,000	200,000	200,000	-
2-Chloronaphthalene	91-58-7	-	-	-	-	82,000	82,000	82,000	82,000	-
2-Chlorophenol	95-57-8	-	-	-	-	5,100	5,100	5,100	5,100	-
2-Chlorotoluene	95-49-8	-	-	-	-	20,000	20,000	20,000	20,000	-
2-Hexanone	591-78-6	-	-	-	-	1,400	1,400	1,400	1,400	-
2-Methylnaphthalene	91-57-6	-	-	-	-	4,100	4,100	4,100	4,100	-
2-Methylphenol	95-48-7	-	-	-	-	31,000	31,000	31,000	31,000	-
2-Nitroaniline	88-74-4	-	-	-	-	6,000	6,000	6,000	6,000	-
2-Nitrophenol	88-75-5	-	-	-	-	-	180,000 [d]	180,000 [d]	180,000 [d]	-
3,3'-Dichlorobenzidine	91-94-1	4.8	37	1,000	-	3.8	4.8	37	1,000	-
3-Nitroaniline	99-09-2	-	-	-	-	-	6,000 [e]	6,000 [e]	6,000 [e]	-
4,4'-DDD	72-54-8	11	83	2,300	-	7.2	11	83	2,300	-
4,4'-DDE	72-55-9	7.7	58	1,600	-	5.1	7.7	58	1,600	-
4,4'-DDT	50-29-3	7.7	58	1,600	-	7	7.7	58	1,600	-
4,6-Dinitro-2-methylphenol	534-52-1	-	-	-	-	49	49	49	49	-
4-Bromophenyl Phenyl Ether	101-55-3	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	59-50-7	-	-	-	-	62,000	62,000	62,000	62,000	-
4-Chloroaniline	106-47-8	-	-	-	-	8.6	8.6	8.6	8.6	-
4-Chlorophenyl Phenyl Ether	7005-72-3	-	-	-	-	-	-	-	-	-
4-Chlorotoluene	106-43-4	-	-	-	-	72,000	72,000	72,000	72,000	-
4-Isopropyltoluene	99-87-6	-	-	-	-	-	53,000 [y]	24,000 [y]	24,000 [y]	-

Table J-4a - Human Health Soil SLVs
Bradford Island, Upland Operable Unit
(2 of 5)

		Candidate Human Health Soil Screening Level Values (mg/kg)					Selected Soil SLVs (mg/kg)			
Analyte	CAS #	DEQ Soil Direct Contact Occupational RBC	DEQ Soil Direct Contact Construction RBC	DEQ Soil Direct Contact Excavation RBC	DEQ Soil Volatilize Outdoor Occupational RBC	USEPA Soil Indust RSL	Outdoor Worker	Construction Worker	Excavation Worker	Site-Specific Reference UPL
4-Methyl-2-pentanone (MIBK)	108-10-1	-	-	-	-	53,000	53,000	53,000	53,000	-
4-Nitroaniline	100-01-6	-	-	-	-	86	86	86	86	-
4-Nitrophenol	100-02-7	-	-	-	-	-	180,000 [d]	180,000 [d]	180,000 [d]	-
Acenaphthene	83-32-9	61,000	19,000	-	-	33,000	61,000	19,000	33,000	3.40
Acenaphthylene	208-96-8	-	-	-	-	-	23 [f]	580 [f]	16,000 [f]	1.60
Acetone	67-64-1	-	-	-	-	630,000	630,000	630,000	630,000	-
Aldrin	309-00-2	0.13	0.98	27	-	0.1	0.13	0.98	27	-
Aluminum	7429-90-5	-	-	-	-	990,000	990,000	990,000	990,000	31,400
Aniline	62-53-3	-	-	-	-	300	300	300	300	-
Anthracene	120-12-7	-	93,000	-	-	170,000	170,000	93,000	170,000	4.90
Antimony	7440-36-0	-	-	-	-	410	410	410	410	0.176
Aroclor 1016	12674-11-2	-	-	-	-	21	21	21	21	-
Aroclor 1221	11104-28-2	-	-	-	-	0.54	0.54	0.54	0.54	-
Aroclor 1232	11141-16-5	-	-	-	-	0.54	0.54	0.54	0.54	-
Aroclor 1242	53469-21-9	-	-	-	-	0.74	0.74	0.74	0.74	-
Aroclor 1248	12672-29-6	-	-	-	-	0.74	0.74	0.74	0.74	-
Aroclor 1254	11097-69-1	-	-	-	-	0.74	0.74	0.74	0.74	-
Aroclor 1260	11096-82-5	-	-	-	-	0.74	0.74	0.74	0.74	-
Aroclor 1262	37324-23-5	-	-	-	-	-	0.54 [g]	0.54 [g]	0.54 [g]	-
Aroclor 1268	11100-14-4	-	-	-	-	-	0.54 [g]	0.54 [g]	0.54 [g]	-
Arsenic	7440-38-2	1.7	13	370	-	1.6	5.40 [u]	13	370	5.40
Barium	7440-39-3	-	60,000	-	-	190,000	190,000	60,000	190,000	169
Benzo(a)anthracene	56-55-3	2.7	21	590	-	2.1	2.7	21	590	28.7
Benzene	71-43-2	34	340	9,500	50	5.4	34	340	9,500	-
Benzidine	92-87-5	55	510	14,000	-	0.0075	55	510	14,000	-
Benzo(a)pyrene	50-32-8	0.27	2.1	59	-	0.21	0.27	2.1	59	37.0
Benzo(b)fluoranthene	205-99-2	2.7	21	590	-	2.1	2.7	21	590	46.4
Benzo(g,h,i)perylene	191-24-2	-	-	-	-	-	27 [h]	210 [h]	5,900 [h]	26.5
Benzo(j,k)flouranthenes	205-82-3 & 207-08-9	-	-	-	-	-	27 [aa]	210 [aa]	5,900 [aa]	-
Benzo(k)fluoranthene	207-08-9	27	210	5,900	-	21	27	210	5,900	16.2
Benzofluoranthenes, Total	56832-73-6	-	-	-	-	-	2.7 [ab]	21 [ab]	590 [ab]	-
Benzoic Acid	65-85-0	-	-	-	-	2,500,000	2,500,000	2,500,000	2,500,000	-
Benzyl Alcohol	100-51-6	-	-	-	-	62,000	62,000	62,000	62,000	-
Beryllium	7440-41-7	2,000	610	17,000	-	2,000	2,000	610	17,000	0.659
BHC (alpha)	319-84-6	0.34	2.6	74	-	0.27	0.34	2.6	74	-
BHC (beta)	319-85-7	-	-	-	-	0.96	0.96	0.96	0.96	-
BHC (delta)	319-86-8	-	-	-	-	-	0.34 [i]	2.6 [i]	74 [i]	-
BHC (gamma) Lindane	58-89-9	2	15	420	-	2.1	2	15	420	-
Bis(2-chloroethoxy)methane	111-91-1	-	-	-	-	1,800	1,800	1,800	1,800	-
Bis(2-chloroethyl) Ether	111-44-4	-	-	-	-	1	1	1	1	-
Bis(2-chloroisopropyl) Ether	or 108-60-1	-	-	-	-	-	1 [j]	1 [j]	1 [j]	-
Bis(2-ethylhexyl) Phthalate	117-81-7	150	1,200	33,000	-	120	150	1,200	33,000	-
Bromobenzene	108-86-1	-	-	-	-	1,800	1,800	1,800	1,800	-
Bromochloromethane	74-97-5	-	-	-	-	-	11 [k]	210 [k]	5,800 [k]	-
Bromodichloromethane	75-27-4	15	210	5,800	11	1.4	11	210	5,800	-
Bromoform	75-25-2	360	2,700	76,000	-	220	360	2,700	76,000	-
Bromomethane	74-83-9	710	330	9,200	700	32	700	330	9,200	-
Butyl Benzyl Phthalate	85-68-7	-	-	-	-	910	910	910	910	-
Cadmium	7440-43-9	500	150	4,300	-	800 [l]	500	150	4,300	0.271
Calcium	7440-70-2	-	-	-	-	-	-	-	-	-
Carbazole	86-74-8	-	-	-	-	-	1,000 [w]	1,000 [w]	1,000 [w]	-
Carbon Disulfide	75-15-0	-	-	-	-	3,700	3,700	3,700	3,700	-
Carbon Tetrachloride	56-23-5	15	150	4,100	26.0	1.2	15	150	4,100	-

Table J-4a - Human Health Soil SLVs
Bradford Island, Upland Operable Unit
(3 of 5)

		Candidate Human Health Soil Screening Level Values (mg/kg)					Selected Soil SLVs (mg/kg)			
Analyte	CAS #	DEQ Soil Direct Contact Occupational RBC	DEQ Soil Direct Contact Construction RBC	DEQ Soil Direct Contact Excavation RBC	DEQ Soil Volatilize Outdoor Occupational RBC	USEPA Soil Indust RSL	Outdoor Worker	Construction Worker	Excavation Worker	Site-Specific Reference UPL
Carbon, Total Organic	7440-44-0	-	-	-	-	-	-	-	-	-
Chlordane (alpha)	5103-71-9	-	-	-	-	-	7.2 [m]	55 [m]	1,500 [m]	-
Chlordane (gamma)	5103-74-2	-	-	-	-	-	7.2 [m]	55 [m]	1,500 [m]	-
Chlordane (technical)	12789-03-6	7.2	55	1,500	-	6.5	7.2	55	1,500	-
Chlorobenzene	108-90-7	8,300	4,300	-	-	1,400	8,300	4,300	1,400	-
Chloroethane	75-00-3	-	-	-	-	61,000	61,000	61,000	61,000	-
Chloroform	67-66-3	25	380	11,000	17	1.5	17	380	11,000	-
Chloromethane	74-87-3	25,000	25,000	-	-	500	25,000	25,000	500	-
Chromium	7440-47-3	190 [z]	920 [z]	26,000 [z]	-	5.6 [z]	190 [z]	920 [z]	26,000 [z]	28.1
Chrysene	218-01-9	270	2,100	59,000	-	210	270	2,100	59,000	37.4
cis-1,2-Dichloroethene	156-59-2	10,000	3,100	86,000	-	10,000	10,000	3,100	86,000	-
cis-1,3-Dichloropropene	10061-01-5	-	-	-	-	-	8.1 [a]	8.1 [a]	8.1 [a]	-
Cobalt	7440-48-4	-	-	-	-	300	300	300	300	19.9
Copper	7440-50-8	41,000	12,000	-	-	41,000	41,000	12,000	41,000	56.7
Dalapon	75-99-0	-	-	-	-	18,000	18,000	18,000	18,000	-
Dibenz(a,h)anthracene	53-70-3	0.27	2.1	59	-	0.21	0.27	2.1	59	6.90
Dibenzofuran	132-64-9	-	-	-	-	1,000	1,000	1,000	1,000	-
Dibromochloromethane	124-48-1	34	260	7,200	-	3.3	34	260	7,200	-
Dibromomethane	74-95-3	-	-	-	-	110	110	110	110	-
Dibutyltin	1002-53-5	-	-	-	-	180	180	180	180	-
Dicamba	1918-00-9	-	-	-	-	18,000	18,000	18,000	18,000	-
Dichlorodifluoromethane	75-71-8	-	-	-	-	780	780	780	780	-
Dichloromethane (Methylene Chloride)	75-09-2	310	2,700	75,000	830	53	310	2,700	75,000	-
Dichloroprop	120-36-5	-	-	-	-	-	4,900 [v]	4,900 [v]	4,900 [v]	-
Dieldrin	60-57-1	0.13	1	29	-	0.11	0.13	1	29	-
Diesel Range Organics	68334-30-5	70,000	23,000	-	-	-	70,000	23,000	70,000	-
Diethyl Phthalate	84-66-2	-	-	-	-	490,000	490,000	490,000	490,000	-
Dimethyl Phthalate	131-11-3	-	-	-	-	-	150 [n]	1,200 [n]	33,000 [n]	-
Di-n-butyl Phthalate	84-74-2	-	-	-	-	62,000	62,000	62,000	62,000	-
Di-n-octyl Phthalate	117-84-0	-	-	-	-	-	150 [n]	1,200 [n]	33,000 [n]	-
Dinoseb	88-85-7	-	-	-	-	620	620	620	620	-
Endosulfan I	959-98-8	4,600	1,400	40,000	-	3,700 [o]	4,600	1,400	40,000	-
Endosulfan II	33213-65-9	4,600	1,400	40,000	-	3,700 [o]	4,600	1,400	40,000	-
Endosulfan Sulfate	1031-07-8	-	-	-	-	-	4,600 [o]	1,400 [o]	40,000 [o]	-
Endrin	72-20-8	230	71	2,000	-	180	230	71	2,000	-
Endrin Aldehyde	7421-93-4	-	-	-	-	-	230 [p]	71 [p]	2,000 [p]	-
Endrin Ketone	53494-70-5	-	-	-	-	-	230 [p]	71 [p]	2,000 [p]	-
Ethylbenzene	100-41-4	140	1,600	44,000	160	27	140	1,600	44,000	-
Fluoranthene	206-44-0	29,000	8,900	-	-	22,000	29,000	8,900	22,000	55.1
Fluorene	86-73-7	41,000	12,000	-	-	22,000	41,000	12,000	22,000	3.20
Gasoline Range Organics	8006-61-9	22,000	13,000	-	100,000	-	22,000	13,000	22,000	-
Heptachlor	76-44-8	0.48	3.7	100	-	0.38	0.48	3.7	100	-
Heptachlor Epoxide	1024-57-3	0.24	1.8	51	-	0.19	0.24	1.8	51	-
Hexachlorobenzene	118-74-1	1.8	14	380	-	1.1	1.8	14	380	-
Hexachlorobutadiene	87-68-3	-	-	-	-	22	22	22	22	-
Hexachlorocyclopentadiene	77-47-4	-	-	-	-	3,700	3,700	3,700	3,700	-
Hexachloroethane	67-72-1	150	240	6,600	-	120	150	240	6,600	-
Indeno(1,2,3-cd)pyrene	193-39-5	2.7	21	590	-	2.1	2.7	21	590	29.4
Iron	7439-89-6	-	-	-	-	720,000	720,000	720,000	720,000	-
Isophorone	78-59-1	-	-	-	-	1,800	1,800	1,800	1,800	-
Isopropylbenzene	98-82-8	53,000	24,000	-	-	11,000	53,000	24,000	11,000	-
Lead	7439-92-1	800	800	800	-	800	800	800	800	25.5
m,p-Xylenes	179601-23-1	25,000	19,000	-	-	2,700 [q]	2,700	19,000	2,700	-

Table J-4a - Human Health Soil SLVs
Bradford Island, Upland Operable Unit
(4 of 5)

		Candidate Human Health Soil Screening Level Values (mg/kg)					Selected Soil SLVs (mg/kg)			
Analyte	CAS #	DEQ Soil Direct Contact Occupational RBC	DEQ Soil Direct Contact Construction RBC	DEQ Soil Direct Contact Excavation RBC	DEQ Soil Volatilize Outdoor Occupational RBC	USEPA Soil Indust RSL	Outdoor Worker	Construction Worker	Excavation Worker	Site-Specific Reference UPL
Magnesium	7439-95-4	-	-	-	-	-	-	-	-	-
Manganese	7439-96-5	23,000	7,200	-	-	23,000 [r]	23,000	7,200	23,000	885
MCPA	94-74-6	380	120	3,300	-	310	380	120	3,300	-
MCPP	93-65-2	-	-	-	-	620	620	620	620	-
Mercury	7439-97-6	310	93	2,600	-	34	310	93	2,600	0.066
Methoxychlor	72-43-5	-	-	-	-	3,100	3,100	3,100	3,100	-
Monobutyltin	78763-54-9	-	-	-	-	-	180 [s]	180 [s]	180 [s]	-
Naphthalene	91-20-3	23	580	16,000	27	18	23	580	16,000	2.20
n-Butylbenzene	104-51-8	-	-	-	-	-	-	-	-	-
Nickel	7440-02-0	20,000	6,100	-	-	20,000	20,000	6,100	20,000	26.5
Nitrobenzene	98-95-3	-	-	-	-	24	24	24	24	-
N-Nitrosodimethylamine	62-75-9	-	-	-	-	0.034	0.034	0.034	0.034	-
N-Nitrosodi-n-propylamine	621-64-7	-	-	-	-	0.25	0.25	0.25	0.25	-
N-Nitrosodiphenylamine	86-30-6	-	-	-	-	350	350	350	350	-
n-Propylbenzene	103-65-1	-	-	-	-	21,000	21,000	21,000	21,000	-
o-Xylene	95-47-6	-	-	-	-	19,000	19,000	19,000	19,000	-
p-cresol (4-Methylphenol)	106-44-5	-	-	-	-	3,100	3,100	3,100	3,100	-
Pentachlorophenol	87-86-5	13	100	2,900	-	9	13	100	2,900	-
Phenanthrene	85-01-8	-	-	-	-	-	170,000 [x]	93,000 [x]	170,000 [x]	27.0
Phenol	108-95-2	-	-	-	-	180,000	180,000	180,000	180,000	-
Potassium	7440-09-7	-	-	-	-	-	-	-	-	-
Pyrene	129-00-0	21,000	6,700	-	-	17,000	21,000	6,700	17,000	53.3
Residual Range Organics	RRO	-	40,000	-	-	-	40,000 [ac]	40,000	40,000 [ac]	-
sec-Butylbenzene	135-98-8	-	-	-	-	-	-	-	-	-
Selenium	7782-49-2	-	-	-	-	5,100	5,100	5,100	5,100	0.500
Silver	7440-22-4	5,100	1,500	43,000	-	5,100	5,100	1,500	43,000	0.187
Sodium	7440-23-5	-	-	-	-	-	-	-	-	-
Solids, Total	TS	-	-	-	-	-	-	-	-	-
Styrene	100-42-5	-	51,000	-	-	36,000	36,000	51,000	36,000	-
tert-Butylbenzene	98-06-6	-	-	-	-	-	-	-	-	-
Tetrabutyltin	1461-25-2	-	-	-	-	-	180 [s]	180 [s]	180 [s]	-
Tetrachloroethene (PCE)	127-18-4	5.1	40	1,100	66	2.6	5.1	40	1,100	-
Thallium	7440-28-0	-	-	-	-	-	0.203 [u]	0.203 [u]	0.203 [u]	0.203
Toluene	108-88-3	77,000	24,000	-	-	45,000	77,000	24,000	45,000	-
Total PCBs		0.98	4.4	120	-	0.74	0.74 [t]	0.74 [t]	0.74 [t]	-
Total PAH		-	-	-	-	-	-	-	-	-
Total LPAH		-	-	-	-	-	-	-	-	-
Total HPAH		-	-	-	-	-	-	-	-	-
Toxaphene	8001-35-2	2	15	420	-	1.6	2	15	420	-
trans-1,2-Dichloroethene	156-60-5	9,200	4,500	-	-	690	9,200	4,500	690	-
trans-1,3-Dichloropropene	10061-02-6	-	-	-	-	-	8.1 [a]	8.1 [a]	8.1 [a]	-
Tributyltin	688-73-3	-	-	-	-	180	180	180	180	-
Trichloroethene (TCE)	79-01-6	3.9	43	1,200	4.3	14	3.9	43	1,200	-
Trichlorofluoromethane	75-69-4	-	63,000	-	-	3,400	3,400	63,000	3,400	-
Vanadium	7440-62-2	-	-	-	-	72	104 [u]	104 [u]	104 [u]	104
Vinyl Acetate	108-05-4	-	-	-	-	4,100	4,100	4,100	4,100	-
Vinyl Chloride	75-01-4	3.9	30	830	89	1.7	3.9	30	830	-
Zinc	7440-66-6	-	-	-	-	310,000	310,000	310,000	310,000	71.7

- = No benchmark available
DEQ = Oregon Department of Environmental Quality
USEPA = United States Environmental Protection Agency
HMW = high molecular weight

Table J-4a - Human Health Soil SLVs
Bradford Island, Upland Operable Unit
(5 of 5)

Analyte	CAS #	Candidate Human Health Soil Screening Level Values (mg/kg)					Selected Soil SLVs (mg/kg)			Site-Specific Reference UPL
		DEQ Soil Direct Contact Occupational RBC	DEQ Soil Direct Contact Construction RBC	DEQ Soil Direct Contact Excavation RBC	DEQ Soil Volatilize Outdoor Occupational RBC	USEPA Soil Indust RSL	Outdoor Worker	Construction Worker	Excavation Worker	

LMW = low molecular weight
mg/kg = milligram per kilogram dry weight
PAH = polycyclic aromatic hydrocarbons
RBC = Risk Based Concentrations
RSL = Regional Screening Level
SLV = screening level value
UPL = upper prediction limit

Notes
Only analytes with one or more candidate SLVs is shown on this table. For the full list of analytes, see Appendix K-1.
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, 3. Surrogate used as noted.
Construction Worker hierarchical SLV selection for soil: 1. DEQ Soil RBCs (Direct Contact Construction,. 2. USEPA Soil Industrial RSL, 3. Surrogate used as noted.
Excavation Worker hierarchical SLV selection for soil: 1. DEQ Soil RBCs (Direct Contact Excavation), 2. USEPA Soil Industrial RSL, 3. Outdoor Worker SLV, 4. Surrogate used as noted.
LMW PAHs include: 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Fluorene, Naphthalene, and Phenanthrene.
HWM PAHs include : Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(j,k)flouranthenes, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, and Pyrene.
Human Health Screening Levels correspond to a target risk of 1E-06 for carcinogens and target hazard quotient of 1.0 for non-carcinogens for the selected receptor and pathway.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Level. May.
For Arsenic and Vanadium, the Site-Specific Reference UPLs were greater than the SLVs based on health risk (DEQ and/or USEPA), therefore the Reference UPLs were used as the Selected SLVs.

Footnotes
[a] 1,3- Dichloropropene was used as a surrogate because there was no chemical specific SLV.
[b] 1,4- Dichlorobenzene was used as a surrogate because there was no chemical specific SLV.
[c] 1,2- Dichloropropane was used as a surrogate because there was no chemical specific SLV.
[d] Phenol was used as a surrogate because there was no chemical specific SLV.
[e] 2-Nitroaniline was used as a surrogate because there was no chemical specific SLV.
[f] Naphthalene was used as a surrogate because there was no chemical-specific SLV.
[g] Aroclor 1221 was used as a surrogate because there was no chemical specific SLV.
[h] Toxic Equivalency Factors for Benzo(g,h,i)perylene (0.01) was applied to the Benzo(a)pyrene SLV because there was no chemical specific SLV.
[i] BHC alpha was used as a surrogate, because there was no chemical-specific SLV, and BHC alpha was the lowest BHC.
[j] Bis(2-chloroethyl) ether was used as a surrogate because there was no chemical specific SLV.
[k] Bromodichloromethane was used as a surrogate because there was no chemical specific SLV.
[l] Cadmium (diet) was used as opposed to Cadmium (water).
[m] Chlordane (technical) was used as a surrogate because there was no chemical specific SLV.
[n] Bis(2-ethylhexyl) Phthalate was used as a surrogate, because there was no chemical-specific SLV, and Bis(2-ethylhexyl) Phthalate was the lowest phthalate.
[o] Endosulfan was used as a surrogate because there was no chemical specific SLV.
[p] Endrin was used as a surrogate because there was no chemical specific SLV.
[q] Xylene (mixed) was used as a surrogate because there was no chemical specific SLV.
[r] Manganese (water) was used as opposed to Manganese (diet).
[s] Tributyltin was used as a surrogate because there was no chemical specific SLV.
[t] The RSL for Total PCBs was selected as the SLV per DEQ.
[u] For metals only, the reference UPL was higher than the selected HH SLV.
[v] The SLV for 2,4,5-TP (Silvex) was selected as a surrogate because there was no chemical specific SLV.
[w] The SLV for dibenzofuran was selected as a surrogate because there was no chemical specific SLV.
[x] The SLV for anthracene was selected as a surrogate because there was no chemical specific SLV.
[y] The SLV for isopropylbenzene (cumene) was selected as a surrogate because there was no chemical specific SLV.
[z] Assumed worst case scenario, total Cr as 100% Chromium VI.
[aa] Benzo(k)fluoranthene was used as a surrogate because there was no chemical specific SLV.
[ab] Benzo(b)fluoranthene was used as a surrogate because there was no chemical-specific SLV and benzo(b)fluoranthene had the lowest SLV of the benzofluoranthenes.
[ac] Residual Range Organics for Construction Worker was used as a surrogate because receptor specific RBC is greater than the maximum (100,000 mg/kg).

Table J-4b - Human Health Potable Water SLVs
Bradford Island, Upland Operable Unit

Analyte	CAS #	Candidate Human Health Water Screening Level Values for Direct Contact (ug/L)							Selected Potable Water User SLVs (ug/L)	
		DEQ GW Ingest Residential RBC	DEQ GW Ingest Occupational RBC	DEQ GW Volatilize Outdoor Air Occupational RBC	DEQ GW Vapor Intrusion Occupational RBC	DEQ GW Excavation Construct/Exca RBC	USEPA Tapwater RSL	DEQ MCL	Groundwater/Seep water	Surface Water
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	-	-	-	-	-	0.0052	-	0.0052	0.0052
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	-	-	-	-	-	0.0052	-	0.0052	0.0052
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	-	-	-	-	-	0.0052	-	0.0052	0.0052
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	-	-	-	-	-	0.0001	-	0.0001	0.0001
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	-	-	-	-	-	0.0052	-	0.0052	0.0052
2,3',4,4',5'-Pentachlorobiphenyl	65510-44-3	-	-	-	-	-	0.0052	-	0.0052	0.0052
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	-	-	-	-	-	0.0000052	-	0.0000052	0.0000052
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	-	-	-	-	-	0.001	-	0.001	0.001
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	-	-	-	-	-	0.001	-	0.001	0.001
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	-	-	-	-	-	0.052	-	0.052	0.052
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	-	-	-	-	-	0.000052	-	0.000052	0.000052
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	-	-	-	-	-	0.0052	-	0.0052	0.0052
1,1,1,2-Tetrachloroethane	630-20-6	-	-	-	-	-	0.52	-	0.52	0.52
1,1,1-Trichloroethane (TCA)	71-55-6	9,100	38,000	-	-	1,100,000	9,100	200	9,100	9,100
1,1,2,2-Tetrachloroethane	79-34-5	-	-	-	-	-	0.067	-	0.067	0.067
1,1,2-Trichloroethane	79-00-5	0.23	1.3	19,000	8,800	990	0.24	5	0.23	0.23
1,1-Dichloroethane	75-34-3	2.3	13	73,000	16,000	10,000	2.4	-	2.3	2.3
1,1-Dichloroethene	75-35-4	340	1,400	-	340,000	43,000	340	7	340	340
1,1-Dichloropropene	563-58-6	-	-	-	-	-	0.43	-	0.43 [a]	0.43 [a]
1,2,3-Trichlorobenzene	87-61-6	-	-	-	-	-	29	-	29	29
1,2,3-Trichloropropane	96-18-4	-	-	-	-	-	0.00072	-	0.00072	0.00072
1,2,4-Trichlorobenzene	120-82-1	-	-	-	-	-	2.3	0.07	2.3	2.3
1,2,4-Trimethylbenzene	95-63-6	15	61	-	-	1,700	15	-	15	15
1,2-Dibromo-3-chloropropane	96-12-8	-	-	-	-	-	0.00032	-	0.00032	0.00032
1,2-Dibromoethane (EDB)	106-93-4	0.0063	0.034	960	690	28	0.0065	-	0.0063	0.0063
1,2-Dichlorobenzene	95-50-1	370	1,500	-	-	37,000	370	600	370	370
1,2-Dichloroethane (EDC)	107-06-2	0.14	0.78	9,500	3,800	630	0.15	5	0.14	0.14
1,2-Dichloropropane	78-87-5	-	-	-	-	-	0.39	5	0.39	0.39
1,3,5-Trimethylbenzene	108-67-8	12	52	-	41,000	1,400	370	-	12	12
1,3-Dichlorobenzene	541-73-1	-	-	-	-	-	-	-	0.42 [b]	0.42 [b]
1,3-Dichloropropane	142-28-9	-	-	-	-	-	730	-	730	730
1,4-Dichlorobenzene	106-46-7	0.42	2.2	20,000	5,700	1,500	0.43	75	0.42	0.42
2,2-Dichloropropane	594-20-7	-	-	-	-	-	-	-	0.39 [c]	0.39 [c]
2,3,7,8-TCDD (TEQ)	-	0.00000044	0.0000031	-	-	0.000016	0.00000052	0.00000003	0.00000044	0.00000044
2,4,5-T	93-76-5	-	-	-	-	-	370	-	370	370
2,4,5-TP (Silvex)	93-72-1	-	-	-	-	-	290	50	290	290
2,4,5-Trichlorophenol	95-95-4	-	-	-	-	-	3,700	-	3,700	3,700
2,4,6-Trichlorophenol	88-06-2	5.2	37	-	-	1,600	6.1	-	5.2	5.2
2,4-D	94-75-7	370	1,500	-	-	72,000	370	70	370	370
2,4-DB	94-82-6	-	-	-	-	-	290	-	290	290
2,4-Dichlorophenol	120-83-2	-	-	-	-	-	110	-	110	110
2,4-Dimethylphenol	105-67-9	-	-	-	-	-	730	-	730	730
2,4-Dinitrophenol	51-28-5	-	-	-	-	-	73	-	73	73
2,4-Dinitrotoluene	121-14-2	-	-	-	-	-	0.22	-	0.22	0.22
2,6-Dinitrotoluene	606-20-2	37	150	-	-	29,000	37	-	37	37
2-Butanone (MEK)	78-93-3	-	-	-	-	-	7,100	-	7,100	7,100
2-Chloroethylvinylether	110-75-8	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	91-58-7	-	-	-	-	-	2,900	-	2,900	2,900
2-Chlorophenol	95-57-8	-	-	-	-	-	180	-	180	180

Table J-4b - Human Health Potable Water SLVs
Bradford Island, Upland Operable Unit
(2 of 6)

Analyte	CAS #	Candidate Human Health Water Screening Level Values for Direct Contact (ug/L)							Selected Potable Water User SLVs (ug/L)	
		DEQ GW Ingest Residential RBC	DEQ GW Ingest Occupational RBC	DEQ GW Volatilize Outdoor Air Occupational RBC	DEQ GW Vapor Intrusion Occupational RBC	DEQ GW Excavation Construct/Exca RBC	USEPA Tapwater RSL	DEQ MCL	Groundwater/Seep water	Surface Water
2-Chlorotoluene	95-49-8	-	-	-	-	-	730	-	730	730
2-Hexanone	591-78-6	-	-	-	-	-	47	-	47	47
2-Methylnaphthalene	91-57-6	-	-	-	-	-	150	-	150	150
2-Methylphenol	95-48-7	-	-	-	-	-	1,800	-	1,800	1,800
2-Nitroaniline	88-74-4	-	-	-	-	-	370	-	370	370
2-Nitrophenol	88-75-5	-	-	-	-	-	-	-	11,000 [d]	11,000 [d]
3,3'-Dichlorobenzidine	91-94-1	0.13	0.91	-	-	460	0.15	-	0.13	0.13
3-Nitroaniline	99-09-2	-	-	-	-	-	-	-	3.4 [e]	3.4 [e]
4,4'-DDD	72-54-8	0.24	1.7	-	-	40	0.28	-	0.24	0.24
4,4'-DDE	72-55-9	0.17	1.2	-	-	32	0.2	-	0.17	0.17
4,4'-DDT	50-29-3	0.17	1.2	-	-	15	0.2	-	0.17	0.17
4,6-Dinitro-2-methylphenol	534-52-1	-	-	-	-	-	2.9	-	2.9	2.9
4-Chloro-3-methylphenol	59-50-7	-	-	-	-	-	3,700	-	3,700	3,700
4-Chloroaniline	106-47-8	-	-	-	-	-	0.34	-	0.34	0.34
4-Chlorotoluene	106-43-4	-	-	-	-	-	2,600	-	2,600	2,600
4-Methyl-2-pentanone (MIBK)	108-10-1	-	-	-	-	-	2,000	-	2,000	2,000
4-Nitroaniline	100-01-6	-	-	-	-	-	3.4	-	3.4	3.4
4-Nitrophenol	100-02-7	-	-	-	-	-	-	-	11,000 [d]	11,000 [d]
Acenaphthene	83-32-9	2,200	-	-	-	-	2,200	-	2,200	2,200
Acenaphthylene	208-96-8	-	-	-	-	-	-	-	0.14 [f]	0.14 [f]
Acetone	67-64-1	-	-	-	-	-	22,000	-	22,000	22,000
Aldrin	309-00-2	0.0033	0.024	-	-	-	0.004	-	0.0033	0.0033
Aniline	62-53-3	-	-	-	-	-	12	-	12	12
Anthracene	120-12-7	-	-	-	-	-	11,000	-	11,000	11,000
Aroclor 1016	12674-11-2	-	-	-	-	-	0.96	-	0.96	0.96
Aroclor 1221	11104-28-2	-	-	-	-	-	0.0068	-	0.0068	0.0068
Aroclor 1232	11141-16-5	-	-	-	-	-	0.0068	-	0.0068	0.0068
Aroclor 1242	53469-21-9	-	-	-	-	-	0.034	-	0.034	0.034
Aroclor 1248	12672-29-6	-	-	-	-	-	0.034	-	0.034	0.034
Aroclor 1254	11097-69-1	-	-	-	-	-	0.034	-	0.034	0.034
Aroclor 1260	11096-82-5	-	-	-	-	-	0.034	-	0.034	0.034
Benzene	71-43-2	0.39	2.2	14,000	2,800	1,700	0.41	5	0.39	0.39
Benzidine	92-87-5	0.72	14	-	-	130,000	0.000094	-	0.72	0.72
Benzo(a)anthracene	56-55-3	0.029	0.56	-	-	9.1	0.029	-	0.029	0.029
Benzo(a)pyrene	50-32-8	0.0029	0.056	-	-	0.53	0.0029	0.2	0.0029	0.0029
Benzo(b)fluoranthene	205-99-2	0.029	0.56	-	-	-	0.029	-	0.029	0.029
Benzo(g,h,i)perylene	191-24-2	-	-	-	-	-	-	-	0.29 [g]	0.29 [g]
Benzo(j,k)flouranthenes	205-82-3 & 207-08-9	-	-	-	-	-	-	-	0.29 [x]	0.29 [x]
Benzo(k)fluoranthene	207-08-9	0.29	-	-	-	-	0.29	-	0.29	0.29
Benzofluoranthenes, Total	56832-73-6	-	-	-	-	-	-	-	0.029 [y]	0.029 [y]
Benzoic Acid	65-85-0	-	-	-	-	-	150,000	-	150,000	150,000
Benzyl Alcohol	100-51-6	-	-	-	-	-	3,700	-	3,700	3,700
BHC (alpha)	319-84-6	0.009	0.065	-	-	28	0.011	-	0.009	0.009
BHC (beta)	319-85-7	-	-	-	-	-	0.037	-	0.037	0.037
BHC (delta)	319-86-8	-	-	-	-	-	-	-	0.009 [h]	0.009 [h]
BHC (gamma) Lindane	58-89-9	0.052	0.37	-	-	170	0.061	0.2	0.052	0.052
Bis(2-chloroethoxy)methane	111-91-1	-	-	-	-	-	110	-	110	110
Bis(2-chloroethyl) Ether	111-44-4	-	-	-	-	-	0.012	-	0.012	0.012

Table J-4b - Human Health Potable Water SLVs
Bradford Island, Upland Operable Unit
(3 of 6)

Analyte	CAS #	Candidate Human Health Water Screening Level Values for Direct Contact (ug/L)							Selected Potable Water User SLVs (ug/L)	
		DEQ GW Ingest Residential RBC	DEQ GW Ingest Occupational RBC	DEQ GW Volatilize Outdoor Air Occupational RBC	DEQ GW Vapor Intrusion Occupational RBC	DEQ GW Excavation Construct/Exca RBC	USEPA Tapwater RSL	DEQ MCL	Groundwater/Seep water	Surface Water
Bis(2-ethylhexyl) Phthalate	117-81-7	4.1	29	-	-	-	4.8	-	4.1	4.1
Bromobenzene	108-86-1	-	-	-	-	-	88	-	88	88
Bromochloromethane	74-97-5	-	-	-	-	-	-	-	0.12 [i]	0.12 [i]
Bromodichloromethane	75-27-4	0.12	0.6	9,300	5,600	450	0.12	-	0.12	0.12
Bromoform	75-25-2	7.2	52	-	-	150,000	8.5	-	7.2	7.2
Bromomethane	74-83-9	8.7	36	170,000	36,000	1,200	8.7	-	8.7	8.7
Butyl Benzyl Phthalate	85-68-7	-	-	-	-	-	35	-	35	35
Carbon Disulfide	75-15-0	-	-	-	-	-	1,000	-	1,000	1,000
Carbon Tetrachloride	56-23-5	0.19	1.1	2,200	320	770	0.2	5	0.19	0.19
Chlordane (alpha)	5103-71-9	-	-	-	-	-	-	-	0.16 [j]	0.16 [j]
Chlordane (gamma)	5103-74-2	-	-	-	-	-	-	-	0.16 [j]	0.16 [j]
Chlordane (technical)	12789-03-6	0.16	1.2	-	-	-	0.19	2	0.16	0.16
Chlorobenzene	108-90-7	91	380	-	-	10,000	91	100	91	91
Chloroethane	75-00-3	21,000	88,000	-	-	2,400,000	21,000	-	21,000	21,000
Chloroform	67-66-3	0.19	0.99	5,500	1,200	720	0.19	-	0.19	0.19
Chloromethane	74-87-3	190	790	2,100,000	320,000	22,000	190	-	190	190
Chrysene	218-01-9	-	-	-	-	-	2.9	-	2.9	2.9
cis-1,2-Dichloroethene	156-59-2	360	1,500	-	-	120,000	370	70	360	360
cis-1,3-Dichloropropene	10061-01-5	-	-	-	-	-	0.43	-	0.43 [a]	0.43 [a]
Dalapon	75-99-0	-	-	-	-	-	1,100	200	1,100	1,100
Dibenz(a,h)anthracene	53-70-3	0.0029	0.056	-	-	0.21	0.0029	-	0.0029	0.0029
Dibenzofuran	132-64-9	-	-	-	-	-	37	-	37	37
Dibromochloromethane	124-48-1	0.68	4.9	-	-	13,000	0.15	-	0.68	0.68
Dibromomethane	74-95-3	-	-	-	-	-	8.2	-	8.2	8.2
Dibutyltin	1002-53-5	-	-	-	-	-	11	-	11 [k]	11 [k]
Dicamba	1918-00-9	-	-	-	-	-	1,100	-	1,100	1,100
Dichlorodifluoromethane	75-71-8	-	-	-	-	-	390	-	390	390
Dichloromethane (Methylene Chloride)	75-09-2	4.4	27	330,000	99,000	32,000	4.8	5	4.4	4.4
Dichloroprop	120-36-5	-	-	-	-	-	290	-	290 [l]	290 [l]
Dieldrin	60-57-1	0.0035	0.026	-	-	6.1	0.0042	-	0.0035	0.0035
Diesel Range Organics	68334-30-5	90	360	-	-	-	-	-	90	90
Diethyl Phthalate	84-66-2	-	-	-	-	-	29,000	-	29,000	29,000
Dimethyl Phthalate	131-11-3	-	-	-	-	-	-	-	29,000 [m]	29,000 [m]
Di-n-butyl Phthalate	84-74-2	-	-	-	-	-	3,700	-	3,700	3,700
Di-n-octyl Phthalate	117-84-0	-	-	-	-	-	-	-	4.1 [n]	4.1 [n]
Dinoseb	88-85-7	-	-	-	-	-	37	7	37	37
Endosulfan I	959-98-8	-	-	-	-	-	220	-	220 [o]	220 [o]
Endosulfan II	33213-65-9	-	-	-	-	-	220	-	220 [o]	220 [o]
Endosulfan Sulfate	1031-07-8	-	-	-	-	-	220	-	220 [o]	220 [o]
Endrin	72-20-8	11	44	-	-	-	11	2	11	11
Endrin Aldehyde	7421-93-4	-	-	-	-	-	-	-	11 [p]	11 [p]
Endrin Ketone	53494-70-5	-	-	-	-	-	-	-	11 [p]	11 [p]
Ethylbenzene	100-41-4	1.4	7.8	41,000	7,400	4,400	1.5	700	1.4	1.4
Fluoranthene	206-44-0	-	-	-	-	-	1,500	-	1,500	1,500
Fluorene	86-73-7	1,500	-	-	-	-	1,500	-	1,500	1,500
Gasoline Range Organics	8006-61-9	100	420	-	-	13,000	-	-	100	100
Heptachlor	76-44-8	0.013	0.091	-	-	32	0.015	0.4	0.013	0.013
Heptachlor Epoxide	1024-57-3	0.0062	0.045	-	-	3.2	0.0074	0.2	0.0062	0.0062
Hexachlorobenzene	118-74-1	0.035	0.26	-	-	10	0.042	1	0.035	0.035

Table J-4b - Human Health Potable Water SLVs
Bradford Island, Upland Operable Unit
(4 of 6)

Analyte	CAS #	Candidate Human Health Water Screening Level Values for Direct Contact (ug/L)							Selected Potable Water User SLVs (ug/L)	
		DEQ GW Ingest Residential RBC	DEQ GW Ingest Occupational RBC	DEQ GW Volatilize Outdoor Air Occupational RBC	DEQ GW Vapor Intrusion Occupational RBC	DEQ GW Excavation Construct/Exca RBC	USEPA Tapwater RSL	DEQ MCL	Groundwater/Seep water	Surface Water
Hexachlorobutadiene	87-68-3	-	-	-	-	-	0.86	-	0.86	0.86
Hexachlorocyclopentadiene	77-47-4	-	-	-	-	-	220	50	220	220
Hexachloroethane	67-72-1	4.1	29	-	-	1,400	4.8	-	4.1	4.1
Indeno(1,2,3-cd)pyrene	193-39-5	-	-	-	-	-	0.029	-	0.029	0.029
Isophorone	78-59-1	-	-	-	-	-	71	-	71	71
Isopropylbenzene	98-82-8	-	-	-	-	-	680	-	680	680
m,p-Xylenes	179601-23-1	-	-	200	850	2,300	200	10,000	200 [q]	200 [q]
MCPA	94-74-6	18	73	-	-	6,600	18	-	18	18
MCPP	93-65-2	-	-	-	-	-	37	-	37	37
Methoxychlor	72-43-5	-	-	-	-	-	180	40	180	180
Monobutyltin	78763-54-9	-	-	-	-	-	-	-	11 [s]	11 [s]
Naphthalene	91-20-3	0.14	0.72	16,000	10,000	500	0.14	-	0.14	0.14
Nitrobenzene	98-95-3	-	-	-	-	-	0.12	-	0.12	0.12
N-Nitrosodimethylamine	62-75-9	-	-	-	-	-	0.00042	-	0.00042	0.00042
N-Nitrosodi-n-propylamine	621-64-7	-	-	-	-	-	0.0096	-	0.0096	0.0096
N-Nitrosodiphenylamine	86-30-6	-	-	-	-	-	14	-	14	14
n-Propylbenzene	103-65-1	-	-	-	-	-	1,300	-	1,300	1,300
o-Xylene	95-47-6	-	-	-	-	-	1,200	-	1,200	1,200
p-cresol (4-Methylphenol)	106-44-5	-	-	-	-	-	180	-	180	180
Pentachlorophenol	87-86-5	0.47	3.4	-	-	52	0.56	1	0.47	0.47
Phenanthrene	85-01-8	-	-	-	-	-	-	-	11,000 [w]	11,000 [w]
Phenol	108-95-2	-	-	-	-	-	11,000	-	11,000	11,000
Pyrene	129-00-0	-	-	-	-	-	1,100	-	1,100	1,100
Residual Range Organics	RRO	290	1,100	-	-	-	-	-	290	290
Styrene	100-42-5	1,600	6,700	-	-	160,000	1,600	100	1,600	1,600
Tetrabutyltin	1461-25-2	-	-	-	-	-	-	-	11 [s]	11 [s]
Tetrachloroethene (PCE)	127-18-4	0.093	0.64	9,200	1,400	240	0.11	5	0.093	0.093
Toluene	108-88-3	2,300	9,200	-	-	210,000	2,300	1,000	2,300	2,300
Total PCBs	1336-36-3	0.028	0.2	-	-	1.9	0.17	0.5	0.17 [r]	0.17 [r]
Toxaphene	8001-35-2	0.052	0.37	-	-	71	0.061	3	0.052	0.052
trans-1,2-Dichloroethene	156-60-5	110	450	1,800,000	350,000	14,000	110	100	110	110
trans-1,3-Dichloropropene	10061-02-6	-	-	-	-	-	0.43	-	0.43 [a]	0.43 [a]
Tributyltin	688-73-3	-	-	-	-	-	11	-	11 [s]	11 [s]
Trichloroethene (TCE)	79-01-6	0.039	0.22	870	150	160	2	5	0.039	0.039
Trichlorofluoromethane	75-69-4	1,300	5,400	-	340,000	160,000	1,300	-	1,300	1,300
Vinyl Acetate	108-05-4	-	-	-	-	-	410	-	410	410
Vinyl Chloride	75-01-4	0.025	0.52	6,800	910	1,200	0.016	2	0.025	0.025
Cyanide (Hydrogen Cyanide)	74-90-8	730	2,900	-	-	2,500,000	6.2	-	730	730
Fluoride	16984-48-8	-	-	-	-	-	1,500	4,000	1,500	1,500
Nitrate as Nitrogen	14797-55-8	-	-	-	-	-	58,000	10,000	58,000	58,000
Nitrate+Nitrite as Nitrogen	NOx-N	-	-	-	-	-	-	10,000	10,000	10,000
Aluminum	7429-90-5	-	-	-	-	-	37,000	-	37,000	37,000
Antimony	7440-36-0	-	-	-	-	-	15	6	15	15
Arsenic	7440-38-2	0.038	0.27	-	-	5,800	0.045	10	0.038	0.038
Barium	7440-39-3	7,300	29,000	-	-	25,000,000	7,300	2,000	7,300	7,300
Beryllium	7440-41-7	73	290	-	-	250,000	73	4	73	73
Cadmium	7440-43-9	18	73	-	-	57,000	18 [t]	5	18	18
Chromium	7440-47-3	55,000	220,000	-	-	-	-	100	55,000	55,000
Cobalt	7440-48-4	-	-	-	-	-	11	-	11	11

Table J-4b - Human Health Potable Water SLVs
Bradford Island, Upland Operable Unit
(5 of 6)

Analyte	CAS #	Candidate Human Health Water Screening Level Values for Direct Contact (ug/L)							Selected Potable Water User SLVs (ug/L)	
		DEQ GW Ingest Residential RBC	DEQ GW Ingest Occupational RBC	DEQ GW Volatilize Outdoor Air Occupational RBC	DEQ GW Vapor Intrusion Occupational RBC	DEQ GW Excavation Construct/Exca RBC	USEPA Tapwater RSL	DEQ MCL	Groundwater/Seep water	Surface Water
Copper	7440-50-8	1,500	5,800	-	-	5,000,000	1,500	1,300	1,500	1,500
Iron	7439-89-6	-	-	-	-	-	26,000	-	26,000	26,000
Lead	7439-92-1	15	15	-	-	-	-	15	15	15
Manganese	7439-96-5	880	3,500	-	-	3,000,000	880 [u]	-	880	880
Mercury	7439-97-6	11	44	-	-	-	0.57	2	11	11
Nickel	7440-02-0	730	2,900	-	-	12,000,000	730	-	730	730
Selenium	7782-49-2	-	-	-	-	-	180	50	180	180
Silver	7440-22-4	180	730	-	-	1,000,000	180	-	180	180
Thallium	7440-28-0	-	-	-	-	-	-	2	2	2
Vanadium	7440-62-2	-	-	-	-	-	2.6 [v]	-	2.6	2.6
Zinc	7440-66-6	-	-	-	-	-	11,000	-	11,000	11,000

- = No benchmark available or available benchmark not needed, based on hierarchy of sources
DEQ = Oregon Department of Environmental Quality
USEPA = US Environmental Protection Agency
GW = groundwater
MCL = Maximum Contaminant Level
ug/L = microgram per liter
PAH = Polycyclic aromatic hydrocarbon
RBC = Risk Based Concentrations
RSL = Regional Screening Level
SLV = Screening Level Value

Notes
Only analytes with one or more candidate SLVs is shown on this table. For the full list of analytes, see Appendix K-1.
Potable Water User hierarchical SLV selection for groundwater: 1. DEQ RBCs (the minimum of Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA RSL, and 3. DEQ MCL.
Potable Water User hierarchical SLV selection for surface water: 1. DEQ RBCs (the minimum of Ingest Residential and Ingest Occupational), 2. USEPA RSL, and 3. DEQ MCL.
Human Health Screening Levels correspond to a target risk of 1E-06 for carcinogens and target hazard quotient of 1.0 for non-carcinogens for the selected receptor and pathway. MCLs incorporate considerations of risk as well as feasibility in attaining target level.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2010. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Level. May.

Footnotes
[a] Dichloropropene, 1,3- was used as a surrogate.
[b] 1,4-Dichlorobenzene was used as a surogate because there was no chemical specific SLV.
[c] 1,2- Dichloropropane was used as a surrogate because there was no chemical specific SLV.
[d] Phenol was used as a surrogate because there was no chemical specific SLV.
[e] 2- Nitroaniline was used as a surrogate because there was no chemical specific SLV.
[f] Naphthalene was used as a surrogate because there was no chemical-specific SLV.
[g] Toxic Equivalency Factors for Benzo(g,h,i)perylene (0.01) was applied to the Benzo(a)pyrene SLV because there was no chemical specific SLV.
[h] BHC alpha was used as a surrogate, because there was no chemical-specific SLV, and BHC alpha was the lowest BHC.
[i] Bromodichloromethane was used as a surrogate because there was no chemical specific SLV.
[j] Chlordane was used as a surrogate.
[k] Dibutyltin compounds was used as a surrogate because there was no chemical specific SLV.
[l] 4-(2,4-Dichlorophenoxy)butyric Acid was used as a surrogate because there was no chemical specific SLV.
[m] Diethyl Phthalate was used as a surrogate because there was no chemical specific SLV.
[n] Bis(2-ethyl hexyl) phthalate was used as a surrogate because there was no chemical specific SLV, and Bis(2-ethyl hexyl) phthalate was the lowest of the pthalates.
[o] Endosulfan was used as a surrogate because there was no chemical specific SLV.
[p] Endrin was used as a surrogate because there was no chemical specific SLV.

Table J-4b - Human Health Potable Water SLVs
Bradford Island, Upland Operable Unit
(6 of 6)

Analyte	CAS #	Candidate Human Health Water Screening Level Values for Direct Contact (ug/L)							Selected Potable Water User SLVs (ug/L)	
		DEQ GW Ingest Residential RBC	DEQ GW Ingest Occupational RBC	DEQ GW Volatilize Outdoor Air Occupational RBC	DEQ GW Vapor Intrusion Occupational RBC	DEQ GW Excavation Construct/Exca RBC	USEPA Tapwater RSL	DEQ MCL	Groundwater/Seep water	Surface Water

[q] Xylene (mixed) was used as a surrogate because there was no chemical specific SLV.
[r] The RSL for Total PCBs was selected as the SLV per DEQ.
[s] Tributyltin compounds was used as a surrogate because there was no chemical specific SLV.
[t] Cadmium (water) was used.
[u] Manganese (water) was used as opposed to Manganese (diet).
[v] Vanadium, Metallic was used.
[w] Anthracene was used as a surogate because there was no chemical specific SLV.
[x] Benzo(k)fluoranthene was used as a surrogate because there was no chemical specific SLV.
[y] Benzo(b)fluoranthene was used as a surrogate because there was no chemical-specific SLV and benzo(b)fluoranthene had the lowest SLV of the benzofluoranthenes.

Table J-4c - Human Health Discharge to Surface Water Bioaccumulation Water SLVs
Bradford Island, Upland and River Operable Units
(1 of 5)

Analyte	CAS #	Candidate Human Health Water Screening Level Values for Discharge to Surface Water and Bioaccumulation (ug/L)						Selected Discharge/Bio SLVs (ug/L) (GW & SW)
		USEPA NRWQC (Water + Organism)	USEPA NRWQC (Organism Only)	DEQ Table 33A WQC (Water+ Organism)	DEQ Table 33A WQC (Organism Only)	DEQ Table 33B WQC (Water+Organism)	DEQ Table 33B WQC (Organism Only)	
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	-	-	-	-	-	-	-
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	-	-	-	-	-	-	-
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	-	-	-	-	-	-	-
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	-	-	-	-	-	-	-
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	-	-	-	-	-	-	-
2,3',4,4',5'-Pentachlorobiphenyl	65510-44-3	-	-	-	-	-	-	-
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	-	-	-	-	-	-	-
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	-	-	-	-	-	-	-
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	-	-	-	-	-	-	-
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	-	-	-	-	-	-	-
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	-	-	-	-	-	-	-
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	79-34-5	0.17	4	0.17	4	-	-	0.17
1,1,2-Trichloroethane	79-00-5	0.59	16	0.59	16	-	-	0.59
1,1-Dichloroethene	75-35-4	330	7,100	330	7,100	-	-	330
1,2,4-Trichlorobenzene	120-82-1	35	70	35	70	-	-	35
1,2-Dichlorobenzene	95-50-1	420	1,300	420	1,300	-	-	420
1,2-Dichloroethane (EDC)	107-06-2	0.38	37	0.38	37	-	-	0.38
1,2-Dichloropropane	78-87-5	0.5	15	0.5	15	-	-	0.5
1,3-Dichlorobenzene	541-73-1	320	960	320	960	-	-	320
1,4-Dichlorobenzene	106-46-7	63	190	63	190	-	-	63
2,2-Dichloropropane	594-20-7	-	-	-	-	-	-	0.5 [b]
2,3,7,8-TCDD (TEQ)	-	0.000000005	5.1E-09	0.000000005	5.1E-09	-	-	0.000000005
2,4,5-Trichlorophenol	95-95-4	-	-	1,800	3,600	-	-	1,800
2,4,6-Trichlorophenol	88-06-2	1.4	2.4	-	2.4	1.4	-	1.4
2,4-D	94-75-7	-	-	100	-	-	-	100
2,4-Dichlorophenol	120-83-2	77	290	77	290	-	-	77
2,4-Dimethylphenol	105-67-9	380	850	380	850	-	-	380
2,4-Dinitrophenol	51-28-5	69	5,300	69	5,300	-	-	69
2,4-Dinitrotoluene	121-14-2	0.11	3.4	0.11	3.4	-	-	0.11
2-Chloronaphthalene	91-58-7	1,000	1,600	1,000	1,600	-	-	1,000
2-Chlorophenol	95-57-8	81	150	81	150	-	-	81
2-Methylnaphthalene	91-57-6	-	-	-	-	-	-	670 [c]
2-Methylphenol	95-48-7	-	-	-	-	-	-	10,000 [d]
2-Nitrophenol	88-75-5	-	-	-	-	-	-	10,000 [d]
3,3'-Dichlorobenzidine	91-94-1	0.021	0.028	0.021	0.028	-	-	0.021
4,4'-DDD	72-54-8	0.00031	0.00031	0.00031	0.00031	-	-	0.00031
4,4'-DDE	72-55-9	0.00022	0.00022	0.00022	0.00022	-	-	0.00022
4,4'-DDT	50-29-3	0.00022	0.00022	-	-	0.00022	0.00022	0.00022
4,6-Dinitro-2-methylphenol	534-52-1	13	280	13	280	-	-	13
4-Nitrophenol	100-02-7	-	-	-	-	-	-	10,000 [d]
Acenaphthene	83-32-9	670	990	670	990	-	-	670
Acenaphthylene	208-96-8	-	-	-	-	-	-	670 [c]

Table J-4c - Human Health Discharge to Surface Water Bioaccumulation Water SLVs
Bradford Island, Upland and River Operable Units
(2 of 5)

Analyte	CAS #	Candidate Human Health Water Screening Level Values for Discharge to Surface Water and Bioaccumulation (ug/L)						Selected Discharge/Bio SLVs (ug/L) (GW & SW)
		USEPA NRWQC (Water + Organism)	USEPA NRWQC (Organism Only)	DEQ Table 33A WQC (Water+ Organism)	DEQ Table 33A WQC (Organism Only)	DEQ Table 33B WQC (Water+Organism)	DEQ Table 33B WQC (Organism Only)	
Aldrin	309-00-2	0.000049	0.00005	0.000049	0.00005	-	-	0.000049
Anthracene	120-12-7	8,300	40,000	8,300	40,000	-	-	8,300
Aroclor 1016	12674-11-2	-	-	-	-	-	-	0.000064 [e]
Aroclor 1221	11104-28-2	-	-	-	-	-	-	0.000064 [e]
Aroclor 1232	11141-16-5	-	-	-	-	-	-	0.000064 [e]
Aroclor 1242	53469-21-9	-	-	-	-	-	-	0.000064 [e]
Aroclor 1248	12672-29-6	-	-	-	-	-	-	0.000064 [e]
Aroclor 1254	11097-69-1	-	-	-	-	-	-	0.000064 [e]
Aroclor 1260	11096-82-5	-	-	-	-	-	-	0.000064 [e]
Benzene	71-43-2	2.2	51	-	-	2.2	51	2.2
Benzidine	92-87-5	0.000086	0.0002	0.000086	0.0002	-	-	0.000086
Benzo(a)anthracene	56-55-3	0.0038	0.018	0.0038	0.018	-	-	0.0038
Benzo(a)pyrene	50-32-8	0.0038	0.018	0.0038	0.018	-	-	0.0038
Benzo(b)fluoranthene	205-99-2	0.0038	0.018	0.0038	0.018	-	-	0.0038
Benzo(g,h,i)perylene	191-24-2	-	-	-	-	-	-	0.38 [f]
Benzo(j,k)flouranthenes	205-82-3 & 207-08-9	-	-	-	-	-	-	0.0038 [n]
Benzo(k)fluoranthene	207-08-9	0.0038	0.018	0.0038	0.018	-	-	0.0038
Benzofluoranthenes, Total	56832-73-6	-	-	-	-	-	-	0.0038 [o]
BHC (alpha)	319-84-6	0.0026	0.0049	0.0026	0.0049	-	-	0.0026
BHC (beta)	319-85-7	0.0091	0.017	0.0091	0.017	-	-	0.0091
BHC (delta)	319-86-8	-	-	-	-	-	-	0.0026 [g]
BHC (gamma) Lindane	58-89-9	0.98	1.8	-	-	0.98	1.8	0.98
Bis(2-chloroethyl) Ether	111-44-4	0.03	0.53	0.03	0.53	-	-	0.03
Bis(2-chloroisopropyl) Ether	39638-32-9 or 108-60-1	1,400	65,000	-	-	1,400	65,000	1,400
Bis(2-ethylhexyl) Phthalate	117-81-7	1.2	2.2	1.2	2.2	-	-	1.2
Bromochloromethane	74-97-5	-	-	-	-	-	-	0.55 [h]
Bromodichloromethane	75-27-4	0.55	17	0.55	17	-	-	0.55
Bromoform	75-25-2	4.3	140	4.3	140	-	-	4.3
Bromomethane	74-83-9	47	1,500	47	1,500	-	-	47
Butyl Benzyl Phthalate	85-68-7	1,500	1,900	1,500	1,900	-	-	1,500
Carbon Tetrachloride	56-23-5	0.23	1.6	0.23	1.6	-	-	0.23
Chlordane (alpha)	5103-71-9	-	-	-	-	-	-	0.0008 [i]
Chlordane (gamma)	5103-74-2	-	-	-	-	-	-	0.0008 [i]
Chlordane (technical)	12789-03-6	0.0008	0.00081	-	-	0.0008	0.00081	0.0008
Chlorobenzene	108-90-7	130	1,600	130	1,600	-	-	130
Chloroform	67-66-3	5.7	470	-	-	5.7	470	5.7
Chrysene	218-01-9	0.0038	0.018	0.0038	0.018	-	-	0.0038
Dibenz(a,h)anthracene	53-70-3	0.038	0.018	0.0038	0.018	-	-	0.018
Dibenzofuran	132-64-9	-	-	-	-	-	-	37
Dibromochloromethane	124-48-1	0.4	13	0.4	13	-	-	0.4
Dichloromethane (Methylene Chloride)	75-09-2	4.6	590	4.6	590	-	-	4.6
Dieldrin	60-57-1	0.000052	0.000054	0.000052	0.000054	-	-	0.000052

Table J-4c - Human Health Discharge to Surface Water Bioaccumulation Water SLVs
Bradford Island, Upland and River Operable Units
(3 of 5)

Analyte	CAS #	Candidate Human Health Water Screening Level Values for Discharge to Surface Water and Bioaccumulation (ug/L)						Selected Discharge/Bio SLVs (ug/L) (GW & SW)
		USEPA NRWQC (Water + Organism)	USEPA NRWQC (Organism Only)	DEQ Table 33A WQC (Water+ Organism)	DEQ Table 33A WQC (Organism Only)	DEQ Table 33B WQC (Water+Organism)	DEQ Table 33B WQC (Organism Only)	
Diethyl Phthalate	84-66-2	17,000	44,000	17,000	44,000	-	-	17,000
Dimethyl Phthalate	131-11-3	270,000	1,100,000	270,000	1,100,000	-	-	270,000
Di-n-butyl Phthalate	84-74-2	2,000	4,500	2,000	4,500	-	-	2,000
Di-n-octyl Phthalate	117-84-0	-	-	-	-	-	-	1.2 [j]
Endosulfan I	959-98-8	62	89	62	89	-	-	62 [k]
Endosulfan II	33213-65-9	62	89	62	89	-	-	62 [k]
Endosulfan Sulfate	1031-07-8	62	89	62	89	-	-	62 [k]
Endrin	72-20-8	0.059	0.06	0.059	0.06	-	-	0.059
Endrin Aldehyde	7421-93-4	0.29	0.3	0.29	0.3	-	-	0.29
Endrin Ketone	53494-70-5	-	-	-	-	-	-	0.059 [l]
Ethylbenzene	100-41-4	530	2,100	530	2,100	-	-	530
Fluoranthene	206-44-0	130	140	-	-	130	140	130
Fluorene	86-73-7	1,100	5,300	1,100	5,300	-	-	1,100
Heptachlor	76-44-8	0.000079	0.000079	0.000079	0.000079	-	-	0.000079
Heptachlor Epoxide	1024-57-3	0.000039	0.000039	0.000039	0.000039	-	-	0.000039
Hexachlorobenzene	118-74-1	0.00028	0.00029	0.00028	0.00029	-	-	0.00028
Hexachlorobutadiene	87-68-3	0.44	18	0.44	18	-	-	0.44
Hexachlorocyclopentadiene	77-47-4	40	1,100	40	1,100	-	-	40
Hexachloroethane	67-72-1	1.4	3.3	1.4	3.3	-	-	1.4
Indeno(1,2,3-cd)pyrene	193-39-5	0.0038	0.018	0.0038	0.018	-	-	0.0038
Isophorone	78-59-1	35	960	35	960	-	-	35
Methoxychlor	72-43-5	100	-	100	-	-	-	100
Naphthalene	91-20-3	-	-	-	-	-	-	670 [c]
Nitrobenzene	98-95-3	17	690	17	690	-	-	17
N-Nitrosodimethylamine	62-75-9	0.00069	3	0.00069	3	-	-	0.00069
N-Nitrosodi-n-propylamine	621-64-7	0.005	0.51	0.005	0.51	-	-	0.005
N-Nitrosodiphenylamine	86-30-6	3.3	6	3.3	6	-	-	3.3
Pentachlorophenol	87-86-5	0.27	3	0.27	3	-	-	0.27
Phenanthrene	85-01-8	-	-	-	-	-	-	8,300 [m]
Phenol	108-95-2	10,000	860,000	-	1,700,000	21,000	-	10,000
Pyrene	129-00-0	830	4,000	830	4,000	-	-	830
Tetrachloroethene (PCE)	127-18-4	0.69	3.3	0.69	3.3	-	-	0.69
Toluene	108-88-3	1,300	15,000	1,300	15,000	-	-	1,300
Total PCBs	1336-36-3	0.000064	0.000064	0.000064	0.000064	-	-	0.000064
Toxaphene	8001-35-2	0.00028	0.00028	-	-	-	-	0.00028
trans-1,2-Dichloroethene	156-60-5	140	10,000	140	10,000	-	-	140
Trichloroethene (TCE)	79-01-6	2.5	30	2.5	30	-	-	2.5
Vinyl Chloride	75-01-4	0.025	2.4	0.025	2.4	-	-	0.025
Cyanide (Hydrogen Cyanide)	74-90-8	140	140	140	140	-	-	140
Nitrate as Nitrogen	14797-55-8	-	-	10,000	-	-	-	10,000
Antimony	7440-36-0	5.6	640	5.6	640	-	-	5.6
Arsenic	7440-38-2	0.018	0.14	-	-	0.018	0.14	0.018
Barium	7440-39-3	-	-	1,000	-	-	-	1,000

Table J-4c - Human Health Discharge to Surface Water Bioaccumulation Water SLVs
Bradford Island, Upland and River Operable Units
(4 of 5)

Analyte	CAS #	Candidate Human Health Water Screening Level Values for Discharge to Surface Water and Bioaccumulation (ug/L)						Selected Discharge/Bio SLVs (ug/L) (GW & SW)
		USEPA NRWQC (Water + Organism)	USEPA NRWQC (Organism Only)	DEQ Table 33A WQC (Water+ Organism)	DEQ Table 33A WQC (Organism Only)	DEQ Table 33B WQC (Water+Organism)	DEQ Table 33B WQC (Organism Only)	
Copper	7440-50-8	1,300	-	1,300	-	-	-	1,300
Iron	7439-89-6	-	-	-	-	300	-	300
Manganese	7439-96-5	-	-	-	-	50	100	50
Nickel	7440-02-0	610	4,600	-	-	610	4,600	610
Selenium	7782-49-2	170	4,200	-	4,200	170	-	170
Thallium	7440-28-0	0.24	0.47	0.24	0.47	-	-	0.24
Zinc	7440-66-6	7,400	26,000	7,400	26,000	-	-	7,400

- = No benchmark available or available benchmark not needed, based on hierarchy of sources
Bio = bioaccumulation
DEQ = Oregon Department of Environmental Quality
USEPA = US Environmental Protection Agency
GW = groundwater
MCL = Maximum Contaminant Level
ug/L = microgram per liter
NRWQC = National Recommended Water Quality Criteria
PAH = polycyclic aromatic hydrocarbon
SLV = screening level value
SW = surface water
WQC = Water Quality Criteria

Notes

Only analytes with one or more candidate SLVs is shown on this table. For the full list of analytes, see Appendix K-1.
Groundwater Discharge to Surface Water and Bioaccumulation hierarchical SLV selection for groundwater and surface Wwater: 1. Min EPA AWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, and 3. Min DEQ WQC Table 33B.
Human Health Screening Levels correspond to a target risk of 1E-06 for carcinogens and target hazard quotient of 1.0 for non-carcinogens for the selected receptor and pathway. MCLs incorporate considerations of risk as well as feasibility in attaining target level.
Oregon Department of Environmental Quality (DEQ) 2009 . Water Quality Criteria for freshwater organisms (Oregon Administrative rules, section 340-041, Tables 33A and 33B).
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. Office of Water and Office of Science and Technology.

Footnotes

[a] 1,2,4- Trichlorobenzene was used as a surrogate because there was no chemical specific SLV.
[b] 1,2- Dichloropropane was used as a surrogate because there was no chemical specific SLV.
[c] Acenaphthene was used as a surrogate because there was no chemical-specific SLV.
[d] Phenol was used as a surrogate because there was no chemical specific SLV.
[e] Total PCBs was used as a surrogate because there was no aroclor-specific SLV.
[f] Toxic Equivalency Factors for Benzo(g,h,i)perylene (0.01) was applied to the Benzo(a)pyrene SLV because there was no chemical specific SLV.
[g] BHC alpha was used as a surrogate, because there was no chemical-specific SLV, and BHC alpha was the lowest BHC.
[h] Bromodichloromethane was used as a surrogate because there was no chemical specific SLV.
[i] Chlordane was used as a surrogate.
[j] Bis(2-ethyl hexyl) phthalate was used as a surrogate because there was no chemical specific SLV, and Bis(2-ethyl hexyl) phthalate was the lowest of the pthalates.
[k] Endosulfan was used as a surrogate.
[l] Endrin was used as a surrogate because there was no chemical specific SLV.
[m] Anthracene was used as a surogate because there was no chemical specific SLV.

Table J-4c - Human Health Discharge to Surface Water Bioaccumulation Water SLVs
Bradford Island, Upland and River Operable Units
(5 of 5)

Analyte	CAS #	Candidate Human Health Water Screening Level Values for Discharge to Surface Water and Bioaccumulation (ug/L)						Selected Discharge/Bio SLVs (ug/L) (GW & SW)
		USEPA NRWQC (Water + Organism)	USEPA NRWQC (Organism Only)	DEQ Table 33A WQC (Water+ Organism)	DEQ Table 33A WQC (Organism Only)	DEQ Table 33B WQC (Water+Organism)	DEQ Table 33B WQC (Organism Only)	

[n] Benzo(k)fluoranthene was used as a surrogate because there was no chemical specific SLV.

[o] Benzo(b)fluoranthene was used as a surrogate because there was no chemical-specific SLV and benzo(b)fluoranthene had the lowest SLV of the benzofluoranthenes.

Table J-4d - Human Health Soil Gas SLVs for Indoor Worker
Bradford Island, Upland Operable Unit
(1 of 2)

Analyte	CAS #	Candidate Soil Gas Screening Level Values (ug/m3)		Selected Soil Gas SLVs (ug/m3)
		DEQ Vapor Intru Occup RBC	Adjusted USEPA Industrial Air RSL[a]	
1,1,1-Trichloroethane (TCA)	71-55-6	22,000,000	22,000,000	22,000,000
1,1,2,2-Tetrachloroethane	79-34-5	-	210	210
1,1,2-Trichloroethane	79-00-5	770	770	770
1,1-Dichloroethane	75-34-3	7,700	7,700	7,700
1,1-Dichloroethene	75-35-4	880,000	880,000	880,000
1,2,4-Trichlorobenzene	120-82-1	-	8,800	8,800
1,2,4-Trimethylbenzene	95-63-6	31,000	31,000	31,000
1,2-Dibromoethane (EDB)	106-93-4	20	20	20
1,2-Dichlorobenzene	95-50-1	880,000	880,000	880,000
1,2-Dichloroethane (EDC)	107-06-2	470	470	470
1,2-Dichloropropane	78-87-5	-	1,200	1,200
1,3,5-Trimethylbenzene	108-67-8	26,000	-	26,000
1,3-Butadiene	106-99-0	-	410	410
1,3-Dichlorobenzene	541-73-1	-	-	1,100 [b]
1,4-Dichlorobenzene	106-46-7	1,100	1,100	1,100
1,4-Dioxane	123-91-1	-	1,600	1,600
2,2,4-Trimethylpentane	540-84-1	-	-	31,000 [g]
2-Butanone (MEK)	78-93-3	-	22,000,000	22,000,000
2-Hexanone	591-78-6	-	130,000	130,000
2-Propanol	67-63-0	-	31,000,000	31,000,000
3-Chloropropene	107-05-1	-	2,000	2,000
4-Ethyltoluene	622-96-8	-	-	22,000,000 [h]
4-Methyl-2-pentanone (MIBK)	108-10-1	-	13,000,000	13,000,000
Acetone	67-64-1	-	140,000,000	140,000,000
alpha-Chlorotoluene	100-44-7	-	250	250
Benzene	71-43-2	1,600	1,600	1,600
Bromodichloromethane	75-27-4	330	330	330
Bromoform	75-25-2	-	11,000	11,000
Bromomethane	74-83-9	22,000	22,000	22,000
Carbon Disulfide	75-15-0	-	3,100,000	3,100,000
Carbon Tetrachloride	56-23-5	820	820	820
Chlorobenzene	108-90-7	220,000	220,000	220,000
Chloroethane	75-00-3	44,000,000	44,000,000	44,000,000
Chloroform	67-66-3	530	530	530
Chloromethane	74-87-3	390,000	390,000	390,000
cis-1,2-Dichloroethene	156-59-2	-	-	260,000 [c]
cis-1,3-Dichloropropene	10061-01-5	-	3,100	3,100 [d]
Cyclohexane	110-82-7	-	26,000,000	26,000,000
Dibromochloromethane	124-48-1	-	450	450.0
Dichlorodifluoromethane	75-71-8	-	880,000	880,000
Dichloromethane (Methylene Chloride)	75-09-2	26,000	26,000	26,000
Ethylbenzene	100-41-4	4,900	4,900	4,900
Freon 113	76-13-1	-	130,000,000	130,000,000
Freon 114	76-14-2	-	-	130,000,000 [e]
Heptane	142-82-5	-	-	3,100,000 [i]
Hexachlorobutadiene	87-68-3	-	560	560
Hexane	110-54-3	-	3,100,000	3,100,000
Isopropylbenzene	98-82-8	1,800,000	1,800,000	1,800,000
m,p-Xylenes	179601-23-1	440,000	440,000	440,000 [f]
Methyl tert-butyl ether	1634-04-4	47,000	47,000	47,000
n-Propylbenzene	103-65-1	-	4,400,000	4,400,000
o-Xylene	95-47-6	-	3,100,000	3,100,000
Styrene	100-42-5	4,400,000	4,400,000	4,400,000
Tetrachloroethene (PCE)	127-18-4	2,100	2,100	2,100
Toluene	108-88-3	22,000,000	22,000,000	22,000,000
trans-1,2-Dichloroethene	156-60-5	260,000	260,000	260,000
trans-1,3-Dichloropropene	10061-02-6	-	3,100	3,100 [d]
Trichloroethene (TCE)	79-01-6	140	6,100	140
Trichlorofluoromethane	75-69-4	3,100,000	3,100,000	3,100,000
Vinyl Chloride	75-01-4	2,800	2,800	2,800

- = No benchmark available
DEQ = Oregon Department of Environmental Quality
USEPA = US Environmental Protection Agency
RBC = Risk Based Concentrations
RSL = regional screening level
ug/m3 = microgram per cubic meter

Notes
Only analytes with one or more candidate SLVs is shown on this table. For the full list of analytes, see Appendix K-1.
Indoor Worker hierarchical SLV selection for Soil Gas: 1. DEQ Vapor Intrusion Occupational RBC, 2. Adjusted USEPA Industrial Air RSL
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Level. May.

Table J-4d - Human Health Soil Gas SLVs for Indoor Worker
Bradford Island, Upland Operable Unit
(2 of 2)

Analyte	CAS #	Candidate Soil Gas Screening Level Values (ug/m3)		Selected Soil Gas SLVs (ug/m3)
		DEQ Vapor Intru Occup RBC	Adjusted USEPA Industrial Air RSL[a]	

Footnotes

[a] Industrial Air RSL was multipled by a factor of 1000.

[b] 1,4-Dichlorobenzene was used as a surrogate.

[c] trans-1,2-Dichloroethene was used as a surrogate.

[d] Dichloropropene, 1,3- was used as a surrogate.

[e] Freon 113 was used as a surrogate.

[f] Xylene (mixed) was used as a surrogate.

[g] 1,2,4-trimethylbenzene was used as a surrogate.

[h] Hexane was used as a surrogate.

[i] Toluene was used as a surrogate.

Table J-4e - Human Health Sediment SLVs
Bradford Island, Upland and River Operable Unit
(1 of 2)

Analyte	CAS #	Candidate Sediment Screening levels (mg/kg) DEQ SLVs Humans General	Subsistence	Selected Mass Wasting SLVs (mg/kg)	Selected Subsistence Fisher SLVs (mg/kg)	Selected Recreational Fisher SLVs (mg/kg)	Site-Specific Reference UPL[a]
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	0.000052	0.0000064	0.0000064	0.0000064	0.000052	0.002
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	0.000017	0.0000021	0.0000021	0.0000021	0.000017	1.43E-04
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	0.00017	0.000021	0.000021	0.000021	0.00017	0.018
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	0.00017	0.000021	0.000021	0.000021	0.00017	0.002
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	0.00012	0.000026	0.000026	0.000026	0.00012	0.055
2,3',4,4',5'-Pentachlorobiphenyl	65510-44-3	0.00021	0.000026	0.000026	0.000026	0.00021	0.001
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	0.00000005	6.2E-09	6.2E-09	6.2E-09	0.00000005	3.37E-04
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	0.00021	0.000026	0.000026	0.000026	0.00021	0.006
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	0.00021	0.000026	0.000026	0.000026	0.00021	-
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	0.00021	0.000026	0.000026	0.000026	0.00021	0.004
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	0.00021	0.000000021	0.000000021	0.000000021	0.00021	2.00E-04
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	0.0012	0.00014	0.00014	0.00014	0.0012	0.001
2,3,7,8-TCDD (TEQ)	-	9.1E-09	1.1E-09	1.1E-09	1.1E-09	9.1E-09	
4,4'-DDD	72-54-8	0.00033	4.00E-05	0.00004 [b]	0.00004 [b]	0.00033 [b]	-
4,4'-DDE	72-55-9	0.00033	4.00E-05	0.00004 [b]	0.00004 [b]	0.00033 [b]	-
4,4'-DDT	50-29-3	0.00033	4.00E-05	0.00004 [b]	0.00004 [b]	0.00033 [b]	-
Acenaphthene	83-32-9	-	-	62 [c]	62 [c]	510 [c]	-
Acenaphthylene	208-96-8	-	-	62 [c]	62 [c]	510 [c]	-
Aluminum	7429-90-5	-	-	-	-	-	38,000
Anthracene	120-12-7	-	-	62 [c]	62 [c]	510 [c]	2.30
Antimony	7440-36-0	-	-	-	-	-	0.427
Aroclor 1016	12674-11-2	-	-	0.000048 [d]	0.000048 [d]	0.00039 [d]	13.0
Aroclor 1221	11104-28-2	-	-	0.000048 [d]	0.000048 [d]	0.00039 [d]	11.0
Aroclor 1232	11141-16-5	-	-	0.000048 [d]	0.000048 [d]	0.00039 [d]	12.0
Aroclor 1242	53469-21-9	-	-	0.000048 [d]	0.000048 [d]	0.00039 [d]	16.0
Aroclor 1248	12672-29-6	-	-	0.000048 [d]	0.000048 [d]	0.00039 [d]	1.80
Aroclor 1254	11097-69-1	-	-	0.000048 [d]	0.000048 [d]	0.00039 [d]	1.80
Aroclor 1260	11096-82-5	-	-	0.000048 [d]	0.000048 [d]	0.00039 [d]	1.80
Aroclor 1262	37324-23-5	-	-	0.000048 [d]	0.000048 [d]	0.00039 [d]	1.80
Aroclor 1268	11100-14-4	-	-	0.000048 [d]	0.000048 [d]	0.00039 [d]	1.80
Arsenic	7440-38-2	-	-	-	-	-	5.86
Barium	7440-39-3	-	-	-	-	-	315
Benzo(a)anthracene	56-55-3	-	-	47 [e]	47 [e]	380 [e]	10.0
Benzo(a)pyrene	50-32-8	-	-	47 [e]	47 [e]	380 [e]	11.0
Benzo(b)fluoranthene	205-99-2	-	-	47 [e]	47 [e]	380 [e]	17.0
Benzo(g,h,i)perylene	191-24-2	-	-	47 [e]	47 [e]	380 [e]	7.90
Benzo(k)fluoranthene	207-08-9	-	-	47 [e]	47 [e]	380 [e]	5.00
Benzofluoranthenes, Total	56832-73-6	-	-	47 [e]	47 [e]	380 [e]	-
Beryllium	7440-41-7	-	-	-	-	-	0.847
BHC (alpha)	319-84-6	-	-	0.0023 [g]	0.0023 [g]	0.019 [g]	-
BHC (beta)	319-85-7	-	-	0.0023 [g]	0.0023 [g]	0.019 [g]	-
BHC (delta)	319-86-8	-	-	0.0023 [g]	0.0023 [g]	0.019 [g]	-
BHC (gamma) Lindane	58-89-9	-	-	0.0023 [g]	0.0023 [g]	0.019 [g]	-
Bis(2-ethylhexyl) Phthalate	117-81-7	-	-	-	-	-	110
Butyl Benzyl Phthalate	85-68-7	-	-	-	-	-	3.80
Cadmium	7440-43-9	-	-	-	-	-	0.674
Carbazole	86-74-8	-	-	-	-	-	1.40
Chlordane (alpha)	5103-71-9	-	-	0.000046 [f]	0.000046 [f]	0.00037 [f]	-
Chlordane (gamma)	5103-74-2	-	-	0.000046 [f]	0.000046 [f]	0.00037 [f]	-
Chlordane (technical)	12789-03-6	0.00037	0.000046	0.000046	0.000046	0.00037	-
Chromium	7440-47-3	-	-	-	-	-	28.0
Chrysene	218-01-9	-	-	47 [e]	47 [e]	380 [e]	9.80
Cobalt	7440-48-4	-	-	-	-	-	15.2
Copper	7440-50-8	-	-	-	-	-	55.6
Dibenz(a,h)anthracene	53-70-3	-	-	47 [e]	47 [e]	380 [e]	2.30
Dieldrin	60-57-1	8.10E-06	0.000001	0.000001	0.000001	0.0000081	-
Diesel Range Organics	68334-30-5	-	-	-	-	-	31.7
Di-n-butyl Phthalate	84-74-2	-	-	-	-	-	11.0
Di-n-octyl Phthalate	117-84-0	-	-	-	-	-	1.30
Endosulfan I	959-98-8	-	-	0.000001 [h]	0.000001 [h]	0.0000081 [h]	-
Endosulfan II	33213-65-9	-	-	0.000001 [h]	0.000001 [h]	0.0000081 [h]	-
Endosulfan Sulfate	1031-07-8	-	-	0.000001 [h]	0.000001 [h]	0.0000081 [h]	-
Fluoranthene	206-44-0	510	62	62	62	510	31.0
Fluorene	86-73-7	-	-	62 [c]	62 [c]	510 [c]	1.80
Heptachlor	76-44-8	-	-	0.000001 [h]	0.000001 [h]	0.0000081 [h]	-
Hexachlorobenzene	118-74-1	0.019	0.0023	0.0023	0.0023	0.019	-
Indeno(1,2,3-cd)pyrene	193-39-5	-	-	47 [e]	47 [e]	380 [e]	8.80
Lead	7439-92-1	-	-	-	-	-	14.5
Mercury	7439-97-6	-	-	-	-	-	0.214
Naphthalene	91-20-3	-	-	62 [c]	62 [c]	510 [c]	-
Nickel	7440-02-0	-	-	-	-	-	21.2
Pentachlorophenol	87-86-5	0.25	0.03	0.03	0.03	0.25	-
Phenanthrene	85-01-8	-	-	62 [c]	62 [c]	510 [c]	5.90
Total Polychlorinated biphenyl (PCB)	1336-36-3	0.00039	0.000048	0.000048	0.000048	0.00039	-
Pyrene	129-00-0	380	47	47	47	380	12.7
Thallium	7440-28-0	-	-	-	-	-	0.354
Tributyltin	688-73-3	0.085	0.01	0.01	0.01	0.085	-
Vanadium	7440-62-2	-	-	-	-	-	70.6
Zinc	7440-66-6	-	-	-	-	-	106

- = No benchmark available
DEQ = Oregon Department of Environmental Quality
mg/kg = milligram per kilogram
SLV = screening level value
UPL = Upper Prediction Limit

Table J-4e - Human Health Sediment SLVs
Bradford Island, Upland and River Operable Unit
(2 of 2)

Analyte	CAS #	Candidate Sediment Screening levels (mg/kg)		Selected Mass Wasting SLVs (mg/kg)	Selected Subsistence Fisher SLVs (mg/kg)	Selected Recreational Fisher SLVs (mg/kg)	Site-Specific Reference UPL[a]
		DEQ SLVs Humans					
		General	Subsistence				

Notes

Only analytes with one or more candidate SLVs is shown on this table. For the full list of analytes, see Appendix K-1.

Mass Wasting hierarchical SLVs for sediment: 1. Minimum of DEQ HH Bioaccumulative SLVs.

Subsistence Fisher hierarchical SLVs for sediment: 1. Subsistence DEQ Bioaccumulative SLVs.

Recreational Fisher hierarchical SLVs for sediment: 1. General DEQ Bioaccumulative SLVs.

Oregon Department of Environmental Quality (DEQ) 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31

Footnotes

[a] Site-Specific Reference UPLs are based are not based on toxicity values.

[b] DDT (Total) was used as a surrogate because there was no chemical specific SLVs.

[c] Fluoranthene was used as a surrogate because there was no chemical specific SLV and fluoranthene had the lowest SLV of the low Molecular Weight PAHs.

[d] Total Aroclors was used as a surrogate because there was no individual aroclor chemical specific SLV.

[e] Pyrene was used as a surrogate because there was no chemical specific SLV and pyrene had the lowest SLV of the High Molecular Weight PAHs.

[f] Chlordane (technical) was used as a surrogate because there was no chemical specific SLV and chlordane (technical) was the lowest of the chlordanes.

[g] Hexachlorobenzene was used as a surrogate because there was no chemical specific SLV.

[h] Dieldrin was used as a surrogate because there was no chemical specific SLV.

Table J-4f - Human Health Tissue SLVs
Bradford Island, River Operable Unit
(1 of 1)

Analyte	CAS #	Candidate Sediment Screening levels (mg/kg wet wt.)				Selected Tissue SLV (mg/kg wet wt)	
		Humans Subsistence/Tribal		Humans General/Recreational		Subsistence Fisher	Recreational Fisher
		Carcinogens	Non-carcinogens	Carcinogens	Non-carcinogens		
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	0.000076	-	0.00062	-	0.000076	0.00062
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	0.000025	-	0.00021	-	0.000025	0.00021
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	0.00025	-	0.0021	-	0.00025	0.0021
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	0.00025	-	0.0021	-	0.00025	0.0021
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	0.00025	-	0.0021	-	0.00025	0.0021
2,3',4,4',5'-Pentachlorobiphenyl	65510-44-3	0.00025	-	0.0021	-	0.00025	0.0021
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	0.000000076	-	0.00000062	-	0.000000076	0.00000062
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	0.00025	-	0.0021	-	0.00025	0.0021
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	0.00025	-	0.0021	-	0.00025	0.0021
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	0.00025	-	0.0021	-	0.00025	0.0021
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	0.00000025	-	0.0000021	-	0.00000025	0.0000021
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	0.00025	-	0.0021	-	0.00025	0.0021
2,3,7,8-TCDD (TEQ)	-	7.60E-09	-	6.20E-08	-	7.60E-09	6.20E-08
Acenaphthene	83-32-9	-	-	-	-	15 [b]	120 [b]
Acenaphthylene	208-96-8	-	-	-	-	15 [b]	120 [b]
Anthracene	120-12-7	-	-	-	-	15 [b]	120 [b]
Aroclor 1016	12674-11-2	-	-	-	-	0.00057 [a]	0.0047 [a]
Aroclor 1221	11104-28-2	-	-	-	-	0.00057 [a]	0.0047 [a]
Aroclor 1232	11141-16-5	-	-	-	-	0.00057 [a]	0.0047 [a]
Aroclor 1242	53469-21-9	-	-	-	-	0.00057 [a]	0.0047 [a]
Aroclor 1248	12672-29-6	-	-	-	-	0.00057 [a]	0.0047 [a]
Aroclor 1254	11097-69-1	-	-	-	-	0.00057 [a]	0.0047 [a]
Aroclor 1260	11096-82-5	-	-	-	-	0.00057 [a]	0.0047 [a]
Aroclor 1262	37324-23-5	-	-	-	-	0.00057 [a]	0.0047 [a]
Aroclor 1268	11100-14-4	-	-	-	-	0.00057 [a]	0.0047 [a]
Arsenic	7440-38-2	0.00076	0.15	0.0062	1.2	0.00076	0.0062
Benzo(a)anthracene	56-55-3	-	-	-	-	0.00157 [c]	0.0128 [c]
Benzo(a)pyrene	50-32-8	-	-	-	-	0.000157 [c]	0.00128 [c]
Benzo(b)fluoranthene	205-99-2	-	-	-	-	0.00157 [c]	0.0128 [c]
Benzo(g,h,i)perylene	191-24-2	-	-	-	-	0.0157 [c]	0.128 [c]
Benzo(k)fluoranthene	207-08-9	-	-	-	-	0.0157 [c]	0.128 [c]
Bis(2-ethylhexyl) Phthalate	117-81-7	-	-	-	-	0.0819 [c]	0.667 [c]
Butyl Benzyl Phthalate	85-68-7	-	-	-	-	0.604 [c]	4.91 [c]
Cadmium	7440-43-9	-	0.49	-	4	0.49	4
Chrysene	218-01-9	-	-	-	-	0.157 [c]	1.28 [c]
Dibenz(a,h)anthracene	53-70-3	-	-	-	-	0.000157 [c]	0.00128 [c]
Di-n-butyl Phthalate	84-74-2	-	-	-	-	49.2 [c]	400 [c]
Di-n-octyl Phthalate	117-84-0	-	-	-	-	49.2 [c]	400 [c]
Fluoranthene	206-44-0	-	20	-	160	20	160
Fluorene	86-73-7	-	-	-	-	15 [b]	120 [b]
Indeno(1,2,3-cd)pyrene	193-39-5	-	-	-	-	0.00157 [c]	0.0128 [c]
Lead	7439-92-1	-	0.5	-	0.5	0.5	0.5
Mercury	7439-97-6	-	0.049	-	0.4	0.049	0.4
Phenanthrene	85-01-8	-	-	-	-	15 [b]	120 [b]
Pyrene	129-00-0	-	15	-	120	15	120
Selenium	7782-49-2	-	2.5	-	20	2.5	20
Total Polychlorinated biphenyl (PCB)	1336-36-3	0.00057	0.0098	0.0047	0.08	0.00057	0.0047

- = No benchmark available
ATL = Acceptable tissue level
DEQ = Oregon Department of Environmental Quality
mg/kg = milligram per kilogram
SLV = screening level value

Notes
Only analytes with one or more candidate SLVs is shown on this table. For the full list of analytes, see Appendix K-1.
Subsistence Fisher heirarchical SLV selection for tissue: 1. Min DEQ Subsistence/Tribal Carcinogen ATL and DEQ Subsistence/Tribal Non-Carcinogen ATL.
Recreational Fisher heirarchical SLV selection for tissue: 1. Min DEQ General/Recreational Carcinogen ATL and DEQ General/Recreational Non-Carcinogen ATL.
Oregon Department of Environmental Quality (DEQ) 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31

Footnotes
[a] Total Aroclors was used as a surrogate because there was no individual aroclor chemical specific SLV.
[b] The SLV for pyrene was selected as a surrogate because there was no chemical-specific SLV.
[c] The ATLs were developed based on the procedures outlined in DEQ 2007; see Appendix L-2.

Table J-5a - Ecological Soil SLVs by Receptor
Bradford Island, Upland Operable Unit
(1 of 4)

Analyte	CAS #	Candidate Ecological Soil Screening Level Values (mg/kg)																											
		Plants							Invertebrates							Birds						Mammals					
		USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Plant ORNL[an]	USEPA TRVs[aq]	Heirarchical SLV[ar] with Surrogates	Site-Specific Reference UPL	Selected Plant SLV	USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Inverte-brate ORNL[ao]	USEPA TRVs[aq]	Heirarchical SLV[ar] with Surrogates	Site-Specific Reference UPL	Selected Invert SLV	USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Avian ORNL PRG[ap]	Heirarchical SLV[ar] with Surrogates	Site-Specific Reference UPL	Selected Avian SLV	USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Mammal ORNL PRG[ap]	Heirarchical SLV[ar] with Surrogates	Site-Specific Reference UPL	Selected Mammalian SLV
1,1,1-Trichloroethane (TCA)	71-55-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55550	-	55550	-	55550
1,1-Dichloroethane	75-34-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70 [n]	-	70	-	-	-	2780 [n]	-	2780
1,1-Dichloroethene	75-35-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3750	-	3750	-	3750
1,2,3-Trichlorobenzene	87-61-6	-	-	-	-	-	-	-	-	20	20	-	20	-	20	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	120-82-1	-	-	-	-	-	-	-	-	20	20	-	20	-	20	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	95-63-6	-	-	-	-	200 [c]	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1440 [c]	-	1440
1,2-Dichlorobenzene	95-50-1	-	-	-	-	-	-	-	-	-	-	-	2.26 [m]	-	2.26	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane (EDC)	107-06-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	70	-	70	-	2780	-	2780	-	2780
1,2-Dichloropropane	78-87-5	-	-	-	-	-	-	-	-	700	700	-	700	-	700	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	108-67-8	-	-	-	-	200 [c]	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1440 [c]	-	1440
1,3-Dichlorobenzene	541-73-1	-	-	-	-	-	-	-	-	-	-	2.26	2.26	-	2.26	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	106-46-7	-	-	-	-	-	-	-	-	20	20	-	20	-	20	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-T	93-76-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.093 [o]	-	0.093	-	-	-	0.021 [o]	-	0.021
2,4,5-TP (Silvex)	93-72-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.093 [o]	-	0.093	-	-	-	0.021 [o]	-	0.021
2,4,5-Trichlorophenol	95-95-4	-	4	4	-	4	-	4	-	9	9	-	9	-	9	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	88-06-2	-	10	-	-	10	-	10	-	10	10	-	10	-	10	-	-	-	-	-	-	-	-	-	-	-	-
2,4-D	94-75-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.093 [o]	-	0.093	-	-	-	0.021 [o]	-	0.021
2,4-DB	94-82-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.093 [o]	-	0.093	-	-	-	0.021 [o]	-	0.021
2,4-Dichlorophenol	120-83-2	-	20	-	-	20	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	105-67-9	-	20	-	-	20	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	51-28-5	-	20	20	-	20	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (MEK)	78-93-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200000	-	200000	-	200000
2-Chlorophenol	95-57-8	-	60	-	-	60	-	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	591-78-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1250 [e]	-	1250
2-Methylnaphthalene	91-57-6	-	-	-	-	-	-	-	***	-	-	-	***	-	***	-	-	-	-	-	-	***	-	-	***	-	***
2-Methylphenol	95-48-7	-	50	-	-	50	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16000	-	16000	-	16000
3-Nitroaniline	99-09-2	-	70	-	-	70	-	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDD	72-54-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.093	0.01	-	0.093	-	0.093	0.021	100	-	0.021	-	0.021
4,4'-DDE	72-55-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.093	0.01	-	0.093	-	0.093	0.021	100	-	0.021	-	0.021
4,4'-DDT	50-29-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.093	0.01	-	0.093	-	0.093	0.021	100	-	0.021	-	0.021
4-Chloroaniline	106-47-8	-	40	-	-	40	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Isopropyltoluene	99-87-6	-	-	-	-	200 [c]	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (MIBK)	108-10-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1250 [e]	-	1250
4-Nitroaniline	100-01-6	-	40	-	-	40	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	100-02-7	-	10	-	-	10	-	10	-	7	7	-	7	-	7	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	83-32-9	-	20	20	-	20	-	20	***	-	-	-	***	-	***	-	-	-	-	-	-	***	-	-	***	-	***
Acenaphthylene	208-96-8	-	-	-	-	-	-	-	***	-	-	-	***	-	***	-	-	-	-	-	-	***	-	-	***	-	***
Acetone	67-64-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1250	-	1250	-	1250
Aldrin	309-00-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.022	-	-	0.022	-	0.022	0.0049	25	-	0.0049	-	0.0049
Aluminum	7429-90-5	*	50	50	5	50	31400	31400	-	600	-	-	600	-	31400	31400	-	450	-	450	31400	31400	-	107	-	107	31400	31400
Aniline	62-53-3	-	200	-	-	200	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	120-12-7	-	-	-	-	-	-	-	***	-	-	-	***	-	-	***	-	-	-	-	-	***	-	-	***	-	***
Antimony	7440-36-0	-	5	5	0.5	5	0.176	5	78	-	-	-	78	-	0.176	78	-	-	-	-	0.176	0.176	0.27	15	-	0.27	0.176	0.27
Aroclor 1016	12674-11-2	-	-	-	-	40 [f]	-	40	-	-	-	2.51	2.51	-	-	2.51	-	-	-	0.655 [h]	-	0.655	-	100	-	0.371 [h]	-	0.371
Aroclor 1221	11104-28-2	-	-	-	-	40 [f]	-	40	-	-	-	-	2.51 [g]	-	-	2.51	-	-	-	0.655 [h]	-	0.655	-	-	-	0.371 [h]	-	0.371
Aroclor 1232	11141-16-5	-	-	-	-	40 [f]	-	40	-	-	-	-	2.51 [g]	-	-	2.51	-	-	-	0.655 [h]	-	0.655	-	-	-	0.371 [h]	-	0.371
Aroclor 1242	53469-21-9	-	-	-	-	40 [f]	-	40	-	-	-	-	2.51 [g]	-	-	2.51	-	1.5	-	0.655 [h]	-	0.655	-	5	-	0.371 [h]	-	0.371
Aroclor 1248	12672-29-6	-	-	-	-	40 [f]	-	40	-	-	-	-	2.51 [g]	-	-	2.51	-	-	-	0.655 [h]	-	0.655	-	-	-	0.371 [h]	-	0.371
Aroclor 1254	11097-69-1	-	-	40	10	40	-	40	-	-	-	2.51	2.51	-	-	2.51	-	0.7	-	0.655 [h]	-	0.655	-	4	-	0.371 [h]	-	0.371
Aroclor 1260	11096-82-5	-	-	-	-	40 [f]	-	40	-	-	-	-	2.51 [g]	-	-	2.51	-	-	-	0.655 [h]	-	0.655	-	-	-	0.371 [h]	-	0.371
Aroclor 1262	37324-23-5	-	-	-	-	40 [f]	-	40	-	-	-	-	2.51 [g]	-	-	2.51	-	-	-	0.655 [h]	-	0.655	-	-	-	0.371 [h]	-	0.371
Aroclor 1268	11100-14-4	-	-	-	-	40 [f]	-	40	-	-	-	-	2.51 [g]	-	-	2.51	-	-	-	0.655 [h]	-	0.655	-	-	-	0.371 [h]	-	0.371
Arsenic	7440-38-2	18	10	10	1	18	5.4	18	-	60	60	0.25	60	-	5.4	60	43	10	102	43	5.4	43	46	29	9.9	46	5.4	46
Barium	7440-39-3	-	500	500	5	500	169	500	330	3000	-	-	330	-	169	330	-	85	283	85	169	169	2000	638	329	2000	169	2000
Benzo(a)anthracene	56-55-3	-	-	-	1.2	1.2	-	1.2	***	-	-	25	***	-	-	***	-	-	-	-	-	-	***	-	-	***	-	***
Benzene	71-43-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3300	-	3300	-	3300
Benzo(a)pyrene	50-32-8	-	-	-	1.2	1.2	-	1.2	***	-	-	25	***	-	-	***	-	-	-	-	-	-	***	125	-	***	-	***
Benzo(b)fluoranthene	205-99-2	-	-	-	1.2	1.2	-	1.2	***	-	-	25	***	-	-	***	-	-	-	-	-	-	***	-	-	***	-	***
Benzo(g,h,i)perylene	191-24-2	-	-	-	-	-	-	-	***	-	-	-	***	-	-	***	-	-	-	-	-	-	***	-	-	***	-	***
Benzo(j,k)flouranthenes	205-82-3 & 207-08-9	-	-	-	-	-	-	-	***	-	-	-	***	-	-	***	-	-	-	-	-	-	***	-	-	***	-	***
Benzo(k)fluoranthene	207-08-9	-	-	-	1.2	1.2	-	1.2	***	-	-	25	***	-	-	***	-	-	-	-	-	-	***	-	-	***	-	***
Benzofluoranthenes, Total	56832-73-6	-	-	-	-	-	-	-	***	-	-	-	***	-	-	***	-	-	-	-	-	-	***	-	-	***	-	***
Benzoic Acid	65-85-0	-	-	-	-	200 [c]	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1440 [c]	-	1440
Benzyl Alcohol	100-51-6	-	-	-	-	-	-	-	-	-	-	-	2.26 [m]	-	-	2.26	-	-	-	-	-	-	-	-	-	-	-
Beryllium	7440-41-7	-	10	10	0.1	10	0.659	10	***	-	-	-	***	-	0.659	0.659	-	-	-	-	0.659	0.659	21	83	-	21	0.659	21
BHC (alpha)	319-84-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8 [i]	-	8	-	-	-	1000 [i]	-	1000
BHC (beta)	319-85-7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8 [i]	-	8	-	-	-	1000 [i]	-	1000
BHC (delta)	319-86-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8 [i]	-	8	-	-	-	1000 [i]	-	1000
BHC (gamma) Lindane	58-89-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	8	-	8	-	1000	-	1000	-	1000

Table J-5a - Ecological Soil SLVs by Receptor
Bradford Island, Upland Operable Unit
(2 of 4)

Analyte	CAS #	Candidate Ecological Soil Screening Level Values (mg/kg)																												
		Plants							Invertebrates								Birds						Mammals						
		USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Plant ORNL[an]	USEPA TRVs[aq]	Heirarchical SLV[ar] with Surrogates		Site-Specific Reference UPL	Selected Plant SLV	USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Inverte-brate ORNL[ao]	USEPA TRVs[aq]	Heirarchical SLV[ar] with Surrogates		Site-Specific Reference UPL	Selected Invert SLV	USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Avian ORNL PRG[ap]	Heirarchical SLV[ar] with Surrogates		Site-Specific Reference UPL	Selected Avian SLV	USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Mammal ORNL PRG[ap]	Heirarchical SLV[ar] with Surrogates		Site-Specific Reference UPL	Selected Mammalian SLV
Bis(2-chloroethoxy)methane	111-91-1	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-	730	p	-	730
Bis(2-ethylhexyl) Phthalate	117-81-7	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	4.5	-	4.5		-	4.5	-	1020	-	1020		-	1020
Bromochloromethane	74-97-5	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-	730	p	-	730
Bromodichloromethane	75-27-4	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-	730	p	-	730
Bromomethane	74-83-9	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-	730	p	-	730
Butyl Benzyl Phthalate	85-68-7	-	-	-	-	200	j	-	200	-	-	-	-	-		-	-	-	-	-	0.45	j	-	0.45	-	-	-	30000	j	-	30000
Cadmium	7440-43-9	32	4	4	0.2	32		0.271	32	140	20	20	10	140		0.271	140	0.77	6	4.2	0.77		0.271	0.77	0.36	125	6	0.36		0.271	0.36
Calcium	7440-70-2	-	-	-	-	-		10400	10400	-	-	-	-	-		10400	10400	-	-	-	-		10400	10400	-	-	-	-		10400	10400
Carbazole	86-74-8	-	-	-	-	-		-	-	-	-	-	-	2.26	m	-	2.26	-	-	-	-		-	-	-	-	-	-		-	-
Carbon Disulfide	75-15-0	-	-	-	-	-		-	-	-	-	-	-	1000	q	-	1000	-	-	-	-		-	-	-	-	-	2000	q	-	2000
Carbon Tetrachloride	56-23-5	-	-	-	-	-		-	-	-	1000	-	-	1000		-	1000	-	-	-	-		-	-	-	2000	-	2000		-	2000
Chlordane (alpha)	5103-71-9	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	9	-	9	k	-	9	-	250	-	250	k	-	250
Chlordane (gamma)	5103-74-2	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	9	-	9	k	-	9	-	250	-	250	k	-	250
Chlordane (technical)	12789-03-6	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	9	-	9	k	-	9	-	250	-	250	k	-	250
Chlorobenzene	108-90-7	-	-	-	-	-		-	-	-	40	40	-	40		-	40	-	-	-	-		-	-	-	-	-	-		-	-
Chloroform	67-66-3	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	1875	-	1875		-	1875
Chloromethane	74-87-3	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	730	p	-	730
Chromium	7440-47-3	-	-	1	0.018	1		28.1	28.1	-	-	0.4	-	0.4		28.1	28.1	26	-	16.1	26		28.1	28.1	34	410	110	34		28.1	34
Chrysene	218-01-9	-	-	-	1.2	1.2		-	1.2	***	-	-	25	***		-	***	-	-	-	-		-	-	***	-	-	***		-	***
cis-1,2-Dichloroethene	156-59-2	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	2500	-	2500		-	2500
Cobalt	7440-48-4	13	20	20	-	13		19.9	19.9	-	1000	-	-	1000		19.9	1000	120	-	-	120		19.9	120	230	150	-	230		19.9	230
Copper	7440-50-8	70	100	100	1	70		56.7	70	80	50	50	32	80		56.7	80	28	190	515	28		56.7	56.7	49	390	370	49		56.7	56.7
Dibenz(a,h)anthracene	53-70-3	-	-	-	1.2	1.2		-	1.2	***	-	-	25	***		-	***	-	-	-	-		-	-	***	-	-	***		-	***
Dibenzofuran	132-64-9	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	0.002	-	0.002		-	0.002
Dibromochloromethane	124-48-1	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	730		-	730
Dibromomethane	74-95-3	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	730		-	730
Dibutyltin	1002-53-5	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	28	-	28	i	-	28	-	1300	-	1300	i	-	1300
Dichlorodifluoromethane	75-71-8	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	730		-	730
Dichloromethane (Methylene Chloride)	75-09-2	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	730	-	730		-	730
Dichlorprop	120-36-5	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	0.093	o	-	0.093	-	-	-	0.021	o	-	0.021
Dieldrin	60-57-1	-	-	-	-	-		-	-	-	-	-	-	-		-	-	0.022	0.3	-	0.022		-	0.022	0.0049	3	-	0.0049		-	0.0049
Diethyl Phthalate	84-66-2	-	100	100	-	100		-	100	-	-	-	-	-		-	-	-	-	-	-		-	-	-	250000	-	250000		-	250000
Dimethyl Phthalate	131-11-3	-	-	-	-	-		-	-	-	200	200	-	200		-	200	-	-	-	-		-	-	-	-	-	-		-	-
Di-n-butyl Phthalate	84-74-2	-	200	200	-	200		-	200	-	-	-	-	-		-	-	-	0.45	-	0.45		-	0.45	-	30000	-	30000		-	30000
Di-n-octyl Phthalate	117-84-0	-	-	-	-	200	j	-	200	-	-	-	-	-		-	-	-	-	-	0.45	j	-	0.45	-	-	-	30000	j	-	30000
Endosulfan I	959-98-8	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	42	-	42	a	-	42	-	20	-	20	a	-	20
Endosulfan II	33213-65-9	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	42	-	42	a	-	42	-	20	-	20	a	-	20
Endosulfan Sulfate	1031-07-8	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	42	-	42	a	-	42	-	20	-	20	a	-	20
Endrin	72-20-8	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	0.04	-	0.022	r	-	0.022	-	5	-	0.0049	r	-	0.0049
Endrin Aldehyde	7421-93-4	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	0.022	r	-	0.022	-	-	-	0.0049	r	-	0.0049
Endrin Ketone	53494-70-5	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	0.022	r	-	0.022	-	-	-	0.0049	r	-	0.0049
Ethylbenzene	100-41-4	-	-	-	-	-		-	-	-	-	-	-	2.26	m	-	2.26	-	-	-	-		-	-	-	-	-	-		-	-
Fluoranthene	206-44-0	-	-	-	-	-		-	-	***	-	-	-	***		-	***	-	-	-	-		-	-	***	-	-	***		-	***
Fluorene	86-73-7	-	-	-	-	-		-	-	***	30	30	-	***		-	***	-	-	-	-		-	-	***	-	-	***		-	***
Heptachlor	76-44-8	-	-	-	1	1		-	1	-	-	-	-	-		-	-	-	-	-	-		-	-	-	15	-	15		-	15
Heptachlor Epoxide	1024-57-3	-	-	-	-	1	d	-	1	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	15	d	-	15
Hexachlorobenzene	118-74-1	-	-	-	-	-		-	-	-	1000	-	-	1000		-	1000	-	-	-	-		-	-	-	-	-	-		-	-
Hexachlorocyclopentadiene	77-47-4	-	10	10	0.1	10		-	10	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-	-
Indeno(1,2,3-cd)pyrene	193-39-5	-	-	-	1.2	1.2		-	1.2	***	-	-	25	***		-	***	-	-	-	-		-	-	***	-	-	***		-	***
Iron	7439-89-6	**	10	-	-	10		36900	36900	**	200	-	-	200		36900	36900	**	-	-	-		36900	36900	**	-	-	-		36900	36900
Isopropylbenzene	98-82-8	-	-	-	-	-		-	-	-	-	-	-	2.26	m	-	2.26	-	-	-	-		-	-	-	-	-	-		-	-
Lead	7439-92-1	120	50	50	4.6	120		25.5	120	1700	500	500	100	1700		25.5	1700	11	16	40.5	11		25.5	25.5	56	4000	740	56		25.5	56
m,p-Xylenes	179601-23-1	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	120	-	120	as	-	120	-	-	-	-		-	-
Magnesium	7439-95-4	-	-	-	-	-		12400	12400	-	-	-	-	-		12400	12400	-	-	-	-		12400	12400	-	-	-	-		12400	12400
Manganese	7439-96-5	220	500	500	-	220		885	885	450	100	-	-	450		885	885	4300	4125	-	4300		885	4300	4000	11000	-	4000		885	4000
MCPA	94-74-6	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	0.093	o	-	0.093	-	-	-	0.021	o	-	0.021
MCPP	93-65-2	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	0.093	o	-	0.093	-	-	-	0.021	o	-	0.021
Mercury	7439-97-6	-	0.3	0.3	-	0.3		0.066	0.3	-	0.1	0.1	2.5	0.1		0.066	0.1	-	1.5	0.00051	0.00051	s	0.066	0.066	-	73	0.146	0.146	s	0.066	0.146
Methoxychlor	72-43-5	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	500	-	500		-	500
Monobutyltin	78763-54-9	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	28	-	28	i	-	28	-	1300	-	1300	i	-	1300
Naphthalene	91-20-3	-	10	-	-	10		-	10	***	-	-	-	***		-	***	-	-	-	-		-	-	***	3900	-	***		-	***
Nickel	7440-02-0	38	30	30	25	38		26.5	38	280	200	200	100	280		26.5	280	210	320	121	210		26.5	210	130	625	246	130		26.5	130
Nitrobenzene	98-95-3	-	8	-	-	8		-	8	-	40	40	2.26	40		-	40	-	-	-	-		-	-	-	-	-	-		-	-
N-Nitrosodiphenylamine	86-30-6	-	-	-	-	-		-	-	-	20	20	-	20		-	20	-	-	-	-		-	-	-	-	-	-		-	-
n-Propylbenzene	103-65-1	-	-	-	-	-		-	-	-	-	-	-	2.26	m	-	2.26	-	-	-	-		-	-	-	-	-	-		-	-
o-Xylene	95-47-6	-	1	-	-	1		-	1	-	-	-	-	-		-	-	-	-	-	-		-	-	-	120	-	120	as	-	120
p-cresol (4-Methylphenol)	106-44-5	-	-	-	-	50	b	-	50	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	16000	b	-	16000
Pentachlorophenol	87-86-5	5	3	3	1.73	5		-	5	31	4	6	10	31		-	31	2.1	-	-	2.1		-	2.1	2.8	30	-	2.8		-	2.8
Phenanthrene	85-01-8	-	-	-	-	-		-	-	***	-	-	-	***		-	***	-	-	-	-		-	-	***	-	-	***		-	***

Table J-5a - Ecological Soil SLVs by Receptor
Bradford Island, Upland Operable Unit
(3 of 4)

Analyte	CAS #	Candidate Ecological Soil Screening Level Values (mg/kg)																											
		Plants							Invertebrates							Birds						Mammals					
		USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Plant ORNL[an]	USEPA TRVs[aq]	Heirarchical SLV[ar] with Surrogates	Site-Specific Reference UPL	Selected Plant SLV	USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Inverte-brate ORNL[ao]	USEPA TRVs[aq]	Heirarchical SLV[ar] with Surrogates	Site-Specific Reference UPL	Selected Invert SLV	USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Avian ORNL PRG[ap]	Heirarchical SLV[ar] with Surrogates	Site-Specific Reference UPL	Selected Avian SLV	USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Mammal ORNL PRG[ap]	Heirarchical SLV[ar] with Surrogates	Site-Specific Reference UPL	Selected Mammalian SLV
Phenol	108-95-2	-	70	70	-	70	-	70	-	30	30	-	30	-	30	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	7440-09-7	-	-	-	-	-	2050	2050	-	-	-	-	-	2050	2050	-	-	-	-	2050	2050	-	-	-	-	2050	2050
Pyrene	129-00-0	-	-	-	-	-	-	-	18	-	-	-	18	-	***	-	-	-	-	-	-	***	-	-	***	-	***
sec-Butylbenzene	135-98-8	-	-	-	-	-	-	-	-	-	-	-	2.26 [m]	-	2.26	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	7782-49-2	0.52	1	1	0.05	0.52	0.5	0.52	4.1	70	70	7.7	4.1	0.5	4.1	1.2	2	1E-06	1.2	0.5	1.2	0.63	25	0.000001	0.63	0.5	0.63
Silver	7440-22-4	560	2	2	0.02	560	0.187	560	-	50	-	-	50	0.187	50	4.2	-	-	4.2	0.187	4.2	14	-	-	14	0.187	14
Sodium	7440-23-5	-	-	-	-	-	341	341	-	-	-	-	-	341	341	-	-	-	-	341	341	-	-	-	-	341	341
Styrene	100-42-5	-	300	300	-	300	-	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
tert-Butylbenzene	98-06-6	-	-	-	-	-	-	-	-	-	-	-	2.26 [m]	-	2.26	-	-	-	-	-	-	-	-	-	-	-	-
Tetrabutyltin	1461-25-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	-	28 [i]	-	28	-	1300	-	1300 [i]	-	1300
Tetrachloroethene (PCE)	127-18-4	-	10	-	-	10	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80	-	80	-	80
Thallium	7440-28-0	-	1	1	0.01	1	0.203	1	-	-	-	-	-	0.203	0.203	-	-	-	-	0.203	0.203	-	1	2.1	1	0.203	1
Toluene	108-88-3	-	200	200	-	200	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1440	-	1440	-	1440
Total DDTs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.093	0.01	-	0.093	-	0.093	0.021	100	-	0.021	-	0.021
Total PCBs	1336-36-3	-	40	40	-	40	-	40	-	-	-	-	2.51 [g]	-	2.51	-	-	0.655	0.655	-	0.655	-	4	0.371	0.371 [h]	-	0.371
Total PAH		-	-	-	-	-	-	-	***	-	-	-	***	-	***	-	-	-	-	-	-	***	-	-	***	-	***
Total LPAH		-	-	-	-	-	-	-	29	-	-	-	29	-	29	-	-	-	-	-	-	100	-	-	100	-	100
Total HPAH		-	-	-	1.2	1.2	-	1.2	18	-	-	25	18	-	18	-	-	-	-	-	-	1.1	-	-	1.1	-	1.1
Toxaphene	8001-35-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	-	1000	-	1000
trans-1,2-Dichloroethene	156-60-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2500	-	2500	-	2500
Tributyltin	688-73-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	-	28 [i]	-	28	-	1300	-	1300 [i]	-	1300
Trichloroethene (TCE)	79-01-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	-	40	-	40
Trichlorofluoromethane	75-69-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730 [p]	-	730
Vanadium	7440-62-2	-	2	2	-	2	104	104	-	-	-	-	-	104	104	7.8	47	-	7.8	104	104	280	25	55	280	104	280
Vinyl Chloride	75-01-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	20	-	20
Zinc	7440-66-6	160	50	50	0.9	160	71.7	160	120	200	200	199	120	71.7	120	46	60	8.5	46	71.7	71.7	79	20000	1600	79	71.7	79

Note

Only analytes with one or more candidate SLVs is shown on this table. For the full list of analytes, see Appendix J-1.
- = No benchmark available
DEQ = Oregon Department of Environmental Quality
Eco SSL = Ecological Soil Screening Level
USEPA = US Environmental Protection Agency
HPAH = High Molecular Weight PAH
HPAHs include : Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(j,k)flouranthenes, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, and Pyrene.
LPAH = Low Molecular Weight PAH
LPAHs include: 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Fluorene, Naphthalene, and Phenanthrene.
mg/kg = milligram per kilogram dry weight
ORNL = Oak Ridge National Laboratory
PAH = Polycyclic Aromatic Hydrocarbons
PRG = Preliminary Remediation Goal
SLV = Screening Level Value
TRV = Toxicity Reference Value
UPL = Upper Prediction Limit

* = Eco SSL is dependent on pH.
** = Eco SSL is a determination of the geochemical conditions (i.e., pH and Eh at a minimum) of the environmental setting, as well as the presence of iron floc and the toxic metals, is critical to the determination of the relative importance of iron at a site.
*** = PAH Eco SSLs are based on Total LMW PAHs (Invert. Eco SSL = 29 mg/kg and Mammal Eco SSL = 100 mg/kg) and Total HMW PAHs (Invert. Eco SSL = 18 mg/kg and Mammal Eco SSL = 1.1 mg/kg).

[a] Endosulfan was used as a surrogate because there was no chemical specific SLV.
[b] 2-Methylphenol was used as a surrogate because there was no chemical specific SLV.
[c] Toluene was used as a surrogate because there was no chemical specific SLV.
[d] Heptachlor was used as a surrogate because there was no chemical specific SLV.
[e] Acetone was used as a surrogate because there was no chemical specific SLV.
[f] Total PCBs was used as a surrogate because there was no chemical specific SLV.
[g] PCB 1254 was used as a surrogate because there was no chemical specific SLV.
[h] The lowest PRGs (mammal and birds) for Total PCBs was used as a surrogate because the SLV is based on bioaccumulation and is more conservative than the DEQ Level II individual aroclor SLVs and Total PCB SLV, which do not take into account bioaccumulation.
[i] BHC gamma was used as a surrogate, because there was no chemical-specific SLV, and BHC gamma was the lowest BHC.
[j] di-n-butyl Phthalate was used as a surrogate because there was no chemical specific SLV.
[k] Chlordane (CAS # 57-74-9) was used as a surrogate.
[l] Tributyltin oxide was used as a surrogate, because there was no chemical-specific SLV.
[m] 1,3- Dichlorobenzene was used as a surrogate because there was no chemical specific SLV, and it had the SLV lowest of the non-methylbenzenes.
[n] 1,2- Dichloroethane was used as a surrogate because there was no chemical specific SLV.
[o] DDT (and metabolites) was used as a surrogate because there was no chemical specific SLV, and DDT was the lowest of the herbicides/pesticides.
[p] Dichloromethane was used as a surrogate because there was no chemical specific SLV.
[q] Carbon tetrachloride was used as a surrogate because there was no chemical specific SLV.
[r] The lowest Eco SSLs (avian and mammalian) for Dieldrin were used as surrogates because the SLVs are based on bioaccumulation and are more conservative than the DEQ Level II Endrin SLV, which does not take into account bioaccumulation.
[s] The lowest PRGs (avian and mammalian) for Mercury were used as surrogates because the SLVs are based on bioaccumulation and are more conservative than the DEQ Level II Mercury SLV, which does not take into account bioaccumulation.

Table J-5a - Ecological Soil SLVs by Receptor
Bradford Island, Upland Operable Unit
(4 of 4)

Analyte	CAS #	Candidate Ecological Soil Screening Level Values (mg/kg)																									
		Plants							Invertebrates							Birds						Mammals					
		USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Plant ORNL[an]	USEPA TRVs[aq]	Heirarchical SLV[ar] with Surrogates	Site-Specific Reference UPL	Selected Plant SLV	USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Inverte-brate ORNL[ao]	USEPA TRVs[aq]	Heirarchical SLV[ar] with Surrogates	Site-Specific Reference UPL	Selected Invert SLV	USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Avian ORNL PRG[ap]	Heirarchical SLV[ar] with Surrogates	Site-Specific Reference UPL	Selected Avian SLV	USEPA Eco SSL[t-al]	DEQ Level II SLV[m]	Mammal ORNL PRG[ap]	Heirarchical SLV[ar] with Surrogates	Site-Specific Reference UPL	Selected Mammalian SLV

[t] USEPA 2005. Ecological Soil Screening Levels for Antimony. Interim Final. February. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-61.
[u] USEPA 2005. Ecological Soil Screening Levels for Arsenic. Interim Final. March. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-62.
[v] USEPA 2005. Ecological Soil Screening Levels for Barium. Interim Final. February. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7- 63.
[w] USEPA 2005. Ecological Soil Screening Levels for Beryllium. Interim Final. February. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7- 64.
[x] USEPA 2005. Ecological Soil Screening Levels for Cadmium. Interim Final. March. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-65.
[y] USEPA 2005. Ecological Soil Screening Levels for Chromium. Interim Final. March. Revised April 2008. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7- 66.
[z] USEPA 2005. Ecological Soil Screening Levels for Cobalt. Interim Final. March. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-67.
[aa] USEPA 2006. Ecological Soil Screening Levels for Copper. Interim Final. July. Revised February 2007. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-68.
[ab] USEPA 2005. Ecological Soil Screening Levels for Dieldrin. Interim Final. March. Revised April 2007. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-56.
[ac] USEPA 2007. Ecological Soil Screening Levels for DDT and Metabolites. April. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-57.
[ad] USEPA 2005. Ecological Soil Screening Levels for Lead. Interim Final. March. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-70.
[ae] USEPA 2007. Ecological Soil Screening Levels for Manganese Interim Final. April. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-71.
[af] USEPA 2007. Ecological Soil Screening Levels for Nickel. Interim Final. March. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-76.
[ag] USEPA 2007. Ecological Soil Screening Levels for Polycyclic Aromatic Hydrocarbons (PAHs). June. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-78.
[ah] USEPA 2005. Ecological Soil Screening Levels for Pentachlorophenol. Interim Final. March. Revised April 2007. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-58.
[ai] USEPA 2007. Ecological Soil Screening Levels for Selenium. Interim Final. July. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72.
[aj] USEPA 2006. Ecological Soil Screening Levels for Silver. Interim Final. September U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-77.
[ak] USEPA 2005. Ecological Soil Screening Levels for Vanadium. Interim Final. April. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-75.
[al] USEPA 2007. Ecological Soil Screening Levels for Zinc. Interim Final. June. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-73.
[am] DEQ 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001
[an] Efroymson RA, ME Wil, GW Suter II, and AC Wooten. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. ORNL. ES/ER/TM-85/R3.
[ao] Efroymson RA, ME Will, and GW Suter II. 1997. Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process:1997 Revision. November. ORNL. ES/ER/TM-126/R2.
[ap] Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.
[aq] USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.
[ar] Ecological Hierarchical SLV Selection (unless otherwise noted): 1. USEPA Eco SSL, 2. DEQ Level II SLV, 3. ORNL, 4. USEPA TRV (Plants and Soil Invertebrates Only).
[as] Xylene (mixed) was used as a surogate, because there was no chemical-specific SLV.

Table J-5b - Ecological Water SLVs
Bradford Island, Upland and River Operable Units
(1 of 5)

Analyte	CAS #	Canidate Ecological Water Screening Level Values (ug/L)							
		USEPA Freshwater NRWQC [k]	DEQ Freshwater Table 33A WQC[l]	Lowest DEQ Level II SLV[m]	ORNL Tier II Chronic Value[n]	USEPA PAH FCV[o]	Canadian WQG[p]	NOAA SQuiRTs Freshwater Chronic [q]	Selected Ecological Water SLV with Surrogates[r]
1,1,1,2-Tetrachloroethane	630-20-6	-	-	186	-	-	-	-	186
1,1,1-Trichloroethane (TCA)	71-55-6	-	-	11	11	-	-	11	11
1,1,2,2-Tetrachloroethane	79-34-5	-	-	2400	610	-	-	111	2400
1,1,2-Trichloroethane	79-00-5	-	-	9400	1200	-	-	500	9400
1,1-Dichloroethane	75-34-3	-	-	47	47	-	-	47	47
1,1-Dichloroethene	75-35-4	-	-	25	25	-	-	25	25
1,2,3-Trichlorobenzene	87-61-6	-	-	-	-	-	8.0	8	8
1,2,4-Trichlorobenzene	120-82-1	-	-	110	110	-	24	24	110
1,2,4-Trimethylbenzene	95-63-6	-	-	-	-	-	-	-	7.3 [e]
1,2-Dichlorobenzene	95-50-1	-	-	14	14	-	0.7	0.7	14
1,2-Dichloroethane (EDC)	107-06-2	-	-	20000	910	-	100	100	20000
1,2-Dichloropropane	78-87-5	-	-	5700	-	-	-	5700	5700
1,3,5-Trimethylbenzene	108-67-8	-	-	-	-	-	-	-	7.3 [e]
1,3-Dichlorobenzene	541-73-1	-	-	71	71	-	150	38	71
1,3-Dichloropropane	142-28-9	-	-	-	-	-	-	-	5700
1,4-Dichlorobenzene	106-46-7	-	-	15	15	-	26	9.4	15
2,2-Dichloropropane	594-20-7	-	-	-	-	-	-	-	5700 [c]
2,3,7,8-TCDD (TEQ)	-	-	-	0.0076	-	-	-	0.00001	0.0076
2,4,5-T	93-76-5	-	-	-	-	-	-	36	36
2,4,5-Trichlorophenol	95-95-4	-	-	-	-	-	18	63	18
2,4,6-Trichlorophenol	88-06-2	-	-	970	-	-	18	4.9	970
2,4-D	94-75-7	-	-	-	-	-	-	4	4
2,4-Dichlorophenol	120-83-2	-	-	3650	-	-	0.2	11	3650
2,4-Dimethylphenol	105-67-9	-	-	42	-	-	-	100	42
2,4-Dinitrophenol	51-28-5	-	-	-	-	-	-	19	19
2,4-Dinitrotoluene	121-14-2	-	-	230	-	-	-	44	230
2,6-Dinitrotoluene	606-20-2	-	-	230	-	-	-	-	230
2-Butanone (MEK)	78-93-3	-	-	14000	14000	-	-	14000	14000
2-Chloroethylvinylether	110-75-8	-	-	4760	-	-	-	-	4760
2-Chloronaphthalene	91-58-7	-	-	32	-	-	-	0.396	32
2-Chlorophenol	95-57-8	-	-	2000	-	-	7	24	2000
2-Hexanone	591-78-6	-	-	99	99	-	-	99	99
2-Methylnaphthalene	91-57-6	-	-	-	-	72.16	-	330	72.16
2-Methylphenol	95-48-7	-	-	13	13	-	-	13	13
3,3'-Dichlorobenzidine	91-94-1	-	-	-	-	-	-	4.5	4.5
4,4'-DDD	72-54-8	-	-	0.001	0.011	-	-	0.011	0.001
4,4'-DDE	72-55-9	-	-	20	-	-	-	105	0.001
4,4'-DDT	50-29-3	0.001	0.001	0.001	0.013	-	-	0.0005	0.001
4-Bromophenyl Phenyl Ether	101-55-3	-	-	1.5	1.5	-	-	-	1.5
4-Chloroaniline	106-47-8	-	-	-	-	-	-	50	50
4-Methyl-2-pentanone (MIBK)	108-10-1	-	-	170	170	-	-	170	170
4-Nitrophenol	100-02-7	-	-	150	300	-	-	60	150
Acenaphthene	83-32-9	-	-	520	-	55.85	5.8	5.8	55.85 [t]
Acenapthylene	208-96-8	-	-	-	-	306.9	-	4840	306.9
Acetone	67-64-1	-	-	1500	1500	-	-	1500	1500
Aldrin	309-00-2	-	-	0.06	-	-	-	0.017	0.06
Aniline	62-53-3	-	-	-	-	-	-	2.2	2.2

Table J-5b - Ecological Water SLVs
Bradford Island, Upland and River Operable Units
(2 of 5)

Analyte	CAS #	Canidate Ecological Water Screening Level Values (ug/L)							
		USEPA Freshwater NRWQC [k]	DEQ Freshwater Table 33A WQC[l]	Lowest DEQ Level II SLV[m]	ORNL Tier II Chronic Value[n]	USEPA PAH FCV[o]	Canadian WQG[p]	NOAA SQuiRTs Freshwater Chronic [q]	Selected Ecological Water SLV with Surrogates[r]
Anthracene	120-12-7	-	-	13	0.73	20.73	0.012	0.012	13
Aroclor 1016	12674-11-2	-	-	13000	-	-	-	-	0.014 [j]
Aroclor 1221	11104-28-2	-	-	0.28	0.28	-	-	-	0.014 [j]
Aroclor 1232	11141-16-5	-	-	0.58	0.58	-	-	-	0.014 [j]
Aroclor 1242	53469-21-9	-	-	0.053	0.053	-	-	-	0.014 [j]
Aroclor 1248	12672-29-6	-	-	0.081	0.081	-	-	-	0.014 [j]
Aroclor 1254	11097-69-1	-	-	0.033	0.033	-	-	-	0.014 [j]
Aroclor 1260	11096-82-5	-	-	94	94	-	-	-	0.014 [j]
Benzene	71-43-2	-	-	130	130	-	370	46	130
Benzidine	92-87-5	-	-	3.9	3.9	-	-	3.9	3.9
Benzo(a)anthracene	56-55-3	-	-	0.027	0.027	2.227	0.018	0.027	0.027
Benzo(a)pyrene	50-32-8	-	-	0.014	0.014	0.9573	0.015	0.014	0.014
Benzo(b)fluoranthene	205-99-2	-	-	-	-	0.6774	-	9.07	0.6774
Benzo(g,h,i)perylene	191-24-2	-	-	-	-	0.4391	-	7.64	0.4391
Benzo(j,k)flouranthenes	205-82-3 & 207-08-9	-	-	-	-	-	-	-	0.014 [a]
Benzo(k)fluoranthene	207-08-9	-	-	-	-	0.6415	-	-	0.6415
Benzofluoranthenes, Total	56832-73-6	-	-	-	-	-	-	-	0.014 [a]
Benzoic Acid	65-85-0	-	-	42	42	-	-	42	42
Benzyl Alcohol	100-51-6	-	-	8.6	8.6	-	-	8.6	8.6
BHC (alpha)	319-84-6	-	-	2.2	2.2	-	-	2.2	2.2
BHC (beta)	319-85-7	-	-	2.2	2.2	-	-	0.495	2.2
BHC (delta)	319-86-8	-	-	-	2.2	-	-	2.2	2.2
BHC (gamma) Lindane	58-89-9	-	0.08	0.08	-	-	0.01	0.08	0.08
Bis(2-chloroethyl) Ether	111-44-4	-	-	-	-	-	-	1900	1900
Bis(2-ethylhexyl) Phthalate	117-81-7	-	-	3	3.0	-	-	0.3	3
Bromoform	75-25-2	-	-	-	-	-	-	320	320
Bromomethane	74-83-9	-	-	-	-	-	-	16	16
Butyl Benzyl Phthalate	85-68-7	-	-	19	19	-	-	19	19
Carbon Disulfide	75-15-0	-	-	0.92	0.92	-	-	0.92	0.92
Carbon Tetrachloride	56-23-5	-	-	74	9.8	-	13.3	9.8	74
Chlordane (alpha)	5103-71-9	-	-	0.0043	-	-	-	-	0.0043 [g]
Chlordane (gamma)	5103-74-2	-	-	0.0043	-	-	-	-	0.0043 [g]
Chlordane (technical)	12789-03-6	-	-	0.0043	-	-	-	-	0.0043 [g]
Chlorobenzene	108-90-7	-	-	50	64	-	-	1.3	50
Chloroform	67-66-3	-	-	1240	28	-	1.8	1.8	1240
Chrysene	218-01-9	-	-	-	-	2.042	-	-	2.042
cis-1,2-Dichloroethene	156-59-2	-	-	590	-	-	-	590	590
cis-1,3-Dichloropropene	10061-01-5	-	-	-	-	-	-	<0.055	0.055
Dibenz(a,h)anthracene	53-70-3	-	-	-	-	0.2825	-	-	0.2825
Dibenzofuran	132-64-9	-	-	3.7	3.7	-	-	3.7	3.7
Dibutyltin	1002-53-5	-	-	-	-	-	-	-	0.063 [f]
Dicamba	1918-00-9	-	-	-	-	-	10	10	10
Dichloromethane (Methylene Chloride)	75-09-2	-	-	2200	2200	-	98.1	98.1	2200
Dichlorprop	120-36-5	-	-	-	-	-	-	-	4 [i]
Dieldrin	60-57-1	0.056	-	0.056	-	-	-	0.056	0.056
Diethyl Phthalate	84-66-2	-	-	210	210	-	-	110	210
Dimethyl Phthalate	131-11-3	-	-	3	-	-	-	3	3

Table J-5b - Ecological Water SLVs
Bradford Island, Upland and River Operable Units
(3 of 5)

Analyte	CAS #	Canidate Ecological Water Screening Level Values (ug/L)							
		USEPA Freshwater NRWQC [k]	DEQ Freshwater Table 33A WQC[l]	Lowest DEQ Level II SLV[m]	ORNL Tier II Chronic Value[n]	USEPA PAH FCV[o]	Canadian WQG[p]	NOAA SQuiRTs Freshwater Chronic [q]	Selected Ecological Water SLV with Surrogates[r]
Di-n-butyl Phthalate	84-74-2	-	-	35	35	-	19	9.7	35
Di-n-octyl Phthalate	117-84-0	-	-	708	-	-	-	3	708
Dinoseb	88-85-7	-	-	-	-	-	0.05	0.05	0.05
Endosulfan I	959-98-8	0.056	0.056	-	0.051	-	0.02	0.028	0.056
Endosulfan II	33213-65-9	0.056	0.056	-	0.051	-	0.02	0.028	0.056
Endosulfan Sulfate	1031-07-8	-	-	-	0.051	-	0.02	2.22	0.051
Endrin	72-20-8	0.036	-	0.036	-	-	-	0.036	0.036
Endrin Aldehyde	7421-93-4	-	-	-	-	-	-	0.15	0.15
Ethylbenzene	100-41-4	-	-	7.3	7.3	-	90	7.3	7.3
Fluoranthene	206-44-0	-	-	6.16	-	7.109	0.04	0.04	6.16
Fluorene	86-73-7	-	-	3.9	3.9	39.3	3	3.9	3.9
Heptachlor	76-44-8	0.0038	0.0038	0.0038	0.0069	-	-	0.0019	0.0038
Heptachlor Epoxide	1024-57-3	0.0038	0.0038	0.0038	-	-	-	0.0019	0.0038
Hexachlorobenzene	118-74-1	-	-	-	-	-	-	0.0003	0.0003
Hexachlorobutadiene	87-68-3	-	-	9.3	-	-	1.3	0.053	9.3
Hexachlorocyclopentadiene	77-47-4	-	-	5.2	-	-	-	5.2	5.2
Hexachloroethane	67-72-1	-	-	540	12	-	-	8	540
Indeno(1,2,3-cd)pyrene	193-39-5	-	-	-	-	0.275	-	4.31	0.275
Isophorone	78-59-1	-	-	2340	-	-	-	920	2340
Isopropylbenzene	98-82-8	-	-	-	-	-	-	-	7.3 [e]
m,p-Xylenes	179601-23-1	-	-	13	13	-	-	-	13 [b]
MCPA	94-74-6	-	-	-	-	-	2.6	2.6	2.6
Methoxychlor	72-43-5	-	0.03	0.03	0.019	-	-	0.03	0.03
Monobutyltin	78763-54-9	-	-	-	-	-	-	-	0.063 [f]
Naphthalene	91-20-3	-	-	620	12	193.5	1.1	1.1	193.5 [t]
Nitrobenzene	98-95-3	-	-	540	-	-	-	220	540
N-Nitrosodimethylamine	62-75-9	-	-	117	-	-	-	-	117
N-Nitrosodi-n-propylamine	621-64-7	-	-	117	-	-	-	-	117
N-Nitrosodiphenylamine	86-30-6	-	-	210	210	-	-	210	210
n-Propylbenzene	103-65-1	-	-	-	-	-	-	-	7.3 [e]
o-Xylene	95-47-6	-	-	-	-	-	-	350	350
p-cresol (4-Methylphenol)	106-44-5	-	-	-	-	-	-	-	13 [d]
Pentachlorophenol	87-86-5	15	-	15	-	-	0.5	15	15
Phenanthrene	85-01-8	-	-	6.3	-	19.13	0.4	3.6	6.3
Phenol	108-95-2	-	-	110	-	-	4	180	110
Pyrene	129-00-0	-	-	-	-	10.11	0.025	0.025	10.11
Styrene	100-42-5	-	-	-	-	-	72	32	72
Tetrabutyltin	1461-25-2	-	-	-	-	-	-	-	0.063 [f]
Tetrachloroethene (PCE)	127-18-4	-	-	840	98	-	111	45	840
Toluene	108-88-3	-	-	9.8	9.8	-	2	2	9.8
Total PCBs	1336-36-3	0.014	0.014	0.014	0.14	-	-	0.014	0.014
Toxaphene	8001-35-2	0.002	0.0002	0.0002	-	-	-	0.0002	0.002
trans-1,2-Dichloroethene	156-60-5	-	-	590	-	-	-	1160	590
trans-1,3-Dichloropropene	10061-02-6	-	-	-	-	-	-	<0.055	0.055
Tributyltin	688-73-3	-	-	0.063	-	-	0.008	-	0.063
Trichloroethylene (TCE)	79-01-6	-	-	3000	47	-	21	<21	3000
Vinyl Acetate	108-05-4	-	-	16	16	-	-	16	16

Table J-5b - Ecological Water SLVs
Bradford Island, Upland and River Operable Units
(4 of 5)

Analyte	CAS #	Canidate Ecological Water Screening Level Values (ug/L)							
		USEPA Freshwater NRWQC [k]	DEQ Freshwater Table 33A WQC[l]	Lowest DEQ Level II SLV[m]	ORNL Tier II Chronic Value[n]	USEPA PAH FCV[o]	Canadian WQG[p]	NOAA SQuiRTs Freshwater Chronic [q]	Selected Ecological Water SLV with Surrogates[r]
Vinyl Chloride	75-01-4	-	-	1300	-	-	-	930	1300
Chloride	16887-00-6	-	230000	-	-	-	-	-	230000
Cyanide (Hydrogen Cyanide)	74-90-8	5.2	5.2	5.2	-	-	5	5.2	5.2
Nitrate as Nitrogen	14797-55-8	-	-	-	-	-	13000	-	13000
Aluminum (Soluble)	7429-90-5	-	-	87	-	-	5-100	87	87
Antimony	7440-36-0	-	-	1000	30	-	-	30	1000
Arsenic	7440-38-2	150	-	150	-	-	5	150	150
Barium	7440-39-3	-	-	4	4	-	-	3.9	4
Beryllium	7440-41-7	-	-	5.3	0.66	-	-	0.66	5.3
Cadmium	7440-43-9	0.25	-	2.2	-	-	0.017	0.25	0.17 [s]
Calcium	7440-70-2	-	-	116000	-	-	-	-	116000
Chromium	7440-47-3	-	-	74	-	-	8.9	74	49 [h,s]
Cobalt	7440-48-4	-	-	23	23	-	-	3	23
Copper	7440-50-8	9	-	9	-	-	2-4	9	5.8 [s]
Iron	7439-89-6	-	1000	1000	-	-	300	1000	1000
Lead	7439-92-1	2.5	-	2.5	-	-	1-7	2.5	1.44 [s]
Magnesium	7439-95-4	-	-	82000	-	-	-	-	82000
Manganese	7439-96-5	-	-	120	120	-	-	80	120
Mercury	7439-97-6	0.77	0.012	0.77	1.3	-	0.026, 0.004	0.77	0.77
Nickel	7440-02-0	52	-	52	-	-	25-150	52	34 [s]
Potassium	7440-09-7	-	-	53000	-	-	-	-	53000
Selenium	7782-49-2	5	-	5	-	-	1	5	5
Silver	7440-22-4	-	-	0.12	0.36	-	0.1	0.36	0.12
Sodium	7440-23-5	-	-	680000	-	-	-	-	680000
Thallium	7440-28-0	-	-	40	12	-	0.8	0.03	40
Vanadium	7440-62-2	-	-	20	20	-	-	19	20
Zinc	7440-66-6	120	-	120	-	-	30	120	77 [s]

Only analytes with one or more candidate SLVs is shown on this table. For the full list of analytes, see Appendix J-1.
- = No benchmark available or available benchmark not needed, based on hierarchy of sources
DEQ = Oregon Department of Environmental Quality
USEPA = US Environmental Protection Agency
ug/L = microgram per liter
HPAH = High Molecular Weight PAH
HPAHs include : Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(j,k)flouranthenes, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, and Pyrene.
LPAH = Low Molecular Weight PAH
LPAHs include: 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Fluorene, Naphthalene, and Phenanthrene.
NOAA = National Oceanic and Atmospheric Administration
NRWQC = National Recommended Water Quality Criteria
ORNL = Oak Ridge National Laboratory
PAH = Polycyclic aromatic hydrocarbon
SLV = Screening Level Value
SQuiRTs = Screening Quick Reference Tables
WQG = Water Quality Guidelines

[a] Benzo(a)pyrene was used as a surrogate because there was no chemical-specific SLV, and benzo(a)pyrene had the lowest SLV of the high-molecular-weight PAHs.

Table J-5b - Ecological Water SLVs
Bradford Island, Upland and River Operable Units
(5 of 5)

Analyte	CAS #	Canidate Ecological Water Screening Level Values (ug/L)							
		USEPA Freshwater NRWQC [k]	DEQ Freshwater Table 33A WQC[l]	Lowest DEQ Level II SLV[m]	ORNL Tier II Chronic Value[n]	USEPA PAH FCV[o]	Canadian WQG[p]	NOAA SQuiRTs Freshwater Chronic [q]	Selected Ecological Water SLV with Surrogates[r]

[b] Xylene (mixed) was used as a surrogate because there was no chemical specific SLV.
[c] 1,2- Dichloropropane was used as a surrogate because there was no chemical specific SLV.
[d] 2- Methylphenol was used as a surrogate because there was no chemical specific SLV.
[e] Ethylbenzene was used as a surrogate because there was no chemical specific SLV.
[f] Tributyltin was used as a surrogate because there was no chemical specific SLV.
[g] Chlordane (CAS # 57749) was used as a surrogate because there was no chemical specific SLV.
[h] Chromium (III) was used as a surrogate because there was no chemical specific SLV.
[i] 2,4-D was used as a surrogate because there was no chemical specific SLV.
[j] Total PCBs was used as a surrogate because the SLV is more conservative than the individual aroclor SLVs.
[k] USEPA 2009. National Recommended Water Quality Criteria. Office of Water and Office of Science and Technology.
[l] DEQ. Water Quality Criteria for freshwater organisms (Oregon Administrative rules, section 340-041, Table 33A).
[m] Oregon Department of Environmental Quality (ODEQ) 1998. Updated 2001. Guidance for Ecological risk Assessment: Levels I,II,III,IV. Waste Management and Cleanup Division.
[n] Suter GW II, and CL Tsao. 1996. Toxicological Benchmarks for Screening of Potential Contaminants of Concern for Effects on Aquatic Biota on Oak Ridge Reservation: 1996 Revision. ORNL, Oak Ridge, TN. 104pp. ES/ER/TM-96/R2.
[o] USEPA 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. November. EPA-600-R-02-013
[p] Canadian Council of Resource and Environment Ministers. 2007. Canadian Water Quality Guidelines for the Protection of Aquatic Life. December Accessed on 1/20/10 at http://ceqg-rcqe.ccme.ca/.
[q] Buchman, M.F., 2008. NOAA Screening Quick Reference Tables, NOAA OR&R Report 08-1, Seattle WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration, 34 pages.
[r] Ecological Hierarchical SLV Selection: 1. USEPA Freshwater NAWQC, 2. ODEQ Freshwater Table 33A WQC, 3. DEQ Level II SLVs (lowest), 4. ORNL Tier II Value, 5. USEPA PAH FCV, 6. Canadian Freshwater WQG, 7. NOAA SQuiRTs Freshwater Chronic.
[s] As per EPA guidance, certain NRWQC were adjusted for hardness based on a site-specific hardness value of 60 mg/L (minimum value of 54 mg/L and maximum value of 64 mg/L). The equation and input parameters for calculating hardness-dependent freshwater dissolved metals criteria (i.e., Criteria Continuous Concentrations) presented in Appendix B of the NRWQC document were applied (EPA 2009) .

[t] For these two PAHs, the ecological SLV hierarchy presented in footnote "r" was not followed. As per the response to DEQ's Specific Comment #26 (see Appendix P), EPA's FCVs were used instead (EPA 2003).

Table J-5c - Ecological Sediment SLVs by Receptor
Bradford Island, Upland and River Operable Units
(1 of 3)

Analyte	CAS #	Sediment Screening Levels (mg/kg)												
			Benthic Community		Freshwater Fish		Birds				Mammals			
		Site-Specific Reference UPL[i]	DEQ Level II SLV [j]	Selected SLV with Surrogates[l]	DEQ Bioaccumulation SLV [k]	Selected SLV with Surrogates[l]	DEQ Bioaccumulation SLV [k]		Selected SLV with Surrogates[l]		DEQ Bioaccumulation SLV [k]		Selected SLV with Surrogates[l]	
							Individual	Population	Individual	Population	Individual	Population	Individual	Population
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	-	-	-	0.0032	0.0032	0.000008	0.00004	0.000008	0.00004	0.0003	0.0081	0.0003	0.0081
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	-	-	-	0.00065	0.00065	0.000004	0.00002	0.000004	0.00002	0.000098	0.0027	0.000098	0.0027
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	-	-	-	0.062	0.062	0.0039	0.019	0.0039	0.019	0.00094	0.026	0.00094	0.026
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	-	-	-	0.065	0.065	0.04	0.2	0.04	0.2	0.00098	0.027	0.00098	0.027
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	-	-	-	0.079	0.079	0.049	0.24	0.049	0.24	0.0012	0.033	0.0012	0.033
2,3',4,4',5'-Pentachlorobiphenyl	65510-44-3	-	-	-	0.079	0.079	0.049	0.24	0.049	0.24	0.0012	0.033	0.0012	0.033
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	-	-	-	0.000062	0.000062	0.0000039	0.000019	0.0000039	0.000019	0.00000028	0.0000078	0.00000028	0.0000078
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	-	-	-	0.079	0.079	0.0049	0.024	0.0049	0.024	0.0012	0.033	0.0012	0.033
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	-	-	-	0.079	0.079	0.0049	0.024	0.0049	0.024	0.0012	0.033	0.0012	0.033
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	-	-	-	0.079	0.079	0.049	0.24	0.049	0.24	0.0012	0.033	0.0012	0.033
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	-	-	-	0.079	0.079	0.00049	0.0024	0.00049	0.0024	0.0000012	0.000033	0.0000012	0.000033
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	-	-	-	0.43	0.43	0.27	1.4	0.27	1.4	0.0066	0.18	0.0066	0.18
2,3,7,8-TCDD (TEQ)	-	-	0.009	0.009	0.00000056	0.00000056	0.0000017	0.0000035	0.0000017	0.0000035	0.000000052	0.0000014	0.000000052	0.0000014
4,4'-DDD	72-54-8	-	0.004	0.004	0.00039	0.00039 [f]	9.50E-05	3.40E-04	0.000095 [f]	0.00034 [f]	0.0049	0.024	0.0049 [f]	0.024 [f]
4,4'-DDE	72-55-9	-	0.0015	0.0015	0.00039	0.00039 [f]	9.50E-05	3.40E-04	0.000095 [f]	0.00034 [f]	0.0049	0.024	0.0049 [f]	0.024 [f]
4,4'-DDT	50-29-3	-	0.004	0.004	0.00039	0.00039 [f]	9.50E-05	3.40E-04	0.000095 [f]	0.00034 [f]	0.0049	0.024	0.0049 [f]	0.024 [f]
Acenaphthene	83-32-9	-	0.29	0.29	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	208-96-8	-	0.16	0.16	-	-	-	-	-	-	-	-	-	-
Aldrin	309-00-2	-	0.04	0.04	-	-	-	-	-	-	-	-	-	-
Aluminum	7429-90-5	38000	-	38000	-	38000	-	-	38000	38000	-	-	38000	38000
Anthracene	120-12-7	-	0.057	0.057	-	-	-	-	-	-	-	-	-	-
Antimony	7440-36-0	0.427	3	3	-	0.427	-	-	0.427	0.427	-	-	0.427	0.427
Aroclor 1016	12674-11-2	-	-	0.007 [h]	-	0.022 [c]	-	-	0.0018 [c]	0.091 [c]	-	-	0.044 [c]	0.084 [c]
Aroclor 1221	11104-28-2	-	-	0.007 [h]	-	0.022 [c]	-	-	0.0018 [c]	0.091 [c]	-	-	0.044 [c]	0.084 [c]
Aroclor 1232	11141-16-5	-	-	0.007 [h]	-	0.022 [c]	-	-	0.0018 [c]	0.091 [c]	-	-	0.044 [c]	0.084 [c]
Aroclor 1242	53469-21-9	-	-	0.007 [h]	-	0.022 [c]	-	-	0.0018 [c]	0.091 [c]	-	-	0.044 [c]	0.084 [c]
Aroclor 1248	12672-29-6	-	0.021	0.021	-	0.022 [c]	-	-	0.0018 [c]	0.091 [c]	-	-	0.044 [c]	0.084 [c]
Aroclor 1254	11097-69-1	-	0.007	0.007	-	0.022 [c]	-	-	0.0018 [c]	0.091 [c]	-	-	0.044 [c]	0.084 [c]
Aroclor 1260	11096-82-5	-	-	0.007 [h]	-	0.022 [c]	-	-	0.0018 [c]	0.091 [c]	-	-	0.044 [c]	0.084 [c]
Aroclor 1262	37324-23-5	-	-	0.007 [h]	-	0.022 [c]	-	-	0.0018 [c]	0.091 [c]	-	-	0.044 [c]	0.084 [c]
Aroclor 1268	11100-14-4	-	-	0.007 [h]	-	0.022 [c]	-	-	0.0018 [c]	0.091 [c]	-	-	0.044 [c]	0.084 [c]
Arsenic	7440-38-2	5.86	6	6	-	5.86	-	-	5.86	5.86	-	-	5.86	5.86
Barium	7440-39-3	315	-	315	-	315	-	-	315	315	-	-	315	315
Benzo(a)anthracene	56-55-3	-	0.032	0.032	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	50-32-8	-	0.032	0.032	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	205-99-2	-	-	0.027 [a]	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	191-24-2	-	0.3	0.3	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	207-08-9	-	0.027	0.027	-	-	-	-	-	-	-	-	-	-
Benzofluoranthenes, Total	56832-73-6	-	-	0.027 [a]	-	-	-	-	-	-	-	-	-	-
Beryllium	7440-41-7	0.847	-	0.847	-	0.847	-	-	0.847	0.847	-	-	0.847	0.847
BHC (alpha)	319-84-6	-	-	0.0009 [e]	-	-	-	-	-	-	-	-	-	-
BHC (beta)	319-85-7	-	-	0.0009 [e]	-	-	-	-	-	-	-	-	-	-
BHC (delta)	319-86-8	-	-	0.0009 [e]	-	-	-	-	-	-	-	-	-	-
BHC (gamma) Lindane	58-89-9	-	0.0009	0.0009	-	-	-	-	-	-	-	-	-	-
Bis(2-ethylhexyl) Phthalate	117-81-7	-	0.75	0.75	-	-	-	-	-	-	-	-	-	-
Butyl Benzyl Phthalate	85-68-7	-	-	0.11 [b]	-	-	-	-	-	-	-	-	-	-
Cadmium	7440-43-9	0.674	0.6	0.674	-	0.674	-	-	0.674	0.674	-	-	0.674	0.674

Table J-5c - Ecological Sediment SLVs by Receptor
Bradford Island, Upland and River Operable Units
(2 of 3)

Analyte	CAS #	Sediment Screening Levels (mg/kg)												
		Site-Specific Reference UPL[i]	Benthic Community		Freshwater Fish		Birds				Mammals			
			DEQ Level II SLV [j]	Selected SLV with Surrogates[l]	DEQ Bioaccumulation SLV [k]	Selected SLV with Surrogates[l]	DEQ Bioaccumulation SLV [k]		Selected SLV with Surrogates[l]		DEQ Bioaccumulation SLV [k]		Selected SLV with Surrogates[l]	
							Individual	Population	Individual	Population	Individual	Population	Individual	Population
Carbazole	86-74-8	-	0.14	0.14	-	-	-	-	-	-	-	-	-	-
Chlordane (alpha)	5103-71-9	-	-	0.0045 [d]	-	0.0005 [d]	-	-	0.01 [d]	0.051 [d]	-	-	0.028 [d]	0.056 [d]
Chlordane (gamma)	5103-74-2	-	-	0.0045 [d]	-	0.0005 [d]	-	-	0.01 [d]	0.051 [d]	-	-	0.028 [d]	0.056 [d]
Chlordane (technical)	12789-03-6	-	0.0045	0.0045	0.00050	0.0005	0.010	0.051	0.01	0.051	0.028	0.056	0.028	0.056
Chromium	7440-47-3	28.0	37	37	-	28	-	-	28	28	-	-	28	28
Chrysene	218-01-9	-	0.057	0.057	-	-	-	-	-	-	-	-	-	-
Cobalt	7440-48-4	15.2	-	15.2	-	15.2	-	-	15.2	15.2	-	-	15.2	15.2
Copper	7440-50-8	55.6	36	55.6	-	55.6	-	-	55.6	55.6	-	-	55.6	55.6
Dibenz(a,h)anthracene	53-70-3	-	0.033	0.033	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	132-64-9	-	5.1	5.1	-	-	-	-	-	-	-	-	-	-
Dieldrin	60-57-1	-	0.003	0.003	0.0022	0.0022	0.00037	0.0018	0.00037	0.0018	0.0012	0.0061	0.0012	0.0061
Diethyl Phthalate	84-66-2	-	-	0.11 [b]	-	-	-	-	-	-	-	-	-	-
Dimethyl Phthalate	131-11-3	-	-	0.11 [b]	-	-	-	-	-	-	-	-	-	-
Di-n-butyl Phthalate	84-74-2	-	0.11	0.11	-	-	-	-	-	-	-	-	-	-
Di-n-octyl Phthalate	117-84-0	-	-	0.11 [b]	-	-	-	-	-	-	-	-	-	-
Endrin	72-20-8	-	0.003	0.003	-	-	-	-	-	-	-	-	-	-
Fluoranthene	206-44-0	-	0.111	0.111	37	37	-	-	-	-	360	1,800	360	1800
Fluorene	86-73-7	-	0.077	0.077	-	-	-	-	-	-	-	-	-	-
Heptachlor	76-44-8	-	0.01	0.01	-	-	-	-	-	-	-	-	-	-
Heptachlor Epoxide	1024-57-3	-	0.0006	0.0006	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	118-74-1	-	0.1	0.1	61	61	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	193-39-5	-	0.017	0.017	-	-	-	-	-	-	-	-	-	-
Lead	7439-92-1	14.5	35	35	-	14.5	-	-	14.5	14.5	-	-	14.5	14.5
Manganese	7439-96-5	-	1100	1100	-	-	-	-	-	-	-	-	-	-
Mercury	7439-97-6	0.214	0.2	0.214	-	0.214	-	-	0.214	0.214	-	-	0.214	0.214
Naphthalene	91-20-3	-	0.176	0.176	-	-	-	-	-	-	-	-	-	-
Nickel	7440-02-0	21.2	18	21.2	-	21.2	-	-	21.2	21.2	-	-	21.2	21.2
p-cresol (4-Methylphenol)	106-44-5	-	-	0.048 [g]	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	87-86-5	-	-	-	0.31	0.31	-	-	-	-	0.33	3.3	0.33	3.3
Phenanthrene	85-01-8	-	0.042	0.042	-	-	-	-	-	-	-	-	-	-
Phenol	108-95-2	-	0.048	0.048	-	-	-	-	-	-	-	-	-	-
Total DDTs		-	0.007	0.007	0.00039	0.00039	0.000095	0.00034	0.000095	0.00034	0.0049	0.024	0.0049	0.024
Total Polychlorinated biphenyl (PCB)	1336-36-3	-	0.034	0.034	0.022	0.022	0.0018	0.091	0.0018	0.091	0.044	0.084	0.044	0.084
Total PAH		-	1.61	1.61	-	-	-	-	-	-	-	-	-	-
Total LPAH		-	0.076	0.076	-	-	-	-	-	-	-	-	-	-
Total HPAH		-	0.193	0.193	-	-	-	-	-	-	-	-	-	-
Pyrene	129-00-0	-	0.053	0.053	1.9	1.9	-	-	-	-	18000	90,000	18000	90000
Silver	7440-22-4	-	4.5	4.5	-	-	-	-	-	-	-	-	-	-
Thallium	7440-28-0	0.354	-	0.354	-	0.354	-	-	0.354	0.354	-	-	0.354	0.354
Tributyltin	688-73-3	-	-	-	0.0023	0.0023	1.6	4.1	1.6	4.1	0.73	1.1	0.73	1.1
Vanadium	7440-62-2	70.6	-	70.6	-	70.6	-	-	70.6	70.6	-	-	70.6	70.6
Zinc	7440-66-6	106	123	123	-	106	-	-	106	106	-	-	106	106

Note

Only analytes with one or more candidate SLVs is shown on this table. For the full list of analytes, see Appendix J-1.

- = No benchmark available

DEQ = Oregon Department of Environmental Quality

Eco = ecological

Table J-5c - Ecological Sediment SLVs by Receptor
Bradford Island, Upland and River Operable Units
(3 of 3)

Analyte	CAS #	Sediment Screening Levels (mg/kg)												
		Site-Specific Reference UPL[i]	Benthic Community		Freshwater Fish		Birds				Mammals			
			DEQ Level II SLV [j]	Selected SLV with Surrogates[l]	DEQ Bioaccumulation SLV [k]	Selected SLV with Surrogates[l]	DEQ Bioaccumulation SLV [k]		Selected SLV with Surrogates[l]		DEQ Bioaccumulation SLV [k]		Selected SLV with Surrogates[l]	
							Individual	Population	Individual	Population	Individual	Population	Individual	Population

HH = human health
HPAH = High Molecular Weight PAH
HPAHs include : Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(j,k)flouranthenes, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, and Pyrene.
LPAH = Low Molecular Weight PAH
LPAHs include: 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Fluorene, Naphthalene, and Phenanthrene.
mg/kg = milligram per kilogram
SLV = screening level value
UPL = Upper Prediction Limit

[a] Benzo(k)fluoranthene was used as a surrogate because there was no chemical specific SLV.
[b] Di-n-butyl phthalate was used as a surrogate because there was no chemical specific SLV and di-n-butyl phthalate had the lowest SLV of the phthalates.
[c] Total PCBs was used as a surrogate because there were no individual aroclor SLVs.
[d] Chlordane (technical) was used as a surrogate because there was no chemical specific SLV and chlordane (technical) was the lowest of the chlordanes.
[e] BHC (gamma) Lindane was used as a surrogate because there was no chemical specific SLV and BHC (gamma) was the lowest of the BHCs.
[f] DDT (Total) was used as a surrogate because there was no chemical specific SLVs.
[g] Phenol was used as a surrogate because there was no chemical specific SLV and phenol had the lowest SLV of the phenols.
[h] PCB1254 was used as a surrogate because the SLV was the lowest of the individual aroclor SLVs and was lower than the Total PCBs SLV.
[i] Site-Specific Reference UPLs are based are not based on toxicity values.
[j] DEQ. 1998. Updated 2001. Guidance for Ecological Risk Assessment: Levels I,II,III,IV. Waste Management and Cleanup Division.
[k] DEQ 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. April 3.
[l] For inorganics, the higher of the SLV and the Site-Specific Reference UPL was selected as the SLV.

Table J-5d - Ecological Tissue SLVs by Receptor
Bradford Island, River Operable Unit
(1 of 2)

Analyte	CAS #	Tissue Screening Levels (mg/kg wet wt.)									
		Birds				Mammals				Fish, Shellfish, and Other Aquatic Organisms	
		DEQ ATLs [a]		Selected SLV with Surrogates		DEQ ATLs [a]		Selected SLV with Surrogates		DEQ CTLs Freshwater[a]	Selected SLV with Surrogates
		Individual	Population	Individual	Population	Individual	Population	Individual	Population		
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	0.00016	0.0008	0.00016	0.0008	0.0058	0.16	0.0058	0.16	-	0.43 [b]
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	0.00008	0.0004	0.00008	0.0004	0.002	0.054	0.002	0.054	-	0.43 [b]
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	0.08	0.4	0.08	0.4	0.02	0.54	0.02	0.54	-	0.43 [b]
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	0.8	4.0	0.8	4.0	0.02	0.54	0.02	0.5	-	0.43 [b]
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	0.8	4.0	0.8	4.0	0.02	0.54	0.02	0.5	-	0.43 [b]
2,3',4,4',5'-Pentachlorobiphenyl	65510-44-3	0.8	4.0	0.8	4.0	0.02	0.54	0.02	0.5	-	0.43 [b]
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	0.00008	0.0004	0.00008	0.0004	0.0000058	0.00016	0.0000058	0.00016	-	0.43 [b]
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	0.08	0.4	0.08	0.4	0.02	0.54	0.02	0.54	-	0.43 [b]
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	0.08	0.4	0.08	0.4	0.02	0.54	0.02	0.54	-	0.43 [b]
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	0.8	4.0	0.8	4.0	0.02	0.54	0.02	0.5	-	0.43 [b]
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	0.008	0.04	0.008	0.04	0.00002	0.00054	0.00002	0.00054	-	0.43 [b]
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	0.8	4.0	0.8	4.0	0.02	0.54	0.02	0.5	-	0.43 [b]
2,3,7,8-TCDD (TEQ)	-	0.000019	0.00004	0.000019	0.00004	0.00000058	0.000016	0.00000058	0.000016	0.0000064	0.0000064
Acenaphthene	83-32-9	-	-	-	-	-	-	190 [c]	950 [c]	-	19 [c]
Acenaphthylene	208-96-8	-	-	-	-	-	-	190 [c]	950 [c]	-	19 [c]
Anthracene	120-12-7	-	-	-	-	-	-	190 [c]	950 [c]	-	19 [c]
Aroclor 1016	12674-11-2	-	-	0.035 [b]	1.8 [b]	-	-	0.88 [b]	1.7 [b]	-	0.43 [b]
Aroclor 1221	11104-28-2	-	-	0.035 [b]	1.8 [b]	-	-	0.88 [b]	1.7 [b]	-	0.43 [b]
Aroclor 1232	11141-16-5	-	-	0.035 [b]	1.8 [b]	-	-	0.88 [b]	1.7 [b]	-	0.43 [b]
Aroclor 1242	53469-21-9	-	-	0.035 [b]	1.8 [b]	-	-	0.88 [b]	1.7 [b]	-	0.43 [b]
Aroclor 1248	12672-29-6	-	-	0.035 [b]	1.8 [b]	-	-	0.88 [b]	1.7 [b]	-	0.43 [b]
Aroclor 1254	11097-69-1	-	-	0.035 [b]	1.8 [b]	-	-	0.88 [b]	1.7 [b]	-	0.43 [b]
Aroclor 1260	11096-82-5	-	-	0.035 [b]	1.8 [b]	-	-	0.88 [b]	1.7 [b]	-	0.43 [b]
Aroclor 1262	37324-23-5	-	-	0.035 [b]	1.8 [b]	-	-	0.88 [b]	1.7 [b]	-	0.43 [b]
Aroclor 1268	11100-14-4	-	-	0.035 [b]	1.8 [b]	-	-	0.88 [b]	1.7 [b]	-	0.43 [b]
Arsenic	7440-38-2	13	64	13	64	7.6	38	7.6	38	6.6	6.6
Benz(a)anthracene	56-55-3	-	-	-	-	-	-	9500 [d]	47000 [d]	-	1 [d]
Benzo(a)pyrene	50-32-8	-	-	-	-	-	-	9500 [d]	47000 [d]	-	1 [d]
Benzo(b)fluoranthene	205-99-2	-	-	-	-	-	-	9500 [d]	47000 [d]	-	1 [d]
Benzo(g,h,i)perylene	191-24-2	-	-	-	-	-	-	9500 [d]	47000 [d]	-	1 [d]
Benzo(k)fluoranthene	207-08-9	-	-	-	-	-	-	9500 [d]	47000 [d]	-	1 [d]
Bis(2-ethylhexyl) Phthalate	117-81-7	6.26	31.3	6.26	31.3	55.5	555	55.5 [e]	555 [e]	1.76	1.76
Butyl Benzyl Phthalate	85-68-7	6.26	31.3	6.26	31.3	55.5	555	55.5 [e]	555 [e]	0.310	0.310
Cadmium	7440-43-9	8.4	42	8.4	42	5.6	28	5.6	28	0.15	0.15
Chrysene	218-01-9	-	-	-	-	-	-	9500 [d]	47000 [d]	-	1 [d]
Dibenz(a,h)anthracene	53-70-3	-	-	-	-	-	-	9500 [d]	47000 [d]	-	1 [d]
Di-n-butyl Phthalate	84-74-2	0.626	6.26	0.63	6.26	1672	5569	1672 [e]	5569 [e]	3.12	3.12
Di-n-octyl Phthalate	117-84-0	0.626	6.26	0.63	6.26	1672	5569	1672 [e]	5569 [e]	63.0	63.0
Fluoranthene	206-44-0	-	-	-	-	190	950	190	950	19	19
Fluorene	86-73-7	-	-	-	-	-	-	190 [c]	950 [c]	-	19 [c]
Indeno(1,2,3-cd)pyrene	193-39-5	-	-	-	-	-	-	9500 [d]	47000 [d]	-	1 [d]

Table J-5d - Ecological Tissue SLVs by Receptor
Bradford Island, River Operable Unit
(2 of 2)

Analyte	CAS #	Tissue Screening Levels (mg/kg wet wt.)									
		Birds				Mammals				Fish, Shellfish, and Other Aquatic Organisms	
		DEQ ATLs [a]		Selected SLV with Surrogates		DEQ ATLs [a]		Selected SLV with Surrogates		DEQ CTLs Freshwater[a]	Selected SLV with Surrogates
		Individual	Population	Individual	Population	Individual	Population	Individual	Population		
Lead	7439-92-1	9.3	46	9.3	46	34	170	34	170	0.12	0.12
Mercury	7439-97-6	0.074	0.15	0.074	0.15	0.12	0.2	0.12	0.2	0.088	0.088
Phenanthrene	85-01-8	-	-	-	-	-	-	190 [c]	950 [c]	-	19 [c]
Pyrene	129-00-0	-	-	-	-	9500	47,000	9500	47000	1	1
Selenium	7782-49-2	0.23	0.46	0.23	0.46	0.036	0.88	0.036	0.88	0.024	0.024
Total Polychlorinated biphenyl (PCB)	1336-36-3	0.035	1.8	0.035	1.8	0.88	1.7	0.88	1.7	0.43	0.43

Note

Only analytes with one or more candidate SLVs is shown on this table. For the full list of analytes, see Appendix J-1.
- = No benchmark available
ATL = Acceptable tissue level
CTL = Critical tissue level (for fish)
DEQ = Oregon Department of Environmental Quality
Eco = ecological
HH = human health
HPAH = High Molecular Weight PAH

HPAHs include : Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(j,k)flouranthenes, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, and Pyrene.
LPAH = Low Molecular Weight PAH
LPAHs include: 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Fluorene, Naphthalene, and Phenanthrene.
mg/kg = milligram per kilogram
RI = Remedial Investigation
SLV = screening level value
UPL = Upper Prediction Limit

[a] DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. April 3.
[b] Total Aroclors was used as a surrogate because there was no chemical specific SLV.
[c] The SLV for fluoranthene was selected as a surrogate because there was no chemical-specific SLV.
[d] The SLV for pyrene was selected as a surrogate because there was no chemical-specific SLV.
[e] The ATLs and CTLs were developed based on the procedures outlined in DEQ 2007 (see DEQ Appendix L-3).

Table J-6
Identification of Bioaccumulative COIs in the Upland OU
(1 of 6)

Chemicals of Interest	GW/Soil		GW		Soil			HH Bioaccumulation in GW		Eco Bioaccumulation in Soil	
	logK$_{OW}$		BCF		Earthworm BAF[1] (90th %tile)	Plant BAF[2] (90th %tile)	Small Mammal BAF[3] (90th %tile)	COI Identified as Bioaccumulative? (BCF > 300 or LogK$_{ow}$ > 3.5)	HH Bioaccumulation GW SLV?	COI Identified as Bioaccumulative? (BAF > 0.1 or LogK$_{ow}$ > 3.5)	Eco Bioaccumulation Soil SLV?[9]
INORGANICS											
Aluminum	-		500	7	NV	0.005	0.093	**Yes**	**No**	No	No
Antimony	-		100	7	NV	0.0114	NV	No	Yes	No	Mammal
Arsenic	-		300	7	0.523	1.103	0.016	**Yes**	Yes	**Yes**	Avian & Mammal
Barium	-		4.00	7	NV	0.477	0.253	No	Yes	**Yes**	Avian & Mammal
Beryllium	-		100	7	NV	NV	NV	No	No	NA	NA
Cadmium	-		200	7	40.7	3.250	7.017	No	No	**Yes**	Avian & Mammal
Calcium	-		NV		NA	NA	NA	NV	No	NA	NA
Chromium	-		200	7	3.162	0.0839	0.3490	No	No	**Yes**	Avian & Mammal
Cobalt	-		300	7	NV	0.0248	0.14	**Yes**	**No**	**Yes**	Avian & Mammal
Copper	-		200	7	1.531	0.625	1.29	No	Yes	**Yes**	Avian & Mammal
Iron	-		200	7	NA	NA	NA	No	Yes	NA	NA
Lead	-		300	7	1.522	0.468	0.339	**Yes**	**No**	**Yes**	Avian & Mammal
Magnesium	-		NV		NA	NA	NA	NV	No	NA	NA
Manganese	-		400	7	0.124	0.234	0.079	**Yes**	Yes	**Yes**	Avian & Mammal
Mercury	-		1000	7	20.6	5.00	0.192	**Yes**	**No**	**Yes**	Avian & Mammal
Nickel	-		100	7	4.730	1.411	0.5891	No	Yes	**Yes**	Avian & Mammal
Potassium	-		NV		NA	NA	NA	NV	No	NA	NA
Selenium	-		200	7	1.340	3.012	1.263	No	Yes	**Yes**	Avian & Mammal
Silver	-		4.00	7	15.338	0.0367	0.5013	No	No	**Yes**	Avian & Mammal
Sodium	-		20.0	7	NA	NA	NA	No	No	NA	NA
Thallium	-		10000	8	NV	NV	0.123	**Yes**	Yes	**Yes**	Mammal
Vanadium	-		NV		NV	0.0097	0.19	NV	No	**Yes**	Avian & Mammal
Zinc	-		1000	7	12.885	1.820	2.69	**Yes**	Yes	**Yes**	Avian & Mammal
BUTYLTINS											
Dibutyltin	1.49	4	-		-	-	-	No	No	No	No
Monobutyltin	1.23	5	-		-	-	-	No	No	No	No
Tetrabutyltin	9.37	4	-		-	-	-	**Yes**	**No**	**Yes**	**No**
Tributyltin	4.76	4	-		-	-	-	**Yes**	**No**	**Yes**	**No**
PESTICIDES											
4,4'-DDD	6.02	4	-		-	-	-	**Yes**	Yes	**Yes**	Avian & Mammal
4,4'-DDE	6.51	4	-		-	-	-	**Yes**	Yes	**Yes**	Avian & Mammal
4,4'-DDT	6.91	4	-		-	-	-	**Yes**	Yes	**Yes**	Avian & Mammal

Table J-6
Identification of Bioaccumulative COIs in the Upland OU
(2 of 6)

Chemicals of Interest	$logK_{OW}$		BCF		Earthworm BAF[1] (90th %tile)	Plant BAF[2] (90th %tile)	Small Mammal BAF[3] (90th %tile)	COI Identified as Bioaccumulative? (BCF > 300 or $LogK_{ow}$ > 3.5)	HH Bioaccumulation GW SLV?	COI Identified as Bioaccumulative? (BAF > 0.1 or $LogK_{ow}$ > 3.5)	Eco Bioaccumulation Soil SLV?[9]
Aldrin	6.50	4	-		-	-	-	**Yes**	Yes	**Yes**	Avian & Mammal
BHC (alpha)	4.14	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
BHC (beta)	4.14	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
BHC (delta)	4.14	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
BHC (gamma) Lindane	3.72	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Chlordane (alpha)	5.66	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Chlordane (gamma)	5.62	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Chlordane (technical)	6.16	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Dieldrin	5.40	4	-		-	-	-	**Yes**	Yes	**Yes**	Avian & Mammal
Endosulfan I	3.83	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Endosulfan II	5.20	6	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Endosulfan Sulfate	3.66	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Endrin	5.40	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Endrin Aldehyde	6.44	6	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Endrin Ketone	5.33	6	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Heptachlor	5.47	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Heptachlor Epoxide	4.98	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Methoxychlor	5.08	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
PCBs											
Aroclor 1248	6.20	4	-		-	-	-	**Yes**	Yes	**Yes**	Avian & Mammal
Aroclor 1254	6.50	4	-		-	-	-	**Yes**	Yes	**Yes**	Avian & Mammal
Aroclor 1260	7.55	4	-		-	-	-	**Yes**	Yes	**Yes**	Avian & Mammal
Total PCBs (Aroclors)	6.30	6	-		-	-	-	**Yes**	Yes	**Yes**	Avian & Mammal
HERBICIDES											
2,4,5-T	3.31	4	-		-	-	-	No	No	No	Surrogate
4-Nitrophenol	1.91	4	-		-	-	-	No	Yes	No	No
Dichloroprop	3.43	4	-		-	-	-	No	No	No	Surrogate
MCPP	3.13	4	-		-	-	-	No	No	No	Surrogate
VOCs											
1,1,1-Trichloroethane (TCA)	2.49	4	-		-	-	-	No	No	No	No
1,1-Dichloroethane	1.79	4	-		-	-	-	No	No	No	No
1,1-Dichloroethene	2.13	4	-		-	-	-	No	Yes	No	No
1,4-Dichlorobenzene	3.44	4	-		-	-	-	No	Yes	No	No

Table J-6
Identification of Bioaccumulative COIs in the Upland OU
(3 of 6)

Chemicals of Interest	$logK_{OW}$		BCF		Earthworm BAF[1] (90th %tile)	Plant BAF[2] (90th %tile)	Small Mammal BAF[3] (90th %tile)	COI Identified as Bioaccumulative? (BCF > 300 or $LogK_{ow}$ > 3.5)	HH Bioaccumulation GW SLV?	COI Identified as Bioaccumulative? (BAF > 0.1 or $LogK_{ow}$ > 3.5)	Eco Bioaccumulation Soil SLV?[9]
1,2,4-Trimethylbenzene	3.63	4	-		-	-	-	**Yes**	**No**	**Yes**	**No**
1,3,5-Trimethylbenzene	3.42	4	-		-	-	-	No	No	No	No
2,2-Dichloropropane	2.92	4	-		-	-	-	No	Yes	No	No
2-Butanone (MEK)	0.29	4	-		-	-	-	No	No	No	No
2-Hexanone	1.38	4	-		-	-	-	No	No	No	No
4-Isopropyltoluene	4.10	4	-		-	-	-	**Yes**	**No**	**Yes**	**No**
4-Methyl-2-pentanone (MIBK)	1.16	6	-		-	-	-	No	No	No	No
Acetone	-0.24	4	-		-	-	-	No	No	No	No
Benzene	2.13	4	-		-	-	-	No	Yes	No	No
Bromomethane	1.19	4	-		-	-	-	No	Yes	No	No
Carbon Disulfide	1.94	4	-		-	-	-	No	No	No	No
Carbon Tetrachloride	2.83	4	-		-	-	-	No	Yes	No	No
Chloroform	1.97	4	-		-	-	-	No	Yes	No	No
Chloromethane	0.91	4	-		-	-	-	No	No	No	No
cis-1,2-Dichloroethene	1.86	4	-		-	-	-	No	No	No	No
Dichlorodifluoromethane	2.16	4	-		-	-	-	No	No	No	No
Dichloromethane (Methylene Chloride)	1.25	4	-		-	-	-	No	Yes	No	No
Ethylbenzene	3.15	4	-		-	-	-	No	Yes	No	No
Isopropylbenzene	3.66	4	-		-	-	-	**Yes**	**No**	**Yes**	**No**
m,p-Xylenes	3.20	4	-		-	-	-	No	No	No	No
n-Butylbenzene	4.38	4	-		-	-	-	**Yes**	**No**	**Yes**	**No**
Naphthalene	3.30	4	-		-	-	-	No	Yes	No	Incl in tLPAH
n-Propylbenzene	3.69	4	-		-	-	-	**Yes**	**No**	**Yes**	**No**
o-Xylene	3.12	4	-		-	-	-	No	No	No	No
sec-Butylbenzene	4.57	4	-		-	-	-	**Yes**	**No**	**Yes**	**No**
Tetrachloroethene (PCE)	3.40	4	-		-	-	-	No	Yes	No	No
Toluene	2.73	4	-		-	-	-	No	Yes	No	No
trans-1,2-Dichloroethene	2.09	4	-		-	-	-	No	Yes	No	No
Trichloroethene (TCE)	2.42	4	-		-	-	-	No	Yes	No	No
Trichlorofluoromethane	2.53	4	-		-	-	-	No	No	No	No
Vinyl Chloride	1.62	6	-		-	-	-	No	Yes	No	No
SVOCs											
2-Methylphenol	1.95	4	-		-	-	-	No	Yes	No	No

Table J-6
Identification of Bioaccumulative COIs in the Upland OU
(4 of 6)

Chemicals of Interest	$logK_{OW}$		BCF		Earthworm BAF[1] (90th %tile)	Plant BAF[2] (90th %tile)	Small Mammal BAF[3] (90th %tile)	COI Identified as Bioaccumulative? (BCF > 300 or $LogK_{ow}$ > 3.5)	HH Bioaccumulation GW SLV?	COI Identified as Bioaccumulative? (BAF > 0.1 or $LogK_{ow}$ > 3.5)	Eco Bioaccumulation Soil SLV?[9]
Benzoic Acid	1.87	4	-		-	-	-	No	No	No	No
Benzyl alcohol	1.10	4	-		-	-	-	No	No	No	No
Bis(2-ethylhexyl) Phthalate	7.60	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Butyl Benzyl Phthalate	4.73	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Carbazole	3.72	4	-		-	-	-	**Yes**	**No**	**Yes**	**No**
Dibenzofuran	4.12	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Diethyl Phthalate	2.42	4	-		-	-	-	No	Yes	No	No
Dimethyl Phthalate	1.60	4	-		-	-	-	No	Yes	No	No
Di-n-butyl Phthalate	4.50	4	-		-	-	-	**Yes**	Yes	**Yes**	**No**
Di-n-octyl Phthalate	8.54	6	-		-	-	-	**Yes**	Yes	**Yes**	**No**
N-Nitrosodiphenylamine	3.16	6	-		-	-	-	No	Yes	No	No
Isophorone	1.70	4	-		-	-	-	No	Yes	No	No
p-cresol (4-Methylphenol)	1.94	4	-		-	-	-	No	No	No	No
Pentachlorophenol	5.12	4	-		-	-	-	**Yes**	Yes	**Yes**	Avian & Mammal
Phenol	1.46	4	-		-	-	-	No	Yes	No	No
PAHs											
2-Methylnaphthalene	3.86	4	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tLPAH
Acenaphthene	3.92	4	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tLPAH
Acenaphthylene	3.94	4	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tLPAH
Anthracene	4.45	4	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tLPAH
Benzo(a)anthracene	5.52	6	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tHPAH
Benzo(a)pyrene	6.13	4	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tHPAH
Benzo(b)fluoranthene	5.78	4	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tHPAH
Benzo(g,h,i)perylene	6.63	4	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tHPAH
Benzo(k)fluoranthene	6.11	4	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tHPAH
Benzofluoranthenes, Total	NV		-		-	-	-	**Yes**	Yes	**Yes**	Incl in tHPAH
Chrysene	5.81	4	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tHPAH
Dibenz(a,h)anthracene	6.75	4	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tHPAH
Fluoranthene	5.16	4	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tHPAH
Fluorene	4.18	4	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tLPAH
Indeno(1,2,3-cd)pyrene	6.70	6	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tHPAH
Naphthalene	3.30	4	-		-	-	-	No	Yes	No	Incl in tLPAH
Phenanthrene	4.46	4	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tLPAH

Table J-6
Identification of Bioaccumulative COIs in the Upland OU
(5 of 6)

Chemicals of Interest	$logK_{OW}$		BCF		Earthworm BAF[1] (90th %tile)	Plant BAF[2] (90th %tile)	Small Mammal BAF[3] (90th %tile)	COI Identified as Bioaccumulative? (BCF > 300 or $LogK_{ow}$ > 3.5)	HH Bioaccumulation GW SLV?	COI Identified as Bioaccumulative? (BAF > 0.1 or $LogK_{ow}$ > 3.5)	Eco Bioaccumulation Soil SLV?[9]
Pyrene	4.88	4	-		-	-	-	**Yes**	Yes	**Yes**	Incl in tHPAH
Total HPAHs	NV		-		-	-	-	NA	NA	**Yes**	Mammal
Total LPAHs	NV		-		-	-	-	NA	NA	**Yes**	Mammal
TPH											
Diesel Range Organics	NV		-		-	-	-	NV	No	NV	No
Gasoline Range Organics	NV		-		-	-	-	NV	No	NV	No
Residual Range Organics	NV		-		-	-	-	NV	No	NV	No

Notes:
BAF = bioaccumulation factor
BCF = bioconcentration factor
COI = chemical of interest
Eco = Ecological
GW = Groundwater
HH = Human Health
Incl in tHPAH = COI is included in the Total HPAH Screening
Incl in tLPAH = COI is included in the Total LPAH Screening
NA = Not applicable
NV = No Value
SLV = screening level value

Some metals should have BAFs calculated from regression models; however, 90th Percentile BAFs are shown for bioaccumulation decision-making.

(1) Sample, B.E., J.J. Beauchamp, R.A. Efroymson, G.W. Suter, II, and T.L. Ashwood. February 1998. Development and Validation of Bioaccumulation Models for Earthworms. Prepared for the U.S. Department of Energy. Oak Ridge National Laboratory. ES/ER/TM-220.

(2) Bechtel Jacobs Company, LLC. September 1998. Empirical Models for the Uptake of Inorganic Chemicals from Soil by Plants. Prepared for the U.S. Department of Enegry, Office of Environmental Management. BJC/OR-133.

(3) Sample, B.E., J.J. Beauchamp, R.A. Efroymson, and G.W. Suter, II. February 1998. Development and Validation of Bioaccumulation Models for Small Mammals. Prepared for the U.S. Department of Energy, Office of Environmental Management. ES/ER/TM-219.

(4) US Environmental Protection Agency (EPA), 2008. Estimation Programs Interface (EPI) Suite. US Environmental Protection Agency Office of Pollution Prevention and Toxics and Syracuse Research Corporation (SRC).

5) Environment Canada. http://www.ec.gc.ca/CEPARegistry/documents/subs_list/organotin/Organotins_followup_ec_P3.cfm.

6) Texas Commission of Environmental Quality (TCEQ), 2010. TRRP Protective Concentration Levels, toxicity and chemical/physical properties. Updated May 2010.

7) Oak Ridge National Laboratory's Risk Assessment Information System (RAIS) database

Table J-6
Identification of Bioaccumulative COIs in the Upland OU
(6 of 6)

Chemicals of Interest	$logK_{OW}$	BCF	Earthworm BAF[1] (90th %tile)	Plant BAF[2] (90th %tile)	Small Mammal BAF[3] (90th %tile)	COI Identified as Bioaccumulative? (BCF > 300 or $LogK_{ow}$ > 3.5)	HH Bioaccumulation GW SLV?	COI Identified as Bioaccumulative? (BAF > 0.1 or $LogK_{ow}$ > 3.5)	Eco Bioaccumulation Soil SLV?[9]

8) Washington Department of Ecology (WDOE). Cleanup Levels and Risk Calculations (CLARC) Database. Online: https://fortress.wa.gov/ecy/clarc/Reporting/CLARCReporting.aspx

9) Avian and/or Mammalian EPA Eco SSL and/or ORNL PRG for soil.

Table J-7
Identification of Bioaccumulative COIs in the River OU
(1 of 3)

Chemicals of Interest	$logK_{ow}$		BCF		EPA Bioaccumualtive? (BCF>300 or Log Kow >3.5)	DEQ Bioaccumulative for Sediment and Tissue?	COI Identified as Bioaccumulative by EPA or DEQ?	HH Bioaccumulation SW SLV?	HH Bioaccumulation Sediment SLV and Tissue ATL?	Eco Surface Water SLV?[6]	Eco Bioaccumulation Sediment SLV and Tissue ATL?[6]
INORGANICS											
Aluminum	--		500	4	Yes		**Yes**	**No**	**No**	No	**No**
Antimony	--		100	4	No		No	Yes	No	No	No
Arsenic	--		300	4	No	Yes	**Yes**	Yes	SLV/ATL	NRWQC	SLV/ATL
Barium	--		4.00	4	No		No	Yes	No	No	No
Beryllium	--		100	4	No		No	No	No	No	No
Cadmium	--		200	4	No	Yes	**Yes**	**No**	SLV/ATL	NRWQC	SLV/ATL
Chromium	--		200	4	No		No	No	No	No	No
Cobalt	--		300	4	No		No	No	No	No	No
Copper	--		200	4	No		No	Yes	No	No	No
Lead	--		300	4	No	Yes	**Yes**	**No**	SLV/ATL	NRWQC	SLV/ATL
Manganese	--		400	4	Yes		**Yes**	Yes	**No**	No	**No**
Mercury	--		1000	4	Yes	Yes	**Yes**	**No**	SLV/ATL	NRWQC	SLV/ATL
Nickel	--		100	4	No		No	Yes	No	No	No
Selenium	--		200	4	No		No	Yes	SLV/ATL	Yes	SLV
Silver	--		4.00	4	No		No	No	No	No	No
Thallium	--		10000	5	Yes		**Yes**	Yes	**No**	No	**No**
Vanadium	--		NV		NV		NV	No	No	No	No
Zinc	--		1000	4	Yes		**Yes**	Yes	**No**	NRWQC	**No**
PCBs (as Aroclors)											
Aroclor 1242	7.10	1	--		Yes	Yes	**Yes**	Yes	SLV/ATL	Surrogate	SLV/ATL
Aroclor 1248	6.20	1	--		Yes	Yes	**Yes**	Yes	SLV/ATL	Surrogate	SLV/ATL
Aroclor 1254	6.50	1	--		Yes	Yes	**Yes**	Yes	SLV/ATL	Surrogate	SLV/ATL
Total PCBs (as Aroclors)	6.30	3	--		Yes	Yes	**Yes**	Yes	SLV/ATL	NRWQC	SLV/ATL
PCBs (as Congeners)											
3,3',4,4'-Tetrachlorobiphenyl	6.63	1			Yes	Yes	**Yes**	**No**	SLV/ATL	Surrogate	SLV/ATL
3,4,4',5-Tetrachlorobiphenyl	7.10	1	--		Yes	Yes	**Yes**	**No**	SLV/ATL	Surrogate	SLV/ATL
2,3,3',4,4'-Pentachlorobiphenyl	7.10	1	--		Yes	Yes	**Yes**	**No**	SLV/ATL	Surrogate	SLV/ATL
2,3,4,4',5-Pentachlorobiphenyl	7.10	1	--		Yes	Yes	**Yes**	**No**	SLV/ATL	Surrogate	SLV/ATL
2,3',4,4',5-Pentachlorobiphenyl	7.12	1	--		Yes	Yes	**Yes**	**No**	SLV/ATL	Surrogate	SLV/ATL
2,3',4,4',5'-Pentachlorobiphenyl	7.10	1	--		Yes	Yes	**Yes**	**No**	SLV/ATL	Surrogate	SLV/ATL
3,3',4,4',5-Pentachlorobiphenyl	7.10	1	--		Yes	Yes	**Yes**	**No**	SLV/ATL	Surrogate	SLV/ATL

Table J-7
Identification of Bioaccumulative COIs in the River OU
(2 of 3)

Chemicals of Interest	$logK_{ow}$		BCF		EPA Bioaccumualtive? (BCF>300 or Log Kow >3.5)	DEQ Bioaccumulative for Sediment and Tissue?	COI Identified as Bioaccumulative by EPA or DEQ?	HH Bioaccumulation SW SLV?	HH Bioaccumulation Sediment SLV and Tissue ATL?	Eco Surface Water SLV?[6]	Eco Bioaccumulation Sediment SLV and Tissue ATL?[6]
2,3,3',4,4',5-Hexachlorobiphenyl	7.60	1	--		Yes	Yes	**Yes**	**No**	SLV/ATL	Surrogate	SLV/ATL
2,3',4,4',5,5'-Hexachlorobiphenyl	7.50	1	--		Yes	Yes	**Yes**	**No**	SLV/ATL	Surrogate	SLV/ATL
3,3',4,4',5,5'-Hexachlorobiphenyl	7.41	1	--		Yes	Yes	**Yes**	**No**	SLV/ATL	Surrogate	SLV/ATL
2,3,3',4,4',5,5'-Heptachlorobiphenyl	7.10	1	--		Yes	Yes	**Yes**	**No**	SLV/ATL	Surrogate	SLV/ATL
Total PCBs (as Congeners)	6.30	3	--		Yes	Yes	**Yes**	Yes	SLV/ATL	NRWQC	SLV/ATL
SVOCs											
Bis(2-ethylhexyl) Phthalate	7.60	1	588	4	Yes		**Yes**	Yes	Developed ATL	No	Developed ATL
Butyl Benzyl Phthalate	4.73	1	16.3	4	Yes		**Yes**	Yes	Developed ATL	No	Developed ATL
Carbazole	3.72	1	--		Yes		**Yes**	**No**	**No**	No	**No**
Di-n-butyl Phthalate	4.50	1	89	4	Yes		**Yes**	Yes	Developed ATL	No	Developed ATL
Di-n-octyl Phthalate	8.54	3	89	4	Yes		**Yes**	Yes	Developed ATL	No	Developed ATL
p-cresol (4-Methylphenol)	1.94	1	--		No		No	No	No	No	No
PAHs											
Acenaphthene	3.92	1	--		Yes		**Yes**	Yes	Surrogate	No	Surrogate
Anthracene	4.45	1	--		Yes		**Yes**	Yes	Surrogate	No	Surrogate
Benzo(a)anthracene	5.52	3	--		Yes		**Yes**	Yes	Developed ATL	No	Surrogate
Benzo(a)pyrene	6.13	1	--		Yes		**Yes**	Yes	Developed ATL	No	Surrogate
Benzo(b)fluoranthene	5.78	1	--		Yes		**Yes**	Yes	Developed ATL	No	Surrogate
Benzo(g,h,i)perylene	6.63	1	--		Yes		**Yes**	Yes	Developed ATL	No	Surrogate
Benzo(k)fluoranthene	6.11	1	--		Yes		**Yes**	Yes	Developed ATL	No	Surrogate
Chrysene	5.81	1	--		Yes		**Yes**	Yes	Developed ATL	No	Surrogate
Dibenz(a,h)anthracene	6.75	1	--		Yes		**Yes**	Yes	Developed ATL	No	Surrogate
Fluoranthene	5.16	1	--		Yes	Yes	**Yes**	Yes	SLV/ATL	No	SLV/ATL
Fluorene	4.18	1	--		Yes		**Yes**	Yes	Surrogate	No	Surrogate
Indeno(1,2,3-cd)pyrene	6.70	3	--		Yes		**Yes**	Yes	Developed ATL	No	Surrogate
Phenanthrene	4.46	1	--		Yes		**Yes**	Yes	Surrogate	No	Surrogate
Pyrene	4.88	1	--		Yes	Yes	**Yes**	Yes	SLV/ATL	No	SLV/ATL
TPH											
Diesel Range Organics	NV		--		NV		NV	No	No	No	No
Residual Range Organics	NV		--		NV		NV	No	No	No	No

Table J-7
Identification of Bioaccumulative COIs in the River OU
(3 of 3)

Chemicals of Interest	$logK_{ow}$	BCF	EPA Bioaccumualtive? (BCF>300 or Log Kow >3.5)	DEQ Bioaccumulative for Sediment and Tissue?	COI Identified as Bioaccumulative by EPA or DEQ?	HH Bioaccumulation SW SLV?	HH Bioaccumulation Sediment SLV and Tissue ATL?	Eco Surface Water SLV?[6]	Eco Bioaccumulation Sediment SLV and Tissue ATL?[6]

Notes:
ATL = acceptable tissue level
BCF = bioconcentration factor
COI = chemical of interest
DEQ = Oregon Department of Environmental Quality
NRWQC = National recommended water quality criteria
NV = No Value
SLV = screening level value
USEPA = United States Environmental Protection Agency

1) US Environmental Protection Agency (USEPA), 2008. Estimation Programs Interface (EPI) Suite. US Environmental Protection Agency Office of Pollution Prevention and Toxics and Syracuse Research Corporation (SRC).

2) Environment Canada. http://www.ec.gc.ca/CEPARegistry/documents/subs_list/organotin/Organotins_followup_ec_P3.cfm.

3) Texas Commission of Environmental Quality (TCEQ), 2010. TRRP Protective Concentration Levels, toxicity and chemical/physical properties. Updated May 2010.

4) Oak Ridge National Laboratory's Risk Assessment Information System (RAIS) database

5) Washington Department of Ecology (WDOE). Cleanup Levels and Risk Calculations (CLARC) Database. Online: https://fortress.wa.gov/ecy/clarc/Reporting/CLARCReporting.aspx

6) See the USEPA NRWQC SLV, DEQ sediment bioaccumulative SLVs, and DEQ tissue ATLs in Appendix H-3

APPENDIX K

DATA SENSITIVITY ANALYSIS

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 20)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	Metals	Total	Antimony	0-3 ft	mg/kg	410	22	16	2	0.200	2.90	0	0.200	3.04	0
Soil	Metals	Total	Antimony	0-10 ft	mg/kg	410	36	16	4	0.200	2.90	0	0.200	3.04	0
Soil	Metals	Total	Beryllium	0-3 ft	mg/kg	610	23	6	-	0.157	0.280	0	0.270	0.467	0
Soil	Metals	Total	Beryllium	0-10 ft	mg/kg	610	37	11	9	0.155	0.280	0	0.270	0.550	0
Soil	Metals	Total	Cadmium	0-3 ft	mg/kg	150	23	6	-	0.260	0.290	0	0.260	0.290	0
Soil	Metals	Total	Cadmium	0-10 ft	mg/kg	150	37	6	-	0.260	0.290	0	0.260	0.290	0
Soil	Metals	Total	Mercury	0-3 ft	mg/kg	93	25	5	-	0.100	0.110	0	0.100	0.110	0
Soil	Metals	Total	Mercury	0-10 ft	mg/kg	93	39	5	1	0.100	0.110	0	0.0192	0.110	0
Soil	Metals	Total	Selenium	0-3 ft	mg/kg	5,100	23	18	3	0.200	1.50	0	0.200	2.02	0
Soil	Metals	Total	Selenium	0-10 ft	mg/kg	5,100	37	26	9	0.0774	1.50	0	0.200	2.02	0
Soil	Metals	Total	Silver	0-3 ft	mg/kg	1,500	23	14	2	0.200	0.570	0	0.200	2.02	0
Soil	Metals	Total	Silver	0-10 ft	mg/kg	1,500	37	14	12	0.200	0.570	0	0.200	2.02	0
Soil	Metals	Total	Thallium	0-3 ft	mg/kg	0.203	23	19	3	0.200	0.300	14	0.0970	0.506	15
Soil	Metals	Total	Thallium	0-10 ft	mg/kg	0.203	37	19	10	0.200	0.300	14	0.0970	0.951	16
Soil	Butyltins	Total	Dibutyltin	0-3 ft	ug/kg	180,000	9	7	-	0.685	0.899	0	2.13	2.79	0
Soil	Butyltins	Total	Dibutyltin	0-10 ft	ug/kg	180,000	22	20	-	0.567	7.62	0	1.76	23.7	0
Soil	Butyltins	Total	Monobutyltin	0-3 ft	ug/kg	180,000	9	7	-	1.51	1.98	0	2.84	3.73	0
Soil	Butyltins	Total	Monobutyltin	0-10 ft	ug/kg	180,000	22	20	-	1.25	16.8	0	2.35	31.6	0
Soil	Butyltins	Total	Tetrabutyltin	0-3 ft	ug/kg	180,000	9	9	-	0.529	0.694	0	1.42	1.86	0
Soil	Butyltins	Total	Tetrabutyltin	0-10 ft	ug/kg	180,000	22	22	-	0.438	5.89	0	1.18	15.8	0
Soil	Butyltins	Total	Tributyltin	0-3 ft	ug/kg	180,000	9	5	-	1.18	1.43	0	3.07	3.73	0
Soil	Butyltins	Total	Tributyltin	0-10 ft	ug/kg	180,000	22	18	-	0.903	12.1	0	2.35	31.6	0
Soil	Herbicides	Total	2,4,5-T	0-3 ft	ug/kg	6,200,000	14	12	-	1.54	50.0	0	3.10	50.0	0
Soil	Herbicides	Total	2,4,5-T	0-10 ft	ug/kg	6,200,000	21	19	-	1.46	50.0	0	3.10	50.0	0
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-3 ft	ug/kg	4,900,000	14	14	-	2.25	50.0	0	2.50	50.0	0
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-10 ft	ug/kg	4,900,000	21	21	-	2.14	50.0	0	2.50	50.0	0
Soil	Herbicides	Total	2,4-D	0-3 ft	ug/kg	2,400,000	14	14	-	0.581	50.0	0	7.04	50.0	0
Soil	Herbicides	Total	2,4-D	0-10 ft	ug/kg	2,400,000	21	21	-	0.520	50.0	0	6.70	50.0	0
Soil	Herbicides	Total	2,4-DB	0-3 ft	ug/kg	4,900,000	14	14	-	0.988	50.0	0	5.00	50.0	0
Soil	Herbicides	Total	2,4-DB	0-10 ft	ug/kg	4,900,000	21	21	-	0.939	50.0	0	5.00	50.0	0
Soil	Herbicides	Total	4-Nitrophenol	0-3 ft	ug/kg	180,000,000	3	3	-	1.56	1.81	0	7.04	8.18	0
Soil	Herbicides	Total	4-Nitrophenol	0-10 ft	ug/kg	180,000,000	10	10	-	1.48	1.81	0	6.70	8.18	0
Soil	Herbicides	Total	Dalapon	0-3 ft	ug/kg	18,000,000	14	14	-	2.15	50.0	0	7.04	50.0	0
Soil	Herbicides	Total	Dalapon	0-10 ft	ug/kg	18,000,000	21	21	-	2.04	50.0	0	6.70	50.0	0
Soil	Herbicides	Total	Dicamba	0-3 ft	ug/kg	18,000,000	14	14	-	1.71	50.0	0	2.10	50.0	0
Soil	Herbicides	Total	Dicamba	0-10 ft	ug/kg	18,000,000	21	21	-	1.63	50.0	0	2.10	50.0	0
Soil	Herbicides	Total	Dichloroprop	0-3 ft	ug/kg	4,900,000	14	12	-	0.750	400	0	7.04	400	0
Soil	Herbicides	Total	Dichloroprop	0-10 ft	ug/kg	4,900,000	21	19	-	0.713	400	0	6.70	400	0
Soil	Herbicides	Total	Dinoseb	0-3 ft	ug/kg	620,000	14	14	-	0.581	50.0	0	7.04	50.0	0
Soil	Herbicides	Total	Dinoseb	0-10 ft	ug/kg	620,000	21	21	-	0.552	50.0	0	6.70	50.0	0
Soil	Herbicides	Total	MCPA	0-3 ft	ug/kg	120,000	14	14	-	1.06	25,000	0	7.04	25,000	0
Soil	Herbicides	Total	MCPA	0-10 ft	ug/kg	120,000	21	21	-	1.01	25,000	0	6.70	25,000	0
Soil	Herbicides	Total	MCPP	0-3 ft	ug/kg	620,000	14	12	-	1.93	38,000	0	7.04	38,000	0
Soil	Herbicides	Total	MCPP	0-10 ft	ug/kg	620,000	21	19	-	1.83	38,000	0	6.70	38,000	0
Soil	Herbicides	Total	Pentachlorophenol	0-3 ft	ug/kg	13,000	3	3	-	0.822	0.955	0	7.04	8.18	0
Soil	Herbicides	Total	Pentachlorophenol	0-10 ft	ug/kg	13,000	10	10	-	0.781	0.955	0	6.70	8.18	0
Soil	Pesticides	Total	4,4'-DDD	0-3 ft	ug/kg	11,000	23	23	-	1.00	25.0	0	1.00	25.0	0
Soil	Pesticides	Total	4,4'-DDD	0-10 ft	ug/kg	11,000	30	30	-	0.214	25.0	0	1.00	25.0	0
Soil	Pesticides	Total	4,4'-DDE	0-3 ft	ug/kg	7,700	23	22	-	1.00	9.40	0	1.00	9.40	0
Soil	Pesticides	Total	4,4'-DDE	0-10 ft	ug/kg	7,700	30	29	-	0.253	9.40	0	1.00	9.40	0
Soil	Pesticides	Total	4,4'-DDT	0-3 ft	ug/kg	7,700	23	16	-	1.00	13.0	0	1.00	13.0	0
Soil	Pesticides	Total	4,4'-DDT	0-10 ft	ug/kg	7,700	30	23	-	0.285	13.0	0	1.00	13.0	0

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	Pesticides	Total	Aldrin	0-3 ft	ug/kg	130	23	23	-	0.970	1.90	0	0.970	1.90	0
Soil	Pesticides	Total	Aldrin	0-10 ft	ug/kg	130	30	30	-	0.474	1.90	0	0.970	1.90	0
Soil	Pesticides	Total	BHC (alpha)	0-3 ft	ug/kg	340	23	22	-	0.500	1.90	0	0.500	1.90	0
Soil	Pesticides	Total	BHC (alpha)	0-10 ft	ug/kg	340	30	29	-	0.341	1.90	0	0.500	1.90	0
Soil	Pesticides	Total	BHC (beta)	0-3 ft	ug/kg	960	23	22	-	0.900	12.0	0	0.900	12.0	0
Soil	Pesticides	Total	BHC (beta)	0-10 ft	ug/kg	960	30	29	-	0.465	12.0	0	0.900	12.0	0
Soil	Pesticides	Total	BHC (delta)	0-3 ft	ug/kg	340	23	23	-	0.600	1.90	0	0.600	1.90	0
Soil	Pesticides	Total	BHC (delta)	0-10 ft	ug/kg	340	30	30	-	0.422	1.90	0	0.600	1.90	0
Soil	Pesticides	Total	BHC (gamma) Lindane	0-3 ft	ug/kg	2,000	23	23	-	0.970	1.90	0	0.970	1.90	0
Soil	Pesticides	Total	BHC (gamma) Lindane	0-10 ft	ug/kg	2,000	30	30	-	0.420	1.90	0	0.970	1.90	0
Soil	Pesticides	Total	Chlordane (alpha)	0-3 ft	ug/kg	7,200	20	19	-	0.800	19.0	0	0.800	19.0	0
Soil	Pesticides	Total	Chlordane (alpha)	0-10 ft	ug/kg	7,200	20	19	-	0.800	19.0	0	0.800	19.0	0
Soil	Pesticides	Total	Chlordane (gamma)	0-3 ft	ug/kg	7,200	20	20	-	0.700	14.0	0	0.700	14.0	0
Soil	Pesticides	Total	Chlordane (gamma)	0-10 ft	ug/kg	7,200	20	20	-	0.700	14.0	0	0.700	14.0	0
Soil	Pesticides	Total	Chlordane (technical)	0-10 ft	ug/kg	7,200	10	4	-	1.55	11.8	0	9.94	11.8	0
Soil	Pesticides	Total	Dieldrin	0-3 ft	ug/kg	130	23	22	-	1.90	8.00	0	1.90	8.00	0
Soil	Pesticides	Total	Dieldrin	0-10 ft	ug/kg	130	30	29	-	0.360	8.00	0	1.90	8.00	0
Soil	Pesticides	Total	Endosulfan I	0-3 ft	ug/kg	1,400,000	23	23	-	0.970	3.50	0	0.970	3.50	0
Soil	Pesticides	Total	Endosulfan I	0-10 ft	ug/kg	1,400,000	30	30	-	0.468	3.50	0	0.970	3.50	0
Soil	Pesticides	Total	Endosulfan II	0-3 ft	ug/kg	1,400,000	23	22	-	1.90	4.90	0	1.90	4.90	0
Soil	Pesticides	Total	Endosulfan II	0-10 ft	ug/kg	1,400,000	30	29	-	0.425	4.90	0	1.90	4.90	0
Soil	Pesticides	Total	Endosulfan Sulfate	0-3 ft	ug/kg	1,400,000	23	22	-	1.00	8.00	0	1.00	8.00	0
Soil	Pesticides	Total	Endosulfan Sulfate	0-10 ft	ug/kg	1,400,000	30	29	-	0.400	8.00	0	1.00	8.00	0
Soil	Pesticides	Total	Endrin Aldehyde	0-3 ft	ug/kg	71,000	23	23	-	1.90	13.0	0	1.90	13.0	0
Soil	Pesticides	Total	Endrin Aldehyde	0-10 ft	ug/kg	71,000	30	30	-	0.448	13.0	0	1.90	13.0	0
Soil	Pesticides	Total	Endrin Ketone	0-3 ft	ug/kg	71,000	22	22	-	1.90	17.0	0	1.90	17.0	0
Soil	Pesticides	Total	Endrin Ketone	0-10 ft	ug/kg	71,000	29	29	-	0.309	17.0	0	1.90	17.0	0
Soil	Pesticides	Total	Endrin	0-3 ft	ug/kg	71,000	23	23	-	1.90	10.0	0	1.90	10.0	0
Soil	Pesticides	Total	Endrin	0-10 ft	ug/kg	71,000	30	30	-	0.397	10.0	0	1.90	10.0	0
Soil	Pesticides	Total	Heptachlor Epoxide	0-3 ft	ug/kg	240	23	22	-	0.970	7.10	0	0.970	7.10	0
Soil	Pesticides	Total	Heptachlor Epoxide	0-10 ft	ug/kg	240	30	29	-	0.401	7.10	0	0.970	7.10	0
Soil	Pesticides	Total	Heptachlor	0-3 ft	ug/kg	480	23	21	-	0.970	1.90	0	0.970	1.90	0
Soil	Pesticides	Total	Heptachlor	0-10 ft	ug/kg	480	30	28	-	0.378	1.90	0	0.970	1.90	0
Soil	Pesticides	Total	Methoxychlor	0-3 ft	ug/kg	3,100,000	23	23	-	4.00	19.0	0	4.00	19.0	0
Soil	Pesticides	Total	Methoxychlor	0-10 ft	ug/kg	3,100,000	30	30	-	1.51	19.0	0	4.00	19.0	0
Soil	Pesticides	Total	Toxaphene	0-3 ft	ug/kg	2,000	23	23	-	34.0	190	0	34.0	190	0
Soil	Pesticides	Total	Toxaphene	0-10 ft	ug/kg	2,000	30	30	-	6.89	190	0	34.0	190	0
Soil	PCB Aroclors	Total	Aroclor 1016	0-3 ft	ug/kg	21,000	29	29	-	1.14	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1016	0-10 ft	ug/kg	21,000	43	43	-	1.10	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1221	0-3 ft	ug/kg	540	29	29	-	3.80	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1221	0-10 ft	ug/kg	540	43	43	-	3.80	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1232	0-3 ft	ug/kg	540	29	29	-	3.80	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1232	0-10 ft	ug/kg	540	43	43	-	3.77	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1242	0-3 ft	ug/kg	740	29	29	-	2.09	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1242	0-10 ft	ug/kg	740	43	43	-	2.01	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1248	0-3 ft	ug/kg	740	29	27	-	3.80	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1248	0-10 ft	ug/kg	740	43	41	-	3.80	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1254	0-3 ft	ug/kg	740	29	18	-	1.77	50.0	0	4.00	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1254	0-10 ft	ug/kg	740	43	27	-	1.62	50.0	0	4.00	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1260	0-3 ft	ug/kg	740	29	5	-	35.0	50.0	0	35.0	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1260	0-10 ft	ug/kg	740	43	7	2	1.62	50.0	0	10.4	50.0	0
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-3 ft	ug/kg	740	29	5	-	105	150	0	105	150	0

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(3 of 20)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-10 ft	ug/kg	740	43	7	-	8.42	150	0	31.2	150	0
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-3 ft	mg/kg	23,000	20	1	-	25.0	25.0	0	25.0	25.0	0
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-10 ft	mg/kg	23,000	34	4	1	12.3	25.0	0	25.0	28.9	0
Soil	NWTPH-Dx	Total	Residual Range Organics	0-3 ft	mg/kg	40,000	20	1	-	100	100	0	100	100	0
Soil	NWTPH-Dx	Total	Residual Range Organics	0-10 ft	mg/kg	40,000	34	2	1	25.5	100	0	51.1	100	0
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-3 ft	mg/kg	13,000	15	11	1	4.31	20.0	0	4.31	20.0	0
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-10 ft	mg/kg	13,000	22	16	3	4.08	20.0	0	4.02	20.0	0
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-3 ft	ug/kg	99,000	28	28	-	11.8	190	0	20.0	1,680	0
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-10 ft	ug/kg	99,000	35	35	-	11.0	190	0	20.0	1,680	0
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-3 ft	ug/kg	9,800,000	28	28	-	14.6	190	0	20.0	1,680	0
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-10 ft	ug/kg	9,800,000	35	35	-	13.6	190	0	20.0	1,680	0
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-3 ft	ug/kg	36,000	28	28	-	19.9	236	0	20.0	1,680	0
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-10 ft	ug/kg	36,000	35	35	-	18.5	236	0	20.0	1,680	0
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-3 ft	ug/kg	36,000	28	28	-	20.0	269	0	20.0	1,680	0
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-10 ft	ug/kg	36,000	35	35	-	20.0	269	0	20.0	1,680	0
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-3 ft	ug/kg	62,000,000	29	29	-	19.5	930	0	49.8	1,680	0
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-10 ft	ug/kg	62,000,000	36	36	-	19.5	930	0	49.8	1,680	0
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-3 ft	ug/kg	200,000	29	29	-	18.9	300	0	49.8	1,680	0
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-10 ft	ug/kg	200,000	36	36	-	17.6	300	0	49.8	1,680	0
Soil	SVOCs	Total	2,4-Dichlorophenol	0-3 ft	ug/kg	1,800,000	29	29	-	15.6	300	0	49.8	1,680	0
Soil	SVOCs	Total	2,4-Dichlorophenol	0-10 ft	ug/kg	1,800,000	36	36	-	14.5	300	0	49.8	1,680	0
Soil	SVOCs	Total	2,4-Dimethylphenol	0-3 ft	ug/kg	12,000,000	29	29	-	15.6	190	0	20.0	1,680	0
Soil	SVOCs	Total	2,4-Dimethylphenol	0-10 ft	ug/kg	12,000,000	36	36	-	14.5	190	0	20.0	1,680	0
Soil	SVOCs	Total	2,4-Dinitrophenol	0-3 ft	ug/kg	1,200,000	25	25	-	34.1	930	0	200	4,210	0
Soil	SVOCs	Total	2,4-Dinitrophenol	0-10 ft	ug/kg	1,200,000	32	32	-	17.1	930	0	200	4,210	0
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-3 ft	ug/kg	5,500	28	28	-	18.5	366	0	98.0	1,680	0
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-10 ft	ug/kg	5,500	35	35	-	17.2	366	0	98.0	1,680	0
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-3 ft	ug/kg	240,000	28	28	-	25.6	303	0	98.0	1,680	0
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-10 ft	ug/kg	240,000	35	35	-	23.8	303	0	98.0	1,680	0
Soil	SVOCs	Total	2-Chloronaphthalene	0-3 ft	ug/kg	82,000,000	28	28	-	4.27	190	0	14.2	190	0
Soil	SVOCs	Total	2-Chloronaphthalene	0-10 ft	ug/kg	82,000,000	35	35	-	3.97	190	0	13.2	190	0
Soil	SVOCs	Total	2-Chlorophenol	0-3 ft	ug/kg	5,100,000	29	29	-	20.0	252	0	20.0	1,680	0
Soil	SVOCs	Total	2-Chlorophenol	0-10 ft	ug/kg	5,100,000	36	36	-	19.8	252	0	20.0	1,680	0
Soil	SVOCs	Total	2-Methylphenol	0-3 ft	ug/kg	31,000,000	29	29	-	17.1	202	0	20.0	1,680	0
Soil	SVOCs	Total	2-Methylphenol	0-10 ft	ug/kg	31,000,000	36	36	-	15.9	202	0	20.0	1,680	0
Soil	SVOCs	Total	2-Nitroaniline	0-3 ft	ug/kg	6,000,000	28	28	-	18.5	930	0	98.0	1,680	0
Soil	SVOCs	Total	2-Nitroaniline	0-10 ft	ug/kg	6,000,000	35	35	-	17.1	930	0	98.0	1,680	0
Soil	SVOCs	Total	2-Nitrophenol	0-3 ft	ug/kg	180,000,000	29	29	-	19.9	300	0	49.8	1,680	0
Soil	SVOCs	Total	2-Nitrophenol	0-10 ft	ug/kg	180,000,000	36	36	-	18.5	300	0	49.8	1,680	0
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-3 ft	ug/kg	4,800	28	28	-	15.6	2,490	0	98.0	2,490	0
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-10 ft	ug/kg	4,800	35	35	-	14.5	2,490	0	98.0	2,490	0
Soil	SVOCs	Total	3-Nitroaniline	0-3 ft	ug/kg	6,000,000	28	28	-	24.2	930	0	98.0	1,680	0
Soil	SVOCs	Total	3-Nitroaniline	0-10 ft	ug/kg	6,000,000	35	35	-	22.5	930	0	98.0	1,680	0
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-3 ft	ug/kg	49,000	25	25	-	52.6	930	0	200	4,210	0
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-10 ft	ug/kg	49,000	32	32	-	24.6	930	0	200	4,210	0
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-3 ft	ug/kg	NV	28	28	-	18.9	224	-	20.0	1,680	-
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-10 ft	ug/kg	NV	35	35	-	17.6	224	-	20.0	1,680	-
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-3 ft	ug/kg	62,000,000	29	29	-	15.6	300	0	49.8	1,680	0
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-10 ft	ug/kg	62,000,000	36	36	-	14.5	300	0	49.8	1,680	0
Soil	SVOCs	Total	4-Chloroaniline	0-3 ft	ug/kg	8,600	28	28	-	13.2	300	0	98.0	1,680	0
Soil	SVOCs	Total	4-Chloroaniline	0-10 ft	ug/kg	8,600	35	35	-	12.3	300	0	98.0	1,680	0
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-3 ft	ug/kg	NV	28	28	-	20.0	283	-	20.0	1,680	-

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(4 of 20)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-10 ft	ug/kg	NV	35	35	-	20.0	283	-	20.0	1,680	-
Soil	SVOCs	Total	4-Nitroaniline	0-3 ft	ug/kg	86,000	28	28	-	24.2	930	0	98.0	1,680	0
Soil	SVOCs	Total	4-Nitroaniline	0-10 ft	ug/kg	86,000	35	35	-	22.5	930	0	98.0	1,680	0
Soil	SVOCs	Total	4-Nitrophenol	0-3 ft	ug/kg	180,000,000	29	29	-	27.0	930	0	98.0	4,210	0
Soil	SVOCs	Total	4-Nitrophenol	0-10 ft	ug/kg	180,000,000	36	36	-	25.1	930	0	98.0	4,210	0
Soil	SVOCs	Total	Aniline	0-3 ft	ug/kg	300,000	19	19	-	38.4	454	0	49.8	1,680	0
Soil	SVOCs	Total	Aniline	0-10 ft	ug/kg	300,000	26	26	-	35.7	454	0	49.8	1,680	0
Soil	SVOCs	Total	Benzidine	0-3 ft	ug/kg	55,000	18	18	-	26.9	1,800	0	355	4,210	0
Soil	SVOCs	Total	Benzidine	0-10 ft	ug/kg	55,000	25	25	-	25.0	1,800	0	330	4,210	0
Soil	SVOCs	Total	Benzoic Acid	0-3 ft	ug/kg	2,500,000,000	25	16	4	200	930	0	200	4,210	0
Soil	SVOCs	Total	Benzoic Acid	0-10 ft	ug/kg	2,500,000,000	32	22	5	44.9	930	0	200	4,210	0
Soil	SVOCs	Total	Benzyl Alcohol	0-3 ft	ug/kg	62,000,000	29	28	1	20.0	353	0	20.0	1,680	0
Soil	SVOCs	Total	Benzyl Alcohol	0-10 ft	ug/kg	62,000,000	36	35	1	20.0	353	0	20.0	1,680	0
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-3 ft	ug/kg	1,800,000	28	28	-	17.1	202	0	20.0	1,680	0
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-10 ft	ug/kg	1,800,000	35	35	-	15.9	202	0	20.0	1,680	0
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-3 ft	ug/kg	1,000	28	28	-	20.0	321	0	20.0	1,680	2
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-10 ft	ug/kg	1,000	35	35	-	20.0	321	0	20.0	1,680	2
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-3 ft	ug/kg	1,000	28	28	-	20.0	438	0	20.0	1,680	2
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-10 ft	ug/kg	1,000	35	35	-	20.0	438	0	20.0	1,680	2
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-3 ft	ug/kg	150,000	29	3	-	50.0	690	0	50.0	4,210	0
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-10 ft	ug/kg	150,000	36	3	2	50.0	690	0	50.0	4,210	0
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-3 ft	ug/kg	910,000	28	25	2	20.0	320	0	20.0	1,680	0
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-10 ft	ug/kg	910,000	35	30	3	20.0	320	0	20.0	1,680	0
Soil	SVOCs	Total	Carbazole	0-3 ft	ug/kg	1,000,000	29	8	3	20.0	180	0	20.0	180	0
Soil	SVOCs	Total	Carbazole	0-10 ft	ug/kg	1,000,000	36	10	3	5.28	180	0	13.5	180	0
Soil	SVOCs	Total	Dibenzofuran	0-3 ft	ug/kg	1,000,000	29	16	6	20.0	195	0	20.0	1,680	0
Soil	SVOCs	Total	Dibenzofuran	0-10 ft	ug/kg	1,000,000	36	18	9	15.7	195	0	20.0	1,680	0
Soil	SVOCs	Total	Diethyl Phthalate	0-3 ft	ug/kg	490,000,000	28	23	3	20.0	286	0	20.0	1,680	0
Soil	SVOCs	Total	Diethyl Phthalate	0-10 ft	ug/kg	490,000,000	35	29	4	20.0	286	0	20.0	1,680	0
Soil	SVOCs	Total	Dimethyl Phthalate	0-3 ft	ug/kg	150,000	28	28	-	15.6	190	0	20.0	1,680	0
Soil	SVOCs	Total	Dimethyl Phthalate	0-10 ft	ug/kg	150,000	35	35	-	14.5	190	0	20.0	1,680	0
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-3 ft	ug/kg	62,000,000	28	24	1	20.0	1,460	0	20.0	8,420	0
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-10 ft	ug/kg	62,000,000	35	31	1	20.0	1,460	0	20.0	8,420	0
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-3 ft	ug/kg	150,000	28	28	-	20.0	730	0	20.0	1,680	0
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-10 ft	ug/kg	150,000	35	35	-	20.0	730	0	20.0	1,680	0
Soil	SVOCs	Total	Hexachlorobenzene	0-3 ft	ug/kg	1,800	28	28	-	15.6	190	0	20.0	1,680	0
Soil	SVOCs	Total	Hexachlorobenzene	0-10 ft	ug/kg	1,800	35	35	-	13.4	190	0	20.0	1,680	0
Soil	SVOCs	Total	Hexachlorobutadiene	0-3 ft	ug/kg	22,000	28	28	-	12.8	190	0	20.0	1,680	0
Soil	SVOCs	Total	Hexachlorobutadiene	0-10 ft	ug/kg	22,000	35	35	-	11.9	190	0	20.0	1,680	0
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-3 ft	ug/kg	3,700,000	28	28	-	20.0	300	0	98.0	1,680	0
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-10 ft	ug/kg	3,700,000	35	35	-	16.6	300	0	98.0	1,680	0
Soil	SVOCs	Total	Hexachloroethane	0-3 ft	ug/kg	150,000	28	28	-	20.0	320	0	20.0	1,680	0
Soil	SVOCs	Total	Hexachloroethane	0-10 ft	ug/kg	150,000	35	35	-	16.4	320	0	20.0	1,680	0
Soil	SVOCs	Total	Isophorone	0-3 ft	ug/kg	1,800,000	28	28	-	19.9	236	0	20.0	1,680	0
Soil	SVOCs	Total	Isophorone	0-10 ft	ug/kg	1,800,000	35	35	-	18.5	236	0	20.0	1,680	0
Soil	SVOCs	Total	Nitrobenzene	0-3 ft	ug/kg	24,000	28	28	-	19.5	231	0	20.0	1,680	0
Soil	SVOCs	Total	Nitrobenzene	0-10 ft	ug/kg	24,000	35	35	-	18.1	231	0	20.0	1,680	0
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-3 ft	ug/kg	34	24	24	-	15.6	300	21	98.0	4,210	24
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-10 ft	ug/kg	34	31	31	-	10.8	300	21	98.0	4,210	31
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-3 ft	ug/kg	250	28	28	-	15.6	300	1	49.8	1,680	3
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-10 ft	ug/kg	250	35	35	-	14.5	300	1	49.8	1,680	3
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-3 ft	ug/kg	350,000	25	25	-	11.4	190	0	20.0	1,680	0

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(5 of 20)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-10 ft	ug/kg	350,000	32	32	-	10.6	190	0	20.0	1,680	0
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-3 ft	ug/kg	3,100,000	29	28	1	20.0	249	0	20.0	1,680	0
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-10 ft	ug/kg	3,100,000	36	35	1	19.6	249	0	20.0	1,680	0
Soil	SVOCs	Total	Pentachlorophenol	0-3 ft	ug/kg	13,000	29	27	-	29.9	900	0	98.0	1,680	0
Soil	SVOCs	Total	Pentachlorophenol	0-10 ft	ug/kg	13,000	36	34	-	27.8	900	0	98.0	1,680	0
Soil	SVOCs	Total	Phenol	0-3 ft	ug/kg	180,000,000	29	29	-	20.0	337	0	20.0	1,680	0
Soil	SVOCs	Total	Phenol	0-10 ft	ug/kg	180,000,000	36	36	-	20.0	337	0	20.0	1,680	0
Soil	SVOCs	Total	2-Methylnaphthalene	0-3 ft	ug/kg	4,100,000	29	20	1	2.22	190	0	14.2	190	0
Soil	SVOCs	Total	2-Methylnaphthalene	0-10 ft	ug/kg	4,100,000	36	24	1	2.06	190	0	13.2	190	0
Soil	SVOCs	Total	Acenaphthene	0-3 ft	ug/kg	19,000,000	33	8	2	20.0	180	0	20.0	180	0
Soil	SVOCs	Total	Acenaphthene	0-10 ft	ug/kg	19,000,000	44	10	2	6.80	180	0	14.7	1,440	0
Soil	SVOCs	Total	Acenaphthylene	0-3 ft	ug/kg	23,000	33	20	-	20.0	190	0	20.0	190	0
Soil	SVOCs	Total	Acenaphthylene	0-10 ft	ug/kg	23,000	44	25	-	5.90	190	0	13.5	190	0
Soil	SVOCs	Total	Anthracene	0-3 ft	ug/kg	93,000,000	33	4	1	49.8	180	0	20.0	180	0
Soil	SVOCs	Total	Anthracene	0-10 ft	ug/kg	93,000,000	44	5	1	3.70	180	0	14.7	180	0
Soil	SVOCs	Total	Benzo(a)anthracene	0-3 ft	ug/kg	2,700	33	2	-	49.8	92.9	0	49.8	305	0
Soil	SVOCs	Total	Benzo(a)anthracene	0-10 ft	ug/kg	2,700	44	2	-	49.8	92.9	0	49.8	305	0
Soil	SVOCs	Total	Benzo(a)pyrene	0-3 ft	ug/kg	270	33	2	-	35.5	49.8	0	49.8	152	0
Soil	SVOCs	Total	Benzo(a)pyrene	0-10 ft	ug/kg	270	44	2	-	35.5	49.8	0	49.8	152	0
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-3 ft	ug/kg	2,700	28	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-10 ft	ug/kg	2,700	28	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-3 ft	ug/kg	27,000	33	3	-	25.1	49.8	0	49.8	168	0
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-10 ft	ug/kg	27,000	44	3	-	25.1	49.8	0	49.8	168	0
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-3 ft	ug/kg	27,000	28	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-10 ft	ug/kg	27,000	28	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Chrysene	0-3 ft	ug/kg	270,000	33	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Chrysene	0-10 ft	ug/kg	270,000	44	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-3 ft	ug/kg	270	33	5	1	35.5	1,800	1	20.0	1,800	1
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-10 ft	ug/kg	270	44	8	1	3.08	1,800	1	13.2	1,800	1
Soil	SVOCs	Total	Fluoranthene	0-3 ft	ug/kg	8,900,000	33	2	-	49.8	71.1	0	49.8	152	0
Soil	SVOCs	Total	Fluoranthene	0-10 ft	ug/kg	8,900,000	44	2	-	49.8	71.1	0	49.8	152	0
Soil	SVOCs	Total	Fluorene	0-3 ft	ug/kg	12,000,000	33	11	3	20.0	180	0	20.0	180	0
Soil	SVOCs	Total	Fluorene	0-10 ft	ug/kg	12,000,000	44	12	3	6.86	180	0	14.7	180	0
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-3 ft	ug/kg	2,700	33	3	-	35.5	49.8	0	49.8	168	0
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-10 ft	ug/kg	2,700	44	3	-	35.5	49.8	0	49.8	168	0
Soil	SVOCs	Total	Naphthalene	0-3 ft	ug/kg	23,000	33	16	-	20.0	190	0	20.0	190	0
Soil	SVOCs	Total	Naphthalene	0-10 ft	ug/kg	23,000	44	20	-	6.34	190	0	13.5	190	0
Soil	SVOCs	Total	Phenanthrene	0-3 ft	ug/kg	93,000,000	33	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Phenanthrene	0-10 ft	ug/kg	93,000,000	44	2	-	2.93	49.8	0	49.8	11,400	0
Soil	SVOCs	Total	Pyrene	0-3 ft	ug/kg	6,700,000	33	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Pyrene	0-10 ft	ug/kg	6,700,000	44	1	-	49.8	49.8	0	49.8	49.8	0
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-3 ft	ug/kg	9,300	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-10 ft	ug/kg	9,300	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-3 ft	ug/kg	38,000,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-10 ft	ug/kg	38,000,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-3 ft	ug/kg	2,800	20	20	-	0.212	2,300	0	0.424	4,600	1
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-10 ft	ug/kg	2,800	27	27	-	0.174	2,300	0	0.349	4,600	1
Soil	VOCs	Total	1,1,2-Trichloroethane	0-3 ft	ug/kg	24,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,1,2-Trichloroethane	0-10 ft	ug/kg	24,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	1,1-Dichloroethane	0-3 ft	ug/kg	240,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,1-Dichloroethane	0-10 ft	ug/kg	240,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	1,1-Dichloroethene	0-3 ft	ug/kg	1,100,000	20	20	-	0.212	2,300	0	0.424	4,600	0

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(6 of 20)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	VOCs	Total	1,1-Dichloroethene	0-10 ft	ug/kg	1,100,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	1,1-Dichloropropene	0-3 ft	ug/kg	8,100	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,1-Dichloropropene	0-10 ft	ug/kg	8,100	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-3 ft	ug/kg	490,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-10 ft	ug/kg	490,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	1,2,3-Trichloropropane	0-3 ft	ug/kg	95	20	20	-	0.212	2,300	4	0.424	4,600	4
Soil	VOCs	Total	1,2,3-Trichloropropane	0-10 ft	ug/kg	95	27	27	-	0.174	2,300	4	0.349	4,600	4
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-3 ft	ug/kg	99,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-10 ft	ug/kg	99,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-3 ft	ug/kg	980,000	20	17	-	0.212	100	0	0.424	100	0
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-10 ft	ug/kg	980,000	27	23	1	0.174	100	0	0.349	100	0
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-3 ft	ug/kg	69	20	20	-	0.212	2,300	4	0.424	4,600	4
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-10 ft	ug/kg	69	27	27	-	0.174	2,300	4	0.349	4,600	4
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-3 ft	ug/kg	650	20	20	-	0.212	2,300	1	0.424	4,600	1
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-10 ft	ug/kg	650	27	27	-	0.174	2,300	1	0.349	4,600	1
Soil	VOCs	Total	1,2-Dichlorobenzene	0-3 ft	ug/kg	9,800,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,2-Dichlorobenzene	0-10 ft	ug/kg	9,800,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-3 ft	ug/kg	15,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-10 ft	ug/kg	15,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	1,2-Dichloropropane	0-3 ft	ug/kg	4,500	20	20	-	0.212	2,300	0	0.424	4,600	1
Soil	VOCs	Total	1,2-Dichloropropane	0-10 ft	ug/kg	4,500	27	27	-	0.174	2,300	0	0.349	4,600	1
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-3 ft	ug/kg	1,500,000	20	17	2	0.212	100	0	0.424	509	0
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-10 ft	ug/kg	1,500,000	27	24	2	0.174	100	0	0.349	509	0
Soil	VOCs	Total	1,3-Dichlorobenzene	0-3 ft	ug/kg	36,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,3-Dichlorobenzene	0-10 ft	ug/kg	36,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	1,3-Dichloropropane	0-3 ft	ug/kg	20,000,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,3-Dichloropropane	0-10 ft	ug/kg	20,000,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	1,4-Dichlorobenzene	0-3 ft	ug/kg	36,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,4-Dichlorobenzene	0-10 ft	ug/kg	36,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	2,2-Dichloropropane	0-3 ft	ug/kg	4,500	20	20	-	0.212	2,300	0	0.424	4,600	1
Soil	VOCs	Total	2,2-Dichloropropane	0-10 ft	ug/kg	4,500	27	27	-	0.174	2,300	0	0.349	4,600	1
Soil	VOCs	Total	2-Butanone (MEK)	0-3 ft	ug/kg	200,000,000	20	20	-	1.06	11,500	0	2.12	23,000	0
Soil	VOCs	Total	2-Butanone (MEK)	0-10 ft	ug/kg	200,000,000	27	27	-	0.872	11,500	0	1.74	23,000	0
Soil	VOCs	Total	2-Chlorotoluene	0-3 ft	ug/kg	20,000,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	2-Chlorotoluene	0-10 ft	ug/kg	20,000,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	2-Hexanone	0-3 ft	ug/kg	1,400,000	20	20	-	1.06	11,500	0	2.12	23,000	0
Soil	VOCs	Total	2-Hexanone	0-10 ft	ug/kg	1,400,000	27	27	-	0.872	11,500	0	1.74	23,000	0
Soil	VOCs	Total	4-Chlorotoluene	0-3 ft	ug/kg	72,000,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	4-Chlorotoluene	0-10 ft	ug/kg	72,000,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	4-Isopropyltoluene	0-3 ft	ug/kg	24,000,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	4-Isopropyltoluene	0-10 ft	ug/kg	24,000,000	27	26	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-3 ft	ug/kg	53,000,000	20	20	-	1.06	11,500	0	2.12	23,000	0
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-10 ft	ug/kg	53,000,000	27	27	-	0.872	11,500	0	1.74	23,000	0
Soil	VOCs	Total	Acetone	0-3 ft	ug/kg	630,000,000	20	20	-	1.06	11,500	0	2.12	23,000	0
Soil	VOCs	Total	Acetone	0-10 ft	ug/kg	630,000,000	27	27	-	0.872	11,500	0	1.74	23,000	0
Soil	VOCs	Total	Benzene	0-3 ft	ug/kg	34,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Benzene	0-10 ft	ug/kg	34,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Bromobenzene	0-3 ft	ug/kg	1,800,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Bromobenzene	0-10 ft	ug/kg	1,800,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Bromochloromethane	0-3 ft	ug/kg	11,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Bromochloromethane	0-10 ft	ug/kg	11,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Bromodichloromethane	0-3 ft	ug/kg	11,000	20	20	-	0.212	2,300	0	0.424	4,600	0

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(7 of 20)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	VOCs	Total	Bromodichloromethane	0-10 ft	ug/kg	11,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Bromoform	0-3 ft	ug/kg	360,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Bromoform	0-10 ft	ug/kg	360,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Bromomethane	0-3 ft	ug/kg	330,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Bromomethane	0-10 ft	ug/kg	330,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Carbon Disulfide	0-3 ft	ug/kg	3,700,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Carbon Disulfide	0-10 ft	ug/kg	3,700,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Carbon Tetrachloride	0-3 ft	ug/kg	15,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Carbon Tetrachloride	0-10 ft	ug/kg	15,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Chlorobenzene	0-3 ft	ug/kg	1,400,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Chlorobenzene	0-10 ft	ug/kg	1,400,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Chloroethane	0-3 ft	ug/kg	61,000,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Chloroethane	0-10 ft	ug/kg	61,000,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Chloroform	0-3 ft	ug/kg	17,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Chloroform	0-10 ft	ug/kg	17,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Chloromethane	0-3 ft	ug/kg	500,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Chloromethane	0-10 ft	ug/kg	500,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-3 ft	ug/kg	3,100,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-10 ft	ug/kg	3,100,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-3 ft	ug/kg	8,100	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-10 ft	ug/kg	8,100	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Dibromochloromethane	0-3 ft	ug/kg	34,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Dibromochloromethane	0-10 ft	ug/kg	34,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Dibromomethane	0-3 ft	ug/kg	110,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Dibromomethane	0-10 ft	ug/kg	110,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Dichlorodifluoromethane	0-3 ft	ug/kg	780,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Dichlorodifluoromethane	0-10 ft	ug/kg	780,000	27	26	1	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-3 ft	ug/kg	310,000	20	19	-	0.212	2,300	0	0.674	4,600	0
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-10 ft	ug/kg	310,000	27	26	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Ethylbenzene	0-3 ft	ug/kg	140,000	20	19	1	0.212	255	0	0.424	4,600	0
Soil	VOCs	Total	Ethylbenzene	0-10 ft	ug/kg	140,000	27	25	2	0.174	255	0	0.349	4,600	0
Soil	VOCs	Total	Hexachlorobutadiene	0-3 ft	ug/kg	22,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Hexachlorobutadiene	0-10 ft	ug/kg	22,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Isopropylbenzene	0-3 ft	ug/kg	11,000,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Isopropylbenzene	0-10 ft	ug/kg	11,000,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	m,p-Xylenes	0-3 ft	ug/kg	2,700,000	20	19	-	0.424	509	0	0.849	1,020	0
Soil	VOCs	Total	m,p-Xylenes	0-10 ft	ug/kg	2,700,000	27	25	1	0.242	509	0	0.698	1,020	0
Soil	VOCs	Total	Naphthalene	0-3 ft	ug/kg	23,000	20	17	-	0.212	100	0	0.424	100	0
Soil	VOCs	Total	Naphthalene	0-10 ft	ug/kg	23,000	27	24	-	0.192	100	0	0.383	100	0
Soil	VOCs	Total	n-Butylbenzene	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	n-Butylbenzene	0-10 ft	ug/kg	NV	27	27	-	0.174	2,300	-	0.349	4,600	-
Soil	VOCs	Total	n-Propylbenzene	0-3 ft	ug/kg	21,000,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	n-Propylbenzene	0-10 ft	ug/kg	21,000,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	o-Xylene	0-3 ft	ug/kg	19,000,000	24	24	-	0.0590	255	0	0.424	509	0
Soil	VOCs	Total	o-Xylene	0-10 ft	ug/kg	19,000,000	35	32	2	0.0590	255	0	0.349	4,600	0
Soil	VOCs	Total	sec-Butylbenzene	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	sec-Butylbenzene	0-10 ft	ug/kg	NV	27	27	-	0.174	2,300	-	0.349	4,600	-
Soil	VOCs	Total	Styrene	0-3 ft	ug/kg	36,000,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Styrene	0-10 ft	ug/kg	36,000,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	tert-Butylbenzene	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	tert-Butylbenzene	0-10 ft	ug/kg	NV	27	27	-	0.174	2,300	-	0.349	4,600	-
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-3 ft	ug/kg	5,100	24	10	3	2.10	255	0	2.10	509	0

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(8 of 20)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-10 ft	ug/kg	5,100	35	10	3	2.10	255	0	2.10	509	0
Soil	VOCs	Total	Toluene	0-3 ft	ug/kg	24,000,000	24	14	9	0.212	255	0	0.424	509	0
Soil	VOCs	Total	Toluene	0-10 ft	ug/kg	24,000,000	35	16	13	0.208	255	0	0.349	509	0
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-3 ft	ug/kg	690,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-10 ft	ug/kg	690,000	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-3 ft	ug/kg	8,100	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-10 ft	ug/kg	8,100	27	27	-	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Trichloroethene (TCE)	0-3 ft	ug/kg	3,900	20	20	-	0.212	2,300	0	0.424	4,600	3
Soil	VOCs	Total	Trichloroethene (TCE)	0-10 ft	ug/kg	3,900	27	27	-	0.174	2,300	0	0.349	4,600	3
Soil	VOCs	Total	Trichlorofluoromethane	0-3 ft	ug/kg	3,400,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Trichlorofluoromethane	0-10 ft	ug/kg	3,400,000	27	26	1	0.174	2,300	0	0.349	4,600	0
Soil	VOCs	Total	Vinyl Acetate	0-3 ft	ug/kg	4,100,000	19	19	-	1.06	11,500	0	2.12	23,000	0
Soil	VOCs	Total	Vinyl Acetate	0-10 ft	ug/kg	4,100,000	26	26	-	0.872	11,500	0	1.74	23,000	0
Soil	VOCs	Total	Vinyl Chloride	0-3 ft	ug/kg	3,900	20	20	-	0.212	2,300	0	0.424	4,600	1
Soil	VOCs	Total	Vinyl Chloride	0-10 ft	ug/kg	3,900	27	27	-	0.174	2,300	0	0.349	4,600	1
MW Soil Subset	Metals	Total	Antimony	0-1 ft	mg/kg	410	9	9	-	0.200	0.300	0	0.200	0.300	0
MW Soil Subset	Metals	Total	Selenium	0-1 ft	mg/kg	5,100	10	8	-	0.200	0.300	0	0.200	0.300	0
MW Soil Subset	Metals	Total	Silver	0-1 ft	mg/kg	1,500	10	5	-	0.200	0.300	0	0.200	0.300	0
MW Soil Subset	Metals	Total	Thallium	0-1 ft	mg/kg	0.203	10	9	-	0.200	0.300	4	0.200	0.300	4
MW Soil Subset	Herbicides	Total	2,4,5-T	0-1 ft	ug/kg	6,200,000	1	1	-	50.0	50.0	0	50.0	50.0	0
MW Soil Subset	Herbicides	Total	2,4,5-TP (Silvex)	0-1 ft	ug/kg	4,900,000	1	1	-	50.0	50.0	0	50.0	50.0	0
MW Soil Subset	Herbicides	Total	2,4-D	0-1 ft	ug/kg	2,400,000	1	1	-	50.0	50.0	0	50.0	50.0	0
MW Soil Subset	Herbicides	Total	2,4-DB	0-1 ft	ug/kg	4,900,000	1	1	-	50.0	50.0	0	50.0	50.0	0
MW Soil Subset	Herbicides	Total	Dalapon	0-1 ft	ug/kg	18,000,000	1	1	-	50.0	50.0	0	50.0	50.0	0
MW Soil Subset	Herbicides	Total	Dicamba	0-1 ft	ug/kg	18,000,000	1	1	-	50.0	50.0	0	50.0	50.0	0
MW Soil Subset	Herbicides	Total	Dichloroprop	0-1 ft	ug/kg	4,900,000	1	1	-	50.0	50.0	0	50.0	50.0	0
MW Soil Subset	Herbicides	Total	Dinoseb	0-1 ft	ug/kg	620,000	1	1	-	50.0	50.0	0	50.0	50.0	0
MW Soil Subset	Herbicides	Total	MCPA	0-1 ft	ug/kg	120,000	1	1	-	25,000	25,000	0	25,000	25,000	0
MW Soil Subset	Herbicides	Total	MCPP	0-1 ft	ug/kg	620,000	1	1	-	25,000	25,000	0	25,000	25,000	0
MW Soil Subset	Pesticides	Total	4,4'-DDD	0-1 ft	ug/kg	11,000	10	10	-	1.00	3.80	0	1.00	3.80	0
MW Soil Subset	Pesticides	Total	4,4'-DDE	0-1 ft	ug/kg	7,700	10	10	-	1.00	3.80	0	1.00	3.80	0
MW Soil Subset	Pesticides	Total	4,4'-DDT	0-1 ft	ug/kg	7,700	10	3	-	1.00	5.00	0	1.00	5.00	0
MW Soil Subset	Pesticides	Total	Aldrin	0-1 ft	ug/kg	130	10	10	-	0.970	1.90	0	0.970	1.90	0
MW Soil Subset	Pesticides	Total	BHC (alpha)	0-1 ft	ug/kg	340	10	10	-	0.500	1.90	0	0.500	1.90	0
MW Soil Subset	Pesticides	Total	BHC (beta)	0-1 ft	ug/kg	960	10	10	-	0.900	12.0	0	0.900	12.0	0
MW Soil Subset	Pesticides	Total	BHC (delta)	0-1 ft	ug/kg	340	10	10	-	0.600	1.90	0	0.600	1.90	0
MW Soil Subset	Pesticides	Total	BHC (gamma) Lindane	0-1 ft	ug/kg	2,000	10	10	-	0.970	1.90	0	0.970	1.90	0
MW Soil Subset	Pesticides	Total	Chlordane (alpha)	0-1 ft	ug/kg	7,200	10	10	-	0.800	5.50	0	0.800	5.50	0
MW Soil Subset	Pesticides	Total	Chlordane (gamma)	0-1 ft	ug/kg	7,200	10	10	-	0.700	14.0	0	0.700	14.0	0
MW Soil Subset	Pesticides	Total	Dieldrin	0-1 ft	ug/kg	130	10	9	-	1.90	8.00	0	1.90	8.00	0
MW Soil Subset	Pesticides	Total	Endosulfan I	0-1 ft	ug/kg	1,400,000	10	10	-	0.970	1.90	0	0.970	1.90	0
MW Soil Subset	Pesticides	Total	Endosulfan II	0-1 ft	ug/kg	1,400,000	10	10	-	1.90	3.80	0	1.90	3.80	0
MW Soil Subset	Pesticides	Total	Endosulfan Sulfate	0-1 ft	ug/kg	1,400,000	10	10	-	1.00	8.00	0	1.00	8.00	0
MW Soil Subset	Pesticides	Total	Endrin Aldehyde	0-1 ft	ug/kg	71,000	10	10	-	1.90	10.0	0	1.90	10.0	0
MW Soil Subset	Pesticides	Total	Endrin Ketone	0-1 ft	ug/kg	71,000	9	9	-	1.90	17.0	0	1.90	17.0	0
MW Soil Subset	Pesticides	Total	Endrin	0-1 ft	ug/kg	71,000	10	10	-	1.90	10.0	0	1.90	10.0	0
MW Soil Subset	Pesticides	Total	Heptachlor Epoxide	0-1 ft	ug/kg	240	10	10	-	0.970	1.90	0	0.970	1.90	0
MW Soil Subset	Pesticides	Total	Heptachlor	0-1 ft	ug/kg	480	10	10	-	0.970	1.90	0	0.970	1.90	0
MW Soil Subset	Pesticides	Total	Methoxychlor	0-1 ft	ug/kg	3,100,000	10	10	-	4.00	19.0	0	4.00	19.0	0
MW Soil Subset	Pesticides	Total	Toxaphene	0-1 ft	ug/kg	2,000	10	10	-	50.0	190	0	50.0	190	0
MW Soil Subset	PCB Aroclors	Total	Aroclor 1016	0-1 ft	ug/kg	21,000	10	10	-	3.80	50.0	0	3.80	50.0	0
MW Soil Subset	PCB Aroclors	Total	Aroclor 1221	0-1 ft	ug/kg	540	10	10	-	3.80	50.0	0	3.80	50.0	0

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
MW Soil Subset	PCB Aroclors	Total	Aroclor 1232	0-1 ft	ug/kg	540	10	10	-	3.80	50.0	0	3.80	50.0	0
MW Soil Subset	PCB Aroclors	Total	Aroclor 1242	0-1 ft	ug/kg	740	10	10	-	3.80	50.0	0	3.80	50.0	0
MW Soil Subset	PCB Aroclors	Total	Aroclor 1248	0-1 ft	ug/kg	740	10	10	-	3.80	50.0	0	3.80	50.0	0
MW Soil Subset	PCB Aroclors	Total	Aroclor 1254	0-1 ft	ug/kg	740	10	3	-	4.00	50.0	0	4.00	50.0	0
MW Soil Subset	PCB Aroclors	Total	Aroclor 1260	0-1 ft	ug/kg	740	10	1	-	50.0	50.0	0	50.0	50.0	0
MW Soil Subset	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	ug/kg	740	10	1	-	150	150	0	150	150	0
MW Soil Subset	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	mg/kg	23,000	1	1	-	25.0	25.0	0	25.0	25.0	0
MW Soil Subset	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	mg/kg	40,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	mg/kg	13,000	1	1	-	20.0	20.0	0	20.0	20.0	0
MW Soil Subset	SVOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	ug/kg	99,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	1,2-Dichlorobenzene	0-1 ft	ug/kg	19,000,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	1,3-Dichlorobenzene	0-1 ft	ug/kg	17,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	1,4-Dichlorobenzene	0-1 ft	ug/kg	17,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	2,4,5-Trichlorophenol	0-1 ft	ug/kg	62,000,000	10	10	-	49.8	300	0	49.8	300	0
MW Soil Subset	SVOCs	Total	2,4,6-Trichlorophenol	0-1 ft	ug/kg	200,000	10	10	-	49.8	300	0	49.8	300	0
MW Soil Subset	SVOCs	Total	2,4-Dichlorophenol	0-1 ft	ug/kg	1,800,000	10	10	-	49.8	300	0	49.8	300	0
MW Soil Subset	SVOCs	Total	2,4-Dimethylphenol	0-1 ft	ug/kg	12,000,000	10	10	-	20.0	99.7	0	20.0	99.7	0
MW Soil Subset	SVOCs	Total	2,4-Dinitrophenol	0-1 ft	ug/kg	1,200,000	10	10	-	200	590	0	200	590	0
MW Soil Subset	SVOCs	Total	2,4-Dinitrotoluene	0-1 ft	ug/kg	5,500	10	10	-	98.0	300	0	98.0	300	0
MW Soil Subset	SVOCs	Total	2,6-Dinitrotoluene	0-1 ft	ug/kg	240,000	10	10	-	98.0	300	0	98.0	300	0
MW Soil Subset	SVOCs	Total	2-Chloronaphthalene	0-1 ft	ug/kg	82,000,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	2-Chlorophenol	0-1 ft	ug/kg	5,100,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	2-Methylphenol	0-1 ft	ug/kg	31,000,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	2-Nitroaniline	0-1 ft	ug/kg	6,000,000	10	10	-	98.0	300	0	98.0	300	0
MW Soil Subset	SVOCs	Total	2-Nitrophenol	0-1 ft	ug/kg	180,000,000	10	10	-	49.8	300	0	49.8	300	0
MW Soil Subset	SVOCs	Total	3,3'-Dichlorobenzidine	0-1 ft	ug/kg	4,800	10	10	-	98.0	2,490	0	98.0	2,490	0
MW Soil Subset	SVOCs	Total	3-Nitroaniline	0-1 ft	ug/kg	6,000	10	10	-	98.0	300	0	98.0	300	0
MW Soil Subset	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-1 ft	ug/kg	49,000	10	10	-	200	590	0	200	590	0
MW Soil Subset	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-1 ft	ug/kg	NV	10	10	-	20.0	59.0	-	20.0	59.0	-
MW Soil Subset	SVOCs	Total	4-Chloro-3-methylphenol	0-1 ft	ug/kg	62,000,000	10	10	-	49.8	300	0	49.8	300	0
MW Soil Subset	SVOCs	Total	4-Chloroaniline	0-1 ft	ug/kg	8,600	10	10	-	98.0	300	0	98.0	300	0
MW Soil Subset	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-1 ft	ug/kg	NV	10	10	-	20.0	59.0	-	20.0	59.0	-
MW Soil Subset	SVOCs	Total	4-Nitroaniline	0-1 ft	ug/kg	86,000	10	10	-	98.0	300	0	98.0	300	0
MW Soil Subset	SVOCs	Total	4-Nitrophenol	0-1 ft	ug/kg	180,000,000	10	10	-	98.0	300	0	98.0	300	0
MW Soil Subset	SVOCs	Total	Aniline	0-1 ft	ug/kg	2,500,000,000	1	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Benzoic Acid	0-1 ft	ug/kg	62,000,000	10	7	2	200	590	0	200	590	0
MW Soil Subset	SVOCs	Total	Benzyl Alcohol	0-1 ft	ug/kg	62,000,000	10	9	1	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Bis(2-chloroethoxy)methane	0-1 ft	ug/kg	1,800,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Bis(2-chloroethyl) Ether	0-1 ft	ug/kg	1,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-1 ft	ug/kg	1,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	ug/kg	150,000	10	1	-	50.0	50.0	0	50.0	50.0	0
MW Soil Subset	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	ug/kg	910,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Carbazole	0-1 ft	ug/kg	1,000,000	10	2	3	20.0	49.8	0	20.0	49.8	0
MW Soil Subset	SVOCs	Total	Dibenzofuran	0-1 ft	ug/kg	1,000,000	10	8	1	20.0	49.8	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Diethyl Phthalate	0-1 ft	ug/kg	490,000,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Dimethyl Phthalate	0-1 ft	ug/kg	150,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	ug/kg	62,000,000	10	6	1	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Di-n-octyl Phthalate	0-1 ft	ug/kg	150,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Hexachlorobenzene	0-1 ft	ug/kg	1,800	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Hexachlorobutadiene	0-1 ft	ug/kg	22,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Hexachlorocyclopentadiene	0-1 ft	ug/kg	3,700,000	10	10	-	98.0	300	0	98.0	300	0
MW Soil Subset	SVOCs	Total	Hexachloroethane	0-1 ft	ug/kg	150,000	10	10	-	20.0	59.0	0	20.0	59.0	0

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(10 of 20)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
MW Soil Subset	SVOCs	Total	Isophorone	0-1 ft	ug/kg	1,800,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Nitrobenzene	0-1 ft	ug/kg	24,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	N-Nitrosodimethylamine	0-1 ft	ug/kg	34	9	9	-	98.0	300	9	98.0	300	9
MW Soil Subset	SVOCs	Total	N-Nitrosodi-n-propylamine	0-1 ft	ug/kg	250	10	10	-	49.8	300	1	49.8	300	1
MW Soil Subset	SVOCs	Total	N-Nitrosodiphenylamine	0-1 ft	ug/kg	350,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	ug/kg	3,100,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Pentachlorophenol	0-1 ft	ug/kg	13,000	10	10	-	98.0	300	0	98.0	300	0
MW Soil Subset	SVOCs	Total	Phenol	0-1 ft	ug/kg	180,000,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	2-Methylnaphthalene	0-1 ft	ug/kg	4,100,000	10	9	1	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Acenaphthene	0-1 ft	ug/kg	19,000,000	14	3	2	20.0	49.8	0	20.0	49.8	0
MW Soil Subset	SVOCs	Total	Acenaphthylene	0-1 ft	ug/kg	23,000	14	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Anthracene	0-1 ft	ug/kg	93,000,000	14	1	1	49.8	49.8	0	20.0	49.8	0
MW Soil Subset	SVOCs	Total	Benzo(a)anthracene	0-1 ft	ug/kg	2,700	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Benzo(a)pyrene	0-1 ft	ug/kg	270	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	ug/kg	2,700	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	ug/kg	27,000	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	ug/kg	27,000	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Chrysene	0-1 ft	ug/kg	270,000	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	ug/kg	270	14	1	1	49.8	49.8	0	20.0	49.8	0
MW Soil Subset	SVOCs	Total	Fluoranthene	0-1 ft	ug/kg	8,900,000	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Fluorene	0-1 ft	ug/kg	12,000,000	14	4	3	20.0	49.8	0	20.0	49.8	0
MW Soil Subset	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	ug/kg	2,700	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Naphthalene	0-1 ft	ug/kg	23,000	14	9	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Phenanthrene	0-1 ft	ug/kg	93,000,000	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Pyrene	0-1 ft	ug/kg	6,700,000	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	VOCs	Total	1,1,1,2-Tetrachloroethane	0-1 ft	ug/kg	9,300	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-1 ft	ug/kg	38,000,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,1,2,2-Tetrachloroethane	0-1 ft	ug/kg	2,800	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,1,2-Trichloroethane	0-1 ft	ug/kg	2,700	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,1-Dichloroethane	0-1 ft	ug/kg	5,900	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,1-Dichloroethene	0-1 ft	ug/kg	680,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,1-Dichloropropene	0-1 ft	ug/kg	8,100	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,2,3-Trichlorobenzene	0-1 ft	ug/kg	490,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,2,3-Trichloropropane	0-1 ft	ug/kg	95	1	1	-	100	100	1	100	100	1
MW Soil Subset	VOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	ug/kg	99,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	ug/kg	980,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,2-Dibromo-3-chloropropane	0-1 ft	ug/kg	69	1	1	-	500	500	1	500	500	1
MW Soil Subset	VOCs	Total	1,2-Dibromoethane (EDB)	0-1 ft	ug/kg	140	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,2-Dichlorobenzene	0-1 ft	ug/kg	19,000,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,2-Dichloroethane (EDC)	0-1 ft	ug/kg	590	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,2-Dichloropropane	0-1 ft	ug/kg	4,500	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	ug/kg	150,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,3-Dichlorobenzene	0-1 ft	ug/kg	17,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,3-Dichloropropane	0-1 ft	ug/kg	20,000,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	ug/kg	17,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	2,2-Dichloropropane	0-1 ft	ug/kg	4,500	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	2-Butanone (MEK)	0-1 ft	ug/kg	200,000,000	1	1	-	1,000	1,000	0	1,000	1,000	0
MW Soil Subset	VOCs	Total	2-Chlorotoluene	0-1 ft	ug/kg	20,000,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	2-Hexanone	0-1 ft	ug/kg	1,400,000	1	1	-	1,000	1,000	0	1,000	1,000	0
MW Soil Subset	VOCs	Total	4-Chlorotoluene	0-1 ft	ug/kg	72,000,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	4-Isopropyltoluene	0-1 ft	ug/kg	24,000,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	ug/kg	53,000,000	1	1	-	1,000	1,000	0	1,000	1,000	0

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
MW Soil Subset	VOCs	Total	Acetone	0-1 ft	ug/kg	630,000,000	1	1	-	1,000	1,000	0	1,000	1,000	0
MW Soil Subset	VOCs	Total	Benzene	0-1 ft	ug/kg	1,200	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Bromobenzene	0-1 ft	ug/kg	1,800,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Bromochloromethane	0-1 ft	ug/kg	1,900	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Bromodichloromethane	0-1 ft	ug/kg	1,900	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Bromoform	0-1 ft	ug/kg	360,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Bromomethane	0-1 ft	ug/kg	17,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Carbon Disulfide	0-1 ft	ug/kg	3,700,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Carbon Tetrachloride	0-1 ft	ug/kg	630	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Chlorobenzene	0-1 ft	ug/kg	4,300,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Chloroethane	0-1 ft	ug/kg	61,000,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Chloroform	0-1 ft	ug/kg	410	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Chloromethane	0-1 ft	ug/kg	300,000	1	1	-	500	500	0	500	500	0
MW Soil Subset	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	ug/kg	3,100,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	cis-1,3-Dichloropropene	0-1 ft	ug/kg	8,100	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Dibromochloromethane	0-1 ft	ug/kg	34,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Dibromomethane	0-1 ft	ug/kg	110,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Dichlorodifluoromethane	0-1 ft	ug/kg	780,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	ug/kg	20,000	1	1	-	1,000	1,000	0	1,000	1,000	0
MW Soil Subset	VOCs	Total	Ethylbenzene	0-1 ft	ug/kg	12,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Hexachlorobutadiene	0-1 ft	ug/kg	22,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Isopropylbenzene	0-1 ft	ug/kg	24,000,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	m,p-Xylenes	0-1 ft	ug/kg	2,700,000	1	1	-	200	200	0	200	200	0
MW Soil Subset	VOCs	Total	Naphthalene	0-1 ft	ug/kg	23,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	n-Butylbenzene	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	n-Propylbenzene	0-1 ft	ug/kg	21,000,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	o-Xylene	0-1 ft	ug/kg	19,000,000	5	5	-	0.0590	100	0	4.70	100	0
MW Soil Subset	VOCs	Total	sec-Butylbenzene	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	Styrene	0-1 ft	ug/kg	51,000,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	tert-Butylbenzene	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	ug/kg	1,600	5	1	2	100	100	0	4.70	100	0
MW Soil Subset	VOCs	Total	Toluene	0-1 ft	ug/kg	24,000,000	5	1	4	100	100	0	4.70	100	0
MW Soil Subset	VOCs	Total	trans-1,2-Dichloroethene	0-1 ft	ug/kg	200,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	trans-1,3-Dichloropropene	0-1 ft	ug/kg	8,100	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Trichloroethene (TCE)	0-1 ft	ug/kg	130	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Trichlorofluoromethane	0-1 ft	ug/kg	63,000,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Vinyl Chloride	0-1 ft	ug/kg	2,200	1	1	-	100	100	0	100	100	0
Groundwater	Metals	Total	Antimony	N/A	ug/L	5.6	19	11	7	3.00	50.0	10	3.00	50.0	10
Groundwater	Metals	Total	Arsenic	N/A	ug/L	0.018	53	10	6	0.500	5.00	10	0.500	5.00	16
Groundwater	Metals	Total	Beryllium	N/A	ug/L	73	19	12	7	0.0142	5.00	0	0.500	5.00	0
Groundwater	Metals	Total	Cadmium	N/A	ug/L	18	19	13	3	0.00710	5.00	0	0.500	5.00	0
Groundwater	Metals	Total	Chromium	N/A	ug/L	55,000	19	12	-	1.00	10.0	0	1.00	10.0	0
Groundwater	Metals	Total	Copper	N/A	ug/L	1,300	19	8	-	10.0	10.0	0	10.0	10.0	0
Groundwater	Metals	Total	Iron	N/A	ug/L	300	53	3	2	33.7	60.6	0	20.0	60.6	0
Groundwater	Metals	Total	Lead	N/A	ug/L	15	53	21	-	0.00600	3.00	0	0.0200	3.00	0
Groundwater	Metals	Total	Manganese	N/A	ug/L	50	53	1	2	10.0	10.0	0	5.00	10.0	0
Groundwater	Metals	Total	Mercury	N/A	ug/L	11	24	20	2	0.0500	0.200	0	0.200	0.200	0
Groundwater	Metals	Total	Nickel	N/A	ug/L	610	19	8	1	10.0	10.0	0	1.00	10.0	0
Groundwater	Metals	Total	Selenium	N/A	ug/L	170	19	12	3	0.385	5.00	0	3.00	5.00	0
Groundwater	Metals	Total	Silver	N/A	ug/L	180	19	14	1	0.100	10.0	0	0.100	10.0	0
Groundwater	Metals	Total	Thallium	N/A	ug/L	0.24	19	10	9	5.00	5.00	10	0.500	5.00	19
Groundwater	Metals	Total	Zinc	N/A	ug/L	7,400	19	4	-	10.0	10.0	0	10.0	10.0	0

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(12 of 20)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Groundwater	Metals	Dissolved	Antimony	N/A	ug/L	5.6	3	3	-	50.0	50.0	3	50.0	50.0	3
Groundwater	Metals	Dissolved	Arsenic	N/A	ug/L	0.018	36	7	3	0.500	5.00	7	0.500	5.00	10
Groundwater	Metals	Dissolved	Beryllium	N/A	ug/L	73	3	3	-	5.00	5.00	0	5.00	5.00	0
Groundwater	Metals	Dissolved	Cadmium	N/A	ug/L	18	3	3	-	5.00	5.00	0	5.00	5.00	0
Groundwater	Metals	Dissolved	Chromium	N/A	ug/L	55,000	3	3	-	10.0	10.0	0	10.0	10.0	0
Groundwater	Metals	Dissolved	Copper	N/A	ug/L	1,300	3	3	-	10.0	10.0	0	10.0	10.0	0
Groundwater	Metals	Dissolved	Iron	N/A	ug/L	300	36	11	6	4.00	50.0	0	20.0	50.0	0
Groundwater	Metals	Dissolved	Lead	N/A	ug/L	15	36	20	7	0.00600	3.00	0	0.0200	3.00	0
Groundwater	Metals	Dissolved	Manganese	N/A	ug/L	50	36	2	2	0.400	0.400	0	0.400	5.00	0
Groundwater	Metals	Dissolved	Mercury	N/A	ug/L	11	8	8	-	0.0300	0.200	0	0.200	0.200	0
Groundwater	Metals	Dissolved	Nickel	N/A	ug/L	610	3	2	-	10.0	10.0	0	10.0	10.0	0
Groundwater	Metals	Dissolved	Potassium	N/A	ug/L	NV	9	0	1	-	-	-	2,000	2,000	-
Groundwater	Metals	Dissolved	Selenium	N/A	ug/L	170	3	3	-	5.00	5.00	0	5.00	5.00	0
Groundwater	Metals	Dissolved	Silver	N/A	ug/L	180	3	3	-	10.0	10.0	0	10.0	10.0	0
Groundwater	Metals	Dissolved	Thallium	N/A	ug/L	0.24	3	3	-	5.00	5.00	3	5.00	5.00	3
Groundwater	Metals	Dissolved	Zinc	N/A	ug/L	7,400	3	2	-	10.0	10.0	0	10.0	10.0	0
Groundwater	Butyltins	Total	Dibutyltin	N/A	ug/L	11	39	28	2	0.00111	0.00810	0	0.00302	0.0500	0
Groundwater	Butyltins	Total	Monobutyltin	N/A	ug/L	11	39	32	1	0.00105	0.0290	0	0.00302	0.0870	0
Groundwater	Butyltins	Total	Tetrabutyltin	N/A	ug/L	11	8	8	-	0.00110	0.00119	0	0.00300	0.00325	0
Groundwater	Butyltins	Total	Tributyltin	N/A	ug/L	11	8	2	-	0.00156	0.00163	0	0.00402	0.00419	0
Groundwater	Herbicides	Total	2,4,5-T	N/A	ug/L	370	21	21	-	0.0566	0.150	0	0.100	0.160	0
Groundwater	Herbicides	Total	2,4,5-TP (Silvex)	N/A	ug/L	290	21	21	-	0.0227	0.100	0	0.0800	0.100	0
Groundwater	Herbicides	Total	2,4-D	N/A	ug/L	100	21	21	-	0.0296	1.00	0	0.0800	1.00	0
Groundwater	Herbicides	Total	2,4-DB	N/A	ug/L	290	21	21	-	0.0557	1.00	0	0.160	1.00	0
Groundwater	Herbicides	Total	4-Nitrophenol	N/A	ug/L	10,000	8	7	-	0.0114	0.0114	0	0.0800	0.0800	0
Groundwater	Herbicides	Total	Dalapon	N/A	ug/L	1,100	21	21	-	0.0124	2.00	0	0.0800	2.00	0
Groundwater	Herbicides	Total	Dicamba	N/A	ug/L	1,100	21	21	-	0.0221	0.100	0	0.0800	0.100	0
Groundwater	Herbicides	Total	Dichloroprop	N/A	ug/L	290	21	20	-	0.0114	1.00	0	0.0800	1.00	0
Groundwater	Herbicides	Total	Dinoseb	N/A	ug/L	37	21	21	-	0.0292	0.500	0	0.0800	0.500	0
Groundwater	Herbicides	Total	MCPA	N/A	ug/L	18	21	21	-	0.0114	50.0	8	0.0800	50.0	8
Groundwater	Herbicides	Total	MCPP	N/A	ug/L	37	21	21	-	0.0134	50.0	13	0.0800	50.0	13
Groundwater	Herbicides	Total	Pentachlorophenol	N/A	ug/L	0.27	8	7	-	0.0259	0.0259	0	0.0800	0.0800	0
Groundwater	Pesticides	Total	4,4'-DDD	N/A	ug/L	0.00031	22	22	-	0.000458	0.100	22	0.00195	0.100	22
Groundwater	Pesticides	Total	4,4'-DDE	N/A	ug/L	0.00022	22	21	-	0.000380	0.100	21	0.00195	0.100	21
Groundwater	Pesticides	Total	4,4'-DDT	N/A	ug/L	0.00022	22	22	-	0.000486	0.100	22	0.00195	0.100	22
Groundwater	Pesticides	Total	Aldrin	N/A	ug/L	0.000049	22	22	-	0.000111	0.0500	22	0.000973	0.0500	22
Groundwater	Pesticides	Total	BHC (alpha)	N/A	ug/L	0.0026	22	22	-	0.000358	0.0500	14	0.000973	0.0500	14
Groundwater	Pesticides	Total	BHC (beta)	N/A	ug/L	0.0091	22	22	-	0.000415	0.0500	14	0.000973	0.0500	14
Groundwater	Pesticides	Total	BHC (delta)	N/A	ug/L	0.0026	22	22	-	0.000228	0.0500	14	0.000973	0.0500	14
Groundwater	Pesticides	Total	BHC (gamma) Lindane	N/A	ug/L	0.052	22	22	-	0.000700	0.0500	0	0.000973	0.0500	0
Groundwater	Pesticides	Total	Chlordane (alpha)	N/A	ug/L	0.0008	14	14	-	0.0470	0.0500	14	0.0470	0.0500	14
Groundwater	Pesticides	Total	Chlordane (gamma)	N/A	ug/L	0.0008	14	14	-	0.0470	0.0500	14	0.0470	0.0500	14
Groundwater	Pesticides	Total	Chlordane (technical)	N/A	ug/L	0.0008	8	8	-	0.00312	0.0114	8	0.00973	0.0137	8
Groundwater	Pesticides	Total	Dieldrin	N/A	ug/L	0.000052	22	21	1	0.000294	0.100	21	0.00195	0.100	22
Groundwater	Pesticides	Total	Endosulfan I	N/A	ug/L	62	22	22	-	0.000485	0.0500	0	0.000973	0.0500	0
Groundwater	Pesticides	Total	Endosulfan II	N/A	ug/L	62	22	22	-	0.000368	0.100	0	0.00195	0.100	0
Groundwater	Pesticides	Total	Endosulfan Sulfate	N/A	ug/L	62	22	22	-	0.000523	0.100	0	0.00195	0.100	0
Groundwater	Pesticides	Total	Endrin Aldehyde	N/A	ug/L	0.29	22	22	-	0.000947	0.100	0	0.00195	0.100	0
Groundwater	Pesticides	Total	Endrin Ketone	N/A	ug/L	0.059	22	22	-	0.000335	0.100	14	0.00195	0.100	14
Groundwater	Pesticides	Total	Endrin	N/A	ug/L	0.059	22	22	-	0.000301	0.100	14	0.00195	0.100	14
Groundwater	Pesticides	Total	Heptachlor Epoxide	N/A	ug/L	0.000039	22	22	-	0.000364	0.0500	22	0.000973	0.0500	22
Groundwater	Pesticides	Total	Heptachlor	N/A	ug/L	0.000079	22	22	-	0.000733	0.0500	22	0.000973	0.0500	22

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Groundwater	Pesticides	Total	Methoxychlor	N/A	ug/L	100	22	22	-	0.000522	0.500	0	0.00973	0.500	0
Groundwater	Pesticides	Total	Toxaphene	N/A	ug/L	0.00028	22	22	-	0.0113	1.00	22	0.0973	1.00	22
Groundwater	PCB Aroclors	Total	Aroclor 1016	N/A	ug/L	0.000064	22	22	-	0.00199	1.00	22	0.00992	1.00	22
Groundwater	PCB Aroclors	Total	Aroclor 1221	N/A	ug/L	0.000064	22	22	-	0.00496	1.00	22	0.0198	1.00	22
Groundwater	PCB Aroclors	Total	Aroclor 1232	N/A	ug/L	0.000064	22	22	-	0.00236	1.00	22	0.00992	1.00	22
Groundwater	PCB Aroclors	Total	Aroclor 1242	N/A	ug/L	0.000064	22	22	-	0.00327	1.00	22	0.00992	1.00	22
Groundwater	PCB Aroclors	Total	Aroclor 1248	N/A	ug/L	0.000064	22	22	-	0.00155	1.00	22	0.00992	1.00	22
Groundwater	PCB Aroclors	Total	Aroclor 1254	N/A	ug/L	0.000064	22	22	-	0.00199	1.00	22	0.00992	1.00	22
Groundwater	PCB Aroclors	Total	Aroclor 1260	N/A	ug/L	0.000064	22	22	-	0.00109	1.00	22	0.00992	1.00	22
Groundwater	NWTPH-Dx	Total	Diesel Range Organics	N/A	ug/L	90	55	18	11	12.0	250	16	100	250	29
Groundwater	NWTPH-Dx	Total	Residual Range Organics	N/A	ug/L	290	55	28	7	21.0	750	12	100	750	15
Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	ug/L	100	57	40	14	13.0	100	0	100	250	34
Groundwater	SVOCs	Total	1,2,4-Trichlorobenzene	N/A	ug/L	2.3	23	23	-	0.0100	10.0	14	0.0999	10.0	14
Groundwater	SVOCs	Total	1,2-Dichlorobenzene	N/A	ug/L	370	23	23	-	0.0160	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	1,3-Dichlorobenzene	N/A	ug/L	0.42	23	23	-	0.0170	10.0	14	0.0999	10.0	16
Groundwater	SVOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	0.42	54	52	2	0.0150	10.0	14	0.0999	10.0	16
Groundwater	SVOCs	Total	2,4,5-Trichlorophenol	N/A	ug/L	1,800	23	23	-	0.0110	48.0	0	0.0999	48.0	0
Groundwater	SVOCs	Total	2,4,6-Trichlorophenol	N/A	ug/L	1.4	23	23	-	0.0120	10.0	14	0.0999	10.0	15
Groundwater	SVOCs	Total	2,4-Dichlorophenol	N/A	ug/L	77	23	23	-	0.0150	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	2,4-Dimethylphenol	N/A	ug/L	380	23	23	-	0.0150	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	2,4-Dinitrophenol	N/A	ug/L	69	23	23	-	0.0300	48.0	0	0.500	48.0	0
Groundwater	SVOCs	Total	2,4-Dinitrotoluene	N/A	ug/L	0.11	23	23	-	0.0130	10.0	16	0.0999	10.0	20
Groundwater	SVOCs	Total	2,6-Dinitrotoluene	N/A	ug/L	37	23	23	-	0.0200	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	2-Chloronaphthalene	N/A	ug/L	1,000	23	23	-	0.00150	10.0	0	0.00999	10.0	0
Groundwater	SVOCs	Total	2-Chlorophenol	N/A	ug/L	81	23	23	-	0.0170	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	2-Methylnaphthalene	N/A	ug/L	150	23	19	4	0.0150	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	2-Methylphenol	N/A	ug/L	1,800	23	22	-	0.0240	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	2-Nitroaniline	N/A	ug/L	370	23	23	-	0.0180	48.0	0	0.0999	48.0	0
Groundwater	SVOCs	Total	2-Nitrophenol	N/A	ug/L	10,000	23	23	-	0.0220	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	3,3'-Dichlorobenzidine	N/A	ug/L	0.021	23	23	-	0.0360	19.0	23	0.0999	19.0	23
Groundwater	SVOCs	Total	3-Nitroaniline	N/A	ug/L	3.4	23	23	-	0.0330	48.0	14	0.0999	48.0	14
Groundwater	SVOCs	Total	4,6-Dinitro-2-methylphenol	N/A	ug/L	2.9	23	23	-	0.0220	48.0	14	0.500	48.0	16
Groundwater	SVOCs	Total	4-Bromophenyl Phenyl Ether	N/A	ug/L	NV	23	23	-	0.0120	10.0	-	0.0999	10.0	-
Groundwater	SVOCs	Total	4-Chloro-3-methylphenol	N/A	ug/L	3,700	23	23	-	0.0539	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	4-Chloroaniline	N/A	ug/L	0.34	23	23	-	0.0390	10.0	16	0.0999	10.0	16
Groundwater	SVOCs	Total	4-Chlorophenyl Phenyl Ether	N/A	ug/L	NV	23	23	-	0.0150	10.0	-	0.0999	10.0	-
Groundwater	SVOCs	Total	4-Nitroaniline	N/A	ug/L	3.4	23	23	-	0.0210	48.0	14	0.0999	48.0	14
Groundwater	SVOCs	Total	4-Nitrophenol	N/A	ug/L	10,000	53	53	-	0.0290	48.0	0	0.500	48.0	0
Groundwater	SVOCs	Total	Acenaphthene	N/A	ug/L	670	23	21	-	0.00160	10.0	0	0.00999	10.0	0
Groundwater	SVOCs	Total	Acenaphthylene	N/A	ug/L	0.14	23	23	-	0.00150	10.0	14	0.00999	10.0	15
Groundwater	SVOCs	Total	Aniline	N/A	ug/L	12	23	23	-	0.0000616	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Anthracene	N/A	ug/L	8,300	23	22	-	0.00150	10.0	0	0.00999	10.0	0
Groundwater	SVOCs	Total	Benzidine	N/A	ug/L	0.000086	23	23	-	0.0240	100	23	0.500	100	23
Groundwater	SVOCs	Total	Benzo(a)anthracene	N/A	ug/L	0.0038	23	23	-	0.00426	10.0	23	0.00999	10.0	23
Groundwater	SVOCs	Total	Benzo(a)pyrene	N/A	ug/L	0.0029	23	23	-	0.00470	10.0	23	0.00999	10.0	23
Groundwater	SVOCs	Total	Benzo(b)fluoranthene	N/A	ug/L	0.0038	14	14	-	9.40	10.0	14	9.40	10.0	14
Groundwater	SVOCs	Total	Benzo(g,h,i)perylene	N/A	ug/L	0.290	23	23	-	0.00340	10.0	14	0.00999	10.0	14
Groundwater	SVOCs	Total	Benzo(k)fluoranthene	N/A	ug/L	0.0038	14	14	-	9.40	10.0	14	9.40	10.0	14
Groundwater	SVOCs	Total	Benzofluoranthenes, Total	N/A	ug/L	0.00380	9	9	-	0.00380	0.0540	7	0.0200	0.284	9
Groundwater	SVOCs	Total	Benzoic Acid	N/A	ug/L	150,000	23	22	-	0.0200	48.0	0	0.500	48.0	0
Groundwater	SVOCs	Total	Benzyl Alcohol	N/A	ug/L	3,700	23	23	-	0.0320	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Bis(2-chloroethoxy)methane	N/A	ug/L	110	23	23	-	0.0180	10.0	0	0.0999	10.0	0

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Groundwater	SVOCs	Total	Bis(2-chloroethyl) Ether	N/A	ug/L	0.012	23	23	-	0.0190	10.0	23	0.0999	10.0	23
Groundwater	SVOCs	Total	Bis(2-chloroisopropyl) Ether	N/A	ug/L	1,400	23	23	-	0.0210	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	ug/L	1.2	23	19	-	0.0649	48.0	11	0.0999	48.0	12
Groundwater	SVOCs	Total	Butyl Benzyl Phthalate	N/A	ug/L	35	23	23	-	0.187	10.0	0	0.500	10.0	0
Groundwater	SVOCs	Total	Carbazole	N/A	ug/L	NV	23	23	-	0.00280	10.0	-	0.00999	10.0	-
Groundwater	SVOCs	Total	Chrysene	N/A	ug/L	0.0038	23	23	-	0.00250	10.0	16	0.00999	10.0	23
Groundwater	SVOCs	Total	Dibenz(a,h)anthracene	N/A	ug/L	0.0029	23	23	-	0.00270	10.0	20	0.00999	10.0	23
Groundwater	SVOCs	Total	Dibenzofuran	N/A	ug/L	37	23	23	-	0.0140	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Diethyl Phthalate	N/A	ug/L	17,000	23	20	1	0.0579	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Dimethyl Phthalate	N/A	ug/L	29,000	23	22	-	0.0160	10.0	0	0.100	10.0	0
Groundwater	SVOCs	Total	Di-n-butyl Phthalate	N/A	ug/L	2,000	23	23	-	0.231	10.0	0	0.500	10.0	0
Groundwater	SVOCs	Total	Di-n-octyl Phthalate	N/A	ug/L	1.2	23	20	-	0.0340	10.0	14	0.0999	10.0	14
Groundwater	SVOCs	Total	Fluoranthene	N/A	ug/L	130	23	23	-	0.00190	10.0	0	0.00999	10.0	0
Groundwater	SVOCs	Total	Fluorene	N/A	ug/L	1,100	23	23	-	0.00140	10.0	0	0.00999	10.0	0
Groundwater	SVOCs	Total	Hexachlorobenzene	N/A	ug/L	0.00028	23	23	-	0.0200	10.0	23	0.0999	10.0	23
Groundwater	SVOCs	Total	Hexachlorobutadiene	N/A	ug/L	0.44	23	23	-	0.0290	10.0	14	0.0999	10.0	16
Groundwater	SVOCs	Total	Hexachlorocyclopentadiene	N/A	ug/L	40	23	23	-	0.0260	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Hexachloroethane	N/A	ug/L	1.4	23	23	-	0.0400	10.0	14	0.0999	10.0	15
Groundwater	SVOCs	Total	Indeno(1,2,3-cd)pyrene	N/A	ug/L	0.0038	23	23	-	0.00300	10.0	16	0.00999	10.0	23
Groundwater	SVOCs	Total	Isophorone	N/A	ug/L	35	23	21	1	0.0180	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Naphthalene	N/A	ug/L	0.14	23	20	-	0.00220	10.0	14	0.00999	10.0	15
Groundwater	SVOCs	Total	Nitrobenzene	N/A	ug/L	0.12	23	23	-	0.0450	10.0	16	0.0999	10.0	17
Groundwater	SVOCs	Total	N-Nitrosodimethylamine	N/A	ug/L	0.00042	23	23	-	0.00330	10.0	23	0.500	10.0	23
Groundwater	SVOCs	Total	N-Nitrosodi-n-propylamine	N/A	ug/L	0.005	23	23	-	0.0210	10.0	23	0.0999	10.0	23
Groundwater	SVOCs	Total	N-Nitrosodiphenylamine	N/A	ug/L	3.3	23	23	-	0.00999	10.0	14	0.0999	10.0	14
Groundwater	SVOCs	Total	p-cresol (4-Methylphenol)	N/A	ug/L	180	23	22	-	0.0230	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Pentachlorophenol	N/A	ug/L	0.27	23	23	-	0.0170	25.0	14	0.0999	25.0	16
Groundwater	SVOCs	Total	Phenanthrene	N/A	ug/L	8,300	54	49	-	0.00220	10.0	0	0.00999	10.0	0
Groundwater	SVOCs	Total	Phenol	N/A	ug/L	10,000	54	53	1	0.0320	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Pyrene	N/A	ug/L	830	23	23	-	0.00140	10.0	0	0.00999	10.0	0
Groundwater	VOCs	Total	1,1,1,2-Tetrachloroethane	N/A	ug/L	0.52	22	22	-	0.500	1.00	13	1.00	1.00	22
Groundwater	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	ug/L	9,100	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	ug/L	0.067	22	22	-	0.500	1.00	22	1.00	1.00	22
Groundwater	VOCs	Total	1,1,2-Trichloroethane	N/A	ug/L	0.23	22	22	-	0.500	1.00	22	1.00	1.00	22
Groundwater	VOCs	Total	1,1-Dichloroethane	N/A	ug/L	2.3	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,1-Dichloroethene	N/A	ug/L	330	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,1-Dichloropropene	N/A	ug/L	0.43	22	22	-	0.500	1.00	22	1.00	1.00	22
Groundwater	VOCs	Total	1,2,3-Trichlorobenzene	N/A	ug/L	29	22	22	-	0.500	5.00	0	1.00	5.00	0
Groundwater	VOCs	Total	1,2,3-Trichloropropane	N/A	ug/L	0.00072	22	22	-	0.500	1.00	22	1.00	1.00	22
Groundwater	VOCs	Total	1,2,4-Trichlorobenzene	N/A	ug/L	2.3	22	22	-	0.500	5.00	12	1.00	5.00	12
Groundwater	VOCs	Total	1,2,4-Trimethylbenzene	N/A	ug/L	15	22	20	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,2-Dibromo-3-chloropropane	N/A	ug/L	0.00032	22	22	-	0.500	3.00	22	1.00	3.00	22
Groundwater	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	ug/L	0.0063	22	22	-	0.500	1.00	22	1.00	1.00	22
Groundwater	VOCs	Total	1,2-Dichlorobenzene	N/A	ug/L	370	22	22	-	0.500	2.00	0	1.00	2.00	0
Groundwater	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	ug/L	0.14	22	22	-	0.500	1.00	22	1.00	1.00	22
Groundwater	VOCs	Total	1,2-Dichloropropane	N/A	ug/L	0.39	22	22	-	0.500	1.00	22	1.00	1.00	22
Groundwater	VOCs	Total	1,3,5-Trimethylbenzene	N/A	ug/L	12	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,3-Dichlorobenzene	N/A	ug/L	0.42	22	22	-	0.500	2.00	22	1.00	2.00	22
Groundwater	VOCs	Total	1,3-Dichloropropane	N/A	ug/L	730	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	0.42	22	22	-	0.500	2.00	22	1.00	2.00	22
Groundwater	VOCs	Total	2,2-Dichloropropane	N/A	ug/L	0.39	22	22	-	0.500	1.00	22	1.00	1.00	22
Groundwater	VOCs	Total	2-Butanone (MEK)	N/A	ug/L	7,100	14	14	-	2.50	10.0	0	5.00	10.0	0

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(15 of 20)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Groundwater	VOCs	Total	2-Chloroethylvinylether	N/A	ug/L	NV	13	13	-	10.0	10.0	-	10.0	10.0	-
Groundwater	VOCs	Total	2-Chlorotoluene	N/A	ug/L	730	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	2-Hexanone	N/A	ug/L	47	22	22	-	2.50	10.0	0	5.00	10.0	0
Groundwater	VOCs	Total	4-Chlorotoluene	N/A	ug/L	2,600	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	4-Isopropyltoluene	N/A	ug/L	NV	22	22	-	0.500	2.00	-	1.00	2.00	-
Groundwater	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	ug/L	2,000	22	21	1	2.50	10.0	0	5.00	10.0	0
Groundwater	VOCs	Total	Acetone	N/A	ug/L	22,000	22	18	-	2.50	10.0	0	5.00	10.0	0
Groundwater	VOCs	Total	Benzene	N/A	ug/L	0.39	22	22	-	0.500	1.00	22	1.00	1.00	22
Groundwater	VOCs	Total	Bromobenzene	N/A	ug/L	88	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	Bromochloromethane	N/A	ug/L	0.12	22	22	-	0.500	1.00	22	1.00	1.00	22
Groundwater	VOCs	Total	Bromodichloromethane	N/A	ug/L	0.12	22	22	-	0.500	1.00	22	1.00	1.00	22
Groundwater	VOCs	Total	Bromoform	N/A	ug/L	4.3	22	22	-	0.500	3.00	0	1.00	3.00	0
Groundwater	VOCs	Total	Bromomethane	N/A	ug/L	8.7	22	22	-	1.00	1.00	0	1.00	2.00	0
Groundwater	VOCs	Total	Carbon Disulfide	N/A	ug/L	1,000	22	21	-	0.500	10.0	0	1.00	10.0	0
Groundwater	VOCs	Total	Carbon Tetrachloride	N/A	ug/L	0.19	22	21	-	0.500	1.00	21	1.00	1.00	21
Groundwater	VOCs	Total	Chlorobenzene	N/A	ug/L	91	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	Chloroethane	N/A	ug/L	21,000	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	Chloroform	N/A	ug/L	0.19	56	48	4	0.0820	1.00	19	0.500	1.00	52
Groundwater	VOCs	Total	Chloromethane	N/A	ug/L	190	22	22	-	0.500	5.00	0	1.00	5.00	0
Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	ug/L	360	22	21	1	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	cis-1,3-Dichloropropene	N/A	ug/L	0.43	22	22	-	0.500	3.00	22	1.00	3.00	22
Groundwater	VOCs	Total	Dibromochloromethane	N/A	ug/L	0.4	22	22	-	0.500	2.00	22	1.00	2.00	22
Groundwater	VOCs	Total	Dibromomethane	N/A	ug/L	8.2	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	Dichlorodifluoromethane	N/A	ug/L	390	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	ug/L	4.4	22	22	-	0.500	5.00	13	1.00	5.00	13
Groundwater	VOCs	Total	Ethylbenzene	N/A	ug/L	1.4	22	21	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	Hexachlorobutadiene	N/A	ug/L	0.44	22	22	-	0.500	3.00	22	1.00	3.00	22
Groundwater	VOCs	Total	Isopropylbenzene	N/A	ug/L	680	22	20	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	m,p-Xylenes	N/A	ug/L	200	22	22	-	1.00	1.00	0	1.00	2.00	0
Groundwater	VOCs	Total	Naphthalene	N/A	ug/L	0.14	22	22	-	0.500	5.00	22	1.00	5.00	22
Groundwater	VOCs	Total	n-Butylbenzene	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	n-Propylbenzene	N/A	ug/L	1,300	22	20	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	o-Xylene	N/A	ug/L	1,200	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	sec-Butylbenzene	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	Styrene	N/A	ug/L	1,600	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	tert-Butylbenzene	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	0.093	56	43	2	0.0970	1.00	43	0.500	1.00	45
Groundwater	VOCs	Total	Toluene	N/A	ug/L	1,300	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	trans-1,2-Dichloroethene	N/A	ug/L	110	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	trans-1,3-Dichloropropene	N/A	ug/L	0.43	22	22	-	0.500	3.00	22	1.00	3.00	22
Groundwater	VOCs	Total	Trichloroethene (TCE)	N/A	ug/L	0.039	22	22	-	0.500	1.00	22	1.00	1.00	22
Groundwater	VOCs	Total	Trichlorofluoromethane	N/A	ug/L	1,300	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	Vinyl Acetate	N/A	ug/L	410	22	22	-	2.50	10.0	0	5.00	10.0	0
Groundwater	VOCs	Total	Vinyl Chloride	N/A	ug/L	0.025	56	40	13	0.0440	1.00	40	0.500	1.00	53
Seep Water	Metals	Total	Antimony	N/A	ug/L	5.6	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	Metals	Total	Arsenic	N/A	ug/L	0.018	5	1	-	1.01	1.01	1	1.01	1.01	1
Seep Water	Metals	Total	Beryllium	N/A	ug/L	73	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	Metals	Total	Cadmium	N/A	ug/L	18	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	Metals	Total	Lead	N/A	ug/L	15	5	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	Metals	Total	Mercury	N/A	ug/L	11	2	1	1	1.00	1.00	0	0.200	1.00	0
Seep Water	Metals	Total	Silver	N/A	ug/L	180	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	Metals	Total	Thallium	N/A	ug/L	0.24	1	1	-	1.00	1.00	1	1.00	1.00	1

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(16 of 20)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Seep Water	Metals	Total	Zinc	N/A	ug/L	7,400	1	1	-	10.0	10.0	0	10.0	10.0	0
Seep Water	Metals	Dissolved	Arsenic	N/A	ug/L	0.018	5	2	-	0.520	1.00	2	0.520	1.00	2
Seep Water	Metals	Dissolved	Beryllium	N/A	ug/L	73	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	Metals	Dissolved	Cadmium	N/A	ug/L	18	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	Metals	Dissolved	Chromium	N/A	ug/L	55,000	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	Metals	Dissolved	Iron	N/A	ug/L	300	5	2	2	20.0	20.0	0	20.0	20.0	0
Seep Water	Metals	Dissolved	Lead	N/A	ug/L	15	5	2	2	0.0300	1.00	0	0.0300	1.00	0
Seep Water	Metals	Dissolved	Manganese	N/A	ug/L	50	5	2	-	0.140	0.160	0	0.140	0.160	0
Seep Water	Metals	Dissolved	Mercury	N/A	ug/L	11	2	2	-	0.0300	1.00	0	0.200	1.00	0
Seep Water	Metals	Dissolved	Potassium	N/A	ug/L	NV	2	0	1	-	-	-	2,000	2,000	-
Seep Water	Metals	Dissolved	Selenium	N/A	ug/L	170	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	Metals	Dissolved	Silver	N/A	ug/L	180	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	Metals	Dissolved	Thallium	N/A	ug/L	0.24	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	Butyltins	Total	Dibutyltin	N/A	ug/L	11	4	4	-	0.00730	0.00810	0	0.0500	0.0500	0
Seep Water	Butyltins	Total	Monobutyltin	N/A	ug/L	11	4	4	-	0.0110	0.0290	0	0.0500	0.0870	0
Seep Water	Herbicides	Total	2,4,5-T	N/A	ug/L	370	1	1	-	0.400	0.400	0	0.400	0.400	0
Seep Water	Herbicides	Total	2,4,5-TP (Silvex)	N/A	ug/L	290	1	1	-	0.400	0.400	0	0.400	0.400	0
Seep Water	Herbicides	Total	2,4-D	N/A	ug/L	100	1	1	-	0.400	0.400	0	0.400	0.400	0
Seep Water	Herbicides	Total	2,4-DB	N/A	ug/L	290	1	1	-	0.400	0.400	0	0.400	0.400	0
Seep Water	Herbicides	Total	Dalapon	N/A	ug/L	1,100	1	1	-	0.400	0.400	0	0.400	0.400	0
Seep Water	Herbicides	Total	Dicamba	N/A	ug/L	1,100	1	1	-	0.400	0.400	0	0.400	0.400	0
Seep Water	Herbicides	Total	Dichloroprop	N/A	ug/L	290	1	1	-	0.400	0.400	0	0.400	0.400	0
Seep Water	Herbicides	Total	Dinoseb	N/A	ug/L	37	1	1	-	0.400	0.400	0	0.400	0.400	0
Seep Water	Herbicides	Total	MCPA	N/A	ug/L	18	1	1	-	100	100	1	100	100	1
Seep Water	Herbicides	Total	MCPP	N/A	ug/L	37	1	1	-	100	100	1	100	100	1
Seep Water	Pesticides	Total	4,4'-DDD	N/A	ug/L	0.00031	1	1	-	0.0400	0.0400	1	0.0400	0.0400	1
Seep Water	Pesticides	Total	4,4'-DDE	N/A	ug/L	0.00022	1	1	-	0.0300	0.0300	1	0.0300	0.0300	1
Seep Water	Pesticides	Total	4,4'-DDT	N/A	ug/L	0.00022	1	1	-	0.0900	0.0900	1	0.0900	0.0900	1
Seep Water	Pesticides	Total	Aldrin	N/A	ug/L	0.000049	1	1	-	0.0400	0.0400	1	0.0400	0.0400	1
Seep Water	Pesticides	Total	BHC (alpha)	N/A	ug/L	0.0026	1	1	-	0.0200	0.0200	1	0.0200	0.0200	1
Seep Water	Pesticides	Total	BHC (beta)	N/A	ug/L	0.0091	1	1	-	0.100	0.100	1	0.100	0.100	1
Seep Water	Pesticides	Total	BHC (delta)	N/A	ug/L	0.0026	1	1	-	0.0500	0.0500	1	0.0500	0.0500	1
Seep Water	Pesticides	Total	BHC (gamma) Lindane	N/A	ug/L	0.052	1	1	-	0.0300	0.0300	0	0.0300	0.0300	0
Seep Water	Pesticides	Total	Chlordane (alpha)	N/A	ug/L	0.0008	1	1	-	0.0500	0.0500	1	0.0500	0.0500	1
Seep Water	Pesticides	Total	Chlordane (gamma)	N/A	ug/L	0.0008	1	1	-	0.0200	0.0200	1	0.0200	0.0200	1
Seep Water	Pesticides	Total	Dieldrin	N/A	ug/L	0.000052	1	1	-	0.0700	0.0700	1	0.0700	0.0700	1
Seep Water	Pesticides	Total	Endosulfan I	N/A	ug/L	62	1	1	-	0.0300	0.0300	0	0.0300	0.0300	0
Seep Water	Pesticides	Total	Endosulfan II	N/A	ug/L	62	1	1	-	0.0500	0.0500	0	0.0500	0.0500	0
Seep Water	Pesticides	Total	Endosulfan Sulfate	N/A	ug/L	62	1	1	-	0.0700	0.0700	0	0.0700	0.0700	0
Seep Water	Pesticides	Total	Endrin Aldehyde	N/A	ug/L	0.29	1	1	-	0.100	0.100	0	0.100	0.100	0
Seep Water	Pesticides	Total	Endrin	N/A	ug/L	0.059	1	1	-	0.0800	0.0800	1	0.0800	0.0800	1
Seep Water	Pesticides	Total	Heptachlor Epoxide	N/A	ug/L	0.000039	1	1	-	0.0300	0.0300	1	0.0300	0.0300	1
Seep Water	Pesticides	Total	Heptachlor	N/A	ug/L	0.000079	1	1	-	0.0300	0.0300	1	0.0300	0.0300	1
Seep Water	Pesticides	Total	Methoxychlor	N/A	ug/L	100	1	1	-	0.500	0.500	0	0.500	0.500	0
Seep Water	Pesticides	Total	Toxaphene	N/A	ug/L	0.00028	1	1	-	1.50	1.50	1	1.50	1.50	1
Seep Water	PCB Aroclors	Total	Aroclor 1016	N/A	ug/L	0.000064	1	1	-	0.100	0.100	1	0.100	0.100	1
Seep Water	PCB Aroclors	Total	Aroclor 1221	N/A	ug/L	0.000064	1	1	-	0.100	0.100	1	0.100	0.100	1
Seep Water	PCB Aroclors	Total	Aroclor 1232	N/A	ug/L	0.000064	1	1	-	0.100	0.100	1	0.100	0.100	1
Seep Water	PCB Aroclors	Total	Aroclor 1242	N/A	ug/L	0.000064	1	1	-	0.100	0.100	1	0.100	0.100	1
Seep Water	PCB Aroclors	Total	Aroclor 1248	N/A	ug/L	0.000064	1	1	-	0.100	0.100	1	0.100	0.100	1
Seep Water	PCB Aroclors	Total	Aroclor 1254	N/A	ug/L	0.000064	1	1	-	0.100	0.100	1	0.100	0.100	1
Seep Water	PCB Aroclors	Total	Aroclor 1260	N/A	ug/L	0.000064	1	1	-	0.100	0.100	1	0.100	0.100	1

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(17 of 20)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Seep Water	NWTPH-Dx	Total	Diesel Range Organics	N/A	ug/L	90	5	3	1	13.0	250	2	110	250	4
Seep Water	NWTPH-Dx	Total	Residual Range Organics	N/A	ug/L	290	5	4	-	23.0	500	1	110	500	1
Seep Water	NWTPH-Gx	Total	Gasoline Range Organics	N/A	ug/L	100	5	5	-	13.0	250	1	250	250	5
Seep Water	SVOCs	Total	1,2,4-Trichlorobenzene	N/A	ug/L	2.3	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	1,2-Dichlorobenzene	N/A	ug/L	370	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	1,3-Dichlorobenzene	N/A	ug/L	0.42	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	0.42	5	5	-	0.0290	4.76	1	0.200	4.76	1
Seep Water	SVOCs	Total	2,4,5-Trichlorophenol	N/A	ug/L	1,800	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2,4,6-Trichlorophenol	N/A	ug/L	1.4	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	2,4-Dichlorophenol	N/A	ug/L	77	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2,4-Dimethylphenol	N/A	ug/L	380	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2,4-Dinitrophenol	N/A	ug/L	69	1	1	-	9.52	9.52	0	9.52	9.52	0
Seep Water	SVOCs	Total	2,4-Dinitrotoluene	N/A	ug/L	0.11	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	2,6-Dinitrotoluene	N/A	ug/L	37	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2-Chloronaphthalene	N/A	ug/L	1,000	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2-Chlorophenol	N/A	ug/L	81	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2-Methylnaphthalene	N/A	ug/L	150	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2-Methylphenol	N/A	ug/L	1,800	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2-Nitroaniline	N/A	ug/L	370	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2-Nitrophenol	N/A	ug/L	10,000	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	3,3'-Dichlorobenzidine	N/A	ug/L	0.021	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	3-Nitroaniline	N/A	ug/L	3.4	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	4,6-Dinitro-2-methylphenol	N/A	ug/L	2.9	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	4-Bromophenyl Phenyl Ether	N/A	ug/L	NV	1	1	-	4.76	4.76	-	4.76	4.76	-
Seep Water	SVOCs	Total	4-Chloro-3-methylphenol	N/A	ug/L	3,700	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	4-Chloroaniline	N/A	ug/L	0.34	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	4-Chlorophenyl Phenyl Ether	N/A	ug/L	NV	1	1	-	4.76	4.76	-	4.76	4.76	-
Seep Water	SVOCs	Total	4-Nitroaniline	N/A	ug/L	3.4	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	4-Nitrophenol	N/A	ug/L	10,000	5	5	-	0.280	4.76	0	2.00	4.76	0
Seep Water	SVOCs	Total	Acenaphthene	N/A	ug/L	670	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Acenaphthylene	N/A	ug/L	0.14	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Aniline	N/A	ug/L	12	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Anthracene	N/A	ug/L	8,300	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Benzidine	N/A	ug/L	0.000086	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Benzo(a)anthracene	N/A	ug/L	0.0038	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Benzo(a)pyrene	N/A	ug/L	0.0029	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Benzo(b)fluoranthene	N/A	ug/L	0.0038	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Benzo(g,h,i)perylene	N/A	ug/L	0.290	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Benzo(k)fluoranthene	N/A	ug/L	0.0038	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Benzyl Alcohol	N/A	ug/L	3,700	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Bis(2-chloroethoxy)methane	N/A	ug/L	110	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Bis(2-chloroethyl) Ether	N/A	ug/L	0.012	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Bis(2-chloroisopropyl) Ether	N/A	ug/L	1,400	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	ug/L	1.2	1	1	-	23.8	23.8	1	23.8	23.8	1
Seep Water	SVOCs	Total	Butyl Benzyl Phthalate	N/A	ug/L	35	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Carbazole	N/A	ug/L	NV	1	1	-	4.76	4.76	-	4.76	4.76	-
Seep Water	SVOCs	Total	Chrysene	N/A	ug/L	0.0038	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Dibenz(a,h)anthracene	N/A	ug/L	0.0029	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Dibenzofuran	N/A	ug/L	37	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Diethyl Phthalate	N/A	ug/L	17,000	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Dimethyl Phthalate	N/A	ug/L	29,000	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Di-n-butyl Phthalate	N/A	ug/L	2,000	1	1	-	4.76	4.76	0	4.76	4.76	0

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(18 of 20)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Seep Water	SVOCs	Total	Di-n-octyl Phthalate	N/A	ug/L	1.2	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Fluoranthene	N/A	ug/L	130	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Fluorene	N/A	ug/L	1,100	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Hexachlorobenzene	N/A	ug/L	0.00028	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Hexachlorobutadiene	N/A	ug/L	0.44	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Hexachlorocyclopentadiene	N/A	ug/L	40	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Hexachloroethane	N/A	ug/L	1.4	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Indeno(1,2,3-cd)pyrene	N/A	ug/L	0.0038	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Isophorone	N/A	ug/L	35	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Naphthalene	N/A	ug/L	0.14	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Nitrobenzene	N/A	ug/L	0.12	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	N-Nitrosodimethylamine	N/A	ug/L	0.00042	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	N-Nitrosodi-n-propylamine	N/A	ug/L	0.005	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	N-Nitrosodiphenylamine	N/A	ug/L	3.3	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	p-cresol (4-Methylphenol)	N/A	ug/L	180	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Pentachlorophenol	N/A	ug/L	0.27	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Phenanthrene	N/A	ug/L	8,300	5	5	-	0.0220	4.76	0	0.200	4.76	0
Seep Water	SVOCs	Total	Phenol	N/A	ug/L	10,000	5	5	-	0.0630	4.76	0	0.490	4.76	0
Seep Water	SVOCs	Total	Pyrene	N/A	ug/L	830	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	VOCs	Total	1,1,1,2-Tetrachloroethane	N/A	ug/L	0.52	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	ug/L	9,100	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	ug/L	0.067	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	1,1,2-Trichloroethane	N/A	ug/L	0.23	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	1,1-Dichloroethane	N/A	ug/L	2.3	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,1-Dichloroethene	N/A	ug/L	330	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,1-Dichloropropene	N/A	ug/L	0.43	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	1,2,3-Trichlorobenzene	N/A	ug/L	29	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,2,3-Trichloropropane	N/A	ug/L	0.00072	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	1,2,4-Trichlorobenzene	N/A	ug/L	2.3	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,2,4-Trimethylbenzene	N/A	ug/L	15	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,2-Dibromo-3-chloropropane	N/A	ug/L	0.00032	1	1	-	5.00	5.00	1	5.00	5.00	1
Seep Water	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	ug/L	0.0063	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	1,2-Dichlorobenzene	N/A	ug/L	370	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	ug/L	0.14	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	1,2-Dichloropropane	N/A	ug/L	0.39	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	1,3,5-Trimethylbenzene	N/A	ug/L	12	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,3-Dichlorobenzene	N/A	ug/L	0.42	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	1,3-Dichloropropane	N/A	ug/L	730	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	0.42	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	2,2-Dichloropropane	N/A	ug/L	0.39	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	2-Butanone (MEK)	N/A	ug/L	7,100	1	1	-	10.0	10.0	0	10.0	10.0	0
Seep Water	VOCs	Total	2-Chlorotoluene	N/A	ug/L	730	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	2-Hexanone	N/A	ug/L	47	1	1	-	10.0	10.0	0	10.0	10.0	0
Seep Water	VOCs	Total	4-Chlorotoluene	N/A	ug/L	2,600	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	4-Isopropyltoluene	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	ug/L	2,000	1	1	-	10.0	10.0	0	10.0	10.0	0
Seep Water	VOCs	Total	Acetone	N/A	ug/L	22,000	1	1	-	10.0	10.0	0	10.0	10.0	0
Seep Water	VOCs	Total	Benzene	N/A	ug/L	0.39	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	Bromobenzene	N/A	ug/L	88	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Bromochloromethane	N/A	ug/L	0.12	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	Bromodichloromethane	N/A	ug/L	0.12	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	Bromoform	N/A	ug/L	4.3	1	1	-	1.00	1.00	0	1.00	1.00	0

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(19 of 20)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Seep Water	VOCs	Total	Bromomethane	N/A	ug/L	8.7	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Carbon Disulfide	N/A	ug/L	1,000	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Carbon Tetrachloride	N/A	ug/L	0.19	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	Chlorobenzene	N/A	ug/L	91	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Chloroethane	N/A	ug/L	21,000	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Chloroform	N/A	ug/L	0.19	5	3	-	0.0820	1.00	1	0.500	1.00	3
Seep Water	VOCs	Total	Chloromethane	N/A	ug/L	190	1	1	-	5.00	5.00	0	5.00	5.00	0
Seep Water	VOCs	Total	cis-1,2-Dichloroethene	N/A	ug/L	360	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	cis-1,3-Dichloropropene	N/A	ug/L	0.43	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	Dibromochloromethane	N/A	ug/L	0.4	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	Dibromomethane	N/A	ug/L	8.2	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Dichlorodifluoromethane	N/A	ug/L	390	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	ug/L	4.4	1	1	-	5.00	5.00	1	5.00	5.00	1
Seep Water	VOCs	Total	Ethylbenzene	N/A	ug/L	1.4	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Hexachlorobutadiene	N/A	ug/L	0.44	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	Isopropylbenzene	N/A	ug/L	680	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	m,p-Xylenes	N/A	ug/L	200	1	1	-	2.00	2.00	0	2.00	2.00	0
Seep Water	VOCs	Total	Naphthalene	N/A	ug/L	0.14	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	n-Butylbenzene	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	n-Propylbenzene	N/A	ug/L	1,300	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	o-Xylene	N/A	ug/L	1,200	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	sec-Butylbenzene	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	Styrene	N/A	ug/L	1,600	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	tert-Butylbenzene	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	0.093	5	2	1	0.0970	1.00	2	0.500	1.00	3
Seep Water	VOCs	Total	Toluene	N/A	ug/L	1,300	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	trans-1,2-Dichloroethene	N/A	ug/L	110	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	trans-1,3-Dichloropropene	N/A	ug/L	0.43	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	Trichloroethene (TCE)	N/A	ug/L	0.039	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	Trichlorofluoromethane	N/A	ug/L	1,300	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Vinyl Chloride	N/A	ug/L	0.025	5	5	-	0.0440	1.00	5	0.500	1.00	5
Surface Water	Metals	Total	Arsenic	N/A	ug/L	0.018	4	1	-	1.10	1.10	1	1.10	1.10	1
Surface Water	Metals	Total	Mercury	N/A	ug/L	11	1	1	-	0.0300	0.0300	0	0.200	0.200	0
Surface Water	Metals	Dissolved	Iron	N/A	ug/L	300	4	3	1	4.00	20.0	0	20.0	20.0	0
Surface Water	Metals	Dissolved	Lead	N/A	ug/L	15	4	1	3	0.00900	0.00900	0	0.0300	0.0500	0
Surface Water	Metals	Dissolved	Mercury	N/A	ug/L	11	1	1	-	0.0300	0.0300	0	0.200	0.200	0
Surface Water	Butyltins	Total	Dibutyltin	N/A	ug/L	11	4	4	-	0.00730	0.00810	0	0.0500	0.0500	0
Surface Water	Butyltins	Total	Monobutyltin	N/A	ug/L	11	4	4	-	0.0110	0.0290	0	0.0500	0.0870	0
Surface Water	NWTPH-Dx	Total	Diesel Range Organics	N/A	ug/L	90	4	2	2	12.0	120	1	100	120	4
Surface Water	NWTPH-Dx	Total	Residual Range Organics	N/A	ug/L	290	4	4	-	20.0	120	0	100	120	0
Surface Water	NWTPH-Gx	Total	Gasoline Range Organics	N/A	ug/L	100	4	4	-	13.0	13.0	0	250	250	4
Surface Water	SVOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	0.42	4	4	-	0.0290	0.0310	0	0.200	0.210	0
Surface Water	SVOCs	Total	4-Nitrophenol	N/A	ug/L	10,000	4	4	-	0.280	0.300	0	2.00	2.10	0
Surface Water	SVOCs	Total	Phenanthrene	N/A	ug/L	8,300	4	4	-	0.0220	0.0230	0	0.200	0.210	0
Surface Water	SVOCs	Total	Phenol	N/A	ug/L	10,000	4	4	-	0.0630	0.0660	0	0.480	0.530	0
Surface Water	VOCs	Total	Chloroform	N/A	ug/L	0.19	4	4	-	0.0820	0.0820	0	0.500	0.500	4
Surface Water	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	0.093	4	4	-	0.0970	0.0970	4	0.500	0.500	4
Surface Water	VOCs	Total	Vinyl Chloride	N/A	ug/L	0.025	4	4	-	0.0440	0.0440	4	0.500	0.500	4

Notes
The potentially mass wasting soil subset is comprised of the following samples: BIL01USE through BIL09USE, BIL13SSI, and L-01 through L-04.
= The number of applicable MDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.

Table K-1
Human Health Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(20 of 20)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV

= When the number of applicable MRLs > SLV is higher than the number of applicable MDLs > SLV, they are highlited pink when the number of MDLs > SLV is zero or difference is more than 1.

HH = human health
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = methode reporting limit
MW Soil = Mass Wasting Soil
N/A = not applicable
ND = non-detect
NV = No value
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
VOC = volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	Metals	Total	Antimony	0-3 ft	N/A	mg/kg	410	75	20	35	0.160	4.01	0	0.160	4.12	0
Soil	Metals	Total	Antimony	0-10 ft	N/A	mg/kg	410	78	20	36	0.160	4.01	0	0.160	4.12	0
Soil	Metals	Total	Arsenic	0-3 ft	N/A	mg/kg	5.40	75	1	3	0.159	0.159	0	0.907	1.08	0
Soil	Metals	Total	Arsenic	0-10 ft	N/A	mg/kg	5.40	78	1	3	0.159	0.159	0	0.907	1.08	0
Soil	Metals	Total	Beryllium	0-3 ft	N/A	mg/kg	610	75	31	36	0.147	0.191	0	0.248	1.23	0
Soil	Metals	Total	Beryllium	0-10 ft	N/A	mg/kg	610	78	31	36	0.147	0.191	0	0.248	1.23	0
Soil	Metals	Total	Cadmium	0-3 ft	N/A	mg/kg	150	75	8	4	0.0122	0.0153	0	0.248	0.540	0
Soil	Metals	Total	Cadmium	0-10 ft	N/A	mg/kg	150	78	11	4	0.0122	0.0153	0	0.248	0.540	0
Soil	Metals	Total	Lead	0-3 ft	<250um	mg/kg	800	16	0	4	-	-	-	9.80	10.0	0
Soil	Metals	Total	Lead	0-3 ft	<2mm	mg/kg	800	16	0	4	-	-	-	8.20	9.90	0
Soil	Metals	Total	Lead	0-10 ft	<250um	mg/kg	800	16	0	4	-	-	-	9.80	10.0	0
Soil	Metals	Total	Lead	0-10 ft	<2mm	mg/kg	800	16	0	4	-	-	-	8.20	9.90	0
Soil	Metals	Total	Mercury	0-3 ft	N/A	mg/kg	93	75	17	19	0.00528	0.0338	0	0.0196	0.0514	0
Soil	Metals	Total	Mercury	0-10 ft	N/A	mg/kg	93	78	17	20	0.00528	0.0338	0	0.0196	0.0514	0
Soil	Metals	Total	Selenium	0-3 ft	N/A	mg/kg	5,100	75	32	38	0.0781	0.517	0	0.248	4.12	0
Soil	Metals	Total	Selenium	0-10 ft	N/A	mg/kg	5,100	78	32	38	0.0781	0.517	0	0.248	4.12	0
Soil	Metals	Total	Silver	0-3 ft	N/A	mg/kg	1,500	75	3	49	0.0440	0.0524	0	0.0680	0.687	0
Soil	Metals	Total	Silver	0-10 ft	N/A	mg/kg	1,500	78	3	51	0.0440	0.0524	0	0.0680	0.687	0
Soil	Metals	Total	Thallium	0-3 ft	N/A	mg/kg	0.203	75	12	45	0.0429	0.0558	0	0.248	0.687	57
Soil	Metals	Total	Thallium	0-10 ft	N/A	mg/kg	0.203	78	12	48	0.0429	0.0558	0	0.248	0.687	60
Soil	Butyltins	Total	Dibutyltin	0-3 ft	N/A	ug/kg	180,000	62	44	1	0.270	0.887	0	1.20	2.64	0
Soil	Butyltins	Total	Dibutyltin	0-10 ft	N/A	ug/kg	180,000	62	44	1	0.270	0.887	0	1.20	2.64	0
Soil	Butyltins	Total	Monobutyltin	0-3 ft	N/A	ug/kg	180,000	62	40	4	0.240	1.87	0	1.20	3.52	0
Soil	Butyltins	Total	Monobutyltin	0-10 ft	N/A	ug/kg	180,000	62	40	4	0.240	1.87	0	1.20	3.52	0
Soil	Butyltins	Total	Tetrabutyltin	0-3 ft	N/A	ug/kg	180,000	44	43	-	0.445	0.910	0	1.20	2.42	0
Soil	Butyltins	Total	Tetrabutyltin	0-10 ft	N/A	ug/kg	180,000	44	43	-	0.445	0.910	0	1.20	2.42	0
Soil	Butyltins	Total	Tributyltin	0-3 ft	N/A	ug/kg	180,000	62	46	2	0.340	1.53	0	1.20	3.52	0
Soil	Butyltins	Total	Tributyltin	0-10 ft	N/A	ug/kg	180,000	62	46	2	0.340	1.53	0	1.20	3.52	0
Soil	Herbicides	Total	2,4,5-T	0-3 ft	N/A	ug/kg	6,200,000	12	12	-	1.26	1.58	0	5.77	7.23	0
Soil	Herbicides	Total	2,4,5-T	0-10 ft	N/A	ug/kg	6,200,000	12	12	-	1.26	1.58	0	5.77	7.23	0
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-3 ft	N/A	ug/kg	4,900,000	12	12	-	1.84	2.31	0	5.77	7.23	0
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-10 ft	N/A	ug/kg	4,900,000	12	12	-	1.84	2.31	0	5.77	7.23	0
Soil	Herbicides	Total	2,4-D	0-3 ft	N/A	ug/kg	2,400,000	12	12	-	0.476	5.68	0	5.77	7.23	0
Soil	Herbicides	Total	2,4-D	0-10 ft	N/A	ug/kg	2,400,000	12	12	-	0.476	5.68	0	5.77	7.23	0
Soil	Herbicides	Total	2,4-DB	0-3 ft	N/A	ug/kg	4,900,000	12	12	-	0.568	1.01	0	5.77	7.23	0
Soil	Herbicides	Total	2,4-DB	0-10 ft	N/A	ug/kg	4,900,000	12	12	-	0.568	1.01	0	5.77	7.23	0
Soil	Herbicides	Total	4-Nitrophenol	0-3 ft	N/A	ug/kg	180,000,000	12	12	-	1.27	1.60	0	5.77	7.23	0
Soil	Herbicides	Total	4-Nitrophenol	0-10 ft	N/A	ug/kg	180,000,000	12	12	-	1.27	1.60	0	5.77	7.23	0
Soil	Herbicides	Total	Dalapon	0-3 ft	N/A	ug/kg	18,000,000	12	12	-	1.76	2.20	0	5.77	7.23	0
Soil	Herbicides	Total	Dalapon	0-10 ft	N/A	ug/kg	18,000,000	12	12	-	1.76	2.20	0	5.77	7.23	0
Soil	Herbicides	Total	Dicamba	0-3 ft	N/A	ug/kg	18,000,000	12	12	-	1.40	1.76	0	5.77	7.23	0
Soil	Herbicides	Total	Dicamba	0-10 ft	N/A	ug/kg	18,000,000	12	12	-	1.40	1.76	0	5.77	7.23	0
Soil	Herbicides	Total	Dichloroprop	0-3 ft	N/A	ug/kg	4,900,000	12	12	-	0.614	0.770	0	5.77	7.23	0
Soil	Herbicides	Total	Dichloroprop	0-10 ft	N/A	ug/kg	4,900,000	12	12	-	0.614	0.770	0	5.77	7.23	0
Soil	Herbicides	Total	Dinoseb	0-3 ft	N/A	ug/kg	620,000	12	12	-	0.476	0.596	0	5.77	7.23	0
Soil	Herbicides	Total	Dinoseb	0-10 ft	N/A	ug/kg	620,000	12	12	-	0.476	0.596	0	5.77	7.23	0
Soil	Herbicides	Total	MCPA	0-3 ft	N/A	ug/kg	120,000	12	12	-	0.868	1.09	0	5.77	7.23	0
Soil	Herbicides	Total	MCPA	0-10 ft	N/A	ug/kg	120,000	12	12	-	0.868	1.09	0	5.77	7.23	0
Soil	Herbicides	Total	MCPP	0-3 ft	N/A	ug/kg	620,000	12	12	-	1.58	1.98	0	5.77	7.23	0
Soil	Herbicides	Total	MCPP	0-10 ft	N/A	ug/kg	620,000	12	12	-	1.58	1.98	0	5.77	7.23	0
Soil	Herbicides	Total	Pentachlorophenol	0-3 ft	N/A	ug/kg	13,000	12	12	-	0.673	0.843	0	5.77	7.23	0
Soil	Herbicides	Total	Pentachlorophenol	0-10 ft	N/A	ug/kg	13,000	12	12	-	0.673	0.843	0	5.77	7.23	0
Soil	Pesticides	Total	4,4'-DDD	0-3 ft	N/A	ug/kg	11,000	37	35	2	0.110	10.0	0	0.630	10.0	0
Soil	Pesticides	Total	4,4'-DDD	0-10 ft	N/A	ug/kg	11,000	37	35	2	0.110	10.0	0	0.630	10.0	0

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(2 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	Pesticides	Total	4,4'-DDE	0-3 ft	N/A	ug/kg	7,700	37	30	6	0.110	7.80	0	0.660	7.80	0
Soil	Pesticides	Total	4,4'-DDE	0-10 ft	N/A	ug/kg	7,700	37	30	6	0.110	7.80	0	0.660	7.80	0
Soil	Pesticides	Total	4,4'-DDT	0-3 ft	N/A	ug/kg	7,700	37	15	3	0.170	78.0	0	0.990	78.0	0
Soil	Pesticides	Total	4,4'-DDT	0-10 ft	N/A	ug/kg	7,700	37	15	3	0.170	78.0	0	0.990	78.0	0
Soil	Pesticides	Total	Aldrin	0-3 ft	N/A	ug/kg	130	37	36	1	0.101	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	Aldrin	0-10 ft	N/A	ug/kg	130	37	36	1	0.101	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	BHC (alpha)	0-3 ft	N/A	ug/kg	340	37	37	-	0.0981	1.12	0	0.630	5.00	0
Soil	Pesticides	Total	BHC (alpha)	0-10 ft	N/A	ug/kg	340	37	37	-	0.0981	1.12	0	0.630	5.00	0
Soil	Pesticides	Total	BHC (beta)	0-3 ft	N/A	ug/kg	960	37	36	1	0.109	3.78	0	0.630	5.00	0
Soil	Pesticides	Total	BHC (beta)	0-10 ft	N/A	ug/kg	960	37	36	1	0.109	3.78	0	0.630	5.00	0
Soil	Pesticides	Total	BHC (delta)	0-3 ft	N/A	ug/kg	340	37	35	1	0.0740	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	BHC (delta)	0-10 ft	N/A	ug/kg	340	37	35	1	0.0740	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	BHC (gamma) Lindane	0-3 ft	N/A	ug/kg	2,000	37	34	1	0.0800	37.0	0	0.630	37.0	0
Soil	Pesticides	Total	BHC (gamma) Lindane	0-10 ft	N/A	ug/kg	2,000	37	34	1	0.0800	37.0	0	0.630	37.0	0
Soil	Pesticides	Total	Chlordane (alpha)	0-3 ft	N/A	ug/kg	7,200	25	22	3	0.100	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	Chlordane (alpha)	0-10 ft	N/A	ug/kg	7,200	25	22	3	0.100	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	Chlordane (gamma)	0-3 ft	N/A	ug/kg	7,200	25	15	3	0.0900	9.90	0	0.630	9.90	0
Soil	Pesticides	Total	Chlordane (gamma)	0-10 ft	N/A	ug/kg	7,200	25	15	3	0.0900	9.90	0	0.630	9.90	0
Soil	Pesticides	Total	Chlordane (technical)	0-3 ft	N/A	ug/kg	7,200	12	12	-	1.34	11.2	0	9.50	19.8	0
Soil	Pesticides	Total	Chlordane (technical)	0-10 ft	N/A	ug/kg	7,200	12	12	-	1.34	11.2	0	9.50	19.8	0
Soil	Pesticides	Total	Dieldrin	0-3 ft	N/A	ug/kg	130	37	35	2	0.140	31.0	0	0.630	31.0	0
Soil	Pesticides	Total	Dieldrin	0-10 ft	N/A	ug/kg	130	37	35	2	0.140	31.0	0	0.630	31.0	0
Soil	Pesticides	Total	Endosulfan I	0-3 ft	N/A	ug/kg	1,400,000	37	32	2	0.0630	9.50	0	0.630	9.50	0
Soil	Pesticides	Total	Endosulfan I	0-10 ft	N/A	ug/kg	1,400,000	37	32	2	0.0630	9.50	0	0.630	9.50	0
Soil	Pesticides	Total	Endosulfan II	0-3 ft	N/A	ug/kg	1,400,000	37	34	3	0.140	8.40	0	0.630	8.40	0
Soil	Pesticides	Total	Endosulfan II	0-10 ft	N/A	ug/kg	1,400,000	37	34	3	0.140	8.40	0	0.630	8.40	0
Soil	Pesticides	Total	Endosulfan Sulfate	0-3 ft	N/A	ug/kg	1,400,000	37	31	4	0.110	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	Endosulfan Sulfate	0-10 ft	N/A	ug/kg	1,400,000	37	31	4	0.110	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	Endrin Aldehyde	0-3 ft	N/A	ug/kg	71,000	37	32	2	0.120	9.60	0	0.630	9.60	0
Soil	Pesticides	Total	Endrin Aldehyde	0-10 ft	N/A	ug/kg	71,000	37	32	2	0.120	9.60	0	0.630	9.60	0
Soil	Pesticides	Total	Endrin Ketone	0-3 ft	N/A	ug/kg	71,000	37	33	2	0.0930	21.0	0	0.630	21.0	0
Soil	Pesticides	Total	Endrin Ketone	0-10 ft	N/A	ug/kg	71,000	37	33	2	0.0930	21.0	0	0.630	21.0	0
Soil	Pesticides	Total	Endrin	0-3 ft	N/A	ug/kg	71,000	37	33	1	0.0940	6.80	0	0.630	6.80	0
Soil	Pesticides	Total	Endrin	0-10 ft	N/A	ug/kg	71,000	37	33	1	0.0940	6.80	0	0.630	6.80	0
Soil	Pesticides	Total	Heptachlor Epoxide	0-3 ft	N/A	ug/kg	240	37	36	1	0.0840	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	Heptachlor Epoxide	0-10 ft	N/A	ug/kg	240	37	36	1	0.0840	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	Heptachlor	0-3 ft	N/A	ug/kg	480	37	33	4	0.0981	5.00	0	0.660	5.00	0
Soil	Pesticides	Total	Heptachlor	0-10 ft	N/A	ug/kg	480	37	33	4	0.0981	5.00	0	0.660	5.00	0
Soil	Pesticides	Total	Methoxychlor	0-3 ft	N/A	ug/kg	3,100,000	37	35	-	0.141	11.2	0	0.630	19.8	0
Soil	Pesticides	Total	Methoxychlor	0-10 ft	N/A	ug/kg	3,100,000	37	35	-	0.141	11.2	0	0.630	19.8	0
Soil	Pesticides	Total	Toxaphene	0-3 ft	N/A	ug/kg	2,000	37	37	-	4.80	2,900	2	43.0	2,900	2
Soil	Pesticides	Total	Toxaphene	0-10 ft	N/A	ug/kg	2,000	37	37	-	4.80	2,900	2	43.0	2,900	2
Soil	PCB Aroclors	Total	Aroclor 1016	0-3 ft	N/A	ug/kg	21,000	73	73	-	1.08	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1016	0-10 ft	N/A	ug/kg	21,000	73	73	-	1.08	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1221	0-3 ft	N/A	ug/kg	540	73	73	-	2.10	11.0	0	9.82	100	0
Soil	PCB Aroclors	Total	Aroclor 1221	0-10 ft	N/A	ug/kg	540	73	73	-	2.10	11.0	0	9.82	100	0
Soil	PCB Aroclors	Total	Aroclor 1232	0-3 ft	N/A	ug/kg	540	73	73	-	2.10	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1232	0-10 ft	N/A	ug/kg	540	73	73	-	2.10	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1242	0-3 ft	N/A	ug/kg	740	73	73	-	1.97	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1242	0-10 ft	N/A	ug/kg	740	73	73	-	1.97	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1248	0-3 ft	N/A	ug/kg	740	73	73	-	2.10	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1248	0-10 ft	N/A	ug/kg	740	73	73	-	2.10	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1254	0-3 ft	N/A	ug/kg	740	73	63	-	1.53	2.10	0	6.30	13.2	0

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	PCB Aroclors	Total	Aroclor 1254	0-10 ft	N/A	ug/kg	740	73	63	-	1.53	2.10	0	6.30	13.2	0
Soil	PCB Aroclors	Total	Aroclor 1260	0-3 ft	N/A	ug/kg	740	73	12	19	1.54	2.10	0	9.82	13.4	0
Soil	PCB Aroclors	Total	Aroclor 1260	0-10 ft	N/A	ug/kg	740	73	12	19	1.54	2.10	0	9.82	13.4	0
Soil	PCB Aroclors	Total	Aroclor 1262	0-3 ft	N/A	ug/kg	540	18	18	-	2.10	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1262	0-10 ft	N/A	ug/kg	540	18	18	-	2.10	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1268	0-3 ft	N/A	ug/kg	540	18	18	-	2.10	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1268	0-10 ft	N/A	ug/kg	540	18	18	-	2.10	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-3 ft	N/A	ug/kg	740	73	12	-	3.08	4.20	0	19.7	26.4	0
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-10 ft	N/A	ug/kg	740	73	12	-	3.08	4.20	0	19.7	26.4	0
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-3 ft	N/A	mg/kg	23,000	74	11	21	5.02	14.9	0	24.9	36.0	0
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-10 ft	N/A	mg/kg	23,000	77	14	21	5.02	14.9	0	24.9	36.0	0
Soil	NWTPH-Dx	Total	Residual Range Organics	0-3 ft	N/A	mg/kg	40,000	74	8	14	10.0	29.7	0	49.9	140	0
Soil	NWTPH-Dx	Total	Residual Range Organics	0-10 ft	N/A	mg/kg	40,000	77	11	14	10.0	29.7	0	49.9	140	0
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-3 ft	N/A	mg/kg	13,000	44	34	8	0.121	5.00	0	2.60	5.20	0
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-10 ft	N/A	mg/kg	13,000	47	37	8	0.121	5.00	0	2.60	5.20	0
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-3 ft	N/A	ug/kg	99,000	39	39	-	0.880	75.0	0	5.18	340	0
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-10 ft	N/A	ug/kg	99,000	42	42	-	0.880	75.0	0	5.18	340	0
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-3 ft	N/A	ug/kg	9,800,000	39	39	-	0.703	65.0	0	5.18	340	0
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-10 ft	N/A	ug/kg	9,800,000	42	42	-	0.703	65.0	0	5.18	340	0
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-3 ft	N/A	ug/kg	36,000	39	39	-	0.883	80.0	0	5.18	340	0
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-10 ft	N/A	ug/kg	36,000	42	42	-	0.883	80.0	0	5.18	340	0
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-3 ft	N/A	ug/kg	36,000	39	39	-	0.871	95.0	0	5.18	340	0
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-10 ft	N/A	ug/kg	36,000	42	42	-	0.871	95.0	0	5.18	340	0
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-3 ft	N/A	ug/kg	62,000,000	39	39	-	0.804	150	0	5.18	340	0
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-10 ft	N/A	ug/kg	62,000,000	42	42	-	0.804	150	0	5.18	340	0
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-3 ft	N/A	ug/kg	200,000	39	39	-	0.819	90.0	0	5.18	340	0
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-10 ft	N/A	ug/kg	200,000	42	42	-	0.819	90.0	0	5.18	340	0
Soil	SVOCs	Total	2,4-Dichlorophenol	0-3 ft	N/A	ug/kg	1,800,000	39	39	-	0.919	90.0	0	5.18	340	0
Soil	SVOCs	Total	2,4-Dichlorophenol	0-10 ft	N/A	ug/kg	1,800,000	42	42	-	0.919	90.0	0	5.18	340	0
Soil	SVOCs	Total	2,4-Dimethylphenol	0-3 ft	N/A	ug/kg	12,000,000	39	39	-	0.793	280	0	2.07	1,700	0
Soil	SVOCs	Total	2,4-Dimethylphenol	0-10 ft	N/A	ug/kg	12,000,000	42	42	-	0.793	280	0	2.07	1,700	0
Soil	SVOCs	Total	2,4-Dinitrophenol	0-3 ft	N/A	ug/kg	1,200,000	39	39	-	2.81	1,800	0	29.3	6,700	0
Soil	SVOCs	Total	2,4-Dinitrophenol	0-10 ft	N/A	ug/kg	1,200,000	42	42	-	2.81	1,800	0	29.3	6,700	0
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-3 ft	N/A	ug/kg	5,500	39	39	-	1.52	140	0	6.40	340	0
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-10 ft	N/A	ug/kg	5,500	42	42	-	1.52	140	0	6.40	340	0
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-3 ft	N/A	ug/kg	240,000	39	39	-	1.11	140	0	5.18	340	0
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-10 ft	N/A	ug/kg	240,000	42	42	-	1.11	140	0	5.18	340	0
Soil	SVOCs	Total	2-Chloronaphthalene	0-3 ft	N/A	ug/kg	82,000,000	39	39	-	0.351	180	0	1.17	340	0
Soil	SVOCs	Total	2-Chloronaphthalene	0-10 ft	N/A	ug/kg	82,000,000	42	42	-	0.351	180	0	1.17	340	0
Soil	SVOCs	Total	2-Chlorophenol	0-3 ft	N/A	ug/kg	5,100,000	39	39	-	0.697	85.0	0	5.18	340	0
Soil	SVOCs	Total	2-Chlorophenol	0-10 ft	N/A	ug/kg	5,100,000	42	42	-	0.697	85.0	0	5.18	340	0
Soil	SVOCs	Total	2-Methylphenol	0-3 ft	N/A	ug/kg	31,000,000	39	39	-	0.978	170	0	5.18	340	0
Soil	SVOCs	Total	2-Methylphenol	0-10 ft	N/A	ug/kg	31,000,000	42	42	-	0.978	170	0	5.18	340	0
Soil	SVOCs	Total	2-Nitroaniline	0-3 ft	N/A	ug/kg	6,000,000	39	39	-	0.563	140	0	2.07	670	0
Soil	SVOCs	Total	2-Nitroaniline	0-10 ft	N/A	ug/kg	6,000,000	42	42	-	0.563	140	0	2.07	670	0
Soil	SVOCs	Total	2-Nitrophenol	0-3 ft	N/A	ug/kg	180,000,000	39	39	-	1.18	130	0	5.18	340	0
Soil	SVOCs	Total	2-Nitrophenol	0-10 ft	N/A	ug/kg	180,000,000	42	42	-	1.18	130	0	5.18	340	0
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-3 ft	N/A	ug/kg	4,800	39	39	-	1.29	190	0	11.7	3,400	0
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-10 ft	N/A	ug/kg	4,800	42	42	-	1.29	190	0	11.7	3,400	0
Soil	SVOCs	Total	3-Nitroaniline	0-3 ft	N/A	ug/kg	6,000,000	39	39	-	1.99	130	0	10.4	670	0
Soil	SVOCs	Total	3-Nitroaniline	0-10 ft	N/A	ug/kg	6,000,000	42	42	-	1.99	130	0	10.4	670	0
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-3 ft	N/A	ug/kg	49,000	39	39	-	1.51	85.0	0	10.4	3,400	0
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-10 ft	N/A	ug/kg	49,000	42	42	-	1.51	85.0	0	10.4	3,400	0

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-3 ft	N/A	ug/kg	NV	39	39	-	1.40	70.0	-	6.40	340	-
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-10 ft	N/A	ug/kg	NV	42	42	-	1.40	70.0	-	6.40	340	-
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-3 ft	N/A	ug/kg	62,000,000	39	39	-	0.925	110	0	5.18	340	0
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-10 ft	N/A	ug/kg	62,000,000	42	42	-	0.925	110	0	5.18	340	0
Soil	SVOCs	Total	4-Chloroaniline	0-3 ft	N/A	ug/kg	8,600	39	39	-	0.963	110	0	6.40	340	0
Soil	SVOCs	Total	4-Chloroaniline	0-10 ft	N/A	ug/kg	8,600	42	42	-	0.963	110	0	6.40	340	0
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-3 ft	N/A	ug/kg	NV	39	39	-	1.97	100	-	6.40	340	-
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-10 ft	N/A	ug/kg	NV	42	42	-	1.97	100	-	6.40	340	-
Soil	SVOCs	Total	4-Nitroaniline	0-3 ft	N/A	ug/kg	86,000	39	39	-	1.99	170	0	11.7	670	0
Soil	SVOCs	Total	4-Nitroaniline	0-10 ft	N/A	ug/kg	86,000	42	42	-	1.99	170	0	11.7	670	0
Soil	SVOCs	Total	4-Nitrophenol	0-3 ft	N/A	ug/kg	180,000,000	39	39	-	2.22	1,500	0	29.3	3,400	0
Soil	SVOCs	Total	4-Nitrophenol	0-10 ft	N/A	ug/kg	180,000,000	42	42	-	2.22	1,500	0	29.3	3,400	0
Soil	SVOCs	Total	Aniline	0-3 ft	N/A	ug/kg	300,000	39	39	-	1.50	75.0	0	10.4	670	0
Soil	SVOCs	Total	Aniline	0-10 ft	N/A	ug/kg	300,000	42	42	-	1.50	75.0	0	10.4	670	0
Soil	SVOCs	Total	Benzidine	0-3 ft	N/A	ug/kg	55,000	21	21	-	2.21	31.8	0	10.4	366	0
Soil	SVOCs	Total	Benzidine	0-10 ft	N/A	ug/kg	55,000	24	24	-	2.21	31.8	0	10.4	366	0
Soil	SVOCs	Total	Benzoic Acid	0-3 ft	N/A	ug/kg	2,500,000,000	39	27	9	4.15	4,800	0	58.5	6,700	0
Soil	SVOCs	Total	Benzoic Acid	0-10 ft	N/A	ug/kg	2,500,000,000	42	30	9	4.15	4,800	0	58.5	6,700	0
Soil	SVOCs	Total	Benzyl Alcohol	0-3 ft	N/A	ug/kg	62,000,000	39	38	-	2.06	190	0	5.18	670	0
Soil	SVOCs	Total	Benzyl Alcohol	0-10 ft	N/A	ug/kg	62,000,000	42	41	-	2.06	190	0	5.18	670	0
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-3 ft	N/A	ug/kg	1,800,000	39	39	-	1.30	65.0	0	6.40	340	0
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-10 ft	N/A	ug/kg	1,800,000	42	42	-	1.30	65.0	0	6.40	340	0
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-3 ft	N/A	ug/kg	1,000	39	39	-	1.63	120	0	6.40	340	0
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-10 ft	N/A	ug/kg	1,000	42	42	-	1.63	120	0	6.40	340	0
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-3 ft	N/A	ug/kg	1,000	39	39	-	1.20	90.1	0	6.40	340	0
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-10 ft	N/A	ug/kg	1,000	42	42	-	1.20	90.1	0	6.40	340	0
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-3 ft	N/A	ug/kg	150,000	40	11	2	1.90	366	0	20.7	366	0
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-10 ft	N/A	ug/kg	150,000	43	11	3	1.90	366	0	20.7	366	0
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-3 ft	N/A	ug/kg	910,000	39	33	4	1.50	75.0	0	6.40	340	0
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-10 ft	N/A	ug/kg	910,000	42	36	4	1.50	75.0	0	6.40	340	0
Soil	SVOCs	Total	Carbazole	0-3 ft	N/A	ug/kg	1,000,000	39	15	10	1.30	57.1	0	6.40	375	0
Soil	SVOCs	Total	Carbazole	0-10 ft	N/A	ug/kg	1,000,000	42	18	10	1.30	57.1	0	6.40	375	0
Soil	SVOCs	Total	Dibenzofuran	0-3 ft	N/A	ug/kg	1,000,000	40	16	19	0.479	65.0	0	5.18	340	0
Soil	SVOCs	Total	Dibenzofuran	0-10 ft	N/A	ug/kg	1,000,000	43	19	19	0.479	65.0	0	5.18	340	0
Soil	SVOCs	Total	Diethyl Phthalate	0-3 ft	N/A	ug/kg	490,000,000	39	38	1	1.99	180	0	6.40	340	0
Soil	SVOCs	Total	Diethyl Phthalate	0-10 ft	N/A	ug/kg	490,000,000	42	41	1	1.99	180	0	6.40	340	0
Soil	SVOCs	Total	Dimethyl Phthalate	0-3 ft	N/A	ug/kg	150,000	39	36	3	1.29	90.0	0	6.40	340	0
Soil	SVOCs	Total	Dimethyl Phthalate	0-10 ft	N/A	ug/kg	150,000	42	39	3	1.29	90.0	0	6.40	340	0
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-3 ft	N/A	ug/kg	62,000,000	39	25	6	1.89	637	0	6.40	732	0
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-10 ft	N/A	ug/kg	62,000,000	42	28	6	1.89	637	0	6.40	732	0
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-3 ft	N/A	ug/kg	150,000	39	33	3	1.20	60.0	0	6.40	340	0
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-10 ft	N/A	ug/kg	150,000	42	35	3	1.20	60.0	0	6.40	340	0
Soil	SVOCs	Total	Hexachlorobenzene	0-3 ft	N/A	ug/kg	1,800	39	39	-	0.548	110	0	2.07	340	0
Soil	SVOCs	Total	Hexachlorobenzene	0-10 ft	N/A	ug/kg	1,800	42	42	-	0.548	110	0	2.07	340	0
Soil	SVOCs	Total	Hexachlorobutadiene	0-3 ft	N/A	ug/kg	22,000	39	39	-	0.757	70.0	0	5.18	340	0
Soil	SVOCs	Total	Hexachlorobutadiene	0-10 ft	N/A	ug/kg	22,000	42	42	-	0.757	70.0	0	5.18	340	0
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-3 ft	N/A	ug/kg	3,700,000	39	39	-	0.822	750	0	5.18	1,700	0
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-10 ft	N/A	ug/kg	3,700,000	42	42	-	0.822	750	0	5.18	1,700	0
Soil	SVOCs	Total	Hexachloroethane	0-3 ft	N/A	ug/kg	150,000	39	39	-	1.75	110	0	5.18	340	0
Soil	SVOCs	Total	Hexachloroethane	0-10 ft	N/A	ug/kg	150,000	42	42	-	1.75	110	0	5.18	340	0
Soil	SVOCs	Total	Isophorone	0-3 ft	N/A	ug/kg	1,800,000	39	39	-	0.522	80.0	0	6.40	340	0
Soil	SVOCs	Total	Isophorone	0-10 ft	N/A	ug/kg	1,800,000	42	42	-	0.522	80.0	0	6.40	340	0
Soil	SVOCs	Total	Nitrobenzene	0-3 ft	N/A	ug/kg	24,000	39	39	-	1.60	100	0	6.40	340	0

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(5 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	SVOCs	Total	Nitrobenzene	0-10 ft	N/A	ug/kg	24,000	42	42	-	1.60	100	0	6.40	340	0
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-3 ft	N/A	ug/kg	34	39	39	-	1.05	310	9	10.4	1,700	20
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-10 ft	N/A	ug/kg	34	42	42	-	1.05	310	9	10.4	1,700	20
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-3 ft	N/A	ug/kg	250	39	39	-	1.29	160	0	5.18	340	1
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-10 ft	N/A	ug/kg	250	42	42	-	1.29	160	0	5.18	340	1
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-3 ft	N/A	ug/kg	350,000	39	38	1	0.593	110	0	2.07	340	0
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-10 ft	N/A	ug/kg	350,000	42	41	1	0.593	110	0	2.07	340	0
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-3 ft	N/A	ug/kg	3,100,000	39	38	1	1.22	150	0	5.18	340	0
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-10 ft	N/A	ug/kg	3,100,000	42	41	1	1.22	150	0	5.18	340	0
Soil	SVOCs	Total	Pentachlorophenol	0-3 ft	N/A	ug/kg	13,000	39	37	2	2.01	430	0	10.4	3,400	0
Soil	SVOCs	Total	Pentachlorophenol	0-10 ft	N/A	ug/kg	13,000	42	40	2	2.01	430	0	10.4	3,400	0
Soil	SVOCs	Total	Phenol	0-3 ft	N/A	ug/kg	180,000,000	39	34	4	0.749	95.0	0	5.18	1,000	0
Soil	SVOCs	Total	Phenol	0-10 ft	N/A	ug/kg	180,000,000	42	37	4	0.749	95.0	0	5.18	1,000	0
Soil	SVOCs	Total	2-Methylnaphthalene	0-3 ft	N/A	ug/kg	4,100,000	40	22	10	0.183	60.0	0	1.17	340	0
Soil	SVOCs	Total	2-Methylnaphthalene	0-10 ft	N/A	ug/kg	4,100,000	43	24	10	0.183	60.0	0	1.17	340	0
Soil	SVOCs	Total	Acenaphthene	0-3 ft	N/A	ug/kg	19,000,000	40	9	9	0.531	1.00	0	1.23	340	0
Soil	SVOCs	Total	Acenaphthene	0-10 ft	N/A	ug/kg	19,000,000	43	11	9	0.531	1.00	0	1.23	340	0
Soil	SVOCs	Total	Acenaphthylene	0-3 ft	N/A	ug/kg	23,000	40	24	8	0.510	70.0	0	1.17	340	0
Soil	SVOCs	Total	Acenaphthylene	0-10 ft	N/A	ug/kg	23,000	43	27	8	0.510	70.0	0	1.17	340	0
Soil	SVOCs	Total	Anthracene	0-3 ft	N/A	ug/kg	93,000,000	40	5	5	0.356	1.40	0	1.41	340	0
Soil	SVOCs	Total	Anthracene	0-10 ft	N/A	ug/kg	93,000,000	43	7	5	0.356	1.40	0	1.41	340	0
Soil	SVOCs	Total	Benzo(a)anthracene	0-3 ft	N/A	ug/kg	2,700	40	5	-	0.749	1.40	0	2.07	6.50	0
Soil	SVOCs	Total	Benzo(a)anthracene	0-10 ft	N/A	ug/kg	2,700	43	7	-	0.749	1.40	0	2.07	6.50	0
Soil	SVOCs	Total	Benzo(a)pyrene	0-3 ft	N/A	ug/kg	270	40	4	-	0.656	1.60	0	2.07	6.50	0
Soil	SVOCs	Total	Benzo(a)pyrene	0-10 ft	N/A	ug/kg	270	43	6	-	0.656	1.60	0	2.07	6.50	0
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-3 ft	N/A	ug/kg	2,700	18	1	-	2.50	2.50	0	6.50	6.50	0
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-10 ft	N/A	ug/kg	2,700	18	1	-	2.50	2.50	0	6.50	6.50	0
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-3 ft	N/A	ug/kg	27,000	40	7	-	0.202	2.30	0	1.23	6.50	0
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-10 ft	N/A	ug/kg	27,000	43	9	-	0.202	2.30	0	1.23	6.50	0
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-3 ft	N/A	ug/kg	27,000	18	1	1	2.50	2.50	0	6.50	10.0	0
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-10 ft	N/A	ug/kg	27,000	18	1	1	2.50	2.50	0	6.50	10.0	0
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-3 ft	N/A	ug/kg	2,700	22	2	-	0.939	1.14	0	4.14	5.05	0
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-10 ft	N/A	ug/kg	2,700	25	4	-	0.939	1.14	0	4.14	5.05	0
Soil	SVOCs	Total	Chrysene	0-3 ft	N/A	ug/kg	270,000	40	3	1	0.741	0.903	0	2.07	6.50	0
Soil	SVOCs	Total	Chrysene	0-10 ft	N/A	ug/kg	270,000	43	5	1	0.741	0.903	0	2.07	6.50	0
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-3 ft	N/A	ug/kg	270	40	14	4	0.273	3.41	0	1.17	340	1
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-10 ft	N/A	ug/kg	270	43	17	4	0.273	3.41	0	1.17	340	1
Soil	SVOCs	Total	Fluoranthene	0-3 ft	N/A	ug/kg	8,900,000	40	3	-	1.05	2.20	0	2.07	6.50	0
Soil	SVOCs	Total	Fluoranthene	0-10 ft	N/A	ug/kg	8,900,000	43	5	-	1.05	2.20	0	2.07	6.50	0
Soil	SVOCs	Total	Fluorene	0-3 ft	N/A	ug/kg	12,000,000	40	12	5	0.573	85.0	0	1.23	340	0
Soil	SVOCs	Total	Fluorene	0-10 ft	N/A	ug/kg	12,000,000	43	15	5	0.573	85.0	0	1.23	340	0
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-3 ft	N/A	ug/kg	2,700	40	5	-	0.286	1.90	0	1.23	6.50	0
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-10 ft	N/A	ug/kg	2,700	43	7	-	0.286	1.90	0	1.23	6.50	0
Soil	SVOCs	Total	Naphthalene	0-3 ft	N/A	ug/kg	23,000	40	16	13	0.548	65.0	0	1.17	340	0
Soil	SVOCs	Total	Naphthalene	0-10 ft	N/A	ug/kg	23,000	43	19	13	0.548	65.0	0	1.17	340	0
Soil	SVOCs	Total	Phenanthrene	0-3 ft	N/A	ug/kg	93,000,000	40	2	1	0.750	1.30	0	2.50	6.50	0
Soil	SVOCs	Total	Phenanthrene	0-10 ft	N/A	ug/kg	93,000,000	43	4	1	0.713	1.30	0	2.40	6.50	0
Soil	SVOCs	Total	Pyrene	0-3 ft	N/A	ug/kg	6,700,000	40	2	1	0.352	0.429	0	2.07	6.50	0
Soil	SVOCs	Total	Pyrene	0-10 ft	N/A	ug/kg	6,700,000	43	4	1	0.352	0.429	0	2.07	6.50	0
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-3 ft	N/A	ug/kg	9,300	46	46	-	0.0443	1,200	0	1.13	6,200	0
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-10 ft	N/A	ug/kg	9,300	49	49	-	0.0443	1,200	0	1.13	6,200	0
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-3 ft	N/A	ug/kg	38,000,000	46	44	2	0.0650	1,800	0	1.13	6,200	0
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-10 ft	N/A	ug/kg	38,000,000	49	46	3	0.0650	1,800	0	1.13	6,200	0

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-3 ft	N/A	ug/kg	2,800	46	46	-	0.0638	2,500	0	1.13	6,200	1
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-10 ft	N/A	ug/kg	2,800	49	49	-	0.0638	2,500	0	1.13	6,200	1
Soil	VOCs	Total	1,1,2-Trichloroethane	0-3 ft	N/A	ug/kg	24,000	46	46	-	0.0880	2,500	0	1.13	6,200	0
Soil	VOCs	Total	1,1,2-Trichloroethane	0-10 ft	N/A	ug/kg	24,000	49	49	-	0.0880	2,500	0	1.13	6,200	0
Soil	VOCs	Total	1,1-Dichloroethane	0-3 ft	N/A	ug/kg	240,000	46	45	1	0.0480	2,500	0	1.13	6,200	0
Soil	VOCs	Total	1,1-Dichloroethane	0-10 ft	N/A	ug/kg	240,000	49	48	1	0.0480	2,500	0	1.13	6,200	0
Soil	VOCs	Total	1,1-Dichloroethene	0-3 ft	N/A	ug/kg	1,100,000	46	46	-	0.0700	3,000	0	1.13	6,200	0
Soil	VOCs	Total	1,1-Dichloroethene	0-10 ft	N/A	ug/kg	1,100,000	49	49	-	0.0700	3,000	0	1.13	6,200	0
Soil	VOCs	Total	1,1-Dichloropropene	0-3 ft	N/A	ug/kg	8,100	46	46	-	0.150	2,500	0	1.13	6,200	0
Soil	VOCs	Total	1,1-Dichloropropene	0-10 ft	N/A	ug/kg	8,100	49	49	-	0.150	2,500	0	1.13	6,200	0
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-3 ft	N/A	ug/kg	490,000	46	46	-	0.108	2,800	0	1.13	6,200	0
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-10 ft	N/A	ug/kg	490,000	49	49	-	0.108	2,800	0	1.13	6,200	0
Soil	VOCs	Total	1,2,3-Trichloropropane	0-3 ft	N/A	ug/kg	95	46	46	-	0.0756	2,800	1	1.13	6,200	1
Soil	VOCs	Total	1,2,3-Trichloropropane	0-10 ft	N/A	ug/kg	95	49	49	-	0.0756	2,800	1	1.13	6,200	1
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-3 ft	N/A	ug/kg	99,000	46	46	-	0.110	1,800	0	1.13	6,200	0
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-10 ft	N/A	ug/kg	99,000	49	49	-	0.110	1,800	0	1.13	6,200	0
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-3 ft	N/A	ug/kg	980,000	46	25	18	0.0478	3.70	0	1.13	67.0	0
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-10 ft	N/A	ug/kg	980,000	49	28	18	0.0478	3.70	0	1.13	67.0	0
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-3 ft	N/A	ug/kg	69	46	46	-	0.135	3,800	2	1.13	12,000	2
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-10 ft	N/A	ug/kg	69	49	49	-	0.135	3,800	2	1.13	12,000	2
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-3 ft	N/A	ug/kg	650	46	46	-	0.0575	1,800	1	1.13	6,200	1
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-10 ft	N/A	ug/kg	650	49	49	-	0.0575	1,800	1	1.13	6,200	1
Soil	VOCs	Total	1,2-Dichlorobenzene	0-3 ft	N/A	ug/kg	9,800,000	46	46	-	0.0575	2,500	0	1.13	6,200	0
Soil	VOCs	Total	1,2-Dichlorobenzene	0-10 ft	N/A	ug/kg	9,800,000	49	49	-	0.0575	2,500	0	1.13	6,200	0
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-3 ft	N/A	ug/kg	15,000	46	46	-	0.0540	1,800	0	1.13	6,200	0
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-10 ft	N/A	ug/kg	15,000	49	49	-	0.0540	1,800	0	1.13	6,200	0
Soil	VOCs	Total	1,2-Dichloropropane	0-3 ft	N/A	ug/kg	4,500	46	46	-	0.0428	2,500	0	1.13	6,200	1
Soil	VOCs	Total	1,2-Dichloropropane	0-10 ft	N/A	ug/kg	4,500	49	49	-	0.0428	2,500	0	1.13	6,200	1
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-3 ft	N/A	ug/kg	1,500,000	46	38	6	0.0400	6.50	0	1.13	67.0	0
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-10 ft	N/A	ug/kg	1,500,000	49	41	6	0.0400	6.50	0	1.13	67.0	0
Soil	VOCs	Total	1,3-Dichlorobenzene	0-3 ft	N/A	ug/kg	36,000	46	46	-	0.0391	1,800	0	1.13	6,200	0
Soil	VOCs	Total	1,3-Dichlorobenzene	0-10 ft	N/A	ug/kg	36,000	49	49	-	0.0391	1,800	0	1.13	6,200	0
Soil	VOCs	Total	1,3-Dichloropropane	0-3 ft	N/A	ug/kg	20,000,000	46	46	-	0.0590	2,500	0	1.13	6,200	0
Soil	VOCs	Total	1,3-Dichloropropane	0-10 ft	N/A	ug/kg	20,000,000	49	49	-	0.0590	2,500	0	1.13	6,200	0
Soil	VOCs	Total	1,4-Dichlorobenzene	0-3 ft	N/A	ug/kg	36,000	46	44	2	0.0551	2,500	0	1.13	6,200	0
Soil	VOCs	Total	1,4-Dichlorobenzene	0-10 ft	N/A	ug/kg	36,000	49	47	2	0.0551	2,500	0	1.13	6,200	0
Soil	VOCs	Total	2,2-Dichloropropane	0-3 ft	N/A	ug/kg	4,500	46	46	-	0.0763	1,500	0	1.13	6,200	1
Soil	VOCs	Total	2,2-Dichloropropane	0-10 ft	N/A	ug/kg	4,500	49	49	-	0.0763	1,500	0	1.13	6,200	1
Soil	VOCs	Total	2-Butanone (MEK)	0-3 ft	N/A	ug/kg	200,000,000	46	27	13	1.60	12,000	0	7.08	31,000	0
Soil	VOCs	Total	2-Butanone (MEK)	0-10 ft	N/A	ug/kg	200,000,000	49	30	13	1.60	12,000	0	7.08	31,000	0
Soil	VOCs	Total	2-Chlorotoluene	0-3 ft	N/A	ug/kg	20,000,000	46	46	-	0.0490	1,800	0	1.13	6,200	0
Soil	VOCs	Total	2-Chlorotoluene	0-10 ft	N/A	ug/kg	20,000,000	49	49	-	0.0490	1,800	0	1.13	6,200	0
Soil	VOCs	Total	2-Hexanone	0-3 ft	N/A	ug/kg	1,400,000	46	43	3	0.780	7,500	0	5.66	31,000	0
Soil	VOCs	Total	2-Hexanone	0-10 ft	N/A	ug/kg	1,400,000	49	46	3	0.780	7,500	0	5.66	31,000	0
Soil	VOCs	Total	4-Chlorotoluene	0-3 ft	N/A	ug/kg	72,000,000	46	46	-	0.0920	1,800	0	1.13	6,200	0
Soil	VOCs	Total	4-Chlorotoluene	0-10 ft	N/A	ug/kg	72,000,000	49	49	-	0.0920	1,800	0	1.13	6,200	0
Soil	VOCs	Total	4-Isopropyltoluene	0-3 ft	N/A	ug/kg	24,000,000	46	29	15	0.0766	1,800	0	1.37	6,200	0
Soil	VOCs	Total	4-Isopropyltoluene	0-10 ft	N/A	ug/kg	24,000,000	49	32	15	0.0676	1,800	0	1.21	6,200	0
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-3 ft	N/A	ug/kg	53,000,000	46	37	9	0.240	10,000	0	5.66	31,000	0
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-10 ft	N/A	ug/kg	53,000,000	49	40	9	0.240	10,000	0	5.66	31,000	0
Soil	VOCs	Total	Acetone	0-3 ft	N/A	ug/kg	630,000,000	46	23	4	15.0	10,000	0	19.0	31,000	0
Soil	VOCs	Total	Acetone	0-10 ft	N/A	ug/kg	630,000,000	49	26	4	7.77	10,000	0	7.77	31,000	0
Soil	VOCs	Total	Benzene	0-3 ft	N/A	ug/kg	34,000	46	29	17	0.140	2,500	0	1.13	6,200	0

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(7 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	VOCs	Total	Benzene	0-10 ft	N/A	ug/kg	34,000	49	30	19	0.140	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Bromobenzene	0-3 ft	N/A	ug/kg	1,800,000	46	46	-	0.0450	1,800	0	1.13	6,200	0
Soil	VOCs	Total	Bromobenzene	0-10 ft	N/A	ug/kg	1,800,000	49	49	-	0.0450	1,800	0	1.13	6,200	0
Soil	VOCs	Total	Bromochloromethane	0-3 ft	N/A	ug/kg	11,000	46	46	-	0.0519	1,900	0	1.13	6,200	0
Soil	VOCs	Total	Bromochloromethane	0-10 ft	N/A	ug/kg	11,000	49	49	-	0.0519	1,900	0	1.13	6,200	0
Soil	VOCs	Total	Bromodichloromethane	0-3 ft	N/A	ug/kg	11,000	46	46	-	0.0440	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Bromodichloromethane	0-10 ft	N/A	ug/kg	11,000	49	49	-	0.0440	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Bromoform	0-3 ft	N/A	ug/kg	360,000	46	46	-	0.0701	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Bromoform	0-10 ft	N/A	ug/kg	360,000	49	49	-	0.0701	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Bromomethane	0-3 ft	N/A	ug/kg	330,000	46	38	8	0.397	6,200	0	1.13	12,000	0
Soil	VOCs	Total	Bromomethane	0-10 ft	N/A	ug/kg	330,000	49	41	8	0.397	6,200	0	1.13	12,000	0
Soil	VOCs	Total	Carbon Disulfide	0-3 ft	N/A	ug/kg	3,700,000	46	22	23	0.313	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Carbon Disulfide	0-10 ft	N/A	ug/kg	3,700,000	49	25	23	0.313	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Carbon Tetrachloride	0-3 ft	N/A	ug/kg	15,000	46	46	-	0.0780	1,500	0	1.13	6,200	0
Soil	VOCs	Total	Carbon Tetrachloride	0-10 ft	N/A	ug/kg	15,000	49	49	-	0.0780	1,500	0	1.13	6,200	0
Soil	VOCs	Total	Chlorobenzene	0-3 ft	N/A	ug/kg	1,400,000	46	46	-	0.0503	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Chlorobenzene	0-10 ft	N/A	ug/kg	1,400,000	49	49	-	0.0503	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Chloroethane	0-3 ft	N/A	ug/kg	61,000,000	46	46	-	0.300	6,200	0	1.13	12,000	0
Soil	VOCs	Total	Chloroethane	0-10 ft	N/A	ug/kg	61,000,000	49	49	-	0.300	6,200	0	1.13	12,000	0
Soil	VOCs	Total	Chloroform	0-3 ft	N/A	ug/kg	17,000	46	43	3	0.0480	1,800	0	1.13	6,200	0
Soil	VOCs	Total	Chloroform	0-10 ft	N/A	ug/kg	17,000	49	46	3	0.0480	1,800	0	1.13	6,200	0
Soil	VOCs	Total	Chloromethane	0-3 ft	N/A	ug/kg	500,000	46	44	2	0.0570	5,000	0	1.13	12,000	0
Soil	VOCs	Total	Chloromethane	0-10 ft	N/A	ug/kg	500,000	49	47	2	0.0570	5,000	0	1.13	12,000	0
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-3 ft	N/A	ug/kg	3,100,000	46	44	1	0.0810	2,500	0	1.13	6,200	0
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-10 ft	N/A	ug/kg	3,100,000	49	45	1	0.0810	2,500	0	1.13	6,200	0
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-3 ft	N/A	ug/kg	8,100	46	46	-	0.0310	2,500	0	1.13	6,200	0
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-10 ft	N/A	ug/kg	8,100	49	49	-	0.0310	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Dibromochloromethane	0-3 ft	N/A	ug/kg	34,000	46	46	-	0.0730	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Dibromochloromethane	0-10 ft	N/A	ug/kg	34,000	49	49	-	0.0730	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Dibromomethane	0-3 ft	N/A	ug/kg	110,000	46	46	-	0.0734	2,800	0	1.13	6,200	0
Soil	VOCs	Total	Dibromomethane	0-10 ft	N/A	ug/kg	110,000	49	49	-	0.0734	2,800	0	1.13	6,200	0
Soil	VOCs	Total	Dichlorodifluoromethane	0-3 ft	N/A	ug/kg	780,000	46	42	2	0.0463	4,200	0	1.13	12,000	0
Soil	VOCs	Total	Dichlorodifluoromethane	0-10 ft	N/A	ug/kg	780,000	49	44	3	0.0463	4,200	0	1.13	12,000	0
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-3 ft	N/A	ug/kg	310,000	46	29	16	0.140	1,200	0	1.47	6,200	0
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-10 ft	N/A	ug/kg	310,000	49	32	16	0.140	1,200	0	1.47	6,200	0
Soil	VOCs	Total	Ethylbenzene	0-3 ft	N/A	ug/kg	140,000	46	36	9	0.0410	1,800	0	1.13	6,200	0
Soil	VOCs	Total	Ethylbenzene	0-10 ft	N/A	ug/kg	140,000	49	39	9	0.0384	1,800	0	1.13	6,200	0
Soil	VOCs	Total	Hexachlorobutadiene	0-3 ft	N/A	ug/kg	22,000	46	46	-	0.0664	1,800	0	1.13	6,200	0
Soil	VOCs	Total	Hexachlorobutadiene	0-10 ft	N/A	ug/kg	22,000	49	49	-	0.0664	1,800	0	1.13	6,200	0
Soil	VOCs	Total	Isopropylbenzene	0-3 ft	N/A	ug/kg	11,000,000	46	45	-	0.0310	3,000	0	1.13	6,200	0
Soil	VOCs	Total	Isopropylbenzene	0-10 ft	N/A	ug/kg	11,000,000	49	48	-	0.0310	3,000	0	1.13	6,200	0
Soil	VOCs	Total	m,p-Xylenes	0-3 ft	N/A	ug/kg	2,700,000	46	35	9	0.0930	13.0	0	2.26	54.0	0
Soil	VOCs	Total	m,p-Xylenes	0-10 ft	N/A	ug/kg	2,700,000	49	38	9	0.0930	13.0	0	2.26	54.0	0
Soil	VOCs	Total	Naphthalene	0-3 ft	N/A	ug/kg	23,000	46	35	10	0.320	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Naphthalene	0-10 ft	N/A	ug/kg	23,000	49	38	10	0.320	2,500	0	1.13	6,200	0
Soil	VOCs	Total	n-Butylbenzene	0-3 ft	N/A	ug/kg	NV	46	45	1	0.0880	1,800	-	1.13	6,200	-
Soil	VOCs	Total	n-Butylbenzene	0-10 ft	N/A	ug/kg	NV	49	48	1	0.0880	1,800	-	1.13	6,200	-
Soil	VOCs	Total	n-Propylbenzene	0-3 ft	N/A	ug/kg	21,000,000	46	43	2	0.0531	2,800	0	1.13	6,200	0
Soil	VOCs	Total	n-Propylbenzene	0-10 ft	N/A	ug/kg	21,000,000	49	46	2	0.0531	2,800	0	1.13	6,200	0
Soil	VOCs	Total	o-Xylene	0-3 ft	N/A	ug/kg	19,000,000	46	41	4	0.0411	6.90	0	1.13	6,200	0
Soil	VOCs	Total	o-Xylene	0-10 ft	N/A	ug/kg	19,000,000	49	44	4	0.0411	6.90	0	1.13	6,200	0
Soil	VOCs	Total	sec-Butylbenzene	0-3 ft	N/A	ug/kg	NV	46	44	1	0.0442	1,800	-	1.13	6,200	-
Soil	VOCs	Total	sec-Butylbenzene	0-10 ft	N/A	ug/kg	NV	49	47	1	0.0442	1,800	-	1.13	6,200	-

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	VOCs	Total	Styrene	0-3 ft	N/A	ug/kg	36,000,000	46	46	-	0.0340	2,500	0	1.13	12,000	0
Soil	VOCs	Total	Styrene	0-10 ft	N/A	ug/kg	36,000,000	49	49	-	0.0340	2,500	0	1.13	12,000	0
Soil	VOCs	Total	tert-Butylbenzene	0-3 ft	N/A	ug/kg	NV	46	46	-	0.0273	1,800	-	1.13	6,200	-
Soil	VOCs	Total	tert-Butylbenzene	0-10 ft	N/A	ug/kg	NV	49	49	-	0.0273	1,800	-	1.13	6,200	-
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-3 ft	N/A	ug/kg	5,100	46	41	2	0.114	8.30	0	1.13	67.0	0
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-10 ft	N/A	ug/kg	5,100	49	41	3	0.114	8.30	0	1.13	67.0	0
Soil	VOCs	Total	Toluene	0-3 ft	N/A	ug/kg	24,000,000	46	20	24	0.0440	6.10	0	1.13	27.0	0
Soil	VOCs	Total	Toluene	0-10 ft	N/A	ug/kg	24,000,000	49	23	24	0.0440	6.10	0	1.13	27.0	0
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-3 ft	N/A	ug/kg	690,000	46	45	-	0.0480	3,000	0	1.13	6,200	0
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-10 ft	N/A	ug/kg	690,000	49	48	-	0.0480	3,000	0	1.13	6,200	0
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-3 ft	N/A	ug/kg	8,100	46	46	-	0.0513	1,800	0	1.13	6,200	0
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-10 ft	N/A	ug/kg	8,100	49	49	-	0.0513	1,800	0	1.13	6,200	0
Soil	VOCs	Total	Trichloroethene (TCE)	0-3 ft	N/A	ug/kg	3,900	46	39	6	0.0440	13.0	0	1.13	6,200	1
Soil	VOCs	Total	Trichloroethene (TCE)	0-10 ft	N/A	ug/kg	3,900	49	39	7	0.0440	13.0	0	1.13	6,200	1
Soil	VOCs	Total	Trichlorofluoromethane	0-3 ft	N/A	ug/kg	3,400,000	46	46	-	0.0540	1,800	0	1.13	12,000	0
Soil	VOCs	Total	Trichlorofluoromethane	0-10 ft	N/A	ug/kg	3,400,000	49	49	-	0.0540	1,800	0	1.13	12,000	0
Soil	VOCs	Total	Vinyl Acetate	0-3 ft	N/A	ug/kg	4,100,000	46	46	-	0.600	6,200	0	5.66	12,000	0
Soil	VOCs	Total	Vinyl Acetate	0-10 ft	N/A	ug/kg	4,100,000	49	49	-	0.600	6,200	0	5.66	12,000	0
Soil	VOCs	Total	Vinyl Chloride	0-3 ft	N/A	ug/kg	3,900	46	46	-	0.0570	3,800	0	1.13	12,000	1
Soil	VOCs	Total	Vinyl Chloride	0-10 ft	N/A	ug/kg	3,900	49	49	-	0.0570	3,800	0	1.13	12,000	1
Erodible Soil Subset	Metals	Total	Beryllium	0-1 ft	N/A	mg/kg	610	2	0	2	-	-	-	0.740	1.23	0
Erodible Soil Subset	Metals	Total	Selenium	0-1 ft	N/A	mg/kg	5,100	2	0	2	-	-	-	1.50	2.50	0
Erodible Soil Subset	Pesticides	Total	4,4'-DDD	0-1 ft	N/A	ug/kg	11,000	2	2	-	0.110	0.300	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	4,4'-DDE	0-1 ft	N/A	ug/kg	7,700	2	0	2	-	-	-	0.660	0.710	0
Erodible Soil Subset	Pesticides	Total	Aldrin	0-1 ft	N/A	ug/kg	130	2	2	-	0.160	0.160	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	BHC (alpha)	0-1 ft	N/A	ug/kg	340	2	2	-	0.110	0.110	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	BHC (beta)	0-1 ft	N/A	ug/kg	960	2	2	-	0.180	0.660	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	BHC (delta)	0-1 ft	N/A	ug/kg	340	2	1	1	0.140	0.140	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	BHC (gamma) Lindane	0-1 ft	N/A	ug/kg	2,000	2	2	-	0.0800	1.30	0	0.630	1.30	0
Erodible Soil Subset	Pesticides	Total	Chlordane (alpha)	0-1 ft	N/A	ug/kg	7,200	2	2	-	0.100	0.100	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	Chlordane (gamma)	0-1 ft	N/A	ug/kg	7,200	2	2	-	0.630	0.660	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	Dieldrin	0-1 ft	N/A	ug/kg	130	2	2	-	0.140	0.810	0	0.630	0.810	0
Erodible Soil Subset	Pesticides	Total	Endosulfan I	0-1 ft	N/A	ug/kg	1,400,000	2	2	-	0.110	0.660	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	Endosulfan II	0-1 ft	N/A	ug/kg	1,400,000	2	1	1	0.140	0.140	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	Endosulfan Sulfate	0-1 ft	N/A	ug/kg	1,400,000	2	1	-	0.110	0.110	0	0.630	0.630	0
Erodible Soil Subset	Pesticides	Total	Endrin Aldehyde	0-1 ft	N/A	ug/kg	71,000	2	2	-	0.630	0.700	0	0.630	0.700	0
Erodible Soil Subset	Pesticides	Total	Endrin Ketone	0-1 ft	N/A	ug/kg	71,000	2	2	-	0.630	2.90	0	0.630	2.90	0
Erodible Soil Subset	Pesticides	Total	Endrin	0-1 ft	N/A	ug/kg	71,000	2	2	-	0.0940	0.660	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	Heptachlor Epoxide	0-1 ft	N/A	ug/kg	240	2	2	-	0.0840	0.180	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	Heptachlor	0-1 ft	N/A	ug/kg	480	2	0	2	-	-	-	0.660	0.710	0
Erodible Soil Subset	Pesticides	Total	Methoxychlor	0-1 ft	N/A	ug/kg	3,100,000	2	2	-	0.630	1.50	0	0.630	1.50	0
Erodible Soil Subset	Pesticides	Total	Toxaphene	0-1 ft	N/A	ug/kg	2,000	2	2	-	43.0	190	0	43.0	190	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1016	0-1 ft	N/A	ug/kg	21,000	2	2	-	2.10	2.10	0	6.30	6.60	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1221	0-1 ft	N/A	ug/kg	540	2	2	-	2.10	2.10	0	13.0	14.0	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1232	0-1 ft	N/A	ug/kg	540	2	2	-	2.10	2.10	0	6.30	6.60	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1242	0-1 ft	N/A	ug/kg	740	2	2	-	2.10	2.10	0	6.30	6.60	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1248	0-1 ft	N/A	ug/kg	740	2	2	-	2.10	2.10	0	6.30	6.60	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1254	0-1 ft	N/A	ug/kg	740	2	2	-	2.10	2.10	0	6.30	6.60	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1262	0-1 ft	N/A	ug/kg	540	2	2	-	2.10	2.10	0	6.30	6.60	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1268	0-1 ft	N/A	ug/kg	540	2	2	-	2.10	2.10	0	6.30	6.60	0
Erodible Soil Subset	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	N/A	mg/kg	23,000	2	0	1	-	-	-	36.0	36.0	0
Erodible Soil Subset	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	N/A	mg/kg	13,000	8	4	4	1.50	1.50	0	3.30	5.00	0
Erodible Soil Subset	SVOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	N/A	ug/kg	99,000	2	2	-	38.0	75.0	0	160	340	0

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Erodible Soil Subset	SVOCs	Total	1,2-Dichlorobenzene	0-1 ft	N/A	ug/kg	19,000,000	2	2	-	33.0	65.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	1,3-Dichlorobenzene	0-1 ft	N/A	ug/kg	17,000	2	2	-	40.0	80.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	1,4-Dichlorobenzene	0-1 ft	N/A	ug/kg	17,000	2	2	-	48.0	95.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	2,4,5-Trichlorophenol	0-1 ft	N/A	ug/kg	62,000,000	2	2	-	75.0	150	0	160	340	0
Erodible Soil Subset	SVOCs	Total	2,4,6-Trichlorophenol	0-1 ft	N/A	ug/kg	200,000	2	2	-	45.0	90.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	2,4-Dichlorophenol	0-1 ft	N/A	ug/kg	1,800,000	2	2	-	45.0	90.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	2,4-Dimethylphenol	0-1 ft	N/A	ug/kg	12,000,000	2	2	-	140	280	0	780	1,700	0
Erodible Soil Subset	SVOCs	Total	2,4-Dinitrophenol	0-1 ft	N/A	ug/kg	1,200,000	2	2	-	900	1,800	0	3,200	6,700	0
Erodible Soil Subset	SVOCs	Total	2,4-Dinitrotoluene	0-1 ft	N/A	ug/kg	5,500	2	2	-	70.0	140	0	160	340	0
Erodible Soil Subset	SVOCs	Total	2,6-Dinitrotoluene	0-1 ft	N/A	ug/kg	240,000	2	2	-	70.0	140	0	160	340	0
Erodible Soil Subset	SVOCs	Total	2-Chloronaphthalene	0-1 ft	N/A	ug/kg	82,000,000	2	2	-	90.0	180	0	160	340	0
Erodible Soil Subset	SVOCs	Total	2-Chlorophenol	0-1 ft	N/A	ug/kg	5,100,000	2	2	-	43.0	85.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	2-Methylphenol	0-1 ft	N/A	ug/kg	31,000,000	2	2	-	85.0	170	0	160	340	0
Erodible Soil Subset	SVOCs	Total	2-Nitroaniline	0-1 ft	N/A	ug/kg	6,000,000	2	2	-	68.0	140	0	320	670	0
Erodible Soil Subset	SVOCs	Total	2-Nitrophenol	0-1 ft	N/A	ug/kg	180,000,000	2	2	-	65.0	130	0	160	340	0
Erodible Soil Subset	SVOCs	Total	3,3'-Dichlorobenzidine	0-1 ft	N/A	ug/kg	4,800	2	2	-	93.0	190	0	1,600	3,400	0
Erodible Soil Subset	SVOCs	Total	3-Nitroaniline	0-1 ft	N/A	ug/kg	6,000	2	2	-	65.0	130	0	320	670	0
Erodible Soil Subset	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-1 ft	N/A	ug/kg	49,000	2	2	-	43.0	85.0	0	1,600	3,400	0
Erodible Soil Subset	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-1 ft	N/A	ug/kg	NV	2	2	-	35.0	70.0	-	160	340	-
Erodible Soil Subset	SVOCs	Total	4-Chloro-3-methylphenol	0-1 ft	N/A	ug/kg	62,000,000	2	2	-	53.0	110	0	160	340	0
Erodible Soil Subset	SVOCs	Total	4-Chloroaniline	0-1 ft	N/A	ug/kg	8,600	2	2	-	53.0	110	0	160	340	0
Erodible Soil Subset	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-1 ft	N/A	ug/kg	NV	2	2	-	50.0	100	-	160	340	-
Erodible Soil Subset	SVOCs	Total	4-Nitroaniline	0-1 ft	N/A	ug/kg	86,000	2	2	-	85.0	170	0	320	670	0
Erodible Soil Subset	SVOCs	Total	4-Nitrophenol	0-1 ft	N/A	ug/kg	180,000,000	2	2	-	750	1,500	0	1,600	3,400	0
Erodible Soil Subset	SVOCs	Total	Aniline	0-1 ft	N/A	ug/kg	2,500,000,000	2	2	-	38.0	75.0	0	320	670	0
Erodible Soil Subset	SVOCs	Total	Benzoic Acid	0-1 ft	N/A	ug/kg	62,000,000	2	2	-	2,400	4,800	0	3,200	6,700	0
Erodible Soil Subset	SVOCs	Total	Benzyl Alcohol	0-1 ft	N/A	ug/kg	62,000,000	2	2	-	93.0	190	0	320	670	0
Erodible Soil Subset	SVOCs	Total	Bis(2-chloroethoxy)methane	0-1 ft	N/A	ug/kg	1,800,000	2	2	-	33.0	65.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Bis(2-chloroethyl) Ether	0-1 ft	N/A	ug/kg	1,000	2	2	-	60.0	120	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-1 ft	N/A	ug/kg	1,000	2	2	-	30.0	60.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	N/A	ug/kg	910,000	2	2	-	38.0	75.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Carbazole	0-1 ft	N/A	ug/kg	1,000,000	2	0	2	-	-	-	180	340	0
Erodible Soil Subset	SVOCs	Total	Dibenzofuran	0-1 ft	N/A	ug/kg	1,000,000	2	2	-	33.0	65.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Diethyl Phthalate	0-1 ft	N/A	ug/kg	490,000,000	2	2	-	88.0	180	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Dimethyl Phthalate	0-1 ft	N/A	ug/kg	150,000	2	2	-	45.0	90.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	N/A	ug/kg	62,000,000	2	2	-	65.0	130	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Di-n-octyl Phthalate	0-1 ft	N/A	ug/kg	150,000	2	2	-	30.0	60.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Hexachlorobenzene	0-1 ft	N/A	ug/kg	1,800	2	2	-	53.0	110	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Hexachlorobutadiene	0-1 ft	N/A	ug/kg	22,000	2	2	-	35.0	70.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Hexachlorocyclopentadiene	0-1 ft	N/A	ug/kg	3,700,000	2	2	-	380	750	0	780	1,700	0
Erodible Soil Subset	SVOCs	Total	Hexachloroethane	0-1 ft	N/A	ug/kg	150,000	2	2	-	55.0	110	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Isophorone	0-1 ft	N/A	ug/kg	1,800,000	2	2	-	40.0	80.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Nitrobenzene	0-1 ft	N/A	ug/kg	24,000	2	2	-	50.0	100	0	160	340	0
Erodible Soil Subset	SVOCs	Total	N-Nitrosodimethylamine	0-1 ft	N/A	ug/kg	34	2	2	-	160	310	2	780	1,700	2
Erodible Soil Subset	SVOCs	Total	N-Nitrosodi-n-propylamine	0-1 ft	N/A	ug/kg	250	2	2	-	80.0	160	0	160	340	1
Erodible Soil Subset	SVOCs	Total	N-Nitrosodiphenylamine	0-1 ft	N/A	ug/kg	350,000	2	2	-	55.0	110	0	160	340	0
Erodible Soil Subset	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	N/A	ug/kg	3,100,000	2	2	-	73.0	150	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Pentachlorophenol	0-1 ft	N/A	ug/kg	13,000	2	2	-	220	430	0	1,600	3,400	0
Erodible Soil Subset	SVOCs	Total	Phenol	0-1 ft	N/A	ug/kg	180,000,000	2	2	-	48.0	95.0	0	470	1,000	0
Erodible Soil Subset	SVOCs	Total	2-Methylnaphthalene	0-1 ft	N/A	ug/kg	4,100,000	2	2	-	30.0	60.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Acenaphthene	0-1 ft	N/A	ug/kg	19,000,000	2	0	2	-	-	-	180	340	0
Erodible Soil Subset	SVOCs	Total	Acenaphthylene	0-1 ft	N/A	ug/kg	23,000	2	2	-	35.0	70.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Anthracene	0-1 ft	N/A	ug/kg	93,000,000	2	0	2	-	-	-	180	340	0

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(10 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Erodible Soil Subset	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	N/A	ug/kg	270	2	0	2	-	-	-	180	340	1
Erodible Soil Subset	SVOCs	Total	Fluorene	0-1 ft	N/A	ug/kg	12,000,000	2	2	-	43.0	85.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	23,000	2	2	-	33.0	65.0	0	160	340	0
Erodible Soil Subset	VOCs	Total	1,1,1,2-Tetrachloroethane	0-1 ft	N/A	ug/kg	9,300	8	8	-	0.190	9.40	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-1 ft	N/A	ug/kg	38,000,000	8	8	-	0.160	4.30	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,1,2,2-Tetrachloroethane	0-1 ft	N/A	ug/kg	2,800	8	8	-	0.0900	7.40	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,1,2-Trichloroethane	0-1 ft	N/A	ug/kg	2,700	8	8	-	0.0890	7.90	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,1-Dichloroethane	0-1 ft	N/A	ug/kg	5,900	8	8	-	0.0490	9.30	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,1-Dichloroethene	0-1 ft	N/A	ug/kg	680,000	8	8	-	0.0710	7.30	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,1-Dichloropropene	0-1 ft	N/A	ug/kg	8,100	8	8	-	0.160	9.40	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	1,2,3-Trichlorobenzene	0-1 ft	N/A	ug/kg	490,000	8	8	-	0.150	12.0	0	21.0	270	0
Erodible Soil Subset	VOCs	Total	1,2,3-Trichloropropane	0-1 ft	N/A	ug/kg	95	8	8	-	0.280	17.0	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	N/A	ug/kg	99,000	8	8	-	0.230	6.50	0	21.0	67.0	0
Erodible Soil Subset	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	N/A	ug/kg	980,000	8	2	6	0.110	3.70	0	21.0	67.0	0
Erodible Soil Subset	VOCs	Total	1,2-Dibromo-3-chloropropane	0-1 ft	N/A	ug/kg	69	8	8	-	0.790	140	1	21.0	270	1
Erodible Soil Subset	VOCs	Total	1,2-Dibromoethane (EDB)	0-1 ft	N/A	ug/kg	140	8	8	-	0.200	6.90	0	21.0	27.0	0
Erodible Soil Subset	VOCs	Total	1,2-Dichlorobenzene	0-1 ft	N/A	ug/kg	19,000,000	8	8	-	0.0640	6.60	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,2-Dichloroethane (EDC)	0-1 ft	N/A	ug/kg	590	8	8	-	0.0550	9.70	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,2-Dichloropropane	0-1 ft	N/A	ug/kg	4,500	8	8	-	0.0660	11.0	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	N/A	ug/kg	150,000	8	8	-	0.0410	6.50	0	21.0	67.0	0
Erodible Soil Subset	VOCs	Total	1,3-Dichlorobenzene	0-1 ft	N/A	ug/kg	17,000	8	8	-	0.0710	6.10	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,3-Dichloropropane	0-1 ft	N/A	ug/kg	20,000,000	8	8	-	0.0600	5.30	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	N/A	ug/kg	17,000	8	8	-	0.110	5.70	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	2,2-Dichloropropane	0-1 ft	N/A	ug/kg	4,500	8	8	-	0.110	9.50	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	2-Butanone (MEK)	0-1 ft	N/A	ug/kg	200,000,000	8	1	2	290	290	0	21.0	540	0
Erodible Soil Subset	VOCs	Total	2-Chlorotoluene	0-1 ft	N/A	ug/kg	20,000,000	8	8	-	0.0520	4.90	0	21.0	270	0
Erodible Soil Subset	VOCs	Total	2-Hexanone	0-1 ft	N/A	ug/kg	1,400,000	8	5	3	0.820	170	0	21.0	2,700	0
Erodible Soil Subset	VOCs	Total	4-Chlorotoluene	0-1 ft	N/A	ug/kg	72,000,000	8	8	-	0.0930	5.50	0	21.0	270	0
Erodible Soil Subset	VOCs	Total	4-Isopropyltoluene	0-1 ft	N/A	ug/kg	24,000,000	8	5	3	0.0840	6.10	0	21.0	270	0
Erodible Soil Subset	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	N/A	ug/kg	53,000,000	8	5	3	0.260	460	0	21.0	2,700	0
Erodible Soil Subset	VOCs	Total	Acetone	0-1 ft	N/A	ug/kg	630,000,000	8	1	-	230	230	0	810	810	0
Erodible Soil Subset	VOCs	Total	Benzene	0-1 ft	N/A	ug/kg	1,200	8	4	4	0.230	5.70	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	Bromobenzene	0-1 ft	N/A	ug/kg	1,800,000	8	8	-	0.0930	8.20	0	5.10	270	0
Erodible Soil Subset	VOCs	Total	Bromochloromethane	0-1 ft	N/A	ug/kg	1,900	8	8	-	0.260	9.40	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Bromodichloromethane	0-1 ft	N/A	ug/kg	1,900	8	8	-	0.0450	6.20	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Bromoform	0-1 ft	N/A	ug/kg	360,000	8	8	-	0.260	13.0	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Bromomethane	0-1 ft	N/A	ug/kg	17,000	8	6	2	0.430	29.0	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Carbon Disulfide	0-1 ft	N/A	ug/kg	3,700,000	8	1	7	7.40	7.40	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	Carbon Tetrachloride	0-1 ft	N/A	ug/kg	630	8	8	-	0.0790	11.0	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	Chlorobenzene	0-1 ft	N/A	ug/kg	4,300,000	8	8	-	0.0550	6.60	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	Chloroethane	0-1 ft	N/A	ug/kg	61,000,000	8	8	-	0.310	24.0	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Chloroform	0-1 ft	N/A	ug/kg	410	8	5	3	0.0490	0.0630	0	5.10	41.0	0
Erodible Soil Subset	VOCs	Total	Chloromethane	0-1 ft	N/A	ug/kg	300,000	8	6	2	0.0580	8.70	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	3,100,000	8	7	1	0.0820	0.110	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	cis-1,3-Dichloropropene	0-1 ft	N/A	ug/kg	8,100	8	8	-	0.0320	8.30	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Dibromochloromethane	0-1 ft	N/A	ug/kg	34,000	8	8	-	0.170	9.10	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Dibromomethane	0-1 ft	N/A	ug/kg	110,000	8	8	-	0.190	18.0	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	Dichlorodifluoromethane	0-1 ft	N/A	ug/kg	780,000	8	7	-	0.0730	0.0940	0	5.10	6.60	0
Erodible Soil Subset	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	N/A	ug/kg	20,000	8	4	3	0.160	0.190	0	11.0	14.0	0
Erodible Soil Subset	VOCs	Total	Ethylbenzene	0-1 ft	N/A	ug/kg	12,000	8	5	3	0.0430	6.10	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	Hexachlorobutadiene	0-1 ft	N/A	ug/kg	22,000	8	8	-	0.180	15.0	0	21.0	67.0	0
Erodible Soil Subset	VOCs	Total	Isopropylbenzene	0-1 ft	N/A	ug/kg	24,000,000	8	8	-	0.0320	6.10	0	21.0	67.0	0
Erodible Soil Subset	VOCs	Total	m,p-Xylenes	0-1 ft	N/A	ug/kg	2,700,000	8	5	3	0.0980	13.0	0	5.10	54.0	0

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Erodible Soil Subset	VOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	23,000	8	6	2	0.340	7.90	0	21.0	270	0
Erodible Soil Subset	VOCs	Total	n-Butylbenzene	0-1 ft	N/A	ug/kg	NV	8	8	-	0.0890	6.50	-	21.0	270	-
Erodible Soil Subset	VOCs	Total	n-Propylbenzene	0-1 ft	N/A	ug/kg	21,000,000	8	8	-	0.0630	5.70	0	21.0	270	0
Erodible Soil Subset	VOCs	Total	o-Xylene	0-1 ft	N/A	ug/kg	19,000,000	8	8	-	0.0600	6.90	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	sec-Butylbenzene	0-1 ft	N/A	ug/kg	NV	8	8	-	0.0660	6.50	-	21.0	270	-
Erodible Soil Subset	VOCs	Total	Styrene	0-1 ft	N/A	ug/kg	51,000,000	8	8	-	0.0770	6.10	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	tert-Butylbenzene	0-1 ft	N/A	ug/kg	NV	8	8	-	0.0550	4.30	-	21.0	270	-
Erodible Soil Subset	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	N/A	ug/kg	1,600	8	8	-	0.130	8.30	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Toluene	0-1 ft	N/A	ug/kg	24,000,000	8	1	7	6.10	6.10	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	trans-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	200,000	8	8	-	0.0490	9.90	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	trans-1,3-Dichloropropene	0-1 ft	N/A	ug/kg	8,100	8	8	-	0.110	12.0	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Trichloroethene (TCE)	0-1 ft	N/A	ug/kg	130	8	8	-	0.140	13.0	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	Trichlorofluoromethane	0-1 ft	N/A	ug/kg	63,000,000	8	8	-	0.0550	11.0	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Vinyl Acetate	0-1 ft	N/A	ug/kg	4,100,000	8	8	-	0.610	52.0	0	21.0	670	0
Erodible Soil Subset	VOCs	Total	Vinyl Chloride	0-1 ft	N/A	ug/kg	2,200	8	8	-	0.0580	13.0	0	5.10	27.0	0
Groundwater	Metals	Total	Iron	N/A	N/A	ug/L	300	20	4	2	20.0	55.6	0	20.0	55.6	0
Groundwater	Metals	Total	Vanadium	N/A	N/A	ug/L	2.6	20	2	6	0.0700	0.200	0	0.200	10.0	5
Groundwater	Metals	Dissolved	Iron	N/A	N/A	ug/L	300	20	13	3	4.00	20.0	0	20.0	20.0	0
Groundwater	Metals	Dissolved	Potassium	N/A	N/A	ug/L	NV	5	0	3	-	-	-	2,000	2,000	-
Groundwater	Metals	Dissolved	Vanadium	N/A	N/A	ug/L	2.6	20	5	5	0.0700	0.800	0	0.200	10.0	5
Groundwater	Butyltins	Total	Monobutyltin	N/A	N/A	ug/L	11	20	18	2	0.0110	0.0290	0	0.0500	0.0870	0
Groundwater	NWTPH-Dx	Total	Diesel Range Organics	N/A	N/A	ug/L	90	20	18	2	11.0	120	7	100	120	20
Groundwater	NWTPH-Dx	Total	Residual Range Organics	N/A	N/A	ug/L	290	20	20	-	19.0	120	0	100	120	0
Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	N/A	ug/L	100	20	17	3	13.0	13.0	0	250	250	20
Groundwater	SVOCs	Total	Benzo(b)fluoranthene	N/A	N/A	ug/L	0.0038	20	19	1	0.0170	0.0200	19	0.190	0.230	20
Groundwater	SVOCs	Total	Benzo(k)fluoranthene	N/A	N/A	ug/L	0.0038	20	20	-	0.0240	0.0280	20	0.190	0.230	20
Groundwater	SVOCs	Total	Phenanthrene	N/A	N/A	ug/L	8,300	20	19	1	0.0220	0.0250	0	0.190	0.230	0
Groundwater	VOCs	Total	1,1,1,2-Tetrachloroethane	N/A	N/A	ug/L	0.52	5	5	-	0.0450	0.0450	0	0.500	0.500	0
Groundwater	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/L	9,100	5	3	1	0.0620	0.0620	0	0.500	0.500	0
Groundwater	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	N/A	ug/L	0.067	5	5	-	0.0880	0.0880	5	0.500	0.500	5
Groundwater	VOCs	Total	1,1,2-Trichloroethane	N/A	N/A	ug/L	0.23	5	5	-	0.0940	0.0940	0	0.500	0.500	5
Groundwater	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/L	2.3	5	3	1	0.0590	0.0590	0	0.500	0.500	0
Groundwater	VOCs	Total	1,1-Dichloroethene	N/A	N/A	ug/L	330	5	4	-	0.100	0.100	0	0.500	0.500	0
Groundwater	VOCs	Total	1,1-Dichloropropene	N/A	N/A	ug/L	0.43	5	5	-	0.0620	0.0620	0	0.500	0.500	5
Groundwater	VOCs	Total	1,2,3-Trichlorobenzene	N/A	N/A	ug/L	29	5	5	-	0.0840	0.0840	0	2.00	2.00	0
Groundwater	VOCs	Total	1,2,3-Trichloropropane	N/A	N/A	ug/L	0.00072	5	5	-	0.240	0.240	5	0.500	0.500	5
Groundwater	VOCs	Total	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	2.3	5	5	-	0.180	0.180	0	2.00	2.00	0
Groundwater	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/L	15	5	5	-	0.0620	0.0620	0	2.00	2.00	0
Groundwater	VOCs	Total	1,2-Dibromo-3-chloropropane	N/A	N/A	ug/L	0.00032	5	5	-	0.500	0.500	5	2.00	2.00	5
Groundwater	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	N/A	ug/L	0.0063	5	5	-	0.0720	0.0720	5	2.00	2.00	5
Groundwater	VOCs	Total	1,2-Dichlorobenzene	N/A	N/A	ug/L	370	5	5	-	0.0690	0.0690	0	0.500	0.500	0
Groundwater	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	N/A	ug/L	0.14	5	5	-	0.0660	0.0660	0	0.500	0.500	5
Groundwater	VOCs	Total	1,2-Dichloropropane	N/A	N/A	ug/L	0.39	5	5	-	0.0620	0.0620	0	0.500	0.500	5
Groundwater	VOCs	Total	1,3,5-Trimethylbenzene	N/A	N/A	ug/L	12	5	5	-	0.0660	0.0660	0	5.00	5.00	0
Groundwater	VOCs	Total	1,3-Dichlorobenzene	N/A	N/A	ug/L	0.42	5	5	-	0.0820	0.0820	0	0.500	0.500	5
Groundwater	VOCs	Total	1,3-Dichloropropane	N/A	N/A	ug/L	730	5	5	-	0.0570	0.0570	0	0.500	0.500	0
Groundwater	VOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/L	0.42	5	5	-	0.0840	0.0840	0	0.500	0.500	5
Groundwater	VOCs	Total	2,2-Dichloropropane	N/A	N/A	ug/L	0.39	20	20	-	0.0830	0.420	1	0.500	2.50	20
Groundwater	VOCs	Total	2-Butanone (MEK)	N/A	N/A	ug/L	7,100	5	5	-	2.30	2.30	0	20.0	20.0	0
Groundwater	VOCs	Total	2-Chlorotoluene	N/A	N/A	ug/L	730	5	5	-	0.0790	0.0790	0	2.00	2.00	0
Groundwater	VOCs	Total	2-Hexanone	N/A	N/A	ug/L	47	5	5	-	2.40	2.40	0	20.0	20.0	0
Groundwater	VOCs	Total	4-Chlorotoluene	N/A	N/A	ug/L	2,600	5	5	-	0.0570	0.0570	0	4.00	4.00	0
Groundwater	VOCs	Total	4-Isopropyltoluene	N/A	N/A	ug/L	NV	5	5	-	0.0700	0.0700	-	2.00	2.00	-

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(12 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Groundwater	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	N/A	ug/L	2,000	5	5	-	1.40	1.40	0	20.0	20.0	0
Groundwater	VOCs	Total	Acetone	N/A	N/A	ug/L	22,000	5	5	-	3.00	3.00	0	20.0	20.0	0
Groundwater	VOCs	Total	Benzene	N/A	N/A	ug/L	0.39	5	5	-	0.0620	0.0620	0	0.500	0.500	5
Groundwater	VOCs	Total	Bromobenzene	N/A	N/A	ug/L	88	5	5	-	0.0660	0.0660	0	2.00	2.00	0
Groundwater	VOCs	Total	Bromochloromethane	N/A	N/A	ug/L	0.12	5	5	-	0.0990	0.0990	0	0.500	0.500	5
Groundwater	VOCs	Total	Bromodichloromethane	N/A	N/A	ug/L	0.12	5	5	-	0.0550	0.0550	0	0.500	0.500	5
Groundwater	VOCs	Total	Bromoform	N/A	N/A	ug/L	4.3	5	5	-	0.0990	0.0990	0	0.500	0.500	0
Groundwater	VOCs	Total	Bromomethane	N/A	N/A	ug/L	8.7	5	5	-	0.120	0.120	0	0.500	0.500	0
Groundwater	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/L	1,000	5	0	5	-	-	-	0.500	0.500	0
Groundwater	VOCs	Total	Carbon Tetrachloride	N/A	N/A	ug/L	0.19	5	5	-	0.0480	0.0480	0	0.500	0.500	5
Groundwater	VOCs	Total	Chlorobenzene	N/A	N/A	ug/L	91	5	5	-	0.0640	0.0640	0	0.500	0.500	0
Groundwater	VOCs	Total	Chloroethane	N/A	N/A	ug/L	21,000	5	5	-	0.130	0.130	0	0.500	0.500	0
Groundwater	VOCs	Total	Chloroform	N/A	N/A	ug/L	0.19	20	19	1	0.0820	0.410	3	0.500	2.50	20
Groundwater	VOCs	Total	Chloromethane	N/A	N/A	ug/L	190	5	5	-	0.110	0.110	0	0.500	0.500	0
Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/L	360	20	5	3	0.0660	0.0660	0	0.500	0.500	0
Groundwater	VOCs	Total	cis-1,3-Dichloropropene	N/A	N/A	ug/L	0.43	5	5	-	0.0550	0.0550	0	0.500	0.500	5
Groundwater	VOCs	Total	Dibromochloromethane	N/A	N/A	ug/L	0.4	5	5	-	0.0720	0.0720	0	0.500	0.500	5
Groundwater	VOCs	Total	Dibromomethane	N/A	N/A	ug/L	8.2	5	5	-	0.120	0.120	0	0.500	0.500	0
Groundwater	VOCs	Total	Dichlorodifluoromethane	N/A	N/A	ug/L	390	5	5	-	0.0750	0.0750	0	0.500	0.500	0
Groundwater	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	N/A	ug/L	4.4	5	4	1	0.0840	0.0840	0	2.00	2.00	0
Groundwater	VOCs	Total	Ethylbenzene	N/A	N/A	ug/L	1.4	5	5	-	0.0680	0.0680	0	0.500	0.500	0
Groundwater	VOCs	Total	Hexachlorobutadiene	N/A	N/A	ug/L	0.44	5	5	-	0.150	0.150	0	2.00	2.00	5
Groundwater	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/L	680	5	5	-	0.0760	0.0760	0	0.500	0.500	0
Groundwater	VOCs	Total	m,p-Xylenes	N/A	N/A	ug/L	200	5	5	-	0.110	0.110	0	0.500	0.500	0
Groundwater	VOCs	Total	Naphthalene	N/A	N/A	ug/L	0.14	5	5	-	0.0960	0.0960	0	2.00	2.00	5
Groundwater	VOCs	Total	n-Butylbenzene	N/A	N/A	ug/L	NV	5	5	-	0.0850	0.0850	-	2.00	2.00	-
Groundwater	VOCs	Total	n-Propylbenzene	N/A	N/A	ug/L	1,300	5	5	-	0.00590	0.00590	0	2.00	2.00	0
Groundwater	VOCs	Total	o-Xylene	N/A	N/A	ug/L	1,200	5	5	-	0.0680	0.0680	0	0.500	0.500	0
Groundwater	VOCs	Total	sec-Butylbenzene	N/A	N/A	ug/L	NV	5	5	-	0.0710	0.0710	-	2.00	2.00	-
Groundwater	VOCs	Total	Styrene	N/A	N/A	ug/L	1,600	5	5	-	0.0770	0.0770	0	0.500	0.500	0
Groundwater	VOCs	Total	tert-Butylbenzene	N/A	N/A	ug/L	NV	5	5	-	0.0590	0.0590	-	2.00	2.00	-
Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/L	0.093	20	4	3	0.0970	0.0970	4	0.500	0.500	7
Groundwater	VOCs	Total	Toluene	N/A	N/A	ug/L	1,300	5	0	2	-	-	-	0.500	0.500	0
Groundwater	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/L	110	5	3	1	0.0690	0.0690	0	0.500	0.500	0
Groundwater	VOCs	Total	trans-1,3-Dichloropropene	N/A	N/A	ug/L	0.43	5	5	-	0.0750	0.0750	0	0.500	0.500	5
Groundwater	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/L	0.039	20	5	4	0.0730	0.0730	5	0.500	0.500	9
Groundwater	VOCs	Total	Trichlorofluoromethane	N/A	N/A	ug/L	1,300	5	5	-	0.0990	0.0990	0	0.500	0.500	0
Groundwater	VOCs	Total	Vinyl Acetate	N/A	N/A	ug/L	410	5	5	-	0.910	0.910	0	5.00	5.00	0
Groundwater	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/L	0.025	20	16	2	0.0440	0.0440	16	0.500	2.50	18
DP Groundwater	Metals	Total	Aluminum	N/A	N/A	ug/L	37,000	10	0	2	-	-	-	100	100	0
DP Groundwater	Metals	Total	Antimony	N/A	N/A	ug/L	5.6	10	1	5	0.500	0.500	0	0.500	0.500	0
DP Groundwater	Metals	Total	Arsenic	N/A	N/A	ug/L	0.018	10	2	2	0.102	0.102	2	0.500	0.500	4
DP Groundwater	Metals	Total	Beryllium	N/A	N/A	ug/L	73	10	6	3	0.0782	0.0782	0	0.500	0.500	0
DP Groundwater	Metals	Total	Cadmium	N/A	N/A	ug/L	18	10	10	-	0.0247	0.0247	0	0.500	0.500	0
DP Groundwater	Metals	Total	Cobalt	N/A	N/A	ug/L	11	10	4	3	0.770	0.770	0	5.00	5.00	0
DP Groundwater	Metals	Total	Iron	N/A	N/A	ug/L	300	10	1	1	14.0	14.0	0	100	100	0
DP Groundwater	Metals	Total	Lead	N/A	N/A	ug/L	15	10	3	1	0.500	0.500	0	0.500	0.500	0
DP Groundwater	Metals	Total	Mercury	N/A	N/A	ug/L	11	10	8	2	0.0530	0.0530	0	0.200	0.200	0
DP Groundwater	Metals	Total	Nickel	N/A	N/A	ug/L	610	10	1	7	0.370	0.370	0	10.0	10.0	0
DP Groundwater	Metals	Total	Potassium	N/A	N/A	ug/L	NV	10	0	2	-	-	-	1,000	1,000	-
DP Groundwater	Metals	Total	Silver	N/A	N/A	ug/L	180	10	1	6	0.0188	0.0188	0	0.100	0.100	0
DP Groundwater	Metals	Total	Thallium	N/A	N/A	ug/L	0.24	10	3	7	0.0292	0.0292	0	0.500	0.500	10
DP Groundwater	Metals	Total	Vanadium	N/A	N/A	ug/L	2.6	10	0	6	-	-	-	10.0	10.0	6

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(13 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
DP Groundwater	Metals	Dissolved	Aluminum	N/A	N/A	ug/L	37,000	10	3	5	5.88	5.88	0	100	100	0
DP Groundwater	Metals	Dissolved	Antimony	N/A	N/A	ug/L	5.6	10	0	9	-	-	-	0.500	0.500	0
DP Groundwater	Metals	Dissolved	Arsenic	N/A	N/A	ug/L	0.018	10	0	1	-	-	-	0.500	0.500	1
DP Groundwater	Metals	Dissolved	Beryllium	N/A	N/A	ug/L	73	10	10	-	0.0782	0.0782	0	0.500	0.500	0
DP Groundwater	Metals	Dissolved	Cadmium	N/A	N/A	ug/L	18	10	9	1	0.0247	0.0247	0	0.500	0.500	0
DP Groundwater	Metals	Dissolved	Cobalt	N/A	N/A	ug/L	11	10	2	7	0.770	0.770	0	5.00	5.00	0
DP Groundwater	Metals	Dissolved	Copper	N/A	N/A	ug/L	1,300	10	3	-	0.500	1.23	0	0.500	1.23	0
DP Groundwater	Metals	Dissolved	Iron	N/A	N/A	ug/L	300	10	6	1	14.0	14.0	0	100	100	0
DP Groundwater	Metals	Dissolved	Lead	N/A	N/A	ug/L	15	10	4	6	0.0240	0.500	0	0.500	0.500	0
DP Groundwater	Metals	Dissolved	Mercury	N/A	N/A	ug/L	11	10	8	2	0.0530	0.0530	0	0.200	0.200	0
DP Groundwater	Metals	Dissolved	Nickel	N/A	N/A	ug/L	610	10	7	3	0.370	10.0	0	10.0	10.0	0
DP Groundwater	Metals	Dissolved	Potassium	N/A	N/A	ug/L	NV	10	0	3	-	-	-	1,000	1,000	-
DP Groundwater	Metals	Dissolved	Selenium	N/A	N/A	ug/L	170	10	0	3	-	-	-	0.500	0.500	0
DP Groundwater	Metals	Dissolved	Silver	N/A	N/A	ug/L	180	10	2	8	0.0188	0.0188	0	0.100	0.100	0
DP Groundwater	Metals	Dissolved	Thallium	N/A	N/A	ug/L	0.24	10	7	3	0.0292	0.0292	0	0.500	0.500	10
DP Groundwater	Metals	Dissolved	Vanadium	N/A	N/A	ug/L	2.6	10	4	6	0.488	10.0	3	10.0	10.0	10
DP Groundwater	Metals	Dissolved	Zinc	N/A	N/A	ug/L	7,400	10	6	-	2.00	2.00	0	2.00	2.00	0
DP Groundwater	Butyltins	Total	Dibutyltin	N/A	N/A	ug/L	11	4	4	-	0.000231	0.000287	0	0.000793	0.000988	0
DP Groundwater	Butyltins	Total	Monobutyltin	N/A	N/A	ug/L	11	4	2	-	0.000114	0.000142	0	0.000396	0.000494	0
DP Groundwater	Butyltins	Total	Tetrabutyltin	N/A	N/A	ug/L	11	4	4	-	0.000600	0.000748	0	0.00198	0.00247	0
DP Groundwater	Butyltins	Total	Tributyltin	N/A	N/A	ug/L	11	4	2	-	0.000454	0.000552	0	0.00142	0.00173	0
DP Groundwater	Pesticides	Total	4,4'-DDD	N/A	N/A	ug/L	0.00031	3	3	-	0.000453	0.000575	3	0.00385	0.00488	3
DP Groundwater	Pesticides	Total	4,4'-DDE	N/A	N/A	ug/L	0.00022	3	3	-	0.000375	0.000476	3	0.00385	0.00488	3
DP Groundwater	Pesticides	Total	4,4'-DDT	N/A	N/A	ug/L	0.00022	3	3	-	0.000480	0.000609	3	0.00385	0.00488	3
DP Groundwater	Pesticides	Total	Aldrin	N/A	N/A	ug/L	0.000049	3	3	-	0.000110	0.000140	3	0.000962	0.00122	3
DP Groundwater	Pesticides	Total	BHC (alpha)	N/A	N/A	ug/L	0.0026	3	3	-	0.000354	0.000449	0	0.000962	0.00122	0
DP Groundwater	Pesticides	Total	BHC (beta)	N/A	N/A	ug/L	0.0091	3	3	-	0.000411	0.000521	0	0.000962	0.00122	0
DP Groundwater	Pesticides	Total	BHC (delta)	N/A	N/A	ug/L	0.0026	3	3	-	0.000226	0.000286	0	0.000962	0.00122	0
DP Groundwater	Pesticides	Total	BHC (gamma) Lindane	N/A	N/A	ug/L	0.052	3	0	1	-	-	-	0.00111	0.00111	0
DP Groundwater	Pesticides	Total	Chlordane (alpha)	N/A	N/A	ug/L	0.0008	3	3	-	0.000339	0.000429	0	0.000962	0.00122	3
DP Groundwater	Pesticides	Total	Chlordane (gamma)	N/A	N/A	ug/L	0.0008	3	3	-	0.000461	0.000584	0	0.000962	0.00122	3
DP Groundwater	Pesticides	Total	Dieldrin	N/A	N/A	ug/L	0.000052	3	3	-	0.000290	0.000368	3	0.00192	0.00244	3
DP Groundwater	Pesticides	Total	Endosulfan I	N/A	N/A	ug/L	62	3	3	-	0.000480	0.000608	0	0.000962	0.00122	0
DP Groundwater	Pesticides	Total	Endosulfan II	N/A	N/A	ug/L	62	3	3	-	0.000411	0.00192	0	0.00192	0.00244	0
DP Groundwater	Pesticides	Total	Endosulfan Sulfate	N/A	N/A	ug/L	62	3	3	-	0.000517	0.000655	0	0.00192	0.00244	0
DP Groundwater	Pesticides	Total	Endrin Aldehyde	N/A	N/A	ug/L	0.29	3	3	-	0.000936	0.00119	0	0.00192	0.00244	0
DP Groundwater	Pesticides	Total	Endrin Ketone	N/A	N/A	ug/L	0.059	3	3	-	0.000332	0.000421	0	0.00192	0.00244	0
DP Groundwater	Pesticides	Total	Endrin	N/A	N/A	ug/L	0.059	3	3	-	0.000298	0.000378	0	0.00192	0.00244	0
DP Groundwater	Pesticides	Total	Heptachlor Epoxide	N/A	N/A	ug/L	0.000039	3	3	-	0.000360	0.000456	3	0.000962	0.00122	3
DP Groundwater	Pesticides	Total	Heptachlor	N/A	N/A	ug/L	0.000079	3	3	-	0.000724	0.000919	3	0.000962	0.00122	3
DP Groundwater	Pesticides	Total	Methoxychlor	N/A	N/A	ug/L	100	3	1	2	0.000584	0.000584	0	0.0109	0.0122	0
DP Groundwater	Pesticides	Total	Toxaphene	N/A	N/A	ug/L	0.00028	3	3	-	0.0112	0.0142	3	0.0962	0.122	3
DP Groundwater	PCB Aroclors	Total	Aroclor 1016	N/A	N/A	ug/L	0.000064	7	7	-	0.00206	0.00244	7	0.00941	0.0112	7
DP Groundwater	PCB Aroclors	Total	Aroclor 1221	N/A	N/A	ug/L	0.000064	7	7	-	0.00206	0.00244	7	0.00941	0.0112	7
DP Groundwater	PCB Aroclors	Total	Aroclor 1232	N/A	N/A	ug/L	0.000064	7	7	-	0.00206	0.00244	7	0.00941	0.0112	7
DP Groundwater	PCB Aroclors	Total	Aroclor 1242	N/A	N/A	ug/L	0.000064	7	7	-	0.00206	0.00244	7	0.00941	0.0112	7
DP Groundwater	PCB Aroclors	Total	Aroclor 1248	N/A	N/A	ug/L	0.000064	7	7	-	0.00206	0.00244	7	0.00941	0.0112	7
DP Groundwater	PCB Aroclors	Total	Aroclor 1254	N/A	N/A	ug/L	0.000064	7	7	-	0.00227	0.00269	7	0.00941	0.0112	7
DP Groundwater	PCB Aroclors	Total	Aroclor 1260	N/A	N/A	ug/L	0.000064	7	7	-	0.00227	0.00269	7	0.00941	0.0112	7
DP Groundwater	NWTPH-Dx	Total	Diesel Range Organics	N/A	N/A	ug/L	90	4	4	-	74.7	89.7	0	244	293	4
DP Groundwater	NWTPH-Dx	Total	Residual Range Organics	N/A	N/A	ug/L	290	4	3	1	92.5	111	0	487	585	4
DP Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	N/A	ug/L	100	6	4	2	13.0	13.0	0	100	100	0
DP Groundwater	SVOCs	Total	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	2.3	9	9	-	0.0117	0.0151	0	0.190	1.00	0

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(14 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
DP Groundwater	SVOCs	Total	1,2-Dichlorobenzene	N/A	N/A	ug/L	370	9	9	-	0.0264	0.0340	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	1,3-Dichlorobenzene	N/A	N/A	ug/L	0.42	9	9	-	0.0349	0.0449	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/L	0.42	9	9	-	0.0300	0.0387	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2,4,5-Trichlorophenol	N/A	N/A	ug/L	1,800	6	6	-	0.0421	0.0542	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2,4,6-Trichlorophenol	N/A	N/A	ug/L	1.4	6	6	-	0.0305	0.0393	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2,4-Dichlorophenol	N/A	N/A	ug/L	77	6	6	-	0.0177	0.0228	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2,4-Dimethylphenol	N/A	N/A	ug/L	380	6	6	-	0.174	0.224	0	0.950	1.22	0
DP Groundwater	SVOCs	Total	2,4-Dinitrophenol	N/A	N/A	ug/L	69	6	6	-	0.197	0.253	0	0.950	1.22	0
DP Groundwater	SVOCs	Total	2,4-Dinitrotoluene	N/A	N/A	ug/L	0.11	9	9	-	0.0545	0.0703	0	0.190	0.245	9
DP Groundwater	SVOCs	Total	2,6-Dinitrotoluene	N/A	N/A	ug/L	37	9	9	-	0.0361	0.0465	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2-Chloronaphthalene	N/A	N/A	ug/L	1,000	9	9	-	0.00456	0.00588	0	0.0190	0.0245	0
DP Groundwater	SVOCs	Total	2-Chlorophenol	N/A	N/A	ug/L	81	6	6	-	0.0400	0.0515	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2-Methylnaphthalene	N/A	N/A	ug/L	150	9	3	3	0.0142	0.0149	0	0.0475	0.0553	0
DP Groundwater	SVOCs	Total	2-Methylphenol	N/A	N/A	ug/L	1,800	6	6	-	0.0371	0.0479	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2-Nitroaniline	N/A	N/A	ug/L	370	9	9	-	0.0284	0.0366	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2-Nitrophenol	N/A	N/A	ug/L	10,000	6	6	-	0.0406	0.0524	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	3,3'-Dichlorobenzidine	N/A	N/A	ug/L	0.021	9	9	-	0.178	0.229	9	0.950	1.22	9
DP Groundwater	SVOCs	Total	3-Nitroaniline	N/A	N/A	ug/L	3.4	9	9	-	0.0537	0.0692	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	4,6-Dinitro-2-methylphenol	N/A	N/A	ug/L	2.9	6	6	-	0.294	0.379	0	0.950	1.22	0
DP Groundwater	SVOCs	Total	4-Bromophenyl Phenyl Ether	N/A	N/A	ug/L	NV	9	9	-	0.0208	0.0268	-	0.190	0.245	-
DP Groundwater	SVOCs	Total	4-Chloro-3-methylphenol	N/A	N/A	ug/L	3,700	6	6	-	0.0232	0.0299	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	4-Chloroaniline	N/A	N/A	ug/L	0.34	9	9	-	0.0687	0.0885	0	0.285	0.367	1
DP Groundwater	SVOCs	Total	4-Chlorophenyl Phenyl Ether	N/A	N/A	ug/L	NV	9	9	-	0.0306	0.0394	-	0.190	0.245	-
DP Groundwater	SVOCs	Total	4-Nitroaniline	N/A	N/A	ug/L	3.4	9	9	-	0.0368	0.0475	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	4-Nitrophenol	N/A	N/A	ug/L	10,000	6	6	-	0.112	0.144	0	0.950	1.22	0
DP Groundwater	SVOCs	Total	Acenaphthene	N/A	N/A	ug/L	670	9	4	5	0.00323	0.00356	0	0.0190	0.0245	0
DP Groundwater	SVOCs	Total	Acenaphthylene	N/A	N/A	ug/L	0.14	9	9	-	0.00228	0.00294	0	0.0190	0.0245	0
DP Groundwater	SVOCs	Total	Aniline	N/A	N/A	ug/L	12	9	9	-	0.0310	0.367	0	0.285	0.367	0
DP Groundwater	SVOCs	Total	Anthracene	N/A	N/A	ug/L	8,300	9	8	1	0.00180	0.00209	0	0.0190	0.0245	0
DP Groundwater	SVOCs	Total	Benzidine	N/A	N/A	ug/L	0.000086	9	9	-	0.950	1.22	9	0.950	1.22	9
DP Groundwater	SVOCs	Total	Benzo(a)anthracene	N/A	N/A	ug/L	0.0038	9	9	-	0.00494	0.00636	9	0.0190	0.0245	9
DP Groundwater	SVOCs	Total	Benzo(a)pyrene	N/A	N/A	ug/L	0.0029	9	8	1	0.00313	0.00363	8	0.0190	0.0245	9
DP Groundwater	SVOCs	Total	Benzo(g,h,i)perylene	N/A	N/A	ug/L	0.290	9	9	-	0.00484	0.00624	0	0.0190	0.0245	0
DP Groundwater	SVOCs	Total	Benzofluoranthenes, Total	N/A	N/A	ug/L	0.00380	9	8	1	0.0113	0.0131	9	0.0950	0.122	9
DP Groundwater	SVOCs	Total	Benzoic Acid	N/A	N/A	ug/L	150,000	6	6	-	0.127	0.164	0	0.950	1.22	0
DP Groundwater	SVOCs	Total	Benzyl Alcohol	N/A	N/A	ug/L	3,700	7	5	2	0.0404	0.0520	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Bis(2-chloroethoxy)methane	N/A	N/A	ug/L	110	9	9	-	0.0172	0.0222	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Bis(2-chloroethyl) Ether	N/A	N/A	ug/L	0.012	9	9	-	0.0308	0.0397	9	0.190	0.245	9
DP Groundwater	SVOCs	Total	Bis(2-chloroisopropyl) Ether	N/A	N/A	ug/L	1,400	9	9	-	0.0407	0.0525	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	N/A	ug/L	1.2	9	8	1	0.362	0.466	0	1.42	1.84	9
DP Groundwater	SVOCs	Total	Butyl Benzyl Phthalate	N/A	N/A	ug/L	35	9	3	6	0.102	0.285	0	0.285	0.367	0
DP Groundwater	SVOCs	Total	Carbazole	N/A	N/A	ug/L	NV	9	9	-	0.0206	0.0266	-	0.190	0.245	-
DP Groundwater	SVOCs	Total	Chrysene	N/A	N/A	ug/L	0.0038	9	9	-	0.00798	0.0103	9	0.0190	0.0245	9
DP Groundwater	SVOCs	Total	Dibenz(a,h)anthracene	N/A	N/A	ug/L	0.0029	9	8	1	0.00294	0.00341	8	0.0190	0.0245	9
DP Groundwater	SVOCs	Total	Dibenzofuran	N/A	N/A	ug/L	37	9	7	2	0.0195	0.0215	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Diethyl Phthalate	N/A	N/A	ug/L	17,000	9	9	-	0.0529	0.0682	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Dimethyl Phthalate	N/A	N/A	ug/L	29,000	9	9	-	0.0370	0.0477	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Di-n-butyl Phthalate	N/A	N/A	ug/L	2,000	9	3	5	0.190	0.608	0	0.190	0.608	0
DP Groundwater	SVOCs	Total	Di-n-octyl Phthalate	N/A	N/A	ug/L	1.2	9	9	-	0.0259	0.0334	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Fluoranthene	N/A	N/A	ug/L	130	9	8	-	0.00541	0.00626	0	0.0190	0.0220	0
DP Groundwater	SVOCs	Total	Fluorene	N/A	N/A	ug/L	1,100	9	3	5	0.00161	0.00178	0	0.0190	0.0221	0
DP Groundwater	SVOCs	Total	Hexachlorobenzene	N/A	N/A	ug/L	0.00028	9	9	-	0.0237	0.0306	9	0.190	0.245	9
DP Groundwater	SVOCs	Total	Hexachlorobutadiene	N/A	N/A	ug/L	0.44	9	9	-	0.0140	0.0180	0	0.190	0.245	0

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(15 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
DP Groundwater	SVOCs	Total	Hexachlorocyclopentadiene	N/A	N/A	ug/L	40	9	9	-	0.294	0.379	0	0.950	1.22	0
DP Groundwater	SVOCs	Total	Hexachloroethane	N/A	N/A	ug/L	1.4	9	9	-	0.0362	0.0466	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Indeno(1,2,3-cd)pyrene	N/A	N/A	ug/L	0.0038	9	8	1	0.00266	0.00308	0	0.0190	0.0245	9
DP Groundwater	SVOCs	Total	Isophorone	N/A	N/A	ug/L	35	9	7	2	0.0278	0.0311	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Naphthalene	N/A	N/A	ug/L	0.14	9	5	4	0.0165	0.0191	0	0.0475	1.00	4
DP Groundwater	SVOCs	Total	Nitrobenzene	N/A	N/A	ug/L	0.12	9	9	-	0.0494	0.0636	0	0.190	0.245	9
DP Groundwater	SVOCs	Total	N-Nitrosodimethylamine	N/A	N/A	ug/L	0.00042	9	9	-	0.950	1.22	9	0.950	1.22	9
DP Groundwater	SVOCs	Total	N-Nitrosodi-n-propylamine	N/A	N/A	ug/L	0.005	9	9	-	0.0350	0.0452	9	0.190	0.245	9
DP Groundwater	SVOCs	Total	N-Nitrosodiphenylamine	N/A	N/A	ug/L	3.3	9	9	-	0.00807	0.0104	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	p-cresol (4-Methylphenol)	N/A	N/A	ug/L	180	6	6	-	0.0419	0.0540	0	0.380	0.490	0
DP Groundwater	SVOCs	Total	Pentachlorophenol	N/A	N/A	ug/L	0.27	6	6	-	0.190	0.245	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Phenanthrene	N/A	N/A	ug/L	8,300	9	1	7	0.00351	0.00351	0	0.0190	0.0221	0
DP Groundwater	SVOCs	Total	Phenol	N/A	N/A	ug/L	10,000	8	3	5	0.00437	0.00563	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Pyrene	N/A	N/A	ug/L	830	9	6	2	0.00275	0.00319	0	0.0190	0.0220	0
DP Groundwater	SVOCs	Dissolved	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	2.3	8	8	-	0.0120	0.0139	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	1,2-Dichlorobenzene	N/A	N/A	ug/L	370	8	8	-	0.0272	0.0313	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	1,3-Dichlorobenzene	N/A	N/A	ug/L	0.42	8	8	-	0.0359	0.0413	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	1,4-Dichlorobenzene	N/A	N/A	ug/L	0.42	8	8	-	0.0310	0.0356	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	2,4,5-Trichlorophenol	N/A	N/A	ug/L	1,800	3	3	-	0.0457	0.0499	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	2,4,6-Trichlorophenol	N/A	N/A	ug/L	1.4	3	3	-	0.0331	0.0361	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	2,4-Dichlorophenol	N/A	N/A	ug/L	77	3	3	-	0.0192	0.0209	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	2,4-Dimethylphenol	N/A	N/A	ug/L	380	3	3	-	0.189	0.206	0	1.03	1.13	0
DP Groundwater	SVOCs	Dissolved	2,4-Dinitrophenol	N/A	N/A	ug/L	69	3	3	-	0.214	0.233	0	1.03	1.13	0
DP Groundwater	SVOCs	Dissolved	2,4-Dinitrotoluene	N/A	N/A	ug/L	0.11	8	8	-	0.0562	0.0646	0	0.196	0.225	8
DP Groundwater	SVOCs	Dissolved	2,6-Dinitrotoluene	N/A	N/A	ug/L	37	8	8	-	0.0372	0.0428	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	2-Chloronaphthalene	N/A	N/A	ug/L	1,000	8	8	-	0.00470	0.00541	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	2-Chlorophenol	N/A	N/A	ug/L	81	3	3	-	0.0434	0.0474	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	2-Methylnaphthalene	N/A	N/A	ug/L	150	8	2	4	0.0147	0.0168	0	0.0490	0.0563	0
DP Groundwater	SVOCs	Dissolved	2-Methylphenol	N/A	N/A	ug/L	1,800	3	3	-	0.0404	0.0440	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	2-Nitroaniline	N/A	N/A	ug/L	370	8	8	-	0.0293	0.0337	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	2-Nitrophenol	N/A	N/A	ug/L	10,000	3	3	-	0.0442	0.0482	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	3,3'-Dichlorobenzidine	N/A	N/A	ug/L	0.021	8	8	-	0.183	0.211	8	0.979	1.13	8
DP Groundwater	SVOCs	Dissolved	3-Nitroaniline	N/A	N/A	ug/L	3.4	8	8	-	0.0553	0.0636	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	4,6-Dinitro-2-methylphenol	N/A	N/A	ug/L	2.9	3	3	-	0.320	0.349	0	1.03	1.13	0
DP Groundwater	SVOCs	Dissolved	4-Bromophenyl Phenyl Ether	N/A	N/A	ug/L	NV	8	8	-	0.0214	0.0247	-	0.196	0.225	-
DP Groundwater	SVOCs	Dissolved	4-Chloro-3-methylphenol	N/A	N/A	ug/L	3,700	3	3	-	0.0252	0.0275	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	4-Chloroaniline	N/A	N/A	ug/L	0.34	8	8	-	0.0708	0.0814	0	0.294	0.338	0
DP Groundwater	SVOCs	Dissolved	4-Chlorophenyl Phenyl Ether	N/A	N/A	ug/L	NV	8	8	-	0.0315	0.0363	-	0.196	0.225	-
DP Groundwater	SVOCs	Dissolved	4-Nitroaniline	N/A	N/A	ug/L	3.4	8	8	-	0.0380	0.0437	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	4-Nitrophenol	N/A	N/A	ug/L	10,000	3	3	-	0.122	0.133	0	1.03	1.13	0
DP Groundwater	SVOCs	Dissolved	Acenaphthene	N/A	N/A	ug/L	670	8	3	4	0.00333	0.00345	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Acenaphthylene	N/A	N/A	ug/L	0.14	8	7	1	0.00235	0.00270	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Anthracene	N/A	N/A	ug/L	8,300	8	8	-	0.00186	0.00214	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Benzidine	N/A	N/A	ug/L	0.000086	8	8	-	0.979	1.13	8	0.979	1.13	8
DP Groundwater	SVOCs	Dissolved	Benzo(a)anthracene	N/A	N/A	ug/L	0.0038	8	8	-	0.00509	0.00586	8	0.0196	0.0225	8
DP Groundwater	SVOCs	Dissolved	Benzo(a)pyrene	N/A	N/A	ug/L	0.0029	8	7	1	0.00323	0.00372	7	0.0196	0.0225	8
DP Groundwater	SVOCs	Dissolved	Benzo(g,h,i)perylene	N/A	N/A	ug/L	0.290	8	8	-	0.00500	0.00574	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Benzofluoranthenes, Total	N/A	N/A	ug/L	0.00380	8	8	-	0.0117	0.0134	9	0.0979	0.113	9
DP Groundwater	SVOCs	Dissolved	Benzoic Acid	N/A	N/A	ug/L	150,000	4	3	1	0.138	0.151	0	1.03	1.21	0
DP Groundwater	SVOCs	Dissolved	Benzyl Alcohol	N/A	N/A	ug/L	3,700	3	3	-	0.0439	0.0479	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	Bis(2-chloroethoxy)methane	N/A	N/A	ug/L	110	8	8	-	0.0177	0.0204	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Bis(2-chloroethyl) Ether	N/A	N/A	ug/L	0.012	8	8	-	0.0317	0.0365	8	0.196	0.225	8
DP Groundwater	SVOCs	Dissolved	Bis(2-chloroisopropyl) Ether	N/A	N/A	ug/L	1,400	8	8	-	0.0420	0.0483	0	0.196	0.225	0

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
DP Groundwater	SVOCs	Dissolved	Bis(2-ethylhexyl) Phthalate	N/A	N/A	ug/L	1.2	8	8	-	0.373	0.429	0	1.47	1.69	8
DP Groundwater	SVOCs	Dissolved	Butyl Benzyl Phthalate	N/A	N/A	ug/L	35	8	2	6	0.327	0.338	0	0.294	0.363	0
DP Groundwater	SVOCs	Dissolved	Carbazole	N/A	N/A	ug/L	NV	8	8	-	0.0213	0.0244	-	0.196	0.225	-
DP Groundwater	SVOCs	Dissolved	Chrysene	N/A	N/A	ug/L	0.0038	8	8	-	0.00823	0.00946	8	0.0196	0.0225	8
DP Groundwater	SVOCs	Dissolved	Dibenz(a,h)anthracene	N/A	N/A	ug/L	0.0029	8	7	1	0.00304	0.00349	7	0.0196	0.0225	8
DP Groundwater	SVOCs	Dissolved	Dibenzofuran	N/A	N/A	ug/L	37	8	8	-	0.0201	0.0231	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Diethyl Phthalate	N/A	N/A	ug/L	17,000	8	5	3	0.0546	0.0584	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Dimethyl Phthalate	N/A	N/A	ug/L	29,000	8	8	-	0.0382	0.0439	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Di-n-butyl Phthalate	N/A	N/A	ug/L	2,000	8	2	6	0.218	0.275	0	0.196	0.275	0
DP Groundwater	SVOCs	Dissolved	Di-n-octyl Phthalate	N/A	N/A	ug/L	1.2	8	8	-	0.0267	0.0307	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Fluoranthene	N/A	N/A	ug/L	130	8	8	-	0.00558	0.00642	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Fluorene	N/A	N/A	ug/L	1,100	8	3	5	0.00167	0.00191	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Hexachlorobenzene	N/A	N/A	ug/L	0.00028	8	8	-	0.0245	0.0282	8	0.196	0.225	8
DP Groundwater	SVOCs	Dissolved	Hexachlorobutadiene	N/A	N/A	ug/L	0.44	8	8	-	0.0144	0.0166	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Hexachlorocyclopentadiene	N/A	N/A	ug/L	40	8	8	-	0.304	0.349	0	0.979	1.13	0
DP Groundwater	SVOCs	Dissolved	Hexachloroethane	N/A	N/A	ug/L	1.4	8	8	-	0.0373	0.0429	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Indeno(1,2,3-cd)pyrene	N/A	N/A	ug/L	0.0038	8	7	1	0.00274	0.00315	0	0.0196	0.0225	8
DP Groundwater	SVOCs	Dissolved	Isophorone	N/A	N/A	ug/L	35	8	6	2	0.0277	0.0297	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Naphthalene	N/A	N/A	ug/L	0.14	8	2	3	0.0190	0.0196	0	0.0502	0.0605	0
DP Groundwater	SVOCs	Dissolved	Nitrobenzene	N/A	N/A	ug/L	0.12	8	8	-	0.0509	0.0586	0	0.196	0.225	8
DP Groundwater	SVOCs	Dissolved	N-Nitrosodimethylamine	N/A	N/A	ug/L	0.00042	8	8	-	0.979	1.13	8	0.979	1.13	8
DP Groundwater	SVOCs	Dissolved	N-Nitrosodi-n-propylamine	N/A	N/A	ug/L	0.005	8	8	-	0.0361	0.0416	8	0.196	0.225	8
DP Groundwater	SVOCs	Dissolved	N-Nitrosodiphenylamine	N/A	N/A	ug/L	3.3	8	8	-	0.00833	0.00957	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	p-cresol (4-Methylphenol)	N/A	N/A	ug/L	180	3	3	-	0.0455	0.0497	0	0.413	0.450	0
DP Groundwater	SVOCs	Dissolved	Pentachlorophenol	N/A	N/A	ug/L	0.27	3	3	-	0.206	0.225	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	Phenanthrene	N/A	N/A	ug/L	8,300	8	2	6	0.00403	0.00417	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Phenol	N/A	N/A	ug/L	10,000	4	1	3	0.00483	0.00483	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Pyrene	N/A	N/A	ug/L	830	8	8	-	0.00284	0.00327	0	0.0196	0.0225	0
DP Groundwater	VOCs	Total	1,1,1,2-Tetrachloroethane	N/A	N/A	ug/L	0.52	10	10	-	0.0528	0.0528	0	1.00	1.00	10
DP Groundwater	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/L	9,100	10	3	6	0.0477	0.0477	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	N/A	ug/L	0.067	10	10	-	0.0680	0.0680	10	1.00	1.00	10
DP Groundwater	VOCs	Total	1,1,2-Trichloroethane	N/A	N/A	ug/L	0.23	10	10	-	0.0627	0.0627	0	1.00	1.00	10
DP Groundwater	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/L	2.3	10	5	4	0.0360	0.0360	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,1-Dichloroethene	N/A	N/A	ug/L	330	10	8	1	0.0595	0.0595	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,1-Dichloropropene	N/A	N/A	ug/L	0.43	10	10	-	0.0695	0.0695	0	1.00	1.00	10
DP Groundwater	VOCs	Total	1,2,3-Trichlorobenzene	N/A	N/A	ug/L	29	10	10	-	0.0605	0.0605	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,2,3-Trichloropropane	N/A	N/A	ug/L	0.00072	10	10	-	0.123	0.123	10	1.00	1.00	10
DP Groundwater	VOCs	Total	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	2.3	10	10	-	0.0513	1.00	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/L	15	10	7	3	0.0283	0.0283	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,2-Dibromo-3-chloropropane	N/A	N/A	ug/L	0.00032	10	10	-	0.222	0.222	10	1.00	1.00	10
DP Groundwater	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	N/A	ug/L	0.0063	10	10	-	0.0637	0.0637	10	1.00	1.00	10
DP Groundwater	VOCs	Total	1,2-Dichlorobenzene	N/A	N/A	ug/L	370	10	10	-	0.0383	0.0383	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	N/A	ug/L	0.14	10	10	-	0.0533	0.0533	0	1.00	1.00	10
DP Groundwater	VOCs	Total	1,2-Dichloropropane	N/A	N/A	ug/L	0.39	10	10	-	0.0380	0.0380	0	1.00	1.00	10
DP Groundwater	VOCs	Total	1,3,5-Trimethylbenzene	N/A	N/A	ug/L	12	10	9	1	0.0249	0.0249	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,3-Dichlorobenzene	N/A	N/A	ug/L	0.42	10	10	-	0.0599	0.0599	0	1.00	1.00	10
DP Groundwater	VOCs	Total	1,3-Dichloropropane	N/A	N/A	ug/L	730	10	10	-	0.0738	0.0738	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/L	0.42	10	10	-	0.0180	0.0180	0	1.00	1.00	10
DP Groundwater	VOCs	Total	2,2-Dichloropropane	N/A	N/A	ug/L	0.39	10	7	3	0.0487	0.0487	0	1.00	1.00	10
DP Groundwater	VOCs	Total	2-Butanone (MEK)	N/A	N/A	ug/L	7,100	10	10	-	1.71	1.71	0	5.00	5.00	0
DP Groundwater	VOCs	Total	2-Chlorotoluene	N/A	N/A	ug/L	730	10	10	-	0.0857	0.0857	0	1.00	1.00	0
DP Groundwater	VOCs	Total	2-Hexanone	N/A	N/A	ug/L	47	10	10	-	0.993	0.993	0	5.00	5.00	0
DP Groundwater	VOCs	Total	4-Chlorotoluene	N/A	N/A	ug/L	2,600	10	10	-	0.0491	0.0491	0	1.00	1.00	0

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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
DP Groundwater	VOCs	Total	4-Isopropyltoluene	N/A	N/A	ug/L	NV	10	10	-	0.0397	0.0397	-	1.00	1.00	-
DP Groundwater	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	N/A	ug/L	2,000	10	10	-	0.309	0.309	0	5.00	5.00	0
DP Groundwater	VOCs	Total	Acetone	N/A	N/A	ug/L	22,000	10	7	3	1.20	1.20	0	5.00	5.00	0
DP Groundwater	VOCs	Total	Benzene	N/A	N/A	ug/L	0.39	10	4	6	0.0417	0.0417	0	1.00	1.00	10
DP Groundwater	VOCs	Total	Bromobenzene	N/A	N/A	ug/L	88	10	10	-	0.0475	0.0475	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Bromochloromethane	N/A	N/A	ug/L	0.12	10	10	-	0.0573	0.0573	0	1.00	1.00	10
DP Groundwater	VOCs	Total	Bromodichloromethane	N/A	N/A	ug/L	0.12	10	10	-	0.0785	0.0785	0	1.00	1.00	10
DP Groundwater	VOCs	Total	Bromoform	N/A	N/A	ug/L	4.3	10	9	1	0.0830	0.0830	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Bromomethane	N/A	N/A	ug/L	8.7	10	10	-	0.0748	1.00	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/L	1,000	10	9	1	0.0494	1.00	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Carbon Tetrachloride	N/A	N/A	ug/L	0.19	10	10	-	0.0970	0.0970	0	1.00	1.00	10
DP Groundwater	VOCs	Total	Chlorobenzene	N/A	N/A	ug/L	91	10	10	-	0.0376	0.0376	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Chloroethane	N/A	N/A	ug/L	21,000	10	10	-	0.187	0.187	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Chloroform	N/A	N/A	ug/L	0.19	10	8	2	0.0717	0.0717	0	1.00	1.00	10
DP Groundwater	VOCs	Total	Chloromethane	N/A	N/A	ug/L	190	10	10	-	0.110	0.110	0	1.00	1.00	0
DP Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/L	360	10	1	3	0.0433	0.0433	0	1.00	1.00	0
DP Groundwater	VOCs	Total	cis-1,3-Dichloropropene	N/A	N/A	ug/L	0.43	10	10	-	0.0301	0.0301	0	1.00	1.00	10
DP Groundwater	VOCs	Total	Dibromochloromethane	N/A	N/A	ug/L	0.4	10	10	-	0.0539	0.0539	0	1.00	1.00	10
DP Groundwater	VOCs	Total	Dibromomethane	N/A	N/A	ug/L	8.2	10	10	-	0.0864	0.0864	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Dichlorodifluoromethane	N/A	N/A	ug/L	390	10	10	-	0.0575	0.0575	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	N/A	ug/L	4.4	10	10	-	0.0752	1.00	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Ethylbenzene	N/A	N/A	ug/L	1.4	10	6	4	0.0226	1.00	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Hexachlorobutadiene	N/A	N/A	ug/L	0.44	10	10	-	0.152	0.152	0	1.00	1.00	10
DP Groundwater	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/L	680	10	9	1	0.0165	0.0165	0	1.00	1.00	0
DP Groundwater	VOCs	Total	m,p-Xylenes	N/A	N/A	ug/L	200	10	6	4	0.0718	0.0718	0	2.00	2.00	0
DP Groundwater	VOCs	Total	Naphthalene	N/A	N/A	ug/L	0.14	10	8	2	0.0317	1.00	4	1.00	1.00	10
DP Groundwater	VOCs	Total	n-Butylbenzene	N/A	N/A	ug/L	NV	10	10	-	0.0603	0.0603	-	1.00	1.00	-
DP Groundwater	VOCs	Total	n-Propylbenzene	N/A	N/A	ug/L	1,300	10	10	-	0.0356	0.0356	0	1.00	1.00	0
DP Groundwater	VOCs	Total	o-Xylene	N/A	N/A	ug/L	1,200	10	6	4	0.0265	0.0265	0	1.00	1.00	0
DP Groundwater	VOCs	Total	sec-Butylbenzene	N/A	N/A	ug/L	NV	10	10	-	0.0358	0.0358	-	1.00	1.00	-
DP Groundwater	VOCs	Total	Styrene	N/A	N/A	ug/L	1,600	10	10	-	0.0279	0.0279	0	1.00	1.00	0
DP Groundwater	VOCs	Total	tert-Butylbenzene	N/A	N/A	ug/L	NV	10	10	-	0.0535	0.0535	-	1.00	1.00	-
DP Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/L	0.093	10	0	3	-	-	-	1.00	1.00	3
DP Groundwater	VOCs	Total	Toluene	N/A	N/A	ug/L	1,300	10	4	6	0.0588	1.00	0	1.00	1.00	0
DP Groundwater	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/L	110	10	7	1	0.0584	0.0584	0	1.00	1.00	0
DP Groundwater	VOCs	Total	trans-1,3-Dichloropropene	N/A	N/A	ug/L	0.43	10	10	-	0.0539	0.0539	0	1.00	1.00	10
DP Groundwater	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/L	0.039	10	1	5	0.0641	0.0641	1	1.00	1.00	6
DP Groundwater	VOCs	Total	Trichlorofluoromethane	N/A	N/A	ug/L	1,300	10	10	-	0.0620	0.0620	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Vinyl Acetate	N/A	N/A	ug/L	410	10	10	-	0.320	1.01	0	5.00	5.00	0
DP Groundwater	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/L	0.025	10	8	2	0.0604	0.0604	8	1.00	1.00	10
Soil Gas	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/m^3	22,000,000	5	0	4	-	-	-	8.30	690	0
Soil Gas	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	N/A	ug/m^3	210	5	5	-	1.90	110	0	10.0	590	1
Soil Gas	VOCs	Total	1,1,2-Trichloroethane	N/A	N/A	ug/m^3	770	5	5	-	2.00	110	0	8.30	470	0
Soil Gas	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/m^3	7,700	5	5	-	0.980	56.0	0	6.10	350	0
Soil Gas	VOCs	Total	1,1-Dichloroethene	N/A	N/A	ug/m^3	880,000	5	5	-	0.840	48.0	0	6.00	340	0
Soil Gas	VOCs	Total	1,2,4-Trichlorobenzene	N/A	N/A	ug/m^3	8,800	5	5	-	12.0	660	0	45.0	2,600	0
Soil Gas	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	N/A	ug/m^3	20	5	5	-	1.20	66.0	1	12.0	660	3
Soil Gas	VOCs	Total	1,2-Dichlorobenzene	N/A	N/A	ug/m^3	880,000	5	5	-	1.60	93.0	0	9.10	520	0
Soil Gas	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	N/A	ug/m^3	470	5	5	-	0.860	49.0	0	6.10	350	0
Soil Gas	VOCs	Total	1,2-Dichloropropane	N/A	N/A	ug/m^3	1,200	5	5	-	0.980	56.0	0	7.00	400	0
Soil Gas	VOCs	Total	1,3-Butadiene	N/A	N/A	ug/m^3	410	5	1	1	23.0	23.0	0	4.90	190	0
Soil Gas	VOCs	Total	1,3-Dichlorobenzene	N/A	N/A	ug/m^3	1,100	5	5	-	1.80	100	0	9.10	520	0
Soil Gas	VOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/m^3	1,100	5	5	-	1.80	100	0	9.10	520	0

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(18 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil Gas	VOCs	Total	1,4-Dioxane	N/A	N/A	ug/m^3	1,600	5	4	1	1.10	43.0	0	22.0	1,200	0
Soil Gas	VOCs	Total	2,2,4-Trimethylpentane	N/A	N/A	ug/m^3	31,000	5	4	1	1.20	48.0	0	7.10	400	0
Soil Gas	VOCs	Total	2-Butanone (MEK)	N/A	N/A	ug/m^3	22,000,000	5	3	-	1.70	66.0	0	6.50	250	0
Soil Gas	VOCs	Total	2-Hexanone	N/A	N/A	ug/m^3	130,000	5	5	-	2.40	130	0	25.0	1,400	0
Soil Gas	VOCs	Total	2-Propanol	N/A	N/A	ug/m^3	31,000,000	5	5	-	1.50	84.0	0	15.0	840	0
Soil Gas	VOCs	Total	3-Chloropropene	N/A	N/A	ug/m^3	2,000	5	5	-	2.60	150	0	19.0	1,100	0
Soil Gas	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	N/A	ug/m^3	13,000,000	5	4	1	1.10	42.0	0	6.20	350	0
Soil Gas	VOCs	Total	Acetone	N/A	N/A	ug/m^3	140,000,000	5	3	-	4.70	86.0	0	21.0	820	0
Soil Gas	VOCs	Total	alpha-Chlorotoluene	N/A	N/A	ug/m^3	250	5	5	-	1.60	89.0	0	7.80	440	1
Soil Gas	VOCs	Total	Benzene	N/A	N/A	ug/m^3	1,600	5	1	2	27.0	27.0	0	7.10	270	0
Soil Gas	VOCs	Total	Bromodichloromethane	N/A	N/A	ug/m^3	330	5	5	-	0.610	34.0	0	10.0	580	1
Soil Gas	VOCs	Total	Bromoform	N/A	N/A	ug/m^3	11,000	5	5	-	3.10	180	0	16.0	890	0
Soil Gas	VOCs	Total	Bromomethane	N/A	N/A	ug/m^3	22,000	5	5	-	1.40	80.0	0	5.90	330	0
Soil Gas	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/m^3	3,100,000	5	2	2	4.70	27.0	0	4.70	270	0
Soil Gas	VOCs	Total	Carbon Tetrachloride	N/A	N/A	ug/m^3	820	5	5	-	1.10	65.0	0	9.50	540	0
Soil Gas	VOCs	Total	Chlorobenzene	N/A	N/A	ug/m^3	220,000	5	5	-	1.10	63.0	0	7.00	400	0
Soil Gas	VOCs	Total	Chloroethane	N/A	N/A	ug/m^3	44,000,000	5	5	-	0.640	36.0	0	4.00	230	0
Soil Gas	VOCs	Total	Chloroform	N/A	N/A	ug/m^3	530	5	4	1	1.10	42.0	0	7.40	420	0
Soil Gas	VOCs	Total	Chloromethane	N/A	N/A	ug/m^3	390,000	5	5	-	0.940	53.0	0	12.0	710	0
Soil Gas	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/m^3	260,000	5	0	2	-	-	-	19.0	500	0
Soil Gas	VOCs	Total	cis-1,3-Dichloropropene	N/A	N/A	ug/m^3	3,100	5	5	-	0.550	31.0	0	6.90	390	0
Soil Gas	VOCs	Total	Cyclohexane	N/A	N/A	ug/m^3	26,000,000	5	2	2	0.760	30.0	0	5.20	300	0
Soil Gas	VOCs	Total	Dibromochloromethane	N/A	N/A	ug/m^3	450	5	5	-	1.80	100	0	13.0	730	1
Soil Gas	VOCs	Total	Dichlorodifluoromethane	N/A	N/A	ug/m^3	880,000	5	3	2	4.20	76.0	0	7.50	420	0
Soil Gas	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	N/A	ug/m^3	26,000	5	4	1	1.50	60.0	0	5.30	300	0
Soil Gas	VOCs	Total	Ethanol	N/A	N/A	ug/m^3	NV	5	3	1	5.70	100	-	17.0	650	-
Soil Gas	VOCs	Total	Freon 113	N/A	N/A	ug/m^3	130,000,000	5	5	-	1.20	66.0	0	12.0	660	0
Soil Gas	VOCs	Total	Freon 114	N/A	N/A	ug/m^3	130,000,000	5	5	-	1.50	84.0	0	10.0	600	0
Soil Gas	VOCs	Total	Heptane	N/A	N/A	ug/m^3	3,100,000	5	1	2	9.00	9.00	0	9.00	520	0
Soil Gas	VOCs	Total	Hexachlorobutadiene	N/A	N/A	ug/m^3	560	5	5	-	17.0	970	1	65.0	3,700	1
Soil Gas	VOCs	Total	Hexane	N/A	N/A	ug/m^3	3,100,000	5	1	2	42.0	42.0	0	7.80	300	0
Soil Gas	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/m^3	1,800,000	5	0	2	-	-	-	7.40	24.0	0
Soil Gas	VOCs	Total	Methyl tert-butyl ether	N/A	N/A	ug/m^3	47,000	5	5	-	1.40	81.0	0	5.50	310	0
Soil Gas	VOCs	Total	n-Propylbenzene	N/A	N/A	ug/m^3	4,400,000	5	0	1	-	-	-	24.0	24.0	0
Soil Gas	VOCs	Total	Styrene	N/A	N/A	ug/m^3	4,400,000	5	5	-	1.30	73.0	0	6.40	370	0
Soil Gas	VOCs	Total	Tetrahydrofuran	N/A	N/A	ug/m^3	NV	5	5	-	1.10	61.0	-	4.50	250	-
Soil Gas	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/m^3	260,000	5	4	1	2.60	100	0	6.00	340	0
Soil Gas	VOCs	Total	trans-1,3-Dichloropropene	N/A	N/A	ug/m^3	3,100	5	5	-	0.960	55.0	0	6.90	390	0
Soil Gas	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/m^3	140	5	0	1	-	-	-	680	680	1
Soil Gas	VOCs	Total	Trichlorofluoromethane	N/A	N/A	ug/m^3	3,100,000	5	4	1	1.70	68.0	0	8.50	480	0
Soil Gas	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/m^3	2,800	5	5	-	0.930	53.0	0	3.90	220	0

Notes
The erodible soil subset is comprised of the following samples: SB-EUA, SB-EUB, SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, SB-EUB-15, and SB-04.
= The number of applicable MDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.
= When the number of applicable MRLs > SLV is higher than the number of applicable MDLs > SLV, they are highlited pink when the number of MDLs > SLV is zero or difference is more than 1.

HH = human health
DP = Direct Push
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = methode reporting limit

Table K-2
Human Health Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest HH SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV

N/A = not applicable
ND = non-detect
NV = No value
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
VOC = volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
ug/m^3 = micrograms per cubic meter

Table K-3
Human Health Data Sensitivity Analysis for Pistol Range AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 1)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	Metals	Total	Antimony	0-1 ft	mg/kg	410	5	5	-	5.00	6.00	0	5.00	6.00	0
Soil	Metals	Total	Arsenic	0-1 ft	mg/kg	5.4	5	5	-	5.00	6.00	1	5.00	6.00	1
Soil	Metals	Total	Mercury	0-1 ft	mg/kg	93	14	14	-	0.0400	0.0600	0	0.0400	0.0600	0
DP Groun	Metals	Dissolved	Lead	N/A	ug/L	15	2	2	-	0.0200	0.0200	0	0.0200	0.0200	0
DP Groun	Metals	Dissolved	Nickel	N/A	ug/L	730	2	1	1	2.00	2.00	0	20.0	20.0	0

Notes

= The number of applicable MDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.

HH = human health
DP = Direct Push
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = methode reporting limit
N/A = not applicable
ND = non-detect
SLV = screening level value
ug/L = micrograms per liter

Table K-4
Human Health Data Sensitivity Analysis for Bulb Slope AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 1)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest HH SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MDLs > SLV
Soil	PCB Aroclors	Total	Aroclor 1016	0-1 ft	ug/kg	21,000	12	12	-	19.0	67.0	0	19.0	67.0	0
Soil	PCB Aroclors	Total	Aroclor 1221	0-1 ft	ug/kg	540	12	12	-	38.0	134	0	38.0	134	0
Soil	PCB Aroclors	Total	Aroclor 1232	0-1 ft	ug/kg	540	12	12	-	19.0	67.0	0	19.0	67.0	0
Soil	PCB Aroclors	Total	Aroclor 1242	0-1 ft	ug/kg	740	12	12	-	19.0	67.0	0	19.0	67.0	0
Soil	PCB Aroclors	Total	Aroclor 1248	0-1 ft	ug/kg	740	12	12	-	19.0	67.0	0	19.0	67.0	0
Soil	PCB Aroclors	Total	Aroclor 1254	0-1 ft	ug/kg	740	12	12	-	19.0	67.0	0	19.0	67.0	0
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	ug/kg	740	12	4	-	19.0	67.0	0	19.0	67.0	0
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	ug/kg	740	12	4	-	19.0	67.0	0	19.0	67.0	0

Notes

HH = human health
MDL = method detection limit
MRL = methode reporting limit
ND = non-detect
PCB = polychlorinated biphenyl
SLV = screening level value
ug/kg = micrograms per kilogram

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 22)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	Metals	Total	Antimony	0-1 ft	mg/kg	0.27	20	16	1	0.200	2.90	11	0.200	2.90	12
Soil	Metals	Total	Antimony	0-3 ft	mg/kg	0.27	22	16	2	0.200	2.90	11	0.200	3.04	13
Soil	Metals	Total	Beryllium	0-1 ft	mg/kg	21	21	4	-	0.189	0.280	0	0.270	0.467	0
Soil	Metals	Total	Beryllium	0-3 ft	mg/kg	21	23	6	-	0.157	0.280	0	0.270	0.467	0
Soil	Metals	Total	Cadmium	0-1 ft	mg/kg	0.36	21	6	-	0.260	0.290	0	0.260	0.290	0
Soil	Metals	Total	Cadmium	0-3 ft	mg/kg	0.36	23	6	-	0.260	0.290	0	0.260	0.290	0
Soil	Metals	Total	Mercury	0-1 ft	mg/kg	0.066	23	5	-	0.100	0.110	5	0.100	0.110	5
Soil	Metals	Total	Mercury	0-3 ft	mg/kg	0.066	25	5	-	0.100	0.110	5	0.100	0.110	5
Soil	Metals	Total	Selenium	0-1 ft	mg/kg	0.52	21	18	1	0.200	1.50	3	0.200	1.50	3
Soil	Metals	Total	Selenium	0-3 ft	mg/kg	0.52	23	18	3	0.200	1.50	3	0.200	2.02	4
Soil	Metals	Total	Silver	0-1 ft	mg/kg	4.2	21	14	-	0.200	0.570	0	0.200	0.570	0
Soil	Metals	Total	Silver	0-3 ft	mg/kg	4.2	23	14	2	0.200	0.570	0	0.200	2.02	0
Soil	Metals	Total	Thallium	0-1 ft	mg/kg	1	21	19	1	0.200	0.300	0	0.117	0.300	0
Soil	Metals	Total	Thallium	0-3 ft	mg/kg	1	23	19	3	0.200	0.300	0	0.0970	0.506	0
Soil	Butyltins	Total	Dibutyltin	0-1 ft	ug/kg	28,000	7	5	-	0.730	0.899	0	2.27	2.79	0
Soil	Butyltins	Total	Dibutyltin	0-3 ft	ug/kg	28,000	9	7	-	0.685	0.899	0	2.13	2.79	0
Soil	Butyltins	Total	Monobutyltin	0-1 ft	ug/kg	28,000	7	5	-	1.61	1.98	0	3.03	3.73	0
Soil	Butyltins	Total	Monobutyltin	0-3 ft	ug/kg	28,000	9	7	-	1.51	1.98	0	2.84	3.73	0
Soil	Butyltins	Total	Tetrabutyltin	0-1 ft	ug/kg	28,000	7	7	-	0.564	0.694	0	1.51	1.86	0
Soil	Butyltins	Total	Tetrabutyltin	0-3 ft	ug/kg	28,000	9	9	-	0.529	0.694	0	1.42	1.86	0
Soil	Butyltins	Total	Tributyltin	0-1 ft	ug/kg	28,000	7	4	-	1.20	1.43	0	3.13	3.73	0
Soil	Butyltins	Total	Tributyltin	0-3 ft	ug/kg	28,000	9	5	-	1.18	1.43	0	3.07	3.73	0
Soil	Herbicides	Total	2,4,5-T	0-1 ft	ug/kg	21	12	10	-	1.79	50.0	1	3.10	50.0	1
Soil	Herbicides	Total	2,4,5-T	0-3 ft	ug/kg	21	14	12	-	1.54	50.0	1	3.10	50.0	1
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-1 ft	ug/kg	21	12	12	-	2.50	50.0	1	2.50	50.0	1
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-3 ft	ug/kg	21	14	14	-	2.25	50.0	1	2.50	50.0	1
Soil	Herbicides	Total	2,4-D	0-1 ft	ug/kg	21	12	12	-	0.675	50.0	4	8.18	50.0	4
Soil	Herbicides	Total	2,4-D	0-3 ft	ug/kg	21	14	14	-	0.581	50.0	4	7.04	50.0	4
Soil	Herbicides	Total	2,4-DB	0-1 ft	ug/kg	21	12	12	-	1.15	50.0	2	5.00	50.0	2
Soil	Herbicides	Total	2,4-DB	0-3 ft	ug/kg	21	14	14	-	0.988	50.0	2	5.00	50.0	2
Soil	Herbicides	Total	4-Nitrophenol	0-1 ft	ug/kg	7,000	1	1	-	1.81	1.81	0	8.18	8.18	0
Soil	Herbicides	Total	4-Nitrophenol	0-3 ft	ug/kg	7,000	3	3	-	1.56	1.81	0	7.04	8.18	0
Soil	Herbicides	Total	Dalapon	0-1 ft	ug/kg	NV	12	12	-	2.50	50.0	-	8.18	50.0	-
Soil	Herbicides	Total	Dalapon	0-3 ft	ug/kg	NV	14	14	-	2.15	50.0	-	7.04	50.0	-
Soil	Herbicides	Total	Dicamba	0-1 ft	ug/kg	NV	12	12	-	1.99	50.0	-	2.10	50.0	-
Soil	Herbicides	Total	Dicamba	0-3 ft	ug/kg	NV	14	14	-	1.71	50.0	-	2.10	50.0	-
Soil	Herbicides	Total	Dichloroprop	0-1 ft	ug/kg	21	12	10	-	0.871	400	9	8.18	400	9
Soil	Herbicides	Total	Dichloroprop	0-3 ft	ug/kg	21	14	12	-	0.750	400	9	7.04	400	9
Soil	Herbicides	Total	Dinoseb	0-1 ft	ug/kg	NV	12	12	-	0.675	50.0	-	8.18	50.0	-
Soil	Herbicides	Total	Dinoseb	0-3 ft	ug/kg	NV	14	14	-	0.581	50.0	-	7.04	50.0	-
Soil	Herbicides	Total	MCPA	0-1 ft	ug/kg	21	12	12	-	1.23	25,000	11	8.18	25,000	11
Soil	Herbicides	Total	MCPA	0-3 ft	ug/kg	21	14	14	-	1.06	25,000	11	7.04	25,000	11
Soil	Herbicides	Total	MCPP	0-1 ft	ug/kg	21	12	10	-	2.24	38,000	9	8.18	38,000	9
Soil	Herbicides	Total	MCPP	0-3 ft	ug/kg	21	14	12	-	1.93	38,000	9	7.04	38,000	9
Soil	Herbicides	Total	Pentachlorophenol	0-1 ft	ug/kg	2,100	1	1	-	0.955	0.955	0	8.18	8.18	0
Soil	Herbicides	Total	Pentachlorophenol	0-3 ft	ug/kg	2,100	3	3	-	0.822	0.955	0	7.04	8.18	0

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	Pesticides	Total	4,4'-DDD	0-1 ft	ug/kg	21	21	21	-	1.00	25.0	1	1.00	25.0	1
Soil	Pesticides	Total	4,4'-DDD	0-3 ft	ug/kg	21	23	23	-	1.00	25.0	1	1.00	25.0	1
Soil	Pesticides	Total	4,4'-DDE	0-1 ft	ug/kg	21	21	20	-	1.00	9.40	0	1.00	9.40	0
Soil	Pesticides	Total	4,4'-DDE	0-3 ft	ug/kg	21	23	22	-	1.00	9.40	0	1.00	9.40	0
Soil	Pesticides	Total	4,4'-DDT	0-1 ft	ug/kg	21	21	14	-	1.00	13.0	0	1.00	13.0	0
Soil	Pesticides	Total	4,4'-DDT	0-3 ft	ug/kg	21	23	16	-	1.00	13.0	0	1.00	13.0	0
Soil	Pesticides	Total	Aldrin	0-1 ft	ug/kg	4.9	21	21	-	0.970	1.90	0	0.970	1.90	0
Soil	Pesticides	Total	Aldrin	0-3 ft	ug/kg	4.9	23	23	-	0.970	1.90	0	0.970	1.90	0
Soil	Pesticides	Total	BHC (alpha)	0-1 ft	ug/kg	8,000	21	21	-	0.500	1.90	0	0.500	1.90	0
Soil	Pesticides	Total	BHC (alpha)	0-3 ft	ug/kg	8,000	23	22	-	0.500	1.90	0	0.500	1.90	0
Soil	Pesticides	Total	BHC (beta)	0-1 ft	ug/kg	8,000	21	20	-	0.900	12.0	0	0.900	12.0	0
Soil	Pesticides	Total	BHC (beta)	0-3 ft	ug/kg	8,000	23	22	-	0.900	12.0	0	0.900	12.0	0
Soil	Pesticides	Total	BHC (delta)	0-1 ft	ug/kg	8,000	21	21	-	0.600	1.90	0	0.600	1.90	0
Soil	Pesticides	Total	BHC (delta)	0-3 ft	ug/kg	8,000	23	23	-	0.600	1.90	0	0.600	1.90	0
Soil	Pesticides	Total	BHC (gamma) Lindane	0-1 ft	ug/kg	8,000	21	21	-	0.970	1.90	0	0.970	1.90	0
Soil	Pesticides	Total	BHC (gamma) Lindane	0-3 ft	ug/kg	8,000	23	23	-	0.970	1.90	0	0.970	1.90	0
Soil	Pesticides	Total	Chlordane (alpha)	0-1 ft	ug/kg	9,000	20	19	-	0.800	19.0	0	0.800	19.0	0
Soil	Pesticides	Total	Chlordane (alpha)	0-3 ft	ug/kg	9,000	20	19	-	0.800	19.0	0	0.800	19.0	0
Soil	Pesticides	Total	Chlordane (gamma)	0-1 ft	ug/kg	9,000	20	20	-	0.700	14.0	0	0.700	14.0	0
Soil	Pesticides	Total	Chlordane (gamma)	0-3 ft	ug/kg	9,000	20	20	-	0.700	14.0	0	0.700	14.0	0
Soil	Pesticides	Total	Dieldrin	0-1 ft	ug/kg	4.9	21	20	-	1.90	8.00	1	1.90	8.00	1
Soil	Pesticides	Total	Dieldrin	0-3 ft	ug/kg	4.9	23	22	-	1.90	8.00	1	1.90	8.00	1
Soil	Pesticides	Total	Endosulfan I	0-1 ft	ug/kg	20,000	21	21	-	0.970	3.50	0	0.970	3.50	0
Soil	Pesticides	Total	Endosulfan I	0-3 ft	ug/kg	20,000	23	23	-	0.970	3.50	0	0.970	3.50	0
Soil	Pesticides	Total	Endosulfan II	0-1 ft	ug/kg	20,000	21	20	-	1.90	4.90	0	1.90	4.90	0
Soil	Pesticides	Total	Endosulfan II	0-3 ft	ug/kg	20,000	23	22	-	1.90	4.90	0	1.90	4.90	0
Soil	Pesticides	Total	Endosulfan Sulfate	0-1 ft	ug/kg	20,000	21	20	-	1.00	8.00	0	1.00	8.00	0
Soil	Pesticides	Total	Endosulfan Sulfate	0-3 ft	ug/kg	20,000	23	22	-	1.00	8.00	0	1.00	8.00	0
Soil	Pesticides	Total	Endrin Aldehyde	0-1 ft	ug/kg	4.9	21	21	-	1.90	13.0	6	1.90	13.0	6
Soil	Pesticides	Total	Endrin Aldehyde	0-3 ft	ug/kg	4.9	23	23	-	1.90	13.0	6	1.90	13.0	6
Soil	Pesticides	Total	Endrin Ketone	0-1 ft	ug/kg	4.9	20	20	-	1.90	17.0	2	1.90	17.0	2
Soil	Pesticides	Total	Endrin Ketone	0-3 ft	ug/kg	4.9	22	22	-	1.90	17.0	2	1.90	17.0	2
Soil	Pesticides	Total	Endrin	0-1 ft	ug/kg	4.9	21	21	-	1.90	10.0	1	1.90	10.0	1
Soil	Pesticides	Total	Endrin	0-3 ft	ug/kg	4.9	23	23	-	1.90	10.0	1	1.90	10.0	1
Soil	Pesticides	Total	Heptachlor Epoxide	0-1 ft	ug/kg	15,000	21	20	-	0.970	7.10	0	0.970	7.10	0
Soil	Pesticides	Total	Heptachlor Epoxide	0-3 ft	ug/kg	15,000	23	22	-	0.970	7.10	0	0.970	7.10	0
Soil	Pesticides	Total	Heptachlor	0-1 ft	ug/kg	15,000	21	20	-	0.970	1.90	0	0.970	1.90	0
Soil	Pesticides	Total	Heptachlor	0-3 ft	ug/kg	15,000	23	21	-	0.970	1.90	0	0.970	1.90	0
Soil	Pesticides	Total	Methoxychlor	0-1 ft	ug/kg	500,000	21	21	-	4.00	19.0	0	4.00	19.0	0
Soil	Pesticides	Total	Methoxychlor	0-3 ft	ug/kg	500,000	23	23	-	4.00	19.0	0	4.00	19.0	0
Soil	Pesticides	Total	Toxaphene	0-1 ft	ug/kg	1,000,000	21	21	-	34.0	190	0	34.0	190	0
Soil	Pesticides	Total	Toxaphene	0-3 ft	ug/kg	1,000,000	23	23	-	34.0	190	0	34.0	190	0
Soil	PCB Aroclors	Total	Aroclor 1016	0-1 ft	ug/kg	371	27	27	-	1.25	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1016	0-3 ft	ug/kg	371	29	29	-	1.14	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1221	0-1 ft	ug/kg	371	27	27	-	3.80	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1221	0-3 ft	ug/kg	371	29	29	-	3.80	50.0	0	3.80	50.0	0

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	PCB Aroclors	Total	Aroclor 1232	0-1 ft	ug/kg	371	27	27	-	3.80	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1232	0-3 ft	ug/kg	371	29	29	-	3.80	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1242	0-1 ft	ug/kg	371	27	27	-	2.28	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1242	0-3 ft	ug/kg	371	29	29	-	2.09	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1248	0-1 ft	ug/kg	371	27	25	-	3.80	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1248	0-3 ft	ug/kg	371	29	27	-	3.80	50.0	0	3.80	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1254	0-1 ft	ug/kg	371	27	18	-	1.77	50.0	0	4.00	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1254	0-3 ft	ug/kg	371	29	18	-	1.77	50.0	0	4.00	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	ug/kg	371	27	5	-	35.0	50.0	0	35.0	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1260	0-3 ft	ug/kg	371	29	5	-	35.0	50.0	0	35.0	50.0	0
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	ug/kg	371	27	5	-	105	150	0	105	150	0
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-3 ft	ug/kg	371	29	5	-	105	150	0	105	150	0
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	mg/kg	NV	18	1	-	25.0	25.0	-	25.0	25.0	-
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-3 ft	mg/kg	NV	20	1	-	25.0	25.0	-	25.0	25.0	-
Soil	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	mg/kg	NV	18	1	-	100	100	-	100	100	-
Soil	NWTPH-Dx	Total	Residual Range Organics	0-3 ft	mg/kg	NV	20	1	-	100	100	-	100	100	-
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	mg/kg	NV	13	10	-	4.78	20.0	-	4.78	20.0	-
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-3 ft	mg/kg	NV	15	11	1	4.31	20.0	-	4.31	20.0	-
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	ug/kg	20,000	26	26	-	13.0	190	0	20.0	1,680	0
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-3 ft	ug/kg	20,000	28	28	-	11.8	190	0	20.0	1,680	0
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-1 ft	ug/kg	2,260	26	26	-	16.1	190	0	20.0	1,680	0
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-3 ft	ug/kg	2,260	28	28	-	14.6	190	0	20.0	1,680	0
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-1 ft	ug/kg	2,260	26	26	-	20.0	236	0	20.0	1,680	0
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-3 ft	ug/kg	2,260	28	28	-	19.9	236	0	20.0	1,680	0
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-1 ft	ug/kg	20,000	26	26	-	20.0	269	0	20.0	1,680	0
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-3 ft	ug/kg	20,000	28	28	-	20.0	269	0	20.0	1,680	0
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-1 ft	ug/kg	4,000	27	27	-	28.1	930	0	49.8	1,680	0
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-3 ft	ug/kg	4,000	29	29	-	19.5	930	0	49.8	1,680	0
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-1 ft	ug/kg	10,000	27	27	-	20.8	300	0	49.8	1,680	0
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-3 ft	ug/kg	10,000	29	29	-	18.9	300	0	49.8	1,680	0
Soil	SVOCs	Total	2,4-Dichlorophenol	0-1 ft	ug/kg	20,000	27	27	-	17.2	300	0	49.8	1,680	0
Soil	SVOCs	Total	2,4-Dichlorophenol	0-3 ft	ug/kg	20,000	29	29	-	15.6	300	0	49.8	1,680	0
Soil	SVOCs	Total	2,4-Dimethylphenol	0-1 ft	ug/kg	20,000	27	27	-	17.2	190	0	20.0	1,680	0
Soil	SVOCs	Total	2,4-Dimethylphenol	0-3 ft	ug/kg	20,000	29	29	-	15.6	190	0	20.0	1,680	0
Soil	SVOCs	Total	2,4-Dinitrophenol	0-1 ft	ug/kg	20,000	23	23	-	37.5	930	0	200	4,210	0
Soil	SVOCs	Total	2,4-Dinitrophenol	0-3 ft	ug/kg	20,000	25	25	-	34.1	930	0	200	4,210	0
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-1 ft	ug/kg	NV	26	26	-	20.3	366	-	98.0	1,680	-
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-3 ft	ug/kg	NV	28	28	-	18.5	366	-	98.0	1,680	-
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-1 ft	ug/kg	NV	26	26	-	28.1	303	-	98.0	1,680	-
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-3 ft	ug/kg	NV	28	28	-	25.6	303	-	98.0	1,680	-
Soil	SVOCs	Total	2-Chloronaphthalene	0-1 ft	ug/kg	NV	26	26	-	4.68	190	-	15.6	190	-
Soil	SVOCs	Total	2-Chloronaphthalene	0-3 ft	ug/kg	NV	28	28	-	4.27	190	-	14.2	190	-
Soil	SVOCs	Total	2-Chlorophenol	0-1 ft	ug/kg	60,000	27	27	-	20.0	252	0	20.0	1,680	0
Soil	SVOCs	Total	2-Chlorophenol	0-3 ft	ug/kg	60,000	29	29	-	20.0	252	0	20.0	1,680	0
Soil	SVOCs	Total	2-Methylphenol	0-1 ft	ug/kg	50,000	27	27	-	18.7	202	0	20.0	1,680	0
Soil	SVOCs	Total	2-Methylphenol	0-3 ft	ug/kg	50,000	29	29	-	17.1	202	0	20.0	1,680	0

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(4 of 22)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	SVOCs	Total	2-Nitroaniline	0-1 ft	ug/kg	NV	26	26	-	20.3	930	-	98.0	1,680	-
Soil	SVOCs	Total	2-Nitroaniline	0-3 ft	ug/kg	NV	28	28	-	18.5	930	-	98.0	1,680	-
Soil	SVOCs	Total	2-Nitrophenol	0-1 ft	ug/kg	NV	27	27	-	21.9	300	-	49.8	1,680	-
Soil	SVOCs	Total	2-Nitrophenol	0-3 ft	ug/kg	NV	29	29	-	19.9	300	-	49.8	1,680	-
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-1 ft	ug/kg	NV	26	26	-	17.2	2,490	-	98.0	2,490	-
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-3 ft	ug/kg	NV	28	28	-	15.6	2,490	-	98.0	2,490	-
Soil	SVOCs	Total	3-Nitroaniline	0-1 ft	ug/kg	70,000	26	26	-	26.5	930	0	98.0	1,680	0
Soil	SVOCs	Total	3-Nitroaniline	0-3 ft	ug/kg	70,000	28	28	-	24.2	930	0	98.0	1,680	0
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-1 ft	ug/kg	NV	23	23	-	57.8	930	-	200	4,210	-
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-3 ft	ug/kg	NV	25	25	-	52.6	930	-	200	4,210	-
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-1 ft	ug/kg	NV	26	26	-	20.0	224	-	20.0	1,680	-
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-3 ft	ug/kg	NV	28	28	-	18.9	224	-	20.0	1,680	-
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-1 ft	ug/kg	NV	27	27	-	17.2	300	-	49.8	1,680	-
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-3 ft	ug/kg	NV	29	29	-	15.6	300	-	49.8	1,680	-
Soil	SVOCs	Total	4-Chloroaniline	0-1 ft	ug/kg	40,000	26	26	-	14.5	300	0	98.0	1,680	0
Soil	SVOCs	Total	4-Chloroaniline	0-3 ft	ug/kg	40,000	28	28	-	13.2	300	0	98.0	1,680	0
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-1 ft	ug/kg	NV	26	26	-	20.0	283	-	20.0	1,680	-
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-3 ft	ug/kg	NV	28	28	-	20.0	283	-	20.0	1,680	-
Soil	SVOCs	Total	4-Nitroaniline	0-1 ft	ug/kg	40,000	26	26	-	26.5	930	0	98.0	1,680	0
Soil	SVOCs	Total	4-Nitroaniline	0-3 ft	ug/kg	40,000	28	28	-	24.2	930	0	98.0	1,680	0
Soil	SVOCs	Total	4-Nitrophenol	0-1 ft	ug/kg	7,000	27	27	-	29.7	930	0	98.0	4,210	0
Soil	SVOCs	Total	4-Nitrophenol	0-3 ft	ug/kg	7,000	29	29	-	27.0	930	0	98.0	4,210	0
Soil	SVOCs	Total	Aniline	0-1 ft	ug/kg	200,000	17	17	-	42.2	454	0	49.8	1,680	0
Soil	SVOCs	Total	Aniline	0-3 ft	ug/kg	200,000	19	19	-	38.4	454	0	49.8	1,680	0
Soil	SVOCs	Total	Benzidine	0-1 ft	ug/kg	NV	16	16	-	29.5	1,800	-	390	4,210	-
Soil	SVOCs	Total	Benzidine	0-3 ft	ug/kg	NV	18	18	-	26.9	1,800	-	355	4,210	-
Soil	SVOCs	Total	Benzoic Acid	0-1 ft	ug/kg	200,000	23	16	2	200	930	0	200	4,210	0
Soil	SVOCs	Total	Benzoic Acid	0-3 ft	ug/kg	200,000	25	16	4	200	930	0	200	4,210	0
Soil	SVOCs	Total	Benzyl Alcohol	0-1 ft	ug/kg	2,260	27	26	1	20.0	353	0	20.0	1,680	0
Soil	SVOCs	Total	Benzyl Alcohol	0-3 ft	ug/kg	2,260	29	28	1	20.0	353	0	20.0	1,680	0
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-1 ft	ug/kg	730,000	26	26	-	18.7	202	0	20.0	1,680	0
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-3 ft	ug/kg	730,000	28	28	-	17.1	202	0	20.0	1,680	0
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-1 ft	ug/kg	NV	26	26	-	20.0	321	-	20.0	1,680	-
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-3 ft	ug/kg	NV	28	28	-	20.0	321	-	20.0	1,680	-
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-1 ft	ug/kg	NV	26	26	-	20.0	438	-	20.0	1,680	-
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-3 ft	ug/kg	NV	28	28	-	20.0	438	-	20.0	1,680	-
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	ug/kg	4,500	27	3	-	50.0	690	0	50.0	4,210	0
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-3 ft	ug/kg	4,500	29	3	-	50.0	690	0	50.0	4,210	0
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	ug/kg	450	26	23	2	20.0	320	0	20.0	1,680	2
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-3 ft	ug/kg	450	28	25	2	20.0	320	0	20.0	1,680	2
Soil	SVOCs	Total	Carbazole	0-1 ft	ug/kg	2,260	27	8	3	20.0	180	0	20.0	180	0
Soil	SVOCs	Total	Carbazole	0-3 ft	ug/kg	2,260	29	8	3	20.0	180	0	20.0	180	0
Soil	SVOCs	Total	Dibenzofuran	0-1 ft	ug/kg	2	27	16	5	20.0	195	16	20.0	1,680	21
Soil	SVOCs	Total	Dibenzofuran	0-3 ft	ug/kg	2	29	16	6	20.0	195	16	20.0	1,680	22
Soil	SVOCs	Total	Diethyl Phthalate	0-1 ft	ug/kg	100,000	26	23	1	20.0	286	0	20.0	1,680	0
Soil	SVOCs	Total	Diethyl Phthalate	0-3 ft	ug/kg	100,000	28	23	3	20.0	286	0	20.0	1,680	0

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	SVOCs	Total	Dimethyl Phthalate	0-1 ft	ug/kg	200,000	26	26	-	17.2	190	0	20.0	1,680	0
Soil	SVOCs	Total	Dimethyl Phthalate	0-3 ft	ug/kg	200,000	28	28	-	15.6	190	0	20.0	1,680	0
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	ug/kg	450	26	22	1	20.0	1,460	2	20.0	8,420	5
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-3 ft	ug/kg	450	28	24	1	20.0	1,460	2	20.0	8,420	7
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-1 ft	ug/kg	450	26	26	-	20.0	730	1	20.0	1,680	3
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-3 ft	ug/kg	450	28	28	-	20.0	730	1	20.0	1,680	3
Soil	SVOCs	Total	Hexachlorobenzene	0-1 ft	ug/kg	1,000,000	26	26	-	17.2	190	0	20.0	1,680	0
Soil	SVOCs	Total	Hexachlorobenzene	0-3 ft	ug/kg	1,000,000	28	28	-	15.6	190	0	20.0	1,680	0
Soil	SVOCs	Total	Hexachlorobutadiene	0-1 ft	ug/kg	NV	26	26	-	14.1	190	-	20.0	1,680	-
Soil	SVOCs	Total	Hexachlorobutadiene	0-3 ft	ug/kg	NV	28	28	-	12.8	190	-	20.0	1,680	-
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-1 ft	ug/kg	10,000	26	26	-	22.0	300	0	98.0	1,680	0
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-3 ft	ug/kg	10,000	28	28	-	20.0	300	0	98.0	1,680	0
Soil	SVOCs	Total	Hexachloroethane	0-1 ft	ug/kg	NV	26	26	-	20.0	320	-	20.0	1,680	-
Soil	SVOCs	Total	Hexachloroethane	0-3 ft	ug/kg	NV	28	28	-	20.0	320	-	20.0	1,680	-
Soil	SVOCs	Total	Isophorone	0-1 ft	ug/kg	NV	26	26	-	20.0	236	-	20.0	1,680	-
Soil	SVOCs	Total	Isophorone	0-3 ft	ug/kg	NV	28	28	-	19.9	236	-	20.0	1,680	-
Soil	SVOCs	Total	Nitrobenzene	0-1 ft	ug/kg	8,000	26	26	-	20.0	231	0	20.0	1,680	0
Soil	SVOCs	Total	Nitrobenzene	0-3 ft	ug/kg	8,000	28	28	-	19.5	231	0	20.0	1,680	0
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-1 ft	ug/kg	NV	22	22	-	17.2	300	-	98.0	4,210	-
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-3 ft	ug/kg	NV	24	24	-	15.6	300	-	98.0	4,210	-
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-1 ft	ug/kg	NV	26	26	-	17.2	300	-	49.8	1,680	-
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-3 ft	ug/kg	NV	28	28	-	15.6	300	-	49.8	1,680	-
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-1 ft	ug/kg	20,000	23	23	-	12.5	190	0	20.0	1,680	0
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-3 ft	ug/kg	20,000	25	25	-	11.4	190	0	20.0	1,680	0
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	ug/kg	50,000	27	26	1	20.0	249	0	20.0	1,680	0
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-3 ft	ug/kg	50,000	29	28	1	20.0	249	0	20.0	1,680	0
Soil	SVOCs	Total	Pentachlorophenol	0-1 ft	ug/kg	2,100	27	25	-	32.8	900	0	98.0	1,680	0
Soil	SVOCs	Total	Pentachlorophenol	0-3 ft	ug/kg	2,100	29	27	-	29.9	900	0	98.0	1,680	0
Soil	SVOCs	Total	Phenol	0-1 ft	ug/kg	30,000	27	27	-	20.0	337	0	20.0	1,680	0
Soil	SVOCs	Total	Phenol	0-3 ft	ug/kg	30,000	29	29	-	20.0	337	0	20.0	1,680	0
Soil	SVOCs	Total	2-Methylnaphthalene	0-1 ft	ug/kg	NV (1)	27	19	1	2.45	190	0	15.7	190	0
Soil	SVOCs	Total	2-Methylnaphthalene	0-3 ft	ug/kg	NV (1)	29	20	1	2.22	190	0	14.2	190	0
Soil	SVOCs	Total	Acenaphthene	0-1 ft	ug/kg	NV (1)	27	8	2	20.0	180	0	20.0	180	0
Soil	SVOCs	Total	Acenaphthene	0-3 ft	ug/kg	NV (1)	33	8	2	20.0	180	0	20.0	180	0
Soil	SVOCs	Total	Acenaphthylene	0-1 ft	ug/kg	NV (1)	27	20	-	20.0	190	0	20.0	190	0
Soil	SVOCs	Total	Acenaphthylene	0-3 ft	ug/kg	NV (1)	33	20	-	20.0	190	0	20.0	190	0
Soil	SVOCs	Total	Anthracene	0-1 ft	ug/kg	NV (1)	27	4	1	49.8	180	0	20.0	180	0
Soil	SVOCs	Total	Anthracene	0-3 ft	ug/kg	NV (1)	33	4	1	49.8	180	0	20.0	180	0
Soil	SVOCs	Total	Fluorene	0-1 ft	ug/kg	NV (1)	27	11	3	20.0	180	0	20.0	180	0
Soil	SVOCs	Total	Fluorene	0-3 ft	ug/kg	NV (1)	33	11	3	20.0	180	0	20.0	180	0
Soil	SVOCs	Total	Naphthalene	0-1 ft	ug/kg	NV (1)	27	16	-	20.0	190	0	20.0	190	0
Soil	SVOCs	Total	Naphthalene	0-3 ft	ug/kg	NV (1)	33	16	-	20.0	190	0	20.0	190	0
Soil	SVOCs	Total	Phenanthrene	0-1 ft	ug/kg	NV (1)	27	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Phenanthrene	0-3 ft	ug/kg	NV (1)	33	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	29,000	27	1	-	299	299	0	299	299	0

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	ug/kg	29,000	33	1	-	299	299	0	299	299	0
Soil	SVOCs	Total	Benzo(a)anthracene	0-1 ft	ug/kg	NV (2)	27	2	-	49.8	92.9	0	49.8	305	0
Soil	SVOCs	Total	Benzo(a)anthracene	0-3 ft	ug/kg	NV (2)	33	2	-	49.8	92.9	0	49.8	305	0
Soil	SVOCs	Total	Benzo(a)pyrene	0-1 ft	ug/kg	NV (2)	27	2	-	35.5	49.8	0	49.8	152	0
Soil	SVOCs	Total	Benzo(a)pyrene	0-3 ft	ug/kg	NV (2)	33	2	-	35.5	49.8	0	49.8	152	0
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	ug/kg	NV (2)	24	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-3 ft	ug/kg	NV (2)	28	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	ug/kg	NV (2)	27	3	-	25.1	49.8	0	49.8	168	0
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-3 ft	ug/kg	NV (2)	33	3	-	25.1	49.8	0	49.8	168	0
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	ug/kg	NV (2)	24	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-3 ft	ug/kg	NV (2)	28	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Chrysene	0-1 ft	ug/kg	NV (2)	27	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Chrysene	0-3 ft	ug/kg	NV (2)	33	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	ug/kg	NV (2)	27	5	1	35.5	1,800	1	20.0	1,800	1
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-3 ft	ug/kg	NV (2)	33	5	1	35.5	1,800	1	20.0	1,800	1
Soil	SVOCs	Total	Fluoranthene	0-1 ft	ug/kg	NV (2)	27	2	-	49.8	71.1	0	49.8	152	0
Soil	SVOCs	Total	Fluoranthene	0-3 ft	ug/kg	NV (2)	33	2	-	49.8	71.1	0	49.8	152	0
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	ug/kg	NV (2)	27	3	-	35.5	49.8	0	49.8	168	0
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-3 ft	ug/kg	NV (2)	33	3	-	35.5	49.8	0	49.8	168	0
Soil	SVOCs	Total	Pyrene	0-1 ft	ug/kg	NV (2)	27	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Pyrene	0-3 ft	ug/kg	NV (2)	33	1	-	49.8	49.8	0	49.8	49.8	0
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	1,100	27	1	-	498	498	0	498	498	0
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	ug/kg	1,100	33	1	-	498	498	0	498	498	0
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-1 ft	ug/kg	55,550,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-3 ft	ug/kg	55,550,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	1,1,2-Trichloroethane	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	1,1,2-Trichloroethane	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	1,1-Dichloroethane	0-1 ft	ug/kg	70,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	1,1-Dichloroethane	0-3 ft	ug/kg	70,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,1-Dichloroethene	0-1 ft	ug/kg	3,750,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	1,1-Dichloroethene	0-3 ft	ug/kg	3,750,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,1-Dichloropropene	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	1,1-Dichloropropene	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-1 ft	ug/kg	20,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-3 ft	ug/kg	20,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,2,3-Trichloropropane	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	1,2,3-Trichloropropane	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	ug/kg	20,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-3 ft	ug/kg	20,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	ug/kg	200,000	18	15	-	0.218	100	0	0.437	100	0

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-3 ft	ug/kg	200,000	20	17	-	0.212	100	0	0.424	100	0
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	1,2-Dichlorobenzene	0-1 ft	ug/kg	2,260	18	18	-	0.218	2,300	1	0.437	4,600	1
Soil	VOCs	Total	1,2-Dichlorobenzene	0-3 ft	ug/kg	2,260	20	20	-	0.212	2,300	1	0.424	4,600	1
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-1 ft	ug/kg	70,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-3 ft	ug/kg	70,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,2-Dichloropropane	0-1 ft	ug/kg	700,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	1,2-Dichloropropane	0-3 ft	ug/kg	700,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	ug/kg	200,000	18	15	2	0.218	100	0	0.437	509	0
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-3 ft	ug/kg	200,000	20	17	2	0.212	100	0	0.424	509	0
Soil	VOCs	Total	1,3-Dichlorobenzene	0-1 ft	ug/kg	2,260	18	18	-	0.218	2,300	1	0.437	4,600	1
Soil	VOCs	Total	1,3-Dichlorobenzene	0-3 ft	ug/kg	2,260	20	20	-	0.212	2,300	1	0.424	4,600	1
Soil	VOCs	Total	1,3-Dichloropropane	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	1,3-Dichloropropane	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	ug/kg	20,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	1,4-Dichlorobenzene	0-3 ft	ug/kg	20,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	2,2-Dichloropropane	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	2,2-Dichloropropane	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	2-Butanone (MEK)	0-1 ft	ug/kg	#########	18	18	-	1.09	11,500	0	2.18	23,000	0
Soil	VOCs	Total	2-Butanone (MEK)	0-3 ft	ug/kg	#########	20	20	-	1.06	11,500	0	2.12	23,000	0
Soil	VOCs	Total	2-Chlorotoluene	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	2-Chlorotoluene	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	2-Hexanone	0-1 ft	ug/kg	1,250,000	18	18	-	1.09	11,500	0	2.18	23,000	0
Soil	VOCs	Total	2-Hexanone	0-3 ft	ug/kg	1,250,000	20	20	-	1.06	11,500	0	2.12	23,000	0
Soil	VOCs	Total	4-Chlorotoluene	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	4-Chlorotoluene	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	4-Isopropyltoluene	0-1 ft	ug/kg	200,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	4-Isopropyltoluene	0-3 ft	ug/kg	200,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	ug/kg	1,250,000	18	18	-	1.09	11,500	0	2.18	23,000	0
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-3 ft	ug/kg	1,250,000	20	20	-	1.06	11,500	0	2.12	23,000	0
Soil	VOCs	Total	Acetone	0-1 ft	ug/kg	1,250,000	18	18	-	1.09	11,500	0	2.18	23,000	0
Soil	VOCs	Total	Acetone	0-3 ft	ug/kg	1,250,000	20	20	-	1.06	11,500	0	2.12	23,000	0
Soil	VOCs	Total	Benzene	0-1 ft	ug/kg	3,300,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	Benzene	0-3 ft	ug/kg	3,300,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Bromobenzene	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	Bromobenzene	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	Bromochloromethane	0-1 ft	ug/kg	730,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	Bromochloromethane	0-3 ft	ug/kg	730,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Bromodichloromethane	0-1 ft	ug/kg	730,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	Bromodichloromethane	0-3 ft	ug/kg	730,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Bromoform	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	Bromoform	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	Bromomethane	0-1 ft	ug/kg	730,000	18	18	-	0.218	2,300	0	0.437	4,600	0

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	VOCs	Total	Bromomethane	0-3 ft	ug/kg	730,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Carbon Disulfide	0-1 ft	ug/kg	1,000,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	Carbon Disulfide	0-3 ft	ug/kg	1,000,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Carbon Tetrachloride	0-1 ft	ug/kg	1,000,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	Carbon Tetrachloride	0-3 ft	ug/kg	1,000,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Chlorobenzene	0-1 ft	ug/kg	40,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	Chlorobenzene	0-3 ft	ug/kg	40,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Chloroethane	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	Chloroethane	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	Chloroform	0-1 ft	ug/kg	1,875,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	Chloroform	0-3 ft	ug/kg	1,875,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Chloromethane	0-1 ft	ug/kg	730,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	Chloromethane	0-3 ft	ug/kg	730,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	ug/kg	2,500,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-3 ft	ug/kg	2,500,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	Dibromochloromethane	0-1 ft	ug/kg	730,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	Dibromochloromethane	0-3 ft	ug/kg	730,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Dibromomethane	0-1 ft	ug/kg	730,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	Dibromomethane	0-3 ft	ug/kg	730,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Dichlorodifluoromethane	0-1 ft	ug/kg	730,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	Dichlorodifluoromethane	0-3 ft	ug/kg	730,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	ug/kg	730,000	18	17	-	0.218	2,300	0	0.674	4,600	0
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-3 ft	ug/kg	730,000	20	19	-	0.212	2,300	0	0.674	4,600	0
Soil	VOCs	Total	Ethylbenzene	0-1 ft	ug/kg	2,260	18	17	1	0.218	255	0	0.437	4,600	1
Soil	VOCs	Total	Ethylbenzene	0-3 ft	ug/kg	2,260	20	19	1	0.212	255	0	0.424	4,600	1
Soil	VOCs	Total	Hexachlorobutadiene	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	Hexachlorobutadiene	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	Isopropylbenzene	0-1 ft	ug/kg	2,260	18	18	-	0.218	2,300	1	0.437	4,600	1
Soil	VOCs	Total	Isopropylbenzene	0-3 ft	ug/kg	2,260	20	20	-	0.212	2,300	1	0.424	4,600	1
Soil	VOCs	Total	m,p-Xylenes	0-1 ft	ug/kg	120,000	18	17	-	0.437	509	0	0.873	1,020	0
Soil	VOCs	Total	m,p-Xylenes	0-3 ft	ug/kg	120,000	20	19	-	0.424	509	0	0.849	1,020	0
Soil	VOCs	Total	Naphthalene	0-1 ft	ug/kg	NV (1)	18	15	-	0.218	100	0	0.437	100	0
Soil	VOCs	Total	Naphthalene	0-3 ft	ug/kg	NV (1)	20	17	-	0.212	100	0	0.424	100	0
Soil	VOCs	Total	n-Butylbenzene	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	n-Butylbenzene	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	n-Propylbenzene	0-1 ft	ug/kg	2,260	18	18	-	0.218	2,300	1	0.437	4,600	1
Soil	VOCs	Total	n-Propylbenzene	0-3 ft	ug/kg	2,260	20	20	-	0.212	2,300	1	0.424	4,600	1
Soil	VOCs	Total	o-Xylene	0-1 ft	ug/kg	1,000	18	18	-	0.0590	255	0	0.437	509	0
Soil	VOCs	Total	o-Xylene	0-3 ft	ug/kg	1,000	24	24	-	0.0590	255	0	0.424	509	0
Soil	VOCs	Total	sec-Butylbenzene	0-1 ft	ug/kg	2,260	18	18	-	0.218	2,300	1	0.437	4,600	1
Soil	VOCs	Total	sec-Butylbenzene	0-3 ft	ug/kg	2,260	20	20	-	0.212	2,300	1	0.424	4,600	1
Soil	VOCs	Total	Styrene	0-1 ft	ug/kg	300,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	Styrene	0-3 ft	ug/kg	300,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	tert-Butylbenzene	0-1 ft	ug/kg	2,260	18	18	-	0.218	2,300	1	0.437	4,600	1

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	VOCs	Total	tert-Butylbenzene	0-3 ft	ug/kg	2,260	20	20	-	0.212	2,300	1	0.424	4,600	1
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	ug/kg	10,000	18	10	2	2.10	255	0	2.10	509	0
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-3 ft	ug/kg	10,000	24	10	3	2.10	255	0	2.10	509	0
Soil	VOCs	Total	Toluene	0-1 ft	ug/kg	200,000	18	13	4	0.218	255	0	0.437	509	0
Soil	VOCs	Total	Toluene	0-3 ft	ug/kg	200,000	24	14	9	0.212	255	0	0.424	509	0
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-1 ft	ug/kg	2,500,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-3 ft	ug/kg	2,500,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-1 ft	ug/kg	NV	18	18	-	0.218	2,300	-	0.437	4,600	-
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-3 ft	ug/kg	NV	20	20	-	0.212	2,300	-	0.424	4,600	-
Soil	VOCs	Total	Trichloroethene (TCE)	0-1 ft	ug/kg	40,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	Trichloroethene (TCE)	0-3 ft	ug/kg	40,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Trichlorofluoromethane	0-1 ft	ug/kg	730,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	Trichlorofluoromethane	0-3 ft	ug/kg	730,000	20	20	-	0.212	2,300	0	0.424	4,600	0
Soil	VOCs	Total	Vinyl Acetate	0-1 ft	ug/kg	NV	17	17	-	1.09	11,500	-	2.18	23,000	-
Soil	VOCs	Total	Vinyl Acetate	0-3 ft	ug/kg	NV	19	19	-	1.06	11,500	-	2.12	23,000	-
Soil	VOCs	Total	Vinyl Chloride	0-1 ft	ug/kg	20,000	18	18	-	0.218	2,300	0	0.437	4,600	0
Soil	VOCs	Total	Vinyl Chloride	0-3 ft	ug/kg	20,000	20	20	-	0.212	2,300	0	0.424	4,600	0
MW Soil Subset	Metals	Total	Antimony	0-1 ft	mg/kg	0.27	9	9	-	0.200	0.300	4	0.200	0.300	4
MW Soil Subset	Metals	Total	Selenium	0-1 ft	mg/kg	0.52	10	8	-	0.200	0.300	0	0.200	0.300	0
MW Soil Subset	Metals	Total	Silver	0-1 ft	mg/kg	4.2	10	5	-	0.200	0.300	0	0.200	0.300	0
MW Soil Subset	Metals	Total	Thallium	0-1 ft	mg/kg	1	10	9	-	0.200	0.300	0	0.200	0.300	0
MW Soil Subset	Herbicides	Total	2,4,5-T	0-1 ft	ug/kg	21	1	1	-	50.0	50.0	1	50.0	50.0	1
MW Soil Subset	Herbicides	Total	2,4,5-TP (Silvex)	0-1 ft	ug/kg	21	1	1	-	50.0	50.0	1	50.0	50.0	1
MW Soil Subset	Herbicides	Total	2,4-D	0-1 ft	ug/kg	21	1	1	-	50.0	50.0	1	50.0	50.0	1
MW Soil Subset	Herbicides	Total	2,4-DB	0-1 ft	ug/kg	21	1	1	-	50.0	50.0	1	50.0	50.0	1
MW Soil Subset	Herbicides	Total	Dalapon	0-1 ft	ug/kg	NV	1	1	-	50.0	50.0	-	50.0	50.0	-
MW Soil Subset	Herbicides	Total	Dicamba	0-1 ft	ug/kg	NV	1	1	-	50.0	50.0	-	50.0	50.0	-
MW Soil Subset	Herbicides	Total	Dichloroprop	0-1 ft	ug/kg	21	1	1	-	50.0	50.0	1	50.0	50.0	1
MW Soil Subset	Herbicides	Total	Dinoseb	0-1 ft	ug/kg	NV	1	1	-	50.0	50.0	-	50.0	50.0	-
MW Soil Subset	Herbicides	Total	MCPA	0-1 ft	ug/kg	21	1	1	-	25,000	25,000	1	25,000	25,000	1
MW Soil Subset	Herbicides	Total	MCPP	0-1 ft	ug/kg	21	1	1	-	25,000	25,000	1	25,000	25,000	1
MW Soil Subset	Pesticides	Total	4,4'-DDD	0-1 ft	ug/kg	21	10	10	-	1.00	3.80	0	1.00	3.80	0
MW Soil Subset	Pesticides	Total	4,4'-DDE	0-1 ft	ug/kg	21	10	10	-	1.00	3.80	0	1.00	3.80	0
MW Soil Subset	Pesticides	Total	4,4'-DDT	0-1 ft	ug/kg	21	10	3	-	1.00	5.00	0	1.00	5.00	0
MW Soil Subset	Pesticides	Total	Aldrin	0-1 ft	ug/kg	4.9	10	10	-	0.970	1.90	0	0.970	1.90	0
MW Soil Subset	Pesticides	Total	BHC (alpha)	0-1 ft	ug/kg	8,000	10	10	-	0.500	1.90	0	0.500	1.90	0
MW Soil Subset	Pesticides	Total	BHC (beta)	0-1 ft	ug/kg	8,000	10	10	-	0.900	12.0	0	0.900	12.0	0
MW Soil Subset	Pesticides	Total	BHC (delta)	0-1 ft	ug/kg	8,000	10	10	-	0.600	1.90	0	0.600	1.90	0
MW Soil Subset	Pesticides	Total	BHC (gamma) Lindane	0-1 ft	ug/kg	8,000	10	10	-	0.970	1.90	0	0.970	1.90	0
MW Soil Subset	Pesticides	Total	Chlordane (alpha)	0-1 ft	ug/kg	9,000	10	10	-	0.800	5.50	0	0.800	5.50	0
MW Soil Subset	Pesticides	Total	Chlordane (gamma)	0-1 ft	ug/kg	9,000	10	10	-	0.700	14.0	0	0.700	14.0	0
MW Soil Subset	Pesticides	Total	Dieldrin	0-1 ft	ug/kg	4.9	10	9	-	1.90	8.00	1	1.90	8.00	1
MW Soil Subset	Pesticides	Total	Endosulfan I	0-1 ft	ug/kg	20,000	10	10	-	0.970	1.90	0	0.970	1.90	0
MW Soil Subset	Pesticides	Total	Endosulfan II	0-1 ft	ug/kg	20,000	10	10	-	1.90	3.80	0	1.90	3.80	0
MW Soil Subset	Pesticides	Total	Endosulfan Sulfate	0-1 ft	ug/kg	20,000	10	10	-	1.00	8.00	0	1.00	8.00	0
MW Soil Subset	Pesticides	Total	Endrin Aldehyde	0-1 ft	ug/kg	4.9	10	10	-	1.90	10.0	5	1.90	10.0	5

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
MW Soil Subset	Pesticides	Total	Endrin Ketone	0-1 ft	ug/kg	4.9	9	9	-	1.90	17.0	2	1.90	17.0	2
MW Soil Subset	Pesticides	Total	Endrin	0-1 ft	ug/kg	4.9	10	10	-	1.90	10.0	1	1.90	10.0	1
MW Soil Subset	Pesticides	Total	Heptachlor Epoxide	0-1 ft	ug/kg	15,000	10	10	-	0.970	1.90	0	0.970	1.90	0
MW Soil Subset	Pesticides	Total	Heptachlor	0-1 ft	ug/kg	15,000	10	10	-	0.970	1.90	0	0.970	1.90	0
MW Soil Subset	Pesticides	Total	Methoxychlor	0-1 ft	ug/kg	500,000	10	10	-	4.00	19.0	0	4.00	19.0	0
MW Soil Subset	Pesticides	Total	Toxaphene	0-1 ft	ug/kg	1,000,000	10	10	-	50.0	190	0	50.0	190	0
MW Soil Subset	PCB Aroclors	Total	Aroclor 1016	0-1 ft	ug/kg	371	10	10	-	3.80	50.0	0	3.80	50.0	0
MW Soil Subset	PCB Aroclors	Total	Aroclor 1221	0-1 ft	ug/kg	371	10	10	-	3.80	50.0	0	3.80	50.0	0
MW Soil Subset	PCB Aroclors	Total	Aroclor 1232	0-1 ft	ug/kg	371	10	10	-	3.80	50.0	0	3.80	50.0	0
MW Soil Subset	PCB Aroclors	Total	Aroclor 1242	0-1 ft	ug/kg	371	10	10	-	3.80	50.0	0	3.80	50.0	0
MW Soil Subset	PCB Aroclors	Total	Aroclor 1248	0-1 ft	ug/kg	371	10	10	-	3.80	50.0	0	3.80	50.0	0
MW Soil Subset	PCB Aroclors	Total	Aroclor 1254	0-1 ft	ug/kg	371	10	3	-	4.00	50.0	0	4.00	50.0	0
MW Soil Subset	PCB Aroclors	Total	Aroclor 1260	0-1 ft	ug/kg	371	10	1	-	50.0	50.0	0	50.0	50.0	0
MW Soil Subset	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	ug/kg	371	10	1	-	150	150	0	150	150	0
MW Soil Subset	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	mg/kg	NV	1	1	-	25.0	25.0	-	25.0	25.0	-
MW Soil Subset	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	mg/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	mg/kg	NV	1	1	-	20.0	20.0	-	20.0	20.0	-
MW Soil Subset	SVOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	ug/kg	20,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	1,2-Dichlorobenzene	0-1 ft	ug/kg	2,260	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	1,3-Dichlorobenzene	0-1 ft	ug/kg	2,260	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	1,4-Dichlorobenzene	0-1 ft	ug/kg	20,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	2,4,5-Trichlorophenol	0-1 ft	ug/kg	4,000	10	10	-	49.8	300	0	49.8	300	0
MW Soil Subset	SVOCs	Total	2,4,6-Trichlorophenol	0-1 ft	ug/kg	10,000	10	10	-	49.8	300	0	49.8	300	0
MW Soil Subset	SVOCs	Total	2,4-Dichlorophenol	0-1 ft	ug/kg	20,000	10	10	-	49.8	300	0	49.8	300	0
MW Soil Subset	SVOCs	Total	2,4-Dimethylphenol	0-1 ft	ug/kg	20,000	10	10	-	20.0	99.7	0	20.0	99.7	0
MW Soil Subset	SVOCs	Total	2,4-Dinitrophenol	0-1 ft	ug/kg	20,000	10	10	-	200	590	0	200	590	0
MW Soil Subset	SVOCs	Total	2,4-Dinitrotoluene	0-1 ft	ug/kg	NV	10	10	-	98.0	300	-	98.0	300	-
MW Soil Subset	SVOCs	Total	2,6-Dinitrotoluene	0-1 ft	ug/kg	NV	10	10	-	98.0	300	-	98.0	300	-
MW Soil Subset	SVOCs	Total	2-Chloronaphthalene	0-1 ft	ug/kg	NV	10	10	-	20.0	59.0	-	20.0	59.0	-
MW Soil Subset	SVOCs	Total	2-Chlorophenol	0-1 ft	ug/kg	60,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	2-Methylphenol	0-1 ft	ug/kg	50,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	2-Nitroaniline	0-1 ft	ug/kg	NV	10	10	-	98.0	300	-	98.0	300	-
MW Soil Subset	SVOCs	Total	2-Nitrophenol	0-1 ft	ug/kg	NV	10	10	-	49.8	300	-	49.8	300	-
MW Soil Subset	SVOCs	Total	3,3'-Dichlorobenzidine	0-1 ft	ug/kg	NV	10	10	-	98.0	2,490	-	98.0	2,490	-
MW Soil Subset	SVOCs	Total	3-Nitroaniline	0-1 ft	ug/kg	70,000	10	10	-	98.0	300	0	98.0	300	0
MW Soil Subset	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-1 ft	ug/kg	NV	10	10	-	200	590	-	200	590	-
MW Soil Subset	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-1 ft	ug/kg	NV	10	10	-	20.0	59.0	-	20.0	59.0	-
MW Soil Subset	SVOCs	Total	4-Chloro-3-methylphenol	0-1 ft	ug/kg	NV	10	10	-	49.8	300	-	49.8	300	-
MW Soil Subset	SVOCs	Total	4-Chloroaniline	0-1 ft	ug/kg	40,000	10	10	-	98.0	300	0	98.0	300	0
MW Soil Subset	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-1 ft	ug/kg	NV	10	10	-	20.0	59.0	-	20.0	59.0	-
MW Soil Subset	SVOCs	Total	4-Nitroaniline	0-1 ft	ug/kg	40,000	10	10	-	98.0	300	0	98.0	300	0
MW Soil Subset	SVOCs	Total	4-Nitrophenol	0-1 ft	ug/kg	7,000	10	10	-	98.0	300	0	98.0	300	0
MW Soil Subset	SVOCs	Total	Aniline	0-1 ft	ug/kg	200,000	1	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Benzoic Acid	0-1 ft	ug/kg	200,000	10	7	2	200	590	0	200	590	0
MW Soil Subset	SVOCs	Total	Benzyl Alcohol	0-1 ft	ug/kg	2,260	10	9	1	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Bis(2-chloroethoxy)methane	0-1 ft	ug/kg	730,000	10	10	-	20.0	59.0	0	20.0	59.0	0

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
MW Soil Subset	SVOCs	Total	Bis(2-chloroethyl) Ether	0-1 ft	ug/kg	NV	10	10	-	20.0	59.0	-	20.0	59.0	-
MW Soil Subset	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-1 ft	ug/kg	NV	10	10	-	20.0	59.0	-	20.0	59.0	-
MW Soil Subset	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	ug/kg	4,500	10	1	-	50.0	50.0	0	50.0	50.0	0
MW Soil Subset	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	ug/kg	450	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Carbazole	0-1 ft	ug/kg	2,260	10	2	3	20.0	49.8	0	20.0	49.8	0
MW Soil Subset	SVOCs	Total	Dibenzofuran	0-1 ft	ug/kg	2	10	8	1	20.0	49.8	8	20.0	59.0	9
MW Soil Subset	SVOCs	Total	Diethyl Phthalate	0-1 ft	ug/kg	100,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Dimethyl Phthalate	0-1 ft	ug/kg	200,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	ug/kg	450	10	6	1	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Di-n-octyl Phthalate	0-1 ft	ug/kg	450	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Hexachlorobenzene	0-1 ft	ug/kg	1,000,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Hexachlorobutadiene	0-1 ft	ug/kg	NV	10	10	-	20.0	59.0	-	20.0	59.0	-
MW Soil Subset	SVOCs	Total	Hexachlorocyclopentadiene	0-1 ft	ug/kg	10,000	10	10	-	98.0	300	0	98.0	300	0
MW Soil Subset	SVOCs	Total	Hexachloroethane	0-1 ft	ug/kg	NV	10	10	-	20.0	59.0	-	20.0	59.0	-
MW Soil Subset	SVOCs	Total	Isophorone	0-1 ft	ug/kg	NV	10	10	-	20.0	59.0	-	20.0	59.0	-
MW Soil Subset	SVOCs	Total	Nitrobenzene	0-1 ft	ug/kg	8,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	N-Nitrosodimethylamine	0-1 ft	ug/kg	NV	9	9	-	98.0	300	-	98.0	300	-
MW Soil Subset	SVOCs	Total	N-Nitrosodi-n-propylamine	0-1 ft	ug/kg	NV	10	10	-	49.8	300	-	49.8	300	-
MW Soil Subset	SVOCs	Total	N-Nitrosodiphenylamine	0-1 ft	ug/kg	20,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	ug/kg	50,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Pentachlorophenol	0-1 ft	ug/kg	2,100	10	10	-	98.0	300	0	98.0	300	0
MW Soil Subset	SVOCs	Total	Phenol	0-1 ft	ug/kg	30,000	10	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	2-Methylnaphthalene	0-1 ft	ug/kg	NV (1)	10	9	1	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Acenaphthene	0-1 ft	ug/kg	NV (1)	14	3	2	20.0	49.8	0	20.0	49.8	0
MW Soil Subset	SVOCs	Total	Acenaphthylene	0-1 ft	ug/kg	NV (1)	14	10	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Anthracene	0-1 ft	ug/kg	NV (1)	14	1	1	49.8	49.8	0	20.0	49.8	0
MW Soil Subset	SVOCs	Total	Fluorene	0-1 ft	ug/kg	NV (1)	14	4	3	20.0	49.8	0	20.0	49.8	0
MW Soil Subset	SVOCs	Total	Naphthalene	0-1 ft	ug/kg	NV (1)	14	9	-	20.0	59.0	0	20.0	59.0	0
MW Soil Subset	SVOCs	Total	Phenanthrene	0-1 ft	ug/kg	NV (1)	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	29,000	14	1	-	299	299	0	299	299	0
MW Soil Subset	SVOCs	Total	Benzo(a)anthracene	0-1 ft	ug/kg	NV (2)	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Benzo(a)pyrene	0-1 ft	ug/kg	NV (2)	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Benzo(b)fluoranthene	0-1 ft	ug/kg	NV (2)	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	ug/kg	NV (2)	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	ug/kg	NV (2)	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Chrysene	0-1 ft	ug/kg	NV (2)	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	ug/kg	NV (2)	14	1	1	49.8	49.8	0	20.0	49.8	0
MW Soil Subset	SVOCs	Total	Fluoranthene	0-1 ft	ug/kg	NV (2)	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	ug/kg	NV (2)	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Pyrene	0-1 ft	ug/kg	NV (2)	14	1	-	49.8	49.8	0	49.8	49.8	0
MW Soil Subset	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	ug/kg	1,100	14	1	-	498	498	0	498	498	0
MW Soil Subset	VOCs	Total	1,1,1,2-Tetrachloroethane	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-1 ft	ug/kg	55,550,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,1,2,2-Tetrachloroethane	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
MW Soil Subset	VOCs	Total	1,1,2-Trichloroethane	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	1,1-Dichloroethane	0-1 ft	ug/kg	70,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,1-Dichloroethene	0-1 ft	ug/kg	3,750,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,1-Dichloropropene	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	1,2,3-Trichlorobenzene	0-1 ft	ug/kg	20,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,2,3-Trichloropropane	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	ug/kg	20,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	ug/kg	200,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,2-Dibromo-3-chloropropane	0-1 ft	ug/kg	NV	1	1	-	500	500	-	500	500	-
MW Soil Subset	VOCs	Total	1,2-Dibromoethane (EDB)	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	1,2-Dichlorobenzene	0-1 ft	ug/kg	2,260	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,2-Dichloroethane (EDC)	0-1 ft	ug/kg	70,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,2-Dichloropropane	0-1 ft	ug/kg	700,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	ug/kg	200,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,3-Dichlorobenzene	0-1 ft	ug/kg	2,260	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	1,3-Dichloropropane	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	ug/kg	20,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	2,2-Dichloropropane	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	2-Butanone (MEK)	0-1 ft	ug/kg	#########	1	1	-	1,000	1,000	0	1,000	1,000	0
MW Soil Subset	VOCs	Total	2-Chlorotoluene	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	2-Hexanone	0-1 ft	ug/kg	1,250,000	1	1	-	1,000	1,000	0	1,000	1,000	0
MW Soil Subset	VOCs	Total	4-Chlorotoluene	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	4-Isopropyltoluene	0-1 ft	ug/kg	200,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	ug/kg	1,250,000	1	1	-	1,000	1,000	0	1,000	1,000	0
MW Soil Subset	VOCs	Total	Acetone	0-1 ft	ug/kg	1,250,000	1	1	-	1,000	1,000	0	1,000	1,000	0
MW Soil Subset	VOCs	Total	Benzene	0-1 ft	ug/kg	3,300,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Bromobenzene	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	Bromochloromethane	0-1 ft	ug/kg	730,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Bromodichloromethane	0-1 ft	ug/kg	730,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Bromoform	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	Bromomethane	0-1 ft	ug/kg	730,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Carbon Disulfide	0-1 ft	ug/kg	1,000,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Carbon Tetrachloride	0-1 ft	ug/kg	1,000,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Chlorobenzene	0-1 ft	ug/kg	40,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Chloroethane	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	Chloroform	0-1 ft	ug/kg	1,875,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Chloromethane	0-1 ft	ug/kg	730,000	1	1	-	500	500	0	500	500	0
MW Soil Subset	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	ug/kg	2,500,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	cis-1,3-Dichloropropene	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	Dibromochloromethane	0-1 ft	ug/kg	730,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Dibromomethane	0-1 ft	ug/kg	730,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Dichlorodifluoromethane	0-1 ft	ug/kg	730,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	ug/kg	730,000	1	1	-	1,000	1,000	0	1,000	1,000	0
MW Soil Subset	VOCs	Total	Ethylbenzene	0-1 ft	ug/kg	2,260	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Hexachlorobutadiene	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	Isopropylbenzene	0-1 ft	ug/kg	2,260	1	1	-	100	100	0	100	100	0

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
MW Soil Subset	VOCs	Total	m,p-Xylenes	0-1 ft	ug/kg	120,000	1	1	-	200	200	0	200	200	0
MW Soil Subset	VOCs	Total	Naphthalene	0-1 ft	ug/kg	NV (1)	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	n-Butylbenzene	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	n-Propylbenzene	0-1 ft	ug/kg	2,260	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	o-Xylene	0-1 ft	ug/kg	1,000	5	5	-	0.0590	100	0	4.70	100	0
MW Soil Subset	VOCs	Total	sec-Butylbenzene	0-1 ft	ug/kg	2,260	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Styrene	0-1 ft	ug/kg	300,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	tert-Butylbenzene	0-1 ft	ug/kg	2,260	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	ug/kg	10,000	5	1	2	100	100	0	4.70	100	0
MW Soil Subset	VOCs	Total	Toluene	0-1 ft	ug/kg	200,000	5	1	4	100	100	0	4.70	100	0
MW Soil Subset	VOCs	Total	trans-1,2-Dichloroethene	0-1 ft	ug/kg	2,500,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	trans-1,3-Dichloropropene	0-1 ft	ug/kg	NV	1	1	-	100	100	-	100	100	-
MW Soil Subset	VOCs	Total	Trichloroethene (TCE)	0-1 ft	ug/kg	40,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Trichlorofluoromethane	0-1 ft	ug/kg	730,000	1	1	-	100	100	0	100	100	0
MW Soil Subset	VOCs	Total	Vinyl Chloride	0-1 ft	ug/kg	20,000	1	1	-	100	100	0	100	100	0
Groundwater	Metals	Dissolved	Antimony	N/A	ug/L	1,000	3	3	-	50.0	50.0	0	50.0	50.0	0
Groundwater	Metals	Dissolved	Arsenic	N/A	ug/L	150	36	7	3	0.500	5.00	0	0.500	5.00	0
Groundwater	Metals	Dissolved	Beryllium	N/A	ug/L	5.3	3	3	-	5.00	5.00	0	5.00	5.00	0
Groundwater	Metals	Dissolved	Cadmium	N/A	ug/L	0.17	3	3	-	5.00	5.00	3	5.00	5.00	3
Groundwater	Metals	Dissolved	Chromium	N/A	ug/L	49	3	3	-	10.0	10.0	0	10.0	10.0	0
Groundwater	Metals	Dissolved	Copper	N/A	ug/L	5.8	3	3	-	10.0	10.0	3	10.0	10.0	3
Groundwater	Metals	Dissolved	Iron	N/A	ug/L	1,000	36	11	6	4.00	50.0	0	20.0	50.0	0
Groundwater	Metals	Dissolved	Lead	N/A	ug/L	1.44	36	20	7	0.00600	3.00	3	0.0200	3.00	3
Groundwater	Metals	Dissolved	Manganese	N/A	ug/L	120	36	2	2	0.400	0.400	0	0.400	5.00	0
Groundwater	Metals	Dissolved	Mercury	N/A	ug/L	0.77	8	8	-	0.0300	0.200	0	0.200	0.200	0
Groundwater	Metals	Dissolved	Nickel	N/A	ug/L	34	3	2	-	10.0	10.0	0	10.0	10.0	0
Groundwater	Metals	Dissolved	Potassium	N/A	ug/L	53,000	9	0	1	-	-	0	2,000	2,000	0
Groundwater	Metals	Dissolved	Selenium	N/A	ug/L	5	3	3	-	5.00	5.00	0	5.00	5.00	0
Groundwater	Metals	Dissolved	Silver	N/A	ug/L	0.12	3	3	-	10.0	10.0	3	10.0	10.0	3
Groundwater	Metals	Dissolved	Thallium	N/A	ug/L	40	3	3	-	5.00	5.00	0	5.00	5.00	0
Groundwater	Metals	Dissolved	Zinc	N/A	ug/L	77	3	2	-	10.0	10.0	0	10.0	10.0	0
Groundwater	Butyltins	Total	Dibutyltin	N/A	ug/L	0.063	39	28	2	0.00111	0.00810	0	0.00302	0.0500	0
Groundwater	Butyltins	Total	Monobutyltin	N/A	ug/L	0.063	39	32	1	0.00105	0.0290	0	0.00302	0.0870	24
Groundwater	Butyltins	Total	Tetrabutyltin	N/A	ug/L	0.063	8	8	-	0.00110	0.00119	0	0.00300	0.00325	0
Groundwater	Butyltins	Total	Tributyltin	N/A	ug/L	0.063	8	2	-	0.00156	0.00163	0	0.00402	0.00419	0
Groundwater	Herbicides	Total	2,4,5-T	N/A	ug/L	36	21	21	-	0.0566	0.150	0	0.100	0.160	0
Groundwater	Herbicides	Total	2,4,5-TP (Silvex)	N/A	ug/L	NV	21	21	-	0.0227	0.100	-	0.0800	0.100	-
Groundwater	Herbicides	Total	2,4-D	N/A	ug/L	4	21	21	-	0.0296	1.00	0	0.0800	1.00	0
Groundwater	Herbicides	Total	2,4-DB	N/A	ug/L	NV	21	21	-	0.0557	1.00	-	0.160	1.00	-
Groundwater	Herbicides	Total	4-Nitrophenol	N/A	ug/L	150	8	7	-	0.0114	0.0114	0	0.0800	0.0800	0
Groundwater	Herbicides	Total	Dalapon	N/A	ug/L	NV	21	21	-	0.0124	2.00	-	0.0800	2.00	-
Groundwater	Herbicides	Total	Dicamba	N/A	ug/L	10	21	21	-	0.0221	0.100	0	0.0800	0.100	0
Groundwater	Herbicides	Total	Dichloroprop	N/A	ug/L	4	21	20	-	0.0114	1.00	0	0.0800	1.00	0
Groundwater	Herbicides	Total	Dinoseb	N/A	ug/L	0.05	21	21	-	0.0292	0.500	13	0.0800	0.500	21
Groundwater	Herbicides	Total	MCPA	N/A	ug/L	2.6	21	21	-	0.0114	50.0	13	0.0800	50.0	13
Groundwater	Herbicides	Total	MCPP	N/A	ug/L	NV	21	21	-	0.0134	50.0	-	0.0800	50.0	-

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Groundwater	Herbicides	Total	Pentachlorophenol	N/A	ug/L	15	8	7	-	0.0259	0.0259	0	0.0800	0.0800	0
Groundwater	PCB Aroclors	Total	Aroclor 1016	N/A	ug/L	0.014	22	22	-	0.00199	1.00	14	0.00992	1.00	15
Groundwater	PCB Aroclors	Total	Aroclor 1221	N/A	ug/L	0.014	22	22	-	0.00496	1.00	14	0.0198	1.00	22
Groundwater	PCB Aroclors	Total	Aroclor 1232	N/A	ug/L	0.014	22	22	-	0.00236	1.00	14	0.00992	1.00	15
Groundwater	PCB Aroclors	Total	Aroclor 1242	N/A	ug/L	0.014	22	22	-	0.00327	1.00	14	0.00992	1.00	15
Groundwater	PCB Aroclors	Total	Aroclor 1248	N/A	ug/L	0.014	22	22	-	0.00155	1.00	14	0.00992	1.00	15
Groundwater	PCB Aroclors	Total	Aroclor 1254	N/A	ug/L	0.014	22	22	-	0.00199	1.00	14	0.00992	1.00	15
Groundwater	PCB Aroclors	Total	Aroclor 1260	N/A	ug/L	0.014	22	22	-	0.00109	1.00	14	0.00992	1.00	15
Groundwater	Pesticides	Total	4,4'-DDD	N/A	ug/L	0.001	22	22	-	0.000458	0.100	16	0.00195	0.100	22
Groundwater	Pesticides	Total	4,4'-DDE	N/A	ug/L	0.001	22	21	-	0.000380	0.100	16	0.00195	0.100	21
Groundwater	Pesticides	Total	4,4'-DDT	N/A	ug/L	0.001	22	22	-	0.000486	0.100	16	0.00195	0.100	22
Groundwater	Pesticides	Total	Aldrin	N/A	ug/L	0.06	22	22	-	0.000111	0.0500	0	0.000973	0.0500	0
Groundwater	Pesticides	Total	BHC (alpha)	N/A	ug/L	2.2	22	22	-	0.000358	0.0500	0	0.000973	0.0500	0
Groundwater	Pesticides	Total	BHC (beta)	N/A	ug/L	2.2	22	22	-	0.000415	0.0500	0	0.000973	0.0500	0
Groundwater	Pesticides	Total	BHC (delta)	N/A	ug/L	2.2	22	22	-	0.000228	0.0500	0	0.000973	0.0500	0
Groundwater	Pesticides	Total	BHC (gamma) Lindane	N/A	ug/L	0.08	22	22	-	0.000700	0.0500	0	0.000973	0.0500	0
Groundwater	Pesticides	Total	Chlordane (alpha)	N/A	ug/L	0.0043	14	14	-	0.0470	0.0500	14	0.0470	0.0500	14
Groundwater	Pesticides	Total	Chlordane (gamma)	N/A	ug/L	0.0043	14	14	-	0.0470	0.0500	14	0.0470	0.0500	14
Groundwater	Pesticides	Total	Chlordane (technical)	N/A	ug/L	0.0043	8	8	-	0.00312	0.0114	3	0.00973	0.0137	8
Groundwater	Pesticides	Total	Dieldrin	N/A	ug/L	0.056	22	21	1	0.000294	0.100	14	0.00195	0.100	14
Groundwater	Pesticides	Total	Endosulfan I	N/A	ug/L	0.056	22	22	-	0.000485	0.0500	0	0.000973	0.0500	0
Groundwater	Pesticides	Total	Endosulfan II	N/A	ug/L	0.056	22	22	-	0.000368	0.100	14	0.00195	0.100	14
Groundwater	Pesticides	Total	Endosulfan Sulfate	N/A	ug/L	0.051	22	22	-	0.000523	0.100	14	0.00195	0.100	14
Groundwater	Pesticides	Total	Endrin Aldehyde	N/A	ug/L	0.15	22	22	-	0.000947	0.100	0	0.00195	0.100	0
Groundwater	Pesticides	Total	Endrin Ketone	N/A	ug/L	NV	22	22	-	0.000335	0.100	-	0.00195	0.100	-
Groundwater	Pesticides	Total	Endrin	N/A	ug/L	0.036	22	22	-	0.000301	0.100	14	0.00195	0.100	14
Groundwater	Pesticides	Total	Heptachlor Epoxide	N/A	ug/L	0.0038	22	22	-	0.000364	0.0500	14	0.000973	0.0500	14
Groundwater	Pesticides	Total	Heptachlor	N/A	ug/L	0.0038	22	22	-	0.000733	0.0500	14	0.000973	0.0500	14
Groundwater	Pesticides	Total	Methoxychlor	N/A	ug/L	0.03	22	22	-	0.000522	0.500	14	0.00973	0.500	14
Groundwater	Pesticides	Total	Toxaphene	N/A	ug/L	0.002	22	22	-	0.0113	1.00	22	0.0973	1.00	22
Groundwater	NWTPH-Dx	Total	Diesel Range Organics	N/A	ug/L	NV	55	18	11	12.0	250	-	100	250	-
Groundwater	NWTPH-Dx	Total	Residual Range Organics	N/A	ug/L	NV	55	28	7	21.0	750	-	100	750	-
Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	ug/L	NV	57	40	14	13.0	100	-	100	250	-
Groundwater	SVOCs	Total	1,2,4-Trichlorobenzene	N/A	ug/L	110	23	23	-	0.0100	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	1,2-Dichlorobenzene	N/A	ug/L	14	23	23	-	0.0160	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	1,3-Dichlorobenzene	N/A	ug/L	71	23	23	-	0.0170	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	15	54	52	2	0.0150	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	2,4,5-Trichlorophenol	N/A	ug/L	18	23	23	-	0.0110	48.0	14	0.0999	48.0	14
Groundwater	SVOCs	Total	2,4,6-Trichlorophenol	N/A	ug/L	970	23	23	-	0.0120	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	2,4-Dichlorophenol	N/A	ug/L	3,650	23	23	-	0.0150	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	2,4-Dimethylphenol	N/A	ug/L	42	23	23	-	0.0150	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	2,4-Dinitrophenol	N/A	ug/L	19	23	23	-	0.0300	48.0	14	0.500	48.0	14
Groundwater	SVOCs	Total	2,4-Dinitrotoluene	N/A	ug/L	230	23	23	-	0.0130	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	2,6-Dinitrotoluene	N/A	ug/L	230	23	23	-	0.0200	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	2-Chloronaphthalene	N/A	ug/L	32	23	23	-	0.00150	10.0	0	0.00999	10.0	0
Groundwater	SVOCs	Total	2-Chlorophenol	N/A	ug/L	2,000	23	23	-	0.0170	10.0	0	0.0999	10.0	0

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Groundwater	SVOCs	Total	2-Methylnaphthalene	N/A	ug/L	72.16	23	19	4	0.0150	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	2-Methylphenol	N/A	ug/L	13	23	22	-	0.0240	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	2-Nitroaniline	N/A	ug/L	NV	23	23	-	0.0180	48.0	-	0.0999	48.0	-
Groundwater	SVOCs	Total	2-Nitrophenol	N/A	ug/L	NV	23	23	-	0.0220	10.0	-	0.0999	10.0	-
Groundwater	SVOCs	Total	3,3'-Dichlorobenzidine	N/A	ug/L	4.5	23	23	-	0.0360	19.0	14	0.0999	19.0	14
Groundwater	SVOCs	Total	3-Nitroaniline	N/A	ug/L	NV	23	23	-	0.0330	48.0	-	0.0999	48.0	-
Groundwater	SVOCs	Total	4,6-Dinitro-2-methylphenol	N/A	ug/L	NV	23	23	-	0.0220	48.0	-	0.500	48.0	-
Groundwater	SVOCs	Total	4-Bromophenyl Phenyl Ether	N/A	ug/L	1.5	23	23	-	0.0120	10.0	14	0.0999	10.0	14
Groundwater	SVOCs	Total	4-Chloro-3-methylphenol	N/A	ug/L	NV	23	23	-	0.0539	10.0	-	0.0999	10.0	-
Groundwater	SVOCs	Total	4-Chloroaniline	N/A	ug/L	50	23	23	-	0.0390	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	4-Chlorophenyl Phenyl Ether	N/A	ug/L	NV	23	23	-	0.0150	10.0	-	0.0999	10.0	-
Groundwater	SVOCs	Total	4-Nitroaniline	N/A	ug/L	NV	23	23	-	0.0210	48.0	-	0.0999	48.0	-
Groundwater	SVOCs	Total	4-Nitrophenol	N/A	ug/L	150	53	53	-	0.0290	48.0	0	0.500	48.0	0
Groundwater	SVOCs	Total	Acenaphthene	N/A	ug/L	55.85	23	21	-	0.00160	10.0	0	0.00999	10.0	0
Groundwater	SVOCs	Total	Acenaphthylene	N/A	ug/L	306.9	23	23	-	0.00150	10.0	0	0.00999	10.0	0
Groundwater	SVOCs	Total	Aniline	N/A	ug/L	2.2	23	23	-	0.0000616	10.0	14	0.0999	10.0	14
Groundwater	SVOCs	Total	Anthracene	N/A	ug/L	13	23	22	-	0.00150	10.0	0	0.00999	10.0	0
Groundwater	SVOCs	Total	Benzidine	N/A	ug/L	3.9	23	23	-	0.0240	100	14	0.500	100	16
Groundwater	SVOCs	Total	Benzo(a)anthracene	N/A	ug/L	0.027	23	23	-	0.00426	10.0	16	0.00999	10.0	16
Groundwater	SVOCs	Total	Benzo(a)pyrene	N/A	ug/L	0.014	23	23	-	0.00470	10.0	16	0.00999	10.0	16
Groundwater	SVOCs	Total	Benzo(b)fluoranthene	N/A	ug/L	0.6774	14	14	-	9.40	10.0	14	9.40	10.0	14
Groundwater	SVOCs	Total	Benzo(g,h,i)perylene	N/A	ug/L	0.4391	23	23	-	0.00340	10.0	14	0.00999	10.0	14
Groundwater	SVOCs	Total	Benzo(k)fluoranthene	N/A	ug/L	0.6415	14	14	-	9.40	10.0	14	9.40	10.0	14
Groundwater	SVOCs	Total	Benzofluoranthenes, Total	N/A	ug/L	0.014	9	9	-	0.00380	0.0540	2	0.0200	0.284	9
Groundwater	SVOCs	Total	Benzoic Acid	N/A	ug/L	42	23	22	-	0.0200	48.0	8	0.500	48.0	8
Groundwater	SVOCs	Total	Benzyl Alcohol	N/A	ug/L	8.6	23	23	-	0.0320	10.0	14	0.0999	10.0	14
Groundwater	SVOCs	Total	Bis(2-chloroethoxy)methane	N/A	ug/L	NV	23	23	-	0.0180	10.0	-	0.0999	10.0	-
Groundwater	SVOCs	Total	Bis(2-chloroethyl) Ether	N/A	ug/L	1,900	23	23	-	0.0190	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Bis(2-chloroisopropyl) Ether	N/A	ug/L	NV	23	23	-	0.0210	10.0	-	0.0999	10.0	-
Groundwater	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	ug/L	3	23	19	-	0.0649	48.0	11	0.0999	48.0	11
Groundwater	SVOCs	Total	Butyl Benzyl Phthalate	N/A	ug/L	19	23	23	-	0.187	10.0	0	0.500	10.0	0
Groundwater	SVOCs	Total	Carbazole	N/A	ug/L	NV	23	23	-	0.00280	10.0	-	0.00999	10.0	-
Groundwater	SVOCs	Total	Chrysene	N/A	ug/L	2.042	23	23	-	0.00250	10.0	14	0.00999	10.0	14
Groundwater	SVOCs	Total	Dibenz(a,h)anthracene	N/A	ug/L	0.2825	23	23	-	0.00270	10.0	14	0.00999	10.0	14
Groundwater	SVOCs	Total	Dibenzofuran	N/A	ug/L	3.7	23	23	-	0.0140	10.0	14	0.0999	10.0	14
Groundwater	SVOCs	Total	Diethyl Phthalate	N/A	ug/L	210	23	20	1	0.0579	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Dimethyl Phthalate	N/A	ug/L	3	23	22	-	0.0160	10.0	14	0.100	10.0	14
Groundwater	SVOCs	Total	Di-n-butyl Phthalate	N/A	ug/L	35	23	23	-	0.231	10.0	0	0.500	10.0	0
Groundwater	SVOCs	Total	Di-n-octyl Phthalate	N/A	ug/L	708	23	20	-	0.0340	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Fluoranthene	N/A	ug/L	6.16	23	23	-	0.00190	10.0	14	0.00999	10.0	14
Groundwater	SVOCs	Total	Fluorene	N/A	ug/L	3.9	23	23	-	0.00140	10.0	14	0.00999	10.0	14
Groundwater	SVOCs	Total	Hexachlorobenzene	N/A	ug/L	0.0003	23	23	-	0.0200	10.0	23	0.0999	10.0	23
Groundwater	SVOCs	Total	Hexachlorobutadiene	N/A	ug/L	9.3	23	23	-	0.0290	10.0	14	0.0999	10.0	14
Groundwater	SVOCs	Total	Hexachlorocyclopentadiene	N/A	ug/L	5.2	23	23	-	0.0260	10.0	14	0.0999	10.0	14
Groundwater	SVOCs	Total	Hexachloroethane	N/A	ug/L	540	23	23	-	0.0400	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Indeno(1,2,3-cd)pyrene	N/A	ug/L	0.275	23	23	-	0.00300	10.0	14	0.00999	10.0	14

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Groundwater	SVOCs	Total	Isophorone	N/A	ug/L	2,340	23	21	1	0.0180	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Naphthalene	N/A	ug/L	193.5	23	20	-	0.00220	10.0	0	0.00999	10.0	0
Groundwater	SVOCs	Total	Nitrobenzene	N/A	ug/L	540	23	23	-	0.0450	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	N-Nitrosodimethylamine	N/A	ug/L	117	23	23	-	0.00330	10.0	0	0.500	10.0	0
Groundwater	SVOCs	Total	N-Nitrosodi-n-propylamine	N/A	ug/L	117	23	23	-	0.0210	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	N-Nitrosodiphenylamine	N/A	ug/L	210	23	23	-	0.00999	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	p-cresol (4-Methylphenol)	N/A	ug/L	13	23	22	-	0.0230	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Pentachlorophenol	N/A	ug/L	15	23	23	-	0.0170	25.0	5	0.0999	25.0	5
Groundwater	SVOCs	Total	Phenanthrene	N/A	ug/L	6.3	54	49	-	0.00220	10.0	14	0.00999	10.0	14
Groundwater	SVOCs	Total	Phenol	N/A	ug/L	110	54	53	1	0.0320	10.0	0	0.0999	10.0	0
Groundwater	SVOCs	Total	Pyrene	N/A	ug/L	10.11	23	23	-	0.00140	10.0	0	0.00999	10.0	0
Groundwater	VOCs	Total	1,1,1,2-Tetrachloroethane	N/A	ug/L	186	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	ug/L	11	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	ug/L	2,400	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,1,2-Trichloroethane	N/A	ug/L	9,400	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,1-Dichloroethane	N/A	ug/L	47	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,1-Dichloroethene	N/A	ug/L	25	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,1-Dichloropropene	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	1,2,3-Trichlorobenzene	N/A	ug/L	8	22	22	-	0.500	5.00	0	1.00	5.00	0
Groundwater	VOCs	Total	1,2,3-Trichloropropane	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	1,2,4-Trichlorobenzene	N/A	ug/L	110	22	22	-	0.500	5.00	0	1.00	5.00	0
Groundwater	VOCs	Total	1,2,4-Trimethylbenzene	N/A	ug/L	7.3	22	20	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,2-Dibromo-3-chloropropane	N/A	ug/L	NV	22	22	-	0.500	3.00	-	1.00	3.00	-
Groundwater	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	1,2-Dichlorobenzene	N/A	ug/L	14	22	22	-	0.500	2.00	0	1.00	2.00	0
Groundwater	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	ug/L	20,000	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,2-Dichloropropane	N/A	ug/L	5,700	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,3,5-Trimethylbenzene	N/A	ug/L	7.3	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,3-Dichlorobenzene	N/A	ug/L	71	22	22	-	0.500	2.00	0	1.00	2.00	0
Groundwater	VOCs	Total	1,3-Dichloropropane	N/A	ug/L	5,700	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	15	22	22	-	0.500	2.00	0	1.00	2.00	0
Groundwater	VOCs	Total	2,2-Dichloropropane	N/A	ug/L	5,700	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	2-Butanone (MEK)	N/A	ug/L	14,000	14	14	-	2.50	10.0	0	5.00	10.0	0
Groundwater	VOCs	Total	2-Chloroethylvinylether	N/A	ug/L	4,760	13	13	-	10.0	10.0	0	10.0	10.0	0
Groundwater	VOCs	Total	2-Chlorotoluene	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	2-Hexanone	N/A	ug/L	99	22	22	-	2.50	10.0	0	5.00	10.0	0
Groundwater	VOCs	Total	4-Chlorotoluene	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	4-Isopropyltoluene	N/A	ug/L	NV	22	22	-	0.500	2.00	-	1.00	2.00	-
Groundwater	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	ug/L	170	22	21	1	2.50	10.0	0	5.00	10.0	0
Groundwater	VOCs	Total	Acetone	N/A	ug/L	1,500	22	18	-	2.50	10.0	0	5.00	10.0	0
Groundwater	VOCs	Total	Benzene	N/A	ug/L	130	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	Bromobenzene	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	Bromochloromethane	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	Bromodichloromethane	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	Bromoform	N/A	ug/L	320	22	22	-	0.500	3.00	0	1.00	3.00	0
Groundwater	VOCs	Total	Bromomethane	N/A	ug/L	16	22	22	-	1.00	1.00	0	1.00	2.00	0

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(17 of 22)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Groundwater	VOCs	Total	Carbon Disulfide	N/A	ug/L	0.92	22	21	-	0.500	10.0	13	1.00	10.0	21
Groundwater	VOCs	Total	Carbon Tetrachloride	N/A	ug/L	74	22	21	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	Chlorobenzene	N/A	ug/L	50	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	Chloroethane	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	Chloroform	N/A	ug/L	1,240	56	48	4	0.0820	1.00	0	0.500	1.00	0
Groundwater	VOCs	Total	Chloromethane	N/A	ug/L	NV	22	22	-	0.500	5.00	-	1.00	5.00	-
Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	ug/L	590	22	21	1	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	cis-1,3-Dichloropropene	N/A	ug/L	0.055	22	22	-	0.500	3.00	22	1.00	3.00	22
Groundwater	VOCs	Total	Dibromochloromethane	N/A	ug/L	NV	22	22	-	0.500	2.00	-	1.00	2.00	-
Groundwater	VOCs	Total	Dibromomethane	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	Dichlorodifluoromethane	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	ug/L	2,200	22	22	-	0.500	5.00	0	1.00	5.00	0
Groundwater	VOCs	Total	Ethylbenzene	N/A	ug/L	7.3	22	21	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	Hexachlorobutadiene	N/A	ug/L	9.3	22	22	-	0.500	3.00	0	1.00	3.00	0
Groundwater	VOCs	Total	Isopropylbenzene	N/A	ug/L	7.3	22	20	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	m,p-Xylenes	N/A	ug/L	13	22	22	-	1.00	1.00	0	1.00	2.00	0
Groundwater	VOCs	Total	Naphthalene	N/A	ug/L	193.5	22	22	-	0.500	5.00	0	1.00	5.00	0
Groundwater	VOCs	Total	n-Butylbenzene	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	n-Propylbenzene	N/A	ug/L	7.3	22	20	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	o-Xylene	N/A	ug/L	350	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	sec-Butylbenzene	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	Styrene	N/A	ug/L	72	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	tert-Butylbenzene	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	840	56	43	2	0.0970	1.00	0	0.500	1.00	0
Groundwater	VOCs	Total	Toluene	N/A	ug/L	9.8	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	trans-1,2-Dichloroethene	N/A	ug/L	590	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	trans-1,3-Dichloropropene	N/A	ug/L	0.055	22	22	-	0.500	3.00	22	1.00	3.00	22
Groundwater	VOCs	Total	Trichloroethene (TCE)	N/A	ug/L	3,000	22	22	-	0.500	1.00	0	1.00	1.00	0
Groundwater	VOCs	Total	Trichlorofluoromethane	N/A	ug/L	NV	22	22	-	0.500	1.00	-	1.00	1.00	-
Groundwater	VOCs	Total	Vinyl Acetate	N/A	ug/L	16	22	22	-	2.50	10.0	0	5.00	10.0	0
Groundwater	VOCs	Total	Vinyl Chloride	N/A	ug/L	1,300	56	40	13	0.0440	1.00	0	0.500	1.00	0
Seep Water	Metals	Dissolved	Arsenic	N/A	ug/L	150	5	2	-	0.520	1.00	0	0.520	1.00	0
Seep Water	Metals	Dissolved	Beryllium	N/A	ug/L	5.3	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	Metals	Dissolved	Cadmium	N/A	ug/L	0.17	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	Metals	Dissolved	Chromium	N/A	ug/L	49	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	Metals	Dissolved	Iron	N/A	ug/L	1,000	5	2	2	20.0	20.0	0	20.0	20.0	0
Seep Water	Metals	Dissolved	Lead	N/A	ug/L	1.44	5	2	2	0.0300	1.00	0	0.0300	1.00	0
Seep Water	Metals	Dissolved	Manganese	N/A	ug/L	120	5	2	-	0.140	0.160	0	0.140	0.160	0
Seep Water	Metals	Dissolved	Mercury	N/A	ug/L	0.77	2	2	-	0.0300	1.00	1	0.200	1.00	1
Seep Water	Metals	Dissolved	Potassium	N/A	ug/L	53,000	2	0	1	-	-	0	2,000	2,000	0
Seep Water	Metals	Dissolved	Selenium	N/A	ug/L	5	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	Metals	Dissolved	Silver	N/A	ug/L	0.12	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	Metals	Dissolved	Thallium	N/A	ug/L	40	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	Butyltins	Total	Dibutyltin	N/A	ug/L	0.063	4	4	-	0.00730	0.00810	0	0.0500	0.0500	0
Seep Water	Butyltins	Total	Monobutyltin	N/A	ug/L	0.063	4	4	-	0.0110	0.0290	0	0.0500	0.0870	3
Seep Water	Herbicides	Total	2,4,5-T	N/A	ug/L	36	1	1	-	0.400	0.400	0	0.400	0.400	0

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(18 of 22)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Seep Water	Herbicides	Total	2,4,5-TP (Silvex)	N/A	ug/L	NV	1	1	-	0.400	0.400	-	0.400	0.400	-
Seep Water	Herbicides	Total	2,4-D	N/A	ug/L	4	1	1	-	0.400	0.400	0	0.400	0.400	0
Seep Water	Herbicides	Total	2,4-DB	N/A	ug/L	NV	1	1	-	0.400	0.400	-	0.400	0.400	-
Seep Water	Herbicides	Total	Dalapon	N/A	ug/L	NV	1	1	-	0.400	0.400	-	0.400	0.400	-
Seep Water	Herbicides	Total	Dicamba	N/A	ug/L	10	1	1	-	0.400	0.400	0	0.400	0.400	0
Seep Water	Herbicides	Total	Dichloroprop	N/A	ug/L	4	1	1	-	0.400	0.400	0	0.400	0.400	0
Seep Water	Herbicides	Total	Dinoseb	N/A	ug/L	0.05	1	1	-	0.400	0.400	1	0.400	0.400	1
Seep Water	Herbicides	Total	MCPA	N/A	ug/L	2.6	1	1	-	100	100	1	100	100	1
Seep Water	Herbicides	Total	MCPP	N/A	ug/L	NV	1	1	-	100	100	-	100	100	-
Seep Water	PCB Aroclors	Total	Aroclor 1016	N/A	ug/L	0.014	1	1	-	0.100	0.100	1	0.100	0.100	1
Seep Water	PCB Aroclors	Total	Aroclor 1221	N/A	ug/L	0.014	1	1	-	0.100	0.100	1	0.100	0.100	1
Seep Water	PCB Aroclors	Total	Aroclor 1232	N/A	ug/L	0.014	1	1	-	0.100	0.100	1	0.100	0.100	1
Seep Water	PCB Aroclors	Total	Aroclor 1242	N/A	ug/L	0.014	1	1	-	0.100	0.100	1	0.100	0.100	1
Seep Water	PCB Aroclors	Total	Aroclor 1248	N/A	ug/L	0.014	1	1	-	0.100	0.100	1	0.100	0.100	1
Seep Water	PCB Aroclors	Total	Aroclor 1254	N/A	ug/L	0.014	1	1	-	0.100	0.100	1	0.100	0.100	1
Seep Water	PCB Aroclors	Total	Aroclor 1260	N/A	ug/L	0.014	1	1	-	0.100	0.100	1	0.100	0.100	1
Seep Water	Pesticides	Total	4,4'-DDD	N/A	ug/L	0.001	1	1	-	0.0400	0.0400	1	0.0400	0.0400	1
Seep Water	Pesticides	Total	4,4'-DDE	N/A	ug/L	0.001	1	1	-	0.0300	0.0300	1	0.0300	0.0300	1
Seep Water	Pesticides	Total	4,4'-DDT	N/A	ug/L	0.001	1	1	-	0.0900	0.0900	1	0.0900	0.0900	1
Seep Water	Pesticides	Total	Aldrin	N/A	ug/L	0.06	1	1	-	0.0400	0.0400	0	0.0400	0.0400	0
Seep Water	Pesticides	Total	BHC (alpha)	N/A	ug/L	2.2	1	1	-	0.0200	0.0200	0	0.0200	0.0200	0
Seep Water	Pesticides	Total	BHC (beta)	N/A	ug/L	2.2	1	1	-	0.100	0.100	0	0.100	0.100	0
Seep Water	Pesticides	Total	BHC (delta)	N/A	ug/L	2.2	1	1	-	0.0500	0.0500	0	0.0500	0.0500	0
Seep Water	Pesticides	Total	BHC (gamma) Lindane	N/A	ug/L	0.08	1	1	-	0.0300	0.0300	0	0.0300	0.0300	0
Seep Water	Pesticides	Total	Chlordane (alpha)	N/A	ug/L	0.0043	1	1	-	0.0500	0.0500	1	0.0500	0.0500	1
Seep Water	Pesticides	Total	Chlordane (gamma)	N/A	ug/L	0.0043	1	1	-	0.0200	0.0200	1	0.0200	0.0200	1
Seep Water	Pesticides	Total	Dieldrin	N/A	ug/L	0.056	1	1	-	0.0700	0.0700	1	0.0700	0.0700	1
Seep Water	Pesticides	Total	Endosulfan I	N/A	ug/L	0.056	1	1	-	0.0300	0.0300	0	0.0300	0.0300	0
Seep Water	Pesticides	Total	Endosulfan II	N/A	ug/L	0.056	1	1	-	0.0500	0.0500	0	0.0500	0.0500	0
Seep Water	Pesticides	Total	Endosulfan Sulfate	N/A	ug/L	0.051	1	1	-	0.0700	0.0700	1	0.0700	0.0700	1
Seep Water	Pesticides	Total	Endrin Aldehyde	N/A	ug/L	0.15	1	1	-	0.100	0.100	0	0.100	0.100	0
Seep Water	Pesticides	Total	Endrin	N/A	ug/L	0.036	1	1	-	0.0800	0.0800	1	0.0800	0.0800	1
Seep Water	Pesticides	Total	Heptachlor Epoxide	N/A	ug/L	0.0038	1	1	-	0.0300	0.0300	1	0.0300	0.0300	1
Seep Water	Pesticides	Total	Heptachlor	N/A	ug/L	0.0038	1	1	-	0.0300	0.0300	1	0.0300	0.0300	1
Seep Water	Pesticides	Total	Methoxychlor	N/A	ug/L	0.03	1	1	-	0.500	0.500	1	0.500	0.500	1
Seep Water	Pesticides	Total	Toxaphene	N/A	ug/L	0.002	1	1	-	1.50	1.50	1	1.50	1.50	1
Seep Water	NWTPH-Dx	Total	Diesel Range Organics	N/A	ug/L	NV	5	3	1	13.0	250	-	110	250	-
Seep Water	NWTPH-Dx	Total	Residual Range Organics	N/A	ug/L	NV	5	4	-	23.0	500	-	110	500	-
Seep Water	NWTPH-Gx	Total	Gasoline Range Organics	N/A	ug/L	NV	5	5	-	13.0	250	-	250	250	-
Seep Water	SVOCs	Total	1,2,4-Trichlorobenzene	N/A	ug/L	110	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	1,2-Dichlorobenzene	N/A	ug/L	14	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	1,3-Dichlorobenzene	N/A	ug/L	71	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	15	5	5	-	0.0290	4.76	0	0.200	4.76	0
Seep Water	SVOCs	Total	2,4,5-Trichlorophenol	N/A	ug/L	18	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2,4,6-Trichlorophenol	N/A	ug/L	970	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2,4-Dichlorophenol	N/A	ug/L	3,650	1	1	-	4.76	4.76	0	4.76	4.76	0

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(19 of 22)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Seep Water	SVOCs	Total	2,4-Dimethylphenol	N/A	ug/L	42	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2,4-Dinitrophenol	N/A	ug/L	19	1	1	-	9.52	9.52	0	9.52	9.52	0
Seep Water	SVOCs	Total	2,4-Dinitrotoluene	N/A	ug/L	230	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2,6-Dinitrotoluene	N/A	ug/L	230	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2-Chloronaphthalene	N/A	ug/L	32	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2-Chlorophenol	N/A	ug/L	2,000	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2-Methylnaphthalene	N/A	ug/L	72.16	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2-Methylphenol	N/A	ug/L	13	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	2-Nitroaniline	N/A	ug/L	NV	1	1	-	4.76	4.76	-	4.76	4.76	-
Seep Water	SVOCs	Total	2-Nitrophenol	N/A	ug/L	NV	1	1	-	4.76	4.76	-	4.76	4.76	-
Seep Water	SVOCs	Total	3,3'-Dichlorobenzidine	N/A	ug/L	4.5	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	3-Nitroaniline	N/A	ug/L	NV	1	1	-	4.76	4.76	-	4.76	4.76	-
Seep Water	SVOCs	Total	4,6-Dinitro-2-methylphenol	N/A	ug/L	NV	1	1	-	4.76	4.76	-	4.76	4.76	-
Seep Water	SVOCs	Total	4-Bromophenyl Phenyl Ether	N/A	ug/L	1.5	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	4-Chloro-3-methylphenol	N/A	ug/L	NV	1	1	-	4.76	4.76	-	4.76	4.76	-
Seep Water	SVOCs	Total	4-Chloroaniline	N/A	ug/L	50	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	4-Chlorophenyl Phenyl Ether	N/A	ug/L	NV	1	1	-	4.76	4.76	-	4.76	4.76	-
Seep Water	SVOCs	Total	4-Nitroaniline	N/A	ug/L	NV	1	1	-	4.76	4.76	-	4.76	4.76	-
Seep Water	SVOCs	Total	4-Nitrophenol	N/A	ug/L	150	5	5	-	0.280	4.76	0	2.00	4.76	0
Seep Water	SVOCs	Total	Acenaphthene	N/A	ug/L	55.85	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Acenaphthylene	N/A	ug/L	306.9	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Aniline	N/A	ug/L	2.2	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Anthracene	N/A	ug/L	13	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Benzidine	N/A	ug/L	3.9	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Benzo(a)anthracene	N/A	ug/L	0.027	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Benzo(a)pyrene	N/A	ug/L	0.014	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Benzo(b)fluoranthene	N/A	ug/L	0.6774	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Benzo(g,h,i)perylene	N/A	ug/L	0.4391	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Benzo(k)fluoranthene	N/A	ug/L	0.6415	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Benzyl Alcohol	N/A	ug/L	8.6	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Bis(2-chloroethoxy)methane	N/A	ug/L	NV	1	1	-	4.76	4.76	-	4.76	4.76	-
Seep Water	SVOCs	Total	Bis(2-chloroethyl) Ether	N/A	ug/L	1,900	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Bis(2-chloroisopropyl) Ether	N/A	ug/L	NV	1	1	-	4.76	4.76	-	4.76	4.76	-
Seep Water	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	ug/L	3	1	1	-	23.8	23.8	1	23.8	23.8	1
Seep Water	SVOCs	Total	Butyl Benzyl Phthalate	N/A	ug/L	19	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Carbazole	N/A	ug/L	NV	1	1	-	4.76	4.76	-	4.76	4.76	-
Seep Water	SVOCs	Total	Chrysene	N/A	ug/L	2.042	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Dibenz(a,h)anthracene	N/A	ug/L	0.2825	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Dibenzofuran	N/A	ug/L	3.7	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Diethyl Phthalate	N/A	ug/L	210	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Dimethyl Phthalate	N/A	ug/L	3	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Di-n-butyl Phthalate	N/A	ug/L	35	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Di-n-octyl Phthalate	N/A	ug/L	708	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Fluoranthene	N/A	ug/L	6.16	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Fluorene	N/A	ug/L	3.9	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Hexachlorobenzene	N/A	ug/L	0.0003	1	1	-	4.76	4.76	1	4.76	4.76	1

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(20 of 22)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Seep Water	SVOCs	Total	Hexachlorobutadiene	N/A	ug/L	9.3	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Hexachlorocyclopentadiene	N/A	ug/L	5.2	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Hexachloroethane	N/A	ug/L	540	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Indeno(1,2,3-cd)pyrene	N/A	ug/L	0.275	1	1	-	4.76	4.76	1	4.76	4.76	1
Seep Water	SVOCs	Total	Isophorone	N/A	ug/L	2,340	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Naphthalene	N/A	ug/L	193.5	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Nitrobenzene	N/A	ug/L	540	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	N-Nitrosodimethylamine	N/A	ug/L	117	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	N-Nitrosodi-n-propylamine	N/A	ug/L	117	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	N-Nitrosodiphenylamine	N/A	ug/L	210	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	p-cresol (4-Methylphenol)	N/A	ug/L	13	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Pentachlorophenol	N/A	ug/L	15	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	SVOCs	Total	Phenanthrene	N/A	ug/L	6.3	5	5	-	0.0220	4.76	0	0.200	4.76	0
Seep Water	SVOCs	Total	Phenol	N/A	ug/L	110	5	5	-	0.0630	4.76	0	0.490	4.76	0
Seep Water	SVOCs	Total	Pyrene	N/A	ug/L	10.11	1	1	-	4.76	4.76	0	4.76	4.76	0
Seep Water	VOCs	Total	1,1,1,2-Tetrachloroethane	N/A	ug/L	186	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	ug/L	11	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	ug/L	2,400	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,1,2-Trichloroethane	N/A	ug/L	9,400	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,1-Dichloroethane	N/A	ug/L	47	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,1-Dichloroethene	N/A	ug/L	25	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,1-Dichloropropene	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	1,2,3-Trichlorobenzene	N/A	ug/L	8	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,2,3-Trichloropropane	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	1,2,4-Trichlorobenzene	N/A	ug/L	110	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,2,4-Trimethylbenzene	N/A	ug/L	7.3	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,2-Dibromo-3-chloropropane	N/A	ug/L	NV	1	1	-	5.00	5.00	-	5.00	5.00	-
Seep Water	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	1,2-Dichlorobenzene	N/A	ug/L	14	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	ug/L	20,000	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,2-Dichloropropane	N/A	ug/L	5,700	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,3,5-Trimethylbenzene	N/A	ug/L	7.3	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,3-Dichlorobenzene	N/A	ug/L	71	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,3-Dichloropropane	N/A	ug/L	5,700	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	15	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	2,2-Dichloropropane	N/A	ug/L	5,700	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	2-Butanone (MEK)	N/A	ug/L	14,000	1	1	-	10.0	10.0	0	10.0	10.0	0
Seep Water	VOCs	Total	2-Chlorotoluene	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	2-Hexanone	N/A	ug/L	99	1	1	-	10.0	10.0	0	10.0	10.0	0
Seep Water	VOCs	Total	4-Chlorotoluene	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	4-Isopropyltoluene	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	ug/L	170	1	1	-	10.0	10.0	0	10.0	10.0	0
Seep Water	VOCs	Total	Acetone	N/A	ug/L	1,500	1	1	-	10.0	10.0	0	10.0	10.0	0
Seep Water	VOCs	Total	Benzene	N/A	ug/L	130	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Bromobenzene	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	Bromochloromethane	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(21 of 22)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Seep Water	VOCs	Total	Bromodichloromethane	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	Bromoform	N/A	ug/L	320	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Bromomethane	N/A	ug/L	16	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Carbon Disulfide	N/A	ug/L	0.92	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	Carbon Tetrachloride	N/A	ug/L	74	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Chlorobenzene	N/A	ug/L	50	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Chloroethane	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	Chloroform	N/A	ug/L	1,240	5	3	-	0.0820	1.00	0	0.500	1.00	0
Seep Water	VOCs	Total	Chloromethane	N/A	ug/L	NV	1	1	-	5.00	5.00	-	5.00	5.00	-
Seep Water	VOCs	Total	cis-1,2-Dichloroethene	N/A	ug/L	590	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	cis-1,3-Dichloropropene	N/A	ug/L	0.055	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	Dibromochloromethane	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	Dibromomethane	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	Dichlorodifluoromethane	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	ug/L	2,200	1	1	-	5.00	5.00	0	5.00	5.00	0
Seep Water	VOCs	Total	Ethylbenzene	N/A	ug/L	7.3	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Hexachlorobutadiene	N/A	ug/L	9.3	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Isopropylbenzene	N/A	ug/L	7.3	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	m,p-Xylenes	N/A	ug/L	13	1	1	-	2.00	2.00	0	2.00	2.00	0
Seep Water	VOCs	Total	Naphthalene	N/A	ug/L	193.5	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	n-Butylbenzene	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	n-Propylbenzene	N/A	ug/L	7.3	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	o-Xylene	N/A	ug/L	350	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	sec-Butylbenzene	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	Styrene	N/A	ug/L	72	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	tert-Butylbenzene	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	840	5	2	1	0.0970	1.00	0	0.500	1.00	0
Seep Water	VOCs	Total	Toluene	N/A	ug/L	9.8	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	trans-1,2-Dichloroethene	N/A	ug/L	590	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	trans-1,3-Dichloropropene	N/A	ug/L	0.055	1	1	-	1.00	1.00	1	1.00	1.00	1
Seep Water	VOCs	Total	Trichloroethene (TCE)	N/A	ug/L	3,000	1	1	-	1.00	1.00	0	1.00	1.00	0
Seep Water	VOCs	Total	Trichlorofluoromethane	N/A	ug/L	NV	1	1	-	1.00	1.00	-	1.00	1.00	-
Seep Water	VOCs	Total	Vinyl Chloride	N/A	ug/L	1,300	5	5	-	0.0440	1.00	0	0.500	1.00	0
Surface Water	Metals	Total	Arsenic	N/A	ug/L	150	4	1	-	1.10	1.10	0	1.10	1.10	0
Surface Water	Metals	Total	Mercury	N/A	ug/L	0.77	1	1	-	0.0300	0.0300	0	0.200	0.200	0
Surface Water	Metals	Dissolved	Iron	N/A	ug/L	1,000	4	3	1	4.00	20.0	0	20.0	20.0	0
Surface Water	Metals	Dissolved	Lead	N/A	ug/L	1.44	4	1	3	0.00900	0.00900	0	0.0300	0.0500	0
Surface Water	Metals	Dissolved	Mercury	N/A	ug/L	0.77	1	1	-	0.0300	0.0300	0	0.200	0.200	0
Surface Water	Butyltins	Total	Dibutyltin	N/A	ug/L	0.063	4	4	-	0.00730	0.00810	0	0.0500	0.0500	0
Surface Water	Butyltins	Total	Monobutyltin	N/A	ug/L	0.063	4	4	-	0.0110	0.0290	0	0.0500	0.0870	3
Surface Water	NWTPH-Dx	Total	Diesel Range Organics	N/A	ug/L	NV	4	2	2	12.0	120	-	100	120	-
Surface Water	NWTPH-Dx	Total	Residual Range Organics	N/A	ug/L	NV	4	4	-	20.0	120	-	100	120	-
Surface Water	NWTPH-Gx	Total	Gasoline Range Organics	N/A	ug/L	NV	4	4	-	13.0	13.0	-	250	250	-
Surface Water	SVOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	15	4	4	-	0.0290	0.0310	0	0.200	0.210	0
Surface Water	SVOCs	Total	4-Nitrophenol	N/A	ug/L	150	4	4	-	0.280	0.300	0	2.00	2.10	0
Surface Water	SVOCs	Total	Phenanthrene	N/A	ug/L	6.3	4	4	-	0.0220	0.0230	0	0.200	0.210	0

Table K-5
Ecological Data Sensitivity Analysis for Landfill AOPC Samples
Bradford Island - Upland Operable Unit
(22 of 22)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Surface Water	SVOCs	Total	Phenol	N/A	ug/L	110	4	4	-	0.0630	0.0660	0	0.480	0.530	0
Surface Water	VOCs	Total	Chloroform	N/A	ug/L	1,240	4	4	-	0.0820	0.0820	0	0.500	0.500	0
Surface Water	VOCs	Total	Tetrachloroethene (PCE)	N/A	ug/L	840	4	4	-	0.0970	0.0970	0	0.500	0.500	0
Surface Water	VOCs	Total	Vinyl Chloride	N/A	ug/L	1,300	4	4	-	0.0440	0.0440	0	0.500	0.500	0

Notes
(1) The SLV for Total LPAHs was used for the individual LPAHs.
(2) The SLV for Total HPAHs was used for the individual HPAHs.
The potentially mass wasting soil subset is comprised of the following samples: BIL01USE through BIL09USE, BIL13SSI, and L-01 through L-04.
= The number of applicable MDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.
= When the number of applicable MRLs > SLV is higher than the number of applicable MDLs > SLV, they are highlited pink when the number of MDLs > SLV is zero or difference is more than 1.

MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = methode reporting limit
MW Soil = Mass Wasting Soil
N/A = not applicable
ND = non-detect
NV = No value
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic carbon
VOC = volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	Metals	Total	Antimony	0-1 ft	N/A	mg/kg	0.27	58	17	24	0.160	3.54	15	0.160	4.12	36
Soil	Metals	Total	Antimony	0-3 ft	N/A	mg/kg	0.27	75	20	35	0.160	4.01	18	0.160	4.12	46
Soil	Metals	Total	Arsenic	0-1 ft	N/A	mg/kg	18	58	1	3	0.159	0.159	0	0.907	1.08	0
Soil	Metals	Total	Arsenic	0-3 ft	N/A	mg/kg	18	75	1	3	0.159	0.159	0	0.907	1.08	0
Soil	Metals	Total	Beryllium	0-1 ft	N/A	mg/kg	21	58	31	24	0.147	0.191	0	0.248	1.23	0
Soil	Metals	Total	Beryllium	0-3 ft	N/A	mg/kg	21	75	31	36	0.147	0.191	0	0.248	1.23	0
Soil	Metals	Total	Cadmium	0-1 ft	N/A	mg/kg	0.36	58	5	4	0.0122	0.0129	0	0.248	0.540	3
Soil	Metals	Total	Cadmium	0-3 ft	N/A	mg/kg	0.36	75	8	4	0.0122	0.0153	0	0.248	0.540	3
Soil	Metals	Total	Mercury	0-1 ft	N/A	mg/kg	0.066	58	15	15	0.00528	0.0306	0	0.0196	0.0483	0
Soil	Metals	Total	Mercury	0-3 ft	N/A	mg/kg	0.066	75	17	19	0.00528	0.0338	0	0.0196	0.0514	0
Soil	Metals	Total	Selenium	0-1 ft	N/A	mg/kg	0.52	58	28	27	0.0781	0.500	0	0.248	4.12	52
Soil	Metals	Total	Selenium	0-3 ft	N/A	mg/kg	0.52	75	32	38	0.0781	0.517	0	0.248	4.12	66
Soil	Metals	Total	Silver	0-1 ft	N/A	mg/kg	4.2	58	3	36	0.0440	0.0524	0	0.454	0.687	0
Soil	Metals	Total	Silver	0-3 ft	N/A	mg/kg	4.2	75	3	49	0.0440	0.0524	0	0.0680	0.687	0
Soil	Metals	Total	Thallium	0-1 ft	N/A	mg/kg	1	58	12	33	0.0429	0.0558	0	0.248	0.687	0
Soil	Metals	Total	Thallium	0-3 ft	N/A	mg/kg	1	75	12	45	0.0429	0.0558	0	0.248	0.687	0
Soil	Butyltins	Total	Dibutyltin	0-1 ft	N/A	ug/kg	28,000	47	29	1	0.270	0.842	0	1.20	2.62	0
Soil	Butyltins	Total	Dibutyltin	0-3 ft	N/A	ug/kg	28,000	62	44	1	0.270	0.887	0	1.20	2.64	0
Soil	Butyltins	Total	Monobutyltin	0-1 ft	N/A	ug/kg	28,000	47	25	4	0.240	1.86	0	1.20	3.49	0
Soil	Butyltins	Total	Monobutyltin	0-3 ft	N/A	ug/kg	28,000	62	40	4	0.240	1.87	0	1.20	3.52	0
Soil	Butyltins	Total	Tetrabutyltin	0-1 ft	N/A	ug/kg	28,000	34	33	-	0.445	0.853	0	1.20	2.27	0
Soil	Butyltins	Total	Tetrabutyltin	0-3 ft	N/A	ug/kg	28,000	44	43	-	0.445	0.910	0	1.20	2.42	0
Soil	Butyltins	Total	Tributyltin	0-1 ft	N/A	ug/kg	28,000	47	31	2	0.340	1.53	0	1.20	3.49	0
Soil	Butyltins	Total	Tributyltin	0-3 ft	N/A	ug/kg	28,000	62	46	2	0.340	1.53	0	1.20	3.52	0
Soil	Herbicides	Total	2,4,5-T	0-1 ft	N/A	ug/kg	21	12	12	-	1.26	1.58	0	5.77	7.23	0
Soil	Herbicides	Total	2,4,5-T	0-3 ft	N/A	ug/kg	21	12	12	-	1.26	1.58	0	5.77	7.23	0
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-1 ft	N/A	ug/kg	21	12	12	-	1.84	2.31	0	5.77	7.23	0
Soil	Herbicides	Total	2,4,5-TP (Silvex)	0-3 ft	N/A	ug/kg	21	12	12	-	1.84	2.31	0	5.77	7.23	0
Soil	Herbicides	Total	2,4-D	0-1 ft	N/A	ug/kg	21	12	12	-	0.476	5.68	0	5.77	7.23	0
Soil	Herbicides	Total	2,4-D	0-3 ft	N/A	ug/kg	21	12	12	-	0.476	5.68	0	5.77	7.23	0
Soil	Herbicides	Total	2,4-DB	0-1 ft	N/A	ug/kg	21	12	12	-	0.568	1.01	0	5.77	7.23	0
Soil	Herbicides	Total	2,4-DB	0-3 ft	N/A	ug/kg	21	12	12	-	0.568	1.01	0	5.77	7.23	0
Soil	Herbicides	Total	4-Nitrophenol	0-1 ft	N/A	ug/kg	7,000	12	12	-	1.27	1.60	0	5.77	7.23	0
Soil	Herbicides	Total	4-Nitrophenol	0-3 ft	N/A	ug/kg	7,000	12	12	-	1.27	1.60	0	5.77	7.23	0
Soil	Herbicides	Total	Dalapon	0-1 ft	N/A	ug/kg	NV	12	12	-	1.76	2.20	-	5.77	7.23	-
Soil	Herbicides	Total	Dalapon	0-3 ft	N/A	ug/kg	NV	12	12	-	1.76	2.20	-	5.77	7.23	-
Soil	Herbicides	Total	Dicamba	0-1 ft	N/A	ug/kg	NV	12	12	-	1.40	1.76	-	5.77	7.23	-
Soil	Herbicides	Total	Dicamba	0-3 ft	N/A	ug/kg	NV	12	12	-	1.40	1.76	-	5.77	7.23	-
Soil	Herbicides	Total	Dichloroprop	0-1 ft	N/A	ug/kg	21	12	12	-	0.614	0.770	0	5.77	7.23	0
Soil	Herbicides	Total	Dichloroprop	0-3 ft	N/A	ug/kg	21	12	12	-	0.614	0.770	0	5.77	7.23	0
Soil	Herbicides	Total	Dinoseb	0-1 ft	N/A	ug/kg	NV	12	12	-	0.476	0.596	-	5.77	7.23	-
Soil	Herbicides	Total	Dinoseb	0-3 ft	N/A	ug/kg	NV	12	12	-	0.476	0.596	-	5.77	7.23	-
Soil	Herbicides	Total	MCPA	0-1 ft	N/A	ug/kg	21	12	12	-	0.868	1.09	0	5.77	7.23	0
Soil	Herbicides	Total	MCPA	0-3 ft	N/A	ug/kg	21	12	12	-	0.868	1.09	0	5.77	7.23	0
Soil	Herbicides	Total	MCPP	0-1 ft	N/A	ug/kg	21	12	12	-	1.58	1.98	0	5.77	7.23	0
Soil	Herbicides	Total	MCPP	0-3 ft	N/A	ug/kg	21	12	12	-	1.58	1.98	0	5.77	7.23	0
Soil	Herbicides	Total	Pentachlorophenol	0-1 ft	N/A	ug/kg	2,100	12	12	-	0.673	0.843	0	5.77	7.23	0
Soil	Herbicides	Total	Pentachlorophenol	0-3 ft	N/A	ug/kg	2,100	12	12	-	0.673	0.843	0	5.77	7.23	0
Soil	Pesticides	Total	4,4'-DDD	0-1 ft	N/A	ug/kg	21	31	29	2	0.110	10.0	0	0.630	10.0	0

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	Pesticides	Total	4,4'-DDD	0-3 ft	N/A	ug/kg	21	37	35	2	0.110	10.0	0	0.630	10.0	0
Soil	Pesticides	Total	4,4'-DDE	0-1 ft	N/A	ug/kg	21	31	24	6	0.110	7.80	0	0.660	7.80	0
Soil	Pesticides	Total	4,4'-DDE	0-3 ft	N/A	ug/kg	21	37	30	6	0.110	7.80	0	0.660	7.80	0
Soil	Pesticides	Total	4,4'-DDT	0-1 ft	N/A	ug/kg	21	31	13	3	0.230	78.0	1	1.00	78.0	1
Soil	Pesticides	Total	4,4'-DDT	0-3 ft	N/A	ug/kg	21	37	15	3	0.170	78.0	1	0.990	78.0	1
Soil	Pesticides	Total	Aldrin	0-1 ft	N/A	ug/kg	4.9	31	30	1	0.101	5.00	2	0.630	5.00	4
Soil	Pesticides	Total	Aldrin	0-3 ft	N/A	ug/kg	4.9	37	36	1	0.101	5.00	2	0.630	5.00	4
Soil	Pesticides	Total	BHC (alpha)	0-1 ft	N/A	ug/kg	8,000	31	31	-	0.0981	1.12	0	0.630	5.00	0
Soil	Pesticides	Total	BHC (alpha)	0-3 ft	N/A	ug/kg	8,000	37	37	-	0.0981	1.12	0	0.630	5.00	0
Soil	Pesticides	Total	BHC (beta)	0-1 ft	N/A	ug/kg	8,000	31	30	1	0.109	3.78	0	0.630	5.00	0
Soil	Pesticides	Total	BHC (beta)	0-3 ft	N/A	ug/kg	8,000	37	36	1	0.109	3.78	0	0.630	5.00	0
Soil	Pesticides	Total	BHC (delta)	0-1 ft	N/A	ug/kg	8,000	31	29	1	0.0740	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	BHC (delta)	0-3 ft	N/A	ug/kg	8,000	37	35	1	0.0740	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	BHC (gamma) Lindane	0-1 ft	N/A	ug/kg	8,000	31	29	-	0.0800	37.0	0	0.630	37.0	0
Soil	Pesticides	Total	BHC (gamma) Lindane	0-3 ft	N/A	ug/kg	8,000	37	34	1	0.0800	37.0	0	0.630	37.0	0
Soil	Pesticides	Total	Chlordane (alpha)	0-1 ft	N/A	ug/kg	9,000	19	16	3	0.100	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	Chlordane (alpha)	0-3 ft	N/A	ug/kg	9,000	25	22	3	0.100	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	Chlordane (gamma)	0-1 ft	N/A	ug/kg	9,000	19	13	-	0.0900	9.90	0	0.630	9.90	0
Soil	Pesticides	Total	Chlordane (gamma)	0-3 ft	N/A	ug/kg	9,000	25	15	3	0.0900	9.90	0	0.630	9.90	0
Soil	Pesticides	Total	Chlordane (technical)	0-1 ft	N/A	ug/kg	9,000	12	12	-	1.34	11.2	0	9.50	19.8	0
Soil	Pesticides	Total	Chlordane (technical)	0-3 ft	N/A	ug/kg	9,000	12	12	-	1.34	11.2	0	9.50	19.8	0
Soil	Pesticides	Total	Dieldrin	0-1 ft	N/A	ug/kg	4.9	31	29	2	0.140	31.0	5	0.630	31.0	6
Soil	Pesticides	Total	Dieldrin	0-3 ft	N/A	ug/kg	4.9	37	35	2	0.140	31.0	5	0.630	31.0	6
Soil	Pesticides	Total	Endosulfan I	0-1 ft	N/A	ug/kg	20,000	31	29	-	0.0630	9.50	0	0.630	9.50	0
Soil	Pesticides	Total	Endosulfan I	0-3 ft	N/A	ug/kg	20,000	37	32	2	0.0630	9.50	0	0.630	9.50	0
Soil	Pesticides	Total	Endosulfan II	0-1 ft	N/A	ug/kg	20,000	31	28	3	0.140	8.40	0	0.630	8.40	0
Soil	Pesticides	Total	Endosulfan II	0-3 ft	N/A	ug/kg	20,000	37	34	3	0.140	8.40	0	0.630	8.40	0
Soil	Pesticides	Total	Endosulfan Sulfate	0-1 ft	N/A	ug/kg	20,000	31	25	4	0.110	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	Endosulfan Sulfate	0-3 ft	N/A	ug/kg	20,000	37	31	4	0.110	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	Endrin Aldehyde	0-1 ft	N/A	ug/kg	4.9	31	27	2	0.120	9.60	2	0.630	9.60	4
Soil	Pesticides	Total	Endrin Aldehyde	0-3 ft	N/A	ug/kg	4.9	37	32	2	0.120	9.60	2	0.630	9.60	4
Soil	Pesticides	Total	Endrin Ketone	0-1 ft	N/A	ug/kg	4.9	31	27	2	0.0930	21.0	4	0.630	21.0	4
Soil	Pesticides	Total	Endrin Ketone	0-3 ft	N/A	ug/kg	4.9	37	33	2	0.0930	21.0	4	0.630	21.0	4
Soil	Pesticides	Total	Endrin	0-1 ft	N/A	ug/kg	4.9	31	28	1	0.0940	6.80	2	0.630	6.80	4
Soil	Pesticides	Total	Endrin	0-3 ft	N/A	ug/kg	4.9	37	33	1	0.0940	6.80	2	0.630	6.80	4
Soil	Pesticides	Total	Heptachlor Epoxide	0-1 ft	N/A	ug/kg	15,000	31	31	-	0.0840	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	Heptachlor Epoxide	0-3 ft	N/A	ug/kg	15,000	37	36	1	0.0840	5.00	0	0.630	5.00	0
Soil	Pesticides	Total	Heptachlor	0-1 ft	N/A	ug/kg	15,000	31	27	4	0.0981	5.00	0	0.660	5.00	0
Soil	Pesticides	Total	Heptachlor	0-3 ft	N/A	ug/kg	15,000	37	33	4	0.0981	5.00	0	0.660	5.00	0
Soil	Pesticides	Total	Methoxychlor	0-1 ft	N/A	ug/kg	500,000	31	29	-	0.141	11.2	0	0.630	19.8	0
Soil	Pesticides	Total	Methoxychlor	0-3 ft	N/A	ug/kg	500,000	37	35	-	0.141	11.2	0	0.630	19.8	0
Soil	Pesticides	Total	Toxaphene	0-1 ft	N/A	ug/kg	1,000,000	31	31	-	4.80	2,900	0	43.0	2,900	0
Soil	Pesticides	Total	Toxaphene	0-3 ft	N/A	ug/kg	1,000,000	37	37	-	4.80	2,900	0	43.0	2,900	0
Soil	PCB Aroclors	Total	Aroclor 1016	0-1 ft	N/A	ug/kg	371	58	58	-	1.08	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1016	0-3 ft	N/A	ug/kg	371	73	73	-	1.08	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1221	0-1 ft	N/A	ug/kg	371	58	58	-	2.10	11.0	0	9.82	100	0
Soil	PCB Aroclors	Total	Aroclor 1221	0-3 ft	N/A	ug/kg	371	73	73	-	2.10	11.0	0	9.82	100	0
Soil	PCB Aroclors	Total	Aroclor 1232	0-1 ft	N/A	ug/kg	371	58	58	-	2.10	11.0	0	6.30	50.0	0

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	PCB Aroclors	Total	Aroclor 1232	0-3 ft	N/A	ug/kg	371	73	73	-	2.10	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1242	0-1 ft	N/A	ug/kg	371	58	58	-	1.97	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1242	0-3 ft	N/A	ug/kg	371	73	73	-	1.97	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1248	0-1 ft	N/A	ug/kg	371	58	58	-	2.10	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1248	0-3 ft	N/A	ug/kg	371	73	73	-	2.10	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1254	0-1 ft	N/A	ug/kg	371	58	52	-	1.53	2.10	0	6.30	13.0	0
Soil	PCB Aroclors	Total	Aroclor 1254	0-3 ft	N/A	ug/kg	371	73	63	-	1.53	2.10	0	6.30	13.2	0
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	N/A	ug/kg	371	58	6	15	1.54	2.10	0	9.82	13.4	0
Soil	PCB Aroclors	Total	Aroclor 1260	0-3 ft	N/A	ug/kg	371	73	12	19	1.54	2.10	0	9.82	13.4	0
Soil	PCB Aroclors	Total	Aroclor 1262	0-1 ft	N/A	ug/kg	371	13	13	-	2.10	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1262	0-3 ft	N/A	ug/kg	371	18	18	-	2.10	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1268	0-1 ft	N/A	ug/kg	371	13	13	-	2.10	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Aroclor 1268	0-3 ft	N/A	ug/kg	371	18	18	-	2.10	11.0	0	6.30	50.0	0
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	N/A	ug/kg	371	58	6	-	3.08	4.20	0	19.7	20.6	0
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-3 ft	N/A	ug/kg	371	73	12	-	3.08	4.20	0	19.7	26.4	0
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	N/A	mg/kg	NV	57	7	13	5.02	13.6	-	24.9	36.0	-
Soil	NWTPH-Dx	Total	Diesel Range Organics	0-3 ft	N/A	mg/kg	NV	74	11	21	5.02	14.9	-	24.9	36.0	-
Soil	NWTPH-Dx	Total	Residual Range Organics	0-1 ft	N/A	mg/kg	NV	57	5	6	10.0	26.9	-	49.9	140	-
Soil	NWTPH-Dx	Total	Residual Range Organics	0-3 ft	N/A	mg/kg	NV	74	8	14	10.0	29.7	-	49.9	140	-
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	N/A	mg/kg	NV	36	28	8	0.121	4.68	-	2.60	5.20	-
Soil	NWTPH-Gx	Total	Gasoline Range Organics	0-3 ft	N/A	mg/kg	NV	44	34	8	0.121	5.00	-	2.60	5.20	-
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	N/A	ug/kg	20,000	31	31	-	0.880	75.0	0	5.18	340	0
Soil	SVOCs	Total	1,2,4-Trichlorobenzene	0-3 ft	N/A	ug/kg	20,000	39	39	-	0.880	75.0	0	5.18	340	0
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-1 ft	N/A	ug/kg	2,260	31	31	-	0.703	65.0	0	5.18	340	0
Soil	SVOCs	Total	1,2-Dichlorobenzene	0-3 ft	N/A	ug/kg	2,260	39	39	-	0.703	65.0	0	5.18	340	0
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-1 ft	N/A	ug/kg	2,260	31	31	-	0.883	80.0	0	5.18	340	0
Soil	SVOCs	Total	1,3-Dichlorobenzene	0-3 ft	N/A	ug/kg	2,260	39	39	-	0.883	80.0	0	5.18	340	0
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-1 ft	N/A	ug/kg	20,000	31	31	-	0.871	95.0	0	5.18	340	0
Soil	SVOCs	Total	1,4-Dichlorobenzene	0-3 ft	N/A	ug/kg	20,000	39	39	-	0.871	95.0	0	5.18	340	0
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-1 ft	N/A	ug/kg	4,000	31	31	-	0.804	150	0	5.18	340	0
Soil	SVOCs	Total	2,4,5-Trichlorophenol	0-3 ft	N/A	ug/kg	4,000	39	39	-	0.804	150	0	5.18	340	0
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-1 ft	N/A	ug/kg	10,000	31	31	-	0.819	90.0	0	5.18	340	0
Soil	SVOCs	Total	2,4,6-Trichlorophenol	0-3 ft	N/A	ug/kg	10,000	39	39	-	0.819	90.0	0	5.18	340	0
Soil	SVOCs	Total	2,4-Dichlorophenol	0-1 ft	N/A	ug/kg	20,000	31	31	-	0.919	90.0	0	5.18	340	0
Soil	SVOCs	Total	2,4-Dichlorophenol	0-3 ft	N/A	ug/kg	20,000	39	39	-	0.919	90.0	0	5.18	340	0
Soil	SVOCs	Total	2,4-Dimethylphenol	0-1 ft	N/A	ug/kg	20,000	31	31	-	0.793	280	0	2.07	1,700	0
Soil	SVOCs	Total	2,4-Dimethylphenol	0-3 ft	N/A	ug/kg	20,000	39	39	-	0.793	280	0	2.07	1,700	0
Soil	SVOCs	Total	2,4-Dinitrophenol	0-1 ft	N/A	ug/kg	20,000	31	31	-	2.81	1,800	0	29.3	6,700	0
Soil	SVOCs	Total	2,4-Dinitrophenol	0-3 ft	N/A	ug/kg	20,000	39	39	-	2.81	1,800	0	29.3	6,700	0
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-1 ft	N/A	ug/kg	NV	31	31	-	1.52	140	-	6.40	340	-
Soil	SVOCs	Total	2,4-Dinitrotoluene	0-3 ft	N/A	ug/kg	NV	39	39	-	1.52	140	-	6.40	340	-
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-1 ft	N/A	ug/kg	NV	31	31	-	1.11	140	-	5.18	340	-
Soil	SVOCs	Total	2,6-Dinitrotoluene	0-3 ft	N/A	ug/kg	NV	39	39	-	1.11	140	-	5.18	340	-
Soil	SVOCs	Total	2-Chloronaphthalene	0-1 ft	N/A	ug/kg	NV	31	31	-	0.351	180	-	1.17	340	-
Soil	SVOCs	Total	2-Chloronaphthalene	0-3 ft	N/A	ug/kg	NV	39	39	-	0.351	180	-	1.17	340	-
Soil	SVOCs	Total	2-Chlorophenol	0-1 ft	N/A	ug/kg	60,000	31	31	-	0.697	85.0	0	5.18	340	0
Soil	SVOCs	Total	2-Chlorophenol	0-3 ft	N/A	ug/kg	60,000	39	39	-	0.697	85.0	0	5.18	340	0
Soil	SVOCs	Total	2-Methylphenol	0-1 ft	N/A	ug/kg	50,000	31	31	-	0.978	170	0	5.18	340	0

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(4 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	SVOCs	Total	2-Methylphenol	0-3 ft	N/A	ug/kg	50,000	39	39	-	0.978	170	0	5.18	340	0
Soil	SVOCs	Total	2-Nitroaniline	0-1 ft	N/A	ug/kg	NV	31	31	-	0.563	140	-	2.07	670	-
Soil	SVOCs	Total	2-Nitroaniline	0-3 ft	N/A	ug/kg	NV	39	39	-	0.563	140	-	2.07	670	-
Soil	SVOCs	Total	2-Nitrophenol	0-1 ft	N/A	ug/kg	NV	31	31	-	1.18	130	-	5.18	340	-
Soil	SVOCs	Total	2-Nitrophenol	0-3 ft	N/A	ug/kg	NV	39	39	-	1.18	130	-	5.18	340	-
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-1 ft	N/A	ug/kg	NV	31	31	-	1.29	190	-	11.7	3,400	-
Soil	SVOCs	Total	3,3'-Dichlorobenzidine	0-3 ft	N/A	ug/kg	NV	39	39	-	1.29	190	-	11.7	3,400	-
Soil	SVOCs	Total	3-Nitroaniline	0-1 ft	N/A	ug/kg	70,000	31	31	-	1.99	130	0	10.4	670	0
Soil	SVOCs	Total	3-Nitroaniline	0-3 ft	N/A	ug/kg	70,000	39	39	-	1.99	130	0	10.4	670	0
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-1 ft	N/A	ug/kg	NV	31	31	-	1.51	85.0	-	10.4	3,400	-
Soil	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-3 ft	N/A	ug/kg	NV	39	39	-	1.51	85.0	-	10.4	3,400	-
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-1 ft	N/A	ug/kg	NV	31	31	-	1.40	70.0	-	6.40	340	-
Soil	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-3 ft	N/A	ug/kg	NV	39	39	-	1.40	70.0	-	6.40	340	-
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-1 ft	N/A	ug/kg	NV	31	31	-	0.925	110	-	5.18	340	-
Soil	SVOCs	Total	4-Chloro-3-methylphenol	0-3 ft	N/A	ug/kg	NV	39	39	-	0.925	110	-	5.18	340	-
Soil	SVOCs	Total	4-Chloroaniline	0-1 ft	N/A	ug/kg	40,000	31	31	-	0.963	110	0	6.40	340	0
Soil	SVOCs	Total	4-Chloroaniline	0-3 ft	N/A	ug/kg	40,000	39	39	-	0.963	110	0	6.40	340	0
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-1 ft	N/A	ug/kg	NV	31	31	-	1.97	100	-	6.40	340	-
Soil	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-3 ft	N/A	ug/kg	NV	39	39	-	1.97	100	-	6.40	340	-
Soil	SVOCs	Total	4-Nitroaniline	0-1 ft	N/A	ug/kg	40,000	31	31	-	1.99	170	0	11.7	670	0
Soil	SVOCs	Total	4-Nitroaniline	0-3 ft	N/A	ug/kg	40,000	39	39	-	1.99	170	0	11.7	670	0
Soil	SVOCs	Total	4-Nitrophenol	0-1 ft	N/A	ug/kg	7,000	31	31	-	2.22	1,500	0	29.3	3,400	0
Soil	SVOCs	Total	4-Nitrophenol	0-3 ft	N/A	ug/kg	7,000	39	39	-	2.22	1,500	0	29.3	3,400	0
Soil	SVOCs	Total	Aniline	0-1 ft	N/A	ug/kg	200,000	31	31	-	1.50	75.0	0	10.4	670	0
Soil	SVOCs	Total	Aniline	0-3 ft	N/A	ug/kg	200,000	39	39	-	1.50	75.0	0	10.4	670	0
Soil	SVOCs	Total	Benzidine	0-1 ft	N/A	ug/kg	NV	18	18	-	2.21	31.8	-	10.4	366	-
Soil	SVOCs	Total	Benzidine	0-3 ft	N/A	ug/kg	NV	21	21	-	2.21	31.8	-	10.4	366	-
Soil	SVOCs	Total	Benzoic Acid	0-1 ft	N/A	ug/kg	200,000	31	19	9	4.15	4,800	0	58.5	6,700	0
Soil	SVOCs	Total	Benzoic Acid	0-3 ft	N/A	ug/kg	200,000	39	27	9	4.15	4,800	0	58.5	6,700	0
Soil	SVOCs	Total	Benzyl Alcohol	0-1 ft	N/A	ug/kg	2,260	31	30	-	2.06	190	0	5.18	670	0
Soil	SVOCs	Total	Benzyl Alcohol	0-3 ft	N/A	ug/kg	2,260	39	38	-	2.06	190	0	5.18	670	0
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-1 ft	N/A	ug/kg	730,000	31	31	-	1.30	65.0	0	6.40	340	0
Soil	SVOCs	Total	Bis(2-chloroethoxy)methane	0-3 ft	N/A	ug/kg	730,000	39	39	-	1.30	65.0	0	6.40	340	0
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-1 ft	N/A	ug/kg	NV	31	31	-	1.63	120	-	6.40	340	-
Soil	SVOCs	Total	Bis(2-chloroethyl) Ether	0-3 ft	N/A	ug/kg	NV	39	39	-	1.63	120	-	6.40	340	-
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-1 ft	N/A	ug/kg	NV	31	31	-	1.20	90.1	-	6.40	340	-
Soil	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-3 ft	N/A	ug/kg	NV	39	39	-	1.20	90.1	-	6.40	340	-
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-1 ft	N/A	ug/kg	4,500	31	10	-	1.90	366	0	20.7	366	0
Soil	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	0-3 ft	N/A	ug/kg	4,500	40	11	2	1.90	366	0	20.7	366	0
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	N/A	ug/kg	450	31	26	4	1.50	75.0	0	6.40	340	0
Soil	SVOCs	Total	Butyl Benzyl Phthalate	0-3 ft	N/A	ug/kg	450	39	33	4	1.50	75.0	0	6.40	340	0
Soil	SVOCs	Total	Carbazole	0-1 ft	N/A	ug/kg	2,260	31	11	8	2.06	57.1	0	6.40	375	0
Soil	SVOCs	Total	Carbazole	0-3 ft	N/A	ug/kg	2,260	39	15	10	1.30	57.1	0	6.40	375	0
Soil	SVOCs	Total	Dibenzofuran	0-1 ft	N/A	ug/kg	2	31	12	16	0.479	65.0	3	5.18	340	28
Soil	SVOCs	Total	Dibenzofuran	0-3 ft	N/A	ug/kg	2	40	16	19	0.479	65.0	3	5.18	340	35
Soil	SVOCs	Total	Diethyl Phthalate	0-1 ft	N/A	ug/kg	100,000	31	30	1	1.99	180	0	6.40	340	0
Soil	SVOCs	Total	Diethyl Phthalate	0-3 ft	N/A	ug/kg	100,000	39	38	1	1.99	180	0	6.40	340	0
Soil	SVOCs	Total	Dimethyl Phthalate	0-1 ft	N/A	ug/kg	200,000	31	28	3	1.29	90.0	0	6.40	340	0

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(5 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	SVOCs	Total	Dimethyl Phthalate	0-3 ft	N/A	ug/kg	200,000	39	36	3	1.29	90.0	0	6.40	340	0
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	N/A	ug/kg	450	31	21	5	1.89	637	1	6.40	732	2
Soil	SVOCs	Total	Di-n-butyl Phthalate	0-3 ft	N/A	ug/kg	450	39	25	6	1.89	637	1	6.40	732	2
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-1 ft	N/A	ug/kg	450	31	26	2	1.20	60.0	0	6.40	340	0
Soil	SVOCs	Total	Di-n-octyl Phthalate	0-3 ft	N/A	ug/kg	450	39	33	3	1.20	60.0	0	6.40	340	0
Soil	SVOCs	Total	Hexachlorobenzene	0-1 ft	N/A	ug/kg	1,000,000	31	31	-	0.548	110	0	2.07	340	0
Soil	SVOCs	Total	Hexachlorobenzene	0-3 ft	N/A	ug/kg	1,000,000	39	39	-	0.548	110	0	2.07	340	0
Soil	SVOCs	Total	Hexachlorobutadiene	0-1 ft	N/A	ug/kg	NV	31	31	-	0.757	70.0	-	5.18	340	-
Soil	SVOCs	Total	Hexachlorobutadiene	0-3 ft	N/A	ug/kg	NV	39	39	-	0.757	70.0	-	5.18	340	-
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-1 ft	N/A	ug/kg	10,000	31	31	-	0.822	750	0	5.18	1,700	0
Soil	SVOCs	Total	Hexachlorocyclopentadiene	0-3 ft	N/A	ug/kg	10,000	39	39	-	0.822	750	0	5.18	1,700	0
Soil	SVOCs	Total	Hexachloroethane	0-1 ft	N/A	ug/kg	NV	31	31	-	1.75	110	-	5.18	340	-
Soil	SVOCs	Total	Hexachloroethane	0-3 ft	N/A	ug/kg	NV	39	39	-	1.75	110	-	5.18	340	-
Soil	SVOCs	Total	Isophorone	0-1 ft	N/A	ug/kg	NV	31	31	-	0.522	80.0	-	6.40	340	-
Soil	SVOCs	Total	Isophorone	0-3 ft	N/A	ug/kg	NV	39	39	-	0.522	80.0	-	6.40	340	-
Soil	SVOCs	Total	Nitrobenzene	0-1 ft	N/A	ug/kg	8,000	31	31	-	1.60	100	0	6.40	340	0
Soil	SVOCs	Total	Nitrobenzene	0-3 ft	N/A	ug/kg	8,000	39	39	-	1.60	100	0	6.40	340	0
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-1 ft	N/A	ug/kg	NV	31	31	-	1.05	310	-	10.4	1,700	-
Soil	SVOCs	Total	N-Nitrosodimethylamine	0-3 ft	N/A	ug/kg	NV	39	39	-	1.05	310	-	10.4	1,700	-
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-1 ft	N/A	ug/kg	NV	31	31	-	1.29	160	-	5.18	340	-
Soil	SVOCs	Total	N-Nitrosodi-n-propylamine	0-3 ft	N/A	ug/kg	NV	39	39	-	1.29	160	-	5.18	340	-
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-1 ft	N/A	ug/kg	20,000	31	30	1	0.593	110	0	2.07	340	0
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-3 ft	N/A	ug/kg	20,000	39	38	1	0.593	110	0	2.07	340	0
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	N/A	ug/kg	50,000	31	30	1	1.22	150	0	5.18	340	0
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-3 ft	N/A	ug/kg	50,000	39	38	1	1.22	150	0	5.18	340	0
Soil	SVOCs	Total	Pentachlorophenol	0-1 ft	N/A	ug/kg	2,100	31	29	2	2.01	430	0	10.4	3,400	1
Soil	SVOCs	Total	Pentachlorophenol	0-3 ft	N/A	ug/kg	2,100	39	37	2	2.01	430	0	10.4	3,400	1
Soil	SVOCs	Total	Phenol	0-1 ft	N/A	ug/kg	30,000	31	29	2	0.749	95.0	0	5.18	1,000	0
Soil	SVOCs	Total	Phenol	0-3 ft	N/A	ug/kg	30,000	39	34	4	0.749	95.0	0	5.18	1,000	0
Soil	SVOCs	Total	2-Methylnaphthalene	0-1 ft	N/A	ug/kg	NV (1)	31	15	9	0.183	60.0	0	1.17	340	0
Soil	SVOCs	Total	2-Methylnaphthalene	0-3 ft	N/A	ug/kg	NV (1)	40	22	10	0.183	60.0	0	1.17	340	0
Soil	SVOCs	Total	Acenaphthene	0-1 ft	N/A	ug/kg	NV (1)	31	6	6	0.531	1.00	0	1.23	340	0
Soil	SVOCs	Total	Acenaphthene	0-3 ft	N/A	ug/kg	NV (1)	40	9	9	0.531	1.00	0	1.23	340	0
Soil	SVOCs	Total	Acenaphthylene	0-1 ft	N/A	ug/kg	NV (1)	31	17	8	0.510	70.0	0	1.17	340	0
Soil	SVOCs	Total	Acenaphthylene	0-3 ft	N/A	ug/kg	NV (1)	40	24	8	0.510	70.0	0	1.17	340	0
Soil	SVOCs	Total	Anthracene	0-1 ft	N/A	ug/kg	NV (1)	31	2	4	0.356	0.394	0	1.41	340	0
Soil	SVOCs	Total	Anthracene	0-3 ft	N/A	ug/kg	NV (1)	40	5	5	0.356	1.40	0	1.41	340	0
Soil	SVOCs	Total	Fluorene	0-1 ft	N/A	ug/kg	NV (1)	31	8	3	0.573	85.0	0	1.23	340	0
Soil	SVOCs	Total	Fluorene	0-3 ft	N/A	ug/kg	NV (1)	40	12	5	0.573	85.0	0	1.23	340	0
Soil	SVOCs	Total	Phenanthrene	0-3 ft	N/A	ug/kg	NV (1)	40	2	1	0.750	1.30	0	2.50	6.50	0
Soil	SVOCs	Total	Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	N/A	ug/kg	29,000	40	2	-	4.56	8.10	0	15.1	39.0	0
Soil	SVOCs	Total	Benzo(a)anthracene	0-1 ft	N/A	ug/kg	NV (2)	31	2	-	0.749	1.05	0	2.07	2.45	0
Soil	SVOCs	Total	Benzo(a)anthracene	0-3 ft	N/A	ug/kg	NV (2)	40	5	-	0.749	1.40	0	2.07	6.50	0
Soil	SVOCs	Total	Benzo(a)pyrene	0-1 ft	N/A	ug/kg	NV (2)	31	1	-	0.656	0.656	0	2.07	2.07	0
Soil	SVOCs	Total	Benzo(a)pyrene	0-3 ft	N/A	ug/kg	NV (2)	40	4	-	0.656	1.60	0	2.07	6.50	0
Soil	SVOCs	Total	Benzo(b)fluoranthene	0-3 ft	N/A	ug/kg	NV (2)	18	1	-	2.50	2.50	0	6.50	6.50	0
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-1 ft	N/A	ug/kg	NV (2)	31	5	-	0.202	0.498	0	1.23	2.07	0

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	SVOCs	Total	Benzo(g,h,i)perylene	0-3 ft	N/A	ug/kg	NV (2)	40	7	-	0.202	2.30	0	1.23	6.50	0
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-1 ft	N/A	ug/kg	NV (2)	13	0	1	-	-	0	10.0	10.0	0
Soil	SVOCs	Total	Benzo(k)fluoranthene	0-3 ft	N/A	ug/kg	NV (2)	18	1	1	2.50	2.50	0	6.50	10.0	0
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-1 ft	N/A	ug/kg	NV (2)	18	1	-	0.939	0.939	0	4.14	4.14	0
Soil	SVOCs	Total	Benzofluoranthenes, Total	0-3 ft	N/A	ug/kg	NV (2)	22	2	-	0.939	1.14	0	4.14	5.05	0
Soil	SVOCs	Total	Chrysene	0-1 ft	N/A	ug/kg	NV (2)	31	1	-	0.741	0.741	0	2.07	2.07	0
Soil	SVOCs	Total	Chrysene	0-3 ft	N/A	ug/kg	NV (2)	40	3	1	0.741	0.903	0	2.07	6.50	0
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	N/A	ug/kg	NV (2)	31	11	3	0.273	3.41	0	1.17	340	0
Soil	SVOCs	Total	Dibenz(a,h)anthracene	0-3 ft	N/A	ug/kg	NV (2)	40	14	4	0.273	3.41	0	1.17	340	0
Soil	SVOCs	Total	Fluoranthene	0-1 ft	N/A	ug/kg	NV (2)	31	1	-	1.05	1.05	0	2.07	2.07	0
Soil	SVOCs	Total	Fluoranthene	0-3 ft	N/A	ug/kg	NV (2)	40	3	-	1.05	2.20	0	2.07	6.50	0
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-1 ft	N/A	ug/kg	NV (2)	31	3	-	0.286	0.472	0	1.23	2.07	0
Soil	SVOCs	Total	Indeno(1,2,3-cd)pyrene	0-3 ft	N/A	ug/kg	NV (2)	40	5	-	0.286	1.90	0	1.23	6.50	0
Soil	SVOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	NV (2)	31	12	9	0.548	65.0	0	1.17	340	0
Soil	SVOCs	Total	Naphthalene	0-3 ft	N/A	ug/kg	NV (2)	40	16	13	0.548	65.0	0	1.17	340	0
Soil	SVOCs	Total	Pyrene	0-1 ft	N/A	ug/kg	NV (2)	31	1	-	0.352	0.352	0	2.07	2.07	0
Soil	SVOCs	Total	Pyrene	0-3 ft	N/A	ug/kg	NV (2)	40	2	1	0.352	0.429	0	2.07	6.50	0
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	N/A	ug/kg	1,100	31	1	-	5.46	5.46	0	16.6	16.6	0
Soil	SVOCs	Total	Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	N/A	ug/kg	1,100	40	2	-	5.46	6.66	0	16.6	20.2	0
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-1 ft	N/A	ug/kg	NV	37	37	-	0.0443	9.40	-	1.13	67.0	-
Soil	VOCs	Total	1,1,1,2-Tetrachloroethane	0-3 ft	N/A	ug/kg	NV	46	46	-	0.0443	1,200	-	1.13	6,200	-
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-1 ft	N/A	ug/kg	55,550,000	37	35	2	0.0650	4.30	0	1.13	27.0	0
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-3 ft	N/A	ug/kg	55,550,000	46	44	2	0.0650	1,800	0	1.13	6,200	0
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-1 ft	N/A	ug/kg	NV	37	37	-	0.0638	7.40	-	1.13	27.0	-
Soil	VOCs	Total	1,1,2,2-Tetrachloroethane	0-3 ft	N/A	ug/kg	NV	46	46	-	0.0638	2,500	-	1.13	6,200	-
Soil	VOCs	Total	1,1,2-Trichloroethane	0-1 ft	N/A	ug/kg	NV	37	37	-	0.0880	7.90	-	1.13	27.0	-
Soil	VOCs	Total	1,1,2-Trichloroethane	0-3 ft	N/A	ug/kg	NV	46	46	-	0.0880	2,500	-	1.13	6,200	-
Soil	VOCs	Total	1,1-Dichloroethane	0-1 ft	N/A	ug/kg	70,000	37	36	1	0.0480	9.30	0	1.13	27.0	0
Soil	VOCs	Total	1,1-Dichloroethane	0-3 ft	N/A	ug/kg	70,000	46	45	1	0.0480	2,500	0	1.13	6,200	0
Soil	VOCs	Total	1,1-Dichloroethene	0-1 ft	N/A	ug/kg	3,750,000	37	37	-	0.0700	7.30	0	1.13	27.0	0
Soil	VOCs	Total	1,1-Dichloroethene	0-3 ft	N/A	ug/kg	3,750,000	46	46	-	0.0700	3,000	0	1.13	6,200	0
Soil	VOCs	Total	1,1-Dichloropropene	0-1 ft	N/A	ug/kg	NV	37	37	-	0.150	9.40	-	1.13	67.0	-
Soil	VOCs	Total	1,1-Dichloropropene	0-3 ft	N/A	ug/kg	NV	46	46	-	0.150	2,500	-	1.13	6,200	-
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-1 ft	N/A	ug/kg	20,000	37	37	-	0.108	12.0	0	1.13	270	0
Soil	VOCs	Total	1,2,3-Trichlorobenzene	0-3 ft	N/A	ug/kg	20,000	46	46	-	0.108	2,800	0	1.13	6,200	0
Soil	VOCs	Total	1,2,3-Trichloropropane	0-1 ft	N/A	ug/kg	NV	37	37	-	0.0756	17.0	-	1.13	27.0	-
Soil	VOCs	Total	1,2,3-Trichloropropane	0-3 ft	N/A	ug/kg	NV	46	46	-	0.0756	2,800	-	1.13	6,200	-
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	N/A	ug/kg	20,000	37	37	-	0.110	6.50	0	1.13	67.0	0
Soil	VOCs	Total	1,2,4-Trichlorobenzene	0-3 ft	N/A	ug/kg	20,000	46	46	-	0.110	1,800	0	1.13	6,200	0
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	N/A	ug/kg	200,000	37	22	15	0.0478	3.70	0	1.13	67.0	0
Soil	VOCs	Total	1,2,4-Trimethylbenzene	0-3 ft	N/A	ug/kg	200,000	46	25	18	0.0478	3.70	0	1.13	67.0	0
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-1 ft	N/A	ug/kg	NV	37	37	-	0.135	140	-	1.13	270	-
Soil	VOCs	Total	1,2-Dibromo-3-chloropropane	0-3 ft	N/A	ug/kg	NV	46	46	-	0.135	3,800	-	1.13	12,000	-
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-1 ft	N/A	ug/kg	NV	37	37	-	0.0575	6.90	-	1.13	27.0	-
Soil	VOCs	Total	1,2-Dibromoethane (EDB)	0-3 ft	N/A	ug/kg	NV	46	46	-	0.0575	1,800	-	1.13	6,200	-
Soil	VOCs	Total	1,2-Dichlorobenzene	0-1 ft	N/A	ug/kg	2,260	37	37	-	0.0575	6.60	0	1.13	27.0	0
Soil	VOCs	Total	1,2-Dichlorobenzene	0-3 ft	N/A	ug/kg	2,260	46	46	-	0.0575	2,500	1	1.13	6,200	1

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(7 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-1 ft	N/A	ug/kg	70,000	37	37	-	0.0540	9.70	0	1.13	27.0	0
Soil	VOCs	Total	1,2-Dichloroethane (EDC)	0-3 ft	N/A	ug/kg	70,000	46	46	-	0.0540	1,800	0	1.13	6,200	0
Soil	VOCs	Total	1,2-Dichloropropane	0-1 ft	N/A	ug/kg	700,000	37	37	-	0.0428	11.0	0	1.13	27.0	0
Soil	VOCs	Total	1,2-Dichloropropane	0-3 ft	N/A	ug/kg	700,000	46	46	-	0.0428	2,500	0	1.13	6,200	0
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	N/A	ug/kg	200,000	37	32	5	0.0400	6.50	0	1.13	67.0	0
Soil	VOCs	Total	1,3,5-Trimethylbenzene	0-3 ft	N/A	ug/kg	200,000	46	38	6	0.0400	6.50	0	1.13	67.0	0
Soil	VOCs	Total	1,3-Dichlorobenzene	0-1 ft	N/A	ug/kg	2,260	37	37	-	0.0391	6.10	0	1.13	27.0	0
Soil	VOCs	Total	1,3-Dichlorobenzene	0-3 ft	N/A	ug/kg	2,260	46	46	-	0.0391	1,800	0	1.13	6,200	1
Soil	VOCs	Total	1,3-Dichloropropane	0-1 ft	N/A	ug/kg	NV	37	37	-	0.0590	5.30	-	1.13	67.0	-
Soil	VOCs	Total	1,3-Dichloropropane	0-3 ft	N/A	ug/kg	NV	46	46	-	0.0590	2,500	-	1.13	6,200	-
Soil	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	N/A	ug/kg	20,000	37	36	1	0.0551	5.70	0	1.13	27.0	0
Soil	VOCs	Total	1,4-Dichlorobenzene	0-3 ft	N/A	ug/kg	20,000	46	44	2	0.0551	2,500	0	1.13	6,200	0
Soil	VOCs	Total	2,2-Dichloropropane	0-1 ft	N/A	ug/kg	NV	37	37	-	0.0763	9.50	-	1.13	67.0	-
Soil	VOCs	Total	2,2-Dichloropropane	0-3 ft	N/A	ug/kg	NV	46	46	-	0.0763	1,500	-	1.13	6,200	-
Soil	VOCs	Total	2-Butanone (MEK)	0-1 ft	N/A	ug/kg	200,000,000	37	21	10	1.60	290	0	8.89	540	0
Soil	VOCs	Total	2-Butanone (MEK)	0-3 ft	N/A	ug/kg	200,000,000	46	27	13	1.60	12,000	0	7.08	31,000	0
Soil	VOCs	Total	2-Chlorotoluene	0-1 ft	N/A	ug/kg	NV	37	37	-	0.0490	4.90	-	1.13	270	-
Soil	VOCs	Total	2-Chlorotoluene	0-3 ft	N/A	ug/kg	NV	46	46	-	0.0490	1,800	-	1.13	6,200	-
Soil	VOCs	Total	2-Hexanone	0-1 ft	N/A	ug/kg	1,250,000	37	34	3	0.780	170	0	5.66	2,700	0
Soil	VOCs	Total	2-Hexanone	0-3 ft	N/A	ug/kg	1,250,000	46	43	3	0.780	7,500	0	5.66	31,000	0
Soil	VOCs	Total	4-Chlorotoluene	0-1 ft	N/A	ug/kg	NV	37	37	-	0.0920	5.50	-	1.13	270	-
Soil	VOCs	Total	4-Chlorotoluene	0-3 ft	N/A	ug/kg	NV	46	46	-	0.0920	1,800	-	1.13	6,200	-
Soil	VOCs	Total	4-Isopropyltoluene	0-1 ft	N/A	ug/kg	200,000	37	23	13	0.0766	6.10	0	1.37	270	0
Soil	VOCs	Total	4-Isopropyltoluene	0-3 ft	N/A	ug/kg	200,000	46	29	15	0.0766	1,800	0	1.37	6,200	0
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	N/A	ug/kg	1,250,000	37	28	9	0.240	460	0	5.66	2,700	0
Soil	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-3 ft	N/A	ug/kg	1,250,000	46	37	9	0.240	10,000	0	5.66	31,000	0
Soil	VOCs	Total	Acetone	0-1 ft	N/A	ug/kg	1,250,000	37	19	1	15.0	389	0	19.0	810	0
Soil	VOCs	Total	Acetone	0-3 ft	N/A	ug/kg	1,250,000	46	23	4	15.0	10,000	0	19.0	31,000	0
Soil	VOCs	Total	Benzene	0-1 ft	N/A	ug/kg	3,300,000	37	22	15	0.220	5.70	0	1.13	27.0	0
Soil	VOCs	Total	Benzene	0-3 ft	N/A	ug/kg	3,300,000	46	29	17	0.140	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Bromobenzene	0-1 ft	N/A	ug/kg	NV	37	37	-	0.0450	8.20	-	1.13	270	-
Soil	VOCs	Total	Bromobenzene	0-3 ft	N/A	ug/kg	NV	46	46	-	0.0450	1,800	-	1.13	6,200	-
Soil	VOCs	Total	Bromochloromethane	0-1 ft	N/A	ug/kg	730,000	37	37	-	0.0519	9.40	0	1.13	67.0	0
Soil	VOCs	Total	Bromochloromethane	0-3 ft	N/A	ug/kg	730,000	46	46	-	0.0519	1,900	0	1.13	6,200	0
Soil	VOCs	Total	Bromodichloromethane	0-1 ft	N/A	ug/kg	730,000	37	37	-	0.0440	6.20	0	1.13	67.0	0
Soil	VOCs	Total	Bromodichloromethane	0-3 ft	N/A	ug/kg	730,000	46	46	-	0.0440	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Bromoform	0-1 ft	N/A	ug/kg	NV	37	37	-	0.0701	13.0	-	1.13	67.0	-
Soil	VOCs	Total	Bromoform	0-3 ft	N/A	ug/kg	NV	46	46	-	0.0701	2,500	-	1.13	6,200	-
Soil	VOCs	Total	Bromomethane	0-1 ft	N/A	ug/kg	730,000	37	30	7	0.397	29.0	0	1.13	67.0	0
Soil	VOCs	Total	Bromomethane	0-3 ft	N/A	ug/kg	730,000	46	38	8	0.397	6,200	0	1.13	12,000	0
Soil	VOCs	Total	Carbon Disulfide	0-1 ft	N/A	ug/kg	1,000,000	37	18	18	0.313	7.40	0	1.13	27.0	0
Soil	VOCs	Total	Carbon Disulfide	0-3 ft	N/A	ug/kg	1,000,000	46	22	23	0.313	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Carbon Tetrachloride	0-1 ft	N/A	ug/kg	1,000,000	37	37	-	0.0780	11.0	0	1.13	27.0	0
Soil	VOCs	Total	Carbon Tetrachloride	0-3 ft	N/A	ug/kg	1,000,000	46	46	-	0.0780	1,500	0	1.13	6,200	0
Soil	VOCs	Total	Chlorobenzene	0-1 ft	N/A	ug/kg	40,000	37	37	-	0.0503	6.60	0	1.13	27.0	0
Soil	VOCs	Total	Chlorobenzene	0-3 ft	N/A	ug/kg	40,000	46	46	-	0.0503	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Chloroethane	0-1 ft	N/A	ug/kg	NV	37	37	-	0.300	24.0	-	1.13	67.0	-
Soil	VOCs	Total	Chloroethane	0-3 ft	N/A	ug/kg	NV	46	46	-	0.300	6,200	-	1.13	12,000	-

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(8 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	VOCs	Total	Chloroform	0-1 ft	N/A	ug/kg	1,875,000	37	34	3	0.0480	1.00	0	1.13	41.0	0
Soil	VOCs	Total	Chloroform	0-3 ft	N/A	ug/kg	1,875,000	46	43	3	0.0480	1,800	0	1.13	6,200	0
Soil	VOCs	Total	Chloromethane	0-1 ft	N/A	ug/kg	730,000	37	35	2	0.0570	8.70	0	1.13	67.0	0
Soil	VOCs	Total	Chloromethane	0-3 ft	N/A	ug/kg	730,000	46	44	2	0.0570	5,000	0	1.13	12,000	0
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	2,500,000	37	36	1	0.0810	2.00	0	1.13	27.0	0
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-3 ft	N/A	ug/kg	2,500,000	46	44	1	0.0810	2,500	0	1.13	6,200	0
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-1 ft	N/A	ug/kg	NV	37	37	-	0.0310	8.30	-	1.13	67.0	-
Soil	VOCs	Total	cis-1,3-Dichloropropene	0-3 ft	N/A	ug/kg	NV	46	46	-	0.0310	2,500	-	1.13	6,200	-
Soil	VOCs	Total	Dibromochloromethane	0-1 ft	N/A	ug/kg	730,000	37	37	-	0.0730	9.10	0	1.13	67.0	0
Soil	VOCs	Total	Dibromochloromethane	0-3 ft	N/A	ug/kg	730,000	46	46	-	0.0730	2,500	0	1.13	6,200	0
Soil	VOCs	Total	Dibromomethane	0-1 ft	N/A	ug/kg	730,000	37	37	-	0.0734	18.0	0	1.13	27.0	0
Soil	VOCs	Total	Dibromomethane	0-3 ft	N/A	ug/kg	730,000	46	46	-	0.0734	2,800	0	1.13	6,200	0
Soil	VOCs	Total	Dichlorodifluoromethane	0-1 ft	N/A	ug/kg	730,000	37	33	2	0.0463	1.00	0	1.13	10.0	0
Soil	VOCs	Total	Dichlorodifluoromethane	0-3 ft	N/A	ug/kg	730,000	46	42	2	0.0463	4,200	0	1.13	12,000	0
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	N/A	ug/kg	730,000	37	25	11	0.140	5.38	0	1.47	14.0	0
Soil	VOCs	Total	Dichloromethane (Methylene Chloride)	0-3 ft	N/A	ug/kg	730,000	46	29	16	0.140	1,200	0	1.47	6,200	0
Soil	VOCs	Total	Ethylbenzene	0-1 ft	N/A	ug/kg	2,260	37	29	8	0.0410	6.10	0	1.13	27.0	0
Soil	VOCs	Total	Ethylbenzene	0-3 ft	N/A	ug/kg	2,260	46	36	9	0.0410	1,800	0	1.13	6,200	1
Soil	VOCs	Total	Hexachlorobutadiene	0-1 ft	N/A	ug/kg	NV	37	37	-	0.0664	15.0	-	1.13	67.0	-
Soil	VOCs	Total	Hexachlorobutadiene	0-3 ft	N/A	ug/kg	NV	46	46	-	0.0664	1,800	-	1.13	6,200	-
Soil	VOCs	Total	Isopropylbenzene	0-1 ft	N/A	ug/kg	2,260	37	37	-	0.0310	6.10	0	1.13	67.0	0
Soil	VOCs	Total	Isopropylbenzene	0-3 ft	N/A	ug/kg	2,260	46	45	-	0.0310	3,000	1	1.13	6,200	1
Soil	VOCs	Total	m,p-Xylenes	0-1 ft	N/A	ug/kg	120,000	37	29	8	0.0930	13.0	0	2.26	54.0	0
Soil	VOCs	Total	m,p-Xylenes	0-3 ft	N/A	ug/kg	120,000	46	35	9	0.0930	13.0	0	2.26	54.0	0
Soil	VOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	NV (1)	37	29	8	0.320	7.90	0	1.13	270	0
Soil	VOCs	Total	Naphthalene	0-3 ft	N/A	ug/kg	NV (1)	46	35	10	0.320	2,500	0	1.13	6,200	0
Soil	VOCs	Total	n-Butylbenzene	0-1 ft	N/A	ug/kg	NV	37	36	1	0.0880	6.50	-	1.13	270	-
Soil	VOCs	Total	n-Butylbenzene	0-3 ft	N/A	ug/kg	NV	46	45	1	0.0880	1,800	-	1.13	6,200	-
Soil	VOCs	Total	n-Propylbenzene	0-1 ft	N/A	ug/kg	2,260	37	36	1	0.0531	5.70	0	1.13	270	0
Soil	VOCs	Total	n-Propylbenzene	0-3 ft	N/A	ug/kg	2,260	46	43	2	0.0531	2,800	1	1.13	6,200	1
Soil	VOCs	Total	o-Xylene	0-1 ft	N/A	ug/kg	1,000	37	35	2	0.0411	6.90	0	1.13	27.0	0
Soil	VOCs	Total	o-Xylene	0-3 ft	N/A	ug/kg	1,000	46	41	4	0.0411	6.90	0	1.13	6,200	1
Soil	VOCs	Total	sec-Butylbenzene	0-1 ft	N/A	ug/kg	2,260	37	37	-	0.0442	6.50	0	1.13	270	0
Soil	VOCs	Total	sec-Butylbenzene	0-3 ft	N/A	ug/kg	2,260	46	44	1	0.0442	1,800	0	1.13	6,200	1
Soil	VOCs	Total	Styrene	0-1 ft	N/A	ug/kg	300,000	37	37	-	0.0403	6.10	0	1.13	27.0	0
Soil	VOCs	Total	Styrene	0-3 ft	N/A	ug/kg	300,000	46	46	-	0.0340	2,500	0	1.13	12,000	0
Soil	VOCs	Total	tert-Butylbenzene	0-1 ft	N/A	ug/kg	2,260	37	37	-	0.0273	4.30	0	1.13	270	0
Soil	VOCs	Total	tert-Butylbenzene	0-3 ft	N/A	ug/kg	2,260	46	46	-	0.0273	1,800	0	1.13	6,200	1
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	N/A	ug/kg	10,000	37	35	2	0.114	8.30	0	1.13	67.0	0
Soil	VOCs	Total	Tetrachloroethene (PCE)	0-3 ft	N/A	ug/kg	10,000	46	41	2	0.114	8.30	0	1.13	67.0	0
Soil	VOCs	Total	Toluene	0-1 ft	N/A	ug/kg	200,000	37	19	18	0.0440	6.10	0	1.13	27.0	0
Soil	VOCs	Total	Toluene	0-3 ft	N/A	ug/kg	200,000	46	20	24	0.0440	6.10	0	1.13	27.0	0
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	2,500,000	37	37	-	0.0480	9.90	0	1.13	27.0	0
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-3 ft	N/A	ug/kg	2,500,000	46	45	-	0.0480	3,000	0	1.13	6,200	0
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-1 ft	N/A	ug/kg	NV	37	37	-	0.0513	12.0	-	1.13	67.0	-
Soil	VOCs	Total	trans-1,3-Dichloropropene	0-3 ft	N/A	ug/kg	NV	46	46	-	0.0513	1,800	-	1.13	6,200	-
Soil	VOCs	Total	Trichloroethene (TCE)	0-1 ft	N/A	ug/kg	40,000	37	33	4	0.0440	13.0	0	1.13	27.0	0
Soil	VOCs	Total	Trichloroethene (TCE)	0-3 ft	N/A	ug/kg	40,000	46	39	6	0.0440	13.0	0	1.13	6,200	0

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(9 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	VOCs	Total	Trichlorofluoromethane	0-1 ft	N/A	ug/kg	730,000	37	37	-	0.0540	11.0	0	1.13	67.0	0
Soil	VOCs	Total	Trichlorofluoromethane	0-3 ft	N/A	ug/kg	730,000	46	46	-	0.0540	1,800	0	1.13	12,000	0
Soil	VOCs	Total	Vinyl Acetate	0-1 ft	N/A	ug/kg	NV	37	37	-	0.600	52.0	-	5.66	670	-
Soil	VOCs	Total	Vinyl Acetate	0-3 ft	N/A	ug/kg	NV	46	46	-	0.600	6,200	-	5.66	12,000	-
Soil	VOCs	Total	Vinyl Chloride	0-1 ft	N/A	ug/kg	20,000	37	37	-	0.0570	13.0	0	1.13	27.0	0
Soil	VOCs	Total	Vinyl Chloride	0-3 ft	N/A	ug/kg	20,000	46	46	-	0.0570	3,800	0	1.13	12,000	0
Erodible Soil Subset	Metals	Total	Beryllium	0-1 ft	N/A	mg/kg	21	2	0	2	-	-	0	0.740	1.23	0
Erodible Soil Subset	Metals	Total	Selenium	0-1 ft	N/A	mg/kg	0.52	2	0	2	-	-	0	1.50	2.50	2
Erodible Soil Subset	Pesticides	Total	4,4'-DDD	0-1 ft	N/A	ug/kg	21	2	2	-	0.110	0.300	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	4,4'-DDE	0-1 ft	N/A	ug/kg	21	2	0	2	-	-	0	0.660	0.710	0
Erodible Soil Subset	Pesticides	Total	Aldrin	0-1 ft	N/A	ug/kg	4.9	2	2	-	0.160	0.160	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	BHC (alpha)	0-1 ft	N/A	ug/kg	8,000	2	2	-	0.110	0.110	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	BHC (beta)	0-1 ft	N/A	ug/kg	8,000	2	2	-	0.180	0.660	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	BHC (delta)	0-1 ft	N/A	ug/kg	8,000	2	1	1	0.140	0.140	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	BHC (gamma) Lindane	0-1 ft	N/A	ug/kg	8,000	2	2	-	0.0800	1.30	0	0.630	1.30	0
Erodible Soil Subset	Pesticides	Total	Chlordane (alpha)	0-1 ft	N/A	ug/kg	9,000	2	2	-	0.100	0.100	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	Chlordane (gamma)	0-1 ft	N/A	ug/kg	9,000	2	2	-	0.630	0.660	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	Dieldrin	0-1 ft	N/A	ug/kg	4.9	2	2	-	0.140	0.810	0	0.630	0.810	0
Erodible Soil Subset	Pesticides	Total	Endosulfan I	0-1 ft	N/A	ug/kg	20,000	2	2	-	0.110	0.660	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	Endosulfan II	0-1 ft	N/A	ug/kg	20,000	2	1	1	0.140	0.140	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	Endosulfan Sulfate	0-1 ft	N/A	ug/kg	20,000	2	1	-	0.110	0.110	0	0.630	0.630	0
Erodible Soil Subset	Pesticides	Total	Endrin Aldehyde	0-1 ft	N/A	ug/kg	4.9	2	2	-	0.630	0.700	0	0.630	0.700	0
Erodible Soil Subset	Pesticides	Total	Endrin Ketone	0-1 ft	N/A	ug/kg	4.9	2	2	-	0.630	2.90	0	0.630	2.90	0
Erodible Soil Subset	Pesticides	Total	Endrin	0-1 ft	N/A	ug/kg	4.9	2	2	-	0.0940	0.660	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	Heptachlor Epoxide	0-1 ft	N/A	ug/kg	15,000	2	2	-	0.0840	0.180	0	0.630	0.660	0
Erodible Soil Subset	Pesticides	Total	Heptachlor	0-1 ft	N/A	ug/kg	15,000	2	0	2	-	-	0	0.660	0.710	0
Erodible Soil Subset	Pesticides	Total	Methoxychlor	0-1 ft	N/A	ug/kg	500,000	2	2	-	0.630	1.50	0	0.630	1.50	0
Erodible Soil Subset	Pesticides	Total	Toxaphene	0-1 ft	N/A	ug/kg	1,000,000	2	2	-	43.0	190	0	43.0	190	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1016	0-1 ft	N/A	ug/kg	371	2	2	-	2.10	2.10	0	6.30	6.60	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1221	0-1 ft	N/A	ug/kg	371	2	2	-	2.10	2.10	0	13.0	14.0	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1232	0-1 ft	N/A	ug/kg	371	2	2	-	2.10	2.10	0	6.30	6.60	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1242	0-1 ft	N/A	ug/kg	371	2	2	-	2.10	2.10	0	6.30	6.60	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1248	0-1 ft	N/A	ug/kg	371	2	2	-	2.10	2.10	0	6.30	6.60	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1254	0-1 ft	N/A	ug/kg	371	2	2	-	2.10	2.10	0	6.30	6.60	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1262	0-1 ft	N/A	ug/kg	371	2	2	-	2.10	2.10	0	6.30	6.60	0
Erodible Soil Subset	PCB Aroclors	Total	Aroclor 1268	0-1 ft	N/A	ug/kg	371	2	2	-	2.10	2.10	0	6.30	6.60	0
Erodible Soil Subset	NWTPH-Dx	Total	Diesel Range Organics	0-1 ft	N/A	mg/kg	NV	2	0	1	-	-	-	36.0	36.0	-
Erodible Soil Subset	NWTPH-Gx	Total	Gasoline Range Organics	0-1 ft	N/A	mg/kg	NV	8	4	4	1.50	1.50	-	3.30	5.00	-
Erodible Soil Subset	SVOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	N/A	ug/kg	20,000	2	2	-	38.0	75.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	1,2-Dichlorobenzene	0-1 ft	N/A	ug/kg	2,260	2	2	-	33.0	65.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	1,3-Dichlorobenzene	0-1 ft	N/A	ug/kg	2,260	2	2	-	40.0	80.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	1,4-Dichlorobenzene	0-1 ft	N/A	ug/kg	20,000	2	2	-	48.0	95.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	2,4,5-Trichlorophenol	0-1 ft	N/A	ug/kg	4,000	2	2	-	75.0	150	0	160	340	0
Erodible Soil Subset	SVOCs	Total	2,4,6-Trichlorophenol	0-1 ft	N/A	ug/kg	10,000	2	2	-	45.0	90.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	2,4-Dichlorophenol	0-1 ft	N/A	ug/kg	20,000	2	2	-	45.0	90.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	2,4-Dimethylphenol	0-1 ft	N/A	ug/kg	20,000	2	2	-	140	280	0	780	1,700	0
Erodible Soil Subset	SVOCs	Total	2,4-Dinitrophenol	0-1 ft	N/A	ug/kg	20,000	2	2	-	900	1,800	0	3,200	6,700	0
Erodible Soil Subset	SVOCs	Total	2,4-Dinitrotoluene	0-1 ft	N/A	ug/kg	NV	2	2	-	70.0	140	-	160	340	-

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Erodible Soil Subset	SVOCs	Total	2,6-Dinitrotoluene	0-1 ft	N/A	ug/kg	NV	2	2	-	70.0	140	-	160	340	-
Erodible Soil Subset	SVOCs	Total	2-Chloronaphthalene	0-1 ft	N/A	ug/kg	NV	2	2	-	90.0	180	-	160	340	-
Erodible Soil Subset	SVOCs	Total	2-Chlorophenol	0-1 ft	N/A	ug/kg	60,000	2	2	-	43.0	85.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	2-Methylphenol	0-1 ft	N/A	ug/kg	50,000	2	2	-	85.0	170	0	160	340	0
Erodible Soil Subset	SVOCs	Total	2-Nitroaniline	0-1 ft	N/A	ug/kg	NV	2	2	-	68.0	140	-	320	670	-
Erodible Soil Subset	SVOCs	Total	2-Nitrophenol	0-1 ft	N/A	ug/kg	NV	2	2	-	65.0	130	-	160	340	-
Erodible Soil Subset	SVOCs	Total	3,3'-Dichlorobenzidine	0-1 ft	N/A	ug/kg	NV	2	2	-	93.0	190	-	1,600	3,400	-
Erodible Soil Subset	SVOCs	Total	3-Nitroaniline	0-1 ft	N/A	ug/kg	70,000	2	2	-	65.0	130	0	320	670	0
Erodible Soil Subset	SVOCs	Total	4,6-Dinitro-2-methylphenol	0-1 ft	N/A	ug/kg	NV	2	2	-	43.0	85.0	-	1,600	3,400	-
Erodible Soil Subset	SVOCs	Total	4-Bromophenyl Phenyl Ether	0-1 ft	N/A	ug/kg	NV	2	2	-	35.0	70.0	-	160	340	-
Erodible Soil Subset	SVOCs	Total	4-Chloro-3-methylphenol	0-1 ft	N/A	ug/kg	NV	2	2	-	53.0	110	-	160	340	-
Erodible Soil Subset	SVOCs	Total	4-Chloroaniline	0-1 ft	N/A	ug/kg	40,000	2	2	-	53.0	110	0	160	340	0
Erodible Soil Subset	SVOCs	Total	4-Chlorophenyl Phenyl Ether	0-1 ft	N/A	ug/kg	NV	2	2	-	50.0	100	-	160	340	-
Erodible Soil Subset	SVOCs	Total	4-Nitroaniline	0-1 ft	N/A	ug/kg	40,000	2	2	-	85.0	170	0	320	670	0
Erodible Soil Subset	SVOCs	Total	4-Nitrophenol	0-1 ft	N/A	ug/kg	7,000	2	2	-	750	1,500	0	1,600	3,400	0
Erodible Soil Subset	SVOCs	Total	Aniline	0-1 ft	N/A	ug/kg	200,000	2	2	-	38.0	75.0	0	320	670	0
Erodible Soil Subset	SVOCs	Total	Benzoic Acid	0-1 ft	N/A	ug/kg	200,000	2	2	-	2,400	4,800	0	3,200	6,700	0
Erodible Soil Subset	SVOCs	Total	Benzyl Alcohol	0-1 ft	N/A	ug/kg	2,260	2	2	-	93.0	190	0	320	670	0
Erodible Soil Subset	SVOCs	Total	Bis(2-chloroethoxy)methane	0-1 ft	N/A	ug/kg	730,000	2	2	-	33.0	65.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Bis(2-chloroethyl) Ether	0-1 ft	N/A	ug/kg	NV	2	2	-	60.0	120	-	160	340	-
Erodible Soil Subset	SVOCs	Total	Bis(2-chloroisopropyl) Ether	0-1 ft	N/A	ug/kg	NV	2	2	-	30.0	60.0	-	160	340	-
Erodible Soil Subset	SVOCs	Total	Butyl Benzyl Phthalate	0-1 ft	N/A	ug/kg	450	2	2	-	38.0	75.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Carbazole	0-1 ft	N/A	ug/kg	2,260	2	0	2	-	-	0	180	340	0
Erodible Soil Subset	SVOCs	Total	Dibenzofuran	0-1 ft	N/A	ug/kg	2	2	2	-	33.0	65.0	2	160	340	2
Erodible Soil Subset	SVOCs	Total	Diethyl Phthalate	0-1 ft	N/A	ug/kg	100,000	2	2	-	88.0	180	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Dimethyl Phthalate	0-1 ft	N/A	ug/kg	200,000	2	2	-	45.0	90.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Di-n-butyl Phthalate	0-1 ft	N/A	ug/kg	450	2	2	-	65.0	130	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Di-n-octyl Phthalate	0-1 ft	N/A	ug/kg	450	2	2	-	30.0	60.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Hexachlorobenzene	0-1 ft	N/A	ug/kg	1,000,000	2	2	-	53.0	110	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Hexachlorobutadiene	0-1 ft	N/A	ug/kg	NV	2	2	-	35.0	70.0	-	160	340	-
Erodible Soil Subset	SVOCs	Total	Hexachlorocyclopentadiene	0-1 ft	N/A	ug/kg	10,000	2	2	-	380	750	0	780	1,700	0
Erodible Soil Subset	SVOCs	Total	Hexachloroethane	0-1 ft	N/A	ug/kg	NV	2	2	-	55.0	110	-	160	340	-
Erodible Soil Subset	SVOCs	Total	Isophorone	0-1 ft	N/A	ug/kg	NV	2	2	-	40.0	80.0	-	160	340	-
Erodible Soil Subset	SVOCs	Total	Nitrobenzene	0-1 ft	N/A	ug/kg	8,000	2	2	-	50.0	100	0	160	340	0
Erodible Soil Subset	SVOCs	Total	N-Nitrosodimethylamine	0-1 ft	N/A	ug/kg	NV	2	2	-	160	310	-	780	1,700	-
Erodible Soil Subset	SVOCs	Total	N-Nitrosodi-n-propylamine	0-1 ft	N/A	ug/kg	NV	2	2	-	80.0	160	-	160	340	-
Erodible Soil Subset	SVOCs	Total	N-Nitrosodiphenylamine	0-1 ft	N/A	ug/kg	20,000	2	2	-	55.0	110	0	160	340	0
Erodible Soil Subset	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	N/A	ug/kg	50,000	2	2	-	73.0	150	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Pentachlorophenol	0-1 ft	N/A	ug/kg	2,100	2	2	-	220	430	0	1,600	3,400	1
Erodible Soil Subset	SVOCs	Total	Phenol	0-1 ft	N/A	ug/kg	30,000	2	2	-	48.0	95.0	0	470	1,000	0
Erodible Soil Subset	SVOCs	Total	2-Methylnaphthalene	0-1 ft	N/A	ug/kg	NV (1)	2	2	-	30.0	60.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Acenaphthene	0-1 ft	N/A	ug/kg	NV (1)	2	0	2	-	-	0	180	340	0
Erodible Soil Subset	SVOCs	Total	Acenaphthylene	0-1 ft	N/A	ug/kg	NV (1)	2	2	-	35.0	70.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Anthracene	0-1 ft	N/A	ug/kg	NV (1)	2	0	2	-	-	0	180	340	0
Erodible Soil Subset	SVOCs	Total	Fluorene	0-1 ft	N/A	ug/kg	NV (1)	2	2	-	43.0	85.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	NV (1)	2	2	-	33.0	65.0	0	160	340	0
Erodible Soil Subset	SVOCs	Total	Dibenz(a,h)anthracene	0-1 ft	N/A	ug/kg	NV (2)	2	0	2	-	-	0	180	340	0
Erodible Soil Subset	VOCs	Total	1,1,1,2-Tetrachloroethane	0-1 ft	N/A	ug/kg	NV	8	8	-	0.190	9.40	-	5.10	67.0	-

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Erodible Soil Subset	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-1 ft	N/A	ug/kg	55,550,000	8	8	-	0.160	4.30	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,1,2,2-Tetrachloroethane	0-1 ft	N/A	ug/kg	NV	8	8	-	0.0900	7.40	-	5.10	27.0	-
Erodible Soil Subset	VOCs	Total	1,1,2-Trichloroethane	0-1 ft	N/A	ug/kg	NV	8	8	-	0.0890	7.90	-	5.10	27.0	-
Erodible Soil Subset	VOCs	Total	1,1-Dichloroethane	0-1 ft	N/A	ug/kg	70,000	8	8	-	0.0490	9.30	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,1-Dichloroethene	0-1 ft	N/A	ug/kg	3,750,000	8	8	-	0.0710	7.30	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,1-Dichloropropene	0-1 ft	N/A	ug/kg	NV	8	8	-	0.160	9.40	-	5.10	67.0	-
Erodible Soil Subset	VOCs	Total	1,2,3-Trichlorobenzene	0-1 ft	N/A	ug/kg	20,000	8	8	-	0.150	12.0	0	21.0	270	0
Erodible Soil Subset	VOCs	Total	1,2,3-Trichloropropane	0-1 ft	N/A	ug/kg	NV	8	8	-	0.280	17.0	-	5.10	27.0	-
Erodible Soil Subset	VOCs	Total	1,2,4-Trichlorobenzene	0-1 ft	N/A	ug/kg	20,000	8	8	-	0.230	6.50	0	21.0	67.0	0
Erodible Soil Subset	VOCs	Total	1,2,4-Trimethylbenzene	0-1 ft	N/A	ug/kg	200,000	8	2	6	0.110	3.70	0	21.0	67.0	0
Erodible Soil Subset	VOCs	Total	1,2-Dibromo-3-chloropropane	0-1 ft	N/A	ug/kg	NV	8	8	-	0.790	140	-	21.0	270	-
Erodible Soil Subset	VOCs	Total	1,2-Dibromoethane (EDB)	0-1 ft	N/A	ug/kg	NV	8	8	-	0.200	6.90	-	21.0	27.0	-
Erodible Soil Subset	VOCs	Total	1,2-Dichlorobenzene	0-1 ft	N/A	ug/kg	2,260	8	8	-	0.0640	6.60	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,2-Dichloroethane (EDC)	0-1 ft	N/A	ug/kg	70,000	8	8	-	0.0550	9.70	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,2-Dichloropropane	0-1 ft	N/A	ug/kg	700,000	8	8	-	0.0660	11.0	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,3,5-Trimethylbenzene	0-1 ft	N/A	ug/kg	200,000	8	8	-	0.0410	6.50	0	21.0	67.0	0
Erodible Soil Subset	VOCs	Total	1,3-Dichlorobenzene	0-1 ft	N/A	ug/kg	2,260	8	8	-	0.0710	6.10	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	1,3-Dichloropropane	0-1 ft	N/A	ug/kg	NV	8	8	-	0.0600	5.30	-	5.10	67.0	-
Erodible Soil Subset	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	N/A	ug/kg	20,000	8	8	-	0.110	5.70	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	2,2-Dichloropropane	0-1 ft	N/A	ug/kg	NV	8	8	-	0.110	9.50	-	5.10	67.0	-
Erodible Soil Subset	VOCs	Total	2-Butanone (MEK)	0-1 ft	N/A	ug/kg	200,000,000	8	1	2	290	290	0	21.0	540	0
Erodible Soil Subset	VOCs	Total	2-Chlorotoluene	0-1 ft	N/A	ug/kg	NV	8	8	-	0.0520	4.90	-	21.0	270	-
Erodible Soil Subset	VOCs	Total	2-Hexanone	0-1 ft	N/A	ug/kg	1,250,000	8	5	3	0.820	170	0	21.0	2,700	0
Erodible Soil Subset	VOCs	Total	4-Chlorotoluene	0-1 ft	N/A	ug/kg	NV	8	8	-	0.0930	5.50	-	21.0	270	-
Erodible Soil Subset	VOCs	Total	4-Isopropyltoluene	0-1 ft	N/A	ug/kg	200,000	8	5	3	0.0840	6.10	0	21.0	270	0
Erodible Soil Subset	VOCs	Total	4-Methyl-2-pentanone (MIBK)	0-1 ft	N/A	ug/kg	1,250,000	8	5	3	0.260	460	0	21.0	2,700	0
Erodible Soil Subset	VOCs	Total	Acetone	0-1 ft	N/A	ug/kg	1,250,000	8	1	-	230	230	0	810	810	0
Erodible Soil Subset	VOCs	Total	Benzene	0-1 ft	N/A	ug/kg	3,300,000	8	4	4	0.230	5.70	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	Bromobenzene	0-1 ft	N/A	ug/kg	NV	8	8	-	0.0930	8.20	-	5.10	270	-
Erodible Soil Subset	VOCs	Total	Bromochloromethane	0-1 ft	N/A	ug/kg	730,000	8	8	-	0.260	9.40	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Bromodichloromethane	0-1 ft	N/A	ug/kg	730,000	8	8	-	0.0450	6.20	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Bromoform	0-1 ft	N/A	ug/kg	NV	8	8	-	0.260	13.0	-	5.10	67.0	-
Erodible Soil Subset	VOCs	Total	Bromomethane	0-1 ft	N/A	ug/kg	730,000	8	6	2	0.430	29.0	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Carbon Disulfide	0-1 ft	N/A	ug/kg	1,000,000	8	1	7	7.40	7.40	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	Carbon Tetrachloride	0-1 ft	N/A	ug/kg	1,000,000	8	8	-	0.0790	11.0	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	Chlorobenzene	0-1 ft	N/A	ug/kg	40,000	8	8	-	0.0550	6.60	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	Chloroethane	0-1 ft	N/A	ug/kg	NV	8	8	-	0.310	24.0	-	5.10	67.0	-
Erodible Soil Subset	VOCs	Total	Chloroform	0-1 ft	N/A	ug/kg	1,875,000	8	5	3	0.0490	0.0630	0	5.10	41.0	0
Erodible Soil Subset	VOCs	Total	Chloromethane	0-1 ft	N/A	ug/kg	730,000	8	6	2	0.0580	8.70	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	2,500,000	8	7	1	0.0820	0.110	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	cis-1,3-Dichloropropene	0-1 ft	N/A	ug/kg	NV	8	8	-	0.0320	8.30	-	5.10	67.0	-
Erodible Soil Subset	VOCs	Total	Dibromochloromethane	0-1 ft	N/A	ug/kg	730,000	8	8	-	0.170	9.10	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Dibromomethane	0-1 ft	N/A	ug/kg	730,000	8	8	-	0.190	18.0	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	Dichlorodifluoromethane	0-1 ft	N/A	ug/kg	730,000	8	7	-	0.0730	0.0940	0	5.10	6.60	0
Erodible Soil Subset	VOCs	Total	Dichloromethane (Methylene Chloride)	0-1 ft	N/A	ug/kg	730,000	8	4	3	0.160	0.190	0	11.0	14.0	0
Erodible Soil Subset	VOCs	Total	Ethylbenzene	0-1 ft	N/A	ug/kg	2,260	8	5	3	0.0430	6.10	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	Hexachlorobutadiene	0-1 ft	N/A	ug/kg	NV	8	8	-	0.180	15.0	-	21.0	67.0	-
Erodible Soil Subset	VOCs	Total	Isopropylbenzene	0-1 ft	N/A	ug/kg	2,260	8	8	-	0.0320	6.10	0	21.0	67.0	0

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(12 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Erodible Soil Subset	VOCs	Total	m,p-Xylenes	0-1 ft	N/A	ug/kg	120,000	8	5	3	0.0980	13.0	0	5.10	54.0	0
Erodible Soil Subset	VOCs	Total	Naphthalene	0-1 ft	N/A	ug/kg	NV (1)	8	6	2	0.340	7.90	0	21.0	270	0
Erodible Soil Subset	VOCs	Total	n-Butylbenzene	0-1 ft	N/A	ug/kg	NV	8	8	-	0.0890	6.50	-	21.0	270	-
Erodible Soil Subset	VOCs	Total	n-Propylbenzene	0-1 ft	N/A	ug/kg	2,260	8	8	-	0.0630	5.70	0	21.0	270	0
Erodible Soil Subset	VOCs	Total	o-Xylene	0-1 ft	N/A	ug/kg	1,000	8	8	-	0.0600	6.90	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	sec-Butylbenzene	0-1 ft	N/A	ug/kg	2,260	8	8	-	0.0660	6.50	0	21.0	270	0
Erodible Soil Subset	VOCs	Total	Styrene	0-1 ft	N/A	ug/kg	300,000	8	8	-	0.0770	6.10	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	tert-Butylbenzene	0-1 ft	N/A	ug/kg	2,260	8	8	-	0.0550	4.30	0	21.0	270	0
Erodible Soil Subset	VOCs	Total	Tetrachloroethene (PCE)	0-1 ft	N/A	ug/kg	10,000	8	8	-	0.130	8.30	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Toluene	0-1 ft	N/A	ug/kg	200,000	8	1	7	6.10	6.10	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	trans-1,2-Dichloroethene	0-1 ft	N/A	ug/kg	2,500,000	8	8	-	0.0490	9.90	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	trans-1,3-Dichloropropene	0-1 ft	N/A	ug/kg	NV	8	8	-	0.110	12.0	-	5.10	67.0	-
Erodible Soil Subset	VOCs	Total	Trichloroethene (TCE)	0-1 ft	N/A	ug/kg	40,000	8	8	-	0.140	13.0	0	5.10	27.0	0
Erodible Soil Subset	VOCs	Total	Trichlorofluoromethane	0-1 ft	N/A	ug/kg	730,000	8	8	-	0.0550	11.0	0	5.10	67.0	0
Erodible Soil Subset	VOCs	Total	Vinyl Acetate	0-1 ft	N/A	ug/kg	NV	8	8	-	0.610	52.0	-	21.0	670	-
Erodible Soil Subset	VOCs	Total	Vinyl Chloride	0-1 ft	N/A	ug/kg	20,000	8	8	-	0.0580	13.0	0	5.10	27.0	0
Groundwater	Metals	Dissolved	Iron	N/A	N/A	ug/L	1,000	20	13	3	4.00	20.0	0	20.0	20.0	0
Groundwater	Metals	Dissolved	Potassium	N/A	N/A	ug/L	53,000	5	0	3	-	-	0	2,000	2,000	0
Groundwater	Metals	Dissolved	Vanadium	N/A	N/A	ug/L	20	20	5	5	0.0700	0.800	0	0.200	10.0	0
Groundwater	Butyltins	Total	Monobutyltin	N/A	N/A	ug/L	0.063	20	18	2	0.0110	0.0290	0	0.0500	0.0870	15
Groundwater	NWTPH-Dx	Total	Diesel Range Organics	N/A	N/A	ug/L	NV	20	18	2	11.0	120	-	100	120	-
Groundwater	NWTPH-Dx	Total	Residual Range Organics	N/A	N/A	ug/L	NV	20	20	-	19.0	120	-	100	120	-
Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	N/A	ug/L	NV	20	17	3	13.0	13.0	-	250	250	-
Groundwater	SVOCs	Total	Benzo(b)fluoranthene	N/A	N/A	ug/L	0.6774	20	19	1	0.0170	0.0200	0	0.190	0.230	0
Groundwater	SVOCs	Total	Benzo(k)fluoranthene	N/A	N/A	ug/L	0.6415	20	20	-	0.0240	0.0280	0	0.190	0.230	0
Groundwater	SVOCs	Total	Phenanthrene	N/A	N/A	ug/L	6.3	20	19	1	0.0220	0.0250	0	0.190	0.230	0
Groundwater	VOCs	Total	1,1,1,2-Tetrachloroethane	N/A	N/A	ug/L	186	5	5	-	0.0450	0.0450	0	0.500	0.500	0
Groundwater	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/L	11	5	3	1	0.0620	0.0620	0	0.500	0.500	0
Groundwater	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	N/A	ug/L	2,400	5	5	-	0.0880	0.0880	0	0.500	0.500	0
Groundwater	VOCs	Total	1,1,2-Trichloroethane	N/A	N/A	ug/L	9,400	5	5	-	0.0940	0.0940	0	0.500	0.500	0
Groundwater	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/L	47	5	3	1	0.0590	0.0590	0	0.500	0.500	0
Groundwater	VOCs	Total	1,1-Dichloroethene	N/A	N/A	ug/L	25	5	4	-	0.100	0.100	0	0.500	0.500	0
Groundwater	VOCs	Total	1,1-Dichloropropene	N/A	N/A	ug/L	NV	5	5	-	0.0620	0.0620	-	0.500	0.500	-
Groundwater	VOCs	Total	1,2,3-Trichlorobenzene	N/A	N/A	ug/L	8	5	5	-	0.0840	0.0840	0	2.00	2.00	0
Groundwater	VOCs	Total	1,2,3-Trichloropropane	N/A	N/A	ug/L	NV	5	5	-	0.240	0.240	-	0.500	0.500	-
Groundwater	VOCs	Total	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	110	5	5	-	0.180	0.180	0	2.00	2.00	0
Groundwater	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/L	7.3	5	5	-	0.0620	0.0620	0	2.00	2.00	0
Groundwater	VOCs	Total	1,2-Dibromo-3-chloropropane	N/A	N/A	ug/L	NV	5	5	-	0.500	0.500	-	2.00	2.00	-
Groundwater	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	N/A	ug/L	NV	5	5	-	0.0720	0.0720	-	2.00	2.00	-
Groundwater	VOCs	Total	1,2-Dichlorobenzene	N/A	N/A	ug/L	14	5	5	-	0.0690	0.0690	0	0.500	0.500	0
Groundwater	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	N/A	ug/L	20,000	5	5	-	0.0660	0.0660	0	0.500	0.500	0
Groundwater	VOCs	Total	1,2-Dichloropropane	N/A	N/A	ug/L	5,700	5	5	-	0.0620	0.0620	0	0.500	0.500	0
Groundwater	VOCs	Total	1,3,5-Trimethylbenzene	N/A	N/A	ug/L	7.3	5	5	-	0.0660	0.0660	0	5.00	5.00	0
Groundwater	VOCs	Total	1,3-Dichlorobenzene	N/A	N/A	ug/L	71	5	5	-	0.0820	0.0820	0	0.500	0.500	0
Groundwater	VOCs	Total	1,3-Dichloropropane	N/A	N/A	ug/L	5,700	5	5	-	0.0570	0.0570	0	0.500	0.500	0
Groundwater	VOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/L	15	5	5	-	0.0840	0.0840	0	0.500	0.500	0
Groundwater	VOCs	Total	2,2-Dichloropropane	N/A	N/A	ug/L	5,700	20	20	-	0.0830	0.420	0	0.500	2.50	0
Groundwater	VOCs	Total	2-Butanone (MEK)	N/A	N/A	ug/L	14,000	5	5	-	2.30	2.30	0	20.0	20.0	0

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(13 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Groundwater	VOCs	Total	2-Chlorotoluene	N/A	N/A	ug/L	NV	5	5	-	0.0790	0.0790	-	2.00	2.00	-
Groundwater	VOCs	Total	2-Hexanone	N/A	N/A	ug/L	99	5	5	-	2.40	2.40	0	20.0	20.0	0
Groundwater	VOCs	Total	4-Chlorotoluene	N/A	N/A	ug/L	NV	5	5	-	0.0570	0.0570	-	4.00	4.00	-
Groundwater	VOCs	Total	4-Isopropyltoluene	N/A	N/A	ug/L	NV	5	5	-	0.0700	0.0700	-	2.00	2.00	-
Groundwater	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	N/A	ug/L	170	5	5	-	1.40	1.40	0	20.0	20.0	0
Groundwater	VOCs	Total	Acetone	N/A	N/A	ug/L	1,500	5	5	-	3.00	3.00	0	20.0	20.0	0
Groundwater	VOCs	Total	Benzene	N/A	N/A	ug/L	130	5	5	-	0.0620	0.0620	0	0.500	0.500	0
Groundwater	VOCs	Total	Bromobenzene	N/A	N/A	ug/L	NV	5	5	-	0.0660	0.0660	-	2.00	2.00	-
Groundwater	VOCs	Total	Bromochloromethane	N/A	N/A	ug/L	NV	5	5	-	0.0990	0.0990	-	0.500	0.500	-
Groundwater	VOCs	Total	Bromodichloromethane	N/A	N/A	ug/L	NV	5	5	-	0.0550	0.0550	-	0.500	0.500	-
Groundwater	VOCs	Total	Bromoform	N/A	N/A	ug/L	320	5	5	-	0.0990	0.0990	0	0.500	0.500	0
Groundwater	VOCs	Total	Bromomethane	N/A	N/A	ug/L	16	5	5	-	0.120	0.120	0	0.500	0.500	0
Groundwater	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/L	0.92	5	0	5	-	-	0	0.500	0.500	0
Groundwater	VOCs	Total	Carbon Tetrachloride	N/A	N/A	ug/L	74	5	5	-	0.0480	0.0480	0	0.500	0.500	0
Groundwater	VOCs	Total	Chlorobenzene	N/A	N/A	ug/L	50	5	5	-	0.0640	0.0640	0	0.500	0.500	0
Groundwater	VOCs	Total	Chloroethane	N/A	N/A	ug/L	NV	5	5	-	0.130	0.130	-	0.500	0.500	-
Groundwater	VOCs	Total	Chloroform	N/A	N/A	ug/L	1,240	20	19	1	0.0820	0.410	0	0.500	2.50	0
Groundwater	VOCs	Total	Chloromethane	N/A	N/A	ug/L	NV	5	5	-	0.110	0.110	-	0.500	0.500	-
Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/L	590	20	5	3	0.0660	0.0660	0	0.500	0.500	0
Groundwater	VOCs	Total	cis-1,3-Dichloropropene	N/A	N/A	ug/L	0.055	5	5	-	0.0550	0.0550	0	0.500	0.500	5
Groundwater	VOCs	Total	Dibromochloromethane	N/A	N/A	ug/L	NV	5	5	-	0.0720	0.0720	-	0.500	0.500	-
Groundwater	VOCs	Total	Dibromomethane	N/A	N/A	ug/L	NV	5	5	-	0.120	0.120	-	0.500	0.500	-
Groundwater	VOCs	Total	Dichlorodifluoromethane	N/A	N/A	ug/L	NV	5	5	-	0.0750	0.0750	-	0.500	0.500	-
Groundwater	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	N/A	ug/L	2,200	5	4	1	0.0840	0.0840	0	2.00	2.00	0
Groundwater	VOCs	Total	Ethylbenzene	N/A	N/A	ug/L	7.3	5	5	-	0.0680	0.0680	0	0.500	0.500	0
Groundwater	VOCs	Total	Hexachlorobutadiene	N/A	N/A	ug/L	9.3	5	5	-	0.150	0.150	0	2.00	2.00	0
Groundwater	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/L	7.3	5	5	-	0.0760	0.0760	0	0.500	0.500	0
Groundwater	VOCs	Total	m,p-Xylenes	N/A	N/A	ug/L	13	5	5	-	0.110	0.110	0	0.500	0.500	0
Groundwater	VOCs	Total	Naphthalene	N/A	N/A	ug/L	193.5	5	5	-	0.0960	0.0960	0	2.00	2.00	0
Groundwater	VOCs	Total	n-Butylbenzene	N/A	N/A	ug/L	NV	5	5	-	0.0850	0.0850	-	2.00	2.00	-
Groundwater	VOCs	Total	n-Propylbenzene	N/A	N/A	ug/L	7.3	5	5	-	0.00590	0.00590	0	2.00	2.00	0
Groundwater	VOCs	Total	o-Xylene	N/A	N/A	ug/L	350	5	5	-	0.0680	0.0680	0	0.500	0.500	0
Groundwater	VOCs	Total	sec-Butylbenzene	N/A	N/A	ug/L	NV	5	5	-	0.0710	0.0710	-	2.00	2.00	-
Groundwater	VOCs	Total	Styrene	N/A	N/A	ug/L	72	5	5	-	0.0770	0.0770	0	0.500	0.500	0
Groundwater	VOCs	Total	tert-Butylbenzene	N/A	N/A	ug/L	NV	5	5	-	0.0590	0.0590	-	2.00	2.00	-
Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/L	840	20	4	3	0.0970	0.0970	0	0.500	0.500	0
Groundwater	VOCs	Total	Toluene	N/A	N/A	ug/L	9.8	5	0	2	-	-	0	0.500	0.500	0
Groundwater	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/L	590	5	3	1	0.0690	0.0690	0	0.500	0.500	0
Groundwater	VOCs	Total	trans-1,3-Dichloropropene	N/A	N/A	ug/L	0.055	5	5	-	0.0750	0.0750	5	0.500	0.500	5
Groundwater	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/L	3,000	20	5	4	0.0730	0.0730	0	0.500	0.500	0
Groundwater	VOCs	Total	Trichlorofluoromethane	N/A	N/A	ug/L	NV	5	5	-	0.0990	0.0990	-	0.500	0.500	-
Groundwater	VOCs	Total	Vinyl Acetate	N/A	N/A	ug/L	16	5	5	-	0.910	0.910	0	5.00	5.00	0
Groundwater	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/L	1,300	20	16	2	0.0440	0.0440	0	0.500	2.50	0
DP Groundwater	Metals	Dissolved	Aluminum	N/A	N/A	ug/L	87	10	3	5	5.88	5.88	0	100	100	8
DP Groundwater	Metals	Dissolved	Antimony	N/A	N/A	ug/L	1,000	10	0	9	-	-	0	0.500	0.500	0
DP Groundwater	Metals	Dissolved	Arsenic	N/A	N/A	ug/L	150	10	0	1	-	-	0	0.500	0.500	0
DP Groundwater	Metals	Dissolved	Beryllium	N/A	N/A	ug/L	5.3	10	10	-	0.0782	0.0782	0	0.500	0.500	0
DP Groundwater	Metals	Dissolved	Cadmium	N/A	N/A	ug/L	0.17	10	9	1	0.0247	0.0247	0	0.500	0.500	10

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(14 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
DP Groundwater	Metals	Dissolved	Cobalt	N/A	N/A	ug/L	23	10	2	7	0.770	0.770	0	5.00	5.00	0
DP Groundwater	Metals	Dissolved	Copper	N/A	N/A	ug/L	5.8	10	3	-	0.500	1.23	0	0.500	1.23	0
DP Groundwater	Metals	Dissolved	Iron	N/A	N/A	ug/L	1,000	10	6	1	14.0	14.0	0	100	100	0
DP Groundwater	Metals	Dissolved	Lead	N/A	N/A	ug/L	1.44	10	4	6	0.0240	0.500	0	0.500	0.500	0
DP Groundwater	Metals	Dissolved	Mercury	N/A	N/A	ug/L	0.77	10	8	2	0.0530	0.0530	0	0.200	0.200	0
DP Groundwater	Metals	Dissolved	Nickel	N/A	N/A	ug/L	34	10	7	3	0.370	10.0	0	10.0	10.0	0
DP Groundwater	Metals	Dissolved	Potassium	N/A	N/A	ug/L	53,000	10	0	3	-	-	0	1,000	1,000	0
DP Groundwater	Metals	Dissolved	Selenium	N/A	N/A	ug/L	5	10	0	3	-	-	0	0.500	0.500	0
DP Groundwater	Metals	Dissolved	Silver	N/A	N/A	ug/L	0.12	10	2	8	0.0188	0.0188	0	0.100	0.100	0
DP Groundwater	Metals	Dissolved	Thallium	N/A	N/A	ug/L	40	10	7	3	0.0292	0.0292	0	0.500	0.500	0
DP Groundwater	Metals	Dissolved	Vanadium	N/A	N/A	ug/L	20	10	4	6	0.488	10.0	0	10.0	10.0	0
DP Groundwater	Metals	Dissolved	Zinc	N/A	N/A	ug/L	77	10	6	-	2.00	2.00	0	2.00	2.00	0
DP Groundwater	Butyltins	Total	Dibutyltin	N/A	N/A	ug/L	0.063	4	4	-	0.000231	0.000287	0	0.000793	0.000988	0
DP Groundwater	Butyltins	Total	Monobutyltin	N/A	N/A	ug/L	0.063	4	2	-	0.000114	0.000142	0	0.000396	0.000494	0
DP Groundwater	Butyltins	Total	Tetrabutyltin	N/A	N/A	ug/L	0.063	4	4	-	0.000600	0.000748	0	0.00198	0.00247	0
DP Groundwater	Butyltins	Total	Tributyltin	N/A	N/A	ug/L	0.063	4	2	-	0.000454	0.000552	0	0.00142	0.00173	0
DP Groundwater	Pesticides	Total	4,4'-DDD	N/A	N/A	ug/L	0.001	3	3	-	0.000453	0.000575	0	0.00385	0.00488	3
DP Groundwater	Pesticides	Total	4,4'-DDE	N/A	N/A	ug/L	0.001	3	3	-	0.000375	0.000476	0	0.00385	0.00488	3
DP Groundwater	Pesticides	Total	4,4'-DDT	N/A	N/A	ug/L	0.001	3	3	-	0.000480	0.000609	0	0.00385	0.00488	3
DP Groundwater	Pesticides	Total	Aldrin	N/A	N/A	ug/L	0.06	3	3	-	0.000110	0.000140	0	0.000962	0.00122	0
DP Groundwater	Pesticides	Total	BHC (alpha)	N/A	N/A	ug/L	2.2	3	3	-	0.000354	0.000449	0	0.000962	0.00122	0
DP Groundwater	Pesticides	Total	BHC (beta)	N/A	N/A	ug/L	2.2	3	3	-	0.000411	0.000521	0	0.000962	0.00122	0
DP Groundwater	Pesticides	Total	BHC (delta)	N/A	N/A	ug/L	2.2	3	3	-	0.000226	0.000286	0	0.000962	0.00122	0
DP Groundwater	Pesticides	Total	BHC (gamma) Lindane	N/A	N/A	ug/L	0.08	3	0	1	-	-	0	0.00111	0.00111	0
DP Groundwater	Pesticides	Total	Chlordane (alpha)	N/A	N/A	ug/L	0.0043	3	3	-	0.000339	0.000429	0	0.000962	0.00122	0
DP Groundwater	Pesticides	Total	Chlordane (gamma)	N/A	N/A	ug/L	0.0043	3	3	-	0.000461	0.000584	0	0.000962	0.00122	0
DP Groundwater	Pesticides	Total	Dieldrin	N/A	N/A	ug/L	0.056	3	3	-	0.000290	0.000368	0	0.00192	0.00244	0
DP Groundwater	Pesticides	Total	Endosulfan I	N/A	N/A	ug/L	0.056	3	3	-	0.000480	0.000608	0	0.000962	0.00122	0
DP Groundwater	Pesticides	Total	Endosulfan II	N/A	N/A	ug/L	0.056	3	3	-	0.000411	0.00192	0	0.00192	0.00244	0
DP Groundwater	Pesticides	Total	Endosulfan Sulfate	N/A	N/A	ug/L	0.051	3	3	-	0.000517	0.000655	0	0.00192	0.00244	0
DP Groundwater	Pesticides	Total	Endrin Aldehyde	N/A	N/A	ug/L	0.15	3	3	-	0.000936	0.00119	0	0.00192	0.00244	0
DP Groundwater	Pesticides	Total	Endrin Ketone	N/A	N/A	ug/L	NV	3	3	-	0.000332	0.000421	-	0.00192	0.00244	-
DP Groundwater	Pesticides	Total	Endrin	N/A	N/A	ug/L	0.036	3	3	-	0.000298	0.000378	0	0.00192	0.00244	0
DP Groundwater	Pesticides	Total	Heptachlor Epoxide	N/A	N/A	ug/L	0.0038	3	3	-	0.000360	0.000456	0	0.000962	0.00122	0
DP Groundwater	Pesticides	Total	Heptachlor	N/A	N/A	ug/L	0.0038	3	3	-	0.000724	0.000919	0	0.000962	0.00122	0
DP Groundwater	Pesticides	Total	Methoxychlor	N/A	N/A	ug/L	0.03	3	1	2	0.000584	0.000584	0	0.0109	0.0122	0
DP Groundwater	Pesticides	Total	Toxaphene	N/A	N/A	ug/L	0.002	3	3	-	0.0112	0.0142	3	0.0962	0.122	3
DP Groundwater	PCB Aroclors	Total	Aroclor 1016	N/A	N/A	ug/L	0.014	7	7	-	0.00206	0.00244	0	0.00941	0.0112	0
DP Groundwater	PCB Aroclors	Total	Aroclor 1221	N/A	N/A	ug/L	0.014	7	7	-	0.00206	0.00244	0	0.00941	0.0112	0
DP Groundwater	PCB Aroclors	Total	Aroclor 1232	N/A	N/A	ug/L	0.014	7	7	-	0.00206	0.00244	0	0.00941	0.0112	0
DP Groundwater	PCB Aroclors	Total	Aroclor 1242	N/A	N/A	ug/L	0.014	7	7	-	0.00206	0.00244	0	0.00941	0.0112	0
DP Groundwater	PCB Aroclors	Total	Aroclor 1248	N/A	N/A	ug/L	0.014	7	7	-	0.00206	0.00244	0	0.00941	0.0112	0
DP Groundwater	PCB Aroclors	Total	Aroclor 1254	N/A	N/A	ug/L	0.014	7	7	-	0.00227	0.00269	0	0.00941	0.0112	0
DP Groundwater	PCB Aroclors	Total	Aroclor 1260	N/A	N/A	ug/L	0.014	7	7	-	0.00227	0.00269	0	0.00941	0.0112	0
DP Groundwater	NWTPH-Dx	Total	Diesel Range Organics	N/A	N/A	ug/L	NV	4	4	-	74.7	89.7	-	244	293	-
DP Groundwater	NWTPH-Dx	Total	Residual Range Organics	N/A	N/A	ug/L	NV	4	3	1	92.5	111	-	487	585	-
DP Groundwater	NWTPH-Gx	Total	Gasoline Range Organics	N/A	N/A	ug/L	NV	6	4	2	13.0	13.0	-	100	100	-
DP Groundwater	SVOCs	Total	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	110	9	9	-	0.0117	0.0151	0	0.190	1.00	0

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(15 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
DP Groundwater	SVOCs	Total	1,2-Dichlorobenzene	N/A	N/A	ug/L	14	9	9	-	0.0264	0.0340	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	1,3-Dichlorobenzene	N/A	N/A	ug/L	71	9	9	-	0.0349	0.0449	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/L	15	9	9	-	0.0300	0.0387	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2,4,5-Trichlorophenol	N/A	N/A	ug/L	18	6	6	-	0.0421	0.0542	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2,4,6-Trichlorophenol	N/A	N/A	ug/L	970	6	6	-	0.0305	0.0393	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2,4-Dichlorophenol	N/A	N/A	ug/L	3,650	6	6	-	0.0177	0.0228	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2,4-Dimethylphenol	N/A	N/A	ug/L	42	6	6	-	0.174	0.224	0	0.950	1.22	0
DP Groundwater	SVOCs	Total	2,4-Dinitrophenol	N/A	N/A	ug/L	19	6	6	-	0.197	0.253	0	0.950	1.22	0
DP Groundwater	SVOCs	Total	2,4-Dinitrotoluene	N/A	N/A	ug/L	230	9	9	-	0.0545	0.0703	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2,6-Dinitrotoluene	N/A	N/A	ug/L	230	9	9	-	0.0361	0.0465	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2-Chloronaphthalene	N/A	N/A	ug/L	32	9	9	-	0.00456	0.00588	0	0.0190	0.0245	0
DP Groundwater	SVOCs	Total	2-Chlorophenol	N/A	N/A	ug/L	2,000	6	6	-	0.0400	0.0515	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2-Methylnaphthalene	N/A	N/A	ug/L	72.16	9	3	3	0.0142	0.0149	0	0.0475	0.0553	0
DP Groundwater	SVOCs	Total	2-Methylphenol	N/A	N/A	ug/L	13	6	6	-	0.0371	0.0479	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	2-Nitroaniline	N/A	N/A	ug/L	NV	9	9	-	0.0284	0.0366	-	0.190	0.245	-
DP Groundwater	SVOCs	Total	2-Nitrophenol	N/A	N/A	ug/L	NV	6	6	-	0.0406	0.0524	-	0.190	0.245	-
DP Groundwater	SVOCs	Total	3,3'-Dichlorobenzidine	N/A	N/A	ug/L	4.5	9	9	-	0.178	0.229	0	0.950	1.22	0
DP Groundwater	SVOCs	Total	3-Nitroaniline	N/A	N/A	ug/L	NV	9	9	-	0.0537	0.0692	-	0.190	0.245	-
DP Groundwater	SVOCs	Total	4,6-Dinitro-2-methylphenol	N/A	N/A	ug/L	NV	6	6	-	0.294	0.379	-	0.950	1.22	-
DP Groundwater	SVOCs	Total	4-Bromophenyl Phenyl Ether	N/A	N/A	ug/L	1.5	9	9	-	0.0208	0.0268	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	4-Chloro-3-methylphenol	N/A	N/A	ug/L	NV	6	6	-	0.0232	0.0299	-	0.190	0.245	-
DP Groundwater	SVOCs	Total	4-Chloroaniline	N/A	N/A	ug/L	50	9	9	-	0.0687	0.0885	0	0.285	0.367	0
DP Groundwater	SVOCs	Total	4-Chlorophenyl Phenyl Ether	N/A	N/A	ug/L	NV	9	9	-	0.0306	0.0394	-	0.190	0.245	-
DP Groundwater	SVOCs	Total	4-Nitroaniline	N/A	N/A	ug/L	NV	9	9	-	0.0368	0.0475	-	0.190	0.245	-
DP Groundwater	SVOCs	Total	4-Nitrophenol	N/A	N/A	ug/L	150	6	6	-	0.112	0.144	0	0.950	1.22	0
DP Groundwater	SVOCs	Total	Acenaphthene	N/A	N/A	ug/L	55.85	9	4	5	0.00323	0.00356	0	0.0190	0.0245	0
DP Groundwater	SVOCs	Total	Acenaphthylene	N/A	N/A	ug/L	306.9	9	9	-	0.00228	0.00294	0	0.0190	0.0245	0
DP Groundwater	SVOCs	Total	Aniline	N/A	N/A	ug/L	2.2	9	9	-	0.0310	0.367	0	0.285	0.367	0
DP Groundwater	SVOCs	Total	Anthracene	N/A	N/A	ug/L	13	9	8	1	0.00180	0.00209	0	0.0190	0.0245	0
DP Groundwater	SVOCs	Total	Benzidine	N/A	N/A	ug/L	3.9	9	9	-	0.950	1.22	0	0.950	1.22	0
DP Groundwater	SVOCs	Total	Benzo(a)anthracene	N/A	N/A	ug/L	0.027	9	9	-	0.00494	0.00636	0	0.0190	0.0245	0
DP Groundwater	SVOCs	Total	Benzo(a)pyrene	N/A	N/A	ug/L	0.014	9	8	1	0.00313	0.00363	0	0.0190	0.0245	9
DP Groundwater	SVOCs	Total	Benzo(g,h,i)perylene	N/A	N/A	ug/L	0.4391	9	9	-	0.00484	0.00624	0	0.0190	0.0245	0
DP Groundwater	SVOCs	Total	Benzofluoranthenes, Total	N/A	N/A	ug/L	0.014	9	8	1	0.0113	0.0131	0	0.0950	0.122	9
DP Groundwater	SVOCs	Total	Benzoic Acid	N/A	N/A	ug/L	42	6	6	-	0.127	0.164	0	0.950	1.22	0
DP Groundwater	SVOCs	Total	Benzyl Alcohol	N/A	N/A	ug/L	8.6	7	5	2	0.0404	0.0520	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Bis(2-chloroethoxy)methane	N/A	N/A	ug/L	NV	9	9	-	0.0172	0.0222	-	0.190	0.245	-
DP Groundwater	SVOCs	Total	Bis(2-chloroethyl) Ether	N/A	N/A	ug/L	1,900	9	9	-	0.0308	0.0397	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Bis(2-chloroisopropyl) Ether	N/A	N/A	ug/L	NV	9	9	-	0.0407	0.0525	-	0.190	0.245	-
DP Groundwater	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	N/A	N/A	ug/L	3	9	8	1	0.362	0.466	0	1.42	1.84	0
DP Groundwater	SVOCs	Total	Butyl Benzyl Phthalate	N/A	N/A	ug/L	19	9	3	6	0.102	0.285	0	0.285	0.367	0
DP Groundwater	SVOCs	Total	Carbazole	N/A	N/A	ug/L	NV	9	9	-	0.0206	0.0266	-	0.190	0.245	-
DP Groundwater	SVOCs	Total	Chrysene	N/A	N/A	ug/L	2.042	9	9	-	0.00798	0.0103	0	0.0190	0.0245	0
DP Groundwater	SVOCs	Total	Dibenz(a,h)anthracene	N/A	N/A	ug/L	0.2825	9	8	1	0.00294	0.00341	0	0.0190	0.0245	0
DP Groundwater	SVOCs	Total	Dibenzofuran	N/A	N/A	ug/L	3.7	9	7	2	0.0195	0.0215	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Diethyl Phthalate	N/A	N/A	ug/L	210	9	9	-	0.0529	0.0682	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Dimethyl Phthalate	N/A	N/A	ug/L	3	9	9	-	0.0370	0.0477	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Di-n-butyl Phthalate	N/A	N/A	ug/L	35	9	3	5	0.190	0.608	0	0.190	0.608	0

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(16 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
DP Groundwater	SVOCs	Total	Di-n-octyl Phthalate	N/A	N/A	ug/L	708	9	9	-	0.0259	0.0334	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Fluoranthene	N/A	N/A	ug/L	6.16	9	8	-	0.00541	0.00626	0	0.0190	0.0220	0
DP Groundwater	SVOCs	Total	Fluorene	N/A	N/A	ug/L	3.9	9	3	5	0.00161	0.00178	0	0.0190	0.0221	0
DP Groundwater	SVOCs	Total	Hexachlorobenzene	N/A	N/A	ug/L	0.0003	9	9	-	0.0237	0.0306	9	0.190	0.245	9
DP Groundwater	SVOCs	Total	Hexachlorobutadiene	N/A	N/A	ug/L	9.3	9	9	-	0.0140	0.0180	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Hexachlorocyclopentadiene	N/A	N/A	ug/L	5.2	9	9	-	0.294	0.379	0	0.950	1.22	0
DP Groundwater	SVOCs	Total	Hexachloroethane	N/A	N/A	ug/L	540	9	9	-	0.0362	0.0466	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Indeno(1,2,3-cd)pyrene	N/A	N/A	ug/L	0.275	9	8	1	0.00266	0.00308	0	0.0190	0.0245	0
DP Groundwater	SVOCs	Total	Isophorone	N/A	N/A	ug/L	2,340	9	7	2	0.0278	0.0311	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Naphthalene	N/A	N/A	ug/L	193.5	9	5	4	0.0165	0.0191	0	0.0475	1.00	0
DP Groundwater	SVOCs	Total	Nitrobenzene	N/A	N/A	ug/L	540	9	9	-	0.0494	0.0636	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	N-Nitrosodimethylamine	N/A	N/A	ug/L	117	9	9	-	0.950	1.22	0	0.950	1.22	0
DP Groundwater	SVOCs	Total	N-Nitrosodi-n-propylamine	N/A	N/A	ug/L	117	9	9	-	0.0350	0.0452	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	N-Nitrosodiphenylamine	N/A	N/A	ug/L	210	9	9	-	0.00807	0.0104	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	p-cresol (4-Methylphenol)	N/A	N/A	ug/L	13	6	6	-	0.0419	0.0540	0	0.380	0.490	0
DP Groundwater	SVOCs	Total	Pentachlorophenol	N/A	N/A	ug/L	15	6	6	-	0.190	0.245	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Phenanthrene	N/A	N/A	ug/L	6.3	9	1	7	0.00351	0.00351	0	0.0190	0.0221	0
DP Groundwater	SVOCs	Total	Phenol	N/A	N/A	ug/L	110	8	3	5	0.00437	0.00563	0	0.190	0.245	0
DP Groundwater	SVOCs	Total	Pyrene	N/A	N/A	ug/L	10.11	9	6	2	0.00275	0.00319	0	0.0190	0.0220	0
DP Groundwater	SVOCs	Dissolved	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	110	8	8	-	0.0120	0.0139	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	1,2-Dichlorobenzene	N/A	N/A	ug/L	14	8	8	-	0.0272	0.0313	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	1,3-Dichlorobenzene	N/A	N/A	ug/L	71	8	8	-	0.0359	0.0413	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	1,4-Dichlorobenzene	N/A	N/A	ug/L	15	8	8	-	0.0310	0.0356	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	2,4,5-Trichlorophenol	N/A	N/A	ug/L	18	3	3	-	0.0457	0.0499	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	2,4,6-Trichlorophenol	N/A	N/A	ug/L	970	3	3	-	0.0331	0.0361	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	2,4-Dichlorophenol	N/A	N/A	ug/L	3,650	3	3	-	0.0192	0.0209	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	2,4-Dimethylphenol	N/A	N/A	ug/L	42	3	3	-	0.189	0.206	0	1.03	1.13	0
DP Groundwater	SVOCs	Dissolved	2,4-Dinitrophenol	N/A	N/A	ug/L	19	3	3	-	0.214	0.233	0	1.03	1.13	0
DP Groundwater	SVOCs	Dissolved	2,4-Dinitrotoluene	N/A	N/A	ug/L	230	8	8	-	0.0562	0.0646	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	2,6-Dinitrotoluene	N/A	N/A	ug/L	230	8	8	-	0.0372	0.0428	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	2-Chloronaphthalene	N/A	N/A	ug/L	32	8	8	-	0.00470	0.00541	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	2-Chlorophenol	N/A	N/A	ug/L	2,000	3	3	-	0.0434	0.0474	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	2-Methylnaphthalene	N/A	N/A	ug/L	72.16	8	2	4	0.0147	0.0168	0	0.0490	0.0563	0
DP Groundwater	SVOCs	Dissolved	2-Methylphenol	N/A	N/A	ug/L	13	3	3	-	0.0404	0.0440	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	2-Nitroaniline	N/A	N/A	ug/L	NV	8	8	-	0.0293	0.0337	-	0.196	0.225	-
DP Groundwater	SVOCs	Dissolved	2-Nitrophenol	N/A	N/A	ug/L	NV	3	3	-	0.0442	0.0482	-	0.206	0.225	-
DP Groundwater	SVOCs	Dissolved	3,3'-Dichlorobenzidine	N/A	N/A	ug/L	4.5	8	8	-	0.183	0.211	0	0.979	1.13	0
DP Groundwater	SVOCs	Dissolved	3-Nitroaniline	N/A	N/A	ug/L	NV	8	8	-	0.0553	0.0636	-	0.196	0.225	-
DP Groundwater	SVOCs	Dissolved	4,6-Dinitro-2-methylphenol	N/A	N/A	ug/L	NV	3	3	-	0.320	0.349	-	1.03	1.13	-
DP Groundwater	SVOCs	Dissolved	4-Bromophenyl Phenyl Ether	N/A	N/A	ug/L	1.5	8	8	-	0.0214	0.0247	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	4-Chloro-3-methylphenol	N/A	N/A	ug/L	NV	3	3	-	0.0252	0.0275	-	0.206	0.225	-
DP Groundwater	SVOCs	Dissolved	4-Chloroaniline	N/A	N/A	ug/L	50	8	8	-	0.0708	0.0814	0	0.294	0.338	0
DP Groundwater	SVOCs	Dissolved	4-Chlorophenyl Phenyl Ether	N/A	N/A	ug/L	NV	8	8	-	0.0315	0.0363	-	0.196	0.225	-
DP Groundwater	SVOCs	Dissolved	4-Nitroaniline	N/A	N/A	ug/L	NV	8	8	-	0.0380	0.0437	-	0.196	0.225	-
DP Groundwater	SVOCs	Dissolved	4-Nitrophenol	N/A	N/A	ug/L	150	3	3	-	0.122	0.133	0	1.03	1.13	0
DP Groundwater	SVOCs	Dissolved	Acenaphthene	N/A	N/A	ug/L	55.85	8	3	4	0.00333	0.00345	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Acenaphthylene	N/A	N/A	ug/L	306.9	8	7	1	0.00235	0.00270	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Anthracene	N/A	N/A	ug/L	13	8	8	-	0.00186	0.00214	0	0.0196	0.0225	0

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
(17 of 19)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
DP Groundwater	SVOCs	Dissolved	Benzidine	N/A	N/A	ug/L	3.9	8	8	-	0.979	1.13	0	0.979	1.13	0
DP Groundwater	SVOCs	Dissolved	Benzo(a)anthracene	N/A	N/A	ug/L	0.027	8	8	-	0.00509	0.00586	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Benzo(a)pyrene	N/A	N/A	ug/L	0.014	8	7	1	0.00323	0.00372	0	0.0196	0.0225	8
DP Groundwater	SVOCs	Dissolved	Benzo(g,h,i)perylene	N/A	N/A	ug/L	0.4391	8	8	-	0.00500	0.00574	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Benzofluoranthenes, Total	N/A	N/A	ug/L	0.014	8	8	-	0.0117	0.0134	0	0.0979	0.113	8
DP Groundwater	SVOCs	Dissolved	Benzoic Acid	N/A	N/A	ug/L	42	4	3	1	0.138	0.151	0	1.03	1.21	0
DP Groundwater	SVOCs	Dissolved	Benzyl Alcohol	N/A	N/A	ug/L	8.6	3	3	-	0.0439	0.0479	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	Bis(2-chloroethoxy)methane	N/A	N/A	ug/L	NV	8	8	-	0.0177	0.0204	-	0.196	0.225	-
DP Groundwater	SVOCs	Dissolved	Bis(2-chloroethyl) Ether	N/A	N/A	ug/L	1,900	8	8	-	0.0317	0.0365	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Bis(2-chloroisopropyl) Ether	N/A	N/A	ug/L	NV	8	8	-	0.0420	0.0483	-	0.196	0.225	-
DP Groundwater	SVOCs	Dissolved	Bis(2-ethylhexyl) Phthalate	N/A	N/A	ug/L	3	8	8	-	0.373	0.429	0	1.47	1.69	0
DP Groundwater	SVOCs	Dissolved	Butyl Benzyl Phthalate	N/A	N/A	ug/L	19	8	2	6	0.327	0.338	0	0.294	0.363	0
DP Groundwater	SVOCs	Dissolved	Carbazole	N/A	N/A	ug/L	NV	8	8	-	0.0213	0.0244	-	0.196	0.225	-
DP Groundwater	SVOCs	Dissolved	Chrysene	N/A	N/A	ug/L	2.042	8	8	-	0.00823	0.00946	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Dibenz(a,h)anthracene	N/A	N/A	ug/L	0.2825	8	7	1	0.00304	0.00349	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Dibenzofuran	N/A	N/A	ug/L	3.7	8	8	-	0.0201	0.0231	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Diethyl Phthalate	N/A	N/A	ug/L	210	8	5	3	0.0546	0.0584	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Dimethyl Phthalate	N/A	N/A	ug/L	3	8	8	-	0.0382	0.0439	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Di-n-butyl Phthalate	N/A	N/A	ug/L	35	8	2	6	0.218	0.275	0	0.196	0.275	0
DP Groundwater	SVOCs	Dissolved	Di-n-octyl Phthalate	N/A	N/A	ug/L	708	8	8	-	0.0267	0.0307	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Fluoranthene	N/A	N/A	ug/L	6.16	8	8	-	0.00558	0.00642	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Fluorene	N/A	N/A	ug/L	3.9	8	3	5	0.00167	0.00191	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Hexachlorobenzene	N/A	N/A	ug/L	0.0003	8	8	-	0.0245	0.0282	8	0.196	0.225	8
DP Groundwater	SVOCs	Dissolved	Hexachlorobutadiene	N/A	N/A	ug/L	9.3	8	8	-	0.0144	0.0166	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Hexachlorocyclopentadiene	N/A	N/A	ug/L	5.2	8	8	-	0.304	0.349	0	0.979	1.13	0
DP Groundwater	SVOCs	Dissolved	Hexachloroethane	N/A	N/A	ug/L	540	8	8	-	0.0373	0.0429	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Indeno(1,2,3-cd)pyrene	N/A	N/A	ug/L	0.275	8	7	1	0.00274	0.00315	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Isophorone	N/A	N/A	ug/L	2,340	8	6	2	0.0277	0.0297	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Naphthalene	N/A	N/A	ug/L	193.5	8	2	3	0.0190	0.0196	0	0.0502	0.0605	0
DP Groundwater	SVOCs	Dissolved	Nitrobenzene	N/A	N/A	ug/L	540	8	8	-	0.0509	0.0586	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	N-Nitrosodimethylamine	N/A	N/A	ug/L	117	8	8	-	0.979	1.13	0	0.979	1.13	0
DP Groundwater	SVOCs	Dissolved	N-Nitrosodi-n-propylamine	N/A	N/A	ug/L	117	8	8	-	0.0361	0.0416	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	N-Nitrosodiphenylamine	N/A	N/A	ug/L	210	8	8	-	0.00833	0.00957	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	p-cresol (4-Methylphenol)	N/A	N/A	ug/L	13	3	3	-	0.0455	0.0497	0	0.413	0.450	0
DP Groundwater	SVOCs	Dissolved	Pentachlorophenol	N/A	N/A	ug/L	15	3	3	-	0.206	0.225	0	0.206	0.225	0
DP Groundwater	SVOCs	Dissolved	Phenanthrene	N/A	N/A	ug/L	6.3	8	2	6	0.00403	0.00417	0	0.0196	0.0225	0
DP Groundwater	SVOCs	Dissolved	Phenol	N/A	N/A	ug/L	110	4	1	3	0.00483	0.00483	0	0.196	0.225	0
DP Groundwater	SVOCs	Dissolved	Pyrene	N/A	N/A	ug/L	10.11	8	8	-	0.00284	0.00327	0	0.0196	0.0225	0
DP Groundwater	VOCs	Total	1,1,1,2-Tetrachloroethane	N/A	N/A	ug/L	186	10	10	-	0.0528	0.0528	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,1,1-Trichloroethane (TCA)	N/A	N/A	ug/L	11	10	3	6	0.0477	0.0477	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,1,2,2-Tetrachloroethane	N/A	N/A	ug/L	2,400	10	10	-	0.0680	0.0680	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,1,2-Trichloroethane	N/A	N/A	ug/L	9,400	10	10	-	0.0627	0.0627	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,1-Dichloroethane	N/A	N/A	ug/L	47	10	5	4	0.0360	0.0360	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,1-Dichloroethene	N/A	N/A	ug/L	25	10	8	1	0.0595	0.0595	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,1-Dichloropropene	N/A	N/A	ug/L	NV	10	10	-	0.0695	0.0695	-	1.00	1.00	-
DP Groundwater	VOCs	Total	1,2,3-Trichlorobenzene	N/A	N/A	ug/L	8	10	10	-	0.0605	0.0605	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,2,3-Trichloropropane	N/A	N/A	ug/L	NV	10	10	-	0.123	0.123	-	1.00	1.00	-
DP Groundwater	VOCs	Total	1,2,4-Trichlorobenzene	N/A	N/A	ug/L	110	10	10	-	0.0513	1.00	0	1.00	1.00	0

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
DP Groundwater	VOCs	Total	1,2,4-Trimethylbenzene	N/A	N/A	ug/L	7.3	10	7	3	0.0283	0.0283	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,2-Dibromo-3-chloropropane	N/A	N/A	ug/L	NV	10	10	-	0.222	0.222	-	1.00	1.00	-
DP Groundwater	VOCs	Total	1,2-Dibromoethane (EDB)	N/A	N/A	ug/L	NV	10	10	-	0.0637	0.0637	-	1.00	1.00	-
DP Groundwater	VOCs	Total	1,2-Dichlorobenzene	N/A	N/A	ug/L	14	10	10	-	0.0383	0.0383	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,2-Dichloroethane (EDC)	N/A	N/A	ug/L	20,000	10	10	-	0.0533	0.0533	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,2-Dichloropropane	N/A	N/A	ug/L	5,700	10	10	-	0.0380	0.0380	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,3,5-Trimethylbenzene	N/A	N/A	ug/L	7.3	10	9	1	0.0249	0.0249	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,3-Dichlorobenzene	N/A	N/A	ug/L	71	10	10	-	0.0599	0.0599	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,3-Dichloropropane	N/A	N/A	ug/L	5,700	10	10	-	0.0738	0.0738	0	1.00	1.00	0
DP Groundwater	VOCs	Total	1,4-Dichlorobenzene	N/A	N/A	ug/L	15	10	10	-	0.0180	0.0180	0	1.00	1.00	0
DP Groundwater	VOCs	Total	2,2-Dichloropropane	N/A	N/A	ug/L	5,700	10	7	3	0.0487	0.0487	0	1.00	1.00	0
DP Groundwater	VOCs	Total	2-Butanone (MEK)	N/A	N/A	ug/L	14,000	10	10	-	1.71	1.71	0	5.00	5.00	0
DP Groundwater	VOCs	Total	2-Chlorotoluene	N/A	N/A	ug/L	NV	10	10	-	0.0857	0.0857	-	1.00	1.00	-
DP Groundwater	VOCs	Total	2-Hexanone	N/A	N/A	ug/L	99	10	10	-	0.993	0.993	0	5.00	5.00	0
DP Groundwater	VOCs	Total	4-Chlorotoluene	N/A	N/A	ug/L	NV	10	10	-	0.0491	0.0491	-	1.00	1.00	-
DP Groundwater	VOCs	Total	4-Isopropyltoluene	N/A	N/A	ug/L	NV	10	10	-	0.0397	0.0397	-	1.00	1.00	-
DP Groundwater	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	N/A	ug/L	170	10	10	-	0.309	0.309	0	5.00	5.00	0
DP Groundwater	VOCs	Total	Acetone	N/A	N/A	ug/L	1,500	10	7	3	1.20	1.20	0	5.00	5.00	0
DP Groundwater	VOCs	Total	Benzene	N/A	N/A	ug/L	130	10	4	6	0.0417	0.0417	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Bromobenzene	N/A	N/A	ug/L	NV	10	10	-	0.0475	0.0475	-	1.00	1.00	-
DP Groundwater	VOCs	Total	Bromochloromethane	N/A	N/A	ug/L	NV	10	10	-	0.0573	0.0573	-	1.00	1.00	-
DP Groundwater	VOCs	Total	Bromodichloromethane	N/A	N/A	ug/L	NV	10	10	-	0.0785	0.0785	-	1.00	1.00	-
DP Groundwater	VOCs	Total	Bromoform	N/A	N/A	ug/L	320	10	9	1	0.0830	0.0830	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Bromomethane	N/A	N/A	ug/L	16	10	10	-	0.0748	1.00	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Carbon Disulfide	N/A	N/A	ug/L	0.92	10	9	1	0.0494	1.00	4	1.00	1.00	10
DP Groundwater	VOCs	Total	Carbon Tetrachloride	N/A	N/A	ug/L	74	10	10	-	0.0970	0.0970	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Chlorobenzene	N/A	N/A	ug/L	50	10	10	-	0.0376	0.0376	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Chloroethane	N/A	N/A	ug/L	NV	10	10	-	0.187	0.187	-	1.00	1.00	-
DP Groundwater	VOCs	Total	Chloroform	N/A	N/A	ug/L	1,240	10	8	2	0.0717	0.0717	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Chloromethane	N/A	N/A	ug/L	NV	10	10	-	0.110	0.110	-	1.00	1.00	-
DP Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	N/A	ug/L	590	10	1	3	0.0433	0.0433	0	1.00	1.00	0
DP Groundwater	VOCs	Total	cis-1,3-Dichloropropene	N/A	N/A	ug/L	0.055	10	10	-	0.0301	0.0301	0	1.00	1.00	10
DP Groundwater	VOCs	Total	Dibromochloromethane	N/A	N/A	ug/L	NV	10	10	-	0.0539	0.0539	-	1.00	1.00	-
DP Groundwater	VOCs	Total	Dibromomethane	N/A	N/A	ug/L	NV	10	10	-	0.0864	0.0864	-	1.00	1.00	-
DP Groundwater	VOCs	Total	Dichlorodifluoromethane	N/A	N/A	ug/L	NV	10	10	-	0.0575	0.0575	-	1.00	1.00	-
DP Groundwater	VOCs	Total	Dichloromethane (Methylene Chloride)	N/A	N/A	ug/L	2,200	10	10	-	0.0752	1.00	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Ethylbenzene	N/A	N/A	ug/L	7.3	10	6	4	0.0226	1.00	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Hexachlorobutadiene	N/A	N/A	ug/L	9.3	10	10	-	0.152	0.152	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Isopropylbenzene	N/A	N/A	ug/L	7.3	10	9	1	0.0165	0.0165	0	1.00	1.00	0
DP Groundwater	VOCs	Total	m,p-Xylenes	N/A	N/A	ug/L	13	10	6	4	0.0718	0.0718	0	2.00	2.00	0
DP Groundwater	VOCs	Total	Naphthalene	N/A	N/A	ug/L	193.5	10	8	2	0.0317	1.00	0	1.00	1.00	0
DP Groundwater	VOCs	Total	n-Butylbenzene	N/A	N/A	ug/L	NV	10	10	-	0.0603	0.0603	-	1.00	1.00	-
DP Groundwater	VOCs	Total	n-Propylbenzene	N/A	N/A	ug/L	7.3	10	10	-	0.0356	0.0356	0	1.00	1.00	0
DP Groundwater	VOCs	Total	o-Xylene	N/A	N/A	ug/L	350	10	6	4	0.0265	0.0265	0	1.00	1.00	0
DP Groundwater	VOCs	Total	sec-Butylbenzene	N/A	N/A	ug/L	NV	10	10	-	0.0358	0.0358	-	1.00	1.00	-
DP Groundwater	VOCs	Total	Styrene	N/A	N/A	ug/L	72	10	10	-	0.0279	0.0279	0	1.00	1.00	0
DP Groundwater	VOCs	Total	tert-Butylbenzene	N/A	N/A	ug/L	NV	10	10	-	0.0535	0.0535	-	1.00	1.00	-
DP Groundwater	VOCs	Total	Tetrachloroethene (PCE)	N/A	N/A	ug/L	840	10	0	3	-	-	0	1.00	1.00	0

Table K-6
Ecological Data Sensitivity Analysis for Sandblast Area AOPC Samples
Bradford Island - Upland Operable Unit

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Sieve Size	Unit	Lowest Ecological SLV	Number of Samples	Number of Non-Detects (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
DP Groundwater	VOCs	Total	Toluene	N/A	N/A	ug/L	9.8	10	4	6	0.0588	1.00	0	1.00	1.00	0
DP Groundwater	VOCs	Total	trans-1,2-Dichloroethene	N/A	N/A	ug/L	590	10	7	1	0.0584	0.0584	0	1.00	1.00	0
DP Groundwater	VOCs	Total	trans-1,3-Dichloropropene	N/A	N/A	ug/L	0.055	10	10	-	0.0539	0.0539	0	1.00	1.00	10
DP Groundwater	VOCs	Total	Trichloroethene (TCE)	N/A	N/A	ug/L	3,000	10	1	5	0.0641	0.0641	0	1.00	1.00	0
DP Groundwater	VOCs	Total	Trichlorofluoromethane	N/A	N/A	ug/L	NV	10	10	-	0.0620	0.0620	-	1.00	1.00	-
DP Groundwater	VOCs	Total	Vinyl Acetate	N/A	N/A	ug/L	16	10	10	-	0.320	1.01	0	5.00	5.00	0
DP Groundwater	VOCs	Total	Vinyl Chloride	N/A	N/A	ug/L	1,300	10	8	2	0.0604	0.0604	0	1.00	1.00	0

Notes
(1) The SLV for Total LPAHs was used for the individual LPAHs.
(2) The SLV for Total HPAHs was used for the individual HPAHs.
The erodible soil subset is comprised of the following samples: SB-EUA, SB-EUB, SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, SB-EUB-15, and SB-04.
= The number of applicable MDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.
= When the number of applicable MRLs > SLV is higher than the number of applicable MDLs > SLV, they are highlited pink when the number of MDLs > SLV is zero or difference is more than 1.

DP = Direct Push
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = methode reporting limit
N/A = not applicable
ND = non-detect
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
NV = No value
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic carbon
VOC = volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter

Table K-7
Ecological Data Sensitivity Analysis for Pistol Range AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 1)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MRLs > SLV
Soil	Metals	Total	Antimony	0-1 ft	mg/kg	0.270	5	5	-	5.00	6.00	5	5.00	6.00	5
Soil	Metals	Total	Arsenic	0-1 ft	mg/kg	18.0	5	5	-	5.00	6.00	0	5.00	6.00	0
Soil	Metals	Total	Mercury	0-1 ft	mg/kg	0.066	14	14	-	0.0400	0.0600	0	0.0400	0.0600	0
DP Groundwater	Metals	Dissolved	Lead	N/A	ug/L	1.44	2	2	-	0.0200	0.0200	0	0.0200	0.0200	0
DP Groundwater	Metals	Dissolved	Nickel	N/A	ug/L	34	2	1	1	2.00	2.00	0	20.0	20.0	0

Notes

= The number of applicable MDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.

DP = Direct Push
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = methode reporting limit
N/A = not applicable
ND = non-detect
ug/L = micrograms per liter

Table K-8
Ecological Data Sensitivity Analysis for Bulb Slope AOPC Samples
Bradford Island - Upland Operable Unit
(1 of 1)

Medium	Analyte Group	Preparation Fraction	Analyte	Depth Category	Unit	Lowest Ecological SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of MDLs > SLV
Soil	PCB Aroclors	Total	Aroclor 1016	0-1 ft	ug/kg	371	12	12	-	19.0	67.0	0	19.0	67.0	0
Soil	PCB Aroclors	Total	Aroclor 1221	0-1 ft	ug/kg	371	12	12	-	38.0	134	0	38.0	134	0
Soil	PCB Aroclors	Total	Aroclor 1232	0-1 ft	ug/kg	371	12	12	-	19.0	67.0	0	19.0	67.0	0
Soil	PCB Aroclors	Total	Aroclor 1242	0-1 ft	ug/kg	371	12	12	-	19.0	67.0	0	19.0	67.0	0
Soil	PCB Aroclors	Total	Aroclor 1248	0-1 ft	ug/kg	371	12	12	-	19.0	67.0	0	19.0	67.0	0
Soil	PCB Aroclors	Total	Aroclor 1254	0-1 ft	ug/kg	371	12	12	-	19.0	67.0	0	19.0	67.0	0
Soil	PCB Aroclors	Total	Aroclor 1260	0-1 ft	ug/kg	371	12	4	-	19.0	67.0	0	19.0	67.0	0
Soil	PCB Aroclors	Total	Total PCBs as Aroclors (NDs at MDL)	0-1 ft	ug/kg	371	12	4	-	19.0	67.0	0	19.0	67.0	0

Notes
MDL = method detection limit
MRL = methode reporting limit
ND = non-detect
PCB = polychlorinated biphenyl
ug/kg = micrograms per kilogram

Table K-9
Human Health Data Sensativity Analysis for Pre-Sediment Removal Forebay Samples
Bradford Island - River Operable Unit
(1 of 1)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest HH SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	NV	5	0	4	-	-	-	31.0	44.0	-
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	NV	5	0	5	-	-	-	130	180	-
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	0.048	5	5	-	2.60	5.80	5	7.60	17.0	5
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	0.048	5	5	-	2.60	5.80	5	16.0	34.0	5
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	0.048	5	5	-	2.60	5.80	5	7.60	17.0	5
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	0.048	5	5	-	2.60	5.80	5	7.60	17.0	5
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	0.048	5	5	-	2.60	5.80	5	7.60	17.0	5
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	0.048	5	1	-	5.80	5.80	1	17.0	17.0	1
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	0.048	5	5	-	2.60	5.80	5	7.60	17.0	5
Sediment	PCB Aroclors	Total	Aroclor 1262	ug/kg	Dry	0.048	5	5	-	2.60	5.80	5	7.60	17.0	5
Sediment	PCB Aroclors	Total	Aroclor 1268	ug/kg	Dry	0.048	5	5	-	2.60	5.80	5	7.60	17.0	5
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Dry	0.048	5	1	-	11.6	11.6	1	34.0	34.0	1
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	NV	5	1	3	7.00	7.00	-	77.0	170	-
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	NV	5	4	1	3.20	3.20	-	7.70	17.0	-
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	NV	5	4	1	1.30	1.30	-	7.70	17.0	-
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	NV	5	0	5	-	-	-	16.0	34.0	-
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	NV	5	5	-	1.70	2.90	-	7.70	85.0	-
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	NV	5	3	1	2.90	4.70	-	8.40	17.0	-
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	62,000	5	5	-	1.40	2.40	0	7.70	17.0	0
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	62,000	5	4	1	1.40	14.0	0	8.40	78.0	0
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	62,000	5	5	-	1.10	1.90	0	7.70	17.0	0
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	62,000	5	0	4	-	-	0	8.10	17.0	0
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	47,000	5	0	5	-	-	0	7.70	17.0	0
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	47,000	5	2	2	2.60	16.0	0	8.40	78.0	0
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	47,000	5	0	4	-	-	0	8.10	17.0	0
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	47,000	5	0	5	-	-	0	7.70	17.0	0
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	47,000	5	0	5	-	-	0	7.70	17.0	0
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	47,000	5	0	4	-	-	0	8.10	17.0	0
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	47,000	5	3	2	1.50	1.50	0	7.70	17.0	0
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	62,000	5	0	3	-	-	0	8.20	17.0	0
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	47,000	5	0	5	-	-	0	7.70	17.0	0
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	47,000	5	0	4	-	-	0	8.10	17.0	0

Notes

= The number of applicable MDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.

Dry = Dry weight
HH = human health
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = methode reporting limit
ND = non-detect
NV = No value

NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
Wet = Wet Weight

Table K-10a
Human Health Data Sensativity Analysis for Random Forebay Samples
Bradford Island - River Operable Unit
(1 of 5)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest HH SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Surface Water	Metals	Dissolved	Aluminum	ug/L	Wet	37,000	5	5	-	20.0	50.0	0	50.0	50.0	0
Surface Water	Metals	Dissolved	Antimony	ug/L	Wet	5.60	5	5	-	7.00	50.0	5	50.0	50.0	5
Surface Water	Metals	Dissolved	Beryllium	ug/L	Wet	73.0	5	3	2	0.0200	0.0200	0	0.0200	0.0200	0
Surface Water	Metals	Dissolved	Cadmium	ug/L	Wet	18.0	5	3	2	7.00	8.00	0	20.0	20.0	5
Surface Water	Metals	Dissolved	Chromium	ug/L	Wet	55,000	5	5	-	2.00	2.00	0	5.00	5.00	0
Surface Water	Metals	Dissolved	Cobalt	ug/L	Wet	11.0	5	5	-	2.00	2.00	0	10.0	10.0	0
Surface Water	Metals	Dissolved	Lead	ug/L	Wet	15.0	5	2	1	0.00300	0.00900	0	0.0200	0.0200	0
Surface Water	Metals	Dissolved	Mercury	ug/L	Wet	11.0	5	5	-	0.0300	0.0300	0	0.200	0.200	0
Surface Water	Metals	Dissolved	Nickel	ug/L	Wet	610	5	5	-	2.00	2.00	0	20.0	20.0	0
Surface Water	Metals	Dissolved	Vanadium	ug/L	Wet	2.60	5	5	-	5.00	5.00	5	10.0	10.0	5
Surface Water	Metals	Dissolved	Zinc	ug/L	Wet	7,400	5	4	1	7.00	7.00	0	10.0	10.0	0
Surface Water	Metals	Total	Aluminum	ug/L	Wet	37,000	5	2	-	145	152	0	145	152	0
Surface Water	Metals	Total	Antimony	ug/L	Wet	5.60	5	5	-	7.00	50.0	5	50.0	50.0	5
Surface Water	Metals	Total	Beryllium	ug/L	Wet	73.0	5	3	2	0.0200	0.0200	0	0.0200	0.0200	0
Surface Water	Metals	Total	Cadmium	ug/L	Wet	18.0	5	0	5	-	-	0	0.0200	0.0200	0
Surface Water	Metals	Total	Chromium	ug/L	Wet	55,000	5	5	-	2.00	2.00	0	5.00	5.00	0
Surface Water	Metals	Total	Cobalt	ug/L	Wet	11.0	5	5	-	2.00	2.00	0	10.0	10.0	0
Surface Water	Metals	Total	Mercury	ug/L	Wet	11.0	5	5	-	0.0300	0.0300	0	0.200	0.200	0
Surface Water	Metals	Total	Nickel	ug/L	Wet	610	5	5	-	2.00	2.00	0	20.0	20.0	0
Surface Water	Metals	Total	Vanadium	ug/L	Wet	2.60	5	5	-	5.00	5.00	5	10.0	10.0	5
Surface Water	Metals	Total	Zinc	ug/L	Wet	7,400	5	5	-	7.00	7.00	0	10.0	10.0	0
Surface Water	NWTPH-Dx	Dissolved	Diesel Range Organics	ug/L	Wet	90.0	5	0	5	-	-	0	100	120	5
Surface Water	NWTPH-Dx	Dissolved	Residual Range Organics	ug/L	Wet	290	5	5	-	19.0	120	0	100	120	0
Surface Water	NWTPH-Dx	Total	Diesel Range Organics	ug/L	Wet	90.0	5	3	2	11.0	11.0	0	100	120	5
Surface Water	NWTPH-Dx	Total	Residual Range Organics	ug/L	Wet	290	5	5	-	19.0	120	0	100	120	0
Surface Water	SVOCs	Column	Acenaphthene	ng/L	Wet		5	0	0	-	-	0	-	-	0
Surface Water	SVOCs	Filter	Acenaphthene	ng/L	Wet	670,000	5	5	-	0.0150	0.0329	0	0.0150	0.0329	0
Surface Water	SVOCs	C+F	Acenaphthene	ng/L	Wet		5	-	-	0.0150	0.0329	0	0.0150	0.0329	0
Surface Water	SVOCs	Column	Anthracene	ng/L	Wet		5	5	-	0.0569	0.103	0	0.0569	0.103	0
Surface Water	SVOCs	Filter	Anthracene	ng/L	Wet	8,300,000	5	0	0	-	-	0	-	-	0
Surface Water	SVOCs	C+F	Anthracene	ng/L	Wet		5	-	-	0.0569	0.103	0	0.0569	0.103	0
Surface Water	SVOCs	Column	Benzo(a)anthracene	ng/L	Wet		5	2	-	0.00830	0.0116	0	0.0116	0.0116	0
Surface Water	SVOCs	Filter	Benzo(a)anthracene	ng/L	Wet	3.80	5	5	-	0.0288	0.0519	0	0.0288	0.0519	0
Surface Water	SVOCs	C+F	Benzo(a)anthracene	ng/L	Wet		5	-	-	0.0371	0.0635	0	0.0404	0.0635	0
Surface Water	SVOCs	Column	Benzo(a)pyrene	ng/L	Wet		5	5	-	0.0131	0.0269	0	0.0131	0.0269	0
Surface Water	SVOCs	Filter	Benzo(a)pyrene	ng/L	Wet	2.90	5	5	-	0.0221	0.0582	0	0.0221	0.0582	0
Surface Water	SVOCs	C+F	Benzo(a)pyrene	ng/L	Wet		5	-	-	0.0352	0.0851	0	0.0352	0.0851	0
Surface Water	SVOCs	Column	Benzo(b)fluoranthene	ng/L	Wet		5	5	-	0.00920	0.0182	0	0.0107	0.0182	0
Surface Water	SVOCs	Filter	Benzo(b)fluoranthene	ng/L	Wet	3.80	5	3	-	0.0333	0.0774	0	0.0333	0.0422	0
Surface Water	SVOCs	C+F	Benzo(b)fluoranthene	ng/L	Wet		5	-	-	0.0425	0.0956	0	0.0440	0.0604	0
Surface Water	SVOCs	Column	Benzo(g,h,i)perylene	ng/L	Wet		5	5	-	0.00980	0.0195	0	0.00980	0.0195	0
Surface Water	SVOCs	Filter	Benzo(g,h,i)perylene	ng/L	Wet	290	5	5	-	0.0241	0.0523	0	0.0041	0.0523	0
Surface Water	SVOCs	C+F	Benzo(g,h,i)perylene	ng/L	Wet		5	-	-	0.0339	0.0718	0	0.0339	0.0718	0

Table K-10a
Human Health Data Sensitivity Analysis for Random Forebay Samples
Bradford Island - River Operable Unit
(2 of 5)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest HH SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Surface Water	SVOCs	Column	Benzo(j,k)flouranthenes	ng/L	Wet		5	5	-	0.0100	0.0208	0	0.0100	0.0208	0
Surface Water	SVOCs	Filter	Benzo(j,k)flouranthenes	ng/L	Wet	3.80	5	5	-	0.0318	0.0497	0	0.0318	0.0497	0
Surface Water	SVOCs	C+F	Benzo(j,k)flouranthenes	ng/L	Wet		5	-	-	0.0418	0.0705	0	0.0418	0.0705	0
Surface Water	SVOCs	Column	Bis(2-ethylhexyl) Phthalate	ng/L	Wet		5	5	-	6.52	11.8	0	6.52	11.8	0
Surface Water	SVOCs	Filter	Bis(2-ethylhexyl) Phthalate	ng/L	Wet	1,200	5	5	-	3.41	4.63	0	3.41	4.63	0
Surface Water	SVOCs	C+F	Bis(2-ethylhexyl) Phthalate	ng/L	Wet		5	-	-	9.93	16.4	0	9.93	16.4	0
Surface Water	SVOCs	Column	Butyl Benzyl Phthalate	ng/L	Wet		5	5	-	0.260	2.29	0	0.260	2.29	0
Surface Water	SVOCs	Filter	Butyl Benzyl Phthalate	ng/L	Wet	35,000	5	5	-	0.150	0.198	0	0.150	0.198	0
Surface Water	SVOCs	C+F	Butyl Benzyl Phthalate	ng/L	Wet		5	-	-	0.410	2.49	0	0.410	2.49	0
Surface Water	SVOCs	Column	Chrysene	ng/L	Wet		5	0	0	-	-	0	-	-	0
Surface Water	SVOCs	Filter	Chrysene	ng/L	Wet	3.80	5	3	-	0.0626	0.0844	0	0.0626	0.0844	0
Surface Water	SVOCs	C+F	Chrysene	ng/L	Wet		5	-	-	0.0626	0.0844	0	0.0626	0.0844	0
Surface Water	SVOCs	Column	Dibenz(a,h)anthracene	ng/L	Wet		5	5	-	0.0107	0.0212	0	0.0107	0.0212	0
Surface Water	SVOCs	Filter	Dibenz(a,h)anthracene	ng/L	Wet	2.90	5	5	-	0.0187	0.0395	0	0.0187	0.0395	0
Surface Water	SVOCs	C+F	Dibenz(a,h)anthracene	ng/L	Wet		5	-	-	0.0294	0.0607	0	0.0294	0.0607	0
Surface Water	SVOCs	Column	Di-n-butyl Phthalate	ng/L	Wet		5	5	-	0.562	1.97	0	0.562	1.97	0
Surface Water	SVOCs	Filter	Di-n-butyl Phthalate	ng/L	Wet	2,000,000	5	5	-	0.200	0.303	0	0.200	0.303	0
Surface Water	SVOCs	C+F	Di-n-butyl Phthalate	ng/L	Wet		5	-	-	0.762	2.27	0	0.7620	2.27	0
Surface Water	SVOCs	Column	Di-n-octyl Phthalate	ng/L	Wet		5	5	-	0.110	0.852	0	0.110	0.852	0
Surface Water	SVOCs	Filter	Di-n-octyl Phthalate	ng/L	Wet	1,200	5	5	-	0.0960	0.249	0	0.0960	0.249	0
Surface Water	SVOCs	C+F	Di-n-octyl Phthalate	ng/L	Wet		5	-	-	0.206	1.10	0	0.206	1.10	0
Surface Water	SVOCs	Column	Fluoranthene	ng/L	Wet		5	5	-	0.516	0.572	0	0.516	0.572	0
Surface Water	SVOCs	Filter	Fluoranthene	ng/L	Wet	130,000	5	0	0	-	-	0	-	-	0
Surface Water	SVOCs	C+F	Fluoranthene	ng/L	Wet		5	-	-	0.516	0.572	0	0.516	0.572	0
Surface Water	SVOCs	Column	Indeno(1,2,3-cd)pyrene	ng/L	Wet		5	5	-	0.0101	0.0202	0	0.0101	0.0202	0
Surface Water	SVOCs	Filter	Indeno(1,2,3-cd)pyrene	ng/L	Wet	3.80	5	5	-	0.0293	0.0459	0	0.0293	0.0459	0
Surface Water	SVOCs	C+F	Indeno(1,2,3-cd)pyrene	ng/L	Wet		5	-	-	0.0394	0.0661	0	0.0394	0.0661	0
Surface Water	SVOCs	Column	Phenanthrene	ng/L	Wet		5	0	0	-	-	0	-	-	0
Surface Water	SVOCs	Filter	Phenanthrene	ng/L	Wet	8,300,000	5	4	-	0.0660	0.107	0	0.0660	0.107	0
Surface Water	SVOCs	C+F	Phenanthrene	ng/L	Wet		5	-	-	0.0660	0.107	0	0.0660	0.107	0
Sediment	Metals	Total	Antimony	mg/kg	Dry	0.427	19	1	2	0.0400	0.0400	0	0.0600	0.0600	0
Sediment	Metals	Total	Cadmium	mg/kg	Dry	0.674	19	2	-	0.115	0.121	0	0.115	0.121	0
Sediment	Metals	Total	Mercury	mg/kg	Dry	0.214	19	0	1	-	-	0	0.0200	0.0200	0
Sediment	Metals	Total	Thallium	mg/kg	Dry	0.354	19	4	-	0.108	0.132	0	0.108	0.132	0
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	NV	19	0	12	-	-	-	13.0	18.0	-
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	NV	19	7	12	130	180	-	130	200	-
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	0.0480	19	19	-	1.70	10.0	19	6.40	10.0	19
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	0.0480	19	19	-	1.70	29.0	19	13.0	29.0	19
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	0.0480	19	19	-	1.70	18.0	19	6.40	18.0	19
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	0.0480	19	19	-	1.70	5.70	19	6.40	10.0	19
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	0.0480	19	19	-	1.70	4.00	19	6.40	10.0	19
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	0.0480	19	17	1	1.70	2.60	17	6.40	10.0	18
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	0.0480	19	19	-	1.70	4.70	19	6.40	10.0	19
Sediment	PCB Aroclors	Total	Aroclor 1262	ug/kg	Dry	0.0480	19	19	-	1.70	1.70	19	6.40	10.0	19
Sediment	PCB Aroclors	Total	Aroclor 1268	ug/kg	Dry	0.0480	19	19	-	1.70	1.70	19	6.40	10.0	19

Table K-10a
Human Health Data Sensitivity Analysis for Random Forebay Samples
Bradford Island - River Operable Unit
(3 of 5)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest HH SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Dry	0.0480	19	17	-	3.40	8.10	17	12.8	20.0	17
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	NV	19	16	2	200	200	-	200	200	-
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	NV	19	19	-	1.50	10.0	-	9.80	10.0	-
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	NV	19	18	1	1.30	1.30	-	9.80	10.0	-
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	NV	19	19	-	9.80	19.0	-	9.80	19.0	-
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	NV	19	19	-	1.20	1.20	-	9.80	10.0	-
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	NV	19	13	3	2.90	2.90	-	9.80	10.0	-
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	62,000	19	19	-	1.00	1.00	0	9.80	10.0	0
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	62,000	19	14	5	1.40	1.40	0	9.80	10.0	0
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	62,000	19	19	-	1.70	1.70	0	9.80	10.0	0
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	62,000	19	5	14	1.30	1.30	0	9.80	10.0	0
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	47,000	19	7	11	1.40	1.40	0	9.80	10.0	0
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	47,000	19	8	11	1.60	1.60	0	9.80	10.0	0
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	47,000	19	10	9	2.50	2.50	0	9.80	10.0	0
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	47,000	19	10	9	2.30	2.30	0	9.80	10.0	0
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	47,000	19	14	5	2.50	2.50	0	9.80	10.0	0
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	47,000	19	3	14	1.40	1.40	0	9.80	10.0	0
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	47,000	19	19	-	2.20	2.20	0	9.80	10.0	0
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	62,000	19	4	13	2.20	2.20	0	9.80	10.0	0
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	47,000	19	10	9	1.90	1.90	0	9.80	10.0	0
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	47,000	19	3	13	1.30	1.30	0	9.80	10.0	0
Crayfish	Metals	Total	Antimony	mg/kg	Wet	NV	17	0	4	-	-	-	0.0120	0.0130	-
Crayfish	Metals	Total	Beryllium	mg/kg	Wet	NV	17	0	17	-	-	-	0.00420	0.00630	-
Crayfish	Metals	Total	Chromium	mg/kg	Wet	NV	17	0	1	-	-	-	0.3	0.3	-
Crayfish	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	0.570	17	17	-	2.40	2.40	17	9.60	10.0	17
Crayfish	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	0.570	17	17	-	2.60	2.60	17	20.0	20.0	17
Crayfish	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	0.570	17	17	-	2.30	2.30	17	9.60	10.0	17
Crayfish	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	0.570	17	17	-	2.20	2.20	17	9.60	10.0	17
Crayfish	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	0.570	17	17	-	0.510	0.510	0	9.60	10.0	17
Crayfish	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	0.570	17	17	-	1.80	19.0	17	9.60	19.0	17
Crayfish	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	0.570	17	17	-	1.90	17.0	17	9.60	17.0	17
Crayfish	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	0.570	17	17	-	2.50	10.0	17	9.60	10.0	17
Crayfish	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	0.570	17	17	-	2.00	2.00	17	9.60	10.0	17
Crayfish	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Wet	0.570	17	17	-	2.60	19.0	17	20.0	20.0	17
Crayfish	SVOCs	Total	Acenaphthene	ug/kg	Wet	15,000	15	8	7	0.110	0.110	0	0.460	0.500	0
Crayfish	SVOCs	Total	Anthracene	ug/kg	Wet	15,000	15	11	4	0.0650	0.0650	0	0.460	0.500	0
Crayfish	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	1.57	15	5	10	0.0660	0.0660	0	0.460	0.500	0
Crayfish	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	0.157	15	12	3	0.0810	0.0810	0	0.460	0.500	15
Crayfish	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	1.57	15	8	7	0.0700	0.0700	0	0.460	0.500	0
Crayfish	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	15.7	15	11	4	0.0730	0.0730	0	0.460	0.500	0
Crayfish	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	15.7	15	8	7	0.0560	0.0560	0	0.460	0.500	0
Crayfish	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	81.9	15	11	4	66.0	66.0	0	180	200	15
Crayfish	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	604	15	15	-	7.30	7.30	0	35.0	40.0	0
Crayfish	SVOCs	Total	Carbazole	ug/kg	Wet	NV	15	15	-	9.10	9.10	-	35.0	40.0	-
Crayfish	SVOCs	Total	Chrysene	ug/kg	Wet	157	15	7	8	0.0760	0.0760	0	0.460	0.500	0

Table K-10a
Human Health Data Sensativity Analysis for Random Forebay Samples
Bradford Island - River Operable Unit
(4 of 5)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest HH SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Crayfish	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	0.157	15	15	-	0.0590	0.0590	0	0.460	0.500	15
Crayfish	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	49,200	15	15	-	16.0	180	0	35.0	180	0
Crayfish	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	49,200	15	15	-	11.0	11.0	0	35.0	40.0	0
Crayfish	SVOCs	Total	Fluoranthene	ug/kg	Wet	20,000	15	0	12	-	-	0	0.460	0.500	0
Crayfish	SVOCs	Total	Fluorene	ug/kg	Wet	15,000	15	10	5	0.150	0.150	0	0.460	0.500	0
Crayfish	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	1.57	15	12	3	0.0640	0.0640	0	0.460	0.500	0
Crayfish	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	NV	15	15	-	7.70	7.70	-	35.0	40.0	-
Crayfish	SVOCs	Total	Phenanthrene	ug/kg	Wet	15,000	15	5	4	0.360	0.360	0	0.460	0.500	0
Crayfish	SVOCs	Total	Pyrene	ug/kg	Wet	15,000	15	0	14	-	-	0	0.460	0.500	0
Largescale Sucker	Metals	Total	Antimony	mg/kg	Wet	NV	1	1	-	0.00600	0.00600	-	0.0160	0.0160	-
Largescale Sucker	Metals	Total	Beryllium	mg/kg	Wet	NV	1	1	-	0.000600	0.000600	-	0.00640	0.00640	-
Largescale Sucker	Metals	Total	Thallium	mg/kg	Wet	NV	1	0	1	-	-	-	0.0064	0.0064	-
Largescale Sucker	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	0.570	1	1	-	2.40	2.40	1	10.0	10.0	1
Largescale Sucker	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	0.570	1	1	-	2.60	2.60	1	20.0	20.0	1
Largescale Sucker	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	0.570	1	1	-	2.30	2.30	1	10.0	10.0	1
Largescale Sucker	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	0.570	1	1	-	2.20	2.20	1	10.0	10.0	1
Largescale Sucker	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	0.570	1	1	-	0.510	0.510	0	10.0	10.0	1
Largescale Sucker	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	0.570	1	1	-	1.90	1.90	1	10.0	10.0	1
Largescale Sucker	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	0.570	1	1	-	2.00	2.00	1	10.0	10.0	1
Largescale Sucker	SVOCs	Total	Acenaphthene	ug/kg	Wet	15,000	1	1	-	1.10	1.10	0	4.60	4.60	0
Largescale Sucker	SVOCs	Total	Anthracene	ug/kg	Wet	15,000	1	0	1	-	-	0	4.60	4.60	0
Largescale Sucker	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	1.57	1	1	-	0.660	0.660	0	4.60	4.60	1
Largescale Sucker	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	1.57	1	1	-	0.700	0.700	0	4.60	4.60	1
Largescale Sucker	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	15.7	1	0	1	-	-	0	4.60	4.60	0
Largescale Sucker	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	81.9	1	1	-	66.0	66.0	0	180	180	1
Largescale Sucker	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	604	1	1	-	7.30	7.30	0	35.0	35.0	0
Largescale Sucker	SVOCs	Total	Carbazole	ug/kg	Wet	NV	1	1	-	9.10	9.10	-	35.0	35.0	-
Largescale Sucker	SVOCs	Total	Chrysene	ug/kg	Wet	157	1	1	-	0.760	0.760	0	4.60	4.60	0
Largescale Sucker	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	0.157	1	0	1	-	-	0	4.60	4.60	1
Largescale Sucker	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	49,200	1	1	-	16.0	16.0	0	35.0	35.0	0
Largescale Sucker	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	49,200	1	1	-	11.0	11.0	0	35.0	35.0	0
Largescale Sucker	SVOCs	Total	Fluorene	ug/kg	Wet	15,000	1	1	-	1.50	1.50	0	4.60	4.60	0
Largescale Sucker	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	NV	1	1	-	7.70	7.70	-	35.0	35.0	-
Largescale Sucker	SVOCs	Total	Phenanthrene	ug/kg	Wet	15,000	1	0	1	-	-	0	4.60	4.60	0
Smallmouth Bass	Metals	Total	Antimony	mg/kg	Wet	NV	19	19	-	0.00500	0.00600	-	0.0120	0.0150	-
Smallmouth Bass	Metals	Total	Beryllium	mg/kg	Wet	NV	19	15	4	0.000500	0.000600	-	0.00480	0.00590	-
Smallmouth Bass	Metals	Total	Cadmium	mg/kg	Wet	0.490	19	0	4	-	-	0	0.00500	0.00600	0
Smallmouth Bass	Metals	Total	Chromium	mg/kg	Wet	NV	19	14	2	0.120	0.150	-	0.240	0.300	-
Smallmouth Bass	Metals	Total	Lead	mg/kg	Wet	0.500	19	0	3	-	-	0	0.00500	0.00600	0
Smallmouth Bass	Metals	Total	Vanadium	mg/kg	Wet	NV	19	0	7	-	-	-	0.0500	0.0600	-
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	0.570	19	19	-	2.40	240	19	9.90	1,000	19
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	0.570	19	19	-	2.60	260	19	20.0	2,000	19
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	0.570	19	19	-	2.30	230	19	9.90	1,000	19
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	0.570	19	18	-	2.20	220	18	9.90	1,000	18
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	0.570	19	19	-	0.510	68.0	13	9.90	1,000	19

Table K-10a
Human Health Data Sensativity Analysis for Random Forebay Samples
Bradford Island - River Operable Unit
(5 of 5)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest HH SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	0.570	19	12	-	11.0	420	12	11.0	420	12
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	0.570	19	19	-	1.90	300	19	10.0	1,000	19
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	0.570	19	19	-	2.50	250	19	10.0	1,000	19
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	0.570	19	19	-	2.00	200	19	9.90	1,000	19
Smallmouth Bass	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Wet	0.570	19	12	-	17.7	424	12	21.0	430	12
Smallmouth Bass	SVOCs	Total	Acenaphthene	ug/kg	Wet	15,000	19	3	16	0.110	0.110	0	0.460	5.00	0
Smallmouth Bass	SVOCs	Total	Anthracene	ug/kg	Wet	15,000	19	1	14	0.0650	0.0650	0	0.460	2.50	0
Smallmouth Bass	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	1.57	19	14	-	0.0660	0.660	0	0.460	5.00	3
Smallmouth Bass	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	0.157	19	11	3	0.0810	0.0810	0	0.460	1.00	14
Smallmouth Bass	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	1.57	19	13	6	0.0700	0.140	0	0.460	5.00	5
Smallmouth Bass	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	15.7	19	13	6	0.0730	0.150	0	0.460	5.00	0
Smallmouth Bass	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	15.7	19	10	1	0.0560	0.0560	0	0.460	0.490	0
Smallmouth Bass	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	81.9	19	12	5	66.0	5,000	1	170	5,000	17
Smallmouth Bass	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	604	19	17	1	7.30	7.30	0	34.0	40.0	0
Smallmouth Bass	SVOCs	Total	Carbazole	ug/kg	Wet	NV	19	19	-	9.10	9.10	-	34.0	40.0	-
Smallmouth Bass	SVOCs	Total	Chrysene	ug/kg	Wet	157	19	11	7	0.0760	0.0760	0	0.460	5.00	0
Smallmouth Bass	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	0.157	19	13	6	0.0590	0.120	0	0.460	5.00	19
Smallmouth Bass	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	49,200	19	18	-	16.0	71.0	0	34.0	71.0	0
Smallmouth Bass	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	49,200	19	19	-	11.0	11.0	0	34.0	40.0	0
Smallmouth Bass	SVOCs	Total	Fluoranthene	ug/kg	Wet	20,000	19	9	2	0.0900	0.0900	0	0.460	1.00	0
Smallmouth Bass	SVOCs	Total	Fluorene	ug/kg	Wet	15,000	19	2	12	0.150	0.150	0	0.460	5.00	0
Smallmouth Bass	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	1.57	19	12	2	0.0640	0.130	0	0.460	1.00	0
Smallmouth Bass	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	NV	19	19	-	7.70	7.70	-	34.0	40.0	-
Smallmouth Bass	SVOCs	Total	Phenanthrene	ug/kg	Wet	15,000	19	0	3	-	-	0	1.00	4.80	0
Smallmouth Bass	SVOCs	Total	Pyrene	ug/kg	Wet	15,000	19	10	5	0.0980	0.490	0	0.460	2.50	0

Notes
For SVOCs: Although the column and filter fractions are screened, in addition to the totals, the SLVs are based on exposure to totals.
= The number of applicable MDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.
= When the number of applicable MRLs > SLV is higher than the number of applicable MDLs > SLV, they are highlited pink when the number of MDLs > SLV is zero or difference is more than 1.

HH = human health
C+F = Column + Filter (MDL+MDL)
Dry = Dry weight
MDL = method detection limit
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
MRL = methode reporting limit
ND = non-detect
ng/L = nanograms per liter
NV = No value

NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
Wet = Wet Weight
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table K-10b
Human Health PCB Congener Data Sensativity Analysis for Random Forebay Samples
Bradford Island - River Operable Unit
(1 of 2)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Lowest HH SLV	Number of Samples	Number of NDs below RDL	Number of EMPC Results	Minimum RDL of NDs	Maximum RDL of NDs	Number of Applicable RDLs > SLV	Minimum EMPC Value	Maximum EMPC Value	Number of EMPCs > SLV
Surface Water	Column	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	Wet		5	3	2	0.0290	0.0330	0	0.0480	0.0770	0
Surface Water	Filter	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	Wet	5,200	5	2	-	0.0310	0.0390	0	-	-	-
Surface Water	C+F	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	Wet		5	-	-	0.0640	0.0870	0	-	-	-
Surface Water	Column	81	3,4,4',5-Tetrachlorobiphenyl	pg/L	Wet		5	5	-	0.00590	0.00980	0	-	-	-
Surface Water	Filter	81	3,4,4',5-Tetrachlorobiphenyl	pg/L	Wet	5,200	5	5	-	0.00450	0.00840	0	-	-	-
Surface Water	C+F	81	3,4,4',5-Tetrachlorobiphenyl	pg/L	Wet		5	-	-	0.0111	0.0160	0	-	-	-
Surface Water	Column	114	2,3,4,4',5-Pentachlorobiphenyl	pg/L	Wet		5	5	-	0.00800	0.0150	0	-	-	-
Surface Water	Filter	114	2,3,4,4',5-Pentachlorobiphenyl	pg/L	Wet	100	5	5	-	0.0170	0.0250	0	-	-	-
Surface Water	C+F	114	2,3,4,4',5-Pentachlorobiphenyl	pg/L	Wet		5	-	-	0.0290	0.0360	0	-	-	-
Surface Water	Column	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/L	Wet		5	3	2	0.00370	0.00700	0	0.00900	0.0100	0
Surface Water	Filter	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/L	Wet	5,200	5	5	-	0.0130	0.0230	0	-	-	-
Surface Water	C+F	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/L	Wet		5	-	-	0.0200	0.0330	0	-	-	-
Surface Water	Column	126	3,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet		5	5	-	0.00420	0.00600	0	-	-	-
Surface Water	Filter	126	3,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	5.2	5	5	-	0.00410	0.0112	0	-	-	-
Surface Water	C+F	126	3,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet		5	-	-	0.00950	0.0154	0	-	-	-
Surface Water	Column	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	Wet		5	4	-	0.0230	0.0280	0	-	-	-
Surface Water	Filter	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	Wet	1,000	5	0	-	-	-	-	-	-	-
Surface Water	C+F	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	Wet		5	-	-	-	-	-	-	-	-
Surface Water	Column	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet		5	1	1	0.0140	0.0140	0	0.0110	0.0110	0
Surface Water	Filter	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	52,000	5	0	-	-	-	0	-	-	-
Surface Water	C+F	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet		5	-	-	-	-	0	-	-	-
Surface Water	Column	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet		5	5	-	0.00140	0.00290	0	-	-	-
Surface Water	Filter	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	52	5	5	-	0.00170	0.00880	0	-	-	-
Surface Water	C+F	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet		5	-	-	0.00420	0.0109	0	-	-	-
Surface Water	Column	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/L	Wet		5	5	-	0.00180	0.00400	0	-	-	-
Surface Water	Filter	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/L	Wet	5,200	5	3	1	0.00600	0.00800	0	0.0900	0.0900	0
Surface Water	C+F	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/L	Wet		5	-	-	0.00820	0.09250	0	-	-	-
Sediment	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Dry	2.10	19	15	4	0.0486	0.140	0	0.103	3.40	1
Sediment	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Dry	21.0	19	-	4	-	-	-	0.0580	1.71	0
Sediment	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Dry	26.0	19	2	6	0.158	0.201	0	0.0640	1.90	0
Sediment	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	0.00620	19	8	8	0.0479	2.69	8	0.123	0.296	8
Sediment	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Dry	26.0	19	1	-	0.935	0.935	0	-	-	-
Sediment	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	26.0	19	2	1	0.640	0.710	0	0.173	0.173	0
Sediment	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	0.0210	19	18	1	0.0454	0.879	18	0.161	0.161	1
Sediment	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Dry	140	19	2	8	0.0479	0.814	0	0.127	0.620	0
Crayfish	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	25.0	15	8	3	0.125	0.361	0	0.239	0.823	0
Crayfish	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	250	15	-	3	-	-	-	3.67	86.3	0
Crayfish	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	250	15	-	1	-	-	-	2.61	2.61	0
Crayfish	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	250	15	-	1	-	-	-	3.11	3.11	0
Crayfish	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	0.0760	15	8	-	0.397	3.51	8	-	-	-
Crayfish	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	0.250	15	15	-	0.167	2.95	12	-	-	-
Crayfish	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	250	15	-	3	-	-	-	1.09	1.62	0
Smallmouth Bass	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	25.0	19	2	-	6.15	23.1	0	-	-	-
Smallmouth Bass	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	0.0760	19	1	-	48.0	48.0	1	-	-	-
Smallmouth Bass	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	0.250	19	19	-	1.29	607	19	-	-	-

Table K-10b
Human Health PCB Congener Data Sensativity Analysis for Random Forebay Samples
Bradford Island - River Operable Unit
(2 of 2)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Lowest HH SLV	Number of Samples	Number of NDs below RDL	Number of EMPC Results	Minimum RDL of NDs	Maximum RDL of NDs	Number of Applicable RDLs > SLV	Minimum EMPC Value	Maximum EMPC Value	Number of EMPCs > SLV

Notes
For C+F RDL values, the values shown are the sum of the RDLs and/or EMPCs for the ND column and filter results.
= The number of applicable RDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.
= The number of applicable EMPCs > SLV are hightlighted pink when they represent more than 10% of the data, recognizing that this does not take into account spacial density.

HH = human health
C+F = Column + Filter (RDL/EMPC + RDL/EMPC)
Dry = Dry weight
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
ND = non-detect

PCB = polychlorinated biphenyl
pg/kg = picograms per kilogram
pg/L = picograms per liter
RDL = reported detection limit
SLV = screening level value
Wet = Wet Weight

Table K-11a
Human Health Data Sensitivity Analysis for Targeted Forebay Samples
Bradford Island - River Operable Unit
(1 of 3)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest HH SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Forebay - Eagle Creek															
Sediment	Metals	Total	Antimony	mg/kg	Dry	0.427	2	0	1	-	-	0	0.0500	0.0500	0
Sediment	Metals	Total	Cadmium	mg/kg	Dry	0.674	2	2	-	0.0750	0.131	0	0.0750	0.131	0
Sediment	Metals	Total	Mercury	mg/kg	Dry	0.214	2	0	1	-	-	0	0.016	0.016	0
Sediment	Metals	Total	Thallium	mg/kg	Dry	0.354	2	2	-	0.0560	0.156	0	0.0560	0.156	0
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	NV	2	0	2	-	-	-	15.0	15.0	-
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	NV	2	2	-	150	150	-	150	150	-
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	0.048	2	2	-	1.70	1.70	2	7.30	7.40	2
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	0.048	2	2	-	1.70	1.70	2	15.0	15.0	2
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	0.048	2	2	-	1.70	1.70	2	7.30	7.40	2
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	0.048	2	2	-	1.70	1.70	2	7.30	7.40	2
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	0.048	2	1	-	1.70	1.70	1	7.30	7.30	1
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	0.048	2	2	-	1.70	1.70	2	7.30	7.40	2
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	0.048	2	2	-	1.70	1.70	2	7.30	7.40	2
Sediment	PCB Aroclors	Total	Aroclor 1262	ug/kg	Dry	0.048	2	2	-	1.70	1.70	2	7.30	7.40	2
Sediment	PCB Aroclors	Total	Aroclor 1268	ug/kg	Dry	0.048	2	2	-	1.70	1.70	2	7.30	7.40	2
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Dry	0.048	2	1	-	3.40	3.40	1	14.6	14.6	1
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	NV	2	2	-	200	200	-	200	200	-
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	NV	2	2	-	9.90	9.90	-	9.90	9.90	-
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	NV	2	1	1	1.30	1.30	-	9.90	9.90	-
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	NV	2	2	-	9.90	11.0	-	9.90	11.0	-
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	NV	2	2	-	1.20	1.20	-	9.90	9.90	-
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	NV	2	2	-	2.90	2.90	-	9.90	9.90	-
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	62,000	2	2	-	1.00	1.00	0	9.90	9.90	0
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	62,000	2	1	1	1.40	1.40	0	9.90	9.90	0
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	62,000	2	2	-	1.70	1.70	0	9.90	9.90	0
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	62,000	2	0	2	-	-	0	9.90	9.90	0
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	47,000	2	1	1	1.40	1.40	0	9.90	9.90	0
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	47,000	2	1	1	1.60	1.60	0	9.90	9.90	0
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	47,000	2	1	-	2.50	2.50	0	9.90	9.90	0
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	47,000	2	1	1	2.30	2.30	0	9.90	9.90	0
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	47,000	2	1	1	2.50	2.50	0	9.90	9.90	0
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	47,000	2	0	1	-	-	0	9.90	9.90	0
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	47,000	2	2	-	2.20	2.20	0	9.90	9.90	0
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	62,000	2	1	-	2.20	2.20	0	9.90	9.90	0
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	47,000	2	1	1	1.90	1.90	0	9.90	9.90	0
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	47,000	2	0	1	-	-	0	9.90	9.90	0
Forebay - Goose Island															
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	NV	2	0	2	-	-	-	60.0	64.0	-
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	0.048	2	2	-	2.50	2.70	2	12.0	13.0	2
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	0.048	2	2	-	2.50	2.70	2	24.0	26.0	2
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	0.048	2	2	-	2.50	2.70	2	12.0	13.0	2
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	0.048	2	2	-	2.50	2.70	2	12.0	13.0	2
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	0.048	2	2	-	2.50	2.70	2	12.0	13.0	2
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	0.048	2	1	1	2.50	2.50	1	12.0	13.0	2

Table K-11a
Human Health Data Sensitivity Analysis for Targeted Forebay Samples
Bradford Island - River Operable Unit
(2 of 3)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest HH SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	0.048	2	2	-	2.50	2.70	2	12.0	13.0	2
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Dry	0.048	2	1	-	5.00	5.00	1	24.0	24.0	1
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	NV	2	0	2	-	-	-	120	130	-
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	NV	2	2	-	1.80	1.90	-	12.0	13.0	-
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	NV	2	2	-	1.60	1.70	-	12.0	13.0	-
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	NV	2	0	2	-	-	-	12.0	13.0	-
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	NV	2	2	-	1.50	1.60	-	12.0	13.0	-
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	NV	2	1	1	3.70	3.70	-	12.0	13.0	-
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	62,000	2	2	-	1.20	1.30	0	12.0	13.0	0
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	62,000	2	2	-	1.70	1.80	0	12.0	13.0	0
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	62,000	2	2	-	2.10	2.20	0	12.0	13.0	0
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	62,000	2	0	2	-	-	0	12.0	13.0	0
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	47,000	2	0	2	-	-	0	12.0	13.0	0
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	47,000	2	0	1	-	-	0	12.0	12.0	0
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	47,000	2	0	1	-	-	0	12.0	12.0	0
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	47,000	2	0	2	-	-	0	12.0	13.0	0
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	47,000	2	1	1	3.00	3.00	0	12.0	13.0	0
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	47,000	2	0	2	-	-	0	12.0	13.0	0
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	47,000	2	2	-	2.70	2.80	0	12.0	13.0	0
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	62,000	2	0	2	-	-	0	12.0	13.0	0
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	47,000	2	0	2	-	-	0	12.0	13.0	0
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	47,000	2	0	2	-	-	0	12.0	13.0	0
Crayfish	Metals	Total	Antimony	mg/kg	Wet	NV	1	0	1	-	-	-	0.0120	0.0120	-
Crayfish	Metals	Total	Beryllium	mg/kg	Wet	NV	1	0	1	-	-	-	0.00500	0.00500	-
Crayfish	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	0.570	1	1	-	2.40	2.40	1	9.50	9.50	1
Crayfish	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	0.570	1	1	-	2.60	2.60	1	9.50	9.50	1
Crayfish	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	0.570	1	1	-	2.30	2.30	1	9.50	9.50	1
Crayfish	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	0.570	1	1	-	2.20	2.20	1	9.50	9.50	1
Crayfish	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	0.570	1	1	-	0.510	0.510	0	9.50	9.50	1
Crayfish	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	0.570	1	1	-	1.80	1.80	1	9.50	9.50	1
Crayfish	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	0.570	1	1	-	1.90	1.90	1	9.50	9.50	1
Crayfish	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	0.570	1	1	-	2.50	2.50	1	9.50	9.50	1
Crayfish	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	0.570	1	1	-	2.00	2.00	1	9.50	9.50	1
Crayfish	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Wet	0.570	1	1	-	2.60	2.60	1	9.50	9.50	1
Crayfish	SVOCs	Total	Acenaphthene	ug/kg	Wet	15,000	1	1	-	0.500	0.500	0	0.500	0.500	0
Crayfish	SVOCs	Total	Anthracene	ug/kg	Wet	15,000	1	0	1	-	-	0	0.500	0.500	0
Crayfish	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	1.57	1	1	-	0.500	0.500	0	0.500	0.500	0
Crayfish	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	0.157	1	1	-	0.0610	0.0610	0	0.500	0.500	1
Crayfish	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	1.57	1	0	1	-	-	0	0.500	0.500	0
Crayfish	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	15.7	1	0	1	-	-	0	0.500	0.500	0
Crayfish	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	15.7	1	0	1	-	-	0	0.500	0.500	0
Crayfish	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	81.9	1	1	-	66.0	66.0	0	200	200	1
Crayfish	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	604	1	1	-	7.30	7.30	0	39.0	39.0	0
Crayfish	SVOCs	Total	Carbazole	ug/kg	Wet	NV	1	1	-	7.70	7.70	-	39.0	39.0	-
Crayfish	SVOCs	Total	Chrysene	ug/kg	Wet	157	1	1	-	0.200	0.200	0	0.500	0.500	0

Table K-11a
Human Health Data Sensitivity Analysis for Targeted Forebay Samples
Bradford Island - River Operable Unit
(3 of 3)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest HH SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Crayfish	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	0.157	1	1	-	0.0450	0.0450	0	0.500	0.500	1
Crayfish	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	49,200	1	1	-	140	140	0	140	140	0
Crayfish	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	49,200	1	1	-	11.0	11.0	0	39.0	39.0	0
Crayfish	SVOCs	Total	Fluoranthene	ug/kg	Wet	20,000	1	1	-	0.500	0.500	0	0.500	0.500	0
Crayfish	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	1.57	1	0	1	-	-	0	0.500	0.500	0
Crayfish	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	NV	1	1	-	11.0	11.0	-	39.0	39.0	-
Crayfish	SVOCs	Total	Pyrene	ug/kg	Wet	15,000	1	1	-	0.500	0.500	0	0.500	0.500	0

Notes

= The number of applicable MDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.

= When the number of applicable MRLs > SLV is higher than the number of applicable MDLs > SLV, they are highlited pink when the number of MDLs > SLV is zero or difference is more than 1.

HH = human health
Dry = Dry weight
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = methode reporting limit
ND = non-detect
NV = No value
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
Wet = Wet Weight

Table K-11b
Human Health PCB Congener Data Sensativity Analysis for Targeted Forebay Samples
Bradford Island - River Operable Unit
(1 of 1)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Lowest HH SLV	Number of Samples	Number of NDs below RDL	Number of EMPC Results	Minimum RDL of NDs	Maximum RDL of NDs	Number of Applicable RDLs > SLV	Minimum EMPC Value	Maximum EMPC Value	Number of EMPCs > SLV
Sediment	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Dry	2.10	2	-	1	-	-	-	0.150	0.150	0
Sediment	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Dry	26.0	2	-	1	-	-	-	0.970	0.970	0
Sediment	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	0.00620	2	-	2	-	-	-	0.255	0.419	2
Sediment	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	0.021	2	2	-	0.241	0.250	2	-	-	-
Crayfish	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	25.0	1	1	-	0.145	0.145	0	-	-	-
Crayfish	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	0.0760	1	-	1	-	-	-	0.261	0.261	1
Crayfish	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	0.250	1	1	-	0.164	0.164	0	-	-	-

Notes

= The number of applicable RDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.
= The number of applicable EMPCs > SLV are hightlighted pink when they represent more than 10% of the data, recognizing that this does not take into account spacial density.

HH = human health
Dry = Dry weight
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
ND = non-detect
PCB = polychlorinated biphenyl
pg/kg = picograms per kilogram
RDL = reported detection limit
SLV = screening level value
Wet = Wet Weight

Table K-12a
Human Health Data Sensativity Analysis for Downstream Samples
Bradford Island - River Operable Unit
(1 of 1)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest HH SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Sediment	Metals	Total	Thallium	mg/kg	Dry	0.354	6	1	-	0.130	0.130	0	0.130	0.130	0
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	NV	6	0	4	-	-	-	14.0	15.0	-
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	NV	6	5	1	140	180	-	140	180	-
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	0.048	6	6	-	1.70	1.70	6	7.00	8.80	6
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	0.048	6	6	-	1.70	1.70	6	14.0	18.0	6
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	0.048	6	6	-	1.70	1.70	6	7.00	8.80	6
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	0.048	6	6	-	1.70	1.70	6	7.00	8.80	6
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	0.048	6	6	-	1.70	1.70	6	7.00	8.80	6
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	0.048	6	6	-	1.70	1.70	6	7.00	8.80	6
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	0.048	6	6	-	1.70	1.70	6	7.00	8.80	6
Sediment	PCB Aroclors	Total	Aroclor 1262	ug/kg	Dry	0.048	6	6	-	1.70	1.70	6	7.00	8.80	6
Sediment	PCB Aroclors	Total	Aroclor 1268	ug/kg	Dry	0.048	6	6	-	1.70	1.70	6	7.00	8.80	6
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Dry	0.048	6	6	-	1.70	1.70	6	14.00	18.00	6
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	NV	6	6	-	200	200	-	200	200	-
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	NV	6	6	-	1.50	9.90	-	9.70	10.0	-
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	NV	6	5	1	1.30	1.30	-	9.70	10.0	-
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	NV	6	6	-	9.80	14.0	-	9.80	14.0	-
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	NV	6	6	-	1.20	1.20	-	9.70	10.0	-
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	NV	6	4	1	2.90	2.90	-	9.70	10.0	-
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	62,000	6	6	-	1.00	1.00	0	9.70	10.0	0
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	62,000	6	3	3	1.40	1.40	0	9.70	10.0	0
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	62,000	6	6	-	1.70	1.70	0	9.70	10.0	0
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	62,000	6	2	4	1.30	1.30	0	9.70	10.0	0
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	47,000	6	0	5	-	-	0	9.70	10.0	0
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	47,000	6	1	3	1.60	1.60	0	9.70	9.90	0
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	47,000	6	2	3	2.50	2.50	0	9.70	10.0	0
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	47,000	6	3	3	2.30	2.30	0	9.70	10.0	0
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	47,000	6	4	2	2.50	2.50	0	9.70	10.0	0
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	47,000	6	1	4	1.40	1.40	0	9.70	10.0	0
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	47,000	6	5	1	2.20	2.20	0	9.70	10.0	0
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	62,000	6	1	3	2.20	2.20	0	9.70	9.90	0
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	47,000	6	3	3	1.90	1.90	0	9.70	10.0	0
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	47,000	6	0	4	-	-	0	9.70	9.90	0

Notes

= The number of applicable MDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.

HH = human health
Dry = Dry weight
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = methode reporting limit
ND = non-detect
NV = No value

NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram

Table K-12b
Human Health PCB Congener Data Sensativity Analysis for Downstream Samples
Bradford Island - River Operable Unit
(1 of 1)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Lowest HH SLV	Number of Samples	Number of NDs below RDL	Number of EMPC Results	Minimum RDL of NDs	Maximum RDL of NDs	Number of Applicable RDLs > SLV	Minimum EMPC Value	Maximum EMPC Value	Number of EMPCs > SLV
Sediment	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Dry	6.40	6	-	2	-	-	-	0.259	0.531	0
Sediment	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Dry	2.10	6	5	-	0.0492	0.100	0	-	-	-
Sediment	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Dry	21.0	6	1	-	0.0976	0.0976	0	-	-	-
Sediment	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Dry	26.0	6	-	1	-	-	-	0.168	0.168	0
Sediment	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	0.00620	6	5	-	0.0787	0.171	5	-	-	-
Sediment	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Dry	26.0	6	-	2	-	-	-	0.604	1.39	0
Sediment	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	0.0210	6	6	-	0.0630	0.154	6	-	-	-
Sediment	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Dry	140	6	1	1	0.0733	0.0733	0	0.115	0.115	0

Notes

= The number of applicable RDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.

HH = human health
Dry = Dry weight
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
ND = non-detect
PCB = polychlorinated biphenyl
pg/kg = picograms per kilogram
RDL = reported detection limit
SLV = screening level value

Table K-13
Ecological Data Sensitivity Analysis for Pre-Sediment Removal Forebay Samples
Bradford Island - River Operable Unit
(1 of 2)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	NV	5	0	4	-	-	-	31.0	44.0	-
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	NV	5	0	5	-	-	-	130	180	-
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	1.80	5	5	-	2.60	5.80	5	7.60	17.0	5
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	1.80	5	5	-	2.60	5.80	5	16.0	34.0	5
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	1.80	5	5	-	2.60	5.80	5	7.60	17.0	5
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	1.80	5	5	-	2.60	5.80	5	7.60	17.0	5
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	1.80	5	5	-	2.60	5.80	5	7.60	17.0	5
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	1.80	5	1	-	5.80	5.80	1	17.0	17.0	1
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	1.80	5	5	-	2.60	5.80	5	7.60	17.0	5
Sediment	PCB Aroclors	Total	Aroclor 1262	ug/kg	Dry	1.80	5	5	-	2.60	5.80	5	7.60	17.0	5
Sediment	PCB Aroclors	Total	Aroclor 1268	ug/kg	Dry	1.80	5	5	-	2.60	5.80	5	7.60	17.0	5
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Dry	1.80	5	1	-	11.6	11.6	1	34.0	34.0	1
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	750	5	1	3	7.00	7.00	0	77.0	170	0
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	110	5	4	1	3.20	3.20	0	7.70	17.0	0
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	140	5	4	1	1.30	1.30	0	7.70	17.0	0
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	110	5	0	5	-	-	0	16.0	34.0	0
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	110	5	5	-	1.70	2.90	0	7.70	85.0	0
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	48.0	5	3	1	2.90	4.70	0	8.40	17.0	0
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	290	5	5	-	1.40	2.40	0	7.70	17.0	0
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	57.0	5	4	1	1.40	14.0	0	8.40	78.0	1
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	77.0	5	5	-	1.10	1.90	0	7.70	17.0	0
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	42.0	5	0	4	-	-	0	8.10	17.0	0
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	32.0	5	0	5	-	-	0	7.70	17.0	0
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	32.0	5	2	2	2.60	16.0	0	8.40	78.0	1
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	27.0	5	0	4	-	-	0	8.10	17.0	0
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	300	5	0	5	-	-	0	7.70	17.0	0
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	27.0	5	0	5	-	-	0	7.70	17.0	0
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	57.0	5	0	4	-	-	0	8.10	17.0	0
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	33.0	5	3	2	1.50	1.50	0	7.70	17.0	0
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	111	5	0	3	-	-	0	8.20	17.0	0
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	17.0	5	0	5	-	-	0	7.70	17.0	0
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	53.0	5	0	4	-	-	0	8.10	17.0	0
Clam	Metals	Total	Antimony	mg/kg	Wet	NV	4	4	-	0.00500	0.00500	-	0.0120	0.0130	-
Clam	Metals	Total	Beryllium	mg/kg	Wet	NV	4	0	2	-	-	-	0.0049	0.005	-
Clam	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	35.0	4	4	-	2.40	4.70	0	9.80	20.0	0
Clam	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	35.0	4	4	-	2.60	5.10	0	20.0	40.0	1
Clam	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	35.0	4	4	-	2.30	4.50	0	9.80	20.0	0
Clam	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	35.0	4	4	-	2.20	4.40	0	9.80	20.0	0
Clam	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	35.0	4	4	-	0.510	1.00	0	9.80	20.0	0
Clam	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	35.0	4	4	-	1.90	3.80	0	9.80	20.0	0
Clam	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	35.0	4	4	-	2.00	4.00	0	9.80	20.0	0
Clam	SVOCs	Total	Acenaphthene	ug/kg	Wet	19,000	3	0	3	-	-	0	0.490	0.500	0
Clam	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	1,000	3	3	-	0.0810	0.0810	0	0.490	0.500	0
Clam	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	1,000	3	3	-	0.0700	0.0700	0	0.490	0.500	0
Clam	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	1,000	3	3	-	0.0730	0.0730	0	0.490	0.500	0

Table K-13
Ecological Data Sensativity Analysis for Pre-Sediment Removal Forebay Samples
Bradford Island - River Operable Unit
(2 of 2)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Clam	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	1,000	3	3	-	0.0560	0.0560	0	0.490	0.500	0
Clam	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	1,760	3	3	-	66.0	66.0	0	170	200	0
Clam	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	310	3	3	-	7.30	7.30	0	34.0	40.0	0
Clam	SVOCs	Total	Carbazole	ug/kg	Wet	NV	3	3	-	9.10	9.10	-	34.0	40.0	-
Clam	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	1,000	3	3	-	0.0590	0.0590	0	0.490	0.500	0
Clam	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	626	3	1	-	16.0	16.0	0	34.0	34.0	0
Clam	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	626	3	3	-	11.0	11.0	0	34.0	40.0	0
Clam	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	1,000	3	3	-	0.0640	0.0640	0	0.490	0.500	0
Clam	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	NV	3	3	-	7.70	7.70	-	34.0	40.0	-

Notes

= The number of applicable MDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.

= When the number of applicable MRLs > SLV is higher than the number of applicable MDLs > SLV, they are highlited pink when the number of MDLs > SLV is zero or difference is more than 1.

Eco = Ecological
Dry = Dry weight
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = methode reporting limit
ND = non-detect
NV = No value
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
Wet = Wet Weight

Table K-14a
Ecological Data Sensitivity Analysis for Random Forebay Samples
Bradford Island - River Operable Unit
(1 of 6)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Surface Water	Metals	Dissolved	Aluminum	ug/L	Wet	87	5	5	-	20.0	50.0	0	50.0	50.0	0
Surface Water	Metals	Dissolved	Antimony	ug/L	Wet	1,000	5	5	-	7.00	50.0	0	50.0	50.0	0
Surface Water	Metals	Dissolved	Beryllium	ug/L	Wet	5.3	5	3	2	0.0200	0.0200	0	0.0200	0.0200	0
Surface Water	Metals	Dissolved	Cadmium	ug/L	Wet	0.17	5	3	2	7.00	8.00	3	20.0	20.0	5
Surface Water	Metals	Dissolved	Chromium	ug/L	Wet	49	5	5	-	2.00	2.00	0	5.00	5.00	0
Surface Water	Metals	Dissolved	Cobalt	ug/L	Wet	23	5	5	-	2.00	2.00	0	10.0	10.0	0
Surface Water	Metals	Dissolved	Lead	ug/L	Wet	1.44	5	2	1	0.00300	0.00900	0	0.0200	0.0200	0
Surface Water	Metals	Dissolved	Mercury	ug/L	Wet	0.77	5	5	-	0.0300	0.0300	0	0.200	0.200	0
Surface Water	Metals	Dissolved	Nickel	ug/L	Wet	34	5	5	-	2.00	2.00	0	20.0	20.0	0
Surface Water	Metals	Dissolved	Vanadium	ug/L	Wet	20	5	5	-	5.00	5.00	0	10.0	10.0	0
Surface Water	Metals	Dissolved	Zinc	ug/L	Wet	77	5	4	1	7.00	7.00	0	10.0	10.0	0
Surface Water	Metals	Total	Aluminum	ug/L	Wet	87	5	2	-	145	152	2	145	152	2
Surface Water	Metals	Total	Antimony	ug/L	Wet	1,000	5	5	-	7.00	50.0	0	50.0	50.0	0
Surface Water	Metals	Total	Beryllium	ug/L	Wet	5.3	5	3	2	0.0200	0.0200	0	0.0200	0.0200	0
Surface Water	Metals	Total	Cadmium	ug/L	Wet	0.17	5	0	5	-	-	0	0.0200	0.0200	0
Surface Water	Metals	Total	Chromium	ug/L	Wet	49	5	5	-	2.00	2.00	0	5.00	5.00	0
Surface Water	Metals	Total	Cobalt	ug/L	Wet	23	5	5	-	2.00	2.00	0	10.0	10.0	0
Surface Water	Metals	Total	Mercury	ug/L	Wet	0.77	5	5	-	0.0300	0.0300	0	0.200	0.200	0
Surface Water	Metals	Total	Nickel	ug/L	Wet	34	5	5	-	2.00	2.00	0	20.0	20.0	0
Surface Water	Metals	Total	Vanadium	ug/L	Wet	20	5	5	-	5.00	5.00	0	10.0	10.0	0
Surface Water	Metals	Total	Zinc	ug/L	Wet	77	5	5	-	7.00	7.00	0	10.0	10.0	0
Surface Water	NWTPH-Dx	Dissolved	Diesel Range Organics	ug/L	Wet	NV	5	0	5	-	-	-	100	120	-
Surface Water	NWTPH-Dx	Dissolved	Residual Range Organics	ug/L	Wet	NV	5	5	-	19.0	120	-	100	120	-
Surface Water	NWTPH-Dx	Total	Diesel Range Organics	ug/L	Wet	NV	5	3	2	11.0	11.0	-	100	120	-
Surface Water	NWTPH-Dx	Total	Residual Range Organics	ug/L	Wet	NV	5	5	-	19.0	120	-	100	120	-
Surface Water	SVOCs	Column	Acenaphthene	ng/L	Wet		5	0	0	-	-	0	-	-	0
Surface Water	SVOCs	Filter	Acenaphthene	ng/L	Wet	55,850	5	5	-	0.0150	0.0329	0	0.0150	0.0329	0
Surface Water	SVOCs	C+F	Acenaphthene	ng/L	Wet		5	-	-	0.0150	0.0329	0	0.0150	0.0329	0
Surface Water	SVOCs	Column	Anthracene	ng/L	Wet		5	5	-	0.0569	0.103	0	0.0569	0.103	0
Surface Water	SVOCs	Filter	Anthracene	ng/L	Wet	13,000	5	0	0	-	-	0	-	-	0
Surface Water	SVOCs	C+F	Anthracene	ng/L	Wet		5	-	-	0.0569	0.103	0	0.0569	0.103	0
Surface Water	SVOCs	Column	Benzo(a)anthracene	ng/L	Wet		5	2	-	0.00830	0.0116	0	0.0116	0.0116	0
Surface Water	SVOCs	Filter	Benzo(a)anthracene	ng/L	Wet	27.0	5	5	-	0.0288	0.0519	0	0.0288	0.0519	0
Surface Water	SVOCs	C+F	Benzo(a)anthracene	ng/L	Wet		5	-	-	0.0371	0.0635	0	0.0404	0.0635	0
Surface Water	SVOCs	Column	Benzo(a)pyrene	ng/L	Wet		5	5	-	0.0131	0.0269	0	0.0131	0.0269	0
Surface Water	SVOCs	Filter	Benzo(a)pyrene	ng/L	Wet	14.0	5	5	-	0.0221	0.0582	0	0.0221	0.0582	0
Surface Water	SVOCs	C+F	Benzo(a)pyrene	ng/L	Wet		5	-	-	0.0352	0.0851	0	0.0352	0.0851	0
Surface Water	SVOCs	Column	Benzo(b)fluoranthene	ng/L	Wet		5	5	-	0.00920	0.0182	0	0.0107	0.0182	0
Surface Water	SVOCs	Filter	Benzo(b)fluoranthene	ng/L	Wet	677.4	5	3	-	0.0333	0.0774	0	0.0333	0.0422	0
Surface Water	SVOCs	C+F	Benzo(b)fluoranthene	ng/L	Wet		5	-	-	0.0425	0.0956	0	0.0440	0.0604	0
Surface Water	SVOCs	Column	Benzo(g,h,i)perylene	ng/L	Wet		5	5	-	0.00980	0.0195	0	0.00980	0.0195	0
Surface Water	SVOCs	Filter	Benzo(g,h,i)perylene	ng/L	Wet	439.1	5	5	-	0.0241	0.0523	0	0.0041	0.0523	0
Surface Water	SVOCs	C+F	Benzo(g,h,i)perylene	ng/L	Wet		5	-	-	0.0339	0.0718	0	0.0339	0.0718	0

Table K-14a
Ecological Data Sensitivity Analysis for Random Forebay Samples
Bradford Island - River Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Surface Water	SVOCs	Column	Benzo(j,k)flouranthenes	ng/L	Wet		5	5	-	0.0100	0.0208	0	0.0100	0.0208	0
Surface Water	SVOCs	Filter	Benzo(j,k)flouranthenes	ng/L	Wet	14.0	5	5	-	0.0318	0.0497	0	0.0318	0.0497	0
Surface Water	SVOCs	C+F	Benzo(j,k)flouranthenes	ng/L	Wet		5	-	-	0.0418	0.0705	0	0.0418	0.0705	0
Surface Water	SVOCs	Column	Bis(2-ethylhexyl) Phthalate	ng/L	Wet		5	5	-	6.52	11.8	0	6.52	11.8	0
Surface Water	SVOCs	Filter	Bis(2-ethylhexyl) Phthalate	ng/L	Wet	3,000	5	5	-	3.41	4.63	0	3.41	4.63	0
Surface Water	SVOCs	C+F	Bis(2-ethylhexyl) Phthalate	ng/L	Wet		5	-	-	9.93	16.4	0	9.93	16.4	0
Surface Water	SVOCs	Column	Butyl Benzyl Phthalate	ng/L	Wet		5	5	-	0.260	2.29	0	0.260	2.29	0
Surface Water	SVOCs	Filter	Butyl Benzyl Phthalate	ng/L	Wet	19,000	5	5	-	0.150	0.198	0	0.150	0.198	0
Surface Water	SVOCs	C+F	Butyl Benzyl Phthalate	ng/L	Wet		5	-	-	0.410	2.49	0	0.410	2.49	0
Surface Water	SVOCs	Column	Chrysene	ng/L	Wet		5	0	0	-	-	0	-	-	0
Surface Water	SVOCs	Filter	Chrysene	ng/L	Wet	2,042	5	3	-	0.0626	0.0844	0	0.0626	0.0844	0
Surface Water	SVOCs	C+F	Chrysene	ng/L	Wet		5	-	-	0.0626	0.0844	0	0.0626	0.0844	0
Surface Water	SVOCs	Column	Dibenz(a,h)anthracene	ng/L	Wet		5	5	-	0.0107	0.0212	0	0.0107	0.0212	0
Surface Water	SVOCs	Filter	Dibenz(a,h)anthracene	ng/L	Wet	282.5	5	5	-	0.0187	0.0395	0	0.0187	0.0395	0
Surface Water	SVOCs	C+F	Dibenz(a,h)anthracene	ng/L	Wet		5	-	-	0.0294	0.0607	0	0.0294	0.0607	0
Surface Water	SVOCs	Column	Di-n-butyl Phthalate	ng/L	Wet		5	5	-	0.562	1.97	0	0.562	1.97	0
Surface Water	SVOCs	Filter	Di-n-butyl Phthalate	ng/L	Wet	35,000	5	5	-	0.200	0.303	0	0.200	0.303	0
Surface Water	SVOCs	C+F	Di-n-butyl Phthalate	ng/L	Wet		5	-	-	0.762	2.27	0	0.7620	2.27	0
Surface Water	SVOCs	Column	Di-n-octyl Phthalate	ng/L	Wet		5	5	-	0.110	0.852	0	0.110	0.852	0
Surface Water	SVOCs	Filter	Di-n-octyl Phthalate	ng/L	Wet	708,000	5	5	-	0.0960	0.249	0	0.0960	0.249	0
Surface Water	SVOCs	C+F	Di-n-octyl Phthalate	ng/L	Wet		5	-	-	0.206	1.10	0	0.206	1.10	0
Surface Water	SVOCs	Column	Fluoranthene	ng/L	Wet		5	5	-	0.516	0.572	0	0.516	0.572	0
Surface Water	SVOCs	Filter	Fluoranthene	ng/L	Wet	6,160	5	0	0	-	-	0	-	-	0
Surface Water	SVOCs	C+F	Fluoranthene	ng/L	Wet		5	-	-	0.516	0.572	0	0.516	0.572	0
Surface Water	SVOCs	Column	Indeno(1,2,3-cd)pyrene	ng/L	Wet		5	5	-	0.0101	0.0202	0	0.0101	0.0202	0
Surface Water	SVOCs	Filter	Indeno(1,2,3-cd)pyrene	ng/L	Wet	275	5	5	-	0.0293	0.0459	0	0.0293	0.0459	0
Surface Water	SVOCs	C+F	Indeno(1,2,3-cd)pyrene	ng/L	Wet		5	-	-	0.0394	0.0661	0	0.0394	0.0661	0
Surface Water	SVOCs	Column	Phenanthrene	ng/L	Wet		5	0	0	-	-	0	-	-	0
Surface Water	SVOCs	Filter	Phenanthrene	ng/L	Wet	6,300	5	4	-	0.0660	0.107	0	0.0660	0.107	0
Surface Water	SVOCs	C+F	Phenanthrene	ng/L	Wet		5	-	-	0.0660	0.107	0	0.0660	0.107	0
Sediment	Metals	Total	Antimony	mg/kg	Dry	3.00	19	1	2	0.0400	0.0400	0	0.0600	0.0600	0
Sediment	Metals	Total	Cadmium	mg/kg	Dry	0.674	19	2	-	0.115	0.121	0	0.115	0.121	0
Sediment	Metals	Total	Mercury	mg/kg	Dry	0.214	19	0	1	-	-	0	0.0200	0.0200	0
Sediment	Metals	Total	Thallium	mg/kg	Dry	0.354	19	4	-	0.108	0.132	0	0.108	0.132	0
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	NV	19	0	12	-	-	-	13.0	18.0	-
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	NV	19	7	12	130	180	-	130	200	-
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	1.80	19	19	-	1.70	10.0	2	6.40	10.0	19
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	1.80	19	19	-	1.70	29.0	7	13.0	29.0	19
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	1.80	19	19	-	1.70	18.0	7	6.40	18.0	19
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	1.80	19	19	-	1.70	5.70	5	6.40	10.0	19
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	1.80	19	19	-	1.70	4.00	4	6.40	10.0	19
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	1.80	19	17	1	1.70	2.60	5	6.40	10.0	18
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	1.80	19	19	-	1.70	4.70	1	6.40	10.0	19
Sediment	PCB Aroclors	Total	Aroclor 1262	ug/kg	Dry	1.80	19	19	-	1.70	1.70	0	6.40	10.0	19
Sediment	PCB Aroclors	Total	Aroclor 1268	ug/kg	Dry	1.80	19	19	-	1.70	1.70	0	6.40	10.0	19

Table K-14a
Ecological Data Sensitivity Analysis for Random Forebay Samples
Bradford Island - River Operable Unit
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Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Dry	1.80	19	17	-	3.40	8.10	17	12.8	20.0	17
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	750	19	16	2	200	200	0	200	200	0
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	110	19	19	-	1.50	10.0	0	9.80	10.0	0
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	140	19	18	1	1.30	1.30	0	9.80	10.0	0
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	110	19	19	-	9.80	19.0	0	9.80	19.0	0
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	110	19	19	-	1.20	1.20	0	9.80	10.0	0
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	48.0	19	13	3	2.90	2.90	0	9.80	10.0	0
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	290	19	19	-	1.00	1.00	0	9.80	10.0	0
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	57.0	19	14	5	1.40	1.40	0	9.80	10.0	0
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	77.0	19	19	-	1.70	1.70	0	9.80	10.0	0
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	42.0	19	5	14	1.30	1.30	0	9.80	10.0	0
Sediment	SVOCs	Total	Total LPAHs (KM, capped)	ug/kg	Dry	76.0	19	5	-	5.40	5.40	0	39.2	40.0	0
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	32.0	19	7	11	1.40	1.40	0	9.80	10.0	0
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	32.0	19	8	11	1.60	1.60	0	9.80	10.0	0
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	27.0	19	10	9	2.50	2.50	0	9.80	10.0	0
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	300	19	10	9	2.30	2.30	0	9.80	10.0	0
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	27.0	19	14	5	2.50	2.50	0	9.80	10.0	0
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	57.0	19	3	14	1.40	1.40	0	9.80	10.0	0
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	33.0	19	19	-	2.20	2.20	0	9.80	10.0	0
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	111	19	4	13	2.20	2.20	0	9.80	10.0	0
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	17.0	19	10	9	1.90	1.90	0	9.80	10.0	0
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	53.0	19	3	13	1.30	1.30	0	9.80	10.0	0
Sediment	SVOCs	Total	Total HPAHs (KM, capped)	ug/kg	Dry	193	19	3	-	19.3	19.3	0	98.0	99.0	0
Sediment	SVOCs	Total	Total PAHs (KM, capped)	ug/kg	Dry	1,600	19	3	-	24.7	24.7	0	137	139	0
Crayfish	Metals	Total	Antimony	mg/kg	Wet	NV	17	0	4	-	-	-	0.0120	0.0130	-
Crayfish	Metals	Total	Beryllium	mg/kg	Wet	NV	17	0	17	-	-	-	0.00420	0.00630	-
Crayfish	Metals	Total	Chromium	mg/kg	Wet	NV	17	0	1	-	-	-	0.3	0.3	-
Crayfish	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	35.0	17	17	-	2.40	2.40	0	9.60	10.0	0
Crayfish	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	35.0	17	17	-	2.60	2.60	0	20.0	20.0	0
Crayfish	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	35.0	17	17	-	2.30	2.30	0	9.60	10.0	0
Crayfish	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	35.0	17	17	-	2.20	2.20	0	9.60	10.0	0
Crayfish	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	35.0	17	17	-	0.510	0.510	0	9.60	10.0	0
Crayfish	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	35.0	17	17	-	1.80	19.0	0	9.60	19.0	0
Crayfish	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	35.0	17	17	-	1.90	17.0	0	9.60	17.0	0
Crayfish	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	35.0	17	17	-	2.50	10.0	0	9.60	10.0	0
Crayfish	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	35.0	17	17	-	2.00	2.00	0	9.60	10.0	0
Crayfish	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Wet	35.0	17	17	-	2.60	19.0	0	20.0	20.0	0
Crayfish	SVOCs	Total	Acenaphthene	ug/kg	Wet	19,000	15	8	7	0.110	0.110	0	0.460	0.500	0
Crayfish	SVOCs	Total	Anthracene	ug/kg	Wet	19,000	15	11	4	0.0650	0.0650	0	0.460	0.500	0
Crayfish	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	1,000	15	5	10	0.0660	0.0660	0	0.460	0.500	0
Crayfish	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	1,000	15	12	3	0.0810	0.0810	0	0.460	0.500	0
Crayfish	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	1,000	15	8	7	0.0700	0.0700	0	0.460	0.500	0
Crayfish	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	1,000	15	11	4	0.0730	0.0730	0	0.460	0.500	0
Crayfish	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	1,000	15	8	7	0.0560	0.0560	0	0.460	0.500	0
Crayfish	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	1,760	15	11	4	66.0	66.0	0	180	200	0

Table K-14a
Ecological Data Sensitivity Analysis for Random Forebay Samples
Bradford Island - River Operable Unit
(4 of 6)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Crayfish	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	310	15	15	-	7.30	7.30	0	35.0	40.0	0
Crayfish	SVOCs	Total	Carbazole	ug/kg	Wet	NV	15	15	-	9.10	9.10	-	35.0	40.0	-
Crayfish	SVOCs	Total	Chrysene	ug/kg	Wet	1,000	15	7	8	0.0760	0.0760	0	0.460	0.500	0
Crayfish	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	1,000	15	15	-	0.0590	0.0590	0	0.460	0.500	0
Crayfish	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	626	15	15	-	16.0	180	0	35.0	180	0
Crayfish	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	626	15	15	-	11.0	11.0	0	35.0	40.0	0
Crayfish	SVOCs	Total	Fluoranthene	ug/kg	Wet	19,000	15	0	12	-	-	0	0.460	0.500	0
Crayfish	SVOCs	Total	Fluorene	ug/kg	Wet	19,000	15	10	5	0.150	0.150	0	0.460	0.500	0
Crayfish	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	1,000	15	12	3	0.0640	0.0640	0	0.460	0.500	0
Crayfish	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	NV	15	15	-	7.70	7.70	-	35.0	40.0	-
Crayfish	SVOCs	Total	Phenanthrene	ug/kg	Wet	19,000	15	5	4	0.360	0.360	0	0.460	0.500	0
Crayfish	SVOCs	Total	Pyrene	ug/kg	Wet	1,000	15	0	14	-	-	0	0.460	0.500	0
Largescale Sucker	Metals	Total	Antimony	mg/kg	Wet	NV	1	1	-	0.00600	0.00600	-	0.0160	0.0160	-
Largescale Sucker	Metals	Total	Beryllium	mg/kg	Wet	NV	1	1	-	0.000600	0.000600	-	0.00640	0.00640	-
Largescale Sucker	Metals	Total	Thallium	mg/kg	Wet	NV	1	0	1	-	-	-	0.0064	0.0064	-
Largescale Sucker	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	35.0	1	1	-	2.40	2.40	0	10.0	10.0	0
Largescale Sucker	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	35.0	1	1	-	2.60	2.60	0	20.0	20.0	0
Largescale Sucker	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	35.0	1	1	-	2.30	2.30	0	10.0	10.0	0
Largescale Sucker	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	35.0	1	1	-	2.20	2.20	0	10.0	10.0	0
Largescale Sucker	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	35.0	1	1	-	0.510	0.510	0	10.0	10.0	0
Largescale Sucker	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	35.0	1	1	-	1.90	1.90	0	10.0	10.0	0
Largescale Sucker	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	35.0	1	1	-	2.00	2.00	0	10.0	10.0	0
Largescale Sucker	SVOCs	Total	Acenaphthene	ug/kg	Wet	19,000	1	1	-	1.10	1.10	0	4.60	4.60	0
Largescale Sucker	SVOCs	Total	Anthracene	ug/kg	Wet	19,000	1	0	1	-	-	0	4.60	4.60	0
Largescale Sucker	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	1,000	1	1	-	0.660	0.660	0	4.60	4.60	0
Largescale Sucker	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	1,000	1	1	-	0.700	0.700	0	4.60	4.60	0
Largescale Sucker	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	1,000	1	0	1	-	-	0	4.60	4.60	0
Largescale Sucker	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	1,760	1	1	-	66.0	66.0	0	180	180	0
Largescale Sucker	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	310	1	1	-	7.30	7.30	0	35.0	35.0	0
Largescale Sucker	SVOCs	Total	Carbazole	ug/kg	Wet	NV	1	1	-	9.10	9.10	-	35.0	35.0	-
Largescale Sucker	SVOCs	Total	Chrysene	ug/kg	Wet	1,000	1	1	-	0.760	0.760	0	4.60	4.60	0
Largescale Sucker	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	1,000	1	0	1	-	-	0	4.60	4.60	0
Largescale Sucker	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	626	1	1	-	16.0	16.0	0	35.0	35.0	0
Largescale Sucker	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	626	1	1	-	11.0	11.0	0	35.0	35.0	0
Largescale Sucker	SVOCs	Total	Fluorene	ug/kg	Wet	19,000	1	1	-	1.50	1.50	0	4.60	4.60	0
Largescale Sucker	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	NV	1	1	-	7.70	7.70	-	35.0	35.0	-
Largescale Sucker	SVOCs	Total	Phenanthrene	ug/kg	Wet	19,000	1	0	1	-	-	0	4.60	4.60	0
Smallmouth Bass	Metals	Total	Antimony	mg/kg	Wet	NV	19	19	-	0.00500	0.00600	-	0.0120	0.0150	-
Smallmouth Bass	Metals	Total	Beryllium	mg/kg	Wet	NV	19	15	4	0.000500	0.000600	-	0.00480	0.00590	-
Smallmouth Bass	Metals	Total	Cadmium	mg/kg	Wet	0.150	19	0	4	-	-	0	0.00500	0.00600	0
Smallmouth Bass	Metals	Total	Chromium	mg/kg	Wet	NV	19	14	2	0.120	0.150	-	0.240	0.300	-
Smallmouth Bass	Metals	Total	Lead	mg/kg	Wet	0.120	19	0	3	-	-	0	0.00500	0.00600	0
Smallmouth Bass	Metals	Total	Vanadium	mg/kg	Wet	NV	19	0	7	-	-	-	0.0500	0.0600	-
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	35.0	19	19	-	2.40	240	3	9.90	1,000	6
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	35.0	19	19	-	2.60	260	2	20.0	2,000	5

Table K-14a
Ecological Data Sensitivity Analysis for Random Forebay Samples
Bradford Island - River Operable Unit
(5 of 6)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	35.0	19	19	-	2.30	230	2	9.90	1,000	5
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	35.0	19	18	-	2.20	220	2	9.90	1,000	5
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	35.0	19	19	-	0.510	68.0	3	9.90	1,000	7
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	35.0	19	12	-	11.0	420	7	11.0	420	7
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	35.0	19	19	-	1.90	300	11	10.0	1,000	14
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	35.0	19	19	-	2.50	250	6	10.0	1,000	9
Smallmouth Bass	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	35.0	19	19	-	2.00	200	2	9.90	1,000	5
Smallmouth Bass	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Wet	35.0	19	12	-	17.7	424	7	21.0	430	8
Smallmouth Bass	SVOCs	Total	Acenaphthene	ug/kg	Wet	19,000	19	3	16	0.110	0.110	0	0.460	5.00	0
Smallmouth Bass	SVOCs	Total	Anthracene	ug/kg	Wet	19,000	19	1	14	0.0650	0.0650	0	0.460	2.50	0
Smallmouth Bass	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	1,000	19	14	-	0.0660	0.660	0	0.460	5.00	0
Smallmouth Bass	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	1,000	19	11	3	0.0810	0.0810	0	0.460	1.00	0
Smallmouth Bass	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	1,000	19	13	6	0.0700	0.140	0	0.460	5.00	0
Smallmouth Bass	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	1,000	19	13	6	0.0730	0.150	0	0.460	5.00	0
Smallmouth Bass	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	1,000	19	10	1	0.0560	0.0560	0	0.460	0.490	0
Smallmouth Bass	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	1,760	19	12	5	66.0	5,000	1	170	5,000	1
Smallmouth Bass	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	310	19	17	1	7.30	7.30	0	34.0	40.0	0
Smallmouth Bass	SVOCs	Total	Carbazole	ug/kg	Wet	NV	19	19	-	9.10	9.10	-	34.0	40.0	-
Smallmouth Bass	SVOCs	Total	Chrysene	ug/kg	Wet	1,000	19	11	7	0.0760	0.0760	0	0.460	5.00	0
Smallmouth Bass	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	1,000	19	13	6	0.0590	0.120	0	0.460	5.00	0
Smallmouth Bass	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	626	19	18	-	16.0	71.0	0	34.0	71.0	0
Smallmouth Bass	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	626	19	19	-	11.0	11.0	0	34.0	40.0	0
Smallmouth Bass	SVOCs	Total	Fluoranthene	ug/kg	Wet	19,000	19	9	2	0.0900	0.0900	0	0.460	1.00	0
Smallmouth Bass	SVOCs	Total	Fluorene	ug/kg	Wet	19,000	19	2	12	0.150	0.150	0	0.460	5.00	0
Smallmouth Bass	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	1,000	19	12	2	0.0640	0.130	0	0.460	1.00	0
Smallmouth Bass	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	NV	19	19	-	7.70	7.70	-	34.0	40.0	-
Smallmouth Bass	SVOCs	Total	Phenanthrene	ug/kg	Wet	19,000	19	0	3	-	-	0	1.00	4.80	0
Smallmouth Bass	SVOCs	Total	Pyrene	ug/kg	Wet	1,000	19	10	5	0.0980	0.490	0	0.460	2.50	0
Sculpin	Metals	Total	Lead	mg/kg	Wet	0.120	17	1	-	0.0214	0.0214	0	0.0214	0.0214	0
Sculpin	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	35.0	17	17	-	2.40	14.0	0	9.20	50.0	2
Sculpin	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	35.0	17	17	-	2.60	69.0	1	19.0	99.0	3
Sculpin	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	35.0	17	17	-	2.30	62.0	2	9.20	62.0	3
Sculpin	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	35.0	17	17	-	2.20	35.0	0	9.20	50.0	2
Sculpin	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	35.0	17	17	-	0.510	13.0	0	9.20	50.0	2
Sculpin	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	35.0	17	14	-	13.0	130	3	13.0	130	5
Sculpin	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	35.0	17	17	-	1.90	82.0	3	9.20	82.0	4
Sculpin	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	35.0	17	17	-	2.50	13.0	0	9.20	50.0	2
Sculpin	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	35.0	17	17	-	2.00	10.0	0	9.20	50.0	2
Sculpin	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Wet	35.0	17	14	-	13.0	130	3	13.0	130	4
Clam	Metals	Total	Antimony	mg/kg	Wet	NV	19	14	5	0.00200	0.00500	-	0.00700	0.0120	-
Clam	Metals	Total	Beryllium	mg/kg	Wet	NV	19	0	19	-	-	-	0.00280	0.00460	-
Clam	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	35.0	19	19	-	2.40	23.0	0	9.80	23.0	0
Clam	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	35.0	19	19	-	2.60	20.0	0	20.0	20.0	0
Clam	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	35.0	19	19	-	2.30	40.0	2	9.80	40.0	2
Clam	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	35.0	19	19	-	2.20	48.0	1	9.80	48.0	1

Table K-14a
Ecological Data Sensitivity Analysis for Random Forebay Samples
Bradford Island - River Operable Unit
(6 of 6)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Clam	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	35.0	19	19	-	0.510	26.0	0	9.60	26.0	0
Clam	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	35.0	19	10	-	28.0	74.0	4	28.0	74.0	4
Clam	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	35.0	19	19	-	1.90	11.0	0	9.60	11.0	0
Clam	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	35.0	19	19	-	2.50	2.50	0	9.60	10.0	0
Clam	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	35.0	19	19	-	2.00	2.00	0	9.60	10.0	0
Clam	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Wet	35.0	19	10	-	28.0	74.0	4	28.0	74.0	4
Clam	SVOCs	Total	Acenaphthene	ug/kg	Wet	19,000	19	1	2	0.110	0.110	0	0.490	0.500	0
Clam	SVOCs	Total	Anthracene	ug/kg	Wet	19,000	19	4	8	0.0650	0.330	0	0.470	2.50	0
Clam	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	1,000	19	11	-	0.0660	22.0	0	0.470	22.0	0
Clam	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	1,000	19	16	2	0.0810	0.860	0	0.470	2.50	0
Clam	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	1,000	19	10	1	0.0700	0.800	0	0.480	2.50	0
Clam	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	1,000	19	11	8	0.0730	2.50	0	0.470	2.50	0
Clam	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	1,000	19	17	2	0.0560	0.580	0	0.470	2.50	0
Clam	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	1,760	19	0	11	-	-	0	180	280	0
Clam	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	310	19	16	3	7.30	11.0	0	36.0	56.0	0
Clam	SVOCs	Total	Carbazole	ug/kg	Wet	NV	19	19	-	9.10	13.0	-	36.0	56.0	-
Clam	SVOCs	Total	Chrysene	ug/kg	Wet	1,000	19	11	-	0.0760	7.80	0	0.470	7.80	0
Clam	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	1,000	19	19	-	0.0590	0.500	0	0.470	2.50	0
Clam	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	626	19	19	-	16.0	56.0	0	36.0	56.0	0
Clam	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	626	19	18	1	11.0	16.0	0	36.0	56.0	0
Clam	SVOCs	Total	Fluoranthene	ug/kg	Wet	19,000	19	5	-	8.60	16.0	0	8.60	16.0	0
Clam	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	1,000	19	13	5	0.0640	0.500	0	0.470	2.50	0
Clam	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	NV	19	9	10	7.70	11.0	-	36.0	56.0	-
Clam	SVOCs	Total	Pyrene	ug/kg	Wet	1,000	19	12	-	0.0980	7.20	0	0.470	7.20	0

Notes
For SVOCs: Although the column and filter fractions are screened, in addition to the totals, the SLVs are based on exposure to totals.
= The number of applicable MDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.
= When the number of applicable MRLs > SLV is higher than the number of applicable MDLs > SLV, they are highlited pink when the number of MDLs > SLV is zero or difference is more than 1.

Eco = Ecological
C+F = Column + Filter (MDL+MDL)
Dry = Dry weight
MDL = method detection limit
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
MRL = methode reporting limit
ND = non-detect
ng/L = nanogram per liter

NV = No value
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
Wet = Wet Weight
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table K-14b
Ecological PCB Congener Data Sensitivity Analysis for Random Forebay Samples
Bradford Island - River Operable Unit
(1 of 2)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs below RDL	Number of EMPC Results	Minimum RDL of NDs	Maximum RDL of NDs	Number of Applicable RDLs > SLV	Minimum EMPC Value	Maximum EMPC Value	Number of EMPCs > SLV
Surface Water	Column	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	Wet		5	3	2	0.0290	0.0330	-	0.0480	0.0770	-
Surface Water	Filter	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	Wet	NV	5	2	-	0.0310	0.0390	-	-	-	-
Surface Water	C+F	77	3,3',4,4'-Tetrachlorobiphenyl	pg/L	Wet		5	-	-	0.0640	0.0870	-	-	-	-
Surface Water	Column	81	3,4,4',5-Tetrachlorobiphenyl	pg/L	Wet		5	5	-	0.00590	0.00980	-	-	-	-
Surface Water	Filter	81	3,4,4',5-Tetrachlorobiphenyl	pg/L	Wet	NV	5	5	-	0.00450	0.00840	-	-	-	-
Surface Water	C+F	81	3,4,4',5-Tetrachlorobiphenyl	pg/L	Wet		5	-	-	0.0111	0.0160	-	-	-	-
Surface Water	Column	114	2,3,4,4',5-Pentachlorobiphenyl	pg/L	Wet		5	5	-	0.00800	0.0150	-	-	-	-
Surface Water	Filter	114	2,3,4,4',5-Pentachlorobiphenyl	pg/L	Wet	NV	5	5	-	0.0170	0.0250	-	-	-	-
Surface Water	C+F	114	2,3,4,4',5-Pentachlorobiphenyl	pg/L	Wet		5	-	-	0.0290	0.0360	-	-	-	-
Surface Water	Column	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/L	Wet		5	3	2	0.00370	0.00700	-	0.00900	0.0100	-
Surface Water	Filter	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/L	Wet	NV	5	5	-	0.0130	0.0230	-	-	-	-
Surface Water	C+F	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/L	Wet		5	-	-	0.0200	0.0330	-	-	-	-
Surface Water	Column	126	3,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet		5	5	-	0.00420	0.00600	-	-	-	-
Surface Water	Filter	126	3,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet	NV	5	5	-	0.00410	0.0112	-	-	-	-
Surface Water	C+F	126	3,3',4,4',5-Pentachlorobiphenyl	pg/L	Wet		5	-	-	0.00950	0.0154	-	-	-	-
Surface Water	Column	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	Wet		5	4	-	0.0230	0.0280	-	-	-	-
Surface Water	Filter	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	Wet	NV	5	0	-	-	-	-	-	-	-
Surface Water	C+F	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/L	Wet		5	-	-	-	-	-	-	-	-
Surface Water	Column	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet		5	1	1	0.0140	0.0140	-	0.0110	0.0110	-
Surface Water	Filter	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	NV	5	0	-	-	-	-	-	-	-
Surface Water	C+F	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet		5	-	-	-	-	-	-	-	-
Surface Water	Column	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet		5	5	-	0.00140	0.00290	-	-	-	-
Surface Water	Filter	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet	NV	5	5	-	0.00170	0.00880	-	-	-	-
Surface Water	C+F	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/L	Wet		5	-	-	0.00420	0.0109	-	-	-	-
Surface Water	Column	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/L	Wet		5	5	-	0.00180	0.00400	-	-	-	-
Surface Water	Filter	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/L	Wet	NV	5	3	1	0.00600	0.00800	-	0.0900	0.0900	-
Surface Water	C+F	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/L	Wet		5	-	-	0.00820	0.09250	-	-	-	-
Sediment	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Dry	4.00	19	15	4	0.0486	0.140	0	0.103	3.40	0
Sediment	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Dry	980	19	-	4	-	-	-	0.0580	1.71	0
Sediment	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Dry	1,200	19	2	6	0.158	0.201	0	0.0640	1.90	0
Sediment	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	0.280	19	8	8	0.0479	2.69	2	0.123	0.296	1
Sediment	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Dry	1,200	19	1	-	0.935	0.935	0	-	-	-
Sediment	Total	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	1,200	19	2	1	0.640	0.710	0	0.173	0.173	0
Sediment	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	1.20	19	18	1	0.0454	0.879	0	0.161	0.161	0
Sediment	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Dry	6,600	19	2	8	0.0479	0.814	0	0.127	0.620	0
Crayfish	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	80.0	15	8	3	0.125	0.361	0	0.239	0.823	0
Crayfish	Total	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	Wet	20,000	15	-	3	-	-	-	3.67	86.3	0
Crayfish	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Wet	20,000	15	-	1	-	-	-	2.61	2.61	0
Crayfish	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	20,000	15	-	1	-	-	-	3.11	3.11	0
Crayfish	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	5.80	15	8	-	0.397	3.51	0	-	-	-
Crayfish	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	20.0	15	15	-	0.167	2.95	0	-	-	-
Crayfish	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Wet	20,000	15	-	3	-	-	-	1.09	1.62	0
Smallmouth Bass	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	80.0	19	2	-	6.15	23.1	0	-	-	-
Smallmouth Bass	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	5.80	19	1	-	48.0	48.0	1	-	-	-
Smallmouth Bass	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	20.0	19	19	-	1.29	607	3	-	-	-

Table K-14b
Ecological PCB Congener Data Sensativity Analysis for Random Forebay Samples
Bradford Island - River Operable Unit
(2 of 2)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs below RDL	Number of EMPC Results	Minimum RDL of NDs	Maximum RDL of NDs	Number of Applicable RDLs > SLV	Minimum EMPC Value	Maximum EMPC Value	Number of EMPCs > SLV
Sculpin	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	80.0	17	11	5	0.225	295	1	0.382	0.846	0
Sculpin	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Wet	20,000	17	-	1	-	-	-	12.8	12.8	0
Sculpin	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	5.80	17	-	1	-	-	-	405	405	1
Sculpin	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	20.0	17	16	-	1.45	164	2	-	-	-
Clam	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	80.0	17	-	13	-	-	-	0.693	3.30	0
Clam	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	20.0	17	17	-	0.901	16.5	0	-	-	-

Notes
For C+F RDL values, the values shown are the sum of the RDLs and/or EMPCs for the ND column and filter results.
= The number of applicable RDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.
= The number of applicable EMPCs > SLV are hightlighted pink when they represent more than 10% of the data, recognizing that this does not take into account spacial density.

Eco = Ecological
C+F = Column + Filter (RDL/EMPC + RDL/EMPC)
Dry = Dry weight
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
ND = non-detect
PCB = polychlorinated biphenyl
pg/kg = picograms per kilogram
pg/L = picograms per liter
RDL = reported detection limit
SLV = screening level value
Wet = Wet Weight

Table K-15a
Ecological Data Sensitivity Analysis for Targeted Forebay Samples
Bradford Island - River Operable Unit
(1 of 3)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Forebay - Eagle Creek															
Sediment	Metals	Total	Antimony	mg/kg	Dry	3.00	2	0	1	-	-	0	0.0500	0.0500	0
Sediment	Metals	Total	Cadmium	mg/kg	Dry	0.674	2	2	-	0.0750	0.131	0	0.0750	0.131	0
Sediment	Metals	Total	Mercury	mg/kg	Dry	0.214	2	0	1	-	-	0	0.016	0.016	0
Sediment	Metals	Total	Thallium	mg/kg	Dry	0.354	2	2	-	0.0560	0.156	0	0.0560	0.156	0
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	NV	2	0	2	-	-	-	15.0	15.0	-
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	NV	2	2	-	150	150	-	150	150	-
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	1.80	2	2	-	1.70	1.70	0	7.30	7.40	2
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	1.80	2	2	-	1.70	1.70	0	15.0	15.0	2
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	1.80	2	2	-	1.70	1.70	0	7.30	7.40	2
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	1.80	2	2	-	1.70	1.70	0	7.30	7.40	2
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	1.80	2	1	-	1.70	1.70	0	7.30	7.30	1
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	1.80	2	2	-	1.70	1.70	0	7.30	7.40	2
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	1.80	2	2	-	1.70	1.70	0	7.30	7.40	2
Sediment	PCB Aroclors	Total	Aroclor 1262	ug/kg	Dry	1.80	2	2	-	1.70	1.70	0	7.30	7.40	2
Sediment	PCB Aroclors	Total	Aroclor 1268	ug/kg	Dry	1.80	2	2	-	1.70	1.70	0	7.30	7.40	2
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Dry	1.80	2	1	-	3.40	3.40	1	14.6	14.6	1
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	750	2	2	-	200	200	0	200	200	0
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	110	2	2	-	9.90	9.90	0	9.90	9.90	0
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	140	2	1	1	1.30	1.30	0	9.90	9.90	0
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	110	2	2	-	9.90	11.0	0	9.90	11.0	0
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	110	2	2	-	1.20	1.20	0	9.90	9.90	0
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	48.0	2	2	-	2.90	2.90	0	9.90	9.90	0
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	290	2	2	-	1.00	1.00	0	9.90	9.90	0
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	57.0	2	1	1	1.40	1.40	0	9.90	9.90	0
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	77.0	2	2	-	1.70	1.70	0	9.90	9.90	0
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	42.0	2	0	2	-	-	0	9.90	9.90	0
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	32.0	2	1	1	1.40	1.40	0	9.90	9.90	0
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	32.0	2	1	1	1.60	1.60	0	9.90	9.90	0
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	27.0	2	1	-	2.50	2.50	0	9.90	9.90	0
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	300	2	1	1	2.30	2.30	0	9.90	9.90	0
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	27.0	2	1	1	2.50	2.50	0	9.90	9.90	0
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	57.0	2	0	1	-	-	0	9.90	9.90	0
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	33.0	2	2	-	2.20	2.20	0	9.90	9.90	0
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	111	2	1	-	2.20	2.20	0	9.90	9.90	0
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	17.0	2	1	1	1.90	1.90	0	9.90	9.90	0
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	53.0	2	0	1	-	-	0	9.90	9.90	0
Forebay - Goose Island															
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	NV	2	0	2	-	-	-	60.0	64.0	-
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	1.80	2	2	-	2.50	2.70	2	12.0	13.0	2
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	1.80	2	2	-	2.50	2.70	2	24.0	26.0	2
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	1.80	2	2	-	2.50	2.70	2	12.0	13.0	2
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	1.80	2	2	-	2.50	2.70	2	12.0	13.0	2
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	1.80	2	2	-	2.50	2.70	2	12.0	13.0	2
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	1.80	2	1	1	2.50	2.50	1	12.0	13.0	2

Table K-15a
Ecological Data Sensitivity Analysis for Targeted Forebay Samples
Bradford Island - River Operable Unit
(2 of 3)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	1.80	2	2	-	2.50	2.70	2	12.0	13.0	2
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Dry	1.80	2	1	-	5.00	5.00	1	24.0	24.0	1
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	750	2	0	2	-	-	0	120	130	0
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	110	2	2	-	1.80	1.90	0	12.0	13.0	0
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	140	2	2	-	1.60	1.70	0	12.0	13.0	0
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	110	2	0	2	-	-	0	12.0	13.0	0
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	110	2	2	-	1.50	1.60	0	12.0	13.0	0
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	48.0	2	1	1	3.70	3.70	0	12.0	13.0	0
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	290	2	2	-	1.20	1.30	0	12.0	13.0	0
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	57.0	2	2	-	1.70	1.80	0	12.0	13.0	0
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	77.0	2	2	-	2.10	2.20	0	12.0	13.0	0
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	42.0	2	0	2	-	-	0	12.0	13.0	0
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	32.0	2	0	2	-	-	0	12.0	13.0	0
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	32.0	2	0	1	-	-	0	12.0	12.0	0
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	27.0	2	0	1	-	-	0	12.0	12.0	0
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	300	2	0	2	-	-	0	12.0	13.0	0
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	27.0	2	1	1	3.00	3.00	0	12.0	13.0	0
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	57.0	2	0	2	-	-	0	12.0	13.0	0
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	33.0	2	2	-	2.70	2.80	0	12.0	13.0	0
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	111	2	0	2	-	-	0	12.0	13.0	0
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	17.0	2	0	2	-	-	0	12.0	13.0	0
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	53.0	2	0	2	-	-	0	12.0	13.0	0
Crayfish	Metals	Total	Antimony	mg/kg	Wet	NV	1	0	1	-	-	-	0.0120	0.0120	-
Crayfish	Metals	Total	Beryllium	mg/kg	Wet	NV	1	0	1	-	-	-	0.00500	0.00500	-
Crayfish	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	35.0	1	1	-	2.40	2.40	0	9.50	9.50	0
Crayfish	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	35.0	1	1	-	2.60	2.60	0	9.50	9.50	0
Crayfish	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	35.0	1	1	-	2.30	2.30	0	9.50	9.50	0
Crayfish	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	35.0	1	1	-	2.20	2.20	0	9.50	9.50	0
Crayfish	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	35.0	1	1	-	0.510	0.510	0	9.50	9.50	0
Crayfish	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	35.0	1	1	-	1.80	1.80	0	9.50	9.50	0
Crayfish	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	35.0	1	1	-	1.90	1.90	0	9.50	9.50	0
Crayfish	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	35.0	1	1	-	2.50	2.50	0	9.50	9.50	0
Crayfish	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	35.0	1	1	-	2.00	2.00	0	9.50	9.50	0
Crayfish	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Wet	35.0	1	1	-	2.60	2.60	0	9.50	9.50	0
Crayfish	SVOCs	Total	Acenaphthene	ug/kg	Wet	19,000	1	1	-	0.500	0.500	0	0.500	0.500	0
Crayfish	SVOCs	Total	Anthracene	ug/kg	Wet	19,000	1	0	1	-	-	0	0.500	0.500	0
Crayfish	SVOCs	Total	Benzo(a)anthracene	ug/kg	Wet	1,000	1	1	-	0.500	0.500	0	0.500	0.500	0
Crayfish	SVOCs	Total	Benzo(a)pyrene	ug/kg	Wet	1,000	1	1	-	0.0610	0.0610	0	0.500	0.500	0
Crayfish	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Wet	1,000	1	0	1	-	-	0	0.500	0.500	0
Crayfish	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Wet	1,000	1	0	1	-	-	0	0.500	0.500	0
Crayfish	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Wet	1,000	1	0	1	-	-	0	0.500	0.500	0
Crayfish	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	1,760	1	1	-	66.0	66.0	0	200	200	0
Crayfish	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	310	1	1	-	7.30	7.30	0	39.0	39.0	0
Crayfish	SVOCs	Total	Carbazole	ug/kg	Wet	NV	1	1	-	7.70	7.70	-	39.0	39.0	-
Crayfish	SVOCs	Total	Chrysene	ug/kg	Wet	1,000	1	1	-	0.200	0.200	0	0.500	0.500	0

Table K-15a
Ecological Data Sensitivity Analysis for Targeted Forebay Samples
Bradford Island - River Operable Unit
(3 of 3)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Crayfish	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	1,000	1	1	-	0.0450	0.0450	0	0.500	0.500	0
Crayfish	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	626	1	1	-	140	140	0	140	140	0
Crayfish	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	626	1	1	-	11.0	11.0	0	39.0	39.0	0
Crayfish	SVOCs	Total	Fluoranthene	ug/kg	Wet	19,000	1	1	-	0.500	0.500	0	0.500	0.500	0
Crayfish	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Wet	1,000	1	0	1	-	-	0	0.500	0.500	0
Crayfish	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	NV	1	1	-	11.0	11.0	-	39.0	39.0	-
Crayfish	SVOCs	Total	Pyrene	ug/kg	Wet	1,000	1	1	-	0.500	0.500	0	0.500	0.500	0
Clam	Metals	Total	Antimony	mg/kg	Wet	NV	1	1	-	0.00100	0.00100	-	0.00900	0.00900	-
Clam	Metals	Total	Beryllium	mg/kg	Wet	NV	1	0	1	-	-	-	0.00400	0.00400	-
Clam	PCB Aroclors	Total	Aroclor 1016	ug/kg	Wet	35.0	1	1	-	6.10	6.10	0	9.70	9.70	0
Clam	PCB Aroclors	Total	Aroclor 1221	ug/kg	Wet	35.0	1	1	-	5.90	5.90	0	9.70	9.70	0
Clam	PCB Aroclors	Total	Aroclor 1232	ug/kg	Wet	35.0	1	1	-	9.70	9.70	0	9.70	9.70	0
Clam	PCB Aroclors	Total	Aroclor 1242	ug/kg	Wet	35.0	1	1	-	6.60	6.60	0	9.70	9.70	0
Clam	PCB Aroclors	Total	Aroclor 1248	ug/kg	Wet	35.0	1	1	-	5.20	5.20	0	9.70	9.70	0
Clam	PCB Aroclors	Total	Aroclor 1254	ug/kg	Wet	35.0	1	1	-	14.0	14.0	0	14.0	14.0	0
Clam	PCB Aroclors	Total	Aroclor 1260	ug/kg	Wet	35.0	1	1	-	6.30	6.30	0	9.70	9.70	0
Clam	PCB Aroclors	Total	Aroclor 1262	ug/kg	Wet	35.0	1	1	-	3.20	3.20	0	9.70	9.70	0
Clam	PCB Aroclors	Total	Aroclor 1268	ug/kg	Wet	35.0	1	1	-	2.00	2.00	0	9.70	9.70	0
Clam	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Wet	35.0	1	1	-	14.0	14.0	0	14.0	14.0	0
Clam	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Wet	1,760	1	1	-	66.0	66.0	0	190	190	0
Clam	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Wet	310	1	1	-	7.30	7.30	0	38.0	38.0	0
Clam	SVOCs	Total	Carbazole	ug/kg	Wet	NV	1	1	-	7.70	7.70	-	38.0	38.0	-
Clam	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Wet	1,000	1	0	1	-	-	0	0.490	0.490	0
Clam	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Wet	626	1	1	-	170	170	0	170	170	0
Clam	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Wet	626	1	1	-	11.0	11.0	0	38.0	38.0	0
Clam	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Wet	NV	1	0	1	-	-	0	38.0	38.0	-

Notes

= The number of applicable MDLs > SLV are hightlighted yellow when they represent more than 10% of the data, recognizing that this does not take into account spacial density.

= When the number of applicable MRLs > SLV is higher than the number of applicable MDLs > SLV, they are highlited pink when the number of MDLs > SLV is zero or difference is more than 1.

Eco = Ecological
Dry = Dry weight
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = methode reporting limit
ND = non-detect
NV = No value

NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
Wet = Wet Weight

Table K-15b
Ecological PCB Congener Data Sensativity Analysis for Targeted Forebay Samples
Bradford Island - River Operable Unit
(1 of 1)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs below RDL	Number of EMPC Results	Minimum RDL of NDs	Maximum RDL of NDs	Number of Applicable RDLs > SLV	Minimum EMPC Value	Maximum EMPC Value	Number of EMPCs > SLV
Sediment	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Dry	4.00	2	-	1	-	-	-	0.150	0.150	0
Sediment	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Dry	1,200	2	-	1	-	-	-	0.970	0.970	0
Sediment	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	0.280	2	-	2	-	-	-	0.255	0.419	1
Sediment	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	1.20	2	2	-	0.241	0.250	0	-	-	-
Crayfish	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	80.0	1	1	-	0.145	0.145	0	-	-	-
Crayfish	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Wet	5.80	1	-	1	-	-	-	0.261	0.261	0
Crayfish	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	20.0	1	1	-	0.164	0.164	0	-	-	-
Sculpin	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	80.0	1	-	1	-	-	-	0.882	0.882	0
Sculpin	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	20.0	1	1	-	1.31	1.31	0	-	-	-
Clam	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Wet	80.0	1	-	1	-	-	-	2.17	2.17	0
Clam	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Wet	20.0	1	1	-	1.08	1.08	0	-	-	-

Notes

= The number of applicable EMPCs > SLV are hightlighted pink when they represent more than 10% of the data, recognizing that this does not take into account spacial density.

Eco = Ecological
Dry = Dry weight
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
ND = non-detect
PCB = polychlorinated biphenyl
pg/kg = picograms per kilogram
RDL = reported detection limit
SLV = screening level value
Wet = Wet Weight

Table K-16a
Ecological Data Sensitivity Analysis for Downstream Samples
Bradford Island - River Operable Unit
(1 of 1)

Medium	Analyte Group	Preparation Fraction	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs (below MDL)	Number of Detects Between MDL and MRL	Minimum MDL of NDs	Maximum MDL of NDs	Number of Applicable MDLs > SLV	Minimum MRL of NDs and Detects below MRL	Maximum MRL of NDs and Detects below MRL	Number of Applicable MRLs > SLV
Sediment	Metals	Total	Thallium	mg/kg	Dry	0.354	6	1	-	0.130	0.130	0	0.130	0.130	0
Sediment	NWTPH-Dx	Total	Diesel Range Organics	mg/kg	Dry	NV	6	0	4	-	-	-	14.0	15.0	-
Sediment	NWTPH-Dx	Total	Residual Range Organics	mg/kg	Dry	NV	6	5	1	140	180	-	140	180	-
Sediment	PCB Aroclors	Total	Aroclor 1016	ug/kg	Dry	1.80	6	6	-	1.70	1.70	0	7.00	8.80	6
Sediment	PCB Aroclors	Total	Aroclor 1221	ug/kg	Dry	1.80	6	6	-	1.70	1.70	0	14.0	18.0	6
Sediment	PCB Aroclors	Total	Aroclor 1232	ug/kg	Dry	1.80	6	6	-	1.70	1.70	0	7.00	8.80	6
Sediment	PCB Aroclors	Total	Aroclor 1242	ug/kg	Dry	1.80	6	6	-	1.70	1.70	0	7.00	8.80	6
Sediment	PCB Aroclors	Total	Aroclor 1248	ug/kg	Dry	1.80	6	6	-	1.70	1.70	0	7.00	8.80	6
Sediment	PCB Aroclors	Total	Aroclor 1254	ug/kg	Dry	1.80	6	6	-	1.70	1.70	0	7.00	8.80	6
Sediment	PCB Aroclors	Total	Aroclor 1260	ug/kg	Dry	1.80	6	6	-	1.70	1.70	0	7.00	8.80	6
Sediment	PCB Aroclors	Total	Aroclor 1262	ug/kg	Dry	1.80	6	6	-	1.70	1.70	0	7.00	8.80	6
Sediment	PCB Aroclors	Total	Aroclor 1268	ug/kg	Dry	1.80	6	6	-	1.70	1.70	0	7.00	8.80	6
Sediment	PCB Aroclors	Total	Total PCBs As Aroclors	ug/kg	Dry	1.80	6	6	-	1.70	1.70	0	14.0	18.0	6
Sediment	SVOCs	Total	Bis(2-ethylhexyl) Phthalate	ug/kg	Dry	750	6	6	-	200	200	0	200	200	0
Sediment	SVOCs	Total	Butyl Benzyl Phthalate	ug/kg	Dry	110	6	6	-	1.50	9.90	0	9.70	10.0	0
Sediment	SVOCs	Total	Carbazole	ug/kg	Dry	140	6	5	1	1.30	1.30	0	9.70	10.0	0
Sediment	SVOCs	Total	Di-n-butyl Phthalate	ug/kg	Dry	110	6	6	-	9.80	14.0	0	9.80	14.0	0
Sediment	SVOCs	Total	Di-n-octyl Phthalate	ug/kg	Dry	110	6	6	-	1.20	1.20	0	9.70	10.0	0
Sediment	SVOCs	Total	p-cresol (4-Methylphenol)	ug/kg	Dry	48.0	6	4	1	2.90	2.90	0	9.70	10.0	0
Sediment	SVOCs	Total	Acenaphthene	ug/kg	Dry	290	6	6	-	1.00	1.00	0	9.70	10.0	0
Sediment	SVOCs	Total	Anthracene	ug/kg	Dry	57.0	6	3	3	1.40	1.40	0	9.70	10.0	0
Sediment	SVOCs	Total	Fluorene	ug/kg	Dry	77.0	6	6	-	1.70	1.70	0	9.70	10.0	0
Sediment	SVOCs	Total	Phenanthrene	ug/kg	Dry	42.0	6	2	4	1.30	1.30	0	9.70	10.0	0
Sediment	SVOCs	Total	Total LPAHs (KM, capped)	ug/kg	Dry	76.0	6	2	4	5.40	5.40	0	38.8	38.8	0
Sediment	SVOCs	Total	Benzo(a)anthracene	ug/kg	Dry	32.0	6	0	5	-	-	0	9.70	10.0	0
Sediment	SVOCs	Total	Benzo(a)pyrene	ug/kg	Dry	32.0	6	1	3	1.60	1.60	0	9.70	9.90	0
Sediment	SVOCs	Total	Benzo(b)fluoranthene	ug/kg	Dry	27.0	6	2	3	2.50	2.50	0	9.70	10.0	0
Sediment	SVOCs	Total	Benzo(g,h,i)perylene	ug/kg	Dry	300	6	3	3	2.30	2.30	0	9.70	10.0	0
Sediment	SVOCs	Total	Benzo(k)fluoranthene	ug/kg	Dry	27.0	6	4	2	2.50	2.50	0	9.70	10.0	0
Sediment	SVOCs	Total	Chrysene	ug/kg	Dry	57.0	6	1	4	1.40	1.40	0	9.70	10.0	0
Sediment	SVOCs	Total	Dibenz(a,h)anthracene	ug/kg	Dry	33.0	6	5	1	2.20	2.20	0	9.70	10.0	0
Sediment	SVOCs	Total	Fluoranthene	ug/kg	Dry	111	6	1	3	2.20	2.20	0	9.70	9.90	0
Sediment	SVOCs	Total	Indeno(1,2,3-cd)pyrene	ug/kg	Dry	17.0	6	3	3	1.90	1.90	0	9.70	10.0	0
Sediment	SVOCs	Total	Pyrene	ug/kg	Dry	53.0	6	0	4	-	-	0	9.70	9.90	0

Notes

= When the number of applicable MRLs > SLV when they represent more than 10% of the data, recognizing that this does not take into account spacial density.

Eco = Ecological
Dry = Dry weight
MDL = method detection limit
mg/kg = milligrams per kilogram
MRL = methode reporting limit
ND = non-detect
NV = No value

NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table K-16b
Ecological PCB Congener Data Sensitivity Analysis for Downstream Samples
Bradford Island - River Operable Unit
(1 of 1)

Medium	Preparation Fraction	IUPAC Number	Analyte	Unit	Basis	Lowest Eco SLV	Number of Samples	Number of NDs below RDL	Number of EMPC Results	Minimum RDL of NDs	Maximum RDL of NDs	Number of Applicable RDLs > SLV	Minimum EMPC Value	Maximum EMPC Value	Number of EMPCs > SLV
Sediment	Total	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	Dry	8.00	6	-	2	-	-	-	0.259	0.531	0
Sediment	Total	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	Dry	4.00	6	5	-	0.0492	0.100	0	-	-	-
Sediment	Total	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	Dry	980	6	1	-	0.0976	0.0976	0	-	-	-
Sediment	Total	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	Dry	1,200	6	-	1	-	-	-	0.168	0.168	0
Sediment	Total	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	Dry	0.280	6	5	-	0.0787	0.171	0	-	-	-
Sediment	Total	156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	Dry	1,200	6	-	2	-	-	-	0.604	1.39	0
Sediment	Total	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	Dry	1.20	6	6	-	0.0630	0.154	0	-	-	-
Sediment	Total	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	Dry	6,600	6	1	1	0.0733	0.0733	0	0.115	0.115	0

Notes
Eco = Ecological
Dry = Dry weight
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
ND = non-detect
PCB = polychlorinated biphenyl
pg/kg = picograms per kilogram
SLV = screening level value
RDL = reported detection limit

APPENDIX L

SITE AND REFERENCE AREA COMPARISON

Figure L-1. Statistical Comparison of Upland OU Soils to Reference Area Soils -- MDL Censored

						Reference Area										Site AOPC										Shapiro-Wilk W Test	Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Site AOPC	Depth Group	Analyte Group	Analyte	Unit	Median MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	Distribution	Appropriate Statistical Test	p-value	Significant Higher Conc in Site?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
Landfill	0-1 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	10	100%	100%	0%	14026	3769	7560	19100	-	-	Normal	t-Test (normal)	1.000	**No**	4358	5019	22%
Landfill	0-1 ft	Metals	Antimony	mg/kg	0.3	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	20	20%	20%	80%	0.815	1.210	0.309	4.2	0.2	2.9	-	Wilcoxon Rank Sum Test	0.043	**Yes**			
Landfill	0-1 ft	Metals	Arsenic	mg/kg	-	14	100%	100%	0%	3.10	1.26	1.09	5.18	-	-	21	100%	100%	0%	5.33	6.02	1.5	30.1	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.063	**No**	4.75	4.58	148%
Landfill	0-1 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	21	100%	100%	0%	116	41	58.9	242.5	-	-	Lognormal	t-Test (lognormal)	0.314	**No**	37.9	36.5	33%
Landfill	0-1 ft	Metals	Beryllium	mg/kg	0.27	14	100%	100%	0%	0.491	0.091	0.319	0.629	-	-	21	81%	81%	19%	0.378	0.084	0.3	0.5755	0.189	0.28	-	Wilcoxon Rank Sum Test	0.999	**No**	0.0871	0.0839	17%
Landfill	0-1 ft	Metals	Cadmium	mg/kg	0.27	14	100%	7%	93%	0.162	0.059	0.099	0.3395	-	-	21	71%	71%	29%	0.769	0.524	0.343	2.09	0.26	0.29	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	10	100%	100%	0%	5608	969	4380	6920	-	-	Normal	t-Test (normal)	0.985	**No**	1537	1770	25%
Landfill	0-1 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	21	100%	100%	0%	77.2	173.6	14.7	801	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.278	**No**	135	130	598%
Landfill	0-1 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	10	100%	100%	0%	11.1	4.9	6.4	22.7	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.998	**No**	3.90	4.50	27%
Landfill	0-1 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	21	100%	100%	0%	73.6	101.3	23.5	494	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.076	**No**	79.1	76.2	195%
Landfill	0-1 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	21	100%	100%	0%	25524	7916	14100	45900	-	-	Normal	t-Test (normal)	0.980	**No**	6624	6381	21%
Landfill	0-1 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	21	100%	100%	0%	211	236	5.34	741	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Landfill	0-1 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	10	100%	100%	0%	8933	9321	4260	35100	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.873	**No**	6263	7213	92%
Landfill	0-1 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	21	100%	100%	0%	382	142	196	720	-	-	Lognormal	t-Test (lognormal)	1.000	**No**	141	136	22%
Landfill	0-1 ft	Metals	Mercury	mg/kg	0.11	14	100%	0%	100%	0.0494	0.0091	0.034	0.068	-	-	23	78%	61%	39%	0.427	0.851	0.07	4.15	0.1	0.11	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	21	100%	100%	0%	58.4	122.5	13.4	570	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.186	**No**	95.4	91.9	492%
Landfill	0-1 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	10	100%	100%	0%	1325	291	797	1870	-	-	Normal	t-Test (normal)	0.526	**No**	354	408	31%
Landfill	0-1 ft	Metals	Selenium	mg/kg	0.4	14	0%	0%	100%	-	-	-	-	0.4	0.5	21	14%	5%	95%	0.245	0.144	0.205	0.848	0.2	1.5	-	Contingency Table Analysis	0.203	**No**			
Landfill	0-1 ft	Metals	Silver	mg/kg	0.51	14	86%	0%	100%	0.0583	0.0412	0.027	0.187	0.022	0.023	21	33%	10%	90%	0.346	0.286	0.2	1.5	0.2	0.57	-	Wilcoxon Rank Sum Test	0.129	**No**	0.224	0.216	370%
Landfill	0-1 ft	Metals	Sodium	mg/kg	169	14	100%	36%	64%	171	75	69.6	324	-	-	10	90%	90%	10%	495	57	420	570	169	169	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	Metals	Thallium	mg/kg	0.26	14	57%	0%	100%	0.145	0.023	0.128	0.203	0.042	0.103	21	10%	5%	95%	0.109	0.060	0.0953	0.378	0.2	0.3	-	Contingency Table Analysis	1.000	**No**			
Landfill	0-1 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	10	100%	100%	0%	42.3	8.2	34.3	56.3	-	-	Normal	t-Test (normal)	1.000	**No**	11.6	13.4	17%
Landfill	0-1 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	21	100%	100%	0%	164	120	41.6	635	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Acenaphthene	ug/kg	20	14	64%	0%	100%	1.55	0.57	1.2	3.4	1	1	27	70%	63%	37%	261	523	15	2600	20	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Acenaphthylene	ug/kg	20	14	7%	0%	100%	-	-	1.6	1.6	1.4	1.4	27	26%	11%	89%	19.9	20.1	3.4	78.1	20	190	-	Contingency Table Analysis	0.153	**No**			
Landfill	0-1 ft	SVOCs	Anthracene	ug/kg	114.9	14	86%	0%	100%	2.33	0.94	1.5	4.9	1.4	1.4	27	85%	41%	59%	398	613	12	2700	49.8	180	-	Wilcoxon Rank Sum Test	0.004	**Yes**			
Landfill	0-1 ft	SVOCs	Benzo(a)anthracene	ug/kg	71.35	14	100%	0%	100%	14.0	7.2	4.6	34	-	-	27	93%	85%	15%	2970	6280	29	32000	49.8	92.9	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Benzo(a)pyrene	ug/kg	42.65	14	100%	7%	93%	18.2	9.5	7.7	45	-	-	27	93%	89%	11%	3180	6450	28	33000	35.5	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	49.8	14	100%	7%	93%	23.4	11.5	9.1	55	-	-	24	96%	92%	8%	4330	12900	34	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	27.8	14	100%	7%	93%	13.7	6.6	5.8	32	-	-	27	89%	85%	15%	1580	3510	20	18000	25.1	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	49.8	14	100%	0%	100%	8.00	3.94	2.7	19	-	-	24	96%	92%	8%	3460	12900	40	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Chrysene	ug/kg	49.8	14	100%	0%	100%	18.3	9.5	6.4	45	-	-	27	96%	96%	4%	3110	6180	62	32000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	2.2	14	50%	50%	50%	3.53	1.20	2.7	6.9	2.2	2.2	27	81%	81%	19%	612	1850	18	9900	35.5	1800	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Fluoranthene	ug/kg	60.45	14	100%	7%	93%	27.0	14.0	10	66	-	-	27	93%	89%	11%	5320	10800	42	54000	49.8	71.1	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Fluorene	ug/kg	1.7	14	7%	7%	93%	-	-	3.2	3.2	1.7	1.7	27	59%	59%	41%	130	239	10	1200	20	180	-	Contingency Table Analysis	0.001	**Yes**			
Landfill	0-1 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	39.2	14	100%	0%	100%	14.1	7.5	5.2	34	-	-	27	89%	85%	15%	1790	3790	18	19000	35.5	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Naphthalene	ug/kg	20	14	43%	0%	100%	1.47	0.27	1.3	2.2	1.3	1.3	27	41%	30%	70%	98.5	212.0	5	823	20	190	-	Wilcoxon Rank Sum Test	0.021	**Yes**			
Landfill	0-1 ft	SVOCs	Phenanthrene	ug/kg	49.8	14	100%	0%	100%	13.2	7.2	5.5	34	-	-	27	96%	81%	19%	1540	2480	13	12000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Pyrene	ug/kg	49.8	14	100%	7%	93%	26.8	13.3	10	64	-	-	27	96%	93%	7%	4940	8640	43	40000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Total LPAHs	ug/kg	299	14	100%	0%	100%	21	9	12	49	-	-	27	96%	70%	30%	2549	3812	141	18674	299	299	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Total HPAHs	ug/kg	498	14	100%	0%	100%	167	84	65	401	-	-	27	96%	93%	7%	30467	69775	334	367900	498	498	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	12	100%	100%	0%	13008	4235	6000	19100	-	-	Normal	t-Test (normal)	1.000	**No**	4506	4709	21%
Landfill	0-3 ft	Metals	Antimony	mg/kg	0.3	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	22	27%	27%	73%	0.958	1.230	0.309	4.2	0.2	2.9	-	Wilcoxon Rank Sum Test	0.019	**Yes**			
Landfill	0-3 ft	Metals	Arsenic	mg/kg	-	14	100%	100%	0%	3.10	1.26	1.09	5.18	-	-	23	100%	100%	0%	5.30	5.75	1.5	30.1	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.041	**Yes**			
Landfill	0-3 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	23	100%	100%	0%	114	42	42.6	242.5	-	-	Lognormal	t-Test (lognormal)	0.442	**No**	38.9	37.4	34%
Landfill	0-3 ft	Metals	Beryllium	mg/kg	0.2295	14	100%	100%	0%	0.491	0.091	0.319	0.629	-	-	23	74%	74%	26%	0.371	0.083	0.3	0.5755	0.157	0.28	-	Wilcoxon Rank Sum Test	1.000	**No**	0.0864	0.0833	17%
Landfill	0-3 ft	Metals	Cadmium	mg/kg	0.27	14	100%	7%	93%	0.162	0.059	0.099	0.3395	-	-	23	74%	74%	26%	0.888	0.756	0.343	3.54	0.26	0.29	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	12	100%	100%	0%	6055	1654	4380	10485	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.962	**No**	1751	1830	26%
Landfill	0-3 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	23	100%	100%	0%	190	444	14.7	1950	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.162	**No**	352	339	1559%
Landfill	0-3 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	12	100%	100%	0%	14.5	10.0	6.4	41	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.962	**No**	7.11	7.43	45%
Landfill	0-3 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	23	100%	100%	0%	85.3	116.0	23.5	494	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.061	**No**	92.1	88.8	228%
Landfill	0-3 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	23	100%	100%	0%	27267	9645	14100	51000	-	-	Lognormal	t-Test (lognormal)	0.955	**No**	8002	7709	26%
Landfill	0-3 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	29	100%	100%	0%	342	413	5.34	1660	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Landfill	0-3 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	12	100%	100%	0%	16190	21772	4260	77700	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.611	**No**	14854	15522	198%
Landfill	0-3 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	23	100%	100%	0%	462	323	196	1712.5	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	270	260	41%
Landfill	0-3 ft	Metals	Mercury	mg/kg	0.11	14	100%	0%	100%	0.0494	0.0091	0.034	0.068	-	-	25	80%	56%	44%	0.397	0.823	0.0475	4.15	0.1	0.11	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Landfill	0-3 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	23	100%	100%	0%	148	356	13.4	1610	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.102	**No**	282	272	1458%
Landfill	0-3 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	12	100%	100%	0%	1191	418	322	1870	-	-	Normal	t-Test (normal)	0.812	**No**	404	422	32%
Landfill	0-3 ft	Metals	Selenium	mg/kg	0.4	14	0%	0%	100%	-	-	-	-	0.4	0.5	23	22%	9%	91%	0.276	0.192	0.205	0.879	0.2	1.5	-	Contingency Table Analysis	0.077	**No**			
Landfill	0-3 ft	Metals	Silver	mg/kg	0.51	14	86%	0%	100%	0.0583	0.0412	0.027	0.187	0.022	0.023	23	39%	13%	87%	0.327	0.304	0.126	1.5	0.2	0.57	-	Wilcoxon Rank Sum Test	0.088	**No**	0.242	0.233	400%
Landfill	0-3 ft	Metals	Sodium	mg/kg	147	14	100%	36%	64%	171	75	69.6	324	-	-	12	75%	75%	25%	482	59	420	570	141	169	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Landfill	0-3 ft	Metals	Thallium	mg/kg	0.26	14	57%	0%	100%	0.145	0.023	0.128	0.203	0.042	0.103	23	17%	4%	96%	0.0917	0.0629	0.0578	0.378	0.2	0.3	-	Wilcoxon Rank Sum Test	0.234	**No**	0.0519	0.0500	34%
Landfill	0-3 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	12	100%	100%	0%	43.2	8.5	34.3	56.3	-	-	Normal	t-Test (normal)	1.000	**No**	11.5	12.0	15%
Landfill	0-3 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	23	100%	100%	0%	204	234	41.6	1140	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Acenaphthene	ug/kg	20	14	64%	0%	100%	1.55	0.57	1.2	3.4	1	1	33	76%	70%	30%	395	669	15	2600	20	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Acenaphthylene	ug/kg	20	14	7%	0%	100%	-	-	1.6	1.6	1.4	1.4	33	39%	18%	82%	25.5	25.9	3.4	111	20	190	-	Contingency Table Analysis	0.026	**Yes**			
Landfill	0-3 ft	SVOCs	Anthracene	ug/kg	114.9	14	86%	0%	100%	2.33	0.94	1.5	4.9	1.4	1.4	33	88%	52%	48%	761	1510	12	8440	49.8	180	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Landfill	0-3 ft	SVOCs	Benzo(a)anthracene	ug/kg	71.35	14	100%	0%	100%	14.0	7.2	4.6	34	-	-	33	94%	88%	12%	4330	7300	29	32000	49.8	92.9	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Benzo(a)pyrene	ug/kg	42.65	14	100%	7%	93%	18.2	9.5	7.7	45	-	-	33	94%	91%	9%	4890	8130	28	34000	35.5	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	49.8	14	100%	7%	93%	23.4	11.5	9.1	55	-	-	28	96%	93%	7%	5030	12100	34	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			

Figure L-1. Statistical Comparison of Upland OU Soils to Reference Area Soils -- MDL Censored

						Reference Area										Site AOPC										Shapiro-Wilk W Test	Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Site AOPC	Depth Group	Analyte Group	Analyte	Unit	Median MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	Distribution	Appropriate Statistical Test	p-value	Significant Higher Conc in Site?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
Landfill	0-3 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	27.8	14	100%	7%	93%	13.7	6.6	5.8	32	-	-	33	91%	88%	12%	2490	4320	20	18000	25.1	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	49.8	14	100%	0%	100%	8.00	3.94	2.7	19	-	-	28	96%	93%	7%	3440	11900	40	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Chrysene	ug/kg	49.8	14	100%	0%	100%	18.3	9.5	6.4	45	-	-	33	97%	97%	3%	4780	8050	62	35300	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	2.2	14	50%	50%	50%	3.53	1.20	2.7	6.9	2.2	2.2	33	85%	85%	15%	739	1710	18	9900	35.5	1800	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Fluoranthene	ug/kg	60.45	14	100%	7%	93%	27.0	14.0	10	66	-	-	33	94%	91%	9%	7750	12600	42	54000	49.8	71.1	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Fluorene	ug/kg	1.7	14	7%	7%	93%	-	-	3.2	3.2	1.7	1.7	33	67%	67%	33%	203	343	10	1610	20	180	-	Contingency Table Analysis	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	39.2	14	100%	0%	100%	14.1	7.5	5.2	34	-	-	33	91%	88%	12%	2940	5000	18	20000	35.5	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Naphthalene	ug/kg	20	14	43%	0%	100%	1.47	0.27	1.3	2.2	1.3	1.3	33	52%	42%	58%	98.7	193.0	5	823	20	190	-	Wilcoxon Rank Sum Test	0.004	**Yes**			
Landfill	0-3 ft	SVOCs	Phenanthrene	ug/kg	49.8	14	100%	0%	100%	13.2	7.2	5.5	34	-	-	33	97%	85%	15%	2500	4260	13	21900	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Pyrene	ug/kg	49.8	14	100%	7%	93%	26.8	13.3	10	64	-	-	33	97%	94%	6%	8220	13700	43	67100	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Total LPAHs	ug/kg	299	14	100%	0%	100%	21	9	12	49	-	-	33	97%	76%	24%	4065	6694	141	34767	299	299	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Total HPAHs	ug/kg	498	14	100%	0%	100%	167	84	65	401	-	-	33	97%	94%	6%	43348	75465	334	367900	498	498	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	26	100%	100%	0%	10731	5200	2380	23100	-	-	Normal	t-Test (normal)	1.000	**No**	5042	4858	21%
Landfill	0-10 ft	Metals	Antimony	mg/kg	0.3	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	36	56%	56%	44%	1.50	1.86	0.309	8.19	0.2	2.9	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	Metals	Arsenic	mg/kg	-	14	100%	100%	0%	3.10	1.26	1.09	5.18	-	-	37	100%	100%	0%	4.73	4.71	1.5	30.1	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.066	**No**	4.09	3.94	127%
Landfill	0-10 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	37	100%	100%	0%	104	41	34	242.5	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.719	**No**	38.7	37.3	34%
Landfill	0-10 ft	Metals	Beryllium	mg/kg	0.167	14	100%	100%	0%	0.491	0.091	0.319	0.629	-	-	37	70%	70%	30%	0.298	0.111	0.186	0.5755	0.155	0.28	-	Wilcoxon Rank Sum Test	1.000	**No**	0.106	0.102	21%
Landfill	0-10 ft	Metals	Cadmium	mg/kg	0.27	14	100%	7%	93%	0.162	0.059	0.099	0.3395	-	-	37	84%	84%	16%	1.13	0.78	0.343	3.54	0.26	0.29	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	26	100%	100%	0%	5336	1583	1760	10485	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.998	**No**	1671	1610	23%
Landfill	0-10 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	37	100%	100%	0%	242	577	11	2300	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.103	**No**	495	477	2191%
Landfill	0-10 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	26	100%	100%	0%	15.3	9.8	3.99	42.3	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.976	**No**	8.18	7.88	48%
Landfill	0-10 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	37	100%	100%	0%	79.0	102.1	17.9	494	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.158	**No**	87.7	84.5	217%
Landfill	0-10 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	37	100%	100%	0%	27366	10090	10300	51000	-	-	Lognormal	t-Test (lognormal)	0.977	**No**	8875	8550	29%
Landfill	0-10 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	43	100%	100%	0%	366	391	5.34	1660	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Landfill	0-10 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	26	100%	100%	0%	16251	24551	1190	88300	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.810	**No**	19967	19235	246%
Landfill	0-10 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	37	100%	100%	0%	463	285	146	1712.5	-	-	Lognormal	t-Test (lognormal)	1.000	**No**	255	245	39%
Landfill	0-10 ft	Metals	Mercury	mg/kg	0.11	14	100%	0%	100%	0.0494	0.0091	0.034	0.068	-	-	39	87%	49%	51%	0.327	0.686	0.015	4.15	0.1	0.11	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Landfill	0-10 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	37	100%	100%	0%	166	403	7.85	1760	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.039	**Yes**			
Landfill	0-10 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	26	100%	100%	0%	871	454	214	1870	-	-	Normal	t-Test (normal)	0.999	**No**	434	418	31%
Landfill	0-10 ft	Metals	Selenium	mg/kg	0.3	14	0%	0%	100%	-	-	-	-	0.4	0.5	37	30%	11%	89%	0.190	0.176	0.106	0.879	0.0774	1.5	-	Contingency Table Analysis	0.018	**Yes**			
Landfill	0-10 ft	Metals	Silver	mg/kg	0.51	14	86%	0%	100%	0.0583	0.0412	0.027	0.187	0.022	0.023	37	62%	19%	81%	0.387	0.403	0.101	1.52	0.2	0.57	-	Wilcoxon Rank Sum Test	0.044	**Yes**			
Landfill	0-10 ft	Metals	Sodium	mg/kg	155.5	14	100%	36%	64%	171	75	69.6	324	-	-	26	38%	38%	62%	282	164	165	570	139	172	-	Wilcoxon Rank Sum Test	0.212	**No**	140	135	79%
Landfill	0-10 ft	Metals	Thallium	mg/kg	0.26	14	57%	0%	100%	0.145	0.023	0.128	0.203	0.042	0.103	37	49%	3%	97%	0.109	0.059	0.0361	0.378	0.2	0.3	-	Wilcoxon Rank Sum Test	0.284	**No**	0.0521	0.0502	35%
Landfill	0-10 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	26	100%	100%	0%	48.1	17.7	15.9	93.4	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	16.4	15.8	20%
Landfill	0-10 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	37	100%	100%	0%	204	196	41.6	1140	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Acenaphthene	ug/kg	20	14	64%	0%	100%	1.55	0.57	1.2	3.4	1	1	44	77%	73%	27%	436	719	15	3040	6.8	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Acenaphthylene	ug/kg	20	14	7%	0%	100%	-	-	1.6	1.6	1.4	1.4	44	43%	27%	73%	23.9	26.1	3.4	111	5.9	190	-	Contingency Table Analysis	0.012	**Yes**			
Landfill	0-10 ft	SVOCs	Anthracene	ug/kg	49.8	14	86%	0%	100%	2.33	0.94	1.5	4.9	1.4	1.4	44	89%	73%	27%	1100	1900	12	8440	3.7	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Benzo(a)anthracene	ug/kg	71.35	14	100%	0%	100%	14.0	7.2	4.6	34	-	-	44	95%	91%	9%	5650	8160	29	32000	49.8	92.9	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Benzo(a)pyrene	ug/kg	42.65	14	100%	7%	93%	18.2	9.5	7.7	45	-	-	44	95%	93%	7%	5620	7740	28	34000	35.5	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	49.8	14	100%	7%	93%	23.4	11.5	9.1	55	-	-	28	96%	93%	7%	5030	12100	34	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	27.8	14	100%	7%	93%	13.7	6.6	5.8	32	-	-	44	93%	91%	9%	2850	4040	20	18000	25.1	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	49.8	14	100%	0%	100%	8.00	3.94	2.7	19	-	-	28	96%	93%	7%	3440	11900	40	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Chrysene	ug/kg	49.8	14	100%	0%	100%	18.3	9.5	6.4	45	-	-	44	98%	98%	2%	5680	8030	62	35300	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	3.08	14	50%	43%	57%	3.53	1.20	2.7	6.9	2.2	2.2	44	82%	82%	18%	653	1500	18	9900	3.08	1800	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Fluoranthene	ug/kg	60.45	14	100%	7%	93%	27.0	14.0	10	66	-	-	44	95%	93%	7%	9600	12600	42	54000	49.8	71.1	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Fluorene	ug/kg	1.7	14	7%	7%	93%	-	-	3.2	3.2	1.7	1.7	44	73%	73%	27%	249	375	10	1610	6.86	180	-	Contingency Table Analysis	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	39.2	14	100%	0%	100%	14.1	7.5	5.2	34	-	-	44	93%	91%	9%	3370	4710	18	20000	35.5	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Naphthalene	ug/kg	20	14	43%	0%	100%	1.47	0.27	1.3	2.2	1.3	1.3	44	55%	48%	52%	120	296	5	1710	6.34	190	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Landfill	0-10 ft	SVOCs	Phenanthrene	ug/kg	26.365	14	100%	7%	93%	13.2	7.2	5.5	34	-	-	44	95%	91%	9%	2800	4370	13	21900	2.93	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Pyrene	ug/kg	49.8	14	100%	7%	93%	26.8	13.3	10	64	-	-	44	98%	95%	5%	10600	13900	43	67100	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Total LPAHs	ug/kg	299	14	100%	0%	100%	21	9	12	49	-	-	44	98%	80%	20%	4791	7221	55	34767	299	299	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Total HPAHs	ug/kg	498	14	100%	0%	100%	167	84	65	401	-	-	44	98%	95%	5%	49396	70844	334	367900	498	498	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	58	100%	100%	0%	6906	5003	1530	24300	-	-	Lognormal	t-Test (lognormal)	1.000	**No**	4952	4771	21%
Sandblast	0-1 ft	Metals	Antimony	mg/kg	3.11	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	58	71%	7%	93%	1.62	2.23	0.0895	13.7	0.16	3.54	-	Wilcoxon Rank Sum Test	0.162	**No**	2.01	1.94	1516%
Sandblast	0-1 ft	Metals	Arsenic	mg/kg	0.159	14	100%	100%	0%	3.10	1.26	1.09	5.18	-	-	58	98%	98%	2%	7.64	12.90	0.613	80.9	0.159	0.159	-	Wilcoxon Rank Sum Test	0.006	**Yes**			
Sandblast	0-1 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	58	100%	100%	0%	67.2	32.9	10.7	133	-	-	Normal	t-Test (normal)	1.000	**No**	32.8	31.6	29%
Sandblast	0-1 ft	Metals	Beryllium	mg/kg	0.173	14	100%	100%	0%	0.491	0.091	0.319	0.629	-	-	58	47%	41%	59%	0.186	0.127	0.0587	0.63	0.147	0.191	-	Wilcoxon Rank Sum Test	1.000	**No**	0.121	0.117	24%
Sandblast	0-1 ft	Metals	Cadmium	mg/kg	0.0127	14	100%	100%	0%	0.162	0.059	0.099	0.3395	-	-	58	91%	91%	9%	1.66	2.65	0.0561	17.3	0.0122	0.0129	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	58	100%	100%	0%	4259	2711	863	15100	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	2570	2476	35%
Sandblast	0-1 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	61	100%	100%	0%	383	605	5.27	2650	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.003	**Yes**			
Sandblast	0-1 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	58	100%	100%	0%	12.7	4.4	2.52	24.95	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	4.17	4.02	24%
Sandblast	0-1 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	58	100%	100%	0%	64.8	66.2	13.2	319	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.446	**No**	59.9	57.7	148%
Sandblast	0-1 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	58	100%	100%	0%	27103	8838	10100	46500	-	-	Lognormal	t-Test (lognormal)	0.992	**No**	8147	7849	26%
Sandblast	0-1 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	61	100%	100%	0%	362	479	8.58	3260	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Sandblast	0-1 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	58	100%	100%	0%	11462	11051	1350	47500	-	-	Lognormal	t-Test (lognormal)	0.363	**No**	10030	9662	124%
Sandblast	0-1 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	58	100%	100%	0%	416	145	167	789	-	-	Normal	t-Test (normal)	1.000	**No**	144	139	22%
Sandblast	0-1 ft	Metals	Mercury	mg/kg	0.0277	14	100%	100%	0%	0.0494	0.0091	0.034	0.068	-	-	58	74%	66%	34%	0.0812	0.1300	0.0114	0.723	0.00528	0.0306	-	Wilcoxon Rank Sum Test	0.960	**No**	0.117	0.113	229%
Sandblast	0-1 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	58	100%	100%	0%	167	254	4.79	1060	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.003	**Yes**			
Sandblast	0-1 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	58	100%	100%	0%	524	340	74.9	1480	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	350	337	25%

Figure L-1. Statistical Comparison of Upland OU Soils to Reference Area Soils -- MDL Censored

						Reference Area										Site AOPC										Shapiro-Wilk W Test	Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Site AOPC	Depth Group	Analyte Group	Analyte	Unit	Median MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	Distribution	Appropriate Statistical Test	p-value	Significant Higher Conc in Site?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
Sandblast	0-1 ft	Metals	Selenium	mg/kg	0.4005	14	0%	0%	100%	-	-	-	-	0.4	0.5	58	52%	41%	59%	0.411	0.206	0.175	0.9	0.0781	0.5	-	Contingency Table Analysis	0.000	**Yes**			
Sandblast	0-1 ft	Metals	Silver	mg/kg	0.044	14	86%	57%	43%	0.0583	0.0412	0.027	0.187	0.022	0.023	58	95%	95%	5%	0.141	0.080	0.0571	0.431	0.044	0.0524	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	Metals	Sodium	mg/kg	153	14	100%	36%	64%	171	75	69.6	324	-	-	58	24%	24%	76%	292	61	264	470	11.7	171	-	Wilcoxon Rank Sum Test	0.640	**No**	63.8	61.4	36%
Sandblast	0-1 ft	Metals	Thallium	mg/kg	0.05135	14	57%	57%	43%	0.145	0.023	0.128	0.203	0.042	0.103	58	79%	72%	28%	0.0859	0.0471	0.0288	0.239	0.0429	0.0558	-	Wilcoxon Rank Sum Test	0.852	**No**	0.0437	0.0421	29%
Sandblast	0-1 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	58	100%	100%	0%	44.4	20.9	6.89	84.7	-	-	Normal	t-Test (normal)	1.000	**No**	19.7	19.0	24%
Sandblast	0-1 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	58	100%	100%	0%	173	194	30.3	1160	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Acenaphthene	ug/kg	1	14	64%	64%	36%	1.55	0.57	1.2	3.4	1	1	31	81%	81%	19%	74.9	121.0	1.5	469.5	0.531	1	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Acenaphthylene	ug/kg	1.4	14	7%	7%	93%	-	-	1.6	1.6	1.4	1.4	31	45%	42%	58%	11.2	19.2	1.39	87.7	0.51	70	-	Contingency Table Analysis	0.012	**Yes**			
Sandblast	0-1 ft	SVOCs	Anthracene	ug/kg	0.897	14	86%	86%	14%	2.33	0.94	1.5	4.9	1.4	1.4	31	94%	94%	6%	148	239	1.72	832	0.356	0.394	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Benzo(a)anthracene	ug/kg	0.8995	14	100%	100%	0%	14.0	7.2	4.6	34	-	-	31	94%	94%	6%	736	1270	3.96	6440	0.749	1.05	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Benzo(a)pyrene	ug/kg	0.656	14	100%	100%	0%	18.2	9.5	7.7	45	-	-	31	97%	97%	3%	746	1280	7.49	6470	0.656	0.656	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	-	14	100%	100%	0%	23.4	11.5	9.1	55	-	-	13	100%	100%	0%	1348	1218	25	4100	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	0.233	14	100%	100%	0%	13.7	6.6	5.8	32	-	-	31	84%	84%	16%	449	774	6.89	3830	0.202	0.498	-	Wilcoxon Rank Sum Test	0.004	**Yes**			
Sandblast	0-1 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	-	14	100%	100%	0%	8.00	3.94	2.7	19	-	-	13	100%	100%	0%	469	419	8.3	1400	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Chrysene	ug/kg	0.741	14	100%	100%	0%	18.3	9.5	6.4	45	-	-	31	97%	97%	3%	875	1500	6.36	7590	0.741	0.741	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	1.4215	14	50%	50%	50%	3.53	1.20	2.7	6.9	2.2	2.2	31	65%	61%	39%	150	280	1.23	1430	0.273	3.41	-	Wilcoxon Rank Sum Test	0.011	**Yes**			
Sandblast	0-1 ft	SVOCs	Fluoranthene	ug/kg	1.05	14	100%	100%	0%	27.0	14.0	10	66	-	-	31	97%	97%	3%	1660	3740	8.47	20700	1.05	1.05	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Fluorene	ug/kg	1.7	14	7%	7%	93%	-	-	3.2	3.2	1.7	1.7	31	74%	71%	29%	63.4	113.0	1.69	462.5	0.573	85	-	Contingency Table Analysis	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	0.347	14	100%	100%	0%	14.1	7.5	5.2	34	-	-	31	90%	90%	10%	479	811	3.68	3910	0.286	0.472	-	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-1 ft	SVOCs	Naphthalene	ug/kg	1.3	14	43%	43%	57%	1.47	0.27	1.3	2.2	1.3	1.3	31	61%	61%	39%	24.8	45.0	1.7	227	0.548	65	-	Wilcoxon Rank Sum Test	0.005	**Yes**			
Sandblast	0-1 ft	SVOCs	Phenanthrene	ug/kg	-	14	100%	100%	0%	13.2	7.2	5.5	34	-	-	31	100%	100%	0%	707	1081	5.64	4000	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Pyrene	ug/kg	0.352	14	100%	100%	0%	26.8	13.3	10	64	-	-	31	97%	97%	3%	1660	3920	10	21900	0.352	0.352	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Total LPAHs	ug/kg	-	14	100%	100%	0%	21	9	12	49	-	-	31	100%	100%	0%	1039	1603	9	5687	-	-	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Total HPAHs	ug/kg	5	14	100%	100%	0%	167	84	65	401	-	-	31	97%	97%	3%	7516	13891	37	72270	5	5	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-3 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	75	100%	100%	0%	8256	5476	1530	24300	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	5370	5173	23%
Sandblast	0-3 ft	Metals	Antimony	mg/kg	3.135	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	75	73%	5%	95%	1.38	2.02	0.07	13.7	0.16	4.01	-	Wilcoxon Rank Sum Test	0.194	**No**	1.86	1.79	1404%
Sandblast	0-3 ft	Metals	Arsenic	mg/kg	0.159	14	100%	100%	0%	3.10	1.26	1.09	5.18	-	-	75	99%	99%	1%	7.15	11.40	0.613	80.9	0.159	0.159	-	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-3 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	75	100%	100%	0%	71.7	32.3	10.7	138	-	-	Normal	t-Test (normal)	1.000	**No**	32.3	31.2	28%
Sandblast	0-3 ft	Metals	Beryllium	mg/kg	0.173	14	100%	100%	0%	0.491	0.091	0.319	0.629	-	-	75	59%	55%	45%	0.236	0.153	0.0587	0.63	0.147	0.191	-	Wilcoxon Rank Sum Test	1.000	**No**	0.145	0.140	29%
Sandblast	0-3 ft	Metals	Cadmium	mg/kg	0.0128	14	100%	100%	0%	0.162	0.059	0.099	0.3395	-	-	75	89%	89%	11%	1.42	2.38	0.0561	17.3	0.0122	0.0153	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	75	100%	100%	0%	4820	2694	863	15100	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	2584	2489	35%
Sandblast	0-3 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	78	100%	100%	0%	306	554	5.27	2650	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.007	**Yes**			
Sandblast	0-3 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	75	100%	100%	0%	13.2	4.1	2.52	24.95	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	4.01	3.86	23%
Sandblast	0-3 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	75	100%	100%	0%	62.3	58.5	13.2	319	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.162	**No**	54.1	52.1	134%
Sandblast	0-3 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	75	100%	100%	0%	27114	8238	10100	46500	-	-	Lognormal	t-Test (lognormal)	0.995	**No**	7743	7460	25%
Sandblast	0-3 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	78	100%	100%	0%	309	446	8.58	3260	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	75	100%	100%	0%	10593	9932	9.75	47500	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.572	**No**	9211	8874	113%
Sandblast	0-3 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	75	100%	100%	0%	426	143	167	816	-	-	Normal	t-Test (normal)	1.000	**No**	143	137	22%
Sandblast	0-3 ft	Metals	Mercury	mg/kg	0.0281	14	100%	100%	0%	0.0494	0.0091	0.034	0.068	-	-	75	77%	68%	32%	0.0741	0.1160	0.0114	0.723	0.00528	0.0338	-	Wilcoxon Rank Sum Test	0.963	**No**	0.107	0.103	209%
Sandblast	0-3 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	75	100%	100%	0%	135	230	4.79	1060	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-3 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	75	100%	100%	0%	559	321	74.9	1480	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	333	320	24%
Sandblast	0-3 ft	Metals	Selenium	mg/kg	0.401	14	0%	0%	100%	-	-	-	-	0.4	0.5	75	57%	45%	55%	0.436	0.207	0.175	0.9	0.0781	0.517	-	Contingency Table Analysis	0.000	**Yes**			
Sandblast	0-3 ft	Metals	Silver	mg/kg	0.044	14	86%	57%	43%	0.0583	0.0412	0.027	0.187	0.022	0.023	75	96%	96%	4%	0.137	0.076	0.045	0.431	0.044	0.0524	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	Metals	Sodium	mg/kg	153.5	14	100%	36%	64%	171	75	69.6	324	-	-	75	36%	36%	64%	236	103	173	547	11.7	195	-	Wilcoxon Rank Sum Test	0.325	**No**	99.3	95.7	56%
Sandblast	0-3 ft	Metals	Thallium	mg/kg	0.05135	14	57%	57%	43%	0.145	0.023	0.128	0.203	0.042	0.103	75	84%	79%	21%	0.0959	0.0487	0.0288	0.255	0.0429	0.0558	-	Wilcoxon Rank Sum Test	0.756	**No**	0.0458	0.0441	30%
Sandblast	0-3 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	75	100%	100%	0%	48.1	20.8	6.89	89.1	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	19.9	19.1	24%
Sandblast	0-3 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	75	100%	100%	0%	148	176	30.3	1160	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-3 ft	SVOCs	Acenaphthene	ug/kg	0.869	14	64%	64%	36%	1.55	0.57	1.2	3.4	1	1	40	78%	78%	23%	147	503	1.1	3200	0.531	1	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-3 ft	SVOCs	Acenaphthylene	ug/kg	1.4	14	7%	7%	93%	-	-	1.6	1.6	1.4	1.4	40	40%	38%	63%	16.4	47.8	1.39	295	0.51	70	-	Contingency Table Analysis	0.021	**Yes**			
Sandblast	0-3 ft	SVOCs	Anthracene	ug/kg	0.48	14	86%	86%	14%	2.33	0.94	1.5	4.9	1.4	1.4	40	88%	88%	13%	178	372	1.72	2040	0.356	1.4	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	SVOCs	Benzo(a)anthracene	ug/kg	1.26	14	100%	100%	0%	14.0	7.2	4.6	34	-	-	40	88%	88%	13%	935	2160	3.96	12300	0.749	1.4	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-3 ft	SVOCs	Benzo(a)pyrene	ug/kg	0.7955	14	100%	100%	0%	18.2	9.5	7.7	45	-	-	40	90%	90%	10%	926	2090	7.49	11700	0.656	1.6	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-3 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	2.5	14	100%	100%	0%	23.4	11.5	9.1	55	-	-	18	94%	94%	6%	991	1150	25	4100	2.5	2.5	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	0.246	14	100%	100%	0%	13.7	6.6	5.8	32	-	-	40	83%	83%	18%	459	843	4.33	3830	0.202	2.3	-	Wilcoxon Rank Sum Test	0.006	**Yes**			
Sandblast	0-3 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	2.5	14	100%	100%	0%	8.00	3.94	2.7	19	-	-	18	94%	94%	6%	345	396	8.3	1400	2.5	2.5	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	SVOCs	Chrysene	ug/kg	0.895	14	100%	100%	0%	18.3	9.5	6.4	45	-	-	40	93%	93%	8%	1030	2230	1.8	12000	0.741	0.903	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-3 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	0.784	14	50%	50%	50%	3.53	1.20	2.7	6.9	2.2	2.2	40	65%	65%	35%	153	295	1.23	1430	0.273	3.41	-	Wilcoxon Rank Sum Test	0.006	**Yes**			
Sandblast	0-3 ft	SVOCs	Fluoranthene	ug/kg	1.28	14	100%	100%	0%	27.0	14.0	10	66	-	-	40	93%	93%	8%	2120	5420	6.29	28600	1.05	2.2	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-3 ft	SVOCs	Fluorene	ug/kg	1.7	14	7%	7%	93%	-	-	3.2	3.2	1.7	1.7	40	70%	68%	33%	73.3	153.0	1.69	779	0.573	85	-	Contingency Table Analysis	0.000	**Yes**			
Sandblast	0-3 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	0.472	14	100%	100%	0%	14.1	7.5	5.2	34	-	-	40	88%	88%	13%	503	944	3.52	4170	0.286	1.9	-	Wilcoxon Rank Sum Test	0.005	**Yes**			
Sandblast	0-3 ft	SVOCs	Naphthalene	ug/kg	1.3	14	43%	43%	57%	1.47	0.27	1.3	2.2	1.3	1.3	40	60%	60%	40%	26.1	54.8	1.7	256	0.548	65	-	Wilcoxon Rank Sum Test	0.005	**Yes**			
Sandblast	0-3 ft	SVOCs	Phenanthrene	ug/kg	1.025	14	100%	100%	0%	13.2	7.2	5.5	34	-	-	40	95%	95%	5%	757	1350	2.47	6550	0.75	1.3	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	SVOCs	Pyrene	ug/kg	0.3905	14	100%	100%	0%	26.8	13.3	10	64	-	-	40	95%	95%	5%	2230	5950	2.1	32000	0.352	0.429	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	SVOCs	Total LPAHs	ug/kg	6	14	100%	100%	0%	21	9	12	49	-	-	40	95%	95%	5%	1205	2403	6	13120	5	8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	SVOCs	Total HPAHs	ug/kg	6	14	100%	100%	0%	167	84	65	401	-	-	40	95%	95%	5%	8959	19945	16	105200	5	7	-	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-10 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	78	100%	100%	0%	8518	5534	1530	24300	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	5425	5226	23%
Sandblast	0-10 ft	Metals	Antimony	mg/kg	3.135	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	78	74%	5%	95%	1.35	1.99	0.07	13.7	0.16	4.01	-	Wilcoxon Rank Sum Test	0.199	**No**	1.84	1.77	1387%
Sandblast	0-10 ft	Metals	Arsenic	mg/kg	0.159	14	100%	100%	0%	3.10	1.26	1.09	5.18	-	-	78	99%	99%	1%	7.08	11.20	0.613	80.9	0.159	0.159	-	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-10 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	78	100%	100%	0%	73.0	32.3	10.7	138	-	-	Normal	t-Test (normal)	1.000	**No**	32.3	31.2	28%
Sandblast	0-10 ft	Metals	Beryllium	mg/kg	0.173	14	100%	100%	0%	0.491	0.091	0.319	0.629	-	-	78	60%	56%	44%	0.241	0.152	0.0587	0.63	0.147	0.191	-	Wilcoxon Rank Sum Test	1.000	**No**	0.145	0.140	28%

Figure L-1. Statistical Comparison of Upland OU Soils to Reference Area Soils -- MDL Censored

						Reference Area										Site AOPC										Shapiro-Wilk W Test	Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Site AOPC	Depth Group	Analyte Group	Analyte	Unit	Median MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	Distribution	Appropriate Statistical Test	p-value	Significant Higher Conc in Site?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
Sandblast	0-10 ft	Metals	Cadmium	mg/kg	0.013	14	100%	100%	0%	0.162	0.059	0.099	0.3395	-	-	78	86%	86%	14%	1.37	2.35	0.0561	17.3	0.0122	0.0153	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-10 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	78	100%	100%	0%	4833	2656	863	15100	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	2553	2460	35%
Sandblast	0-10 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	81	100%	100%	0%	296	546	5.27	2650	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.007	**Yes**			
Sandblast	0-10 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	78	100%	100%	0%	13.3	4.1	2.52	24.95	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	3.95	3.81	23%
Sandblast	0-10 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	78	100%	100%	0%	61.8	57.6	13.2	319	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.171	**No**	53.4	51.4	132%
Sandblast	0-10 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	78	100%	100%	0%	27049	8095	10100	46500	-	-	Lognormal	t-Test (lognormal)	0.995	**No**	7631	7351	25%
Sandblast	0-10 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	81	100%	100%	0%	298	442	5.235	3260	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-10 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	78	100%	100%	0%	10445	9768	9.75	47500	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.595	**No**	9085	8752	112%
Sandblast	0-10 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	78	100%	100%	0%	433	148	167	818	-	-	Normal	t-Test (normal)	1.000	**No**	147	142	23%
Sandblast	0-10 ft	Metals	Mercury	mg/kg	0.0281	14	100%	100%	0%	0.0494	0.0091	0.034	0.068	-	-	78	78%	67%	33%	0.0727	0.1140	0.0114	0.723	0.00528	0.0338	-	Wilcoxon Rank Sum Test	0.967	**No**	0.106	0.102	206%
Sandblast	0-10 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	78	100%	100%	0%	131	227	4.79	1060	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-10 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	78	100%	100%	0%	562	315	74.9	1480	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	328	316	24%
Sandblast	0-10 ft	Metals	Selenium	mg/kg	0.401	14	0%	0%	100%	-	-	-	-	0.4	0.5	78	59%	44%	56%	0.435	0.201	0.175	0.9	0.0781	0.517	-	Contingency Table Analysis	0.000	**Yes**			
Sandblast	0-10 ft	Metals	Silver	mg/kg	0.044	14	86%	57%	43%	0.0583	0.0412	0.027	0.187	0.022	0.023	78	96%	96%	4%	0.137	0.074	0.045	0.431	0.044	0.0524	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-10 ft	Metals	Sodium	mg/kg	153	14	100%	36%	64%	171	75	69.6	324	-	-	78	36%	35%	65%	195	126	114	547	11.7	195	-	Wilcoxon Rank Sum Test	0.365	**No**	120	116	67%
Sandblast	0-10 ft	Metals	Thallium	mg/kg	0.05135	14	57%	57%	43%	0.145	0.023	0.128	0.203	0.042	0.103	78	85%	79%	21%	0.0980	0.0498	0.0288	0.255	0.0429	0.0558	-	Wilcoxon Rank Sum Test	0.726	**No**	0.0469	0.0452	31%
Sandblast	0-10 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	78	100%	100%	0%	48.9	20.8	6.89	89.1	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	19.9	19.2	24%
Sandblast	0-10 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	78	100%	100%	0%	145	173	30.3	1160	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.003	**Yes**			
Sandblast	0-10 ft	SVOCs	Acenaphthene	ug/kg	0.719	14	64%	64%	36%	1.55	0.57	1.2	3.4	1	1	43	74%	74%	26%	137	486	1.1	3200	0.531	1	-	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-10 ft	SVOCs	Acenaphthylene	ug/kg	1.4	14	7%	7%	93%	-	-	1.6	1.6	1.4	1.4	43	37%	35%	65%	15.4	46.3	1.39	295	0.51	70	-	Contingency Table Analysis	0.030	**Yes**			
Sandblast	0-10 ft	SVOCs	Anthracene	ug/kg	0.476	14	86%	86%	14%	2.33	0.94	1.5	4.9	1.4	1.4	43	84%	84%	16%	166	362	1.72	2040	0.356	1.4	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-10 ft	SVOCs	Benzo(a)anthracene	ug/kg	1.23	14	100%	100%	0%	14.0	7.2	4.6	34	-	-	43	84%	84%	16%	870	2100	3.96	12300	0.749	1.4	-	Wilcoxon Rank Sum Test	0.003	**Yes**			
Sandblast	0-10 ft	SVOCs	Benzo(a)pyrene	ug/kg	0.78	14	100%	100%	0%	18.2	9.5	7.7	45	-	-	43	86%	86%	14%	862	2030	7.49	11700	0.656	1.6	-	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-10 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	2.5	14	100%	100%	0%	23.4	11.5	9.1	55	-	-	18	94%	94%	6%	991	1150	25	4100	2.5	2.5	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-10 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	0.498	14	100%	100%	0%	13.7	6.6	5.8	32	-	-	43	79%	79%	21%	428	821	4.33	3830	0.202	2.3	-	Wilcoxon Rank Sum Test	0.015	**Yes**			
Sandblast	0-10 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	2.5	14	100%	100%	0%	8.00	3.94	2.7	19	-	-	18	94%	94%	6%	345	396	8.3	1400	2.5	2.5	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-10 ft	SVOCs	Chrysene	ug/kg	0.867	14	100%	100%	0%	18.3	9.5	6.4	45	-	-	43	88%	88%	12%	962	2170	1.8	12000	0.741	0.903	-	Wilcoxon Rank Sum Test	0.003	**Yes**			
Sandblast	0-10 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	0.765	14	50%	50%	50%	3.53	1.20	2.7	6.9	2.2	2.2	43	60%	60%	40%	143	287	1.23	1430	0.273	3.41	-	Wilcoxon Rank Sum Test	0.015	**Yes**			
Sandblast	0-10 ft	SVOCs	Fluoranthene	ug/kg	1.23	14	100%	100%	0%	27.0	14.0	10	66	-	-	43	88%	88%	12%	1970	5260	6.29	28600	1.05	2.2	-	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-10 ft	SVOCs	Fluorene	ug/kg	1.7	14	7%	7%	93%	-	-	3.2	3.2	1.7	1.7	43	65%	63%	37%	68.3	149.0	1.69	779	0.573	85	-	Contingency Table Analysis	0.000	**Yes**			
Sandblast	0-10 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	0.547	14	100%	100%	0%	14.1	7.5	5.2	34	-	-	43	84%	84%	16%	469	920	3.52	4170	0.286	1.9	-	Wilcoxon Rank Sum Test	0.015	**Yes**			
Sandblast	0-10 ft	SVOCs	Naphthalene	ug/kg	1.3	14	43%	43%	57%	1.47	0.27	1.3	2.2	1.3	1.3	43	56%	56%	44%	24.4	53.2	1.7	256	0.548	65	-	Wilcoxon Rank Sum Test	0.012	**Yes**			
Sandblast	0-10 ft	SVOCs	Phenanthrene	ug/kg	0.735	14	100%	100%	0%	13.2	7.2	5.5	34	-	-	43	91%	91%	9%	705	1320	2.47	6550	0.713	1.3	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-10 ft	SVOCs	Pyrene	ug/kg	0.41	14	100%	100%	0%	26.8	13.3	10	64	-	-	43	91%	91%	9%	2080	5770	2.1	32000	0.352	0.429	-	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-10 ft	SVOCs	Total LPAHs	ug/kg	4	14	100%	100%	0%	21	9	12	49	-	-	43	91%	91%	9%	1122	2337	6	13120	4	8	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-10 ft	SVOCs	Total HPAHs	ug/kg	6	14	100%	100%	0%	167	84	65	401	-	-	43	91%	91%	9%	8340	19369	16	105200	5	7	-	Wilcoxon Rank Sum Test	0.006	**Yes**			
Pistol Range	0-1 ft	Metals	Antimony	mg/kg	5	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	5	0%	0%	100%	-	-	-	-	5	6	-	Contingency Table Analysis	1.000	**No**			
Pistol Range	0-1 ft	Metals	Arsenic	mg/kg	5	14	100%	7%	93%	3.10	1.26	1.09	5.18	-	-	5	0%	0%	100%	-	-	-	-	5	6	-	Contingency Table Analysis	1.000	**No**			
Pistol Range	0-1 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	14	100%	100%	0%	38.1	14.3	15.6	53.1	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.307	**No**	12.2	11.8	30%
Pistol Range	0-1 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	63	100%	100%	0%	208	286	7.5	1110	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
Pistol Range	0-1 ft	Metals	Mercury	mg/kg	0.06	14	100%	14%	86%	0.0494	0.0091	0.034	0.068	-	-	14	0%	0%	100%	-	-	-	-	0.04	0.06	-	Contingency Table Analysis	1.000	**No**			
Pistol Range	0-1 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	10	100%	100%	0%	23.7	3.8	19	32	-	-	Normal	t-Test (normal)	0.004	**Yes**			
Pistol Range	0-1 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	10	100%	100%	0%	124	42	74	199	-	-	Normal	t-Test (normal)	0.000	**Yes**			
Bulb Slope	0-1 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	12	100%	100%	0%	222	165	25	597	-	-	Normal	t-Test (normal)	0.001	**Yes**			
Bulb Slope	0-1 ft	Metals	Mercury	mg/kg	-	14	100%	100%	0%	0.0494	0.0091	0.034	0.068	-	-	12	100%	100%	0%	0.404	0.425	0.05	1.54	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
4 AOPCs	0-1 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	68	100%	100%	0%	7953	5445	1530	24300	-	-	Lognormal	t-Test (lognormal)	1.000	**No**	5335	5139	23%
4 AOPCs	0-1 ft	Metals	Antimony	mg/kg	2.83	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	83	54%	7%	93%	1.39	2.02	0.0895	13.7	0.16	6	-	Wilcoxon Rank Sum Test	0.154	**No**	1.88	1.81	1414%
4 AOPCs	0-1 ft	Metals	Arsenic	mg/kg	5	14	100%	7%	93%	3.10	1.26	1.09	5.18	-	-	84	93%	38%	62%	6.79	11.20	0.613	80.9	0.159	6	-	Wilcoxon Rank Sum Test	0.009	**Yes**			
4 AOPCs	0-1 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	79	100%	100%	0%	80.3	41.2	10.7	242.5	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.996	**No**	40.1	38.6	35%
4 AOPCs	0-1 ft	Metals	Beryllium	mg/kg	0.176	14	100%	100%	0%	0.491	0.091	0.319	0.629	-	-	79	56%	52%	48%	0.228	0.147	0.0587	0.63	0.147	0.28	-	Wilcoxon Rank Sum Test	1.000	**No**	0.140	0.135	28%
4 AOPCs	0-1 ft	Metals	Cadmium	mg/kg	0.26	14	100%	7%	93%	0.162	0.059	0.099	0.3395	-	-	79	86%	82%	18%	1.41	2.33	0.0561	17.3	0.0122	0.29	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	68	100%	100%	0%	4457	2571	863	15100	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	2466	2376	34%
4 AOPCs	0-1 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	82	100%	100%	0%	305	544	5.27	2650	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.012	**Yes**			
4 AOPCs	0-1 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	68	100%	100%	0%	12.4	4.5	2.52	24.95	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	4.26	4.10	25%
4 AOPCs	0-1 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	93	100%	100%	0%	62.8	71.4	13.2	494	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.277	**No**	66.9	64.4	165%
4 AOPCs	0-1 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	79	100%	100%	0%	26683	8581	10100	46500	-	-	Lognormal	t-Test (lognormal)	0.998	**No**	8078	7782	26%
4 AOPCs	0-1 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	157	100%	100%	0%	270	368	5.34	3260	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	68	100%	100%	0%	11090	10788	1350	47500	-	-	Lognormal	t-Test (lognormal)	0.397	**No**	9924	9560	122%
4 AOPCs	0-1 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	79	100%	100%	0%	407	144	167	789	-	-	Lognormal	t-Test (lognormal)	1.000	**No**	144	139	22%
4 AOPCs	0-1 ft	Metals	Mercury	mg/kg	0.05	14	100%	36%	64%	0.0494	0.0091	0.034	0.068	-	-	107	68%	45%	55%	0.183	0.459	0.0114	4.15	0.00528	0.11	-	Wilcoxon Rank Sum Test	0.066	**No**	0.433	0.417	846%
4 AOPCs	0-1 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	89	100%	100%	0%	125	220	4.79	1060	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.005	**Yes**			
4 AOPCs	0-1 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	68	100%	100%	0%	642	437	74.9	1870	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	430	415	31%
4 AOPCs	0-1 ft	Metals	Selenium	mg/kg	0.4	14	0%	0%	100%	-	-	-	-	0.4	0.5	79	42%	32%	68%	0.355	0.216	0.175	0.9	0.0781	1.5	-	Contingency Table Analysis	0.001	**Yes**			
4 AOPCs	0-1 ft	Metals	Silver	mg/kg	0.3	14	86%	0%	100%	0.0583	0.0412	0.027	0.187	0.022	0.023	79	78%	11%	89%	0.177	0.185	0.0571	1.5	0.044	0.57	-	Wilcoxon Rank Sum Test	0.127	**No**	0.172	0.166	284%
4 AOPCs	0-1 ft	Metals	Sodium	mg/kg	153	14	100%	36%	64%	171	75	69.6	324	-	-	68	34%	34%	66%	320	93	264	570	11.7	171	-	Wilcoxon Rank Sum Test	0.280	**No**	90.6	87.3	51%
4 AOPCs	0-1 ft	Metals	Thallium	mg/kg	0.2	14	57%	7%	93%	0.145	0.023	0.128	0.203	0.042	0.103	79	61%	5%	95%	0.0891	0.0561	0.0288	0.378	0.0429	0.3	-	Wilcoxon Rank Sum Test	0.598	**No**	0.0527	0.0507	35%
4 AOPCs	0-1 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	68	100%	100%	0%	44.1	19.5	6.89	84.7	-	-	Normal	t-Test (normal)	1.000	**No**	18.7	18.0	23%
4 AOPCs	0-1 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	89	100%	100%	0%	165	167	30.3	1160	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Acenaphthene	ug/kg	1	14	64%	64%	36%	1.55	0.57	1.2	3.4	1	1	58	76%	76%	24%	160	380	1.5	2600	0.531	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Acenaphthylene	ug/kg	3.89	14	7%	0%	100%	-	-	1.6	1.6	1.4	1.4	58	36%	28%	72%	12.8	20.5	1.39	87.7	0.51	190	-	Contingency Table Analysis	0.029	**Yes**			

Figure L-1. Statistical Comparison of Upland OU Soils to Reference Area Soils -- MDL Censored

						Reference Area										Site AOPC										Shapiro-Wilk W Test	Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Site AOPC	Depth Group	Analyte Group	Analyte	Unit	Median MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	Distribution	Appropriate Statistical Test	p-value	Significant Higher Conc in Site?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
4 AOPCs	0-1 ft	SVOCs	Anthracene	ug/kg	25.6	14	86%	0%	100%	2.33	0.94	1.5	4.9	1.4	1.4	58	90%	60%	40%	263	471	1.72	2700	0.356	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Benzo(a)anthracene	ug/kg	25.425	14	100%	7%	93%	14.0	7.2	4.6	34	-	-	58	93%	83%	17%	1770	4520	3.96	32000	0.749	92.9	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Benzo(a)pyrene	ug/kg	35.5	14	100%	7%	93%	18.2	9.5	7.7	45	-	-	58	95%	81%	19%	1880	4660	7.49	33000	0.656	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	49.8	14	100%	7%	93%	23.4	11.5	9.1	55	-	-	37	97%	92%	8%	3280	10500	25	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	0.372	14	100%	100%	0%	13.7	6.6	5.8	32	-	-	58	86%	86%	14%	976	2520	6.89	18000	0.202	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	49.8	14	100%	0%	100%	8.00	3.94	2.7	19	-	-	37	97%	89%	11%	2410	10500	8.3	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Chrysene	ug/kg	25.2705	14	100%	14%	86%	18.3	9.5	6.4	45	-	-	58	97%	84%	16%	1920	4500	6.36	32000	0.741	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	2.2	14	50%	50%	50%	3.53	1.20	2.7	6.9	2.2	2.2	58	72%	71%	29%	363	1300	1.23	9900	0.273	1800	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Fluoranthene	ug/kg	49.8	14	100%	7%	93%	27.0	14.0	10	66	-	-	58	95%	79%	21%	3360	8060	8.47	54000	1.05	71.1	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Fluorene	ug/kg	1.7	14	7%	7%	93%	-	-	3.2	3.2	1.7	1.7	58	67%	66%	34%	92.7	186.0	1.69	1200	0.573	180	-	Contingency Table Analysis	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	17.986	14	100%	14%	86%	14.1	7.5	5.2	34	-	-	58	90%	79%	21%	1090	2730	3.68	19000	0.286	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Naphthalene	ug/kg	13.425	14	43%	0%	100%	1.47	0.27	1.3	2.2	1.3	1.3	58	52%	33%	67%	56.9	153.0	1.7	823	0.548	190	-	Wilcoxon Rank Sum Test	0.008	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Phenanthrene	ug/kg	49.8	14	100%	0%	100%	13.2	7.2	5.5	34	-	-	58	98%	71%	29%	1090	1910	5.64	12000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Pyrene	ug/kg	25.076	14	100%	50%	50%	26.8	13.3	10	64	-	-	58	97%	91%	9%	3190	6750	10	40000	0.352	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Total LPAHs	ug/kg	299	14	100%	0%	100%	21	9	12	49	-	-	58	98%	57%	43%	1740	2944	9	18674	299	299	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Total HPAHs	ug/kg	252	14	100%	7%	93%	167	84	65	401	-	-	58	97%	83%	17%	18198	50007	37	367900	5	498	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	87	100%	100%	0%	8912	5551	1530	24300	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	5449	5249	23%
4 AOPCs	0-3 ft	Metals	Antimony	mg/kg	2.9	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	102	60%	6%	94%	1.26	1.86	0.07	13.7	0.16	6	-	Wilcoxon Rank Sum Test	0.180	**No**	1.75	1.69	1319%
4 AOPCs	0-3 ft	Metals	Arsenic	mg/kg	5	14	100%	7%	93%	3.10	1.26	1.09	5.18	-	-	103	94%	42%	58%	6.55	10.10	0.613	80.9	0.159	6	-	Wilcoxon Rank Sum Test	0.005	**Yes**			
4 AOPCs	0-3 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	98	100%	100%	0%	81.6	39.0	10.7	242.5	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.996	**No**	38.3	36.9	34%
4 AOPCs	0-3 ft	Metals	Beryllium	mg/kg	0.175	14	100%	100%	0%	0.491	0.091	0.319	0.629	-	-	98	62%	59%	41%	0.256	0.156	0.0587	0.63	0.147	0.28	-	Wilcoxon Rank Sum Test	1.000	**No**	0.150	0.144	29%
4 AOPCs	0-3 ft	Metals	Cadmium	mg/kg	0.01505	14	100%	100%	0%	0.162	0.059	0.099	0.3395	-	-	98	86%	86%	14%	1.28	2.14	0.0561	17.3	0.0122	0.29	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	87	100%	100%	0%	4991	2604	863	15100	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	2516	2424	34%
4 AOPCs	0-3 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	101	100%	100%	0%	279	531	5.27	2650	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.014	**Yes**			
4 AOPCs	0-3 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	87	100%	100%	0%	13.4	5.3	2.52	41	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	5.03	4.85	29%
4 AOPCs	0-3 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	112	100%	100%	0%	64.0	71.8	13.2	494	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.124	**No**	68.0	65.5	168%
4 AOPCs	0-3 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	98	100%	100%	0%	27150	8537	10100	51000	-	-	Lognormal	t-Test (lognormal)	0.996	**No**	8126	7828	26%
4 AOPCs	0-3 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	182	100%	100%	0%	274	379	5.34	3260	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	87	100%	100%	0%	11365	12218	9.75	77700	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.586	**No**	11424	11005	141%
4 AOPCs	0-3 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	98	100%	100%	0%	434	199	167	1712.5	-	-	Lognormal	t-Test (lognormal)	1.000	**No**	193	186	30%
4 AOPCs	0-3 ft	Metals	Mercury	mg/kg	0.045	14	100%	64%	36%	0.0494	0.0091	0.034	0.068	-	-	126	71%	48%	52%	0.163	0.426	0.0114	4.15	0.00528	0.11	-	Wilcoxon Rank Sum Test	0.332	**No**	0.405	0.391	791%
4 AOPCs	0-3 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	108	100%	100%	0%	128	253	4.79	1610	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.003	**Yes**			
4 AOPCs	0-3 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	87	100%	100%	0%	646	399	74.9	1870	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	398	383	29%
4 AOPCs	0-3 ft	Metals	Selenium	mg/kg	0.4	14	0%	0%	100%	-	-	-	-	0.4	0.5	98	49%	37%	63%	0.387	0.225	0.175	0.9	0.0781	1.5	-	Contingency Table Analysis	0.000	**Yes**			
4 AOPCs	0-3 ft	Metals	Silver	mg/kg	0.3	14	86%	0%	100%	0.0583	0.0412	0.027	0.187	0.022	0.023	98	83%	10%	90%	0.172	0.179	0.045	1.5	0.044	0.57	-	Wilcoxon Rank Sum Test	0.137	**No**	0.169	0.163	279%
4 AOPCs	0-3 ft	Metals	Sodium	mg/kg	153	14	100%	36%	64%	171	75	69.6	324	-	-	87	41%	41%	59%	262	128	173	570	11.7	195	-	Wilcoxon Rank Sum Test	0.160	**No**	122	118	69%
4 AOPCs	0-3 ft	Metals	Thallium	mg/kg	0.2	14	57%	7%	93%	0.145	0.023	0.128	0.203	0.042	0.103	98	68%	5%	95%	0.0977	0.0551	0.0288	0.378	0.0429	0.3	-	Wilcoxon Rank Sum Test	0.598	**No**	0.0524	0.0504	35%
4 AOPCs	0-3 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	87	100%	100%	0%	47.4	19.6	6.89	89.1	-	-	Normal	t-Test (normal)	1.000	**No**	18.9	18.2	23%
4 AOPCs	0-3 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	108	100%	100%	0%	158	183	30.3	1160	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Acenaphthene	ug/kg	1	14	64%	64%	36%	1.55	0.57	1.2	3.4	1	1	73	77%	77%	23%	257	598	1.1	3200	0.531	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Acenaphthylene	ug/kg	1.4	14	7%	7%	93%	-	-	1.6	1.6	1.4	1.4	73	40%	38%	62%	18.0	39.8	1.39	295	0.51	190	-	Contingency Table Analysis	0.015	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Anthracene	ug/kg	1.4	14	86%	86%	14%	2.33	0.94	1.5	4.9	1.4	1.4	73	88%	88%	12%	440	1090	1.72	8440	0.356	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Benzo(a)anthracene	ug/kg	1.28	14	100%	100%	0%	14.0	7.2	4.6	34	-	-	73	90%	90%	10%	2470	5430	3.96	32000	0.749	92.9	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Benzo(a)pyrene	ug/kg	1.1995	14	100%	100%	0%	18.2	9.5	7.7	45	-	-	73	92%	92%	8%	2720	6020	7.49	34000	0.656	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	26.15	14	100%	43%	57%	23.4	11.5	9.1	55	-	-	46	96%	93%	7%	3450	9690	25	65000	2.5	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	0.5525	14	100%	100%	0%	13.7	6.6	5.8	32	-	-	73	86%	86%	14%	1380	3140	4.33	18000	0.202	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	26.15	14	100%	0%	100%	8.00	3.94	2.7	19	-	-	46	96%	87%	13%	2230	9420	8.3	65000	2.5	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Chrysene	ug/kg	0.899	14	100%	100%	0%	18.3	9.5	6.4	45	-	-	73	95%	95%	5%	2730	5960	1.8	35300	0.741	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	2.2	14	50%	50%	50%	3.53	1.20	2.7	6.9	2.2	2.2	73	74%	73%	27%	416	1210	1.23	9900	0.273	1800	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Fluoranthene	ug/kg	2.2	14	100%	100%	0%	27.0	14.0	10	66	-	-	73	93%	93%	7%	4660	9770	6.29	54000	1.05	71.1	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Fluorene	ug/kg	1.7	14	7%	7%	93%	-	-	3.2	3.2	1.7	1.7	73	68%	67%	33%	130	266	1.69	1610	0.573	180	-	Contingency Table Analysis	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	1.238	14	100%	100%	0%	14.1	7.5	5.2	34	-	-	73	89%	89%	11%	1600	3640	3.52	20000	0.286	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Naphthalene	ug/kg	1.3	14	43%	43%	57%	1.47	0.27	1.3	2.2	1.3	1.3	73	56%	56%	44%	56.1	141.0	1.7	823	0.548	190	-	Wilcoxon Rank Sum Test	0.007	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Phenanthrene	ug/kg	1.3	14	100%	100%	0%	13.2	7.2	5.5	34	-	-	73	96%	96%	4%	1550	3150	2.47	21900	0.75	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Pyrene	ug/kg	0.429	14	100%	100%	0%	26.8	13.3	10	64	-	-	73	96%	96%	4%	4940	10600	2.1	67100	0.352	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Total LPAHs	ug/kg	8	14	100%	100%	0%	21	9	12	49	-	-	73	96%	95%	5%	2496	5046	6	34767	5	299	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Total HPAHs	ug/kg	7	14	100%	100%	0%	167	84	65	401	-	-	73	96%	96%	4%	24503	55546	16	367900	5	498	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	104	100%	100%	0%	9071	5513	1530	24300	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	5430	5231	23%
4 AOPCs	0-10 ft	Metals	Antimony	mg/kg	2.9	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	119	66%	8%	92%	1.36	1.93	0.07	13.7	0.16	6	-	Wilcoxon Rank Sum Test	0.146	**No**	1.83	1.76	1380%
4 AOPCs	0-10 ft	Metals	Arsenic	mg/kg	5	14	100%	7%	93%	3.10	1.26	1.09	5.18	-	-	120	95%	39%	61%	6.20	9.46	0.613	80.9	0.159	6	-	Wilcoxon Rank Sum Test	0.007	**Yes**			
4 AOPCs	0-10 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	115	100%	100%	0%	83.1	38.0	10.7	242.5	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.994	**No**	37.5	36.1	33%
4 AOPCs	0-10 ft	Metals	Beryllium	mg/kg	0.172	14	100%	100%	0%	0.491	0.091	0.319	0.629	-	-	115	63%	61%	39%	0.251	0.149	0.0587	0.63	0.147	0.28	-	Wilcoxon Rank Sum Test	1.000	**No**	0.144	0.139	28%
4 AOPCs	0-10 ft	Metals	Cadmium	mg/kg	0.0143	14	100%	100%	0%	0.162	0.059	0.099	0.3395	-	-	115	85%	85%	15%	1.28	2.00	0.0561	17.3	0.0122	0.29	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	104	100%	100%	0%	4959	2435	863	15100	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	2375	2288	32%
4 AOPCs	0-10 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	118	100%	100%	0%	279	554	5.27	2650	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.015	**Yes**			
4 AOPCs	0-10 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	104	100%	100%	0%	13.8	6.1	2.52	42.3	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.998	**No**	5.80	5.59	34%
4 AOPCs	0-10 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	129	100%	100%	0%	64.1	71.4	13.2	494	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.159	**No**	68.0	65.6	168%
4 AOPCs	0-10 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	115	100%	100%	0%	27151	8743	10100	51000	-	-	Lognormal	t-Test (lognormal)	0.997	**No**	8375	8068	27%
4 AOPCs	0-10 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	199	100%	100%	0%	280	377	5.235	3260	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	104	100%	100%	0%	11897	14967	9.75	88300	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.672	**No**	14128	13610	174%

Figure L-1. Statistical Comparison of Upland OU Soils to Reference Area Soils -- MDL Censored

						Reference Area										Site AOPC										Shapiro-Wilk W Test	Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Site AOPC	Depth Group	Analyte Group	Analyte	Unit	Median MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	Distribution	Appropriate Statistical Test	p-value	Significant Higher Conc in Site?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
4 AOPCs	0-10 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	115	100%	100%	0%	443	202	146	1712.5	-	-	Lognormal	t-Test (lognormal)	1.000	**No**	196	189	30%
4 AOPCs	0-10 ft	Metals	Mercury	mg/kg	0.045	14	100%	64%	36%	0.0494	0.0091	0.034	0.068	-	-	143	75%	49%	51%	0.165	0.410	0.0114	4.15	0.00528	0.11	-	Wilcoxon Rank Sum Test	0.279	**No**	0.392	0.378	766%
4 AOPCs	0-10 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	125	100%	100%	0%	133	284	4.79	1760	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.003	**Yes**			
4 AOPCs	0-10 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	104	100%	100%	0%	639	378	74.9	1870	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	379	365	27%
4 AOPCs	0-10 ft	Metals	Selenium	mg/kg	0.4	14	0%	0%	100%	-	-	-	-	0.4	0.5	115	50%	31%	69%	0.338	0.237	0.106	0.9	0.0774	1.5	-	Contingency Table Analysis	0.000	**Yes**			
4 AOPCs	0-10 ft	Metals	Silver	mg/kg	0.3	14	86%	0%	100%	0.0583	0.0412	0.027	0.187	0.022	0.023	115	85%	14%	86%	0.211	0.264	0.045	1.52	0.044	0.57	-	Wilcoxon Rank Sum Test	0.086	**No**	0.250	0.241	414%
4 AOPCs	0-10 ft	Metals	Sodium	mg/kg	153.5	14	100%	36%	64%	171	75	69.6	324	-	-	104	37%	36%	64%	209	145	114	570	11.7	195	-	Wilcoxon Rank Sum Test	0.307	**No**	139	134	78%
4 AOPCs	0-10 ft	Metals	Thallium	mg/kg	0.2	14	57%	7%	93%	0.145	0.023	0.128	0.203	0.042	0.103	115	73%	6%	94%	0.101	0.054	0.0288	0.378	0.0429	0.3	-	Wilcoxon Rank Sum Test	0.532	**No**	0.0516	0.0497	34%
4 AOPCs	0-10 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	104	100%	100%	0%	48.7	20.0	6.89	93.4	-	-	Normal	t-Test (normal)	1.000	**No**	19.3	18.6	24%
4 AOPCs	0-10 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	125	100%	100%	0%	161	175	30.3	1160	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Acenaphthene	ug/kg	1	14	64%	64%	36%	1.55	0.57	1.2	3.4	1	1	87	76%	76%	24%	286	634	1.1	3200	0.531	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Acenaphthylene	ug/kg	1.4	14	7%	7%	93%	-	-	1.6	1.6	1.4	1.4	87	40%	39%	61%	18.2	37.7	1.39	295	0.51	190	-	Contingency Table Analysis	0.013	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Anthracene	ug/kg	1.4	14	86%	86%	14%	2.33	0.94	1.5	4.9	1.4	1.4	87	86%	86%	14%	640	1450	1.72	8440	0.356	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Benzo(a)anthracene	ug/kg	1.26	14	100%	100%	0%	14.0	7.2	4.6	34	-	-	87	90%	90%	10%	3290	6450	3.96	32000	0.749	92.9	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Benzo(a)pyrene	ug/kg	0.7955	14	100%	100%	0%	18.2	9.5	7.7	45	-	-	87	91%	91%	9%	3270	6160	7.49	34000	0.656	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	26.15	14	100%	43%	57%	23.4	11.5	9.1	55	-	-	46	96%	93%	7%	3450	9690	25	65000	2.5	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	0.58	14	100%	100%	0%	13.7	6.6	5.8	32	-	-	87	86%	86%	14%	1650	3170	4.33	18000	0.202	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	26.15	14	100%	0%	100%	8.00	3.94	2.7	19	-	-	46	96%	87%	13%	2230	9420	8.3	65000	2.5	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Chrysene	ug/kg	0.881	14	100%	100%	0%	18.3	9.5	6.4	45	-	-	87	93%	93%	7%	3350	6370	1.8	35300	0.741	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	2.2	14	50%	50%	50%	3.53	1.20	2.7	6.9	2.2	2.2	87	71%	70%	30%	398	1120	1.23	9900	0.273	1800	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Fluoranthene	ug/kg	1.28	14	100%	100%	0%	27.0	14.0	10	66	-	-	87	92%	92%	8%	5830	10400	6.29	54000	1.05	71.1	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Fluorene	ug/kg	1.7	14	7%	7%	93%	-	-	3.2	3.2	1.7	1.7	87	69%	68%	32%	158	301	1.69	1610	0.573	180	-	Contingency Table Analysis	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	0.5645	14	100%	100%	0%	14.1	7.5	5.2	34	-	-	87	89%	89%	11%	1940	3710	3.52	20000	0.286	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Naphthalene	ug/kg	1.3	14	43%	43%	57%	1.47	0.27	1.3	2.2	1.3	1.3	87	55%	55%	45%	70.7	219.0	1.7	1710	0.548	190	-	Wilcoxon Rank Sum Test	0.008	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Phenanthrene	ug/kg	1.025	14	100%	100%	0%	13.2	7.2	5.5	34	-	-	87	93%	93%	7%	1760	3410	2.47	21900	0.713	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Pyrene	ug/kg	0.412	14	100%	100%	0%	26.8	13.3	10	64	-	-	87	94%	94%	6%	6370	11500	2.1	67100	0.352	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Total LPAHs	ug/kg	5	14	100%	100%	0%	21	9	12	49	-	-	87	94%	94%	6%	2976	5696	6	34767	4	299	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Total HPAHs	ug/kg	6	14	100%	100%	0%	167	84	65	401	-	-	87	94%	94%	6%	29102	56082	16	367900	5	498	-	Wilcoxon Rank Sum Test	0.000	**Yes**			

Figure L-2. Comparison of Upland OU Soils to Reference Area Soils -- MRL Censored

						Reference Area										Site AOPC										Shapiro-Wilk W Test	Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Site AOPC	Depth Group	Analyte Group	Analyte	Unit	Median MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	Distribution	Appropriate Statistical Test	p-value	Significant Higher Conc in Site?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
Landfill	0-1 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	10	100%	100%	0%	14026	3769	7560	19100	-	-	Normal	t-Test (normal)	1.000	**No**	4358	5019	22%
Landfill	0-1 ft	Metals	Antimony	mg/kg	0.3	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	20	20%	20%	80%	0.815	1.210	0.309	4.2	0.2	2.9	-	Wilcoxon Rank Sum Test	0.043	**Yes**			
Landfill	0-1 ft	Metals	Arsenic	mg/kg	-	14	100%	100%	0%	3.10	1.26	1.09	5.18	-	-	21	100%	100%	0%	5.33	6.02	1.5	30.1	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.063	**No**	4.75	4.58	148%
Landfill	0-1 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	21	100%	100%	0%	116	41	58.9	242.5	-	-	Lognormal	t-Test (lognormal)	0.314	**No**	37.9	36.5	33%
Landfill	0-1 ft	Metals	Beryllium	mg/kg	0.275	14	100%	100%	0%	0.491	0.091	0.319	0.629	-	-	21	81%	81%	19%	0.380	0.083	0.3	0.5755	0.27	0.467	-	Wilcoxon Rank Sum Test	0.999	**No**	0.0866	0.0834	17%
Landfill	0-1 ft	Metals	Cadmium	mg/kg	0.27	14	100%	7%	93%	0.162	0.059	0.099	0.3395	-	-	21	71%	71%	29%	0.769	0.524	0.343	2.09	0.26	0.29	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	10	100%	100%	0%	5608	969	4380	6920	-	-	Normal	t-Test (normal)	0.985	**No**	1537	1770	25%
Landfill	0-1 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	21	100%	100%	0%	77.2	173.6	14.7	801	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.278	**No**	135	130	598%
Landfill	0-1 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	10	100%	100%	0%	11.1	4.9	6.4	22.7	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.998	**No**	3.90	4.50	27%
Landfill	0-1 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	21	100%	100%	0%	73.6	101.3	23.5	494	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.076	**No**	79.1	76.2	195%
Landfill	0-1 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	21	100%	100%	0%	25524	7916	14100	45900	-	-	Normal	t-Test (normal)	0.980	**No**	6624	6381	21%
Landfill	0-1 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	21	100%	100%	0%	211	236	5.34	741	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Landfill	0-1 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	10	100%	100%	0%	8933	9321	4260	35100	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.873	**No**	6263	7213	92%
Landfill	0-1 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	21	100%	100%	0%	382	142	196	720	-	-	Lognormal	t-Test (lognormal)	1.000	**No**	141	136	22%
Landfill	0-1 ft	Metals	Mercury	mg/kg	0.11	14	100%	0%	100%	0.0494	0.0091	0.034	0.068	-	-	23	78%	61%	39%	0.427	0.851	0.07	4.15	0.1	0.11	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	21	100%	100%	0%	58.4	122.5	13.4	570	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.186	**No**	95.4	91.9	492%
Landfill	0-1 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	10	100%	100%	0%	1325	291	797	1870	-	-	Normal	t-Test (normal)	0.526	**No**	354	408	31%
Landfill	0-1 ft	Metals	Selenium	mg/kg	0.975	14	0%	0%	100%	-	-	-	-	2.1	2.3	21	14%	0%	100%	0.245	0.144	0.205	0.848	0.2	1.5	-	Contingency Table Analysis	0.203	**No**			
Landfill	0-1 ft	Metals	Silver	mg/kg	0.51	14	86%	0%	100%	0.0605	0.0400	0.027	0.187	0.065	0.069	21	33%	10%	90%	0.346	0.286	0.2	1.5	0.2	0.57	-	Wilcoxon Rank Sum Test	0.129	**No**	0.224	0.216	357%
Landfill	0-1 ft	Metals	Sodium	mg/kg	467	14	100%	0%	100%	171	75	69.6	324	-	-	10	90%	60%	40%	497	55	420	570	467	467	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Landfill	0-1 ft	Metals	Thallium	mg/kg	0.26	14	57%	0%	100%	0.145	0.023	0.128	0.203	0.042	0.103	21	10%	5%	95%	0.109	0.060	0.0953	0.378	0.2	0.3	-	Contingency Table Analysis	1.000	**No**			
Landfill	0-1 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	10	100%	100%	0%	42.3	8.2	34.3	56.3	-	-	Normal	t-Test (normal)	1.000	**No**	11.6	13.4	17%
Landfill	0-1 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	21	100%	100%	0%	164	120	41.6	635	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Acenaphthene	ug/kg	20	14	64%	0%	100%	1.75	0.63	1.2	3.4	9.9	10	27	70%	63%	37%	262	523	15	2600	20	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Acenaphthylene	ug/kg	20	14	7%	0%	100%	-	-	1.6	1.6	9.9	10	27	26%	11%	89%	20.7	21.0	3.4	78.1	20	190	-	Contingency Table Analysis	0.153	**No**			
Landfill	0-1 ft	SVOCs	Anthracene	ug/kg	114.9	14	86%	0%	100%	2.47	0.94	1.5	4.9	9.9	10	27	85%	41%	59%	398	613	12	2700	49.8	180	-	Wilcoxon Rank Sum Test	0.004	**Yes**			
Landfill	0-1 ft	SVOCs	Benzo(a)anthracene	ug/kg	177.4	14	100%	0%	100%	14.0	7.2	4.6	34	-	-	27	93%	70%	30%	2970	6280	29	32000	49.8	305	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Benzo(a)pyrene	ug/kg	100.9	14	100%	0%	100%	18.2	9.5	7.7	45	-	-	27	93%	78%	22%	3180	6450	28	33000	49.8	152	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	49.8	14	100%	7%	93%	23.4	11.5	9.1	55	-	-	24	96%	92%	8%	4330	12900	34	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	152	14	100%	0%	100%	13.7	6.6	5.8	32	-	-	27	89%	63%	37%	1580	3510	20	18000	49.8	168	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	49.8	14	100%	0%	100%	8.00	3.94	2.7	19	-	-	24	96%	92%	8%	3460	12900	40	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Chrysene	ug/kg	49.8	14	100%	0%	100%	18.3	9.5	6.4	45	-	-	27	96%	96%	4%	3110	6180	62	32000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	10	14	50%	0%	100%	4.36	1.23	2.7	6.9	10	10	27	81%	81%	19%	615	1850	18	9900	49.8	1800	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Fluoranthene	ug/kg	100.9	14	100%	0%	100%	27.0	14.0	10	66	-	-	27	93%	85%	15%	5320	10800	42	54000	49.8	152	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Fluorene	ug/kg	10	14	7%	0%	100%	-	-	3.2	3.2	9.9	10	27	59%	59%	41%	133	239	10	1200	20	180	-	Contingency Table Analysis	0.001	**Yes**			
Landfill	0-1 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	152	14	100%	0%	100%	14.1	7.5	5.2	34	-	-	27	89%	63%	37%	1790	3790	18	19000	49.8	168	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Naphthalene	ug/kg	20	14	43%	0%	100%	1.70	0.27	1.3	2.2	9.9	10	27	41%	30%	70%	98.5	212.0	5	823	20	190	-	Wilcoxon Rank Sum Test	0.021	**Yes**			
Landfill	0-1 ft	SVOCs	Phenanthrene	ug/kg	49.8	14	100%	0%	100%	13.2	7.2	5.5	34	-	-	27	96%	81%	19%	1540	2480	13	12000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Pyrene	ug/kg	49.8	14	100%	7%	93%	26.8	13.3	10	64	-	-	27	96%	93%	7%	4940	8640	43	40000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Total LPAHs	ug/kg	299	14	100%	0%	100%	32	12	20	56	-	-	27	96%	70%	30%	2566	3828	141	18674	299	299	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-1 ft	SVOCs	Total HPAHs	ug/kg	498	14	100%	0%	100%	169	83	68	401	-	-	27	96%	93%	7%	30511	69770	334	367900	498	498	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	12	100%	100%	0%	13008	4235	6000	19100	-	-	Normal	t-Test (normal)	1.000	**No**	4506	4709	21%
Landfill	0-3 ft	Metals	Antimony	mg/kg	0.3	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	22	27%	27%	73%	0.958	1.230	0.309	4.2	0.2	2.9	-	Wilcoxon Rank Sum Test	0.019	**Yes**			
Landfill	0-3 ft	Metals	Arsenic	mg/kg	-	14	100%	100%	0%	3.10	1.26	1.09	5.18	-	-	23	100%	100%	0%	5.30	5.75	1.5	30.1	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.041	**Yes**			
Landfill	0-3 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	23	100%	100%	0%	114	42	42.6	242.5	-	-	Lognormal	t-Test (lognormal)	0.442	**No**	38.9	37.4	34%
Landfill	0-3 ft	Metals	Beryllium	mg/kg	0.334	14	100%	93%	7%	0.491	0.091	0.319	0.629	-	-	23	74%	52%	48%	0.376	0.082	0.3	0.5755	0.27	0.467	-	Wilcoxon Rank Sum Test	0.999	**No**	0.0856	0.0825	17%
Landfill	0-3 ft	Metals	Cadmium	mg/kg	0.27	14	100%	7%	93%	0.162	0.059	0.099	0.3395	-	-	23	74%	74%	26%	0.888	0.756	0.343	3.54	0.26	0.29	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	12	100%	100%	0%	6055	1654	4380	10485	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.962	**No**	1751	1830	26%
Landfill	0-3 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	23	100%	100%	0%	190	444	14.7	1950	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.162	**No**	352	339	1559%
Landfill	0-3 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	12	100%	100%	0%	14.5	10.0	6.4	41	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.962	**No**	7.11	7.43	45%
Landfill	0-3 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	23	100%	100%	0%	85.3	116.0	23.5	494	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.061	**No**	92.1	88.8	228%
Landfill	0-3 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	23	100%	100%	0%	27267	9645	14100	51000	-	-	Lognormal	t-Test (lognormal)	0.955	**No**	8002	7709	26%
Landfill	0-3 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	29	100%	100%	0%	342	413	5.34	1660	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Landfill	0-3 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	12	100%	100%	0%	16190	21772	4260	77700	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.611	**No**	14854	15522	198%
Landfill	0-3 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	23	100%	100%	0%	462	323	196	1712.5	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	270	260	41%
Landfill	0-3 ft	Metals	Mercury	mg/kg	0.11	14	100%	0%	100%	0.0494	0.0091	0.034	0.068	-	-	25	80%	56%	44%	0.397	0.823	0.0475	4.15	0.1	0.11	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Landfill	0-3 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	23	100%	100%	0%	148	356	13.4	1610	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.102	**No**	282	272	1458%
Landfill	0-3 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	12	100%	100%	0%	1191	418	322	1870	-	-	Normal	t-Test (normal)	0.812	**No**	404	422	32%
Landfill	0-3 ft	Metals	Selenium	mg/kg	0.975	14	0%	0%	100%	-	-	-	-	2.1	2.3	23	22%	0%	100%	0.276	0.192	0.205	0.879	0.2	1.5	-	Contingency Table Analysis	0.077	**No**			
Landfill	0-3 ft	Metals	Silver	mg/kg	0.51	14	86%	0%	100%	0.0605	0.0400	0.027	0.187	0.065	0.069	23	39%	13%	87%	0.327	0.304	0.126	1.5	0.2	0.57	-	Wilcoxon Rank Sum Test	0.088	**No**	0.242	0.233	386%
Landfill	0-3 ft	Metals	Sodium	mg/kg	405	14	100%	0%	100%	171	75	69.6	324	-	-	12	75%	75%	25%	483	58	420	570	388	467	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	Metals	Thallium	mg/kg	0.26	14	57%	0%	100%	0.145	0.023	0.128	0.203	0.042	0.103	23	17%	4%	96%	0.0917	0.0629	0.0578	0.378	0.2	0.3	-	Wilcoxon Rank Sum Test	0.234	**No**	0.0519	0.0500	34%
Landfill	0-3 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	12	100%	100%	0%	43.2	8.5	34.3	56.3	-	-	Normal	t-Test (normal)	1.000	**No**	11.5	12.0	15%
Landfill	0-3 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	23	100%	100%	0%	204	234	41.6	1140	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Acenaphthene	ug/kg	20	14	64%	0%	100%	1.75	0.63	1.2	3.4	9.9	10	33	76%	70%	30%	395	669	15	2600	20	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Acenaphthylene	ug/kg	20	14	7%	0%	100%	-	-	1.6	1.6	9.9	10	33	39%	18%	82%	26.2	26.7	3.4	111	20	190	-	Contingency Table Analysis	0.026	**Yes**			
Landfill	0-3 ft	SVOCs	Anthracene	ug/kg	114.9	14	86%	0%	100%	2.47	0.94	1.5	4.9	9.9	10	33	88%	52%	48%	761	1510	12	8440	49.8	180	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Landfill	0-3 ft	SVOCs	Benzo(a)anthracene	ug/kg	177.4	14	100%	0%	100%	14.0	7.2	4.6	34	-	-	33	94%	76%	24%	4330	7300	29	32000	49.8	305	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Benzo(a)pyrene	ug/kg	100.9	14	100%	0%	100%	18.2	9.5	7.7	45	-	-	33	94%	82%	18%	4890	8130	28	34000	49.8	152	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	49.8	14	100%	7%	93%	23.4	11.5	9.1	55	-	-	28	96%	93%	7%	5030	12100	34	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			

Figure L-2. Comparison of Upland OU Soils to Reference Area Soils -- MRL Censored

						Reference Area										Site AOPC										Shapiro-Wilk W Test	Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Site AOPC	Depth Group	Analyte Group	Analyte	Unit	Median MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	Distribution	Appropriate Statistical Test	p-value	Significant Higher Conc in Site?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
Landfill	0-3 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	152	14	100%	0%	100%	13.7	6.6	5.8	32	-	-	33	91%	70%	30%	2490	4320	20	18000	49.8	168	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	49.8	14	100%	0%	100%	8.00	3.94	2.7	19	-	-	28	96%	93%	7%	3440	11900	40	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Chrysene	ug/kg	49.8	14	100%	0%	100%	18.3	9.5	6.4	45	-	-	33	97%	97%	3%	4780	8050	62	35300	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	10	14	50%	0%	100%	4.36	1.23	2.7	6.9	10	10	33	85%	85%	15%	742	1710	18	9900	49.8	1800	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Fluoranthene	ug/kg	100.9	14	100%	0%	100%	27.0	14.0	10	66	-	-	33	94%	88%	12%	7750	12600	42	54000	49.8	152	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Fluorene	ug/kg	10	14	7%	0%	100%	-	-	3.2	3.2	9.9	10	33	67%	67%	33%	205	342	10	1610	20	180	-	Contingency Table Analysis	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	152	14	100%	0%	100%	14.1	7.5	5.2	34	-	-	33	91%	70%	30%	2940	5000	18	20000	49.8	168	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Naphthalene	ug/kg	20	14	43%	0%	100%	1.70	0.27	1.3	2.2	9.9	10	33	52%	42%	58%	98.7	193.0	5	823	20	190	-	Wilcoxon Rank Sum Test	0.004	**Yes**			
Landfill	0-3 ft	SVOCs	Phenanthrene	ug/kg	49.8	14	100%	0%	100%	13.2	7.2	5.5	34	-	-	33	97%	85%	15%	2500	4260	13	21900	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Pyrene	ug/kg	49.8	14	100%	7%	93%	26.8	13.3	10	64	-	-	33	97%	94%	6%	8220	13700	43	67100	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Total LPAHs	ug/kg	299	14	100%	0%	100%	32	12	20	56	-	-	33	97%	76%	24%	4079	6699	141	34767	299	299	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-3 ft	SVOCs	Total HPAHs	ug/kg	498	14	100%	0%	100%	169	83	68	401	-	-	33	97%	94%	6%	43384	75455	334	367900	498	498	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	26	100%	100%	0%	10731	5200	2380	23100	-	-	Normal	t-Test (normal)	1.000	**No**	5042	4858	21%
Landfill	0-10 ft	Metals	Antimony	mg/kg	0.3	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	36	56%	56%	44%	1.50	1.86	0.309	8.19	0.2	2.9	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	Metals	Arsenic	mg/kg	-	14	100%	100%	0%	3.10	1.26	1.09	5.18	-	-	37	100%	100%	0%	4.73	4.71	1.5	30.1	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.066	**No**	4.09	3.94	127%
Landfill	0-10 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	37	100%	100%	0%	104	41	34	242.5	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.719	**No**	38.7	37.3	34%
Landfill	0-10 ft	Metals	Beryllium	mg/kg	0.39	14	100%	86%	14%	0.491	0.091	0.319	0.629	-	-	37	70%	27%	73%	0.321	0.099	0.186	0.5755	0.27	0.467	-	Wilcoxon Rank Sum Test	1.000	**No**	0.0968	0.0933	19%
Landfill	0-10 ft	Metals	Cadmium	mg/kg	0.27	14	100%	7%	93%	0.162	0.059	0.099	0.3395	-	-	37	84%	84%	16%	1.13	0.78	0.343	3.54	0.26	0.29	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	26	100%	100%	0%	5336	1583	1760	10485	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.998	**No**	1671	1610	23%
Landfill	0-10 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	37	100%	100%	0%	242	577	11	2300	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.103	**No**	495	477	2191%
Landfill	0-10 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	26	100%	100%	0%	15.3	9.8	3.99	42.3	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.976	**No**	8.18	7.88	48%
Landfill	0-10 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	37	100%	100%	0%	79.0	102.1	17.9	494	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.158	**No**	87.7	84.5	217%
Landfill	0-10 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	37	100%	100%	0%	27366	10090	10300	51000	-	-	Lognormal	t-Test (lognormal)	0.977	**No**	8875	8550	29%
Landfill	0-10 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	43	100%	100%	0%	366	391	5.34	1660	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Landfill	0-10 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	26	100%	100%	0%	16251	24551	1190	88300	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.810	**No**	19967	19235	246%
Landfill	0-10 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	37	100%	100%	0%	463	285	146	1712.5	-	-	Lognormal	t-Test (lognormal)	1.000	**No**	255	245	39%
Landfill	0-10 ft	Metals	Mercury	mg/kg	0.11	14	100%	0%	100%	0.0494	0.0091	0.034	0.068	-	-	39	87%	49%	51%	0.327	0.686	0.015	4.15	0.1	0.11	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Landfill	0-10 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	37	100%	100%	0%	166	403	7.85	1760	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.039	**Yes**			
Landfill	0-10 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	26	100%	100%	0%	871	454	214	1870	-	-	Normal	t-Test (normal)	0.999	**No**	434	418	31%
Landfill	0-10 ft	Metals	Selenium	mg/kg	0.448	14	0%	0%	100%	-	-	-	-	2.1	2.3	37	30%	5%	95%	0.223	0.167	0.106	0.879	0.2	1.5	-	Contingency Table Analysis	0.018	**Yes**			
Landfill	0-10 ft	Metals	Silver	mg/kg	0.51	14	86%	0%	100%	0.0605	0.0400	0.027	0.187	0.065	0.069	37	62%	19%	81%	0.387	0.403	0.101	1.52	0.2	0.57	-	Wilcoxon Rank Sum Test	0.044	**Yes**			
Landfill	0-10 ft	Metals	Sodium	mg/kg	386	14	100%	0%	100%	171	75	69.6	324	-	-	26	38%	35%	65%	285	164	165	570	214	467	-	Wilcoxon Rank Sum Test	0.008	**Yes**			
Landfill	0-10 ft	Metals	Thallium	mg/kg	0.26	14	57%	0%	100%	0.145	0.023	0.128	0.203	0.042	0.103	37	49%	3%	97%	0.109	0.059	0.0361	0.378	0.2	0.3	-	Wilcoxon Rank Sum Test	0.284	**No**	0.0521	0.0502	35%
Landfill	0-10 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	26	100%	100%	0%	48.1	17.7	15.9	93.4	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	16.4	15.8	20%
Landfill	0-10 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	37	100%	100%	0%	204	196	41.6	1140	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Acenaphthene	ug/kg	20	14	64%	0%	100%	1.75	0.63	1.2	3.4	9.9	10	44	77%	73%	27%	441	718	15	3040	14.7	1440	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Acenaphthylene	ug/kg	20	14	7%	0%	100%	-	-	1.6	1.6	9.9	10	44	43%	27%	73%	26.7	25.2	3.4	111	13.5	190	-	Contingency Table Analysis	0.012	**Yes**			
Landfill	0-10 ft	SVOCs	Anthracene	ug/kg	49.8	14	86%	0%	100%	2.47	0.94	1.5	4.9	9.9	10	44	89%	73%	27%	1100	1900	12	8440	14.7	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Benzo(a)anthracene	ug/kg	177.4	14	100%	0%	100%	14.0	7.2	4.6	34	-	-	44	95%	80%	20%	5650	8160	29	32000	49.8	305	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Benzo(a)pyrene	ug/kg	100.9	14	100%	0%	100%	18.2	9.5	7.7	45	-	-	44	95%	86%	14%	5620	7730	28	34000	49.8	152	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	49.8	14	100%	7%	93%	23.4	11.5	9.1	55	-	-	28	96%	93%	7%	5030	12100	34	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	152	14	100%	0%	100%	13.7	6.6	5.8	32	-	-	44	93%	75%	25%	2850	4040	20	18000	49.8	168	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	49.8	14	100%	0%	100%	8.00	3.94	2.7	19	-	-	28	96%	93%	7%	3440	11900	40	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Chrysene	ug/kg	49.8	14	100%	0%	100%	18.3	9.5	6.4	45	-	-	44	98%	98%	2%	5680	8030	62	35300	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	13.2	14	50%	0%	100%	4.36	1.23	2.7	6.9	10	10	44	82%	82%	18%	655	1500	18	9900	13.2	1800	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Fluoranthene	ug/kg	100.9	14	100%	0%	100%	27.0	14.0	10	66	-	-	44	95%	91%	9%	9600	12600	42	54000	49.8	152	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Fluorene	ug/kg	10	14	7%	0%	100%	-	-	3.2	3.2	9.9	10	44	73%	73%	27%	251	374	10	1610	14.7	180	-	Contingency Table Analysis	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	152	14	100%	0%	100%	14.1	7.5	5.2	34	-	-	44	93%	75%	25%	3380	4710	18	20000	49.8	168	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Naphthalene	ug/kg	20	14	43%	0%	100%	1.70	0.27	1.3	2.2	9.9	10	44	55%	48%	52%	120	296	5	1710	13.5	190	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Landfill	0-10 ft	SVOCs	Phenanthrene	ug/kg	5724.9	14	100%	0%	100%	13.2	7.2	5.5	34	-	-	44	95%	11%	89%	2840	4360	13	21900	49.8	11400	-	Wilcoxon Rank Sum Test	0.099	**No**	3821	3681	27868%
Landfill	0-10 ft	SVOCs	Pyrene	ug/kg	49.8	14	100%	7%	93%	26.8	13.3	10	64	-	-	44	98%	95%	5%	10600	13900	43	67100	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Total LPAHs	ug/kg	299	14	100%	0%	100%	32	12	20	56	-	-	44	98%	80%	20%	4846	7239	97	34767	299	299	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Landfill	0-10 ft	SVOCs	Total HPAHs	ug/kg	498	14	100%	0%	100%	169	83	68	401	-	-	44	98%	95%	5%	49424	70834	334	367900	498	498	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	58	100%	100%	0%	6906	5003	1530	24300	-	-	Lognormal	t-Test (lognormal)	1.000	**No**	4952	4771	21%
Sandblast	0-1 ft	Metals	Antimony	mg/kg	3.11	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	58	71%	7%	93%	1.62	2.23	0.0895	13.7	0.16	3.54	-	Wilcoxon Rank Sum Test	0.162	**No**	2.01	1.94	1516%
Sandblast	0-1 ft	Metals	Arsenic	mg/kg	1.04	14	100%	100%	0%	3.10	1.26	1.09	5.18	-	-	58	98%	90%	10%	7.64	12.90	0.613	80.9	1.04	1.04	-	Wilcoxon Rank Sum Test	0.006	**Yes**			
Sandblast	0-1 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	58	100%	100%	0%	67.2	32.9	10.7	133	-	-	Normal	t-Test (normal)	1.000	**No**	32.8	31.6	29%
Sandblast	0-1 ft	Metals	Beryllium	mg/kg	0.427	14	100%	79%	21%	0.491	0.091	0.319	0.629	-	-	58	47%	5%	95%	0.269	0.099	0.0587	0.63	0.363	0.472	-	Wilcoxon Rank Sum Test	1.000	**No**	0.0974	0.0938	19%
Sandblast	0-1 ft	Metals	Cadmium	mg/kg	0.256	14	100%	7%	93%	0.162	0.059	0.099	0.3395	-	-	58	91%	86%	14%	1.67	2.64	0.0561	17.3	0.248	0.261	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	58	100%	100%	0%	4259	2711	863	15100	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	2570	2476	35%
Sandblast	0-1 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	61	100%	100%	0%	383	605	5.27	2650	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.003	**Yes**			
Sandblast	0-1 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	58	100%	100%	0%	12.7	4.4	2.52	24.95	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	4.17	4.02	24%
Sandblast	0-1 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	58	100%	100%	0%	64.8	66.2	13.2	319	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.446	**No**	59.9	57.7	148%
Sandblast	0-1 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	58	100%	100%	0%	27103	8838	10100	46500	-	-	Lognormal	t-Test (lognormal)	0.992	**No**	8147	7849	26%
Sandblast	0-1 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	61	100%	100%	0%	362	479	8.58	3260	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Sandblast	0-1 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	58	100%	100%	0%	11462	11051	1350	47500	-	-	Lognormal	t-Test (lognormal)	0.363	**No**	10030	9662	124%
Sandblast	0-1 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	58	100%	100%	0%	416	145	167	789	-	-	Normal	t-Test (normal)	1.000	**No**	144	139	22%
Sandblast	0-1 ft	Metals	Mercury	mg/kg	0.0421	14	100%	86%	14%	0.0494	0.0091	0.034	0.068	-	-	58	74%	43%	57%	0.0847	0.1280	0.0114	0.723	0.0199	0.0466	-	Wilcoxon Rank Sum Test	0.932	**No**	0.116	0.111	226%
Sandblast	0-1 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	58	100%	100%	0%	167	254	4.79	1060	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.003	**Yes**			
Sandblast	0-1 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	58	100%	100%	0%	524	340	74.9	1480	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	350	337	25%

Figure L-2. Comparison of Upland OU Soils to Reference Area Soils -- MRL Censored

						Reference Area										Site AOPC										Shapiro-Wilk W Test	Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Site AOPC	Depth Group	Analyte Group	Analyte	Unit	Median MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	Distribution	Appropriate Statistical Test	p-value	Significant Higher Conc in Site?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
Sandblast	0-1 ft	Metals	Selenium	mg/kg	2.955	14	0%	0%	100%	-	-	-	-	2.1	2.3	58	52%	0%	100%	0.547	0.191	0.175	0.9	0.262	3.54	-	Contingency Table Analysis	0.000	**Yes**			
Sandblast	0-1 ft	Metals	Silver	mg/kg	0.454	14	86%	0%	100%	0.0605	0.0400	0.027	0.187	0.065	0.069	58	95%	0%	100%	0.145	0.080	0.0571	0.431	0.454	0.54	-	All Samples are Censored at Median MRL	-	**-**			
Sandblast	0-1 ft	Metals	Sodium	mg/kg	227.5	14	100%	21%	79%	171	75	69.6	324	-	-	58	24%	24%	76%	298	64	264	470	103	1130	-	Wilcoxon Rank Sum Test	0.327	**No**	66.3	63.8	37%
Sandblast	0-1 ft	Metals	Thallium	mg/kg	0.497	14	57%	0%	100%	0.145	0.023	0.128	0.203	0.042	0.103	58	79%	0%	100%	0.0991	0.0441	0.0288	0.239	0.454	0.589	-	All Samples are Censored at Median MRL	-	**-**			
Sandblast	0-1 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	58	100%	100%	0%	44.4	20.9	6.89	84.7	-	-	Normal	t-Test (normal)	1.000	**No**	19.7	19.0	24%
Sandblast	0-1 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	58	100%	100%	0%	173	194	30.3	1160	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Acenaphthene	ug/kg	9.9	14	64%	0%	100%	1.75	0.63	1.2	3.4	9.9	10	31	81%	58%	42%	75.0	121.0	1.5	469.5	1.23	10	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Acenaphthylene	ug/kg	10	14	7%	0%	100%	-	-	1.6	1.6	9.9	10	31	45%	23%	77%	12.0	20.1	1.39	87.7	1.17	340	-	Contingency Table Analysis	0.012	**Yes**			
Sandblast	0-1 ft	SVOCs	Anthracene	ug/kg	5.985	14	86%	0%	100%	2.47	0.94	1.5	4.9	9.9	10	31	94%	68%	32%	148	239	1.72	832	1.41	2.07	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Benzo(a)anthracene	ug/kg	2.26	14	100%	100%	0%	14.0	7.2	4.6	34	-	-	31	94%	94%	6%	736	1270	3.96	6440	2.07	2.45	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Benzo(a)pyrene	ug/kg	2.07	14	100%	100%	0%	18.2	9.5	7.7	45	-	-	31	97%	97%	3%	746	1280	7.49	6470	2.07	2.07	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	-	14	100%	100%	0%	23.4	11.5	9.1	55	-	-	13	100%	100%	0%	1348	1218	25	4100	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	1.41	14	100%	100%	0%	13.7	6.6	5.8	32	-	-	31	84%	84%	16%	449	774	6.89	3830	1.23	2.07	-	Wilcoxon Rank Sum Test	0.004	**Yes**			
Sandblast	0-1 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	-	14	100%	100%	0%	8.00	3.94	2.7	19	-	-	13	100%	100%	0%	469	419	8.3	1400	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Chrysene	ug/kg	2.07	14	100%	100%	0%	18.3	9.5	6.4	45	-	-	31	97%	97%	3%	875	1500	6.36	7590	2.07	2.07	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	6.035	14	50%	7%	93%	4.36	1.23	2.7	6.9	10	10	31	65%	61%	39%	150	280	1.23	1430	1.17	14.6	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Fluoranthene	ug/kg	2.07	14	100%	100%	0%	27.0	14.0	10	66	-	-	31	97%	97%	3%	1660	3740	8.47	20700	2.07	2.07	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Fluorene	ug/kg	10	14	7%	0%	100%	-	-	3.2	3.2	9.9	10	31	74%	45%	55%	65.2	113.0	1.69	462.5	1.23	340	-	Contingency Table Analysis	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	1.49	14	100%	100%	0%	14.1	7.5	5.2	34	-	-	31	90%	90%	10%	479	811	3.68	3910	1.23	2.07	-	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-1 ft	SVOCs	Naphthalene	ug/kg	9.9	14	43%	0%	100%	1.70	0.27	1.3	2.2	9.9	10	31	61%	29%	71%	25.9	45.6	1.7	227	1.17	340	-	Wilcoxon Rank Sum Test	0.014	**Yes**			
Sandblast	0-1 ft	SVOCs	Phenanthrene	ug/kg	-	14	100%	100%	0%	13.2	7.2	5.5	34	-	-	31	100%	100%	0%	707	1081	5.64	4000	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Pyrene	ug/kg	2.07	14	100%	100%	0%	26.8	13.3	10	64	-	-	31	97%	97%	3%	1660	3920	10	21900	2.07	2.07	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-1 ft	SVOCs	Total LPAHs	ug/kg	-	14	100%	100%	0%	32	12	20	56	-	-	31	100%	100%	0%	1049	1608	12	5714	-	-	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-1 ft	SVOCs	Total HPAHs	ug/kg	17	14	100%	100%	0%	169	83	68	401	-	-	31	97%	97%	3%	7517	13891	41	72270	17	17	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-3 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	75	100%	100%	0%	8256	5476	1530	24300	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	5370	5173	23%
Sandblast	0-3 ft	Metals	Antimony	mg/kg	3.135	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	75	73%	5%	95%	1.38	2.02	0.07	13.7	0.16	4.01	-	Wilcoxon Rank Sum Test	0.194	**No**	1.86	1.79	1404%
Sandblast	0-3 ft	Metals	Arsenic	mg/kg	1.04	14	100%	100%	0%	3.10	1.26	1.09	5.18	-	-	75	99%	92%	8%	7.15	11.40	0.613	80.9	1.04	1.04	-	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-3 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	75	100%	100%	0%	71.7	32.3	10.7	138	-	-	Normal	t-Test (normal)	1.000	**No**	32.3	31.2	28%
Sandblast	0-3 ft	Metals	Beryllium	mg/kg	0.427	14	100%	79%	21%	0.491	0.091	0.319	0.629	-	-	75	59%	13%	87%	0.309	0.114	0.0587	0.63	0.363	0.472	-	Wilcoxon Rank Sum Test	1.000	**No**	0.111	0.107	22%
Sandblast	0-3 ft	Metals	Cadmium	mg/kg	0.259	14	100%	7%	93%	0.162	0.059	0.099	0.3395	-	-	75	89%	81%	19%	1.43	2.38	0.0561	17.3	0.248	0.311	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	75	100%	100%	0%	4820	2694	863	15100	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	2584	2489	35%
Sandblast	0-3 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	78	100%	100%	0%	306	554	5.27	2650	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.007	**Yes**			
Sandblast	0-3 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	75	100%	100%	0%	13.2	4.1	2.52	24.95	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	4.01	3.86	23%
Sandblast	0-3 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	75	100%	100%	0%	62.3	58.5	13.2	319	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.162	**No**	54.1	52.1	134%
Sandblast	0-3 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	75	100%	100%	0%	27114	8238	10100	46500	-	-	Lognormal	t-Test (lognormal)	0.995	**No**	7743	7460	25%
Sandblast	0-3 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	78	100%	100%	0%	309	446	8.58	3260	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	75	100%	100%	0%	10593	9932	9.75	47500	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.572	**No**	9211	8874	113%
Sandblast	0-3 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	75	100%	100%	0%	426	143	167	816	-	-	Normal	t-Test (normal)	1.000	**No**	143	137	22%
Sandblast	0-3 ft	Metals	Mercury	mg/kg	0.0428	14	100%	86%	14%	0.0494	0.0091	0.034	0.068	-	-	75	77%	39%	61%	0.0771	0.1150	0.0114	0.723	0.0199	0.0514	-	Wilcoxon Rank Sum Test	0.946	**No**	0.106	0.102	207%
Sandblast	0-3 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	75	100%	100%	0%	135	230	4.79	1060	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-3 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	75	100%	100%	0%	559	321	74.9	1480	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	333	320	24%
Sandblast	0-3 ft	Metals	Selenium	mg/kg	3	14	0%	0%	100%	-	-	-	-	2.1	2.3	75	57%	0%	100%	0.555	0.189	0.175	0.9	0.262	4.01	-	Contingency Table Analysis	0.000	**Yes**			
Sandblast	0-3 ft	Metals	Silver	mg/kg	0.454	14	86%	0%	100%	0.0605	0.0400	0.027	0.187	0.065	0.069	75	96%	0%	100%	0.141	0.075	0.045	0.431	0.454	0.54	-	All Samples are Censored at Median MRL	-	**-**			
Sandblast	0-3 ft	Metals	Sodium	mg/kg	232	14	100%	21%	79%	171	75	69.6	324	-	-	75	36%	31%	69%	251	104	173	547	103	1130	-	Wilcoxon Rank Sum Test	0.175	**No**	100	97	56%
Sandblast	0-3 ft	Metals	Thallium	mg/kg	0.497	14	57%	0%	100%	0.145	0.023	0.128	0.203	0.042	0.103	75	84%	0%	100%	0.107	0.045	0.0288	0.255	0.454	0.589	-	All Samples are Censored at Median MRL	-	**-**			
Sandblast	0-3 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	75	100%	100%	0%	48.1	20.8	6.89	89.1	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	19.9	19.1	24%
Sandblast	0-3 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	75	100%	100%	0%	148	176	30.3	1160	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-3 ft	SVOCs	Acenaphthene	ug/kg	4.51	14	64%	0%	100%	1.75	0.63	1.2	3.4	9.9	10	40	78%	63%	38%	147	503	1.1	3200	1.23	10	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	SVOCs	Acenaphthylene	ug/kg	9.9	14	7%	0%	100%	-	-	1.6	1.6	9.9	10	40	40%	20%	80%	17.2	48.5	1.39	295	1.17	340	-	Contingency Table Analysis	0.021	**Yes**			
Sandblast	0-3 ft	SVOCs	Anthracene	ug/kg	2.52	14	86%	29%	71%	2.47	0.94	1.5	4.9	9.9	10	40	88%	75%	25%	178	372	1.72	2040	1.41	6.5	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	SVOCs	Benzo(a)anthracene	ug/kg	2.5	14	100%	100%	0%	14.0	7.2	4.6	34	-	-	40	88%	88%	13%	935	2160	3.96	12300	2.07	6.5	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-3 ft	SVOCs	Benzo(a)pyrene	ug/kg	2.51	14	100%	100%	0%	18.2	9.5	7.7	45	-	-	40	90%	90%	10%	926	2090	7.49	11700	2.07	6.5	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-3 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	6.5	14	100%	100%	0%	23.4	11.5	9.1	55	-	-	18	94%	94%	6%	991	1150	25	4100	6.5	6.5	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	1.49	14	100%	100%	0%	13.7	6.6	5.8	32	-	-	40	83%	83%	18%	459	843	4.33	3830	1.23	6.5	-	Wilcoxon Rank Sum Test	0.006	**Yes**			
Sandblast	0-3 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	6.5	14	100%	79%	21%	8.00	3.94	2.7	19	-	-	18	94%	94%	6%	345	396	8.3	1400	6.5	6.5	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	SVOCs	Chrysene	ug/kg	2.5	14	100%	100%	0%	18.3	9.5	6.4	45	-	-	40	93%	90%	10%	1030	2230	1.8	12000	2.07	2.52	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-3 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	2.52	14	50%	50%	50%	4.36	1.23	2.7	6.9	10	10	40	65%	63%	38%	154	295	1.23	1430	1.17	14.6	-	Wilcoxon Rank Sum Test	0.007	**Yes**			
Sandblast	0-3 ft	SVOCs	Fluoranthene	ug/kg	2.52	14	100%	100%	0%	27.0	14.0	10	66	-	-	40	93%	93%	8%	2120	5420	6.29	28600	2.07	6.5	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-3 ft	SVOCs	Fluorene	ug/kg	10	14	7%	0%	100%	-	-	3.2	3.2	9.9	10	40	70%	40%	60%	74.6	153.0	1.69	779	1.23	340	-	Contingency Table Analysis	0.000	**Yes**			
Sandblast	0-3 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	2.07	14	100%	100%	0%	14.1	7.5	5.2	34	-	-	40	88%	88%	13%	503	944	3.52	4170	1.23	6.5	-	Wilcoxon Rank Sum Test	0.005	**Yes**			
Sandblast	0-3 ft	SVOCs	Naphthalene	ug/kg	6.7	14	43%	0%	100%	1.70	0.27	1.3	2.2	9.9	10	40	60%	33%	68%	27.0	55.4	1.7	256	1.17	340	-	Wilcoxon Rank Sum Test	0.012	**Yes**			
Sandblast	0-3 ft	SVOCs	Phenanthrene	ug/kg	4.51	14	100%	100%	0%	13.2	7.2	5.5	34	-	-	40	95%	93%	8%	757	1350	2.47	6550	2.52	6.5	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	SVOCs	Pyrene	ug/kg	2.295	14	100%	100%	0%	26.8	13.3	10	64	-	-	40	95%	93%	8%	2230	5950	2.1	32000	2.07	2.52	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-3 ft	SVOCs	Total LPAHs	ug/kg	27	14	100%	64%	36%	32	12	20	56	-	-	40	95%	75%	25%	1214	2405	12	13120	15	39	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-3 ft	SVOCs	Total HPAHs	ug/kg	18	14	100%	100%	0%	169	83	68	401	-	-	40	95%	95%	5%	8961	19944	20	105200	17	20	-	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-10 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	78	100%	100%	0%	8518	5534	1530	24300	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	5425	5226	23%

Figure L-2. Comparison of Upland OU Soils to Reference Area Soils -- MRL Censored

						Reference Area										Site AOPC										Shapiro-Wilk W Test	Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Site AOPC	Depth Group	Analyte Group	Analyte	Unit	Median MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	Distribution	Appropriate Statistical Test	p-value	Significant Higher Conc in Site?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
Sandblast	0-10 ft	Metals	Antimony	mg/kg	3.135	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	78	74%	5%	95%	1.35	1.99	0.07	13.7	0.16	4.01	-	Wilcoxon Rank Sum Test	0.199	**No**	1.84	1.77	1387%
Sandblast	0-10 ft	Metals	Arsenic	mg/kg	1.04	14	100%	100%	0%	3.10	1.26	1.09	5.18	-	-	78	99%	92%	8%	7.09	11.20	0.613	80.9	1.04	1.04	-	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-10 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	78	100%	100%	0%	73.0	32.3	10.7	138	-	-	Normal	t-Test (normal)	1.000	**No**	32.3	31.2	28%
Sandblast	0-10 ft	Metals	Beryllium	mg/kg	0.427	14	100%	79%	21%	0.491	0.091	0.319	0.629	-	-	78	60%	13%	87%	0.314	0.112	0.0587	0.63	0.363	0.472	-	Wilcoxon Rank Sum Test	1.000	**No**	0.109	0.105	21%
Sandblast	0-10 ft	Metals	Cadmium	mg/kg	0.264	14	100%	7%	93%	0.162	0.059	0.099	0.3395	-	-	78	86%	77%	23%	1.38	2.34	0.0561	17.3	0.248	0.311	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-10 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	78	100%	100%	0%	4833	2656	863	15100	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	2553	2460	35%
Sandblast	0-10 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	81	100%	100%	0%	296	546	5.27	2650	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.007	**Yes**			
Sandblast	0-10 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	78	100%	100%	0%	13.3	4.1	2.52	24.95	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	3.95	3.81	23%
Sandblast	0-10 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	78	100%	100%	0%	61.8	57.6	13.2	319	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.171	**No**	53.4	51.4	132%
Sandblast	0-10 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	78	100%	100%	0%	27049	8095	10100	46500	-	-	Lognormal	t-Test (lognormal)	0.995	**No**	7631	7351	25%
Sandblast	0-10 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	81	100%	100%	0%	298	442	5.235	3260	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-10 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	78	100%	100%	0%	10445	9768	9.75	47500	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.595	**No**	9085	8752	112%
Sandblast	0-10 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	78	100%	100%	0%	433	148	167	818	-	-	Normal	t-Test (normal)	1.000	**No**	147	142	23%
Sandblast	0-10 ft	Metals	Mercury	mg/kg	0.0428	14	100%	86%	14%	0.0494	0.0091	0.034	0.068	-	-	78	78%	38%	62%	0.0753	0.1130	0.0114	0.723	0.0199	0.0514	-	Wilcoxon Rank Sum Test	0.952	**No**	0.105	0.101	204%
Sandblast	0-10 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	78	100%	100%	0%	131	227	4.79	1060	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-10 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	78	100%	100%	0%	562	315	74.9	1480	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	328	316	24%
Sandblast	0-10 ft	Metals	Selenium	mg/kg	3	14	0%	0%	100%	-	-	-	-	2.1	2.3	78	59%	0%	100%	0.539	0.193	0.175	0.9	0.262	4.01	-	Contingency Table Analysis	0.000	**Yes**			
Sandblast	0-10 ft	Metals	Silver	mg/kg	0.454	14	86%	0%	100%	0.0605	0.0400	0.027	0.187	0.065	0.069	78	96%	0%	100%	0.141	0.074	0.045	0.431	0.454	0.54	-	All Samples are Censored at Median MRL	-	**-**			
Sandblast	0-10 ft	Metals	Sodium	mg/kg	232	14	100%	21%	79%	171	75	69.6	324	-	-	78	36%	29%	71%	223	123	114	547	103	1130	-	Wilcoxon Rank Sum Test	0.198	**No**	117	113	66%
Sandblast	0-10 ft	Metals	Thallium	mg/kg	0.497	14	57%	0%	100%	0.145	0.023	0.128	0.203	0.042	0.103	78	85%	0%	100%	0.109	0.046	0.0288	0.255	0.454	0.589	-	All Samples are Censored at Median MRL	-	**-**			
Sandblast	0-10 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	78	100%	100%	0%	48.9	20.8	6.89	89.1	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	19.9	19.2	24%
Sandblast	0-10 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	78	100%	100%	0%	145	173	30.3	1160	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.003	**Yes**			
Sandblast	0-10 ft	SVOCs	Acenaphthene	ug/kg	2.51	14	64%	7%	93%	1.75	0.63	1.2	3.4	9.9	10	43	74%	70%	30%	137	486	1.1	3200	1.23	10	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-10 ft	SVOCs	Acenaphthylene	ug/kg	6.85	14	7%	0%	100%	-	-	1.6	1.6	9.9	10	43	37%	21%	79%	16.0	46.9	1.39	295	1.17	340	-	Contingency Table Analysis	0.030	**Yes**			
Sandblast	0-10 ft	SVOCs	Anthracene	ug/kg	2.5	14	86%	29%	71%	2.47	0.94	1.5	4.9	9.9	10	43	84%	72%	28%	166	362	1.72	2040	1.41	6.5	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-10 ft	SVOCs	Benzo(a)anthracene	ug/kg	2.45	14	100%	100%	0%	14.0	7.2	4.6	34	-	-	43	84%	84%	16%	870	2100	3.96	12300	2.07	6.5	-	Wilcoxon Rank Sum Test	0.003	**Yes**			
Sandblast	0-10 ft	SVOCs	Benzo(a)pyrene	ug/kg	2.465	14	100%	100%	0%	18.2	9.5	7.7	45	-	-	43	86%	86%	14%	862	2030	7.49	11700	2.07	6.5	-	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-10 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	6.5	14	100%	100%	0%	23.4	11.5	9.1	55	-	-	18	94%	94%	6%	991	1150	25	4100	6.5	6.5	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-10 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	2.07	14	100%	100%	0%	13.7	6.6	5.8	32	-	-	43	79%	79%	21%	428	821	4.33	3830	1.23	6.5	-	Wilcoxon Rank Sum Test	0.015	**Yes**			
Sandblast	0-10 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	6.5	14	100%	79%	21%	8.00	3.94	2.7	19	-	-	18	94%	94%	6%	345	396	8.3	1400	6.5	6.5	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
Sandblast	0-10 ft	SVOCs	Chrysene	ug/kg	2.43	14	100%	100%	0%	18.3	9.5	6.4	45	-	-	43	88%	86%	14%	962	2170	1.8	12000	2.07	2.52	-	Wilcoxon Rank Sum Test	0.003	**Yes**			
Sandblast	0-10 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	2.465	14	50%	50%	50%	4.36	1.23	2.7	6.9	10	10	43	60%	58%	42%	143	287	1.23	1430	1.17	14.6	-	Wilcoxon Rank Sum Test	0.017	**Yes**			
Sandblast	0-10 ft	SVOCs	Fluoranthene	ug/kg	2.43	14	100%	100%	0%	27.0	14.0	10	66	-	-	43	88%	88%	12%	1970	5260	6.29	28600	2.07	6.5	-	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-10 ft	SVOCs	Fluorene	ug/kg	9.9	14	7%	0%	100%	-	-	3.2	3.2	9.9	10	43	65%	37%	63%	69.4	149.0	1.69	779	1.23	340	-	Contingency Table Analysis	0.000	**Yes**			
Sandblast	0-10 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	2.4	14	100%	100%	0%	14.1	7.5	5.2	34	-	-	43	84%	84%	16%	469	920	3.52	4170	1.23	6.5	-	Wilcoxon Rank Sum Test	0.015	**Yes**			
Sandblast	0-10 ft	SVOCs	Naphthalene	ug/kg	6.4	14	43%	0%	100%	1.70	0.27	1.3	2.2	9.9	10	43	56%	30%	70%	25.2	53.7	1.7	256	1.17	340	-	Wilcoxon Rank Sum Test	0.011	**Yes**			
Sandblast	0-10 ft	SVOCs	Phenanthrene	ug/kg	2.475	14	100%	100%	0%	13.2	7.2	5.5	34	-	-	43	91%	88%	12%	705	1320	2.47	6550	2.4	6.5	-	Wilcoxon Rank Sum Test	0.001	**Yes**			
Sandblast	0-10 ft	SVOCs	Pyrene	ug/kg	2.415	14	100%	100%	0%	26.8	13.3	10	64	-	-	43	91%	88%	12%	2080	5770	2.1	32000	2.07	2.52	-	Wilcoxon Rank Sum Test	0.002	**Yes**			
Sandblast	0-10 ft	SVOCs	Total LPAHs	ug/kg	15	14	100%	100%	0%	32	12	20	56	-	-	43	91%	84%	16%	1131	2339	12	13120	14	39	-	Wilcoxon Rank Sum Test	0.010	**Yes**			
Sandblast	0-10 ft	SVOCs	Total HPAHs	ug/kg	19	14	100%	100%	0%	169	83	68	401	-	-	43	91%	91%	9%	8341	19368	20	105200	17	20	-	Wilcoxon Rank Sum Test	0.007	**Yes**			
Pistol Range	0-1 ft	Metals	Antimony	mg/kg	5	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	5	0%	0%	100%	-	-	-	-	5	6	-	Contingency Table Analysis	1.000	**No**			
Pistol Range	0-1 ft	Metals	Arsenic	mg/kg	5	14	100%	7%	93%	3.10	1.26	1.09	5.18	-	-	5	0%	0%	100%	-	-	-	-	5	6	-	Contingency Table Analysis	1.000	**No**			
Pistol Range	0-1 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	14	100%	100%	0%	38.1	14.3	15.6	53.1	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.307	**No**	12.2	11.8	30%
Pistol Range	0-1 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	63	100%	100%	0%	208	286	7.5	1110	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
Pistol Range	0-1 ft	Metals	Mercury	mg/kg	0.06	14	100%	14%	86%	0.0494	0.0091	0.034	0.068	-	-	14	0%	0%	100%	-	-	-	-	0.04	0.06	-	Contingency Table Analysis	1.000	**No**			
Pistol Range	0-1 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	10	100%	100%	0%	23.7	3.8	19	32	-	-	Normal	t-Test (normal)	0.004	**Yes**			
Pistol Range	0-1 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	10	100%	100%	0%	124	42	74	199	-	-	Normal	t-Test (normal)	0.000	**Yes**			
Bulb Slope	0-1 ft	GenChem-TOC	Carbon, Total Organic	%	-	14	100%	100%	0%	4.47	1.20	2.99	7.78	-	-	8	100%	100%	0%	3.56	1.92	1.715	6.92	-	-	Lognormal	t-Test (lognormal)	0.929	**No**	1.49	1.94	43%
Bulb Slope	0-1 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	12	100%	100%	0%	222	165	25	597	-	-	Normal	t-Test (normal)	0.001	**Yes**			
Bulb Slope	0-1 ft	Metals	Mercury	mg/kg	-	14	100%	100%	0%	0.0494	0.0091	0.034	0.068	-	-	12	100%	100%	0%	0.404	0.425	0.05	1.54	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
4 AOPCs	0-1 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	68	100%	100%	0%	7953	5445	1530	24300	-	-	Lognormal	t-Test (lognormal)	1.000	**No**	5335	5139	23%
4 AOPCs	0-1 ft	Metals	Antimony	mg/kg	2.83	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	83	54%	7%	93%	1.39	2.02	0.0895	13.7	0.16	6	-	Wilcoxon Rank Sum Test	0.154	**No**	1.88	1.81	1414%
4 AOPCs	0-1 ft	Metals	Arsenic	mg/kg	5	14	100%	7%	93%	3.10	1.26	1.09	5.18	-	-	84	93%	38%	62%	6.80	11.20	0.613	80.9	1.04	6	-	Wilcoxon Rank Sum Test	0.009	**Yes**			
4 AOPCs	0-1 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	79	100%	100%	0%	80.3	41.2	10.7	242.5	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.996	**No**	40.1	38.6	35%
4 AOPCs	0-1 ft	Metals	Beryllium	mg/kg	0.424	14	100%	79%	21%	0.491	0.091	0.319	0.629	-	-	79	56%	10%	90%	0.303	0.108	0.0587	0.63	0.27	0.472	-	Wilcoxon Rank Sum Test	1.000	**No**	0.106	0.102	21%
4 AOPCs	0-1 ft	Metals	Cadmium	mg/kg	0.261	14	100%	7%	93%	0.162	0.059	0.099	0.3395	-	-	79	86%	82%	18%	1.42	2.32	0.0561	17.3	0.248	0.29	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	68	100%	100%	0%	4457	2571	863	15100	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	2466	2376	34%
4 AOPCs	0-1 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	82	100%	100%	0%	305	544	5.27	2650	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.012	**Yes**			
4 AOPCs	0-1 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	68	100%	100%	0%	12.4	4.5	2.52	24.95	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	4.26	4.10	25%
4 AOPCs	0-1 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	93	100%	100%	0%	62.8	71.4	13.2	494	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.277	**No**	66.9	64.4	165%
4 AOPCs	0-1 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	79	100%	100%	0%	26683	8581	10100	46500	-	-	Lognormal	t-Test (lognormal)	0.998	**No**	8078	7782	26%
4 AOPCs	0-1 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	157	100%	100%	0%	270	368	5.34	3260	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	68	100%	100%	0%	11090	10788	1350	47500	-	-	Lognormal	t-Test (lognormal)	0.397	**No**	9924	9560	122%
4 AOPCs	0-1 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	79	100%	100%	0%	407	144	167	789	-	-	Lognormal	t-Test (lognormal)	1.000	**No**	144	139	22%
4 AOPCs	0-1 ft	Metals	Mercury	mg/kg	0.05	14	100%	36%	64%	0.0494	0.0091	0.034	0.068	-	-	107	68%	45%	55%	0.186	0.458	0.0114	4.15	0.0199	0.11	-	Wilcoxon Rank Sum Test	0.066	**No**	0.432	0.416	844%
4 AOPCs	0-1 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	89	100%	100%	0%	125	220	4.79	1060	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.005	**Yes**			
4 AOPCs	0-1 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	68	100%	100%	0%	642	437	74.9	1870	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	430	415	31%
4 AOPCs	0-1 ft	Metals	Selenium	mg/kg	2.2	14	0%	0%	100%	-	-	-	-	2.1	2.3	79	42%	0%	100%	0.431	0.232	0.175	0.9	0.2	3.54	-	Contingency Table Analysis	0.001	**Yes**			

Figure L-2. Comparison of Upland OU Soils to Reference Area Soils -- MRL Censored

						Reference Area										Site AOPC										Shapiro-Wilk W Test	Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Site AOPC	Depth Group	Analyte Group	Analyte	Unit	Median MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	Distribution	Appropriate Statistical Test	p-value	Significant Higher Conc in Site?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
4 AOPCs	0-1 ft	Metals	Silver	mg/kg	0.51	14	86%	0%	100%	0.0605	0.0400	0.027	0.187	0.065	0.069	79	78%	3%	97%	0.182	0.184	0.0571	1.5	0.2	0.57	-	Wilcoxon Rank Sum Test	0.282	**No**	0.171	0.165	272%
4 AOPCs	0-1 ft	Metals	Sodium	mg/kg	228	14	100%	21%	79%	171	75	69.6	324	-	-	68	34%	34%	66%	327	95	264	570	103	1130	-	Wilcoxon Rank Sum Test	0.102	**No**	91.7	88.3	52%
4 AOPCs	0-1 ft	Metals	Thallium	mg/kg	0.28	14	57%	0%	100%	0.145	0.023	0.128	0.203	0.042	0.103	79	61%	1%	99%	0.102	0.054	0.0288	0.378	0.2	0.589	-	Wilcoxon Rank Sum Test	0.348	**No**	0.0509	0.0490	34%
4 AOPCs	0-1 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	68	100%	100%	0%	44.1	19.5	6.89	84.7	-	-	Normal	t-Test (normal)	1.000	**No**	18.7	18.0	23%
4 AOPCs	0-1 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	89	100%	100%	0%	165	167	30.3	1160	-	-	Lognormal	t-Test (lognormal)	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Acenaphthene	ug/kg	10	14	64%	0%	100%	1.75	0.63	1.2	3.4	9.9	10	58	76%	64%	36%	160	380	1.5	2600	1.23	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Acenaphthylene	ug/kg	12.3	14	7%	0%	100%	-	-	1.6	1.6	9.9	10	58	36%	22%	78%	13.6	21.4	1.39	87.7	1.17	340	-	Contingency Table Analysis	0.029	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Anthracene	ug/kg	29.9	14	86%	0%	100%	2.47	0.94	1.5	4.9	9.9	10	58	90%	59%	41%	263	471	1.72	2700	1.41	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Benzo(a)anthracene	ug/kg	26.125	14	100%	7%	93%	14.0	7.2	4.6	34	-	-	58	93%	83%	17%	1780	4520	3.96	32000	2.07	305	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Benzo(a)pyrene	ug/kg	49.8	14	100%	0%	100%	18.2	9.5	7.7	45	-	-	58	95%	76%	24%	1880	4660	7.49	33000	2.07	152	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	49.8	14	100%	7%	93%	23.4	11.5	9.1	55	-	-	37	97%	92%	8%	3280	10500	25	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	1.78	14	100%	100%	0%	13.7	6.6	5.8	32	-	-	58	86%	86%	14%	977	2520	6.89	18000	1.23	168	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	49.8	14	100%	0%	100%	8.00	3.94	2.7	19	-	-	37	97%	89%	11%	2410	10500	8.3	65000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Chrysene	ug/kg	25.935	14	100%	7%	93%	18.3	9.5	6.4	45	-	-	58	97%	84%	16%	1920	4500	6.36	32000	2.07	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	10	14	50%	0%	100%	4.36	1.23	2.7	6.9	10	10	58	72%	69%	31%	364	1300	1.23	9900	1.17	1800	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Fluoranthene	ug/kg	49.8	14	100%	7%	93%	27.0	14.0	10	66	-	-	58	95%	79%	21%	3360	8060	8.47	54000	2.07	152	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Fluorene	ug/kg	10	14	7%	0%	100%	-	-	3.2	3.2	9.9	10	58	67%	52%	48%	94.8	186.0	1.69	1200	1.23	340	-	Contingency Table Analysis	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	25.935	14	100%	7%	93%	14.1	7.5	5.2	34	-	-	58	90%	76%	24%	1090	2730	3.68	19000	1.23	168	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Naphthalene	ug/kg	17.3	14	43%	0%	100%	1.70	0.27	1.3	2.2	9.9	10	58	52%	31%	69%	57.6	153.0	1.7	823	1.17	340	-	Wilcoxon Rank Sum Test	0.009	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Phenanthrene	ug/kg	49.8	14	100%	0%	100%	13.2	7.2	5.5	34	-	-	58	98%	71%	29%	1090	1910	5.64	12000	49.8	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Pyrene	ug/kg	25.935	14	100%	50%	50%	26.8	13.3	10	64	-	-	58	97%	91%	9%	3190	6750	10	40000	2.07	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Total LPAHs	ug/kg	299	14	100%	0%	100%	32	12	20	56	-	-	58	98%	57%	43%	1753	2956	12	18674	299	299	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-1 ft	SVOCs	Total HPAHs	ug/kg	257	14	100%	7%	93%	169	83	68	401	-	-	58	97%	83%	17%	18219	50008	41	367900	17	498	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	87	100%	100%	0%	8912	5551	1530	24300	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	5449	5249	23%
4 AOPCs	0-3 ft	Metals	Antimony	mg/kg	2.9	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	102	60%	6%	94%	1.26	1.86	0.07	13.7	0.16	6	-	Wilcoxon Rank Sum Test	0.180	**No**	1.75	1.69	1319%
4 AOPCs	0-3 ft	Metals	Arsenic	mg/kg	5	14	100%	7%	93%	3.10	1.26	1.09	5.18	-	-	103	94%	42%	58%	6.55	10.10	0.613	80.9	1.04	6	-	Wilcoxon Rank Sum Test	0.005	**Yes**			
4 AOPCs	0-3 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	98	100%	100%	0%	81.6	39.0	10.7	242.5	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.996	**No**	38.3	36.9	34%
4 AOPCs	0-3 ft	Metals	Beryllium	mg/kg	0.421	14	100%	79%	21%	0.491	0.091	0.319	0.629	-	-	98	62%	15%	85%	0.324	0.112	0.0587	0.63	0.27	0.472	-	Wilcoxon Rank Sum Test	1.000	**No**	0.110	0.106	22%
4 AOPCs	0-3 ft	Metals	Cadmium	mg/kg	0.27	14	100%	7%	93%	0.162	0.059	0.099	0.3395	-	-	98	86%	79%	21%	1.29	2.13	0.0561	17.3	0.248	0.311	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	87	100%	100%	0%	4991	2604	863	15100	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	2516	2424	34%
4 AOPCs	0-3 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	101	100%	100%	0%	279	531	5.27	2650	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.014	**Yes**			
4 AOPCs	0-3 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	87	100%	100%	0%	13.4	5.3	2.52	41	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.999	**No**	5.03	4.85	29%
4 AOPCs	0-3 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	112	100%	100%	0%	64.0	71.8	13.2	494	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.124	**No**	68.0	65.5	168%
4 AOPCs	0-3 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	98	100%	100%	0%	27150	8537	10100	51000	-	-	Lognormal	t-Test (lognormal)	0.996	**No**	8126	7828	26%
4 AOPCs	0-3 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	182	100%	100%	0%	274	379	5.34	3260	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	87	100%	100%	0%	11365	12218	9.75	77700	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.586	**No**	11424	11005	141%
4 AOPCs	0-3 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	98	100%	100%	0%	434	199	167	1712.5	-	-	Lognormal	t-Test (lognormal)	1.000	**No**	193	186	30%
4 AOPCs	0-3 ft	Metals	Mercury	mg/kg	0.05	14	100%	36%	64%	0.0494	0.0091	0.034	0.068	-	-	126	71%	44%	56%	0.166	0.425	0.0114	4.15	0.0199	0.11	-	Wilcoxon Rank Sum Test	0.086	**No**	0.404	0.390	790%
4 AOPCs	0-3 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	108	100%	100%	0%	128	253	4.79	1610	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.003	**Yes**			
4 AOPCs	0-3 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	87	100%	100%	0%	646	399	74.9	1870	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	398	383	29%
4 AOPCs	0-3 ft	Metals	Selenium	mg/kg	2.3	14	0%	0%	100%	-	-	-	-	2.1	2.3	98	49%	0%	100%	0.464	0.233	0.175	0.9	0.2	4.01	-	Contingency Table Analysis	0.000	**Yes**			
4 AOPCs	0-3 ft	Metals	Silver	mg/kg	0.51	14	86%	0%	100%	0.0605	0.0400	0.027	0.187	0.065	0.069	98	83%	3%	97%	0.176	0.178	0.045	1.5	0.2	0.57	-	Wilcoxon Rank Sum Test	0.260	**No**	0.168	0.162	267%
4 AOPCs	0-3 ft	Metals	Sodium	mg/kg	235	14	100%	21%	79%	171	75	69.6	324	-	-	87	41%	37%	63%	277	127	173	570	103	1130	-	Wilcoxon Rank Sum Test	0.074	**No**	121	117	68%
4 AOPCs	0-3 ft	Metals	Thallium	mg/kg	0.28	14	57%	0%	100%	0.145	0.023	0.128	0.203	0.042	0.103	98	68%	1%	99%	0.109	0.052	0.0288	0.378	0.2	0.589	-	Wilcoxon Rank Sum Test	0.363	**No**	0.0495	0.0477	33%
4 AOPCs	0-3 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	87	100%	100%	0%	47.4	19.6	6.89	89.1	-	-	Normal	t-Test (normal)	1.000	**No**	18.9	18.2	23%
4 AOPCs	0-3 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	108	100%	100%	0%	158	183	30.3	1160	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Acenaphthene	ug/kg	10	14	64%	0%	100%	1.75	0.63	1.2	3.4	9.9	10	73	77%	62%	38%	257	598	1.1	3200	1.23	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Acenaphthylene	ug/kg	10	14	7%	0%	100%	-	-	1.6	1.6	9.9	10	73	40%	27%	73%	18.9	40.4	1.39	295	1.17	340	-	Contingency Table Analysis	0.015	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Anthracene	ug/kg	9.9	14	86%	0%	100%	2.47	0.94	1.5	4.9	9.9	10	73	88%	73%	27%	440	1090	1.72	8440	1.41	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Benzo(a)anthracene	ug/kg	2.52	14	100%	100%	0%	14.0	7.2	4.6	34	-	-	73	90%	90%	10%	2470	5430	3.96	32000	2.07	305	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Benzo(a)pyrene	ug/kg	4.51	14	100%	100%	0%	18.2	9.5	7.7	45	-	-	73	92%	92%	8%	2720	6020	7.49	34000	2.07	152	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	28.15	14	100%	21%	79%	23.4	11.5	9.1	55	-	-	46	96%	91%	9%	3450	9690	25	65000	6.5	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	2.295	14	100%	100%	0%	13.7	6.6	5.8	32	-	-	73	86%	86%	14%	1380	3140	4.33	18000	1.23	168	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	28.15	14	100%	0%	100%	8.00	3.94	2.7	19	-	-	46	96%	87%	13%	2230	9420	8.3	65000	6.5	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Chrysene	ug/kg	2.51	14	100%	100%	0%	18.3	9.5	6.4	45	-	-	73	95%	93%	7%	2730	5960	1.8	35300	2.07	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	10	14	50%	0%	100%	4.36	1.23	2.7	6.9	10	10	73	74%	68%	32%	416	1210	1.23	9900	1.17	1800	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Fluoranthene	ug/kg	6.5	14	100%	100%	0%	27.0	14.0	10	66	-	-	73	93%	92%	8%	4660	9770	6.29	54000	2.07	152	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Fluorene	ug/kg	10	14	7%	0%	100%	-	-	3.2	3.2	9.9	10	73	68%	52%	48%	132	265	1.69	1610	1.23	340	-	Contingency Table Analysis	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	4.51	14	100%	100%	0%	14.1	7.5	5.2	34	-	-	73	89%	86%	14%	1610	3640	3.52	20000	1.23	168	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Naphthalene	ug/kg	10	14	43%	0%	100%	1.70	0.27	1.3	2.2	9.9	10	73	56%	36%	64%	56.7	141.0	1.7	823	1.17	340	-	Wilcoxon Rank Sum Test	0.005	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Phenanthrene	ug/kg	6.5	14	100%	86%	14%	13.2	7.2	5.5	34	-	-	73	96%	92%	8%	1550	3150	2.47	21900	2.52	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Pyrene	ug/kg	2.52	14	100%	100%	0%	26.8	13.3	10	64	-	-	73	96%	95%	5%	4940	10600	2.1	67100	2.07	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Total LPAHs	ug/kg	39	14	100%	21%	79%	32	12	20	56	-	-	73	96%	81%	19%	2507	5049	12	34767	15	299	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-3 ft	SVOCs	Total HPAHs	ug/kg	20	14	100%	100%	0%	169	83	68	401	-	-	73	96%	95%	5%	24520	55546	20	367900	17	498	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	Metals	Aluminum	mg/kg	-	14	100%	100%	0%	22746	4724	15900	33200	-	-	104	100%	100%	0%	9071	5513	1530	24300	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	5430	5231	23%
4 AOPCs	0-10 ft	Metals	Antimony	mg/kg	2.9	14	100%	0%	100%	0.128	0.026	0.07	0.18	-	-	119	66%	8%	92%	1.36	1.93	0.07	13.7	0.16	6	-	Wilcoxon Rank Sum Test	0.146	**No**	1.83	1.76	1380%
4 AOPCs	0-10 ft	Metals	Arsenic	mg/kg	5	14	100%	7%	93%	3.10	1.26	1.09	5.18	-	-	120	95%	39%	61%	6.20	9.46	0.613	80.9	1.04	6	-	Wilcoxon Rank Sum Test	0.007	**Yes**			
4 AOPCs	0-10 ft	Metals	Barium	mg/kg	-	14	100%	100%	0%	110	33	57.4	182	-	-	115	100%	100%	0%	83.1	38.0	10.7	242.5	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.994	**No**	37.5	36.1	33%
4 AOPCs	0-10 ft	Metals	Beryllium	mg/kg	0.418	14	100%	79%	21%	0.491	0.091	0.319	0.629	-	-	115	63%	13%	87%	0.317	0.108	0.0587	0.63	0.27	0.472	-	Wilcoxon Rank Sum Test	1.000	**No**	0.106	0.103	21%
4 AOPCs	0-10 ft	Metals	Cadmium	mg/kg	0.27	14	100%	7%	93%	0.162	0.059	0.099	0.3395	-	-	115	85%	79%	21%	1.29	1.99	0.0561	17.3	0.248	0.311	-	Wilcoxon Rank Sum Test	0.000	**Yes**			

Figure L-2. Comparison of Upland OU Soils to Reference Area Soils -- MRL Censored

						Reference Area										Site AOPC										Shapiro-Wilk W Test	Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Site AOPC	Depth Group	Analyte Group	Analyte	Unit	Median MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	Distribution	Appropriate Statistical Test	p-value	Significant Higher Conc in Site?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
4 AOPCs	0-10 ft	Metals	Calcium	mg/kg	-	14	100%	100%	0%	7086	1829	3510	9120	-	-	104	100%	100%	0%	4959	2435	863	15100	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	2375	2288	32%
4 AOPCs	0-10 ft	Metals	Chromium	mg/kg	-	14	100%	100%	0%	21.8	3.5	15.5	27.3	-	-	118	100%	100%	0%	279	554	5.27	2650	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.015	**Yes**			
4 AOPCs	0-10 ft	Metals	Cobalt	mg/kg	-	14	100%	100%	0%	16.5	3.1	9.66	19.9	-	-	104	100%	100%	0%	13.8	6.1	2.52	42.3	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.998	**No**	5.80	5.59	34%
4 AOPCs	0-10 ft	Metals	Copper	mg/kg	-	14	100%	100%	0%	39.0	9.7	22.8	58.2	-	-	129	100%	100%	0%	64.1	71.4	13.2	494	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.159	**No**	68.0	65.6	168%
4 AOPCs	0-10 ft	Metals	Iron	mg/kg	-	14	100%	100%	0%	29829	3868	22900	37000	-	-	115	100%	100%	0%	27151	8743	10100	51000	-	-	Lognormal	t-Test (lognormal)	0.997	**No**	8375	8068	27%
4 AOPCs	0-10 ft	Metals	Lead	mg/kg	-	14	100%	100%	0%	17.7	4.2	12.5	26.5	-	-	199	100%	100%	0%	280	377	5.235	3260	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	Metals	Magnesium	mg/kg	-	14	100%	100%	0%	7820	2498	3710	12000	-	-	104	100%	100%	0%	11897	14967	9.75	88300	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.672	**No**	14128	13610	174%
4 AOPCs	0-10 ft	Metals	Manganese	mg/kg	-	14	100%	100%	0%	627	140	415	920.5	-	-	115	100%	100%	0%	443	202	146	1712.5	-	-	Lognormal	t-Test (lognormal)	1.000	**No**	196	189	30%
4 AOPCs	0-10 ft	Metals	Mercury	mg/kg	0.05	14	100%	36%	64%	0.0494	0.0091	0.034	0.068	-	-	143	75%	45%	55%	0.167	0.409	0.0114	4.15	0.0199	0.11	-	Wilcoxon Rank Sum Test	0.067	**No**	0.391	0.377	764%
4 AOPCs	0-10 ft	Metals	Nickel	mg/kg	-	14	100%	100%	0%	18.7	4.3	11.5	26.1	-	-	125	100%	100%	0%	133	284	4.79	1760	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.003	**Yes**			
4 AOPCs	0-10 ft	Metals	Potassium	mg/kg	-	14	100%	100%	0%	1334	392	572	1930	-	-	104	100%	100%	0%	639	378	74.9	1870	-	-	Non-parametric	Wilcoxon Rank Sum Test	1.000	**No**	379	365	27%
4 AOPCs	0-10 ft	Metals	Selenium	mg/kg	2.2	14	0%	0%	100%	-	-	-	-	2.1	2.3	115	50%	0%	100%	0.413	0.234	0.106	0.9	0.2	4.01	-	Contingency Table Analysis	0.000	**Yes**			
4 AOPCs	0-10 ft	Metals	Silver	mg/kg	0.51	14	86%	0%	100%	0.0605	0.0400	0.027	0.187	0.065	0.069	115	85%	6%	94%	0.214	0.263	0.045	1.52	0.2	0.57	-	Wilcoxon Rank Sum Test	0.175	**No**	0.250	0.240	397%
4 AOPCs	0-10 ft	Metals	Sodium	mg/kg	235.5	14	100%	21%	79%	171	75	69.6	324	-	-	104	37%	31%	69%	239	139	114	570	103	1130	-	Wilcoxon Rank Sum Test	0.153	**No**	133	128	75%
4 AOPCs	0-10 ft	Metals	Thallium	mg/kg	0.28	14	57%	0%	100%	0.145	0.023	0.128	0.203	0.042	0.103	115	73%	1%	99%	0.110	0.051	0.0288	0.378	0.2	0.589	-	Wilcoxon Rank Sum Test	0.373	**No**	0.0492	0.0474	33%
4 AOPCs	0-10 ft	Metals	Vanadium	mg/kg	-	14	100%	100%	0%	78.8	13.5	43	99.3	-	-	104	100%	100%	0%	48.7	20.0	6.89	93.4	-	-	Normal	t-Test (normal)	1.000	**No**	19.3	18.6	24%
4 AOPCs	0-10 ft	Metals	Zinc	mg/kg	-	14	100%	100%	0%	58.8	7.0	45.6	68.5	-	-	125	100%	100%	0%	161	175	30.3	1160	-	-	Non-parametric	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Acenaphthene	ug/kg	10	14	64%	0%	100%	1.75	0.63	1.2	3.4	9.9	10	87	76%	62%	38%	288	634	1.1	3200	1.23	1440	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Acenaphthylene	ug/kg	10	14	7%	0%	100%	-	-	1.6	1.6	9.9	10	87	40%	30%	70%	19.1	38.1	1.39	295	1.17	340	-	Contingency Table Analysis	0.013	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Anthracene	ug/kg	8.2	14	86%	0%	100%	2.47	0.94	1.5	4.9	9.9	10	87	86%	75%	25%	640	1450	1.72	8440	1.41	180	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Benzo(a)anthracene	ug/kg	2.5	14	100%	100%	0%	14.0	7.2	4.6	34	-	-	87	90%	90%	10%	3290	6450	3.96	32000	2.07	305	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Benzo(a)pyrene	ug/kg	2.51	14	100%	100%	0%	18.2	9.5	7.7	45	-	-	87	91%	91%	9%	3270	6160	7.49	34000	2.07	152	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Benzo(b)fluoranthene	ug/kg	28.15	14	100%	21%	79%	23.4	11.5	9.1	55	-	-	46	96%	91%	9%	3450	9690	25	65000	6.5	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Benzo(g,h,i)perylene	ug/kg	2.415	14	100%	100%	0%	13.7	6.6	5.8	32	-	-	87	86%	86%	14%	1650	3170	4.33	18000	1.23	168	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Benzo(k)fluoranthene	ug/kg	28.15	14	100%	0%	100%	8.00	3.94	2.7	19	-	-	46	96%	87%	13%	2230	9420	8.3	65000	6.5	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Chrysene	ug/kg	2.465	14	100%	100%	0%	18.3	9.5	6.4	45	-	-	87	93%	92%	8%	3350	6370	1.8	35300	2.07	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Dibenz(a,h)anthracene	ug/kg	10	14	50%	0%	100%	4.36	1.23	2.7	6.9	10	10	87	71%	67%	33%	399	1110	1.23	9900	1.17	1800	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Fluoranthene	ug/kg	2.52	14	100%	100%	0%	27.0	14.0	10	66	-	-	87	92%	92%	8%	5830	10400	6.29	54000	2.07	152	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Fluorene	ug/kg	10	14	7%	0%	100%	-	-	3.2	3.2	9.9	10	87	69%	55%	45%	160	300	1.69	1610	1.23	340	-	Contingency Table Analysis	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Indeno(1,2,3-cd)pyrene	ug/kg	2.475	14	100%	100%	0%	14.1	7.5	5.2	34	-	-	87	89%	89%	11%	1940	3710	3.52	20000	1.23	168	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Naphthalene	ug/kg	10	14	43%	0%	100%	1.70	0.27	1.3	2.2	9.9	10	87	55%	38%	62%	71.3	219.0	1.7	1710	1.17	340	-	Wilcoxon Rank Sum Test	0.003	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Phenanthrene	ug/kg	4.51	14	100%	100%	0%	13.2	7.2	5.5	34	-	-	87	93%	92%	8%	1780	3410	2.47	21900	2.4	11400	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Pyrene	ug/kg	2.43	14	100%	100%	0%	26.8	13.3	10	64	-	-	87	94%	93%	7%	6370	11500	2.1	67100	2.07	49.8	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Total LPAHs	ug/kg	15	14	100%	100%	0%	32	12	20	56	-	-	87	94%	91%	9%	3009	5715	12	34767	14	299	-	Wilcoxon Rank Sum Test	0.000	**Yes**			
4 AOPCs	0-10 ft	SVOCs	Total HPAHs	ug/kg	19	14	100%	100%	0%	169	83	68	401	-	-	87	94%	94%	6%	29117	56080	20	367900	17	498	-	Wilcoxon Rank Sum Test	0.000	**Yes**			

Table L-3
Upland OU Monitoring Well Groundwater Results Compared to Reference Area

	Landfill AOPC Groundwater		Landfill AOPC Seep Water		Sandblast Area AOPC Groundwater		Reference Well (MW-10)	
	Minimum Value	Maximum Value	Minimum Value	Maximum Value	Minimum Value	Maximum Value	Minimum Value	Maximum Value
Total Metals (µg/L)								
Aluminum	-	-	-	-	-	-	**6.45**	**211**
Antimony	**0.294 J**	**3.89**	-	1.00 U	-	-	**0.0250 J**	**0.0800**
Arsenic	**0.138 J**	**21.3**	**0.500**	**12.8**	**0.540**	**11.6**	**1.23**	**1.68**
Barium	**7.15**	**304**	-	**74.2**	-	-	**17.3**	**26.5**
Beryllium	0.0142 U	**0.435 J**	-	1.00 U	-	-	**0.0100 J**	**0.0100 J**
Cadmium	0.00710 U	**5.60**	-	1.00 U	-	-	0.00500 U	**0.0490**
Calcium	-	-	-	-	-	-	**29,150**	**30,950**
Chromium	1.00 U	**18.5**	-	**1.05**	-	-	**0.145 J**	**3.98 J**
Cobalt	-	-	-	-	-	-	**0.0710**	**0.323**
Copper	**2.33**	**201**	-	**2.72**	-	-	**0.125**	**1.12**
Iron	**9.40 J**	**42,900**	**271**	**121,000**	**12.9 J**	**1,500**	37.0 U	**451 J**
Lead	0.00600 U	**78.2**	**0.113**	**25.7**	-	-	**0.102**	**0.248**
Magnesium	-	-	-	-	-	-	**7,620**	**8,315**
Manganese	**0.810**	**5,385**	**8.90**	**3,240**	-	-	**204**	**259**
Mercury	**0.0300 J**	**0.330**	**0.0300**	**0.0300 J**	-	-	0.0300 U	0.0500 U
Nickel	**0.850 J**	**117**	-	**2.32**	-	-	0.500 U	**6.62**
Potassium	-	-	-	-	-	-	**4,705**	**4,955**
Selenium	0.385 U	**32.9**	-	**1.11**	-	-	0.400 U	0.500 U
Silver	**0.0810 J**	**0.658**	-	1.00 U	-	-	**0.00900 J**	**0.00900 J**
Sodium	-	-	-	-	-	-	**4,940**	**5,625**
Thallium	**0.115 J**	**0.323 J**	-	1.00 U	-	-	0.00500 U	0.00800 U
Vanadium	-	-	-	-	0.0700 U	**5.90 J**	0.0700 U	**1.55 J**
Zinc	**4.27**	**2,655**	-	10.0 U	-	-	**1.75**	**8.28 J**
Dissolved Metals (µg/L)								
Aluminum	-	-	-	-	-	-	**2.00 J**	**2.60**
Antimony	50.0 U	50.0 U	-	**2.28**	-	-	0.0100 U	**0.0500 J**
Arsenic	**0.220 J**	**19.3**	**0.500**	**1.00**	**0.510**	**8.99**	**1.13**	**1.55**
Barium	**21.2**	**134**	-	**277**	-	-	**15.3**	**22.9**
Beryllium	5.00 U	5.00 U	-	1.00 U	-	-	0.00800 U	0.0200 U
Cadmium	5.00 U	5.00 U	-	1.00 U	-	-	0.00500 U	**0.0425**
Calcium	**9,510**	**172,000**	**22,600**	**76,400**	**6,690**	**44,300**	**28,950**	**30,100**
Chromium	10.0 U	10.0 U	-	1.00 U	-	-	**0.0600 J**	**0.290**
Cobalt	-	-	-	-	-	-	**0.0630**	**0.139**
Copper	10.0 U	10.0 U	-	**1.09**	-	-	**0.0800 J**	**0.315**
Iron	4.00 U	**35,400**	**9.70 J**	**3,210**	4.00 U	**270**	**9.80 J**	**24.9**
Lead	0.00600 U	**3.50**	**0.00800 J**	**0.0650**	-	-	**0.00600 J**	**0.0220 J**
Magnesium	**1,210**	**25,800**	**5,070**	**16,600**	**883**	**14,000**	**7,360**	**8,085**
Manganese	**0.120**	**5,545**	0.140 U	**1,480 J**	-	-	**187**	**228**
Mercury	0.0300 U	0.200 U	0.0300 U	1.00 U	-	-	0.0300 U	0.0500 U
Nickel	10.0 U	**18.7**	-	**2.22**	-	-	0.500 U	**1.41**
Potassium	**808 J**	**12,900**	**771 J**	**4,160**	**782 J**	**2,610**	**4,710**	**4,880**
Selenium	5.00 U	5.00 U	-	1.00 U	-	-	0.400 U	0.500 U
Silver	10.0 U	10.0 U	-	1.00 U	-	-	0.00900 U	**0.117**
Sodium	**4,040**	**740,000**	**6,680**	**19,700**	**6,860**	**89,400**	**4,825**	**4,975**
Thallium	5.00 U	5.00 U	-	1.00 U	-	-	0.00500 U	0.00800 U
Vanadium	-	-	-	-	0.0700 U	**3.10 J**	0.0700 U	0.800 U
Zinc	10.0 U	**197**	-	**85.6**	-	-	**1.15 J**	**3.15**
Total Petroleum Hydrocarbons (µg/L)								
Diesel Range Organics	12.0 U	**1,800**	13.0 U	**130**	11.0 U	**18.0 J**	-	14.0 U
Residual Range Organics	21.0 U	**1,900**	23.0 U	**130**	19.0 U	120 U	-	24.0 U
Gasoline Range Organics	**13.0 J**	**430**	13.0 U	250 U	13.0 U	**23.5 J**	-	13.0 U
Buyltins (µg/L)								
Dibutyltin	0.00111 U	**0.447 J**	0.00730 U	0.00810 U	-	-	-	0.00810 U
Monobutyltin	0.00105 U	**0.240 J**	0.0110 U	0.0290 U	0.0110 U	**0.0260 J**	-	**0.0345 J**
Total Volatile Organic Compounds (µg/L)								
Chloroform	0.0820 U	**3.70**	0.0820 U	**2.80**	0.0820 U	**0.180 J**	-	0.0820 U
Tetrachloroethene (PCE)	0.0970 U	**8.78**	0.0970 U	**4.40**	0.0970 U	**6.20**	-	0.0970 U
Vinyl Chloride	0.0440 U	**0.955**	0.0440 U	1.00 U	0.0440 U	**4.10**	-	0.0440 U
Total Semivolatile Organic Compounds (µg/L)								
1,4-Dichlorobenzene	0.0150 U	**0.0601 J**	0.0290 U	4.76 UJ	-	-	-	0.0330 U
4-Nitrophenol	0.0290 U	48.0 U	0.280 U	4.76 U	-	-	-	**0.320**
Phenol	0.0320 U	**0.382 J**	0.0630 U	4.76 U	-	-	-	0.0700 U
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/L)								
Phenanthrene	0.00220 UJ	**3.90**	0.0220 U	4.76 UJ	0.0220 U	**0.0840 J**	-	0.0250 U
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/L)								
Benzo(b)fluoranthene	9.40 U	10.0 U	-	4.76 UJ	0.0170 U	**0.0180 J**	-	**0.0250 J**
Benzo(k)fluoranthene	9.40 U	10.0 U	-	4.76 UJ	0.0240 U	0.0280 U	-	0.0270 U

Notes:
Analytes shown include all compounds that were analyzed in one r more samples from MW-10.
µg/L = microgram per liter
mg/L = milligram per liter
MDL = method detection limit
- = Not Analyzed
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL.
UJ = The analyte was not detected. The reported MDL is an estimate.
bold = analyte detected above MDL.
When only one result was available for a given set of data, this value is shown under "Maximum Value" only.
= The AOPC value exceeds the Reference Area maximum result

Table L-4. Statistical Comparison of Forebay Data to Reference Area Data -- MDL Censored

							Reference Area										Forebay Area										Shapiro-Wilk W Test					Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Medium	Basis	Analyte Group	IUPAC #	Analyte	Unit	Median MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	Ref Normality Test p-value	Ref Log-normality Test p-value	Site Normality Test p-value	Site Log-normality Test p-value	Distribution	Appropriate Statistical Test	Comparison p-value	Significant Higher Conc in Forebay?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
Sediment	D	Metals		Aluminum	mg/Kg	-	18	100%	100%	0%	17328	9005	7380	33500	-	-	19	100%	100%	0%	13279	2993	9000	22900	-	-	0.011	0.064	0.008	0.317	Lognormal	t-Test (lognormal)	**0.891**	**No**	6633	5604	32%
Sediment	D	Metals		Antimony	mg/Kg	0.04	18	100%	100%	0%	0.264	0.091	0.15	0.52	-	-	19	95%	95%	5%	0.155	0.065	0.04	0.28	0.04	0.04	-	-	-	-	-	Wilcoxon Rank Sum Test	**1.000**	**No**	0.0790	0.0667	25%
Sediment	D	Metals		Arsenic	mg/Kg	-	18	100%	100%	0%	4.19	0.87	3.03	6.04	-	-	19	100%	100%	0%	3.12	1.00	1.4	5.39	-	-	0.031	0.108	0.025	0.217	Lognormal	t-Test (lognormal)	**1.000**	**No**	0.939	0.793	19%
Sediment	D	Metals		Barium	mg/Kg	-	18	100%	100%	0%	167	67	86.3	312	-	-	19	100%	100%	0%	121	36	53.1	202	-	-	0.037	0.085	0.269	0.170	Lognormal	t-Test (lognormal)	**0.989**	**No**	53.4	45.1	27%
Sediment	D	Metals		Beryllium	mg/Kg	-	18	100%	100%	0%	0.437	0.177	0.194	0.748	-	-	19	100%	100%	0%	0.362	0.092	0.215	0.597	-	-	0.047	0.116	0.547	0.754	Lognormal	t-Test (lognormal)	**0.884**	**No**	0.140	0.118	27%
Sediment	D	Metals		Cadmium	mg/Kg	0.118	18	100%	100%	0%	0.476	0.111	0.262	0.748	-	-	19	89%	89%	11%	0.453	0.181	0.175	0.719	0.115	0.121	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.670**	**No**	0.151	0.128	27%
Sediment	D	Metals		Chromium	mg/Kg	-	18	100%	100%	0%	19.8	4.6	12.8	27.3	-	-	19	100%	100%	0%	19.9	5.2	10.1	33.5	-	-	0.190	0.353	0.150	0.395	Normal	t-Test (normal)	**0.462**	**No**	4.90	4.14	21%
Sediment	D	Metals		Cobalt	mg/Kg	-	18	100%	100%	0%	9.66	3.12	5.68	15.2	-	-	19	100%	100%	0%	8.59	2.10	4.82	15.1	-	-	0.077	0.137	0.019	0.281	Lognormal	t-Test (lognormal)	**0.841**	**No**	2.64	2.23	23%
Sediment	D	Metals		Copper	mg/Kg	-	18	100%	100%	0%	25.6	13.8	8.22	47.8	-	-	19	100%	100%	0%	20.5	4.7	11.3	33.1	-	-	0.015	0.051	0.255	0.490	Lognormal	t-Test (lognormal)	**0.749**	**No**	10.2	8.6	34%
Sediment	D	Metals		Lead	mg/Kg	-	18	100%	100%	0%	11.6	1.6	8.65	15.1	-	-	19	100%	100%	0%	8.93	3.11	3.3	16.8	-	-	0.642	0.869	0.142	0.049	Normal	t-Test (normal)	**0.999**	**No**	2.50	2.12	18%
Sediment	D	Metals		Mercury	mg/Kg	-	18	100%	100%	0%	0.129	0.048	0.041	0.225	-	-	19	100%	100%	0%	0.132	0.111	0.008	0.373	-	-	0.953	0.321	0.049	0.233	Lognormal	t-Test (lognormal)	**0.902**	**No**	0.0862	0.0729	56%
Sediment	D	Metals		Nickel	mg/Kg	-	18	100%	100%	0%	14.6	3.6	9.87	25.6	-	-	19	100%	100%	0%	15.5	9.1	6.39	51.5	-	-	0.015	0.391	0.000	0.001	Non-parametric	Wilcoxon Rank Sum Test	**0.608**	**No**	7.03	5.94	41%
Sediment	D	Metals		Thallium	mg/Kg	0.1175	18	100%	100%	0%	0.244	0.062	0.145	0.36	-	-	19	79%	79%	21%	0.173	0.028	0.135	0.218	0.108	0.132	-	-	-	-	-	Wilcoxon Rank Sum Test	**1.000**	**No**	0.0473	0.0400	16%
Sediment	D	Metals		Vanadium	mg/Kg	-	18	100%	100%	0%	45.0	14.3	25.7	76.9	-	-	19	100%	100%	0%	40.0	8.2	27.5	59.3	-	-	0.219	0.778	0.162	0.582	Normal	t-Test (normal)	**0.901**	**No**	11.6	9.8	22%
Sediment	D	Metals		Zinc	mg/Kg	-	18	100%	100%	0%	87.6	10.1	70.2	109	-	-	19	100%	100%	0%	81.8	18.2	50.3	113	-	-	0.978	0.987	0.323	0.109	Normal	t-Test (normal)	**0.883**	**No**	14.8	12.5	14%
Sediment	D	NWTPH-Dx		Diesel Range Organics	mg/Kg	-	18	100%	100%	0%	15.7	8.2	7	31	-	-	19	100%	100%	0%	15.7	12.7	2.6	54	-	-	0.003	0.125	0.006	0.586	Lognormal	t-Test (lognormal)	**0.803**	**No**	10.8	9.1	58%
Sediment	D	NWTPH-Dx		Residual Range Organics	mg/Kg	150	18	72%	0%	100%	48.9	20.4	29	100	150	180	19	63%	26%	74%	95.3	48.8	17	180	130	180	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.044**	**Yes**			
Sediment	D	PCB Aroclors		Aroclor 1016	ug/Kg	1.7	18	0%	0%	100%	-	-	-	-	1.7	13	19	0%	0%	100%	-	-	-	-	1.7	10	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Sediment	D	PCB Aroclors		Aroclor 1221	ug/Kg	1.7	18	0%	0%	100%	-	-	-	-	1.7	11	19	0%	0%	100%	-	-	-	-	1.7	29	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Sediment	D	PCB Aroclors		Aroclor 1232	ug/Kg	1.7	18	0%	0%	100%	-	-	-	-	1.7	12	19	0%	0%	100%	-	-	-	-	1.7	18	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Sediment	D	PCB Aroclors		Aroclor 1242	ug/Kg	1.7	18	0%	0%	100%	-	-	-	-	1.7	16	19	0%	0%	100%	-	-	-	-	1.7	5.7	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Sediment	D	PCB Aroclors		Aroclor 1248	ug/Kg	1.7	18	0%	0%	100%	-	-	-	-	1.7	1.8	19	0%	0%	100%	-	-	-	-	1.7	4	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Sediment	D	PCB Aroclors		Aroclor 1254	ug/Kg	1.7	18	0%	0%	100%	-	-	-	-	1.7	1.8	19	11%	11%	89%	5.78	5.00	4.6	27	1.7	2.6	-	-	-	-	-	Contingency Table Analysis	**0.257**	**No**			
Sediment	D	PCB Aroclors		Aroclor 1260	ug/Kg	1.7	18	0%	0%	100%	-	-	-	-	1.7	1.8	19	0%	0%	100%	-	-	-	-	1.7	4.7	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Sediment	D	PCB Aroclors		Aroclor 1262	ug/Kg	1.7	18	0%	0%	100%	-	-	-	-	1.7	1.8	19	0%	0%	100%	-	-	-	-	1.7	1.7	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Sediment	D	PCB Aroclors		Aroclor 1268	ug/Kg	1.7	18	0%	0%	100%	-	-	-	-	1.7	1.8	19	0%	0%	100%	-	-	-	-	1.7	1.7	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Sediment	D	SVOCs		Acenaphthene	ug/Kg	1	18	0%	0%	100%	-	-	-	-	1	1.1	19	0%	0%	100%	-	-	-	-	1	1	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Sediment	D	SVOCs		Anthracene	ug/Kg	1.4	18	11%	11%	89%	1.45	0.21	1.4	2.3	1.4	1.5	19	26%	26%	74%	1.63	0.30	1.5	2.7	1.4	1.4	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.056**	**No**	0.257	0.217	15%
Sediment	D	SVOCs		Benzo(a)anthracene	ug/Kg	1.4	18	78%	78%	22%	2.90	1.89	1.6	10	1.4	1.4	19	63%	63%	37%	3.49	2.80	1.6	12	1.4	1.4	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.615**	**No**	2.40	2.03	70%
Sediment	D	SVOCs		Benzo(a)pyrene	ug/Kg	1.6	18	50%	50%	50%	3.06	2.36	1.6	11	1.6	1.6	19	58%	58%	42%	3.43	2.13	1.7	7.5	1.6	1.6	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.239**	**No**	2.25	1.90	62%
Sediment	D	SVOCs		Benzo(b)fluoranthene	ug/Kg	2.5	18	72%	72%	28%	4.94	3.32	2.7	17	2.5	2.5	19	47%	47%	53%	5.06	1.57	4	9.1	2.5	2.5	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.735**	**No**	2.57	2.17	44%
Sediment	D	SVOCs		Benzo(g,h,i)perylene	ug/Kg	2.3	18	56%	56%	44%	3.43	1.67	2.3	7.9	2.3	2.3	19	47%	47%	53%	3.26	1.01	2.6	6.2	2.3	2.3	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.628**	**No**	1.37	1.16	34%
Sediment	D	SVOCs		Benzo(k)fluoranthene	ug/Kg	2.5	18	6%	6%	94%	-	-	5	5	2.5	2.6	19	26%	26%	74%	2.74	0.57	2.5	4.9	2.5	2.5	-	-	-	-	-	Contingency Table Analysis	**0.102**	**No**			
Sediment	D	SVOCs		Bis(2-ethylhexyl) Phthalate	ug/Kg	200	18	100%	0%	100%	15.1	24.4	4.9	110	-	-	19	16%	5%	95%	102	75	38	340	200	200	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.179**	**No**	56.3	47.6	315%
Sediment	D	SVOCs		Butyl Benzyl Phthalate	ug/Kg	1.5	18	11%	11%	89%	2.57	0.30	2.5	3.8	1.5	1.6	19	0%	0%	100%	-	-	-	-	1.5	10	-	-	-	-	-	Contingency Table Analysis	**1.000**	**No**			
Sediment	D	SVOCs		Carbazole	ug/Kg	1.3	18	0%	0%	100%	-	-	-	-	1.3	1.4	19	5%	5%	95%	-	-	1.4	1.4	1.3	1.3	-	-	-	-	-	Contingency Table Analysis	**0.514**	**No**			
Sediment	D	SVOCs		Chrysene	ug/Kg	1.4	18	83%	83%	17%	3.95	2.29	1.9	9.8	1.4	1.4	19	84%	84%	16%	4.96	4.73	1.4	20	1.4	1.4	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.567**	**No**	3.75	3.17	80%
Sediment	D	SVOCs		Dibenz(a,h)anthracene	ug/Kg	2.2	18	0%	0%	100%	-	-	-	-	2.2	2.3	19	0%	0%	100%	-	-	-	-	2.2	2.2	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Sediment	D	SVOCs		Di-n-butyl Phthalate	ug/Kg	10	18	83%	6%	94%	5.45	2.06	3.5	11	2.6	2.6	19	0%	0%	100%	-	-	-	-	9.8	19	-	-	-	-	-	Contingency Table Analysis	**1.000**	**No**			
Sediment	D	SVOCs		Di-n-octyl Phthalate	ug/Kg	1.2	18	0%	0%	100%	-	-	-	-	1.2	1.3	19	0%	0%	100%	-	-	-	-	1.2	1.2	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Sediment	D	SVOCs		Fluoranthene	ug/Kg	2.2	18	83%	83%	17%	5.89	6.40	2.3	31	2.2	2.2	19	79%	79%	21%	4.60	2.78	2.5	12	2.2	2.2	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.739**	**No**	4.88	4.13	70%
Sediment	D	SVOCs		Fluorene	ug/Kg	1.7	18	0%	0%	100%	-	-	-	-	1.7	1.8	19	0%	0%	100%	-	-	-	-	1.7	1.7	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Sediment	D	SVOCs		Indeno(1,2,3-cd)pyrene	ug/Kg	1.9	18	50%	50%	50%	3.10	2.08	2	8.8	1.9	1.9	19	47%	47%	53%	2.98	1.15	2.2	5.7	1.9	1.9	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.487**	**No**	1.66	1.41	45%
Sediment	D	SVOCs		p-cresol (4-Methylphenol)	ug/Kg	2.9	18	61%	61%	39%	39.4	65.4	4.5	210	2.9	2.9	19	32%	32%	68%	6.90	4.59	4.8	21	2.9	2.9	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.960**	**No**	45.7	38.6	98%
Sediment	D	SVOCs		Phenanthrene	ug/Kg	1.3	18	89%	89%	11%	2.78	1.16	1.3	5.9	1.3	1.3	19	74%	74%	26%	3.01	1.92	1.4	7.4	1.3	1.3	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.688**	**No**	1.60	1.35	49%
Sediment	D	SVOCs		Pyrene	ug/Kg	1.3	18	100%	100%	0%	5.02	4.89	1.5	23	-	-	19	84%	84%	16%	5.02	4.13	1.8	17	1.3	1.3	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.625**	**No**	4.52	3.82	76%
Sediment	D	SVOCs - PAHs		HPAH	ug/kg	19.3	18	100%	78%	22%	35.3	25.1	16.4	124.7	-	-	19	84%	58%	42%	34.8	20.9	15.4	73.9	19.3	19.3	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.633**	**No**	23.0	19.5	55%
Sediment	D	SVOCs - PAHs		LPAH	ug/kg	5.4	18	89%	89%	11%	6.9	1.2	5.4	10.0	5.4	5.4	19	74%	74%	26%	7.3	2.2	5.5	12.0	5.4	5.4	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.693**	**No**	1.7	1.5	21%
Sediment	D	SVOCs - PAHs		PAH	ug/kg	24.7	18	100%	72%	28%	39.2	26.4	17.1	133.2	-	-	19	84%	58%	42%	39.1	23.5	16.6	83.4	24.7	24.7	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.604**	**No**	24.9	21.1	54%
Clam	W	Metals		Aluminum	mg/Kg	-	18	100%	100%	0%	29.8	19.2	8	83.4	-	-	19	100%	100%	0%	32.6	25.4	9.37	83.2	-	-	0.025	0.949	0.002	0.110	Lognormal	t-Test (lognormal)	**0.499**	**No**	22.6	19.1	64%
Clam	W	Metals		Antimony	mg/Kg	0.004	18	17%	17%	83%	0.00428	0.00093	0.004	0.008	0.004	0.005	19	26%	11%	89%	0.00247	0.00119	0.002	0.007	0.002	0.005	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.729**	**No**	0.00107	0.00091	21%
Clam	W	Metals		Arsenic	mg/Kg	-	18	100%	100%	0%	2.30	0.19	2	2.62	-	-	19	100%	100%	0%	2.22	0.22	1.79	2.49	-	-	0.463	0.346	0.125	0.078	Normal	t-Test (normal)	**0.879**	**No**	0.205	0.173	8%
Clam	W	Metals		Barium	mg/Kg	-	18	100%	100%	0%	1.89	0.18	1.71	2.38	-	-	19	100%	100%	0%	1.87	0.46	1.18	3.05	-	-	0.004	0.010	0.380	0.880	Non-parametric	Wilcoxon Rank Sum Test	**0.803**	**No**	0.355	0.300	16%
Clam	W	Metals		Beryllium	mg/Kg	0.0004	18	50%	50%	50%	0.000622	0.000299	0.0004	0.0014	0.0004	0.0004	19	100%	100%	0%	0.00188	0.00075	0.0007	0.0038	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.000**	**Yes**			
Clam	W	Metals		Cadmium	mg/Kg	-	18	100%	100%	0%	0.332	0.044	0.247	0.405	-	-	19	100%	100%	0%	0.363	0.050	0.286	0.461	-	-	0.811	0.410	0.839	0.839	Normal	t-Test (normal)	**0.026**	**Yes**			
Clam	W	Metals		Chromium	mg/Kg	-	18	100%	100%	0%	0.548	0.100	0.45	0.76	-	-	19	100%	100%	0%	0.595	0.189	0.3	0.9	-	-	0.007	0.015	0.337	0.143	Non-parametric	Wilcoxon Rank Sum Test	**0.161**	**No**	0.152	0.129	23%
Clam	W	Metals		Cobalt	mg/Kg	-	18	100%	100%	0%	0.117	0.020	0.0902	0.15	-	-	19	100%	100%	0%	0.106	0.027	0.067	0.148	-	-	0.142	0.144	0.196	0.097	Normal	t-Test (normal)	**0.917**	**No**	0.0236	0.0199	17%
Clam	W	Metals		Copper	mg/Kg	-	18	100%	100%	0%	9.74	0.84	8.18	11.6	-	-	19	100%	100%	0%	9.15	1.04	7	11.4	-	-	0.932	0.951	0.948	0.905	Normal	t-Test (normal)	**0.969**	**No**	0.946	0.800	8%
Clam	W	Metals		Lead	mg/Kg	-	18	100%	100%	0%	0.0616	0.0063	0.049	0.072	-	-	19	100%	100%	0%	0.0431	0.0193	0.021	0.089	-	-	0.293	0.232	0.010	0.167	Lognormal	t-Test (lognormal)	**1.000**	**No**	0.0145	0.0123	20%
Clam	W	Metals		Mercury	mg/Kg	-	18	100%	100%	0%	0.00892	0.00366	0.0046	0.0179	-	-	19	100%	100%	0%	0.0111	0.0063	0.0058	0.0341	-	-	0.032	0.301	0.000	0.022	Non-parametric	Wilcoxon Rank Sum Test	**0.081**	**No**	0.00520	0.00439	49%
Clam	W	Metals		Methyl Mercury	mg/kg	-	18	100%	100%	0%	0.00534	0.00202	0.0014	0.0099	-	-	19	100%	100%	0%	0.00475	0.00081	0.0035	0.0065	-	-	0.293	0.003	0.202	0.281	Normal	t-Test (normal)	**0.868**	**No**	0.00152	0.00129	24%
Clam	W	Metals		Nickel	mg/Kg	-	18	100%	100%	0%	0.354	0.052	0.273	0.482	-	-	19	100%	100%	0%	0.227	0.085	0.095	0.348	-	-	0.438	0.773	0.101	0.040	Normal	t-Test (normal)	**1.000**	**No**	0.0711	0.0601	17%
Clam	W	Metals		Thallium	mg/Kg	-	18	100%	100%	0%	0.00676	0.00128	0.0053	0.0105	-	-	19	100%	100%	0%	0.00692	0.00187	0.0045	0.0119	-	-	0.006	0.058	0.047	0.533	Lognormal	t-Test (lognormal)	**0.461**	**No**	0.00161	0.00136	20%
Clam	W	Metals		Vanadium	mg/Kg	-	18	100%	100%	0%	0.145	0.050	0.074	0.286	-	-	19	100%	100%	0%	0.177	0.099	0.078	0.426	-	-	0.091	0.619	0.013	0.177	Lognormal	t-Test (lognormal)	**0.215**	**No**	0.0791	0.0668	46%
Clam	W	Metals		Zinc	mg/Kg	-	18	100%	100%	0%	21.0	1.5	18.5	23.2	-	-	19	100%	100%	0%	21.4	2.8	16.3	26.5	-	-	0.633	0.605	0.840	0.779	Normal	t-Test (normal)	**0.308**	**No**	2.28	1.92	9%
Clam	W	PCB Aroclors		Aroclor 1016	ug/Kg	12	18	0%	0%	100%	-	-	-	-	8.4	15	19	0%	0%	100%	-	-	-	-	2.4	23	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Clam	W	PCB Aroclors		Aroclor 1221	ug/Kg	12	18	0%	0%	100%	-	-	-	-	6.3	16	19	0%	0%	100%	-	-	-	-	2.6	20	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Clam	W	PCB Aroclors		Aroclor 1232	ug/Kg	24	18	0%	0%	100%	-	-	-	-	18	35	19	0%	0%	100%	-	-	-	-	2.3	40	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Clam	W	PCB Aroclors		Aroclor 1242	ug/Kg	12	18	0%	0%	100%	-	-	-	-	7.9	14	19	0%	0%	100%	-	-	-	-	2.2	48	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Clam	W	PCB Aroclors		Aroclor 1248	ug/Kg	7.1	18	0%	0%	100%	-	-	-	-	5.5	9.9	19	0%	0%	100%	-	-	-	-	0.51	26	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Clam	W	PCB Aroclors		Aroclor 1254	ug/Kg	32	18	100%	89%	11%	34.9	2.6	30	39	-	-	19	47%	11%	89%	27.7	21.9	21	120	28	74	-	-	-	-	-	Wilcoxon Rank Sum Test	**1.000**	**No**	15.8	13.4	38%
Clam	W	PCB Aroclors		Aroclor 1260	ug/Kg	6.5	18	0%	0%	100%	-	-	-	-	5.7	8.1	19	0%	0%	100%	-	-	-	-	1.9	11	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Clam	W	PCB Aroclors		Aroclor 1262	ug/Kg	2.5	18	0%	0%	100%	-	-	-	-	3.7	9.9	19	0%	0%	100%	-	-	-	-	2.5	2.5	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Clam	W	PCB Aroclors		Aroclor 1268	ug/Kg	2	18	0%	0%	100%	-	-	-	-	2	2	19	0%	0%	100%	-	-	-	-	2	2	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Clam	W	SVOCs		Acenaphthene	ug/Kg	0.11	18	100%	100%	0%	0.647	0.233	0.27	1.2	-	-	19	95%	95%	5%	1.03	0.76	0.42	4.1	0.11	0.11	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.005**	**Yes**			
Clam	W	SVOCs		Anthracene	ug/Kg	1.45	18	11%	6%	94%	0.929	0.263	0.85	1.8	1.3	3.2	19	79%	11%	89%	0.827	0.499	0.28	2.3	0.065	0.33	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.304**	**No**	0.402	0.340	37%
Clam	W	SVOCs		Benzo(a)anthracene	ug/Kg	16	18	0%	0%	100%	-	-	-	-	3.7	27	19	42%	0%	100%	0.829	0.452	0.48	2.1	0.066	22	-	-	-	-	-	Contingency Table Analysis	**0.002**	**Yes**			
Clam	W	SVOCs		Benzo(a)pyrene	ug/Kg	0.41	18	0%	0%	100%	-	-	-	-	0.41	0.41	19	16%	11%	89%	0.396	0.050	0.38	0.58	0.081	0.86	-	-	-	-	-	Contingency Table Analysis	**0.125**	**No**			
Clam	W	SVOCs		Benzo(b)fluoranthene	ug/Kg	0.35	18	0%	0%	100%	-	-	-	-	0.35	0.35	19	47%	47%	53%	0.533	0.170	0.4	0.95	0.07	0.8	-	-	-	-	-	Contingency Table Analysis	**0.001**	**Yes**			
Clam	W	SVOCs		Benzo(g,h,i)perylene	ug/Kg	0.37	18	28%	28%	72%	0.625	0.286	0.5	1.4	0.37	0.37	19	42%	0%	100%	0.174	0.095	0.09	0.36	0.073	2.5	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.992**	**No**	0.211	0.178	28%
Clam	W	SVOCs		Benzo(k)fluoranthene	ug/Kg	0.28	18	0%	0%	100%	-	-	-	-	0.28	0.28	19	11%	0%	100%	0.168	0.026	0.16	0.25	0.056	0.58	-	-	-	-	-	Contingency Table Analysis	**0.257**	**No**			
Clam	W	SVOCs		Bis(2-ethylhexyl) Phthalate	ug/Kg	-	18	100%	100%	0%	444	115	310	680	-	-	19	100%	100%	0%	393	324	67	890	-	-	0.043	0.264	0.000	0.001	Non-parametric	Wilcoxon Rank Sum Test	**0.807**	**No**	246	208	47%
Clam	W	SVOCs		Butyl Benzyl Phthalate	ug/Kg	7.3	18	17%	17%	83%	57.9	3.9	57	74	7.3	7.3	19	16%	16%	84%	13.2	0.5	13	15	7.3	11	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.603**	**No**	2.74	2.31	4%
Clam	W	SVOCs		Carbazole	ug/Kg	9.1	18	0%	0%	100%	-	-	-	-	9.1	9.1	19	0%	0%	100%			-	-	9.1	13	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Clam	W	SVOCs		Chrysene	ug/Kg	5.2	18	0%	0%	100%	-	-	-	-	1.3	13	19	42%	0%	100%	2.55	0.72	1.9	4	0.076	7.8	-	-	-	-	-	Contingency Table Analysis	**0.002**	**Yes**			

Table L-4. Statistical Comparison of Forebay Data to Reference Area Data -- MDL Censored

							Reference Area										Forebay Area										Shapiro-Wilk W Test					Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Medium	Basis	Analyte Group	IUPAC #	Analyte	Unit	Median MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	Ref Normality Test p-value	Ref Log-normality Test p-value	Site Normality Test p-value	Site Log-normality Test p-value	Distribution	Appropriate Statistical Test	Comparison p-value	Significant Higher Conc in Forebay?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
Clam	W	SVOCs		Dibenz(a,h)anthracene	ug/Kg	0.3	18	0%	0%	100%	-	-	-	-	0.3	0.3	19	0%	0%	100%	-	-	-	-	0.059	0.5	-	-	-	-	-	All Samples are NDs	-	-			
Clam	W	SVOCs		Di-n-butyl Phthalate	ug/Kg	16	18	0%	0%	100%	-	-	-	-	16	48	19	0%	0%	100%	-	-	-	-	16	56	-	-	-	-	-	All Samples are NDs	-	-			
Clam	W	SVOCs		Di-n-octyl Phthalate	ug/Kg	11	18	0%	0%	100%	-	-	-	-	11	11	19	5%	5%	95%	-	-	38	38	11	16	-	-	-	-	-	Contingency Table Analysis	0.514	No			
Clam	W	SVOCs		Fluoranthene	ug/Kg	14	18	100%	22%	78%	12.0	2.0	8.5	17	-	-	19	74%	11%	89%	10.5	2.5	6.3	16	8.6	16	-	-	-	-	-	Wilcoxon Rank Sum Test	0.515	No	2.30	1.94	16%
Clam	W	SVOCs		Fluorene	ug/Kg	-	18	100%	100%	0%	2.08	0.43	1.5	3.1	-	-	19	100%	100%	0%	2.25	0.65	0.92	3.8	-	-	0.189	0.595	0.962	0.366	Normal	t-Test (normal)	0.171	No	0.556	0.470	23%
Clam	W	SVOCs		Indeno(1,2,3-cd)pyrene	ug/Kg	0.32	18	39%	39%	61%	1.05	0.41	0.8	2	0.32	0.32	19	32%	16%	84%	0.240	0.540	0.08	2.5	0.064	0.5	-	-	-	-	-	Wilcoxon Rank Sum Test	0.974	No	0.481	0.406	39%
Clam	W	SVOCs		p-cresol (4-Methylphenol)	ug/Kg	7.7	18	100%	100%	0%	46.5	22.4	13	110	-	-	19	53%	53%	47%	12.4	6.4	8.6	31	7.7	11	-	-	-	-	-	Wilcoxon Rank Sum Test	1.000	No	16.3	13.8	30%
Clam	W	SVOCs		Phenanthrene	ug/Kg	-	18	100%	100%	0%	9.60	1.95	6.7	14	-	-	19	100%	100%	0%	9.45	2.66	4.5	15	-	-	0.067	0.340	0.976	0.566	Normal	t-Test (normal)	0.578	No	2.34	1.98	21%
Clam	W	SVOCs		Pyrene	ug/Kg	3.7	18	0%	0%	100%	-	-	-	-	2	5.6	19	37%	5%	95%	2.23	1.15	1.6	6.3	0.098	7.2	-	-	-	-	-	Contingency Table Analysis	0.005	Yes			
Crayfish	W	Metals		Aluminum	mg/Kg	-	19	100%	100%	0%	134	39	71.2	221	-	-	17	100%	100%	0%	105	23	71.4	157	-	-	0.880	0.911	0.045	0.302	Lognormal	t-Test (lognormal)	0.992	No	32.6	28.3	21%
Crayfish	W	Metals		Antimony	mg/Kg	-	19	100%	100%	0%	0.0153	0.0090	0.006	0.039	-	-	17	100%	100%	0%	0.0288	0.0308	0.009	0.133	-	-	0.009	0.391	0.000	0.050	Lognormal	t-Test (lognormal)	0.018	Yes			
Crayfish	W	Metals		Arsenic	mg/Kg	-	19	100%	100%	0%	0.383	0.084	0.275	0.636	-	-	17	100%	100%	0%	0.479	0.092	0.38	0.68	-	-	0.027	0.375	0.025	0.082	Lognormal	t-Test (lognormal)	0.001	Yes			
Crayfish	W	Metals		Barium	mg/Kg	-	19	100%	100%	0%	68.2	19.9	40.2	120	-	-	17	100%	100%	0%	65.4	9.6	51.7	84.3	-	-	0.229	0.664	0.537	0.713	Normal	t-Test (normal)	0.703	No	15.9	13.8	20%
Crayfish	W	Metals		Beryllium	mg/Kg	-	19	100%	100%	0%	0.00349	0.00080	0.0026	0.0061	-	-	17	100%	100%	0%	0.00316	0.00059	0.0017	0.0041	-	-	0.002	0.067	0.520	0.042	Non-parametric	Wilcoxon Rank Sum Test	0.826	No	0.000710	0.000618	18%
Crayfish	W	Metals		Cadmium	mg/Kg	-	19	100%	100%	0%	0.0942	0.0392	0.046	0.201	-	-	17	100%	100%	0%	0.107	0.046	0.061	0.21	-	-	0.108	0.858	0.024	0.164	Lognormal	t-Test (lognormal)	0.183	No	0.0424	0.0369	39%
Crayfish	W	Metals		Chromium	mg/Kg	0.13	19	95%	89%	11%	0.472	0.309	0.12	1.23	0.13	0.13	17	100%	100%	0%	0.659	0.248	0.2	1.2	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	0.010	Yes			
Crayfish	W	Metals		Cobalt	mg/Kg	-	19	100%	100%	0%	0.331	0.058	0.224	0.439	-	-	17	100%	100%	0%	0.233	0.019	0.192	0.262	-	-	0.738	0.435	0.646	0.442	Normal	t-Test (normal)	1.000	No	0.0441	0.0384	12%
Crayfish	W	Metals		Copper	mg/Kg	-	19	100%	100%	0%	18.2	5.1	12.2	33.2	-	-	17	100%	100%	0%	19.6	5.9	10.5	36	-	-	0.002	0.055	0.097	0.907	Lognormal	t-Test (lognormal)	0.225	No	5.50	4.79	26%
Crayfish	W	Metals		Lead	mg/Kg	-	19	100%	100%	0%	0.413	0.369	0.056	1.55	-	-	17	100%	100%	0%	0.603	0.635	0.098	2.66	-	-	0.001	0.998	0.000	0.240	Lognormal	t-Test (lognormal)	0.191	No	0.512	0.445	108%
Crayfish	W	Metals		Mercury	mg/Kg	-	19	100%	100%	0%	0.0176	0.0031	0.0105	0.0246	-	-	17	100%	100%	0%	0.0221	0.0036	0.0157	0.0315	-	-	0.811	0.357	0.329	0.587	Normal	t-Test (normal)	0.000	Yes			
Crayfish	W	Metals		Methyl Mercury	mg/kg	-	19	100%	100%	0%	0.0269	0.0057	0.0181	0.0367	-	-	17	100%	100%	0%	0.0311	0.0044	0.025	0.04	-	-	0.450	0.590	0.535	0.642	Normal	t-Test (normal)	0.011	Yes			
Crayfish	W	Metals		Nickel	mg/Kg	-	19	100%	100%	0%	1.80	0.62	0.992	3.44	-	-	17	100%	100%	0%	4.75	0.30	4.31	5.35	-	-	0.127	0.749	0.284	0.423	Normal	t-Test (normal)	0.000	Yes			
Crayfish	W	Metals		Thallium	mg/Kg	-	19	100%	100%	0%	0.0216	0.0056	0.014	0.037	-	-	17	100%	100%	0%	0.0184	0.0045	0.0117	0.0292	-	-	0.029	0.358	0.123	0.644	Lognormal	t-Test (lognormal)	0.973	No	0.00510	0.00444	21%
Crayfish	W	Metals		Vanadium	mg/Kg	-	19	100%	100%	0%	0.574	0.161	0.261	0.804	-	-	17	100%	100%	0%	0.435	0.070	0.3	0.6	-	-	0.220	0.046	0.003	0.004	Non-parametric	Wilcoxon Rank Sum Test	0.995	No	0.127	0.110	19%
Crayfish	W	Metals		Zinc	mg/Kg	-	19	100%	100%	0%	21.6	3.9	18	36.5	-	-	17	100%	100%	0%	20.5	1.6	16.9	23.2	-	-	0.000	0.000	0.915	0.713	Non-parametric	Wilcoxon Rank Sum Test	0.747	No	3.05	2.66	12%
Crayfish	W	PCB Aroclors		Aroclor 1016	ug/Kg	2.4	19	0%	0%	100%	-	-	-	-	2.4	4.8	17	0%	0%	100%	-	-	-	-	2.4	2.4	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1221	ug/Kg	2.6	19	0%	0%	100%	-	-	-	-	2.6	5.2	17	0%	0%	100%	-	-	-	-	2.6	2.6	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1232	ug/Kg	2.3	19	0%	0%	100%	-	-	-	-	2.3	4.6	17	0%	0%	100%	-	-	-	-	2.3	2.3	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1242	ug/Kg	2.2	19	0%	0%	100%	-	-	-	-	2.2	4.4	17	0%	0%	100%	-	-	-	-	2.2	2.2	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1248	ug/Kg	0.51	19	0%	0%	100%	-	-	-	-	0.51	1.1	17	0%	0%	100%	-	-	-	-	0.51	0.51	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1254	ug/Kg	1.8	19	0%	0%	100%	-	-	-	-	1.8	3.6	17	0%	0%	100%	-	-	-	-	1.8	19	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1260	ug/Kg	1.9	19	0%	0%	100%	-	-	-	-	1.9	3.8	17	0%	0%	100%	-	-	-	-	1.9	17	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1262	ug/Kg	2.5	19	0%	0%	100%	-	-	-	-	2.5	5	17	0%	0%	100%	-	-	-	-	2.5	10	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1268	ug/Kg	2	19	0%	0%	100%	-	-	-	-	2	4	17	0%	0%	100%	-	-	-	-	2	2	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	SVOCs		Acenaphthene	ug/Kg	0.11	18	17%	17%	83%	0.124	0.016	0.12	0.19	0.11	0.11	15	47%	47%	53%	0.138	0.046	0.11	0.26	0.11	0.11	-	-	-	-	-	Wilcoxon Rank Sum Test	0.046	Yes			
Crayfish	W	SVOCs		Anthracene	ug/Kg	0.065	18	11%	11%	89%	0.103	0.021	0.098	0.19	0.065	0.065	15	27%	27%	73%	0.0802	0.0263	0.069	0.16	0.065	0.065	-	-	-	-	-	Wilcoxon Rank Sum Test	0.160	No	0.0236	0.0219	21%
Crayfish	W	SVOCs		Benzo(a)anthracene	ug/Kg	0.066	18	11%	11%	89%	0.315	0.021	0.31	0.4	0.066	0.066	15	67%	67%	33%	0.256	0.032	0.23	0.35	0.066	0.066	-	-	-	-	-	Wilcoxon Rank Sum Test	0.003	Yes			
Crayfish	W	SVOCs		Benzo(a)pyrene	ug/Kg	0.081	18	6%	6%	94%	-	-	0.12	0.12	0.081	0.081	15	20%	20%	80%	0.126	0.015	0.12	0.17	0.081	0.081	-	-	-	-	-	Contingency Table Analysis	0.234	No			
Crayfish	W	SVOCs		Benzo(b)fluoranthene	ug/Kg	0.07	18	22%	22%	78%	0.0970	0.0420	0.082	0.23	0.07	0.07	15	47%	47%	53%	0.118	0.045	0.096	0.24	0.07	0.07	-	-	-	-	-	Wilcoxon Rank Sum Test	0.063	No	0.0436	0.0405	42%
Crayfish	W	SVOCs		Benzo(g,h,i)perylene	ug/Kg	0.073	18	0%	0%	100%	-	-	-	-	0.073	0.5	15	27%	27%	73%	0.126	0.074	0.098	0.39	0.073	0.073	-	-	-	-	-	Contingency Table Analysis	0.033	Yes			
Crayfish	W	SVOCs		Benzo(k)fluoranthene	ug/Kg	0.056	18	22%	22%	78%	0.0862	0.0371	0.072	0.2	0.056	0.056	15	47%	47%	53%	0.0999	0.0232	0.086	0.16	0.056	0.056	-	-	-	-	-	Wilcoxon Rank Sum Test	0.087	No	0.0316	0.0294	34%
Crayfish	W	SVOCs		Bis(2-ethylhexyl) Phthalate	ug/Kg	66	18	22%	22%	78%	70.4	4.3	69	87	66	66	15	27%	27%	73%	71.3	11.6	67	110	66	66	-	-	-	-	-	Wilcoxon Rank Sum Test	0.396	No	8.43	7.83	11%
Crayfish	W	SVOCs		Butyl Benzyl Phthalate	ug/Kg	7.3	18	17%	17%	83%	16.1	3.7	15	31	7.3	7.3	15	0%	0%	100%	-	-	-	-	7.3	7.3	-	-	-	-	-	Contingency Table Analysis	1.000	No			
Crayfish	W	SVOCs		Carbazole	ug/Kg	9.1	18	0%	0%	100%	-	-	-	-	9.1	9.1	15	0%	0%	100%	-	-	-	-	9.1	9.1	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	SVOCs		Chrysene	ug/Kg	0.076	18	28%	28%	72%	0.113	0.054	0.091	0.27	0.076	0.076	15	53%	53%	47%	0.115	0.061	0.082	0.31	0.076	0.076	-	-	-	-	-	Wilcoxon Rank Sum Test	0.109	No	0.0574	0.0534	47%
Crayfish	W	SVOCs		Dibenz(a,h)anthracene	ug/Kg	0.059	18	17%	17%	83%	0.0796	0.0224	0.072	0.16	0.059	0.059	15	0%	0%	100%	-	-	-	-	0.059	0.059	-	-	-	-	-	Contingency Table Analysis	1.000	No			
Crayfish	W	SVOCs		Di-n-butyl Phthalate	ug/Kg	39	18	0%	0%	100%	-	-	-	-	16	110	15	0%	0%	100%	-	-	-	-	16	180	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	SVOCs		Di-n-octyl Phthalate	ug/Kg	11	18	6%	6%	94%	-	-	32	32	11	11	15	0%	0%	100%	-	-	-	-	11	11	-	-	-	-	-	Contingency Table Analysis	1.000	No			
Crayfish	W	SVOCs		Fluoranthene	ug/Kg	0.49	18	0%	0%	100%	-	-	-	-	0.45	0.5	15	100%	20%	80%	0.349	0.156	0.17	0.75	-	-	-	-	-	-	-	Contingency Table Analysis	0.000	Yes			
Crayfish	W	SVOCs		Fluorene	ug/Kg	0.15	18	11%	11%	89%	0.184	0.016	0.18	0.25	0.15	0.15	15	33%	33%	67%	0.157	0.016	0.15	0.21	0.15	0.15	-	-	-	-	-	Wilcoxon Rank Sum Test	0.281	No	0.0161	0.0150	8%
Crayfish	W	SVOCs		Indeno(1,2,3-cd)pyrene	ug/Kg	0.064	18	17%	17%	83%	0.0946	0.0229	0.087	0.18	0.064	0.064	15	20%	20%	80%	0.163	0.007	0.16	0.18	0.064	0.064	-	-	-	-	-	Wilcoxon Rank Sum Test	0.363	No	0.0176	0.0163	17%
Crayfish	W	SVOCs		p-cresol (4-Methylphenol)	ug/Kg	7.7	18	0%	0%	100%	-	-	-	-	7.7	7.7	15	0%	0%	100%	-	-	-	-	7.7	7.7	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	SVOCs		Phenanthrene	ug/Kg	0.36	18	28%	28%	72%	0.469	0.043	0.45	0.59	0.36	0.36	15	67%	67%	33%	0.507	0.136	0.42	0.86	0.36	0.36	-	-	-	-	-	Wilcoxon Rank Sum Test	0.023	Yes			
Crayfish	W	SVOCs		Pyrene	ug/Kg	0.49	18	0%	0%	100%	-	-	-	-	0.45	0.5	15	100%	7%	93%	0.361	0.250	0.16	1.2	-	-	-	-	-	-	-	Contingency Table Analysis	0.000	Yes			
Sculpin	W	Metals		Arsenic	mg/Kg	-	18	100%	100%	0%	0.382	0.074	0.239	0.484	-	-	17	100%	100%	0%	0.312	0.077	0.184	0.435	-	-	0.453	0.338	0.181	0.341	Normal	t-Test (normal)	0.995	No	0.0754	0.0656	17%
Sculpin	W	Metals		Cadmium	mg/Kg	-	18	100%	100%	0%	0.0152	0.0047	0.0087	0.0264	-	-	17	100%	100%	0%	0.0201	0.0091	0.0072	0.0453	-	-	0.096	0.891	0.050	0.947	Lognormal	t-Test (lognormal)	0.032	Yes			
Sculpin	W	Metals		Lead	mg/Kg	0.0214	18	94%	94%	6%	0.0360	0.0130	0.0239	0.0758	0.0214	0.0214	17	94%	94%	6%	0.0759	0.0640	0.0313	0.306	0.0214	0.0214	-	-	-	-	-	Wilcoxon Rank Sum Test	0.002	Yes			
Sculpin	W	Metals		Mercury	mg/Kg	-	18	100%	100%	0%	0.0876	0.0258	0.0448	0.141	-	-	17	100%	100%	0%	0.152	0.083	0.0327	0.308	-	-	0.513	0.712	0.437	0.367	Normal	t-Test (normal)	0.003	Yes			
Sculpin	W	PCB Aroclors		Aroclor 1016	ug/Kg	2.4	18	0%	0%	100%	-	-	-	-	2.4	2.4	17	0%	0%	100%	-	-	-	-	2.4	14	-	-	-	-	-	All Samples are NDs	-	-			
Sculpin	W	PCB Aroclors		Aroclor 1221	ug/Kg	2.6	18	0%	0%	100%	-	-	-	-	2.6	2.6	17	0%	0%	100%	-	-	-	-	2.6	69	-	-	-	-	-	All Samples are NDs	-	-			
Sculpin	W	PCB Aroclors		Aroclor 1232	ug/Kg	2.3	18	0%	0%	100%	-	-	-	-	2.3	2.3	17	0%	0%	100%	-	-	-	-	2.3	62	-	-	-	-	-	All Samples are NDs	-	-			
Sculpin	W	PCB Aroclors		Aroclor 1242	ug/Kg	2.2	18	0%	0%	100%	-	-	-	-	2.2	2.2	17	0%	0%	100%	-	-	-	-	2.2	35	-	-	-	-	-	All Samples are NDs	-	-			
Sculpin	W	PCB Aroclors		Aroclor 1248	ug/Kg	0.51	18	0%	0%	100%	-	-	-	-	0.51	45	17	0%	0%	100%	-	-	-	-	0.51	13	-	-	-	-	-	All Samples are NDs	-	-			
Sculpin	W	PCB Aroclors		Aroclor 1254	ug/Kg	27	18	0%	0%	100%	-	-	-	-	1.8	44	17	18%	18%	82%	242	373	130	1700	13	130	-	-	-	-	-	Contingency Table Analysis	0.104	No			
Sculpin	W	PCB Aroclors		Aroclor 1260	ug/Kg	1.9	18	0%	0%	100%	-	-	-	-	1.9	1.9	17	0%	0%	100%	-	-	-	-	1.9	82	-	-	-	-	-	All Samples are NDs	-	-			
Sculpin	W	PCB Aroclors		Aroclor 1262	ug/Kg	2.5	18	0%	0%	100%	-	-	-	-	2.5	2.5	17	0%	0%	100%	-	-	-	-	2.5	13	-	-	-	-	-	All Samples are NDs	-	-			
Sculpin	W	PCB Aroclors		Aroclor 1268	ug/Kg	2	18	0%	0%	100%	-	-	-	-	2	2	17	0%	0%	100%	-	-	-	-	2	10	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	Metals		Aluminum	mg/Kg	-	19	100%	100%	0%	2.50	2.31	0.33	10.1	-	-	19	100%	100%	0%	5.05	4.13	1.06	15.5	-	-	0.001	0.998	0.010	0.248	Lognormal	t-Test (lognormal)	0.007	Yes			
Smallmouth Bass	W	Metals		Antimony	mg/Kg	0.005	19	21%	5%	95%	0.00416	0.00491	0.003	0.025	0.002	0.006	19	0%	0%	100%	-	-	-	-	0.005	0.006	-	-	-	-	-	Contingency Table Analysis	1.000	No			
Smallmouth Bass	W	Metals		Arsenic	mg/Kg	-	19	100%	100%	0%	0.354	0.151	0.159	0.761	-	-	19	100%	100%	0%	0.412	0.150	0.17	0.7	-	-	0.025	0.807	0.755	0.097	Lognormal	t-Test (lognormal)	0.127	No	0.151	0.124	35%
Smallmouth Bass	W	Metals		Barium	mg/Kg	-	19	100%	100%	0%	1.10	0.39	0.43	1.72	-	-	19	100%	100%	0%	1.51	0.56	0.72	2.64	-	-	0.480	0.133	0.362	0.783	Normal	t-Test (normal)	0.006	Yes			
Smallmouth Bass	W	Metals		Beryllium	mg/Kg	0.0006	19	0%	0%	100%	-	-	-	-	0.0005	0.002	19	21%	16%	84%	0.000521	0.000052	0.0005	0.0007	0.0005	0.0006	-	-	-	-	-	Contingency Table Analysis	0.053	No			
Smallmouth Bass	W	Metals		Cadmium	mg/Kg	-	19	100%	100%	0%	0.0813	0.0602	0.004	0.143	-	-	19	100%	100%	0%	0.00974	0.00667	0.004	0.028	-	-	0.000	0.000	0.000	0.061	Non-parametric	Wilcoxon Rank Sum Test	0.989	No	0.0428	0.0352	43%
Smallmouth Bass	W	Metals		Chromium	mg/Kg	0.13	19	63%	21%	79%	0.458	1.578	0.04	7.15	0.1	0.1	19	26%	26%	74%	0.235	0.150	0.19	0.86	0.12	0.15	-	-	-	-	-	Wilcoxon Rank Sum Test	0.218	No	1.12	0.92	201%
Smallmouth Bass	W	Metals		Cobalt	mg/Kg	0.0267	19	63%	63%	37%	0.0563	0.0098	0.0487	0.0838	0.0248	0.0361	19	100%	100%	0%	0.0548	0.0080	0.0441	0.0758	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	0.198	No	0.00894	0.00735	13%
Smallmouth Bass	W	Metals		Copper	mg/Kg	-	19	100%	100%	0%	0.510	0.133	0.327	0.73	-	-	19	100%	100%	0%	0.664	0.249	0.364	1.42	-	-	0.182	0.259	0.005	0.486	Lognormal	t-Test (lognormal)	0.008	Yes			
Smallmouth Bass	W	Metals		Lead	mg/Kg	0.014	19	63%	63%	37%	1.53	0.12	1.42	1.81	0.013	0.015	19	100%	26%	74%	0.0109	0.0079	0.004	0.036	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	0.999	No	0.0872	0.0716	5%
Smallmouth Bass	W	Metals		Mercury	mg/Kg	-	19	100%	100%	0%	0.131	0.071	0.0548	0.333	-	-	19	100%	100%	0%	0.265	0.130	0.071	0.512	-	-	0.016	0.766	0.499	0.197	Lognormal	t-Test (lognormal)	0.000	Yes			
Smallmouth Bass	W	Metals		Nickel	mg/Kg	0.298	19	84%	84%	16%	0.980	0.499	0.324	1.79	0.277	0.306	19	100%	47%	53%	0.298	0.055	0.213	0.399	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	1.000	No	0.355	0.292	30%
Smallmouth Bass	W	Metals		Thallium	mg/Kg	-	19	100%	100%	0%	0.0160	0.0041	0.0109	0.0261	-	-	19	100%	100%	0%	0.0148	0.0033	0.0079	0.0215	-	-	0.167	0.664	0.753	0.182	Normal	t-Test (normal)	0.825	No	0.00370	0.00304	19%
Smallmouth Bass	W	Metals		Vanadium	mg/Kg	0.006	19	95%	95%	5%	0.0570	0.0212	0.03	0.104	0.006	0.006	19	100%	100%	0%	0.0595	0.0244	0.03	0.13	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	0.430	No	0.0229	0.0188	33%
Smallmouth Bass	W	Metals		Zinc	mg/Kg	-	19	100%	100%	0%	13.4	1.2	11.2	15.5	-	-	19	100%	100%	0%	14.2	1.6	11.4	18	-	-	0.530	0.513	0.854	0.955	Normal	t-Test (normal)	0.042	Yes			
Smallmouth Bass	W	PCB Aroclors		Aroclor 1016	ug/Kg	4.6	19	0%	0%	100%	-	-	-	-	2.4	9.9	19	0%	0%	100%	-	-	-	-	2.4	240	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	PCB Aroclors		Aroclor 1221	ug/Kg	3.75	19	0%	0%	100%	-	-	-	-	2.6	20	19	0%	0%	100%	-	-	-	-	2.6	260	-	-	-	-	-	All Samples are NDs	-	-			

Table L-4. Statistical Comparison of Forebay Data to Reference Area Data -- MDL Censored

							Reference Area										Forebay Area										Shapiro-Wilk W Test					Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Medium	Basis	Analyte Group	IUPAC #	Analyte	Unit	Median MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MDL	Percent of Data Censored at Median MDL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MDL of NDs	Max MDL of NDs	Ref Normality Test p-value	Ref Log-normality Test p-value	Site Normality Test p-value	Site Log-normality Test p-value	Distribution	Appropriate Statistical Test	Comparison p-value	Significant Higher Conc in Forebay?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
Smallmouth Bass	W	PCB Aroclors		Aroclor 1232	ug/Kg	5.55	19	0%	0%	100%	-	-	-	-	2.3	11	19	0%	0%	100%	-	-	-	-	2.3	230	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	PCB Aroclors		Aroclor 1242	ug/Kg	2.9	19	21%	16%	84%	3.68	3.06	2.4	14	2.2	10	19	5%	5%	95%	-	-	260	260	2.2	220	-	-	-	-	-	Contingency Table Analysis	**0.977**	**No**			
Smallmouth Bass	W	PCB Aroclors		Aroclor 1248	ug/Kg	0.51	19	0%	0%	100%	-	-	-	-	0.51	33	19	0%	0%	100%	-	-	-	-	0.51	68	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	PCB Aroclors		Aroclor 1254	ug/Kg	38	19	84%	53%	47%	49.5	22.3	27	110	9.6	130	19	37%	37%	63%	1948	4885	51	18000	11	420	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.500**	**No**	3454	2838	5732%
Smallmouth Bass	W	PCB Aroclors		Aroclor 1260	ug/Kg	19	19	0%	0%	100%	-	-	-	-	1.9	140	19	0%	0%	100%	-	-	-	-	1.9	300	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	PCB Aroclors		Aroclor 1262	ug/Kg	5.45	19	0%	0%	100%	-	-	-	-	2.5	110	19	0%	0%	100%	-	-	-	-	2.5	250	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	PCB Aroclors		Aroclor 1268	ug/Kg	2	19	0%	0%	100%	-	-	-	-	2	10	19	0%	0%	100%	-	-	-	-	2	200	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	SVOCs		Acenaphthene	ug/Kg	0.11	19	95%	95%	5%	0.797	0.214	0.51	1.3	0.11	0.11	19	84%	84%	16%	0.537	0.517	0.16	1.6	0.11	0.11	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.993**	**No**	0.396	0.325	41%
Smallmouth Bass	W	SVOCs		Anthracene	ug/Kg	0.065	19	16%	16%	84%	0.115	0.073	0.09	0.38	0.065	0.65	19	95%	95%	5%	2.16	4.10	0.078	17	0.065	0.065	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.000**	**Yes**			
Smallmouth Bass	W	SVOCs		Benzo(a)anthracene	ug/Kg	0.066	19	16%	16%	84%	0.583	0.085	0.56	0.94	0.066	0.66	19	26%	26%	74%	2.07	3.63	1	17	0.066	0.66	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.143**	**No**	2.57	2.11	362%
Smallmouth Bass	W	SVOCs		Benzo(a)pyrene	ug/Kg	0.081	19	0%	0%	100%	-	-	-	-	0.081	0.81	19	42%	42%	58%	2.18	2.53	0.72	7.4	0.081	0.081	-	-	-	-	-	Contingency Table Analysis	**0.002**	**Yes**			
Smallmouth Bass	W	SVOCs		Benzo(b)fluoranthene	ug/Kg	0.07	19	0%	0%	100%	-	-	-	-	0.07	0.7	19	32%	32%	68%	1.09	1.69	0.11	4.4	0.07	0.14	-	-	-	-	-	Contingency Table Analysis	**0.010**	**Yes**			
Smallmouth Bass	W	SVOCs		Benzo(g,h,i)perylene	ug/Kg	0.073	19	0%	0%	100%	-	-	-	-	0.073	0.73	19	32%	32%	68%	1.01	1.04	0.42	3.3	0.073	0.15	-	-	-	-	-	Contingency Table Analysis	**0.010**	**Yes**			
Smallmouth Bass	W	SVOCs		Benzo(k)fluoranthene	ug/Kg	0.056	19	0%	0%	100%	-	-	-	-	0.056	0.56	19	47%	47%	53%	2.06	2.91	0.11	7.7	0.056	0.056	-	-	-	-	-	Contingency Table Analysis	**0.001**	**Yes**			
Smallmouth Bass	W	SVOCs		Bis(2-ethylhexyl) Phthalate	ug/Kg	66	19	11%	11%	89%	86.3	18.4	81	150	66	2500	19	37%	37%	63%	186	344	89	1600	66	5000	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.027**	**Yes**			
Smallmouth Bass	W	SVOCs		Butyl Benzyl Phthalate	ug/Kg	7.3	19	0%	0%	100%	-	-	-	-	7.3	7.3	19	11%	11%	89%	54.4	90.9	33	440	7.3	7.3	-	-	-	-	-	Contingency Table Analysis	**0.243**	**No**			
Smallmouth Bass	W	SVOCs		Carbazole	ug/Kg	9.1	19	0%	0%	100%	-	-	-	-	7.7	9.1	19	0%	0%	100%	-	-	-	-	9.1	9.1	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	SVOCs		Chrysene	ug/Kg	0.076	19	5%	5%	95%	-	-	0.55	0.55	0.076	0.76	19	42%	42%	58%	1.76	2.47	0.5	10	0.076	0.076	-	-	-	-	-	Contingency Table Analysis	**0.009**	**Yes**			
Smallmouth Bass	W	SVOCs		Dibenz(a,h)anthracene	ug/Kg	0.059	19	0%	0%	100%	-	-	-	-	0.059	0.59	19	32%	32%	68%	1.16	1.30	0.41	4.1	0.059	0.12	-	-	-	-	-	Contingency Table Analysis	**0.010**	**Yes**			
Smallmouth Bass	W	SVOCs		Di-n-butyl Phthalate	ug/Kg	71	19	0%	0%	100%	-	-	-	-	16	280	19	5%	5%	95%	-	-	150	150	16	71	-	-	-	-	-	Contingency Table Analysis	**0.500**	**No**			
Smallmouth Bass	W	SVOCs		Di-n-octyl Phthalate	ug/Kg	11	19	5%	5%	95%	-	-	15	15	11	11	19	0%	0%	100%	-	-	-	-	11	11	-	-	-	-	-	Contingency Table Analysis	**1.000**	**No**			
Smallmouth Bass	W	SVOCs		Fluoranthene	ug/Kg	0.09	19	58%	58%	42%	1.05	0.50	0.69	2.5	0.09	1.2	19	53%	53%	47%	1.93	2.27	0.49	6.5	0.09	0.09	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.463**	**No**	1.64	1.35	129%
Smallmouth Bass	W	SVOCs		Fluorene	ug/Kg	0.15	19	84%	84%	16%	1.31	0.33	0.89	2.1	0.15	2	19	89%	89%	11%	1.20	1.28	0.3	4.7	0.15	0.15	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.938**	**No**	0.936	0.769	59%
Smallmouth Bass	W	SVOCs		Indeno(1,2,3-cd)pyrene	ug/Kg	0.064	19	0%	0%	100%	-	-	-	-	0.064	0.64	19	37%	37%	63%	1.88	2.06	0.7	6.1	0.064	0.13	-	-	-	-	-	Contingency Table Analysis	**0.004**	**Yes**			
Smallmouth Bass	W	SVOCs		p-cresol (4-Methylphenol)	ug/Kg	7.7	19	0%	0%	100%	-	-	-	-	7.7	11	19	0%	0%	100%	-	-	-	-	7.7	7.7	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	SVOCs		Phenanthrene	ug/Kg	-	19	100%	100%	0%	3.11	1.05	1.4	5.1	-	-	19	100%	100%	0%	2.09	1.75	0.54	5.7	-	-	0.306	0.493	0.000	0.082	Lognormal	t-Test (lognormal)	**0.999**	**No**	1.44	1.18	38%
Smallmouth Bass	W	SVOCs		Pyrene	ug/Kg	0.098	19	11%	11%	89%	0.382	0.009	0.38	0.42	0.098	0.98	19	47%	47%	53%	1.35	2.24	0.11	7.2	0.098	0.49	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.005**	**Yes**			

Table L-5. Statistical Comparison of Forebay Data to Reference Area Data -- MRL Censored

							Reference Area										Forebay Area										Shapiro-Wilk W Test					Statistical Comparison(α = 5%)			If "No", Power Analysis (Normal Approximation)		
Medium	Basis	Analyte Group	IUPAC #	Analyte	Unit	Median MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	Ref Normality Test p-value	Ref Log-normality Test p-value	Site Normality Test p-value	Site Log-normality Test p-value	Distribution	Appropriate Statistical Test	Comparison p-value	Significant Higher Conc in Forebay?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
Sediment	D	Metals		Aluminum	mg/Kg	-	18	100%	100%	0%	17328	9005	7380	33500	-	-	19	100%	100%	0%	13279	2993	9000	22900	-	-	0.011	0.064	0.008	0.317	Lognormal	t-Test (lognormal)	**0.891**	**No**	6633	5604	32%
Sediment	D	Metals		Antimony	mg/Kg	0.06	18	100%	100%	0%	0.264	0.091	0.15	0.52	-	-	19	95%	84%	16%	0.155	0.065	0.04	0.28	0.06	0.06	-	-	-	-	-	Wilcoxon Rank Sum Test	**1.000**	**No**	0.0790	0.0667	25%
Sediment	D	Metals		Arsenic	mg/Kg	-	18	100%	100%	0%	4.19	0.87	3.03	6.04	-	-	19	100%	100%	0%	3.12	1.00	1.4	5.39	-	-	0.031	0.108	0.025	0.217	Lognormal	t-Test (lognormal)	**1.000**	**No**	0.939	0.793	19%
Sediment	D	Metals		Barium	mg/Kg	-	18	100%	100%	0%	167	67	86.3	312	-	-	19	100%	100%	0%	121	36	53.1	202	-	-	0.037	0.085	0.269	0.170	Lognormal	t-Test (lognormal)	**0.989**	**No**	53.4	45.1	27%
Sediment	D	Metals		Beryllium	mg/Kg	-	18	100%	100%	0%	0.437	0.177	0.194	0.748	-	-	19	100%	100%	0%	0.362	0.092	0.215	0.597	-	-	0.047	0.116	0.547	0.754	Lognormal	t-Test (lognormal)	**0.884**	**No**	0.140	0.118	27%
Sediment	D	Metals		Cadmium	mg/Kg	0.118	18	100%	100%	0%	0.476	0.111	0.262	0.748	-	-	19	89%	89%	11%	0.453	0.181	0.175	0.719	0.115	0.121	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.670**	**No**	0.151	0.128	27%
Sediment	D	Metals		Chromium	mg/Kg	-	18	100%	100%	0%	19.8	4.6	12.8	27.3	-	-	19	100%	100%	0%	19.9	5.2	10.1	33.5	-	-	0.190	0.353	0.150	0.395	Normal	t-Test (normal)	**0.462**	**No**	4.90	4.14	21%
Sediment	D	Metals		Cobalt	mg/Kg	-	18	100%	100%	0%	9.66	3.12	5.68	15.2	-	-	19	100%	100%	0%	8.59	2.10	4.82	15.1	-	-	0.077	0.137	0.019	0.281	Lognormal	t-Test (lognormal)	**0.841**	**No**	2.64	2.23	23%
Sediment	D	Metals		Copper	mg/Kg	-	18	100%	100%	0%	25.6	13.8	8.22	47.8	-	-	19	100%	100%	0%	20.5	4.7	11.3	33.1	-	-	0.015	0.051	0.255	0.490	Lognormal	t-Test (lognormal)	**0.749**	**No**	10.2	8.6	34%
Sediment	D	Metals		Lead	mg/Kg	-	18	100%	100%	0%	11.6	1.6	8.65	15.1	-	-	19	100%	100%	0%	8.93	3.11	3.3	16.8	-	-	0.642	0.869	0.142	0.049	Normal	t-Test (normal)	**0.999**	**No**	2.50	2.12	18%
Sediment	D	Metals		Mercury	mg/Kg	-	18	100%	100%	0%	0.129	0.048	0.041	0.225	-	-	19	100%	100%	0%	0.132	0.111	0.008	0.373	-	-	0.953	0.321	0.049	0.233	Lognormal	t-Test (lognormal)	**0.902**	**No**	0.0862	0.0729	56%
Sediment	D	Metals		Nickel	mg/Kg	-	18	100%	100%	0%	14.6	3.6	9.87	25.6	-	-	19	100%	100%	0%	15.5	9.1	6.39	51.5	-	-	0.015	0.391	0.000	0.001	Non-parametric	Wilcoxon Rank Sum Test	**0.608**	**No**	7.03	5.94	41%
Sediment	D	Metals		Thallium	mg/Kg	0.1175	18	100%	100%	0%	0.244	0.062	0.145	0.36	-	-	19	79%	79%	21%	0.173	0.028	0.135	0.218	0.108	0.132	-	-	-	-	-	Wilcoxon Rank Sum Test	**1.000**	**No**	0.0473	0.0400	16%
Sediment	D	Metals		Vanadium	mg/Kg	-	18	100%	100%	0%	45.0	14.3	25.7	76.9	-	-	19	100%	100%	0%	40.0	8.2	27.5	59.3	-	-	0.219	0.778	0.162	0.582	Normal	t-Test (normal)	**0.901**	**No**	11.6	9.8	22%
Sediment	D	Metals		Zinc	mg/Kg	-	18	100%	100%	0%	87.6	10.1	70.2	109	-	-	19	100%	100%	0%	81.8	18.2	50.3	113	-	-	0.978	0.987	0.323	0.109	Normal	t-Test (normal)	**0.883**	**No**	14.8	12.5	14%
Sediment	D	NWTPH-Dx		Diesel Range Organics	mg/Kg	-	18	100%	100%	0%	15.7	8.2	7	31	-	-	19	100%	100%	0%	15.7	12.7	2.6	54	-	-	0.003	0.125	0.006	0.586	Lognormal	t-Test (lognormal)	**0.803**	**No**	10.8	9.1	58%
Sediment	D	NWTPH-Dx		Residual Range Organics	mg/Kg	150	18	72%	0%	100%	48.9	20.4	29	100	150	180	19	63%	26%	74%	95.3	48.8	17	180	130	180	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.044**	**Yes**			
Sediment	D	PCB Aroclors		Aroclor 1016	ug/Kg	10	18	0%	0%	100%	-	-	-	-	9.6	13	19	0%	0%	100%	-	-	-	-	6.4	10	-	-	-	-	-	All Samples are NDs	-	-			
Sediment	D	PCB Aroclors		Aroclor 1221	ug/Kg	20	18	0%	0%	100%	-	-	-	-	20	21	19	0%	0%	100%	-	-	-	-	13	29	-	-	-	-	-	All Samples are NDs	-	-			
Sediment	D	PCB Aroclors		Aroclor 1232	ug/Kg	10	18	0%	0%	100%	-	-	-	-	9.6	12	19	0%	0%	100%	-	-	-	-	6.4	18	-	-	-	-	-	All Samples are NDs	-	-			
Sediment	D	PCB Aroclors		Aroclor 1242	ug/Kg	10	18	0%	0%	100%	-	-	-	-	9.6	16	19	0%	0%	100%	-	-	-	-	6.4	10	-	-	-	-	-	All Samples are NDs	-	-			
Sediment	D	PCB Aroclors		Aroclor 1248	ug/Kg	10	18	0%	0%	100%	-	-	-	-	9.6	11	19	0%	0%	100%	-	-	-	-	6.4	10	-	-	-	-	-	All Samples are NDs	-	-			
Sediment	D	PCB Aroclors		Aroclor 1254	ug/Kg	10	18	0%	0%	100%	-	-	-	-	9.6	11	19	11%	5%	95%	5.78	5.00	4.6	27	6.4	10	-	-	-	-	-	Contingency Table Analysis	**0.257**	**No**			
Sediment	D	PCB Aroclors		Aroclor 1260	ug/Kg	10	18	0%	0%	100%	-	-	-	-	9.6	11	19	0%	0%	100%	-	-	-	-	6.4	10	-	-	-	-	-	All Samples are NDs	-	-			
Sediment	D	PCB Aroclors		Aroclor 1262	ug/Kg	10	18	0%	0%	100%	-	-	-	-	9.6	11	19	0%	0%	100%	-	-	-	-	6.4	10	-	-	-	-	-	All Samples are NDs	-	-			
Sediment	D	PCB Aroclors		Aroclor 1268	ug/Kg	10	18	0%	0%	100%	-	-	-	-	9.6	11	19	0%	0%	100%	-	-	-	-	6.4	10	-	-	-	-	-	All Samples are NDs	-	-			
Sediment	D	SVOCs		Acenaphthene	ug/Kg	9.9	18	0%	0%	100%	-	-	-	-	9.5	11	19	0%	0%	100%	-	-	-	-	9.8	10	-	-	-	-	-	All Samples are NDs	-	-			
Sediment	D	SVOCs		Anthracene	ug/Kg	9.95	18	11%	0%	100%	1.85	0.45	1.4	2.3	9.5	11	19	26%	0%	100%	2.00	0.39	1.5	2.7	9.8	10	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Sediment	D	SVOCs		Benzo(a)anthracene	ug/Kg	9.9	18	78%	6%	94%	3.16	1.81	1.6	10	9.8	10	19	63%	5%	95%	4.34	2.74	1.6	12	9.8	10	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.500**	**No**	2.33	1.97	62%
Sediment	D	SVOCs		Benzo(a)pyrene	ug/Kg	9.9	18	50%	6%	94%	4.11	2.14	1.6	11	9.5	10	19	58%	0%	100%	4.69	2.02	1.7	7.5	9.8	10	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.835**	**No**	2.08	1.76	43%
Sediment	D	SVOCs		Benzo(b)fluoranthene	ug/Kg	9.9	18	72%	6%	94%	5.54	3.14	2.7	17	9.8	10	19	47%	0%	100%	6.24	1.60	4	9.1	9.8	10	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.835**	**No**	2.47	2.09	38%
Sediment	D	SVOCs		Benzo(g,h,i)perylene	ug/Kg	9.9	18	56%	0%	100%	4.34	1.78	2.3	7.9	9.8	10	19	47%	0%	100%	4.00	1.05	2.6	6.2	9.8	10	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Sediment	D	SVOCs		Benzo(k)fluoranthene	ug/Kg	10	18	6%	0%	100%	-	-	5	5	9.5	11	19	26%	0%	100%	3.40	0.80	2.5	4.9	9.8	10	-	-	-	-	-	Contingency Table Analysis	**0.102**	**No**			
Sediment	D	SVOCs		Bis(2-ethylhexyl) Phthalate	ug/Kg	200	18	100%	0%	100%	15.1	24.4	4.9	110	-	-	19	16%	5%	95%	102	75	38	340	200	200	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.179**	**No**	56.3	47.6	315%
Sediment	D	SVOCs		Butyl Benzyl Phthalate	ug/Kg	9.9	18	11%	0%	100%	3.15	0.65	2.5	3.8	9.8	11	19	0%	0%	100%	-	-	-	-	9.8	10	-	-	-	-	-	Contingency Table Analysis	**1.000**	**No**			
Sediment	D	SVOCs		Carbazole	ug/Kg	9.95	18	0%	0%	100%	-	-	-	-	9.5	11	19	5%	0%	100%	-	-	1.4	1.4	9.8	10	-	-	-	-	-	Contingency Table Analysis	**0.514**	**No**			
Sediment	D	SVOCs		Chrysene	ug/Kg	9.9	18	83%	0%	100%	4.36	2.30	1.9	9.8	9.9	10	19	84%	11%	89%	5.40	4.63	1.4	20	9.8	9.9	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.087**	**No**	3.69	3.12	71%
Sediment	D	SVOCs		Dibenz(a,h)anthracene	ug/Kg	9.9	18	0%	0%	100%	-	-	-	-	9.5	11	19	0%	0%	100%	-	-	-	-	9.8	10	-	-	-	-	-	All Samples are NDs	-	-			
Sediment	D	SVOCs		Di-n-butyl Phthalate	ug/Kg	10	18	83%	6%	94%	5.78	1.97	3.5	11	9.9	10	19	0%	0%	100%	-	-	-	-	9.8	19	-	-	-	-	-	Contingency Table Analysis	**1.000**	**No**			
Sediment	D	SVOCs		Di-n-octyl Phthalate	ug/Kg	9.9	18	0%	0%	100%	-	-	-	-	9.5	11	19	0%	0%	100%	-	-	-	-	9.8	10	-	-	-	-	-	All Samples are NDs	-	-			
Sediment	D	SVOCs		Fluoranthene	ug/Kg	9.9	18	83%	6%	94%	6.32	6.27	2.3	31	9.9	10	19	79%	11%	89%	4.97	2.73	2.5	12	9.8	9.9	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.327**	**No**	4.79	4.05	64%
Sediment	D	SVOCs		Fluorene	ug/Kg	9.9	18	0%	0%	100%	-	-	-	-	9.5	11	19	0%	0%	100%	-	-	-	-	9.8	10	-	-	-	-	-	All Samples are NDs	-	-			
Sediment	D	SVOCs		Indeno(1,2,3-cd)pyrene	ug/Kg	9.9	18	50%	0%	100%	4.20	2.49	2	8.8	9.8	10	19	47%	0%	100%	3.86	1.15	2.2	5.7	9.8	10	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Sediment	D	SVOCs		p-cresol (4-Methylphenol)	ug/Kg	10	18	61%	22%	78%	40.2	64.9	4.5	210	9.8	10	19	32%	16%	84%	7.85	4.27	4.8	21	9.8	10	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.768**	**No**	45.3	38.3	95%
Sediment	D	SVOCs		Phenanthrene	ug/Kg	9.9	18	89%	0%	100%	2.96	1.10	1.3	5.9	9.9	10	19	74%	0%	100%	3.59	1.93	1.4	7.4	9.8	10	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Sediment	D	SVOCs		Pyrene	ug/Kg	9.8	18	100%	6%	94%	5.02	4.89	1.5	23	-	-	19	84%	16%	84%	5.34	4.02	1.8	17	9.8	9.9	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.191**	**No**	4.46	3.77	75%
Sediment	D	SVOCs - PAHs		HPAH	ug/kg	98	18	100%	6%	94%	45.2	27.3	20.0	129.4	-	-	19	84%	0%	100%	42.1	21.9	16.5	83.0	98.0	99.0	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.835**	**No**	24.7	20.8	46%
Sediment	D	SVOCs - PAHs		LPAH	ug/kg	39.6	18	89%	0%	100%	31.9	2.6	24.6	35.1	39.6	40.0	19	74%	0%	100%	30.5	2.9	23.5	34.6	39.2	40.0	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Sediment	D	SVOCs - PAHs		PAH	ug/kg	137.2	18	100%	6%	94%	59.8	33.0	25.6	146.6	-	-	19	84%	0%	100%	55.3	26.1	23.1	103.7	137.2	138.6	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.835**	**No**	29.6	25.0	42%
Clam	W	Metals		Aluminum	mg/Kg	-	18	100%	100%	0%	29.8	19.2	8	83.4	-	-	19	100%	100%	0%	32.6	25.4	9.37	83.2	-	-	0.025	0.949	0.002	0.110	Lognormal	t-Test (lognormal)	**0.499**	**No**	22.6	19.1	64%
Clam	W	Metals		Antimony	mg/Kg	0.01	18	17%	0%	100%	0.00567	0.00170	0.004	0.008	0.009	0.011	19	26%	0%	100%	0.00360	0.00185	0.002	0.007	0.008	0.012	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Clam	W	Metals		Arsenic	mg/Kg	-	18	100%	100%	0%	2.30	0.19	2	2.62	-	-	19	100%	100%	0%	2.22	0.22	1.79	2.49	-	-	0.463	0.346	0.125	0.078	Normal	t-Test (normal)	**0.879**	**No**	0.205	0.173	8%
Clam	W	Metals		Barium	mg/Kg	-	18	100%	100%	0%	1.89	0.18	1.71	2.38	-	-	19	100%	100%	0%	1.87	0.46	1.18	3.05	-	-	0.004	0.010	0.380	0.880	Non-parametric	Wilcoxon Rank Sum Test	**0.803**	**No**	0.355	0.300	16%
Clam	W	Metals		Beryllium	mg/Kg	0.0042	18	50%	0%	100%	0.000844	0.000283	0.0004	0.0014	0.0039	0.0045	19	100%	0%	100%	0.00188	0.00075	0.0007	0.0038	-	-	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Clam	W	Metals		Cadmium	mg/Kg	-	18	100%	100%	0%	0.332	0.044	0.247	0.405	-	-	19	100%	100%	0%	0.363	0.050	0.286	0.461	-	-	0.811	0.410	0.839	0.839	Normal	t-Test (normal)	**0.026**	**Yes**			
Clam	W	Metals		Chromium	mg/Kg	-	18	100%	100%	0%	0.548	0.100	0.45	0.76	-	-	19	100%	100%	0%	0.595	0.189	0.3	0.9	-	-	0.007	0.015	0.337	0.143	Non-parametric	Wilcoxon Rank Sum Test	**0.161**	**No**	0.152	0.129	23%
Clam	W	Metals		Cobalt	mg/Kg	-	18	100%	100%	0%	0.117	0.020	0.0902	0.15	-	-	19	100%	100%	0%	0.106	0.027	0.067	0.148	-	-	0.142	0.144	0.196	0.097	Normal	t-Test (normal)	**0.917**	**No**	0.0236	0.0199	17%
Clam	W	Metals		Copper	mg/Kg	-	18	100%	100%	0%	9.74	0.84	8.18	11.6	-	-	19	100%	100%	0%	9.15	1.04	7	11.4	-	-	0.932	0.951	0.948	0.905	Normal	t-Test (normal)	**0.969**	**No**	0.946	0.800	8%
Clam	W	Metals		Lead	mg/Kg	-	18	100%	100%	0%	0.0616	0.0063	0.049	0.072	-	-	19	100%	100%	0%	0.0431	0.0193	0.021	0.089	-	-	0.293	0.232	0.010	0.167	Lognormal	t-Test (lognormal)	**1.000**	**No**	0.0145	0.0123	20%
Clam	W	Metals		Mercury	mg/Kg	-	18	100%	100%	0%	0.00892	0.00366	0.0046	0.0179	-	-	19	100%	100%	0%	0.0111	0.0063	0.0058	0.0341	-	-	0.032	0.301	0.000	0.022	Non-parametric	Wilcoxon Rank Sum Test	**0.081**	**No**	0.00520	0.00439	49%
Clam	W	Metals		Methyl Mercury	mg/Kg	-	18	100%	100%	0%	0.00534	0.00202	0.0014	0.0099	-	-	19	100%	100%	0%	0.00475	0.00081	0.0035	0.0065	-	-	0.293	0.003	0.202	0.281	Normal	t-Test (normal)	**0.868**	**No**	0.00152	0.00129	24%
Clam	W	Metals		Nickel	mg/Kg	-	18	100%	100%	0%	0.354	0.052	0.273	0.482	-	-	19	100%	100%	0%	0.227	0.085	0.095	0.348	-	-	0.438	0.773	0.101	0.040	Normal	t-Test (normal)	**1.000**	**No**	0.0711	0.0601	17%
Clam	W	Metals		Thallium	mg/Kg	-	18	100%	100%	0%	0.00676	0.00128	0.0053	0.0105	-	-	19	100%	100%	0%	0.00692	0.00187	0.0045	0.0119	-	-	0.006	0.058	0.047	0.533	Lognormal	t-Test (lognormal)	**0.461**	**No**	0.00161	0.00136	20%
Clam	W	Metals		Vanadium	mg/Kg	-	18	100%	100%	0%	0.145	0.050	0.074	0.286	-	-	19	100%	100%	0%	0.177	0.099	0.078	0.426	-	-	0.091	0.619	0.013	0.177	Lognormal	t-Test (lognormal)	**0.215**	**No**	0.0791	0.0668	46%
Clam	W	Metals		Zinc	mg/Kg	-	18	100%	100%	0%	21.0	1.5	18.5	23.2	-	-	19	100%	100%	0%	21.4	2.8	16.3	26.5	-	-	0.633	0.605	0.840	0.779	Normal	t-Test (normal)	**0.308**	**No**	2.28	1.92	9%
Clam	W	PCB Aroclors		Aroclor 1016	ug/Kg	12	18	0%	0%	100%	-	-	-	-	9.8	15	19	0%	0%	100%	-	-	-	-	9.8	23	-	-	-	-	-	All Samples are NDs	-	-			
Clam	W	PCB Aroclors		Aroclor 1221	ug/Kg	20	18	0%	0%	100%	-	-	-	-	20	20	19	0%	0%	100%	-	-	-	-	20	20	-	-	-	-	-	All Samples are NDs	-	-			
Clam	W	PCB Aroclors		Aroclor 1232	ug/Kg	24	18	0%	0%	100%	-	-	-	-	18	35	19	0%	0%	100%	-	-	-	-	9.8	40	-	-	-	-	-	All Samples are NDs	-	-			
Clam	W	PCB Aroclors		Aroclor 1242	ug/Kg	12	18	0%	0%	100%	-	-	-	-	9.7	14	19	0%	0%	100%	-	-	-	-	9.8	48	-	-	-	-	-	All Samples are NDs	-	-			
Clam	W	PCB Aroclors		Aroclor 1248	ug/Kg	9.9	18	0%	0%	100%	-	-	-	-	9.6	10	19	0%	0%	100%	-	-	-	-	9.6	26	-	-	-	-	-	All Samples are NDs	-	-			
Clam	W	PCB Aroclors		Aroclor 1254	ug/Kg	32	18	100%	89%	11%	34.9	2.6	30	39	-	-	19	47%	11%	89%	27.7	21.9	21	120	28	74	-	-	-	-	-	Wilcoxon Rank Sum Test	**1.000**	**No**	15.8	13.4	38%
Clam	W	PCB Aroclors		Aroclor 1260	ug/Kg	9.9	18	0%	0%	100%	-	-	-	-	9.6	10	19	0%	0%	100%	-	-	-	-	9.6	11	-	-	-	-	-	All Samples are NDs	-	-			
Clam	W	PCB Aroclors		Aroclor 1262	ug/Kg	9.9	18	0%	0%	100%	-	-	-	-	9.6	10	19	0%	0%	100%	-	-	-	-	9.6	10	-	-	-	-	-	All Samples are NDs	-	-			
Clam	W	PCB Aroclors		Aroclor 1268	ug/Kg	9.9	18	0%	0%	100%	-	-	-	-	9.6	10	19	0%	0%	100%	-	-	-	-	9.6	10	-	-	-	-	-	All Samples are NDs	-	-			
Clam	W	SVOCs		Acenaphthene	ug/Kg	0.5	18	100%	72%	28%	0.647	0.233	0.27	1.2	-	-	19	95%	84%	16%	1.03	0.75	0.42	4.1	0.5	0.5	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.004**	**Yes**			
Clam	W	SVOCs		Anthracene	ug/Kg	2.5	18	11%	0%	100%	1.33	0.48	0.85	1.8	2.3	3.2	19	79%	0%	100%	0.905	0.474	0.28	2.3	0.47	2.5	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Clam	W	SVOCs		Benzo(a)anthracene	ug/Kg	16	18	0%	0%	100%	-	-	-	-	3.7	27	19	42%	0%	100%	0.891	0.462	0.48	2.1	0.47	22	-	-	-	-	-	Contingency Table Analysis	**0.002**	**Yes**			
Clam	W	SVOCs		Benzo(a)pyrene	ug/Kg	2.5	18	0%	0%	100%	-	-	-	-	2.3	2.5	19	16%	0%	100%	0.429	0.061	0.38	0.58	0.47	2.5	-	-	-	-	-	Contingency Table Analysis	**0.125**	**No**			
Clam	W	SVOCs		Benzo(b)fluoranthene	ug/Kg	2.5	18	0%	0%	100%	-	-	-	-	2.3	2.5	19	47%	0%	100%	0.624	0.164	0.4	0.95	0.48	2.5	-	-	-	-	-	Contingency Table Analysis	**0.001**	**Yes**			
Clam	W	SVOCs		Benzo(g,h,i)perylene	ug/Kg	2.5	18	28%	0%	100%	0.950	0.385	0.5	1.4	2.3	2.5	19	42%	0%	100%	0.205	0.094	0.09	0.36	0.47	2.5	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Clam	W	SVOCs		Benzo(k)fluoranthene	ug/Kg	2.5	18	0%	0%	100%	-	-	-	-	2.3	2.5	19	11%	0%	100%	0.205	0.045	0.16	0.25	0.47	2.5	-	-	-	-	-	Contingency Table Analysis	**0.257**	**No**			
Clam	W	SVOCs		Bis(2-ethylhexyl) Phthalate	ug/Kg	-	18	100%	100%	0%	444	115	310	680	-	-	19	100%	100%	0%	393	324	67	890	-	-	0.043	0.264	0.000	0.001	Non-parametric	Wilcoxon Rank Sum Test	**0.807**	**No**	246	208	47%
Clam	W	SVOCs		Butyl Benzyl Phthalate	ug/Kg	40	18	17%	17%	83%	61.3	7.4	57	74	39	98	19	16%	0%	100%	14.0	0.8	13	15	36	56	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.964**	**No**	5.16	4.36	7%
Clam	W	SVOCs		Carbazole	ug/Kg	39	18	0%	0%	100%	-	-	-	-	35	40	19	0%	0%	100%	-	-	-	-	36	56	-	-	-	-	-	All Samples are NDs	-	-			
Clam	W	SVOCs		Chrysene	ug/Kg	5.2	18	0%	0%	100%	-	-	-	-	2.5	13	19	42%	0%	100%	2.55	0.72	1.9	4	0.47	7.8	-	-	-	-	-	Contingency Table Analysis	**0.002**	**Yes**			
Clam	W	SVOCs		Dibenz(a,h)anthracene	ug/Kg	2.4	18	0%	0%	100%	-	-	-	-	2.3	2.5	19	0%	0%	100%	-	-	-	-	0.47	2.5	-	-	-	-	-	All Samples are NDs	-	-			
Clam	W	SVOCs		Di-n-butyl Phthalate	ug/Kg	39	18	0%	0%	100%	-	-	-	-	35	48	19	0%	0%	100%	-	-	-	-	36	56	-	-	-	-	-	All Samples are NDs	-	-			
Clam	W	SVOCs		Di-n-octyl Phthalate	ug/Kg	38.5	18	0%	0%	100%	-	-	-	-	35	40	19	5%	0%	100%	-	-	38	38	36	56	-	-	-	-	-	Contingency Table Analysis	**0.514**	**No**			
Clam	W	SVOCs		Fluoranthene	ug/Kg	14	18	100%	22%	78%	12.0	2.0	8.5	17	-	-	19	74%	11%	89%	10.5	2.5	6.3	16	8.6	16	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.515**	**No**	2.30	1.94	16%
Clam	W	SVOCs		Fluorene	ug/Kg	-	18	100%	100%	0%	2.08	0.43	1.5	3.1	-	-	19	100%	100%	0%	2.25	0.65	0.92	3.8	-	-	0.189	0.595	0.962	0.366	Normal	t-Test (normal)	**0.171**	**No**	0.556	0.470	23%

Table L-5. Statistical Comparison of Forebay Data to Reference Area Data -- MRL Censored

							Reference Area										Forebay Area										Shapiro-Wilk W Test					Statistical Comparison(α = 5%)			If "No", Power Analysis (Normal Approximation)		
Medium	Basis	Analyte Group	IUPAC #	Analyte	Unit	Median MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	Ref Normality Test p-value	Ref Log-normality Test p-value	Site Normality Test p-value	Site Log-normality Test p-value	Distribution	Appropriate Statistical Test	Comparison p-value	Significant Higher Conc in Forebay?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
Clam	W	SVOCs		Indeno(1,2,3-cd)pyrene	ug/Kg	2.5	18	39%	0%	100%	1.43	0.43	0.8	2	2.4	2.5	19	32%	5%	95%	0.316	0.532	0.08	2.5	0.47	2.5	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Clam	W	SVOCs		p-cresol (4-Methylphenol)	ug/Kg	40	18	100%	61%	39%	46.5	22.4	13	110	-	-	19	53%	0%	100%	15.9	7.2	8.6	31	36	56	-	-	-	-	-	Wilcoxon Rank Sum Test	**1.000**	**No**	16.5	13.9	30%
Clam	W	SVOCs		Phenanthrene	ug/Kg	-	18	100%	100%	0%	9.60	1.95	6.7	14	-	-	19	100%	100%	0%	9.45	2.66	4.5	15	-	-	0.067	0.340	0.976	0.566	Normal	t-Test (normal)	**0.578**	**No**	2.34	1.98	21%
Clam	W	SVOCs		Pyrene	ug/Kg	3.7	18	0%	0%	100%	-	-	-	-	2.5	5.6	19	37%	5%	95%	2.26	1.14	1.6	6.3	0.47	7.2	-	-	-	-	-	Contingency Table Analysis	**0.005**	**Yes**			
Crayfish	W	Metals		Aluminum	mg/Kg	-	19	100%	100%	0%	134	39	71.2	221	-	-	17	100%	100%	0%	105	23	71.4	157	-	-	0.880	0.911	0.045	0.302	Lognormal	t-Test (lognormal)	**0.992**	**No**	32.6	28.3	21%
Crayfish	W	Metals		Antimony	mg/Kg	-	19	100%	100%	0%	0.0153	0.0090	0.006	0.039	-	-	17	100%	100%	0%	0.0288	0.0308	0.009	0.133	-	-	0.009	0.391	0.000	0.050	Lognormal	t-Test (lognormal)	**0.018**	**Yes**			
Crayfish	W	Metals		Arsenic	mg/Kg	-	19	100%	100%	0%	0.383	0.084	0.275	0.636	-	-	17	100%	100%	0%	0.479	0.092	0.38	0.68	-	-	0.027	0.375	0.025	0.082	Lognormal	t-Test (lognormal)	**0.001**	**Yes**			
Crayfish	W	Metals		Barium	mg/Kg	-	19	100%	100%	0%	68.2	19.9	40.2	120	-	-	17	100%	100%	0%	65.4	9.6	51.7	84.3	-	-	0.229	0.664	0.537	0.713	Normal	t-Test (normal)	**0.703**	**No**	15.9	13.8	20%
Crayfish	W	Metals		Beryllium	mg/Kg	-	19	100%	100%	0%	0.00349	0.00080	0.0026	0.0061	-	-	17	100%	100%	0%	0.00316	0.00059	0.0017	0.0041	-	-	0.002	0.067	0.520	0.042	Non-parametric	Wilcoxon Rank Sum Test	**0.826**	**No**	0.000710	0.000618	18%
Crayfish	W	Metals		Cadmium	mg/Kg	-	19	100%	100%	0%	0.0942	0.0392	0.046	0.201	-	-	17	100%	100%	0%	0.107	0.046	0.061	0.21	-	-	0.108	0.858	0.024	0.164	Lognormal	t-Test (lognormal)	**0.183**	**No**	0.0424	0.0369	39%
Crayfish	W	Metals		Chromium	mg/Kg	0.25	19	95%	74%	26%	0.473	0.308	0.12	1.23	0.25	0.25	17	100%	94%	6%	0.659	0.248	0.2	1.2	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.012**	**Yes**			
Crayfish	W	Metals		Cobalt	mg/Kg	-	19	100%	100%	0%	0.331	0.058	0.224	0.439	-	-	17	100%	100%	0%	0.233	0.019	0.192	0.262	-	-	0.738	0.435	0.646	0.442	Normal	t-Test (normal)	**1.000**	**No**	0.0441	0.0384	12%
Crayfish	W	Metals		Copper	mg/Kg	-	19	100%	100%	0%	18.2	5.1	12.2	33.2	-	-	17	100%	100%	0%	19.6	5.9	10.5	36	-	-	0.002	0.055	0.097	0.907	Lognormal	t-Test (lognormal)	**0.225**	**No**	5.50	4.79	26%
Crayfish	W	Metals		Lead	mg/Kg	-	19	100%	100%	0%	0.413	0.369	0.056	1.55	-	-	17	100%	100%	0%	0.603	0.635	0.098	2.66	-	-	0.001	0.998	0.000	0.240	Lognormal	t-Test (lognormal)	**0.191**	**No**	0.512	0.445	108%
Crayfish	W	Metals		Mercury	mg/Kg	-	19	100%	100%	0%	0.0176	0.0031	0.0105	0.0246	-	-	17	100%	100%	0%	0.0221	0.0036	0.0157	0.0315	-	-	0.811	0.357	0.329	0.587	Normal	t-Test (normal)	**0.000**	**Yes**			
Crayfish	W	Metals		Methyl Mercury	mg/kg	-	19	100%	100%	0%	0.0269	0.0057	0.0181	0.0367	-	-	17	100%	100%	0%	0.0311	0.0044	0.025	0.04	-	-	0.450	0.590	0.535	0.642	Normal	t-Test (normal)	**0.011**	**Yes**			
Crayfish	W	Metals		Nickel	mg/Kg	-	19	100%	100%	0%	1.80	0.62	0.992	3.44	-	-	17	100%	100%	0%	4.75	0.30	4.31	5.35	-	-	0.127	0.749	0.284	0.423	Normal	t-Test (normal)	**0.000**	**Yes**			
Crayfish	W	Metals		Thallium	mg/Kg	-	19	100%	100%	0%	0.0216	0.0056	0.014	0.037	-	-	17	100%	100%	0%	0.0184	0.0045	0.0117	0.0292	-	-	0.029	0.358	0.123	0.644	Lognormal	t-Test (lognormal)	**0.973**	**No**	0.00510	0.00444	21%
Crayfish	W	Metals		Vanadium	mg/Kg	-	19	100%	100%	0%	0.574	0.161	0.261	0.804	-	-	17	100%	100%	0%	0.435	0.070	0.3	0.6	-	-	0.220	0.046	0.003	0.004	Non-parametric	Wilcoxon Rank Sum Test	**0.995**	**No**	0.127	0.110	19%
Crayfish	W	Metals		Zinc	mg/Kg	-	19	100%	100%	0%	21.6	3.9	18	36.5	-	-	17	100%	100%	0%	20.5	1.6	16.9	23.2	-	-	0.000	0.000	0.915	0.713	Non-parametric	Wilcoxon Rank Sum Test	**0.747**	**No**	3.05	2.66	12%
Crayfish	W	PCB Aroclors		Aroclor 1016	ug/Kg	9.9	19	0%	0%	100%	-	-	-	-	9.4	20	17	0%	0%	100%	-	-	-	-	9.6	10	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1221	ug/Kg	20	19	0%	0%	100%	-	-	-	-	19	40	17	0%	0%	100%	-	-	-	-	20	20	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1232	ug/Kg	9.9	19	0%	0%	100%	-	-	-	-	9.4	20	17	0%	0%	100%	-	-	-	-	9.6	10	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1242	ug/Kg	9.9	19	0%	0%	100%	-	-	-	-	9.4	20	17	0%	0%	100%	-	-	-	-	9.6	10	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1248	ug/Kg	9.9	19	0%	0%	100%	-	-	-	-	9.4	20	17	0%	0%	100%	-	-	-	-	9.6	10	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1254	ug/Kg	9.9	19	0%	0%	100%	-	-	-	-	9.4	20	17	0%	0%	100%	-	-	-	-	9.6	19	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1260	ug/Kg	9.9	19	0%	0%	100%	-	-	-	-	9.4	20	17	0%	0%	100%	-	-	-	-	9.6	17	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1262	ug/Kg	9.9	19	0%	0%	100%	-	-	-	-	9.4	20	17	0%	0%	100%	-	-	-	-	9.6	10	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	PCB Aroclors		Aroclor 1268	ug/Kg	9.9	19	0%	0%	100%	-	-	-	-	9.4	20	17	0%	0%	100%	-	-	-	-	9.6	10	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	SVOCs		Acenaphthene	ug/Kg	0.49	18	17%	0%	100%	0.147	0.031	0.12	0.19	0.45	0.5	15	47%	0%	100%	0.170	0.050	0.11	0.26	0.47	0.5	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Crayfish	W	SVOCs		Anthracene	ug/Kg	0.49	18	11%	0%	100%	0.144	0.046	0.098	0.19	0.45	0.5	15	27%	0%	100%	0.111	0.036	0.069	0.16	0.46	0.5	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Crayfish	W	SVOCs		Benzo(a)anthracene	ug/Kg	0.49	18	11%	0%	100%	0.355	0.045	0.31	0.4	0.45	0.5	15	67%	0%	100%	0.269	0.033	0.23	0.35	0.47	0.5	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Crayfish	W	SVOCs		Benzo(a)pyrene	ug/Kg	0.49	18	6%	0%	100%	-	-	0.12	0.12	0.45	0.5	15	20%	0%	100%	0.150	0.022	0.12	0.17	0.46	0.5	-	-	-	-	-	Contingency Table Analysis	**0.234**	**No**			
Crayfish	W	SVOCs		Benzo(b)fluoranthene	ug/Kg	0.49	18	22%	0%	100%	0.150	0.066	0.082	0.23	0.48	0.5	15	47%	0%	100%	0.143	0.057	0.096	0.24	0.46	0.5	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Crayfish	W	SVOCs		Benzo(g,h,i)perylene	ug/Kg	0.49	18	0%	0%	100%	-	-	-	-	0.45	0.5	15	27%	0%	100%	0.205	0.111	0.098	0.39	0.46	0.5	-	-	-	-	-	Contingency Table Analysis	**0.033**	**Yes**			
Crayfish	W	SVOCs		Benzo(k)fluoranthene	ug/Kg	0.49	18	22%	0%	100%	0.136	0.055	0.072	0.2	0.48	0.5	15	47%	0%	100%	0.116	0.026	0.086	0.16	0.46	0.5	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Crayfish	W	SVOCs		Bis(2-ethylhexyl) Phthalate	ug/Kg	200	18	22%	0%	100%	75.5	7.2	69	87	190	200	15	27%	0%	100%	83.0	17.8	67	110	180	200	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Crayfish	W	SVOCs		Butyl Benzyl Phthalate	ug/Kg	39	18	17%	0%	100%	21.3	6.9	15	31	38	40	15	0%	0%	100%	-	-	-	-	35	40	-	-	-	-	-	Contingency Table Analysis	**1.000**	**No**			
Crayfish	W	SVOCs		Carbazole	ug/Kg	39	18	0%	0%	100%	-	-	-	-	38	40	15	0%	0%	100%	-	-	-	-	35	40	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	SVOCs		Chrysene	ug/Kg	0.49	18	28%	0%	100%	0.170	0.078	0.091	0.27	0.48	0.5	15	53%	0%	100%	0.143	0.072	0.082	0.31	0.47	0.5	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Crayfish	W	SVOCs		Dibenz(a,h)anthracene	ug/Kg	0.49	18	17%	0%	100%	0.117	0.036	0.072	0.16	0.45	0.5	15	0%	0%	100%	-	-	-	-	0.46	0.5	-	-	-	-	-	Contingency Table Analysis	**1.000**	**No**			
Crayfish	W	SVOCs		Di-n-butyl Phthalate	ug/Kg	40	18	0%	0%	100%	-	-	-	-	38	110	15	0%	0%	100%	-	-	-	-	35	180	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	SVOCs		Di-n-octyl Phthalate	ug/Kg	39	18	6%	0%	100%	-	-	32	32	38	40	15	0%	0%	100%	-	-	-	-	35	40	-	-	-	-	-	Contingency Table Analysis	**1.000**	**No**			
Crayfish	W	SVOCs		Fluoranthene	ug/Kg	0.49	18	0%	0%	100%	-	-	-	-	0.45	0.5	15	100%	20%	80%	0.349	0.156	0.17	0.75	-	-	-	-	-	-	-	Contingency Table Analysis	**0.000**	**Yes**			
Crayfish	W	SVOCs		Indeno(1,2,3-cd)pyrene	ug/Kg	0.49	18	17%	0%	100%	0.132	0.038	0.087	0.18	0.45	0.5	15	20%	0%	100%	0.173	0.009	0.16	0.18	0.46	0.5	-	-	-	-	-	All Samples are Censored at Median MRL	-	-			
Crayfish	W	SVOCs		p-cresol (4-Methylphenol)	ug/Kg	39	18	0%	0%	100%	-	-	-	-	38	40	15	0%	0%	100%	-	-	-	-	35	40	-	-	-	-	-	All Samples are NDs	-	-			
Crayfish	W	SVOCs		Phenanthrene	ug/Kg	0.49	18	28%	17%	83%	0.471	0.043	0.45	0.59	0.45	0.5	15	67%	33%	67%	0.512	0.133	0.42	0.86	0.46	0.49	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.119**	**No**	0.0948	0.0880	19%
Crayfish	W	SVOCs		Pyrene	ug/Kg	0.49	18	0%	0%	100%	-	-	-	-	0.45	0.5	15	100%	7%	93%	0.361	0.250	0.16	1.2	-	-	-	-	-	-	-	Contingency Table Analysis	**0.000**	**Yes**			
Sculpin	W	Metals		Arsenic	mg/Kg	-	18	100%	100%	0%	0.382	0.074	0.239	0.484	-	-	17	100%	100%	0%	0.312	0.077	0.184	0.435	-	-	0.453	0.338	0.181	0.341	Normal	t-Test (normal)	**0.995**	**No**	0.0754	0.0656	17%
Sculpin	W	Metals		Cadmium	mg/Kg	-	18	100%	100%	0%	0.0152	0.0047	0.0087	0.0264	-	-	17	100%	100%	0%	0.0201	0.0091	0.0072	0.0453	-	-	0.096	0.891	0.050	0.947	Lognormal	t-Test (lognormal)	**0.032**	**Yes**			
Sculpin	W	Metals		Lead	mg/Kg	0.0214	18	94%	94%	6%	0.0360	0.0130	0.0239	0.0758	0.0214	0.0214	17	94%	94%	6%	0.0759	0.0640	0.0313	0.306	0.0214	0.0214	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.002**	**Yes**			
Sculpin	W	Metals		Mercury	mg/Kg	-	18	100%	100%	0%	0.0876	0.0258	0.0448	0.141	-	-	17	100%	100%	0%	0.152	0.083	0.0327	0.308	-	-	0.513	0.712	0.437	0.367	Normal	t-Test (normal)	**0.003**	**Yes**			
Sculpin	W	PCB Aroclors		Aroclor 1016	ug/Kg	9.6	18	0%	0%	100%	-	-	-	-	9.2	10	17	0%	0%	100%	-	-	-	-	9.2	50	-	-	-	-	-	All Samples are NDs	-	-			
Sculpin	W	PCB Aroclors		Aroclor 1221	ug/Kg	20	18	0%	0%	100%	-	-	-	-	19	20	17	0%	0%	100%	-	-	-	-	19	99	-	-	-	-	-	All Samples are NDs	-	-			
Sculpin	W	PCB Aroclors		Aroclor 1232	ug/Kg	9.6	18	0%	0%	100%	-	-	-	-	9.2	10	17	0%	0%	100%	-	-	-	-	9.2	62	-	-	-	-	-	All Samples are NDs	-	-			
Sculpin	W	PCB Aroclors		Aroclor 1242	ug/Kg	9.6	18	0%	0%	100%	-	-	-	-	9.2	10	17	0%	0%	100%	-	-	-	-	9.2	50	-	-	-	-	-	All Samples are NDs	-	-			
Sculpin	W	PCB Aroclors		Aroclor 1248	ug/Kg	9.6	18	0%	0%	100%	-	-	-	-	9.2	45	17	0%	0%	100%	-	-	-	-	9.2	50	-	-	-	-	-	All Samples are NDs	-	-			
Sculpin	W	PCB Aroclors		Aroclor 1254	ug/Kg	27.5	18	0%	0%	100%	-	-	-	-	9.7	44	17	18%	18%	82%	242	373	130	1700	13	130	-	-	-	-	-	Contingency Table Analysis	**0.104**	**No**			
Sculpin	W	PCB Aroclors		Aroclor 1260	ug/Kg	9.7	18	0%	0%	100%	-	-	-	-	9.2	10	17	0%	0%	100%	-	-	-	-	9.2	82	-	-	-	-	-	All Samples are NDs	-	-			
Sculpin	W	PCB Aroclors		Aroclor 1262	ug/Kg	9.6	18	0%	0%	100%	-	-	-	-	9.2	10	17	0%	0%	100%	-	-	-	-	9.2	50	-	-	-	-	-	All Samples are NDs	-	-			
Sculpin	W	PCB Aroclors		Aroclor 1268	ug/Kg	9.6	18	0%	0%	100%	-	-	-	-	9.2	10	17	0%	0%	100%	-	-	-	-	9.2	50	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	Metals		Aluminum	mg/Kg	-	19	100%	100%	0%	2.50	2.31	0.33	10.1	-	-	19	100%	100%	0%	5.05	4.13	1.06	15.5	-	-	0.001	0.998	0.010	0.248	Lognormal	t-Test (lognormal)	**0.007**	**Yes**			
Smallmouth Bass	W	Metals		Antimony	mg/Kg	0.013	19	21%	5%	95%	0.00416	0.00491	0.003	0.025	0.011	0.018	19	0%	0%	100%	-	-	-	-	0.012	0.015	-	-	-	-	-	Contingency Table Analysis	**1.000**	**No**			
Smallmouth Bass	W	Metals		Arsenic	mg/Kg	-	19	100%	100%	0%	0.354	0.151	0.159	0.761	-	-	19	100%	100%	0%	0.412	0.150	0.17	0.7	-	-	0.025	0.807	0.755	0.097	Lognormal	t-Test (lognormal)	**0.127**	**No**	0.151	0.124	35%
Smallmouth Bass	W	Metals		Barium	mg/Kg	-	19	100%	100%	0%	1.10	0.39	0.43	1.72	-	-	19	100%	100%	0%	1.51	0.56	0.72	2.64	-	-	0.480	0.133	0.362	0.783	Normal	t-Test (normal)	**0.006**	**Yes**			
Smallmouth Bass	W	Metals		Beryllium	mg/Kg	0.005	19	0%	0%	100%	-	-	-	-	0.004	0.006	19	21%	0%	100%	0.000600	0.000071	0.0005	0.0007	0.0048	0.0059	-	-	-	-	-	Contingency Table Analysis	**0.053**	**No**			
Smallmouth Bass	W	Metals		Cadmium	mg/Kg	-	19	100%	100%	0%	0.0813	0.0602	0.004	0.143	-	-	19	100%	100%	0%	0.00974	0.00667	0.004	0.028	-	-	0.000	0.000	0.000	0.061	Non-parametric	Wilcoxon Rank Sum Test	**0.989**	**No**	0.0428	0.0352	43%
Smallmouth Bass	W	Metals		Chromium	mg/Kg	0.29	19	63%	5%	95%	0.468	1.576	0.04	7.15	0.5	0.5	19	26%	11%	89%	0.241	0.149	0.19	0.86	0.24	0.3	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.500**	**No**	1.12	0.92	196%
Smallmouth Bass	W	Metals		Cobalt	mg/Kg	0.0267	19	63%	63%	37%	0.0563	0.0098	0.0487	0.0838	0.0248	0.0361	19	100%	100%	0%	0.0548	0.0080	0.0441	0.0758	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.198**	**No**	0.00894	0.00735	13%
Smallmouth Bass	W	Metals		Copper	mg/Kg	-	19	100%	100%	0%	0.510	0.133	0.327	0.73	-	-	19	100%	100%	0%	0.664	0.249	0.364	1.42	-	-	0.182	0.259	0.005	0.486	Lognormal	t-Test (lognormal)	**0.008**	**Yes**			
Smallmouth Bass	W	Metals		Lead	mg/Kg	0.014	19	63%	63%	37%	1.53	0.12	1.42	1.81	0.013	0.015	19	100%	26%	74%	0.0109	0.0079	0.004	0.036	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.999**	**No**	0.0872	0.0716	5%
Smallmouth Bass	W	Metals		Mercury	mg/Kg	-	19	100%	100%	0%	0.131	0.071	0.0548	0.333	-	-	19	100%	100%	0%	0.265	0.130	0.071	0.512	-	-	0.016	0.766	0.499	0.197	Lognormal	t-Test (lognormal)	**0.000**	**Yes**			
Smallmouth Bass	W	Metals		Nickel	mg/Kg	0.298	19	84%	84%	16%	0.980	0.499	0.324	1.79	0.277	0.306	19	100%	47%	53%	0.298	0.055	0.213	0.399	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	**1.000**	**No**	0.355	0.292	30%
Smallmouth Bass	W	Metals		Thallium	mg/Kg	-	19	100%	100%	0%	0.0160	0.0041	0.0109	0.0261	-	-	19	100%	100%	0%	0.0148	0.0033	0.0079	0.0215	-	-	0.167	0.664	0.753	0.182	Normal	t-Test (normal)	**0.825**	**No**	0.00370	0.00304	19%
Smallmouth Bass	W	Metals		Vanadium	mg/Kg	0.056	19	95%	47%	53%	0.0576	0.0207	0.03	0.104	0.056	0.056	19	100%	47%	53%	0.0595	0.0244	0.03	0.13	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.450**	**No**	0.0226	0.0186	32%
Smallmouth Bass	W	Metals		Zinc	mg/Kg	-	19	100%	100%	0%	13.4	1.2	11.2	15.5	-	-	19	100%	100%	0%	14.2	1.6	11.4	18	-	-	0.530	0.513	0.854	0.955	Normal	t-Test (normal)	**0.042**	**Yes**			
Smallmouth Bass	W	PCB Aroclors		Aroclor 1016	ug/Kg	10	19	0%	0%	100%	-	-	-	-	9.9	10	19	0%	0%	100%	-	-	-	-	9.9	1000	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	PCB Aroclors		Aroclor 1221	ug/Kg	20	19	0%	0%	100%	-	-	-	-	20	20	19	0%	0%	100%	-	-	-	-	20	2000	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	PCB Aroclors		Aroclor 1232	ug/Kg	10	19	0%	0%	100%	-	-	-	-	9.9	11	19	0%	0%	100%	-	-	-	-	9.9	1000	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	PCB Aroclors		Aroclor 1242	ug/Kg	10	19	21%	5%	95%	6.26	3.36	2.4	14	9.9	10	19	5%	5%	95%	-	-	260	260	9.9	1000	-	-	-	-	-	Contingency Table Analysis	**0.977**	**No**			
Smallmouth Bass	W	PCB Aroclors		Aroclor 1248	ug/Kg	10	19	0%	0%	100%	-	-	-	-	9.9	33	19	0%	0%	100%	-	-	-	-	9.9	1000	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	PCB Aroclors		Aroclor 1254	ug/Kg	38	19	84%	53%	47%	49.5	22.3	27	110	10	130	19	37%	37%	63%	1948	4885	51	18000	11	420	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.500**	**No**	3454	2838	5732%
Smallmouth Bass	W	PCB Aroclors		Aroclor 1260	ug/Kg	24.5	19	0%	0%	100%	-	-	-	-	9.9	140	19	0%	0%	100%	-	-	-	-	10	1000	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	PCB Aroclors		Aroclor 1262	ug/Kg	10	19	0%	0%	100%	-	-	-	-	9.9	110	19	0%	0%	100%	-	-	-	-	10	1000	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	PCB Aroclors		Aroclor 1268	ug/Kg	10	19	0%	0%	100%	-	-	-	-	9.9	10	19	0%	0%	100%	-	-	-	-	9.9	1000	-	-	-	-	-	All Samples are NDs	-	-			
Smallmouth Bass	W	SVOCs		Acenaphthene	ug/Kg	0.485	19	95%	95%	5%	0.797	0.214	0.51	1.3	0.49	0.49	19	84%	26%	74%	0.554	0.506	0.16	1.6	0.46	0.49	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.996**	**No**	0.388	0.319	40%
Smallmouth Bass	W	SVOCs		Anthracene	ug/Kg	0.49	19	16%	0%	100%	0.230	0.119	0.09	0.38	0.47	4.8	19	95%	26%	74%	2.17	4.09	0.078	17	0.49	0.49	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.010**	**Yes**			
Smallmouth Bass	W	SVOCs		Benzo(a)anthracene	ug/Kg	0.49	19	16%	16%	84%	0.589	0.095	0.56	0.94	0.47	4.8	19	26%	26%	74%	2.08	3.63	1	17	0.46	5	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.143**	**No**	2.57	2.11	358%

Table L-5. Statistical Comparison of Forebay Data to Reference Area Data -- MRL Censored

							Reference Area										Forebay Area										Shapiro-Wilk W Test					Statistical Comparison(α = 5%)			If "No", Power Analysis (Normal Approximation)		
Medium	Basis	Analyte Group	IUPAC #	Analyte	Unit	Median MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median MRL	Percent of Data Censored at Median MRL	Mean	Std Dev	Min Detected Value	Max Detected Value	Min MRL of NDs	Max MRL of NDs	Ref Normality Test p-value	Ref Log-normality Test p-value	Site Normality Test p-value	Site Log-normality Test p-value	Distribution	Appropriate Statistical Test	Comparison p-value	Significant Higher Conc in Forebay?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
Smallmouth Bass	W	SVOCs		Benzo(a)pyrene	ug/Kg	0.485	19	0%	0%	100%	-	-	-	-	0.47	4.8	19	42%	42%	58%	2.18	2.53	0.72	7.4	0.46	0.49	-	-	-	-	-	Contingency Table Analysis	**0.002**	**Yes**			
Smallmouth Bass	W	SVOCs		Benzo(b)fluoranthene	ug/Kg	0.49	19	0%	0%	100%	-	-	-	-	0.47	4.8	19	32%	26%	74%	1.09	1.69	0.11	4.4	0.46	1	-	-	-	-	-	Contingency Table Analysis	**0.010**	**Yes**			
Smallmouth Bass	W	SVOCs		Benzo(g,h,i)perylene	ug/Kg	0.49	19	0%	0%	100%	-	-	-	-	0.47	4.8	19	32%	26%	74%	1.01	1.04	0.42	3.3	0.46	0.99	-	-	-	-	-	Contingency Table Analysis	**0.010**	**Yes**			
Smallmouth Bass	W	SVOCs		Benzo(k)fluoranthene	ug/Kg	0.49	19	0%	0%	100%	-	-	-	-	0.47	4.8	19	47%	42%	58%	2.06	2.91	0.11	7.7	0.46	0.49	-	-	-	-	-	Contingency Table Analysis	**0.001**	**Yes**			
Smallmouth Bass	W	SVOCs		Bis(2-ethylhexyl) Phthalate	ug/Kg	190	19	11%	0%	100%	116	35	81	150	180	2500	19	37%	11%	89%	203	340	89	1600	170	5000	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.172**	**No**	241	198	172%
Smallmouth Bass	W	SVOCs		Butyl Benzyl Phthalate	ug/Kg	37	19	0%	0%	100%	-	-	-	-	35	40	19	11%	5%	95%	54.4	90.9	33	440	34	40	-	-	-	-	-	Contingency Table Analysis	**0.243**	**No**			
Smallmouth Bass	W	SVOCs		Carbazole	ug/Kg	37	19	0%	0%	100%	-	-	-	-	35	40	19	0%	0%	100%	-	-	-	-	34	40	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Smallmouth Bass	W	SVOCs		Chrysene	ug/Kg	0.49	19	5%	5%	95%	-	-	0.55	0.55	0.47	4.8	19	42%	42%	58%	1.76	2.47	0.5	10	0.46	0.49	-	-	-	-	-	Contingency Table Analysis	**0.009**	**Yes**			
Smallmouth Bass	W	SVOCs		Dibenz(a,h)anthracene	ug/Kg	0.49	19	0%	0%	100%	-	-	-	-	0.47	4.8	19	32%	26%	74%	1.16	1.30	0.41	4.1	0.46	0.99	-	-	-	-	-	Contingency Table Analysis	**0.010**	**Yes**			
Smallmouth Bass	W	SVOCs		Di-n-butyl Phthalate	ug/Kg	71	19	0%	0%	100%	-	-	-	-	40	280	19	5%	5%	95%	-	-	150	150	34	71	-	-	-	-	-	Contingency Table Analysis	**0.500**	**No**			
Smallmouth Bass	W	SVOCs		Di-n-octyl Phthalate	ug/Kg	37	19	5%	0%	100%	-	-	15	15	35	40	19	0%	0%	100%	-	-	-	-	34	40	-	-	-	-	-	Contingency Table Analysis	**1.000**	**No**			
Smallmouth Bass	W	SVOCs		Fluoranthene	ug/Kg	0.49	19	58%	58%	42%	1.05	0.50	0.69	2.5	0.47	1.2	19	53%	53%	47%	1.93	2.27	0.49	6.5	0.46	0.49	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.500**	**No**	1.64	1.35	129%
Smallmouth Bass	W	SVOCs		Fluorene	ug/Kg	0.49	19	84%	84%	16%	1.31	0.33	0.89	2.1	0.49	2	19	89%	63%	37%	1.21	1.28	0.3	4.7	0.47	0.49	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.962**	**No**	0.932	0.766	58%
Smallmouth Bass	W	SVOCs		Indeno(1,2,3-cd)pyrene	ug/Kg	0.49	19	0%	0%	100%	-	-	-	-	0.47	4.8	19	37%	37%	63%	1.88	2.06	0.7	6.1	0.46	0.99	-	-	-	-	-	Contingency Table Analysis	**0.004**	**Yes**			
Smallmouth Bass	W	SVOCs		p-cresol (4-Methylphenol)	ug/Kg	37	19	0%	0%	100%	-	-	-	-	35	40	19	0%	0%	100%	-	-	-	-	34	40	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Smallmouth Bass	W	SVOCs		Phenanthrene	ug/Kg	-	19	100%	100%	0%	3.11	1.05	1.4	5.1	-	-	19	100%	100%	0%	2.09	1.75	0.54	5.7	-	-	0.306	0.493	0.000	0.082	Lognormal	t-Test (lognormal)	**0.999**	**No**	1.44	1.18	38%
Smallmouth Bass	W	SVOCs		Pyrene	ug/Kg	0.48	19	11%	0%	100%	0.400	0.020	0.38	0.42	0.47	4.8	19	47%	37%	63%	1.37	2.24	0.11	7.2	0.46	2.5	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.002**	**Yes**			

Table L-6. Statistical Comparison of Forebay Congener Data with Reference Area Congener Data

							Reference Area										Forebay Area										Shapiro-Wilk W Test					Statistical Comparison (α = 5%)			If "No", Power Analysis (Normal Approximation)		
Medium	Basis	Analyte Group	IUPAC #	Analyte	Unit	Median RDL or EMPC of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median RDL/EMPC	Percent of Data Censored at Median RDL/EMPC	Mean	Std Dev	Min Detected Value	Max Detected Value	Min RDL/EMPC of NDs	Max RDL/EMPC of NDs	No. of Samples	Detection Rate	Percent of Data NOT Censored at Median RDL/EMPC	Percent of Data Censored at Median RDL/EMPC	Mean	Std Dev	Min Detected Value	Max Detected Value	Min RDL/EMPC of NDs	Max RDL/EMPC of NDs	Ref Normality Test p-value	Ref Log-normality Test p-value	Site Normality Test p-value	Site Log-normality Test p-value	Distribution	Appropriate Statistical Test	Comparison p-value	Significant Higher Conc in Forebay?	Pooled Standard Deviation	Minimum Detectable Differences (MDD)	MDD as a Percentage of Ref Mean
Sediment	D	PCB Congeners	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	-	18	100%	100%	0%	1.02	0.36	0.434	2.01	-	-	19	100%	100%	0%	1.55	1.52	0.209	7.09	-	-	0.168	0.894	0.000	0.333	Lognormal	t-Test (lognormal)	**0.295**	**No**	1.12	0.945	93%
Sediment	D	PCB Congeners	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	0.0802	18	11%	6%	94%	0.0627	0.0195	0.058	0.143	0.049	0.1	19	0%	0%	100%	-	-	-	-	0.0486	3.4	-	-	-	-	-	Contingency Table Analysis	**1.000**	**No**			
Sediment	D	PCB Congeners	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	-	18	100%	100%	0%	8.95	5.21	2.96	27.5	-	-	19	100%	100%	0%	74.1	244	1.3	1080	-	-	0.000	0.243	0.000	0.062	Lognormal	t-Test (lognormal)	**0.035**	**Yes**			
Sediment	D	PCB Congeners	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	0.3445	18	89%	67%	33%	0.473	0.314	0.154	1.63	0.337	0.352	19	79%	68%	32%	4.07	13.3	0.174	60.3	0.058	1.71	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.029**	**Yes**			
Sediment	D	PCB Congeners	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	-	18	100%	100%	0%	25.7	16.5	8.31	70.5	-	-	19	100%	100%	0%	185	598	2.71	2650	-	-	0.000	0.269	0.000	0.097	Lognormal	t-Test (lognormal)	**0.049**	**Yes**			
Sediment	D	PCB Congeners	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	0.38	18	50%	28%	72%	0.439	0.265	0.272	1.22	0.172	0.446	19	58%	58%	42%	2.62	7.95	0.459	36.3	0.064	1.9	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.029**	**Yes**			
Sediment	D	PCB Congeners	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	0.147	18	50%	28%	72%	0.136	0.067	0.084	0.337	0.0583	0.185	19	16%	16%	84%	0.179	0.016	0.173	0.238	0.0479	2.69	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.818**	**No**	0.0479	0.0405	30%
Sediment	D	PCB Congeners	156	2,3,3',4,4',5-Hexachlorobiphenyl	pg/g	0.935	18	100%	94%	6%	2.93	1.65	0.93	8.5	-	-	19	95%	89%	11%	25.8	83.6	0.399	380	0.935	0.935	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.006**	**Yes**			
Sediment	D	PCB Congeners	157	2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	-	0	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**			
Sediment	D	PCB Congeners	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	0.675	18	83%	83%	17%	1.43	0.82	0.761	3.84	0.482	1.1	19	84%	79%	21%	8.27	24.7	0.461	113	0.173	0.71	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.010**	**Yes**			
Sediment	D	PCB Congeners	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	0.0971	18	0%	0%	100%	-	-	-	-	0.0542	0.2	19	0%	0%	100%	-	-	-	-	0.0454	0.879	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Sediment	D	PCB Congeners	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	0.2975	18	78%	17%	83%	0.231	0.116	0.072	0.573	0.159	0.357	19	47%	32%	68%	0.720	1.970	0.098	9.01	0.0479	0.814	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.113**	**No**	1.42	1.20	517%
Sediment	D	PCB Congeners		Sum 209 Congeners (KM-based)	pg/g	-	18	-	-	-	483	247	161	1204	-	-	19	-	-	-	2272	6672	61	29733	-	-	0.003	0.466	0.000	0.080	Lognormal	t-Test (lognormal)	**0.101**	**No**	4787	4045	837%
Clam	W	PCB Congeners	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	-	18	100%	100%	0%	39.1	4.2	33.2	46.8	-	-	17	100%	100%	0%	38.1	9.83	26.9	69	-	-	0.305	0.445	0.001	0.040	Non-parametric	Wilcoxon Rank Sum Test	**0.938**	**No**	7.48	6.51	17%
Clam	W	PCB Congeners	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	1.55	18	56%	56%	44%	2.04	0.29	1.8	2.75	0.961	2.23	17	24%	24%	76%	2.01	0.16	1.94	2.46	0.693	3.3	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.970**	**No**	0.240	0.209	10%
Clam	W	PCB Congeners	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	-	18	100%	100%	0%	446	53.9	350	556	-	-	17	100%	100%	0%	920	1405	361	6200	-	-	0.660	0.807	0.000	0.000	Non-parametric	Wilcoxon Rank Sum Test	**0.334**	**No**	979	852	191%
Clam	W	PCB Congeners	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	-	18	100%	100%	0%	26.2	3.06	21.3	33	-	-	17	100%	100%	0%	62.7	102	20.2	445	-	-	0.623	0.910	0.000	0.000	Non-parametric	Wilcoxon Rank Sum Test	**0.214**	**No**	71.1	61.8	236%
Clam	W	PCB Congeners	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	-	18	100%	100%	0%	2374	250	1910	2820	-	-	17	100%	100%	0%	8331	15120	2050	64700	-	-	0.672	0.724	0.000	0.001	Non-parametric	Wilcoxon Rank Sum Test	**0.028**	**Yes**			
Clam	W	PCB Congeners	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	-	18	100%	100%	0%	44.4	5.11	36.8	54	-	-	17	100%	100%	0%	157	269	38.4	1150	-	-	0.367	0.578	0.000	0.001	Non-parametric	Wilcoxon Rank Sum Test	**0.007**	**Yes**			
Clam	W	PCB Congeners	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	5.88	18	94%	0%	100%	4.79	0.49	4.03	5.64	5.88	5.88	17	100%	6%	94%	4.86	1.74	3.37	11	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.166**	**No**	1.26	1.10	23%
Clam	W	PCB Congeners	156	2,3,3',4,4',5-Hexachlorobiphenyl	pg/g	-	18	100%	100%	0%	141	13.3	123	166	-	-	17	100%	100%	0%	461	839	120	3610	-	-	0.368	0.391	0.000	0.001	Non-parametric	Wilcoxon Rank Sum Test	**0.043**	**Yes**			
Clam	W	PCB Congeners	157	2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	-	0	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**			
Clam	W	PCB Congeners	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	-	18	100%	100%	0%	143	14.8	123	170	-	-	17	100%	100%	0%	562	901	125	3800	-	-	0.270	0.355	0.000	0.002	Non-parametric	Wilcoxon Rank Sum Test	**0.001**	**Yes**			
Clam	W	PCB Congeners	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	1.32	18	0%	0%	100%	-	-	-	-	0.698	1.73	17	0%	0%	100%	-	-	-	-	0.901	16.5	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Clam	W	PCB Congeners	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	1.51	18	94%	89%	11%	1.97	0.30	1.44	2.41	1.51	1.51	17	100%	100%	0%	2.49	2.05	1.52	10.1	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.666**	**No**	1.44	1.26	64%
Clam	W	PCB Congeners		Sum 209 Congeners (KM-based)	pg/g	-	18	-	-	-	30909	2314	26871	34451	-	-	17				55261	68859	24462	311599	-	-	0.630	0.562	0.000	0.000	Non-parametric	Wilcoxon Rank Sum Test	**0.276**	**No**	47976	41756	135%
Crayfish	W	PCB Congeners	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	-	17	100%	100%	0%	2.75	0.88	1.3	4.66	-	-	15	100%	100%	0%	5.96	5.38	1.57	20.7	-	-	0.837	0.991	0.001	0.402	Lognormal	t-Test (lognormal)	**0.009**	**Yes**			
Crayfish	W	PCB Congeners	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	0.1935	17	12%	0%	100%	0.168	0.003	0.167	0.176	0.104	0.401	15	27%	27%	73%	0.306	0.278	0.211	1.32	0.125	0.823	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.014**	**Yes**			
Crayfish	W	PCB Congeners	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	4.89	17	100%	59%	41%	8.40	6.07	1.97	24.8	-	-	15	80%	80%	20%	28.7	36.7	6.36	134	3.67	86.3	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.058**	**No**	25.5	23.7	282%
Crayfish	W	PCB Congeners	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	2.61	17	100%	88%	12%	3.70	1.33	2.36	8.15	-	-	15	93%	87%	13%	115	218	2.14	804	2.61	2.61	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.004**	**Yes**			
Crayfish	W	PCB Congeners	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	-	17	100%	100%	0%	129	70.5	52.6	323	-	-	15	100%	100%	0%	2038	3842	82.4	14000	-	-	0.004	0.637	0.000	0.004	Non-parametric	Wilcoxon Rank Sum Test	**0.007**	**Yes**			
Crayfish	W	PCB Congeners	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	3.11	17	100%	41%	59%	3.37	1.50	1.93	7.36	-	-	15	93%	80%	20%	70.2	128	2.11	460	3.11	3.11	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.003**	**Yes**			
Crayfish	W	PCB Congeners	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	0.397	17	35%	29%	71%	0.406	0.047	0.377	0.53	0.207	1.96	15	47%	33%	67%	1.11	1.97	0.238	7.83	0.397	3.51	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.275**	**No**	1.35	1.25	308%
Crayfish	W	PCB Congeners	156	2,3,3',4,4',5-Hexachlorobiphenyl	pg/g	-	17	100%	100%	0%	19.2	6.83	12.3	39.1	-	-	15	100%	100%	0%	593	1144	13.6	3910	-	-	0.006	0.266	0.000	0.002	Non-parametric	Wilcoxon Rank Sum Test	**0.016**	**Yes**			
Crayfish	W	PCB Congeners	157	2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	-	0	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**			
Crayfish	W	PCB Congeners	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	-	17	100%	100%	0%	13.8	6.37	8.16	30.1	-	-	15	100%	100%	0%	254	480	8.53	1530	-	-	0.001	0.051	0.000	0.003	Non-parametric	Wilcoxon Rank Sum Test	**0.005**	**Yes**			
Crayfish	W	PCB Congeners	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	0.2445	17	0%	0%	100%	-	-	-	-	0.0911	0.325	15	0%	0%	100%	-	-	-	-	0.167	2.95	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Crayfish	W	PCB Congeners	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	1.345	17	94%	12%	88%	1.20	0.34	0.767	2.2	1.14	1.14	15	80%	47%	53%	15.1	25.8	0.923	82.1	1.09	1.62	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.010**	**Yes**			
Crayfish	W	PCB Congeners		Sum 209 Congeners (KM-based)	pg/g	-	17	-	-	-	793	362	366	1940	-	-	15	-	-	-	6744	11572	536	42612	-	-	0.004	0.789	0.000	0.005	Non-parametric	Wilcoxon Rank Sum Test	**0.004**	**Yes**			
Sculpin	W	PCB Congeners	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	-	18	100%	100%	0%	15.1	4.91	5.19	25.9	-	-	17	100%	100%	0%	49.6	104	4.31	443	-	-	0.699	0.145	0.000	0.062	Lognormal	t-Test (lognormal)	**0.081**	**No**	72.5	63.1	418%
Sculpin	W	PCB Congeners	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	1.075	18	0%	0%	100%	-	-	-	-	0.689	2.21	17	6%	6%	94%	-	-	1.45	1.45	0.225	295	-	-	-	-	-	Contingency Table Analysis	**0.486**	**No**			
Sculpin	W	PCB Congeners	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	-	18	100%	100%	0%	692	200	358	1040	-	-	17	100%	100%	0%	20180	64900	303	269000	-	-	0.670	0.708	0.000	0.001	Non-parametric	Wilcoxon Rank Sum Test	**0.200**	**No**	45191	39332	5684%
Sculpin	W	PCB Congeners	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	-	18	100%	100%	0%	48.2	16.4	25	82.1	-	-	17	100%	100%	0%	1631	4820	21.2	19900	-	-	0.553	0.912	0.000	0.003	Non-parametric	Wilcoxon Rank Sum Test	**0.004**	**Yes**			
Sculpin	W	PCB Congeners	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	-	18	100%	100%	0%	2275	802	1050	3870	-	-	17	100%	100%	0%	59810	182500	870	757000	-	-	0.408	0.749	0.000	0.006	Non-parametric	Wilcoxon Rank Sum Test	**0.013**	**Yes**			
Sculpin	W	PCB Congeners	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	22.4	18	94%	67%	33%	30.4	9.71	15.3	47	32	32	17	94%	82%	18%	895	2758	19.6	11800	12.8	12.8	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.024**	**Yes**			
Sculpin	W	PCB Congeners	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	204.175	18	94%	0%	100%	4.17	1.08	2.54	5.93	3.35	3.35	17	94%	0%	100%	10.2	12.9	2.39	54	405	405	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.500**	**No**	9.02	7.85	188%
Sculpin	W	PCB Congeners	156	2,3,3',4,4',5-Hexachlorobiphenyl	pg/g	-	18	100%	100%	0%	275	106	140	464	-	-	17	100%	100%	0%	10240	28800	123	118000	-	-	0.067	0.180	0.000	0.003	Non-parametric	Wilcoxon Rank Sum Test	**0.002**	**Yes**			
Sculpin	W	PCB Congeners	157	2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	-	0	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**			
Sculpin	W	PCB Congeners	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	-	18	100%	100%	0%	108	38.2	51.9	175	-	-	17	100%	100%	0%	2507	7428	43.2	30800	-	-	0.192	0.425	0.000	0.006	Non-parametric	Wilcoxon Rank Sum Test	**0.013**	**Yes**			
Sculpin	W	PCB Congeners	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	4.105	18	0%	0%	100%	-	-	-	-	2.14	9.29	17	6%	0%	100%	-	-	3.65	3.65	1.45	164	-	-	-	-	-	Contingency Table Analysis	**0.486**	**No**			
Sculpin	W	PCB Congeners	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	5.659	18	89%	83%	17%	8.90	3.47	5.2	17.2	0.318	11	17	100%	100%	0%	219	600	5.86	2480	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.000**	**Yes**			
Sculpin	W	PCB Congeners		Sum 209 Congeners (KM-based)	pg/g	-	18	-	-	-	24189	7570	12243	38319	-	-	17	-	-	-	396515	1153555	9874	4773180	-	-	0.485	0.846	0.000	0.002	Non-parametric	Wilcoxon Rank Sum Test	**0.042**	**Yes**			
Smallmouth Bass	W	PCB Congeners	77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	-	19	100%	100%	0%	63.3	44.6	25.4	195	-	-	19	100%	100%	0%	774	2132	21.7	8950	-	-	0.000	0.022	0.000	0.015	Non-parametric	Wilcoxon Rank Sum Test	**0.045**	**Yes**			
Smallmouth Bass	W	PCB Congeners	81	3,4,4',5-Tetrachlorobiphenyl	pg/g	6.15	19	63%	5%	95%	3.80	3.06	2.02	15.9	2.53	20.5	19	89%	37%	63%	70.0	264.0	1.21	1190	6.15	23.1	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.009**	**Yes**			
Smallmouth Bass	W	PCB Congeners	105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	-	19	100%	100%	0%	2738	5079	498	23400	-	-	19	100%	100%	0%	129200	332100	717	1300000	-	-	0.000	0.001	0.000	0.060	Non-parametric	Wilcoxon Rank Sum Test	**0.004**	**Yes**			
Smallmouth Bass	W	PCB Congeners	114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	77	19	89%	68%	32%	257	629	29.2	2910	68.4	85.6	19	100%	95%	5%	9949	24390	59.4	89800	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.000**	**Yes**			
Smallmouth Bass	W	PCB Congeners	118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	-	19	100%	100%	0%	9619	21700	1330	98600	-	-	19	100%	100%	0%	347200	861700	2420	3270000	-	-	0.000	0.000	0.000	0.031	Non-parametric	Wilcoxon Rank Sum Test	**0.001**	**Yes**			
Smallmouth Bass	W	PCB Congeners	123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	45.25	19	89%	79%	21%	165	394	24.8	1830	43.5	47	19	100%	95%	5%	5690	14470	32.3	55300	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.002**	**Yes**			
Smallmouth Bass	W	PCB Congeners	126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	12.2	19	68%	32%	68%	14.0	15.0	5.61	74.6	10.7	30.1	19	95%	58%	42%	254	710	5.05	3030	48	48	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.017**	**Yes**			
Smallmouth Bass	W	PCB Congeners	156	2,3,3',4,4',5-Hexachlorobiphenyl	pg/g	-	19	100%	100%	0%	1651	4461	194	20000	-	-	19	100%	100%	0%	60870	137600	541	486000	-	-	0.000	0.000	0.000	0.051	Non-parametric	Wilcoxon Rank Sum Test	**0.000**	**Yes**			
Smallmouth Bass	W	PCB Congeners	157	2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	-	0	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**			
Smallmouth Bass	W	PCB Congeners	167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	-	19	100%	100%	0%	574	1450	84.3	6540	-	-	19	100%	100%	0%	16980	39680	161	140000	-	-	0.000	0.000	0.000	0.028	Non-parametric	Wilcoxon Rank Sum Test	**0.000**	**Yes**			
Smallmouth Bass	W	PCB Congeners	169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	4.855	19	0%	0%	100%	-	-	-	-	1.3	10.9	19	0%	0%	100%	-	-	-	-	1.29	607	-	-	-	-	-	All Samples are NDs	**-**	**-**			
Smallmouth Bass	W	PCB Congeners	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	18.15	19	79%	63%	37%	56.4	114	13.3	532	16.5	23.2	19	100%	100%	0%	1318	2990	21.6	10100	-	-	-	-	-	-	-	Wilcoxon Rank Sum Test	**0.000**	**Yes**			
Smallmouth Bass	W	PCB Congeners		Sum 209 Congeners (KM-based)	pg/g	-	19	-	-	-	81480	106096	22101	498783	-	-	19	-	-	-	2941078	7172800	32118	2.65E+07	-	-	0.000	0.001	0.000	0.037	Non-parametric	Wilcoxon Rank Sum Test	**0.004**	**Yes**			

Table L-7
Mouth of Eagle Creek and Goose Island Analytical Results Comparison to Reference Area

	Forebay - Eagle Creek		Forebay - Goose Island		Reference		
	Minimum Value	Maximum Value	Minimum Value	Maximum Value	Minimum Value	Maximum Value	95% UPL
SEDIMENT							
PCB Aroclors (µg/kg dry)							
Aroclor 1016	1.70 U	1.70 U	2.50 U	2.70 U	1.70 U	13.0 U	Same as Max
Aroclor 1221	1.70 U	1.70 U	2.50 U	2.70 U	1.70 U	11.0 U	Same as Max
Aroclor 1232	1.70 U	1.70 U	2.50 U	2.70 U	1.70 U	12.0 U	Same as Max
Aroclor 1242	1.70 U	1.70 U	2.50 U	2.70 U	1.70 U	16.0 U	Same as Max
Aroclor 1248	1.70 U	**76.0**	2.50 U	2.70 U	1.70 U	1.80 U	Same as Max
Aroclor 1254	1.70 U	1.70 U	2.50 U	**9.90 J**	1.70 U	1.80 U	Same as Max
Aroclor 1260	1.70 U	1.70 U	2.50 UJ	2.70 UJ	1.70 U	1.80 U	Same as Max
Aroclor 1262	1.70 U	1.70 U	-	-	1.70 U	1.80 U	Same as Max
Aroclor 1268	1.70 U	1.70 U	-	-	1.70 U	1.80 U	Same as Max
Total PCBs as Aroclors (NDs at MDL) [1]	3.40 U	**77.7 J**	5.00 U	**12.6 J**	1.70 U	16.0 U	
PCB Dioxin-Like Congeners (µg/kg dry)							
PCB 77	-	-	**0.00285**	**0.00353**	**0.000434**	**0.00201**	0.00165
PCB 81	-	-	**0.000135**	**0.000135**	0.0000490 EMPC	**0.000143**	Same as Max
PCB 105	-	-	**0.0249**	**0.0277**		**0.0275**	0.0177
PCB 114	-	-	**0.00129**	**0.00137**	**0.000154**	**0.00163**	Same as Max
PCB 118	-	-	**0.0657**	**0.0695**	**0.00831**	**0.0705**	0.0552
PCB 123	-	-	**0.000963**	**0.000963**	0.000172 EMPC	**0.00122**	Same as Max
PCB 126	-	-	0.000255 EMPC	0.000419 EMPC	0.0000583 U	**0.000337**	Same as Max
PCB 156 + 157	-	-	**0.00850**	**0.0104**	**0.000930**	**0.00850**	0.00579
PCB 167	-	-	**0.00381**	**0.00402**	0.000482 EMPC	**0.00384**	Same as Max
PCB 169	-	-	0.000241 U	0.000250 U	0.0000542 U	0.000200 U	Same as Max
PCB 189	-	-	**0.000615**	**0.000869**	**0.0000720**	**0.000573**	Same as Max
Total PCBs as Congeners (KM, capped)	-	-	**1.20 J**	**1.34 J**	**0.161 J**	**1.20 J**	Same as Max
Metals (mg/kg dry)							
Aluminum	**16,300**	**18,000**	**17,100**	**18,800**	**7,380**	**33,500**	38,000
Antimony	**0.0400 J**	**0.0800 J**	**0.440**	**0.580**	**0.150 J**	**0.520 J**	0.427
Arsenic	**0.680**	**3.23**	**4.00**	**4.25**	**3.03**	**6.04**	5.86
Barium	**74.4**	**110**	**112**	**131**	**86.3**	**312**	315
Beryllium	**0.353**	**0.371**	**0.505**	**0.561**	**0.194**	**0.748**	0.847
Cadmium	0.0750 U	0.131 U	**0.887**	**1.17**	**0.262**	**0.748**	0.674
Chromium	**20.2**	**23.5**	**20.6**	**21.6**	**12.8**	**27.3**	28.0
Cobalt	**9.93**	**11.0**	**11.2**	**11.6**	**5.68**	**15.2**	15.2
Copper	**16.6**	**24.8**	**32.6**	**34.2**	**8.22**	**47.8**	55.6
Lead	**4.19**	**10.9**	**13.1**	**13.6**	**8.65**	**15.1**	14.5
Mercury	**0.00700**	**0.0290**	**0.179**	**0.181**	**0.0410**	**0.225 J**	0.214
Nickel	**15.6**	**19.9**	**18.1**	**19.4**	**9.87**	**25.6**	21.2
Thallium	0.0560 U	0.156 U	**0.272**	**0.435**	**0.145**	**0.360**	0.354
Vanadium	**62.5**	**70.3**	**59.3**	**61.5**	**25.7 J**	**76.9 J**	70.6
Zinc	**52.7**	**65.1**	**115**	**148**	**70.2**	**109**	106
Petroleum Hydrocarbons (mg/kg dry)							
Diesel Range Organics	**2.90 J**	**13.0 J**	**49.0 J**	**53.0 J**	**7.00 J**	**31.0**	31.7
Residual Range Organics	150 U	150 U	**410**	**480**	**29.0 J**	**100 J**	Same as Max
Semivolatile Organic Compounds (µg/kg dry)							
Bis(2-ethylhexyl) Phthalate	200 U	200 U	**9.90 J**	**13.0 J**	**4.90 J**	**110 J**	Same as Max
Butyl Benzyl Phthalate	9.90 U	9.90 U	1.80 U	1.90 U	1.50 U	**3.80 J**	Same as Max
Carbazole	1.30 U	**2.20 J**	1.60 U	1.70 U	1.30 U	1.40 U	Same as Max
Di-n-butyl Phthalate	9.90 U	11.0 U	**5.60 J**	**10.0 J**	2.60 UJ	**11.0 J**	Same as Max
Di-n-octyl Phthalate	1.20 U	1.20 U	1.50 U	1.60 U	1.20 U	1.30 U	Same as Max
p-cresol (4-Methylphenol)	2.90 U	2.90 U	3.70 U	**8.50 J**	2.90 U	**210**	Same as Max
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)							
Acenaphthene	1.00 U	1.00 U	1.20 U	1.30 U	1.00 U	1.10 U	Same as Max
Anthracene	1.40 U	**2.60 J**	1.70 U	1.80 U	1.40 U	**2.30 J**	Same as Max
Fluorene	1.70 U	1.70 U	2.10 U	2.20 U	1.70 UJ	1.80 UJ	Same as Max
Phenanthrene	**2.30 J**	**6.50 J**	**3.80 J**	**4.60 J**	1.30 U	**5.90 J**	Same as Max
Total LPAHs (KM, capped; NDs at MDL)	**6.40 J**	**11.8 J**	**8.80 J**	**9.90 J**	5.40 UJ	**10.0 J**	Same as Max
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)							
Benzo(a)anthracene	1.40 U	**6.60 J**	**4.20 J**	**7.80 J**	1.40 U	**10.0**	Same as Max
Benzo(a)pyrene	1.60 U	**7.10 J**	**8.70 J**	**13.0 J**	**1.60 J**	**11.0**	Same as Max
Benzo(b)fluoranthene	2.50 U	**11.0**	**6.50 J**	**15.0**	2.50 U	**17.0**	Same as Max
Benzo(g,h,i)perylene	2.30 U	**5.00 J**	**5.60 J**	**9.90 J**	2.30 U	**7.90 J**	Same as Max
Benzo(k)fluoranthene	2.50 U	**3.40 J**	3.00 U	**4.10 J**	2.50 U	**5.00 J**	Same as Max
Chrysene	**1.80 J**	**13.0**	**5.80 J**	**11.0 J**	1.40 U	**9.80**	Same as Max
Dibenz(a,h)anthracene	2.20 U	2.20 U	2.70 U	2.80 U	2.20 U	2.30 U	Same as Max
Fluoranthene	2.20 U	**11.0**	**7.30 J**	**9.60 J**	2.20 UJ	**31.0 J**	Same as Max
Indeno(1,2,3-cd)pyrene	1.90 U	**4.60 J**	**5.00 J**	**7.10 J**	1.90 UJ	**8.80 J**	Same as Max
Pyrene	**3.40 J**	**17.0**	**7.20 J**	**8.80 J**	**1.50 J**	**23.0 J**	12.7
Total HPAHs (KM, capped; NDs at MDL)	**17.2 J**	**80.9 J**	**55.7 J**	**89.1 J**	**16.4 J**	**125 J**	Same as Max
Total Polycyclic Aromatic Hydrodarbons (PAHs) (µg/kg dry)							
Total PAHs (KM, capped; NDs at MDL)	**19.5 J**	**90.8 J**	**60.1 J**	**96.1 J**	**17.1 J**	**133 J**	Same as Max
CLAM TISSUE							
PCB Aroclors (µg/kg wet)							
Aroclor 1016	-	-	-	6.10 UJ	8.40 U	15.0 U	Same as Max
Aroclor 1221	-	-	-	5.90 UJ	6.30 U	16.0 U	Same as Max
Aroclor 1232	-	-	-	9.70 UJ	18.0 U	35.0 U	Same as Max
Aroclor 1242	-	-	-	6.60 UJ	7.90 U	14.0 U	Same as Max
Aroclor 1248	-	-	-	5.20 UJ	5.50 U	9.90 U	Same as Max
Aroclor 1254	-	-	-	14.0 UJ	**30.0**	**39.0**	39.7
Aroclor 1260	-	-	-	6.30 UJ	5.70 U	8.10 U	Same as Max
Aroclor 1262	-	-	-	3.20 UJ	3.70 U	9.90 U	Same as Max
Aroclor 1268	-	-	-	2.00 UJ	2.00 U	2.00 U	Same as Max
Total PCBs as Aroclors (NDs at MDL) [1]	-	-	-	14.0 UJ	**30.0**	**39.0**	Same as Max
PCB Dioxin-Like Congeners (µg/kg wet)							
PCB 77	-	-	-	**0.0337**	**0.0332**	**0.0468**	0.0466
PCB 81	-	-	-	0.00217 EMPC	0.000961 EMPC	**0.00275**	Same as Max
PCB 105	-	-	-	**0.352**	**0.350**	**0.556**	0.542
PCB 114	-	-	-	**0.0228**	**0.0213**	**0.0330**	0.0316
PCB 118	-	-	-	**1.59**	**1.91**	**2.82**	2.82
PCB 123	-	-	-	**0.0280**	**0.0368**	**0.0540**	0.0536
PCB 126	-	-	-	**0.00307**	**0.00403**	**0.00564**	Same as Max
PCB 156 + 157	-	-	-	**0.0969**	**0.123**	**0.166**	0.165
PCB 167	-	-	-	**0.0925**	**0.123**	**0.170**	0.169
PCB 169	-	-	-	0.00108 U	0.000698 U	0.00173 U	Same as Max
PCB 189	-	-	-	**0.00157**	**0.00144**	**0.00241**	Same as Max
Total PCBs as Congeners (KM, capped)	-	-	-	**21.4 J**	**26.9 J**	**34.5 J**	Same as Max

Table L-7
Mouth of Eagle Creek and Goose Island Analytical Results Comparison to Reference Area

	Forebay - Eagle Creek		Forebay - Goose Island		Reference		
	Minimum Value	Maximum Value	Minimum Value	Maximum Value	Minimum Value	Maximum Value	95% UPL
Metals (mg/kg wet)							
Aluminum	-	-	-	**75.5**	**8.00**	**83.4**	68.7
Antimony	-	-	-	0.00100 U	**0.00400**	**0.00800**	Same as Max
Arsenic	-	-	-	**1.59**	**2.00**	**2.62**	2.64
Barium	-	-	-	**1.66**	**1.71**	**2.38**	Same as Max
Beryllium	-	-	-	**0.00200 J**	0.000400 U	**0.00140**	Same as Max
Cadmium	-	-	-	**0.243**	**0.247**	**0.405**	0.410
Chromium	-	-	-	**0.492**	**0.450**	**0.760**	Same as Max
Cobalt	-	-	-	**0.0996**	**0.0902**	**0.150**	0.153
Copper	-	-	-	**6.75**	**8.18**	**11.6**	11.2
Lead	-	-	-	**0.0615**	**0.0490**	**0.0720**	0.0729
Mercury	-	-	-	**0.0163 J**	**0.00460**	**0.0179**	0.0160
Methyl Mercury	-	-	-	-	**0.00140**	**0.00990**	0.00896
Nickel	-	-	-	**0.221**	**0.273**	**0.482**	0.447
Thallium	-	-	-	**0.00650**	**0.00530**	**0.0105**	0.00905
Vanadium	-	-	-	**0.253**	**0.0740**	**0.286**	0.234
Zinc	-	-	-	**20.5**	**18.5**	**23.2**	23.6
Semivolatile Organic Compounds (µg/kg wet)							
Bis(2-ethylhexyl) Phthalate	-	-	-	66.0 U	**310**	**680**	660
Butyl Benzyl Phthalate	-	-	-	7.30 U	7.30 U	**74.0 J**	Same as Max
Carbazole	-	-	-	7.70 U	9.10 U	9.10 U	Same as Max
Di-n-butyl Phthalate	-	-	-	170 U	16.0 U	48.0 U	Same as Max
Di-n-octyl Phthalate	-	-	-	11.0 U	11.0 U	11.0 U	Same as Max
p-cresol (4-Methylphenol)	-	-	-	**29.0 J**	**13.0 J**	**110**	Same as Max
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)							
Acenaphthene	-	-	-	**0.680**	**0.270 J**	**1.20 J**	1.06
Anthracene	-	-	-	**1.20**	**0.850 J**	**1.80**	Same as Max
Fluorene	-	-	-	**1.80**	**1.50**	**3.10 J**	2.85
Phenanthrene	-	-	-	**10.0**	**6.70**	**14.0 J**	13.1
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)							
Benzo(a)anthracene	-	-	-	**3.40**	3.70 U	27.0 U	Same as Max
Benzo(a)pyrene	-	-	-	**0.750**	0.410 U	0.410 U	Same as Max
Benzo(b)fluoranthene	-	-	-	**2.20**	0.350 U	0.350 U	Same as Max
Benzo(g,h,i)perylene	-	-	-	**0.740**	0.370 U	**1.40 J**	Same as Max
Benzo(k)fluoranthene	-	-	-	**1.30**	0.280 U	0.280 U	Same as Max
Chrysene	-	-	-	**2.50**	1.30 UJ	13.0 UJ	Same as Max
Dibenz(a,h)anthracene	-	-	-	**0.480 J**	0.300 U	0.300 U	Same as Max
Fluoranthene	-	-	-	**18.0**	**8.50**	**17.0 J**	15.6
Indeno(1,2,3-cd)pyrene	-	-	-	**0.890**	0.320 U	2.00 U	Same as Max
Pyrene	-	-	-	**5.40**	2.00 U	5.60 UJ	Same as Max
CRAYFISH TISSUE							
PCB Aroclors (µg/kg wet)							
Aroclor 1016	-	-	-	2.40 U	2.40 U	4.80 U	Same as Max
Aroclor 1221	-	-	-	2.60 U	2.60 U	5.20 U	Same as Max
Aroclor 1232	-	-	-	2.30 U	2.30 U	4.60 U	Same as Max
Aroclor 1242	-	-	-	2.20 U	2.20 U	4.40 U	Same as Max
Aroclor 1248	-	-	-	0.510 U	0.510 U	1.10 U	Same as Max
Aroclor 1254	-	-	-	1.80 U	1.80 U	3.60 U	Same as Max
Aroclor 1260	-	-	-	1.90 U	1.90 U	3.80 U	Same as Max
Aroclor 1262	-	-	-	2.50 U	2.50 U	5.00 U	Same as Max
Aroclor 1268	-	-	-	2.00 U	2.00 U	4.00 U	Same as Max
Total PCBs as Aroclors (NDs at MDL) [1]	-	-	-	2.60 U	2.60 U	5.20 U	
PCB Dioxin-Like Congeners (µg/kg wet)							
PCB 77	-	-	-	**0.00226**	**0.00130**	**0.00466**	0.00434
PCB 81	-	-	-	0.000145 U	0.000104 U	**0.000176**	Same as Max
PCB 105	-	-	-	**0.00624**	**0.00197**	**0.0248**	0.0214
PCB 114	-	-	-	**0.00235**	**0.00236**	**0.00815**	0.00598
PCB 118	-	-	-	**0.0870**	**0.0526**	**0.323**	0.261
PCB 123	-	-	-	**0.00256**	**0.00193**	**0.00736**	0.00610
PCB 126	-	-	-	0.000261 EMPC	0.000207 U	**0.000530**	0.000530
PCB 156 + 157	-	-	-	**0.0133**	**0.0123**	**0.0391**	0.0315
PCB 167	-	-	-	**0.0112**	**0.00816**	**0.0301**	0.0253
PCB 169	-	-	-	0.000164 U	0.0000911 U	0.000325 U	Same as Max
PCB 189	-	-	-	**0.000662**	**0.000767**	**0.00220**	Same as Max
Total PCBs as Congeners (KM, capped)	-	-	-	**0.587 J**	**0.366 J**	**1.94 J**	Same as Max
Metals (mg/kg wet)							
Aluminum	-	-	-	**147**	**71.2 J**	**221 J**	204
Antimony	-	-	-	**0.00800 J**	**0.00600 J**	**0.0390**	0.0327
Arsenic	-	-	-	**0.303**	**0.275**	**0.636**	0.535
Barium	-	-	-	**57.0**	**40.2**	**120**	104
Beryllium	-	-	-	**0.00400 J**	**0.00260 J**	**0.00610 J**	0.00489
Cadmium	-	-	-	**0.0769**	**0.0460**	**0.201**	0.164
Chromium	-	-	-	**0.190**	**0.120 J**	**1.23**	Same as Max
Cobalt	-	-	-	**0.391**	**0.224**	**0.439**	0.434
Copper	-	-	-	**15.5**	**12.2 J**	**33.2 J**	27.4
Lead	-	-	-	**0.471**	**0.0560**	**1.55**	1.14
Mercury	-	-	-	**0.0359 J**	**0.0105 J**	**0.0246 J**	0.0231
Methyl Mercury	-	-	-	-	**0.0181**	**0.0367**	0.0370
Nickel	-	-	-	**1.21**	**0.992**	**3.44**	2.90
Thallium	-	-	-	**0.0128**	**0.0140**	**0.0370**	0.0319
Vanadium	-	-	-	**0.729**	**0.261**	**0.804**	0.860
Zinc	-	-	-	**20.3**	**18.0**	**36.5**	Same as Max
Semivolatile Organic Compounds (µg/kg wet)							
Bis(2-ethylhexyl) Phthalate	-	-	-	66.0 U	66.0 U	**87.0 J**	Same as Max
Butyl Benzyl Phthalate	-	-	-	7.30 U	7.30 U	**31.0 J**	Same as Max
Carbazole	-	-	-	7.70 U	9.10 U	9.10 U	Same as Max
Di-n-butyl Phthalate	-	-	-	140 U	16.0 U	110 U	Same as Max
Di-n-octyl Phthalate	-	-	-	11.0 U	11.0 U	**32.0 J**	Same as Max
p-cresol (4-Methylphenol)	-	-	-	11.0 U	7.70 U	7.70 U	Same as Max
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg wet)							
Acenaphthene	-	-	-	0.500 U	0.110 U	**0.190 J**	Same as Max
Anthracene	-	-	-	**0.430 J**	0.0650 U	**0.190 J**	Same as Max
Fluorene	-	-	-	**0.510**	0.150 U	**0.250 J**	Same as Max
Phenanthrene	-	-	-	**0.820**	0.360 U	**0.590**	Same as Max

Table L-7
Mouth of Eagle Creek and Goose Island Analytical Results Comparison to Reference Area

	Forebay - Eagle Creek		Forebay - Goose Island		Reference		
	Minimum Value	Maximum Value	Minimum Value	Maximum Value	Minimum Value	Maximum Value	95% UPL
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg wet)							
Benzo(a)anthracene	-	-	-	0.500 U	0.0660 U	**0.400 J**	Same as Max
Benzo(a)pyrene	-	-	-	0.0610 U	0.0810 U	**0.120 J**	Same as Max
Benzo(b)fluoranthene	-	-	-	**0.150 J**	0.0700 U	**0.230 J**	Same as Max
Benzo(g,h,i)perylene	-	-	-	**0.110 J**	0.0730 U	0.500 U	Same as Max
Benzo(k)fluoranthene	-	-	-	**0.110 J**	0.0560 U	**0.200 J**	Same as Max
Chrysene	-	-	-	0.200 U	0.0760 U	**0.270 J**	Same as Max
Dibenz(a,h)anthracene	-	-	-	0.0450 U	0.0590 U	**0.160 J**	Same as Max
Fluoranthene	-	-	-	0.500 U	0.450 U	0.500 U	Same as Max
Indeno(1,2,3-cd)pyrene	-	-	-	**0.150 J**	0.0640 U	**0.180 J**	Same as Max
Pyrene	-	-	-	0.500 U	0.450 U	0.500 U	Same as Max
SCULPIN TISSUE							
PCB Aroclors (µg/kg wet)							
Aroclor 1016	-	-	-	-	2.40 U	2.40 U	Same as Max
Aroclor 1221	-	-	-	-	2.60 U	2.60 U	Same as Max
Aroclor 1232	-	-	-	-	2.30 U	2.30 U	Same as Max
Aroclor 1242	-	-	-	-	2.20 U	2.20 U	Same as Max
Aroclor 1248	-	-	-	-	0.510 U	45.0 U	Same as Max
Aroclor 1254	-	-	-	-	1.80 U	44.0 U	Same as Max
Aroclor 1260	-	-	-	-	1.90 U	1.90 U	Same as Max
Aroclor 1262	-	-	-	-	2.50 U	2.50 U	Same as Max
Aroclor 1268	-	-	-	-	2.00 U	2.00 U	Same as Max
Total PCBs as Aroclors (NDs at MDL) [1]	-	-	-	-	13.0 U	45.0 U	
PCB Dioxin-Like Congeners (µg/kg wet)							
PCB 77	-	-	-	**0.00799**	**0.00519**	**0.0259**	0.0239
PCB 81	-	-	-	0.000882 EMPC	0.000689 EMPC	0.00221 EMPC	Same as Max
PCB 105	-	-	-	**0.362**	**0.358**	**1.04**	1.05
PCB 114	-	-	-	**0.0220**	**0.0250**	**0.0821**	0.0775
PCB 118	-	-	-	**0.872**	**1.05**	**3.87**	3.71
PCB 123	-	-	-	**0.0163**	**0.0153**	**0.0470**	Same as Max
PCB 126	-	-	-	**0.00315**	**0.00254**	**0.00593**	Same as Max
PCB 156 + 157	-	-	-	**0.106**	**0.140**	**0.464**	0.465
PCB 167	-	-	-	**0.0348**	**0.0519**	**0.175**	0.177
PCB 169	-	-	-	0.00131 U	0.00214 U	0.00929 U	Same as Max
PCB 189	-	-	-	**0.00383**	**0.000318**	**0.0172**	Same as Max
Total PCBs as Congeners (KM, capped)	-	-	-	**8.14 J**	**12.2 J**	**38.3 J**	Same as Max
Metals (mg/kg wet)							
Arsenic	-	-	-	-	**0.239**	**0.484**	0.513
Cadmium	-	-	-	-	**0.00870**	**0.0264**	0.0236
Lead	-	-	-	-	0.0214 U	**0.0758**	Same as Max
Mercury	-	-	-	-	**0.0448 J**	**0.141 J**	0.134

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
ND = Non Detect
MDL = method detection limit
RDL = reported detection limit
UPL = Upper Prediction Limit
- = Not Analyzed
bold = analyte detected above MDL/RDL.

[1] Only Aroclors 1248 and 1254 were included in summing sediment Total PCBs as Aroclors because all other aroclors were undected in Forebay sediment samples.
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
= The maximum result exceeds the maximum Reference Area and the 95% UPL for the Reference Area.

Table L-8
Comparison of COI Concentrations in Erodible and Mass Wasting Soils with Reference Area Sediment Concentrations

	Upland Area of Potential Concern (AOPC)			Reference Area Sediments	
	Landfill	Sandblast Area	Bulb Slope		
	Max Detected Value	Max Detected Value	Max Detected Value	Maximum Value	95% UPL
PCB Aroclors (µg/kg dry)					
Aroclor 1016	-	-	-	13.0 U	Same as Max
Aroclor 1221	-	-	-	11.0 U	Same as Max
Aroclor 1232	-	-	-	12.0 U	Same as Max
Aroclor 1242	-	-	-	16.0 U	Same as Max
Aroclor 1248	-	-	-	1.80 U	Same as Max
Aroclor 1254	**49.0**			1.80 U	Same as Max
Aroclor 1260	**92.0**	**67.0**	**251**	1.80 U	Same as Max
Aroclor 1262	-	-	-	1.80 U	Same as Max
Aroclor 1268	-	-	-	1.80 U	Same as Max
Total PCBs as Aroclors	**127**	**69.1**	**251**	16.0 U	
PCB Dioxin-Like Congeners (µg/kg dry)					
PCB 77	-	-	-	**0.00201**	0.00165
PCB 81	-	-	-	**0.000143**	Same as Max
PCB 105	-	-	-	**0.0275**	0.01770
PCB 114	-	-	-	**0.00163**	Same as Max
PCB 118	-	-	-	**0.0705**	0.0552
PCB 123	-	-	-	**0.00122**	Same as Max
PCB 126	-	-	-	**0.000337**	Same as Max
PCB 156 + 157	-	-	-	**0.00850**	0.00579
PCB 167	-	-	-	**0.00384**	Same as Max
PCB 169	-	-	-	0.000200 U	Same as Max
PCB 189	-	-	-	**0.000573**	Same as Max
Total PCBs as Congeners (KM, capped)	-	-	-	**1.20 J**	Same as Max
Metals (mg/kg dry)					
Aluminum	**19,100**	**13,000**	-	**33,500**	38,000
Antimony	-	**0.340**	-	**0.520 J**	0.427
Arsenic	**6.20**	**5.94**	-	**6.04**	5.86
Barium	**242**	**108**	-	**312**	315
Beryllium	**0.576**	**0.350**	-	**0.748**	0.847
Cadmium	**1.70**	**1.06**	-	**0.748**	0.674
Chromium	**801**	**162**	-	**27.3**	28.0
Cobalt	**22.7**	**13.4**	-	**15.2**	15.2
Copper	**60.5**	**71.6**	-	**47.8**	55.6
Lead	**680**	**319**	**597**	**15.1**	14.5
Manganese	**614**	**479**	-	-	-
Mercury	**0.320**	**0.0390**	**1.54**	**0.225 J**	0.214
Nickel	**570**	**74.9**	-	**25.6**	21.2
Selenium	**0.848**	**0.650**	-	-	-
Silver	**0.500**	**0.175**	-	-	-
Thallium	**0.378**	**0.117**	-	**0.360**	0.354
Vanadium	**56.3**	**69.8**	-	**76.9 J**	70.6
Zinc	**221**	**203**	-	**109**	106
Petroleum Hydrocarbons (mg/kg dry)					
Diesel Range Organics	-	**69.0**	**170**	**31.0**	31.7
Residual Range Organics	-	**1,000**	**410**	**100 J**	Same as Max
Semivolatile Organic Compounds (µg/kg dry)					
Bis(2-ethylhexyl) Phthalate	**420**	**260,000**	-	**110 J**	Same as Max
Butyl Benzyl Phthalate	-	-	-	**3.80 J**	Same as Max
Carbazole	**210**	**91.0**	-	1.40 U	Same as Max
Di-n-butyl Phthalate	**1,800**	-	-	**11.0 J**	Same as Max
Di-n-octyl Phthalate	-	-	-	1.30 U	Same as Max
p-cresol (4-Methylphenol)	-	-	-	**210**	Same as Max
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)					
Acenaphthene	**1,160**	**68.0**	-	1.10 U	Same as Max
Anthracene	**1,070**	**150**	-	**2.30 J**	Same as Max
Fluorene	**510**	-	-	1.80 UJ	Same as Max
Phenanthrene	**4,200**	**940**	-	**5.90 J**	Same as Max
Total LPAHs (KM, capped; NDs at MDL)	**12,200**	**1,356**	-	**10.0 J**	Same as Max
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)					
Benzo(a)anthracene	**4,500**	**1,200**	-	**10.0**	Same as Max
Benzo(a)pyrene	**6,200**	**1,000**	-	**11.0**	Same as Max
Benzo(b)fluoranthene	**8,200**	**1,600**	-	**17.0**	Same as Max
Benzo(g,h,i)perylene	**3,300**	**590**	-	**7.90 J**	Same as Max
Benzo(k)fluoranthene	**2,500**	**570**	-	**5.00 J**	Same as Max

Table L-8
Comparison of COI Concentrations in Erodible and Mass Wasting Soils with Reference Area Sediment Concentrations

	Upland Area of Potential Concern (AOPC)			Reference Area Sediments	
	Landfill	Sandblast Area	Bulb Slope		
	Max Detected Value	Max Detected Value	Max Detected Value	Maximum Value	95% UPL
Chrysene	**5,900**	**1,500**	-	**9.80**	Same as Max
Dibenz(a,h)anthracene	**1,000**	**220**	-	2.30 U	Same as Max
Fluoranthene	**14,000**	**2,100**	-	**31.0 J**	Same as Max
Indeno(1,2,3-cd)pyrene	**4,600**	**690**	-	**8.80 J**	Same as Max
Pyrene	**9,100**	**1,900**	-	**23.0 J**	12.7
Total HPAHs (KM, capped; NDs at MDL)	**55,030**	**11,370**	-	**125 J**	Same as Max
Total Polycyclic Aromatic Hydrodarbons (PAHs) (µg/kg dry)					
Total PAHs (KM, capped; NDs at MDL)	-	-	-	**133 J**	Same as Max

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
RDL = reported detection limit
SLV = screening level value
UPL = Upper Prediction Limit
- = Not Analyzed
bold = analyte detected above MDL/RDL.

KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners).
For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
= The reported concentration exceeds the Maximum Reference Area sediment concentation and the 95% UPL.

Table L-9
Comparison of COI Concentrations in Erodible and Mass Wasting Soils with Reference Area Soil Concentrations

	Upland Area of Potential Concern (AOPC)			Reference Area Soils	
	Landfill	Sandblast Area	Bulb Slope		
	Max Detected Value	Max Detected Value	Max Detected Value	Maximum Value	95% UPL
Metals (mg/kg dry)					
Aluminum	**19,100**	**13,000**	-	33,200	31,400
Antimony	-	**0.340**	-	0.180	0.176
Arsenic	**6.20**	**5.94**	-	5.18	5.40
Barium	**242**	**108**	-	182	169
Beryllium	**0.576**	**0.350**	-	0.629	0.659
Cadmium	**1.70**	**1.06**	-	0.340	0.271
Chromium	**801**	**162**	-	27.3	28.1
Cobalt	**22.7**	**13.4**	-	19.9	19.9
Copper	**60.5**	**71.6**	-	58.2	56.7
Lead	**680**	**319**	**597**	26.5	25.5
Manganese	**614**	**479**	-	920	885
Mercury	**0.320**	**0.0390**	**1.54**	0.0680	0.0660
Nickel	**570**	**74.9**	-	26.1	26.5
Selenium	**0.848**	**0.650**		0.500 U	0.500
Thallium	**0.378**	**0.117**	-	0.203	0.203
Vanadium	**56.3**	**69.8**	-	99.3	104
Zinc	**221**	**203**	-	68.5	71.7
Low Molecular Weight Polycyclic Aromatic Hydrodarbons (LPAHs) (µg/kg dry)					
Acenaphthene	**1,160**	**68.0**	-	3.40	3.40
Acenaphthylene	**19.0**			1.60	1.60
Anthracene	**1,070**	**150**	-	4.90	4.90
Fluorene	**510**	-	-	3.20	3.20
Naphthalene	**79.0**	-		2.20	29.4
Phenanthrene	**4,200**	**940**	-	34.0	2.20
Total LPAHs (KM, capped; NDs at MDL)	**12,200**	**1,356**	-	49.3	49.3
High Molecular Weight Polycyclic Aromatic Hydrodarbons (HPAHs) (µg/kg dry)					
Benzo(a)anthracene	**4,500**	**1,200**	-	34.0	28.7
Benzo(a)pyrene	**6,200**	**1,000**	-	45.0	37.0
Benzo(b)fluoranthene	**8,200**	**1,600**	-	55.0	46.4
Benzo(g,h,i)perylene	**3,300**	**590**	-	32.0	26.5
Benzo(k)fluoranthene	**2,500**	**570**	-	19.0	16.2
Chrysene	**5,900**	**1,500**	-	45.0	37.4
Dibenz(a,h)anthracene	**1,000**	**220**	-	6.90	6.90
Fluoranthene	**14,000**	**2,100**	-	66.0	55.1
Indeno(1,2,3-cd)pyrene	**4,600**	**690**	-	34.0	27.0
Pyrene	**9,100**	**1,900**	-	64.0	53.3
Total HPAHs (KM, capped; NDs at MDL)	**55,030**	**11,370**	-	401	401

Notes:
µg/kg = microgram per kilogram
mg/kg = milligram per kilogram
MDL = method detection limit
RDL = reported detection limit
SLV = screening level value
UPL = Upper Prediction Limit
- = Not Analyzed
-- = SLV for analyte not available
bold = analyte detected above MDL/RDL.

KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
J = The reported value is an estimate.
U = The analyte was not detected at or above the MDL (except PCB congeners). For PCB congeners, the analyte was not detected at or above the RDL/EMPC.
UJ = The analyte was not detected. The reported MDL (non-congeners) or RDL/EMPC (congeners) is an estimate.
EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.
= The reported concentration exceeds the Maximum Reference Area sediment concentation and the 95% UPL.

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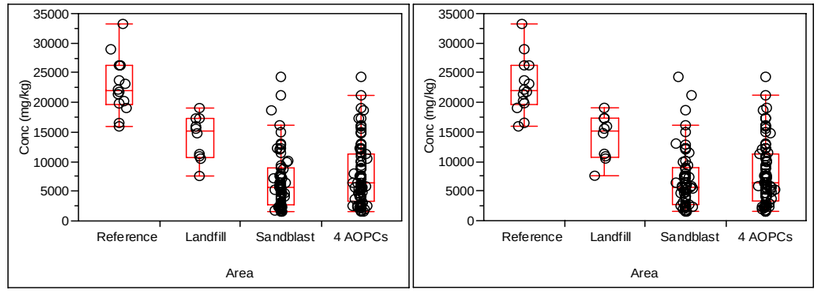

CENSORED AT MDL CENSORED AT MRL

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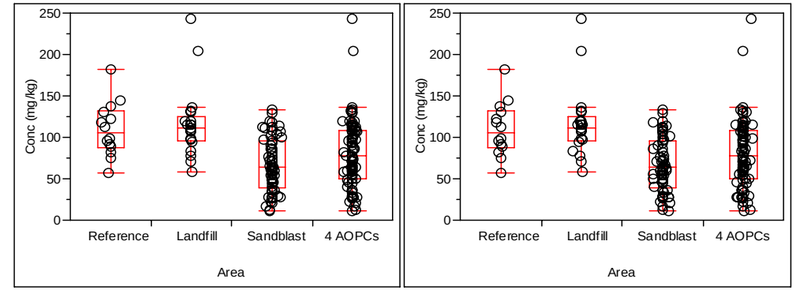

CENSORED AT MDL CENSORED AT MRL

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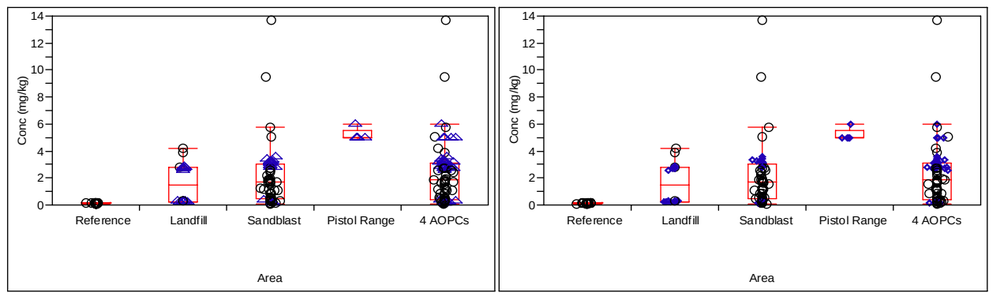

CENSORED AT MDL CENSORED AT MRL

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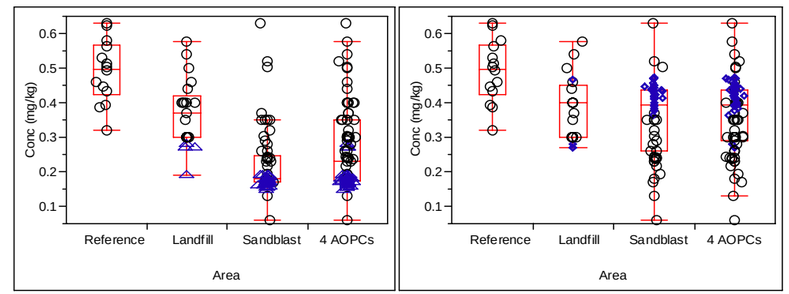

CENSORED AT MDL CENSORED AT MRL

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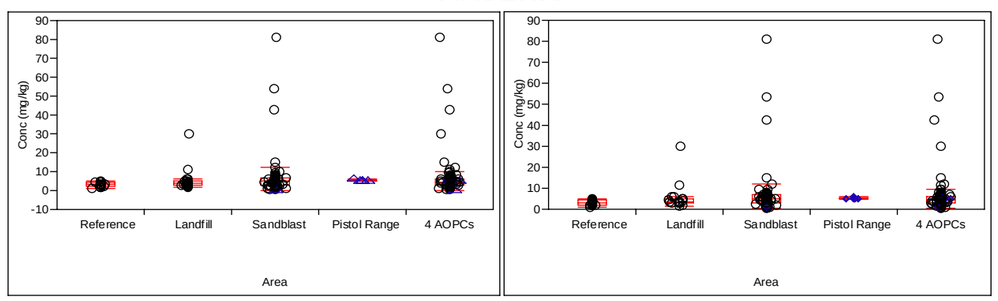
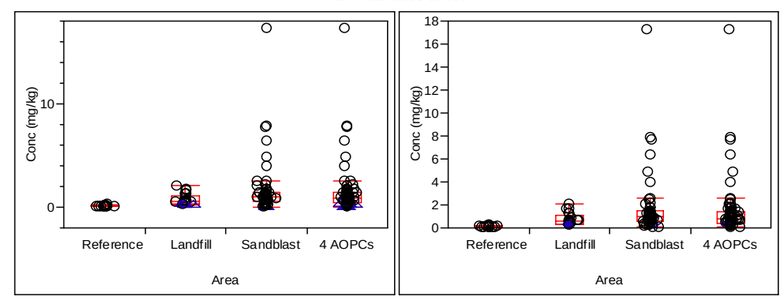


CENSORED AT MDL CENSORED AT MRL

CADMIUM



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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UPLAND OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SOIL (0 - 1ft)

DRAWING NUMBER: FIG L-1a
CAD FILE NUMBER: FIG L-1a
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1a Metals in Upland Soil.dwg Nov 17, 2010 - 8:01am

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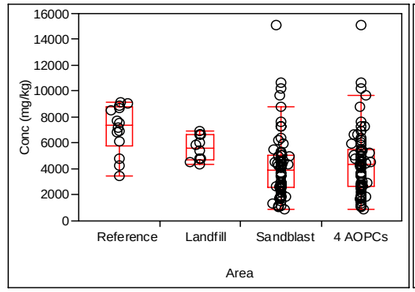

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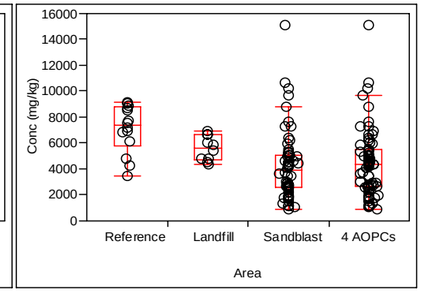
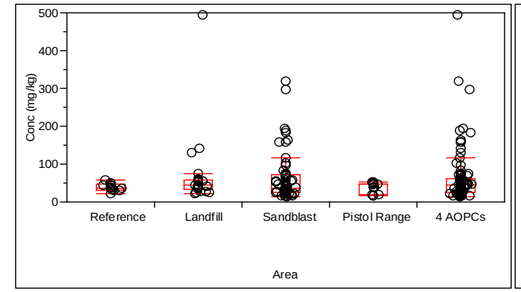


CENSORED AT MRL

COPPER



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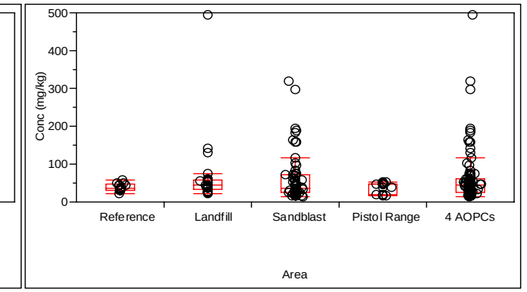

CENSORED AT MRL

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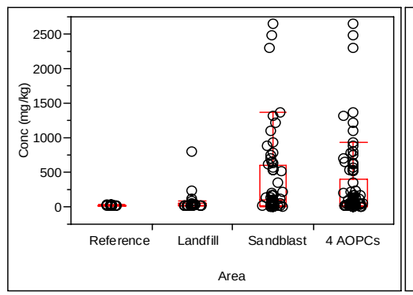

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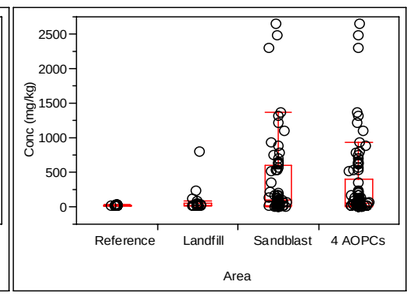

CENSORED AT MRL

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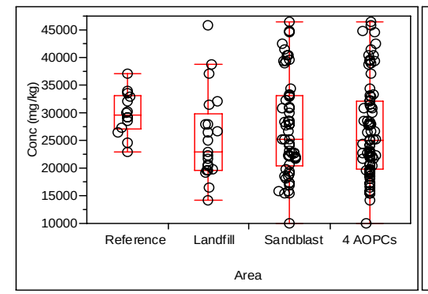

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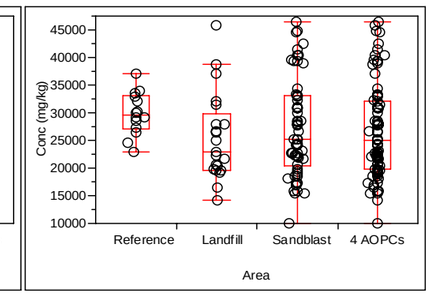
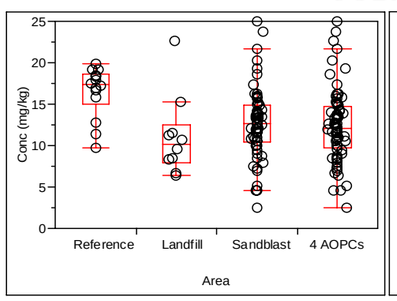


CENSORED AT MRL

COBALT



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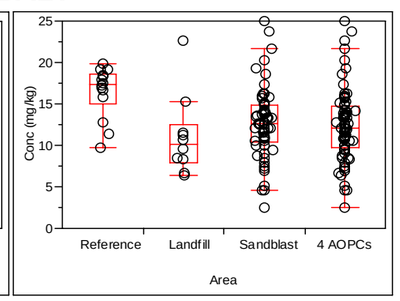

CENSORED AT MRL

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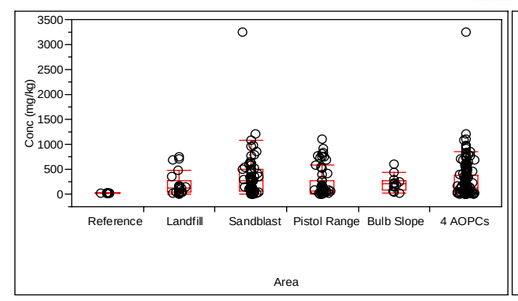

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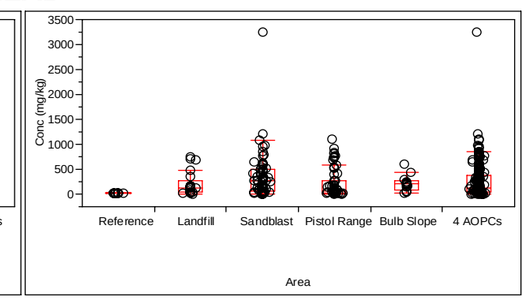

CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

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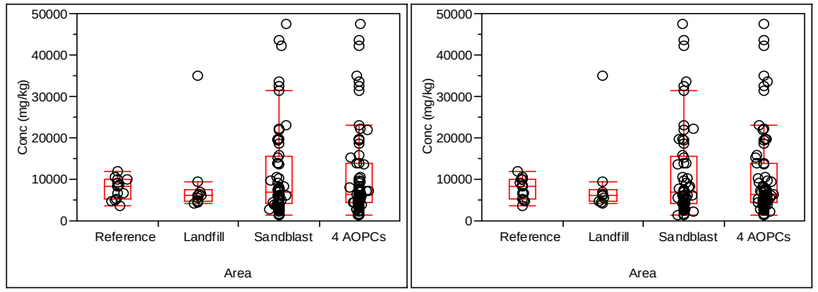
UPLAND OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SOIL (0 - 1ft)

DRAWING NUMBER: FIG L-1b
CAD FILE NUMBER: FIG L-1b
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1b Metals in Upland Soil.dwg Nov 17, 2010 - 8:08am

MAGNESIUM



CENSORED AT MDL CENSORED AT MRL

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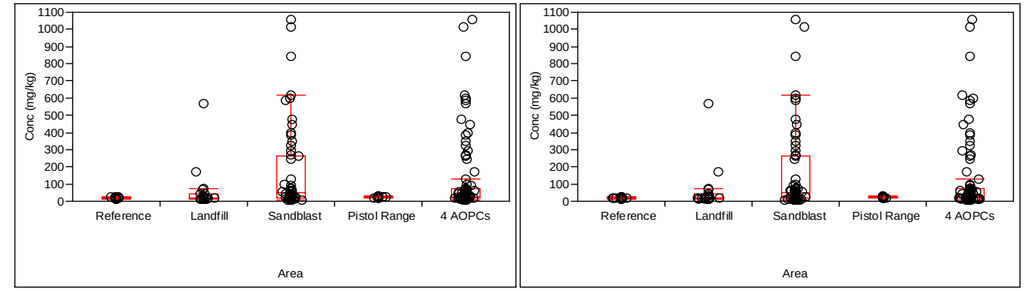

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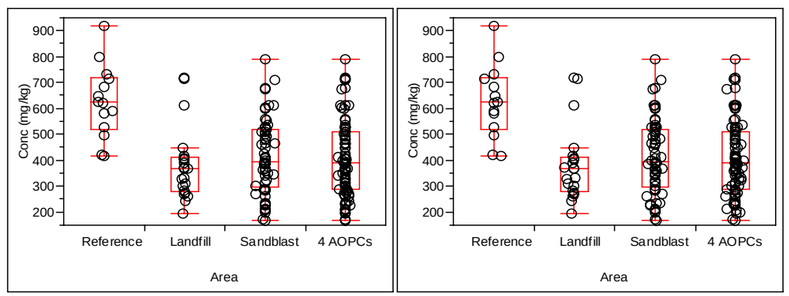

CENSORED AT MDL CENSORED AT MRL

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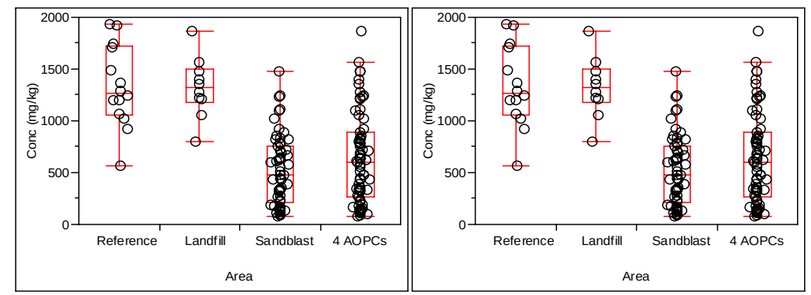
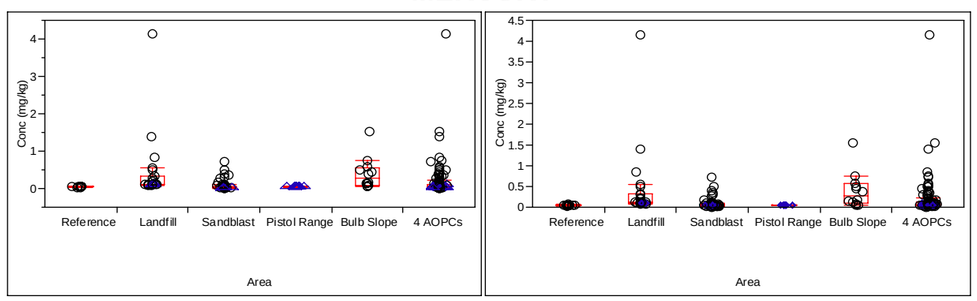


CENSORED AT MDL CENSORED AT MRL

MERCURY



CENSORED AT MDL CENSORED AT MRL

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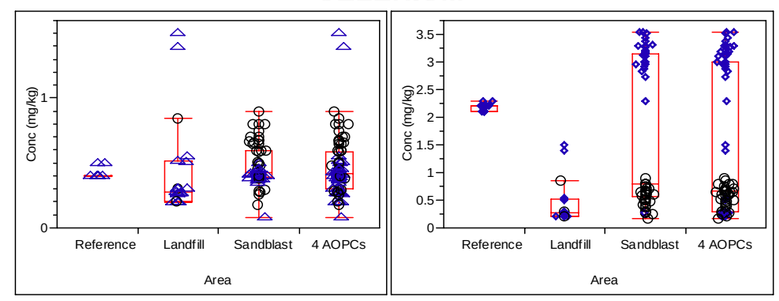

CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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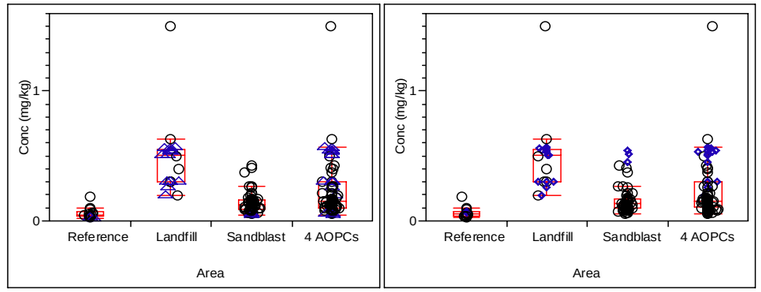
UPLAND OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SOIL (0 - 1ft)

DRAWING NUMBER: FIG L-1c
CAD FILE NUMBER: FIG L-1c
SHEET: OF
REV.

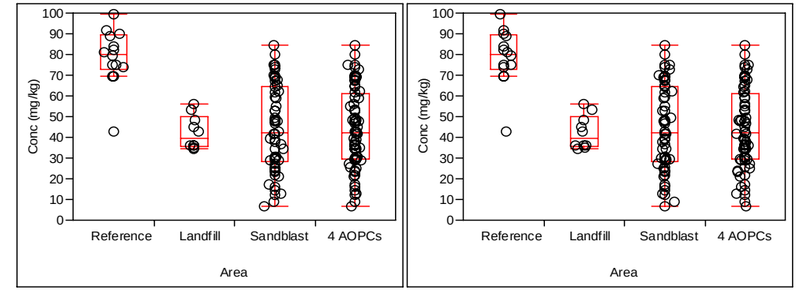
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1c Metals in Upland Soil.dwg Nov 17, 2010 - 8:09am

SILVER



CENSORED AT MDL CENSORED AT MRL

VANADIUM



CENSORED AT MDL CENSORED AT MRL

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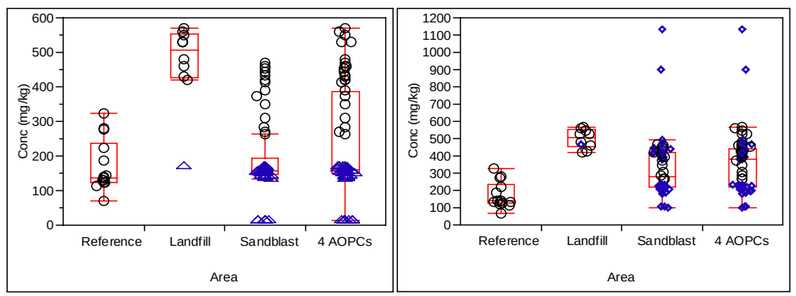

CENSORED AT MDL CENSORED AT MRL

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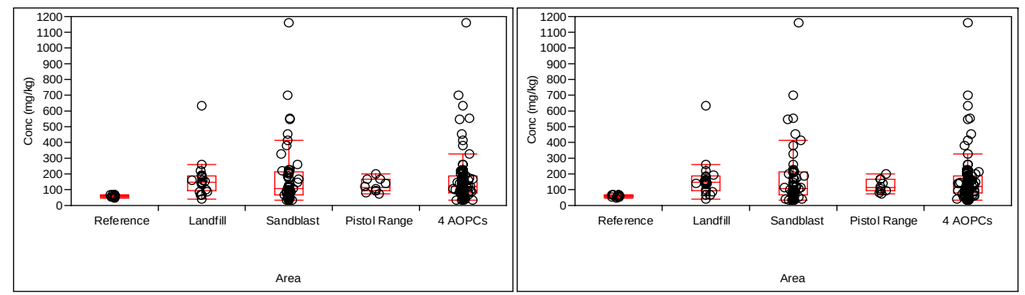
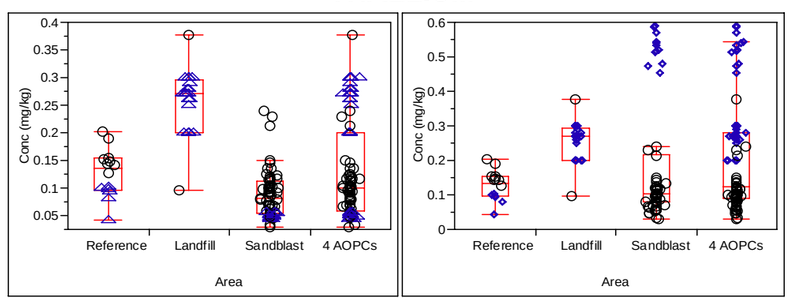


CENSORED AT MDL CENSORED AT MRL

THALLIUM



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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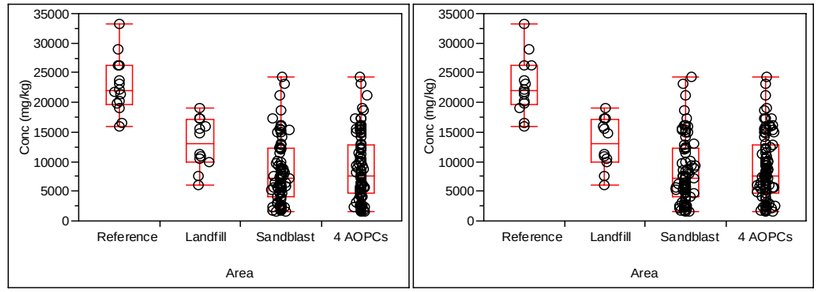
BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SOIL (0 - 1ft)

DRAWING NUMBER: FIG L-1d
CAD FILE NUMBER: FIG L-1d
SHEET: OF
REV.

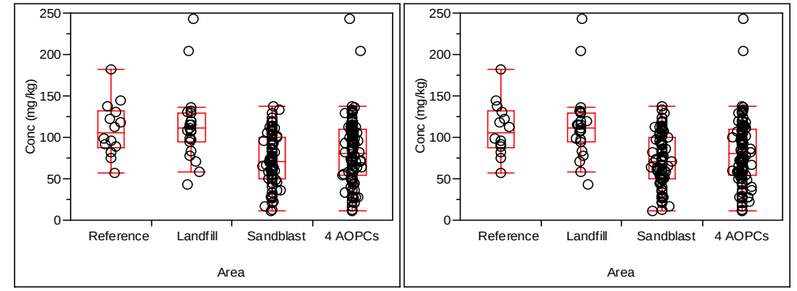
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1d Metals in Upland Soil.dwg Nov 17, 2010 - 8:09am

ALUMINUM



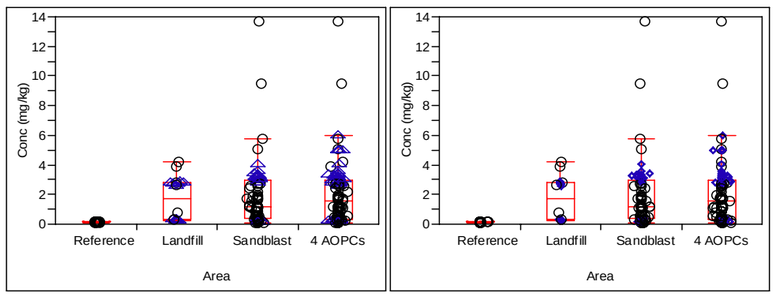
CENSORED AT MDL CENSORED AT MRL

BARIUM



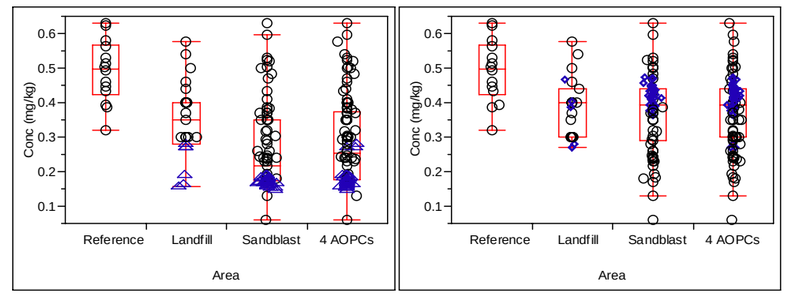
CENSORED AT MDL CENSORED AT MRL

ANTIMONY



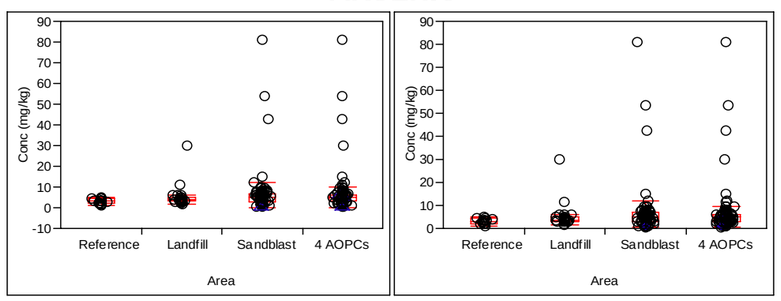
CENSORED AT MDL CENSORED AT MRL

BERYLLIUM



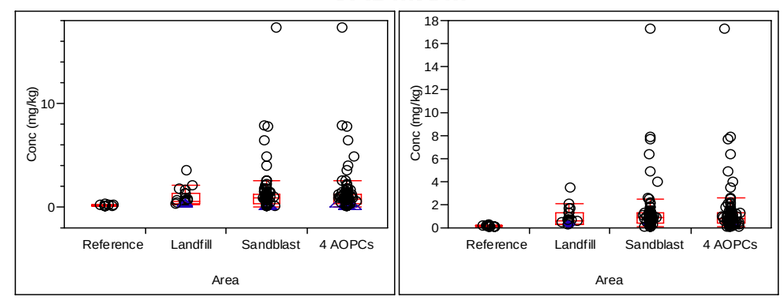
CENSORED AT MDL CENSORED AT MRL

ARSENIC



CENSORED AT MDL CENSORED AT MRL

CADMIUM



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
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SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SOIL (0 - 3ft)

DRAWING NUMBER: FIG L-1e
CAD FILE NUMBER: FIG L-1e
SHEET: OF
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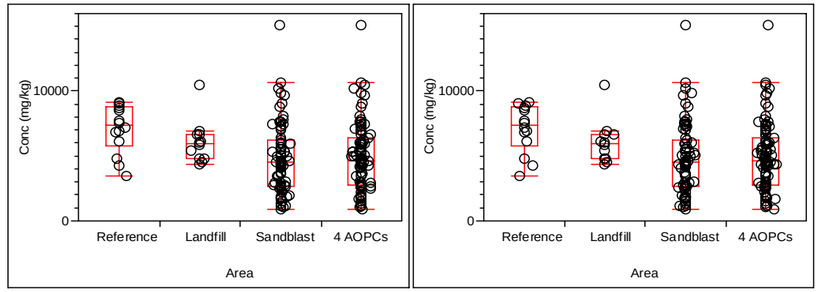
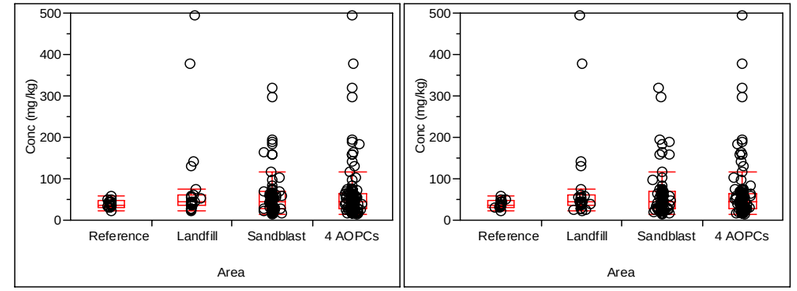
CALCIUM



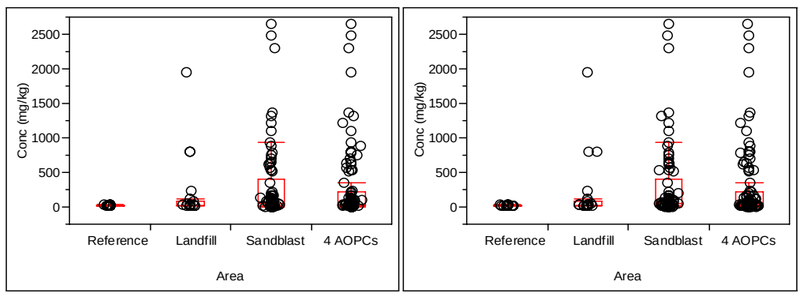
CENSORED AT MDL CENSORED AT MRL

COPPER



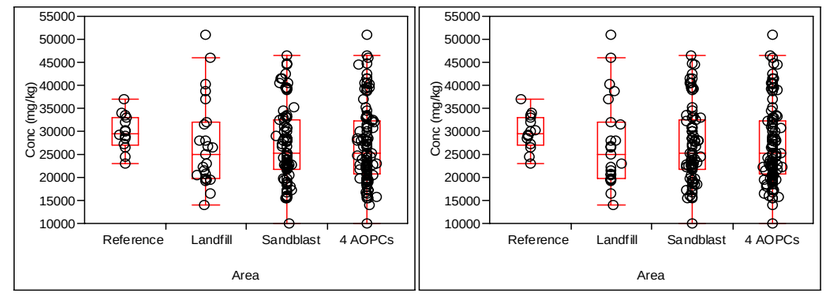
CENSORED AT MDL CENSORED AT MRL

CHROMIUM



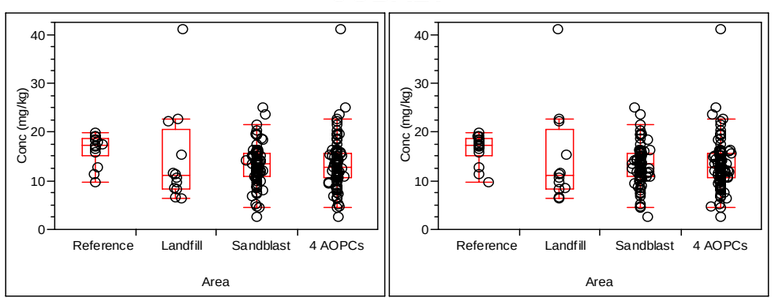
CENSORED AT MDL CENSORED AT MRL

IRON



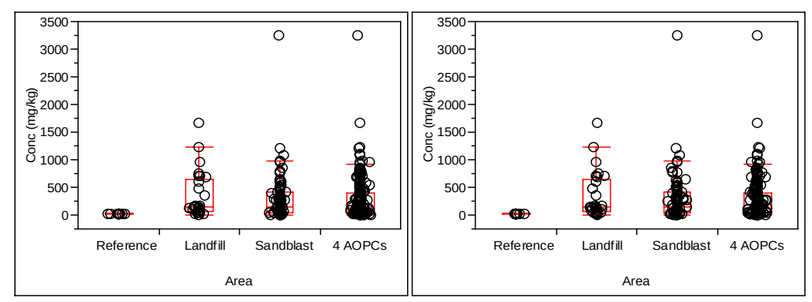
CENSORED AT MDL CENSORED AT MRL

COBALT



CENSORED AT MDL CENSORED AT MRL

LEAD



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SOIL (0 - 3ft)

DRAWING NUMBER: FIG L-1f
CAD FILE NUMBER: FIG L-1f
SHEET: OF
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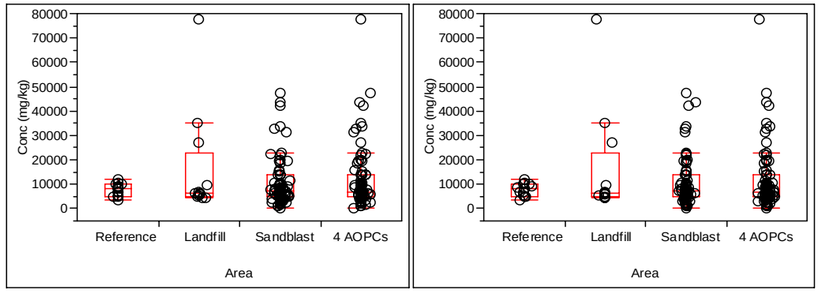
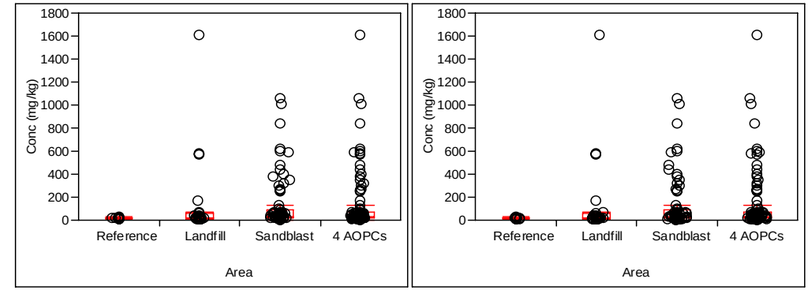
MAGNESIUM



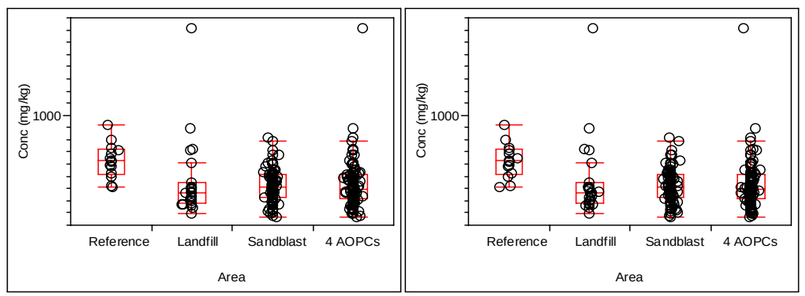
CENSORED AT MDL CENSORED AT MRL

NICKEL



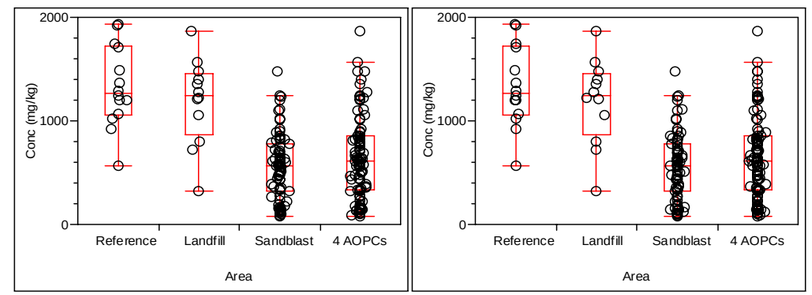
CENSORED AT MDL CENSORED AT MRL

MANGANESE



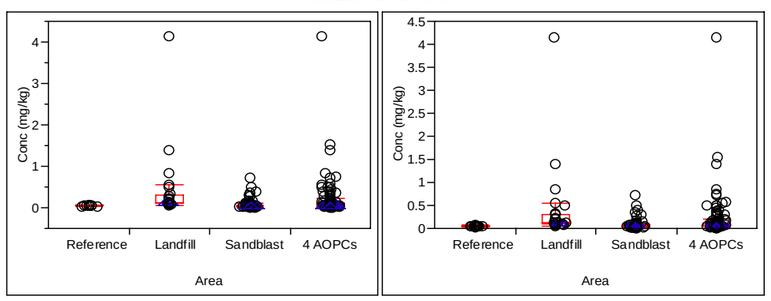
CENSORED AT MDL CENSORED AT MRL

POTASSIUM



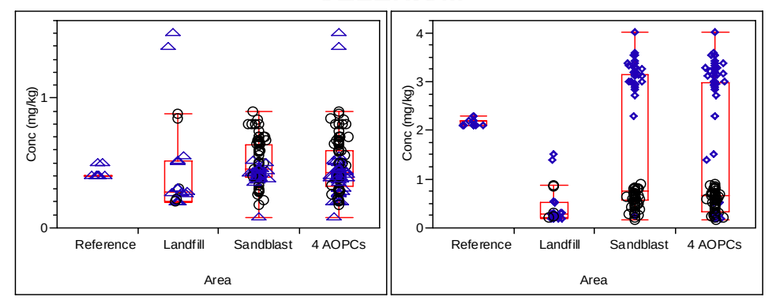
CENSORED AT MDL CENSORED AT MRL

MERCURY



CENSORED AT MDL CENSORED AT MRL

SELENIUM



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
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SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SOIL (0 - 3ft)

DRAWING NUMBER: FIG L-1g
CAD FILE NUMBER: FIG L-1g
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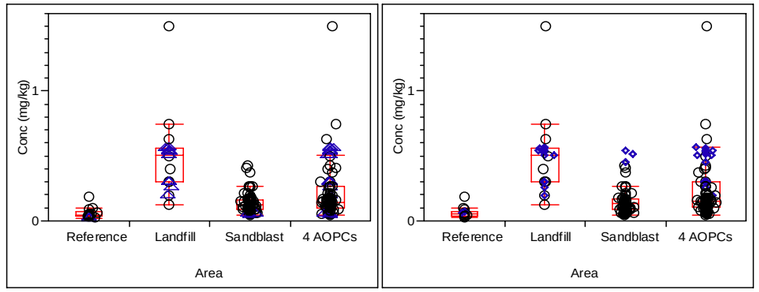
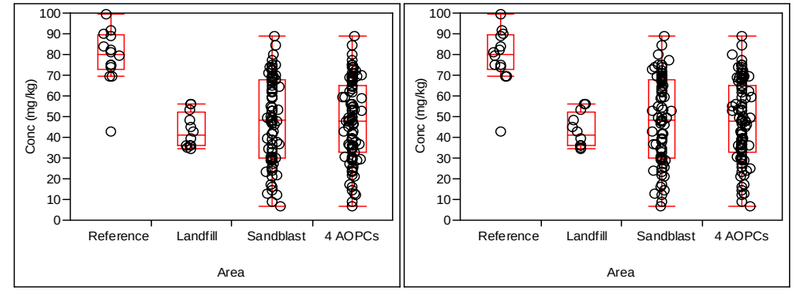
SILVER



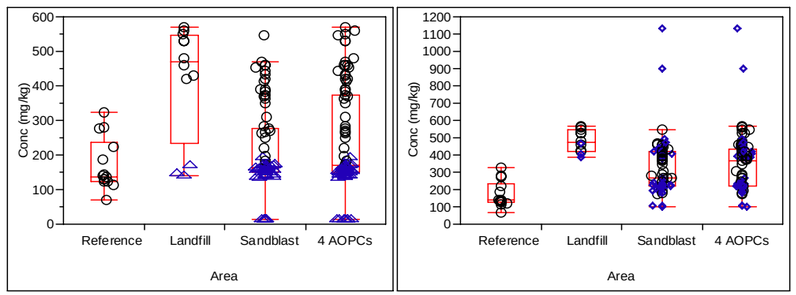
CENSORED AT MDL CENSORED AT MRL

VANADIUM



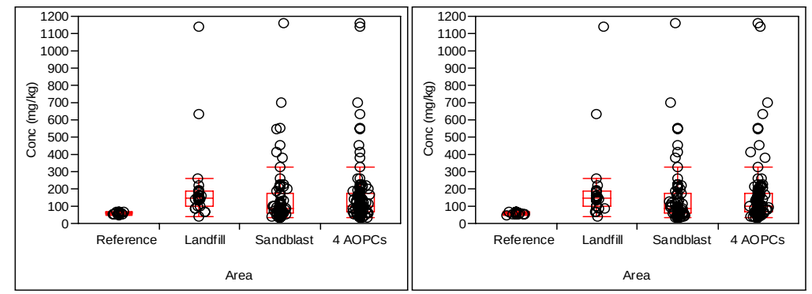
CENSORED AT MDL CENSORED AT MRL

SODIUM



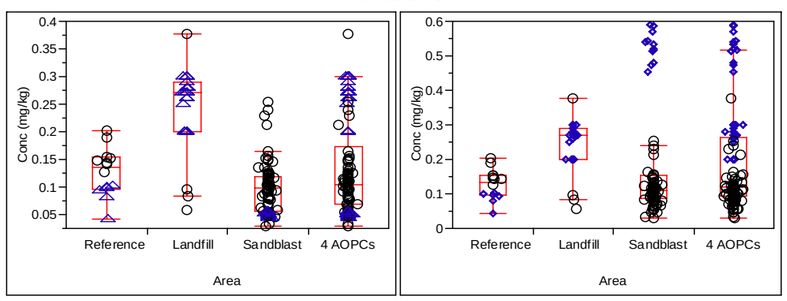
CENSORED AT MDL CENSORED AT MRL

ZINC



CENSORED AT MDL CENSORED AT MRL

THALLIUM



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
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SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SOIL (0 - 3ft)

DRAWING NUMBER: FIG L-1h
CAD FILE NUMBER: FIG L-1h
SHEET: OF
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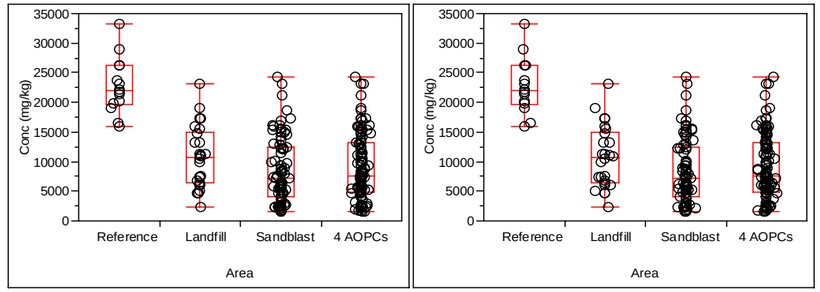
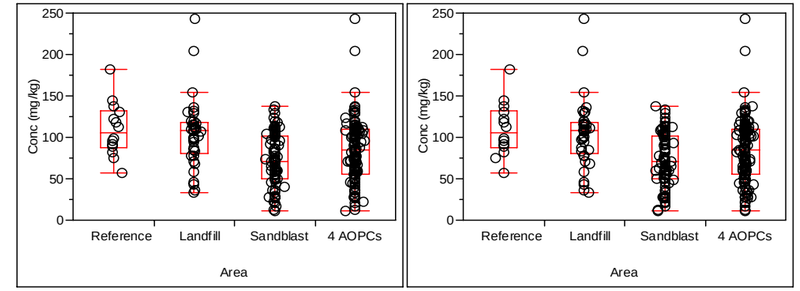
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1h Metals in Upland Soil.dwg Nov 17, 2010 - 8:26am

ALUMINUM



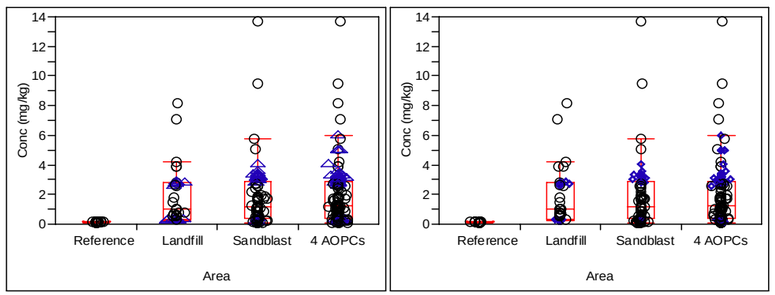
CENSORED AT MDL CENSORED AT MRL

BARIUM



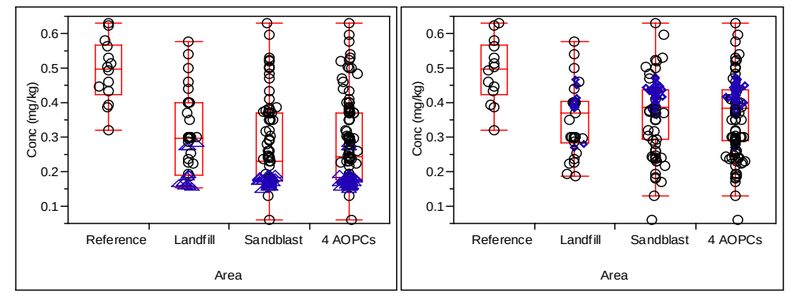
CENSORED AT MDL CENSORED AT MRL

ANTIMONY



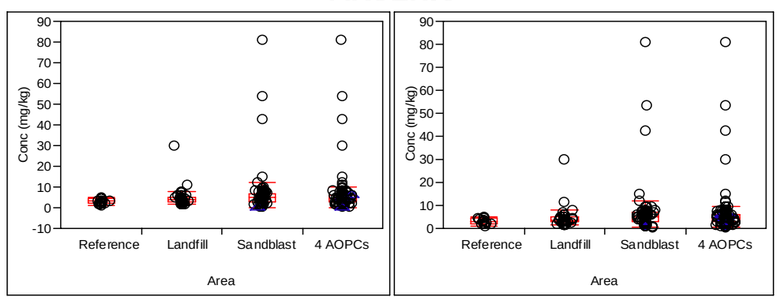
CENSORED AT MDL CENSORED AT MRL

BERYLLIUM



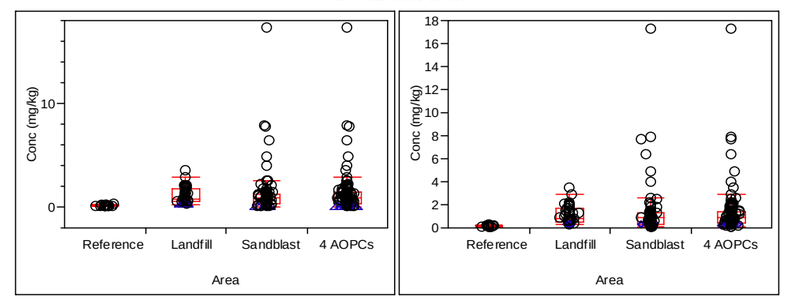
CENSORED AT MDL CENSORED AT MRL

ARSENIC



CENSORED AT MDL CENSORED AT MRL

CADMIUM



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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UPLAND OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SOIL (0 - 10ft)

DRAWING NUMBER: FIG L-1i
CAD FILE NUMBER: FIG L-1i
SHEET: OF
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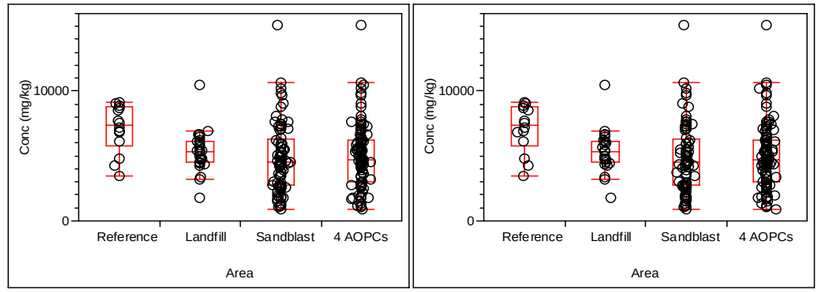
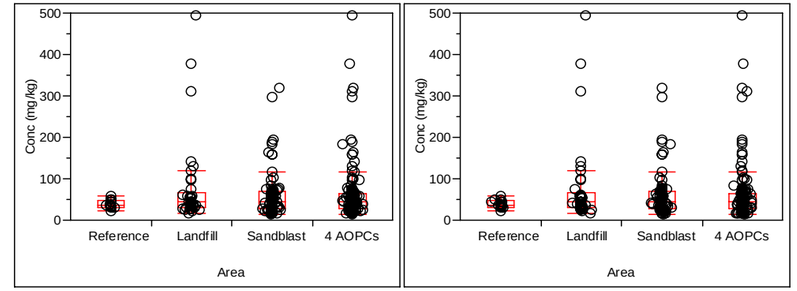
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1i Metals in Upland Soil.dwg Nov 17, 2010 - 8:26am

CALCIUM



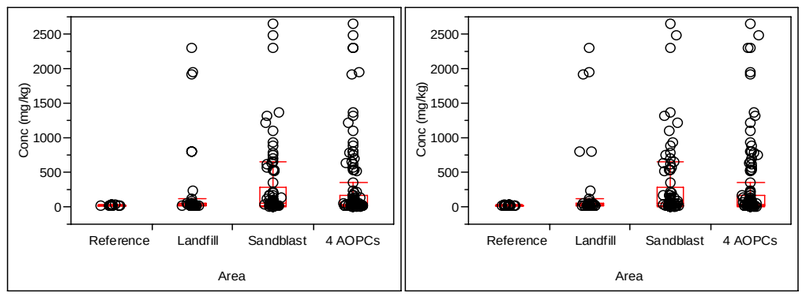
CENSORED AT MDL CENSORED AT MRL

COPPER



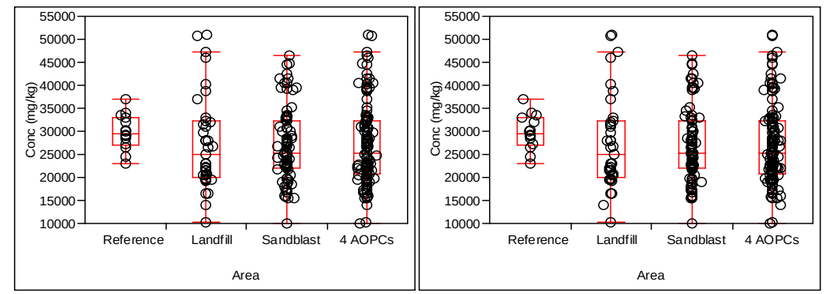
CENSORED AT MDL CENSORED AT MRL

CHROMIUM



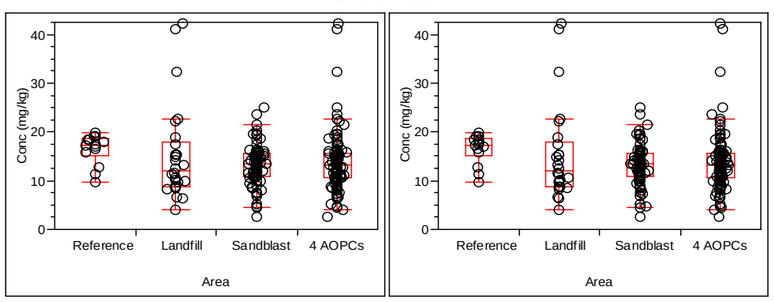
CENSORED AT MDL CENSORED AT MRL

IRON



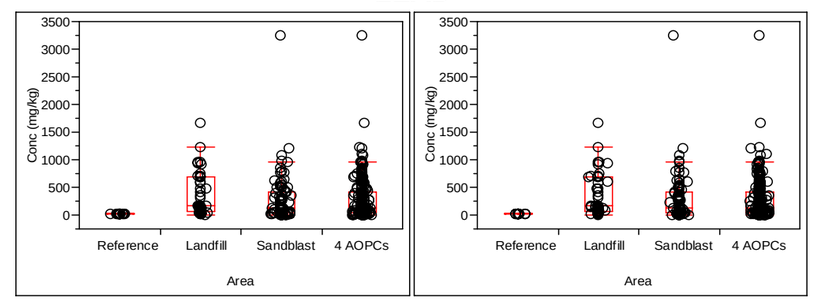
CENSORED AT MDL CENSORED AT MRL

COBALT



CENSORED AT MDL CENSORED AT MRL

LEAD



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

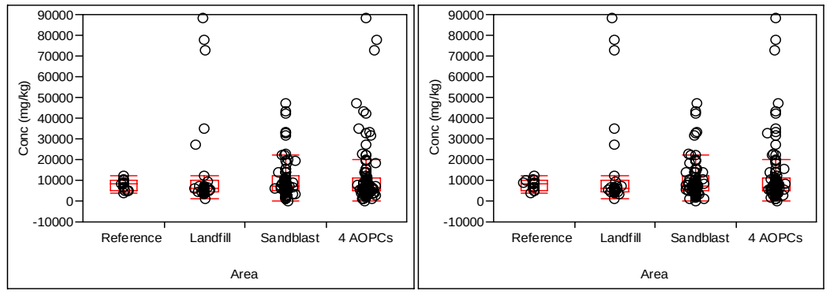
UPLAND OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SOIL (0 - 10ft)

DRAWING NUMBER: FIG L-1j
CAD FILE NUMBER: FIG L-1j
SHEET: OF
REV.

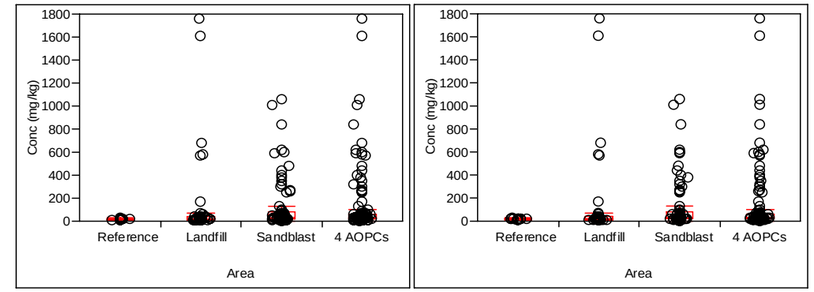
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1j Metals in Upland Soil.dwg Nov 17, 2010 - 8:27am

MAGNESIUM



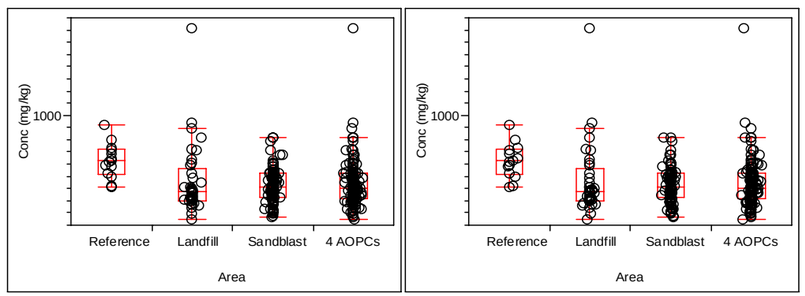
CENSORED AT MDL CENSORED AT MRL

NICKEL



CENSORED AT MDL CENSORED AT MRL

MANGANESE



CENSORED AT MDL CENSORED AT MRL

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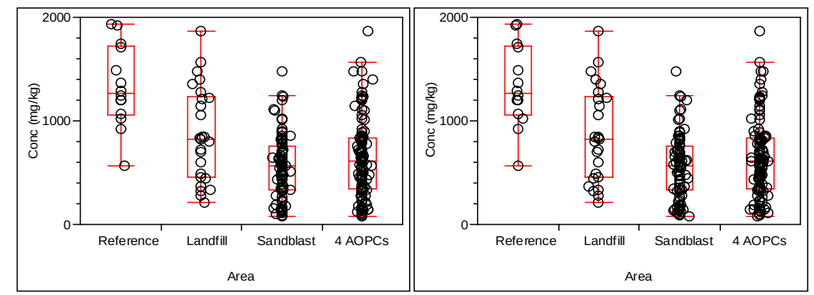
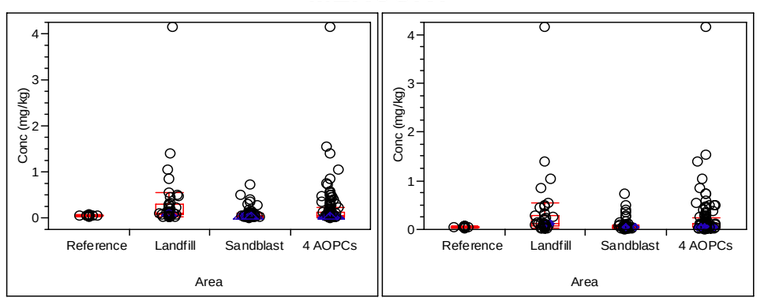


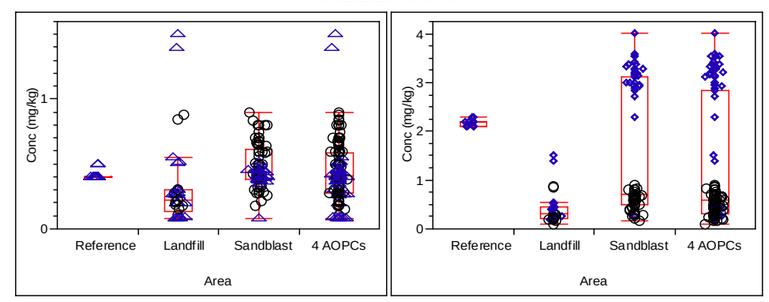
CENSORED AT MDL CENSORED AT MRL

MERCURY



CENSORED AT MDL CENSORED AT MRL

SELENIUM



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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111 SW Columbia, Suite 1500
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BRADFORD ISLAND

CASCADE LOCKS, OREGON

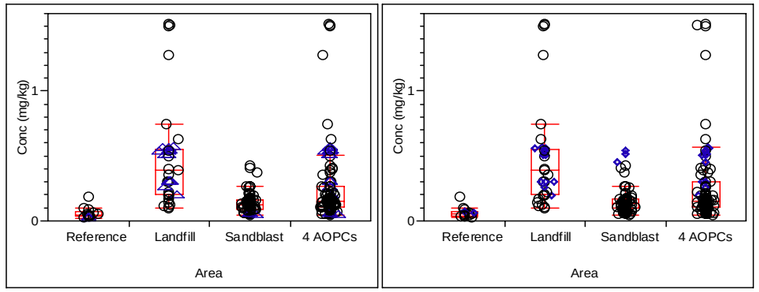
UPLAND OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SOIL (0 - 10ft)

DRAWING NUMBER: FIG L-1k
CAD FILE NUMBER: FIG L-1k
SHEET: OF
REV.

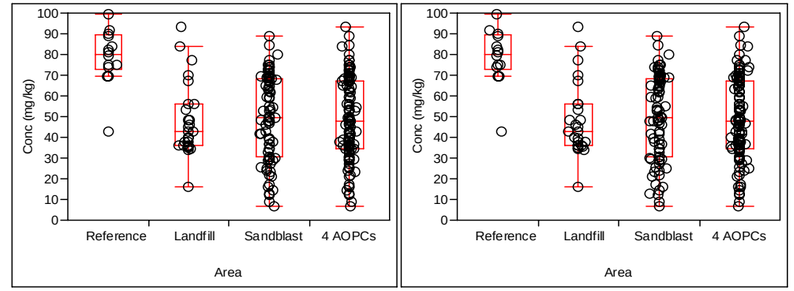
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1k Metals in Upland Soil.dwg Nov 17, 2010 - 8:27am

SILVER



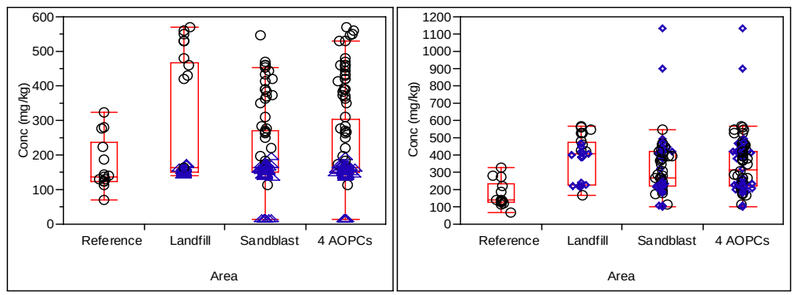
CENSORED AT MDL CENSORED AT MRL

VANADIUM



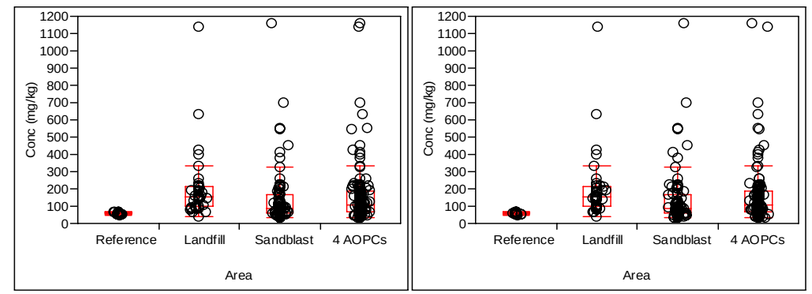
CENSORED AT MDL CENSORED AT MRL

SODIUM



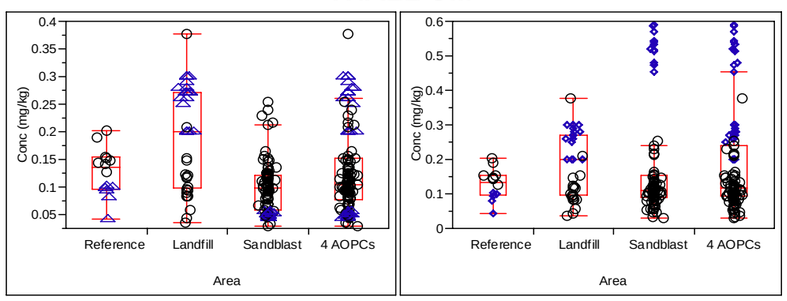
CENSORED AT MDL CENSORED AT MRL

ZINC



CENSORED AT MDL CENSORED AT MRL

THALLIUM



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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UPLAND OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SOIL (0 - 10ft)

DRAWING NUMBER: FIG L-1I
CAD FILE NUMBER: FIG L-1I
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1I Metals in Upland Soil.dwg Nov 17, 2010 - 8:28am

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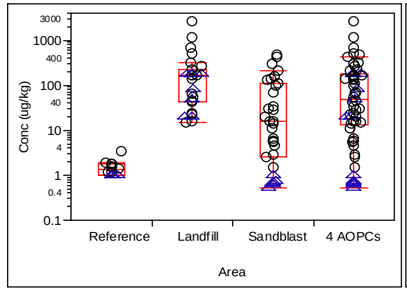

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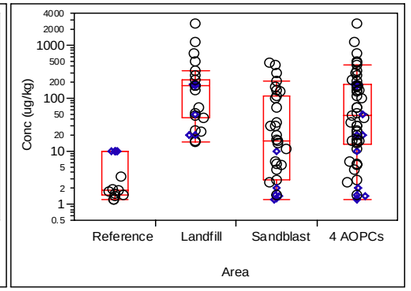
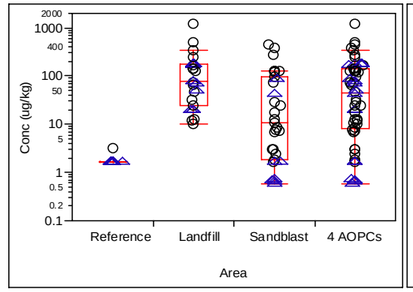
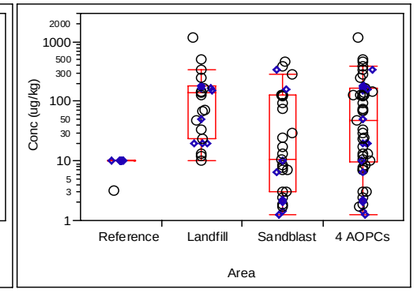


CENSORED AT MRL

FLUORENE

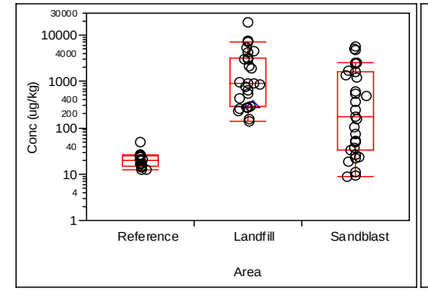


CENSORED AT MDL

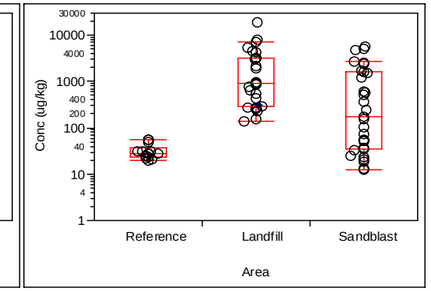


CENSORED AT MRL

TOTAL LPAHs

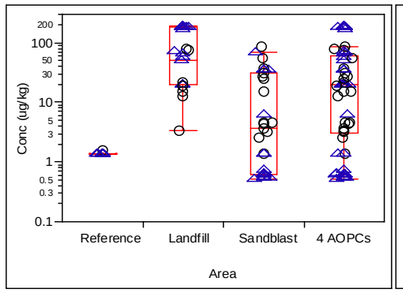


CENSORED AT MDL



CENSORED AT MRL

ACENAPHTHYLENE



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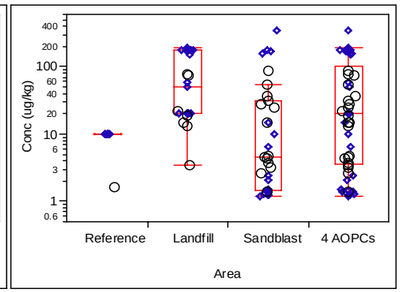
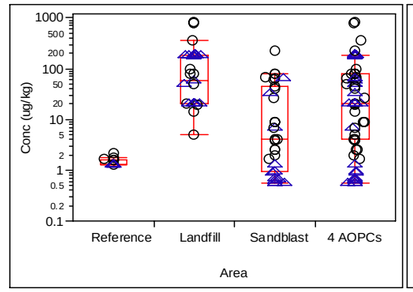


CENSORED AT MRL

NAPHTHALENE



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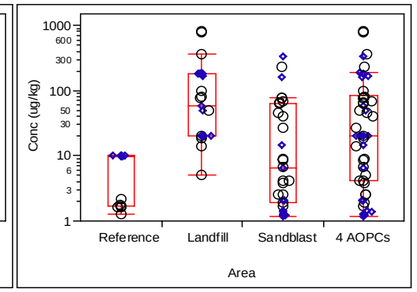
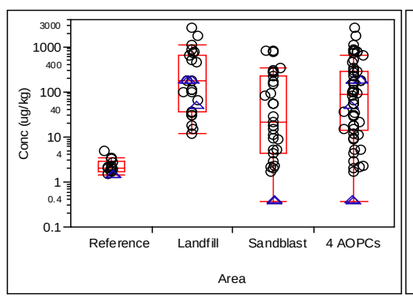


CENSORED AT MRL

ANTHRACENE



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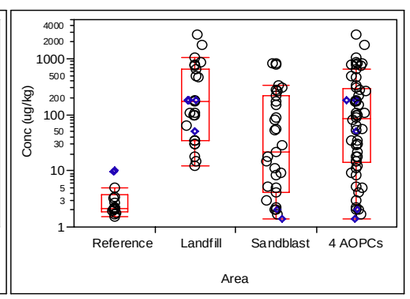
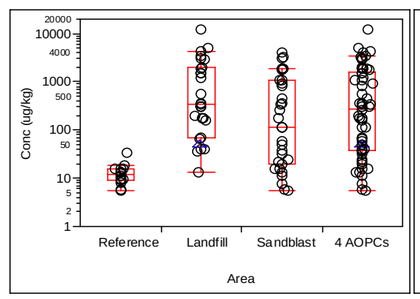
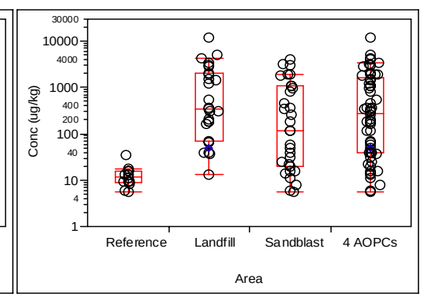


CENSORED AT MRL

PHENANTHRENE



CENSORED AT MDL



CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

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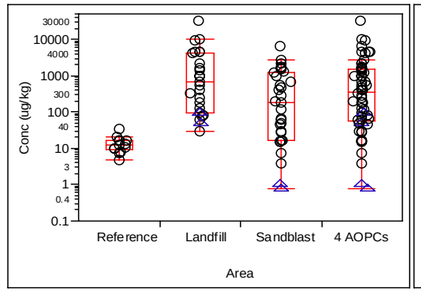
UPLAND OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN UPLAND SOIL (0 - 1ft)

DRAWING NUMBER: FIG L-1m
CAD FILE NUMBER: FIG L-1m
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1m PAHs in Upland Soil.dwg Nov 17, 2010 - 8:28am

BENZO(A)ANTHRACENE



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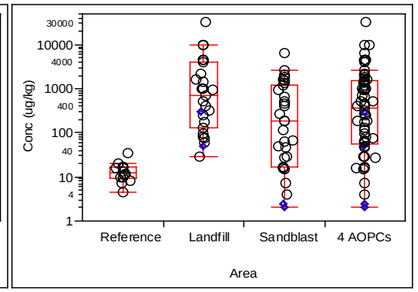
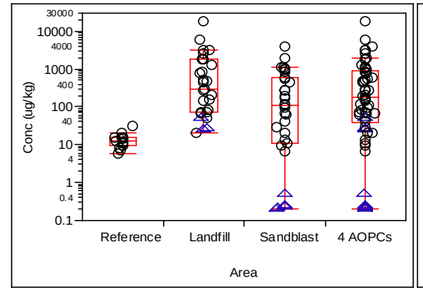


CENSORED AT MRL

BENZO(G,H,I)PERYLENE



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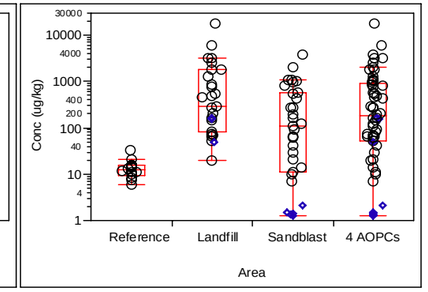
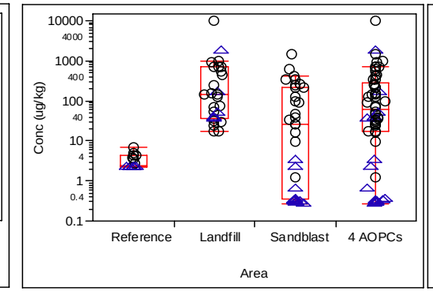


CENSORED AT MRL

DIBENZ(A,H)ANTHRACENE



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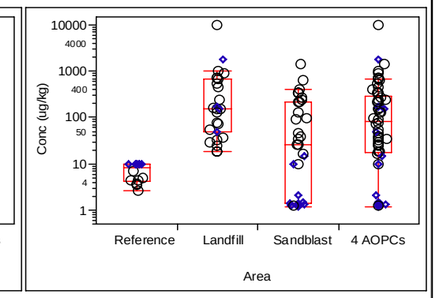
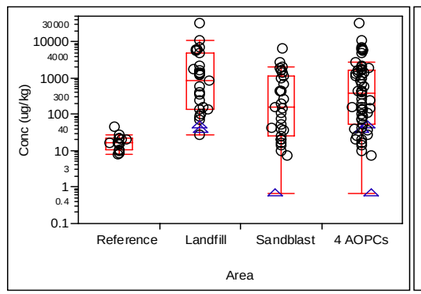


CENSORED AT MRL

BENZO(A)PYRENE



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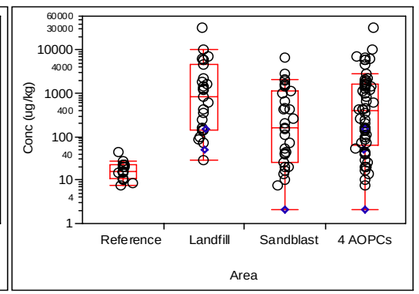
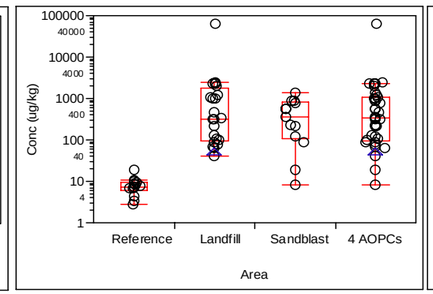


CENSORED AT MRL

BENZO(K)FLUORANTHENE



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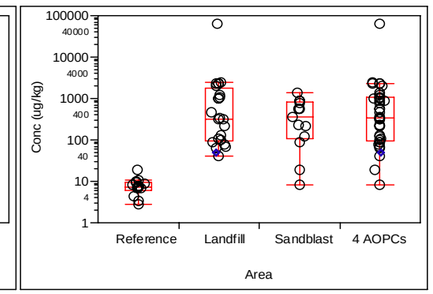
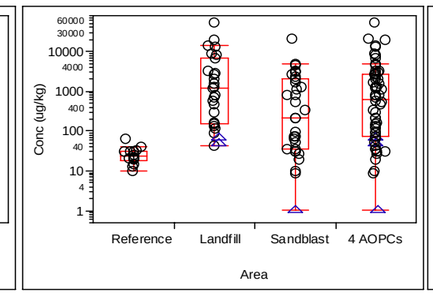


CENSORED AT MRL

FLUORANTHENE



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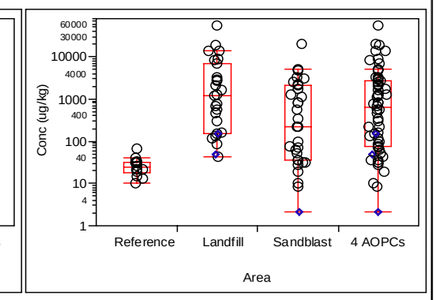
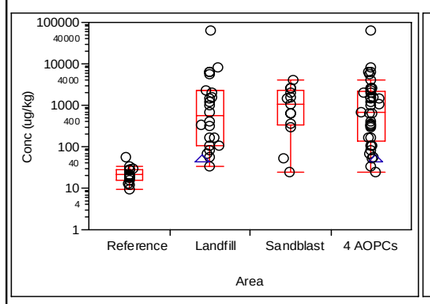


CENSORED AT MRL

BENZO(B)FLUORANTHENE



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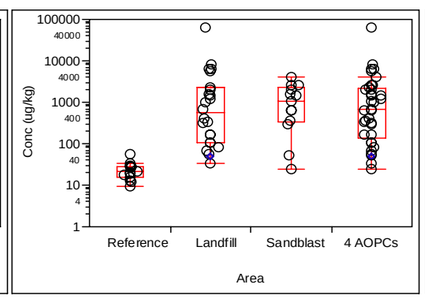
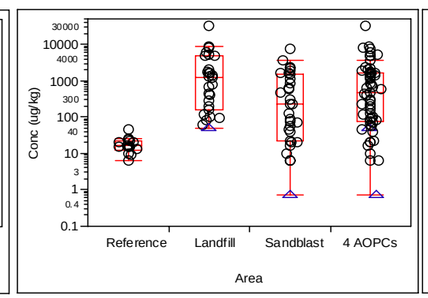


CENSORED AT MRL

CHRYSENE



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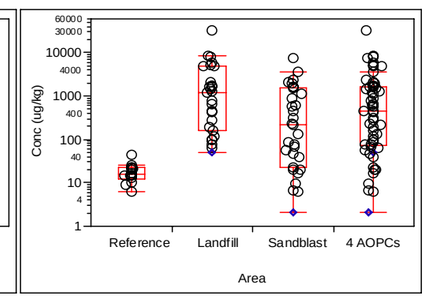
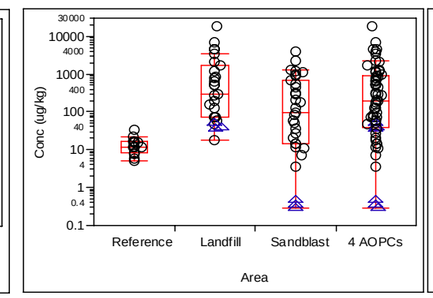


CENSORED AT MRL

INDENO(1,2,3-CD)PYRENE



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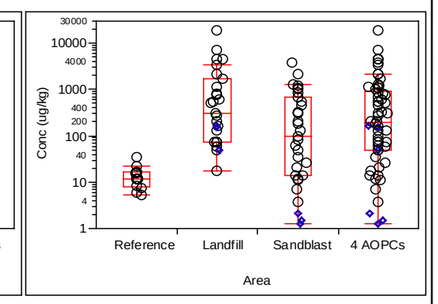

CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

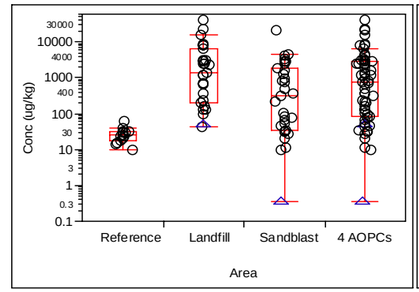
UPLAND OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN UPLAND SOIL (0 - 1ft)

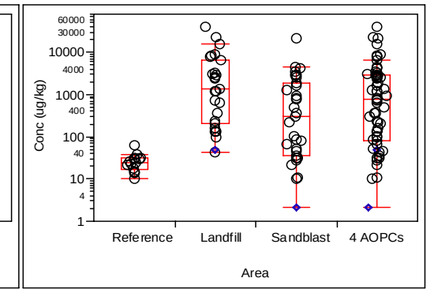
DRAWING NUMBER: FIG L-1n
CAD FILE NUMBER: FIG L-1n
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1n PAHs in Uplond Soil.dwg Nov 17, 2010 - 8:29am

PYRENE

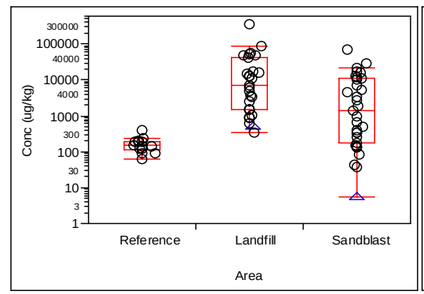


CENSORED AT MDL



CENSORED AT MRL

TOTAL HPAHs



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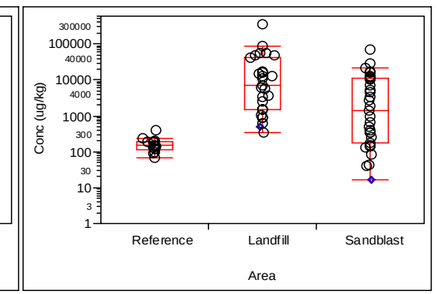
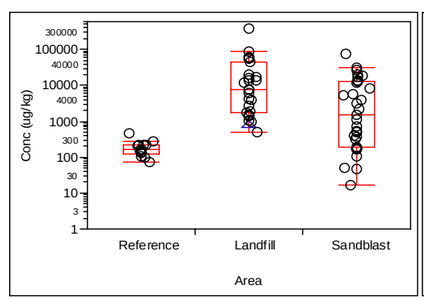


CENSORED AT MRL

tPAHs



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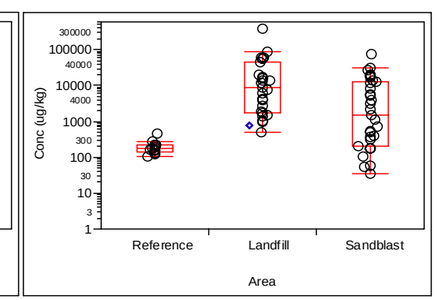

CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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UPLAND OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN UPLAND SOIL (0 - 1ft)

DRAWING NUMBER: FIG L-1o
CAD FILE NUMBER: FIG L-1o
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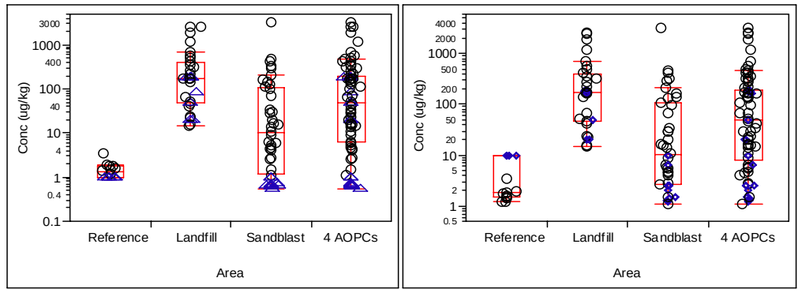
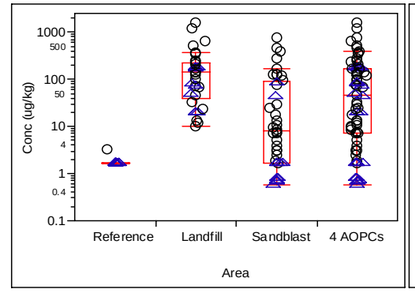
ACENAPHTHENE



CENSORED AT MDL

CENSORED AT MRL

FLUORENE



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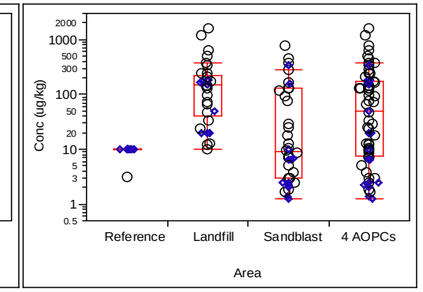
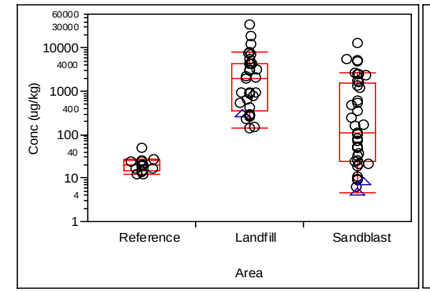


CENSORED AT MRL

TOTAL LPAHs



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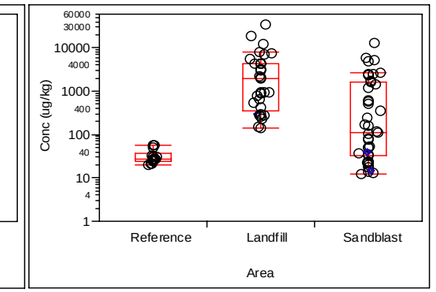
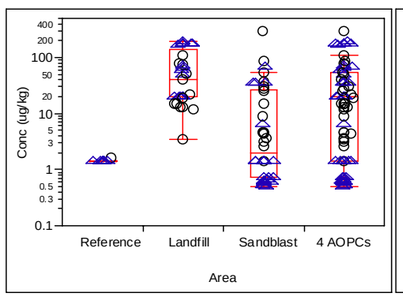


CENSORED AT MRL

ACENAPHTHYLENE



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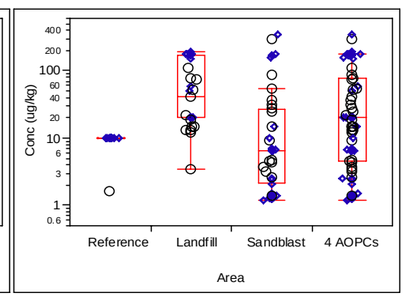
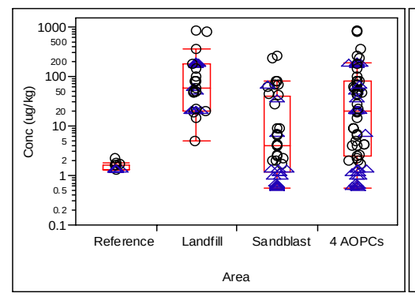


CENSORED AT MRL

NAPHTHALENE



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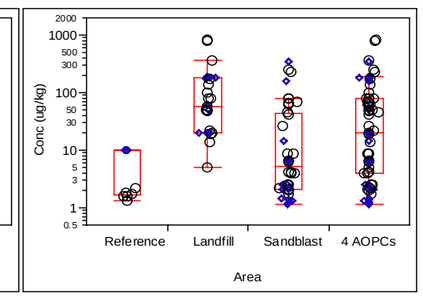
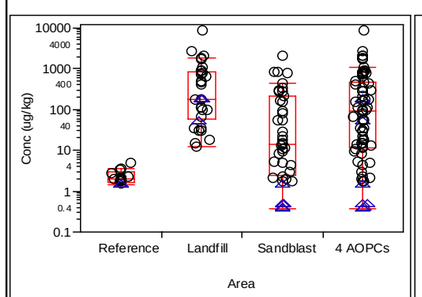


CENSORED AT MRL

ANTHRACENE



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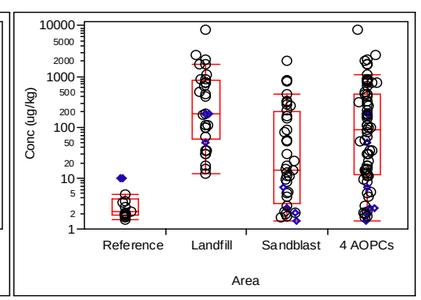
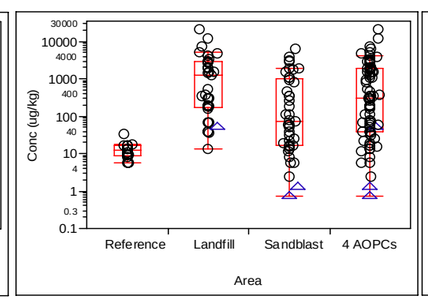


CENSORED AT MRL

PHENANTHRENE



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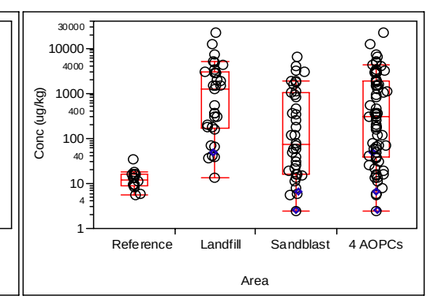

CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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PAHs IN UPLAND SOIL (0 - 3ft)

DRAWING NUMBER: FIG L-1p
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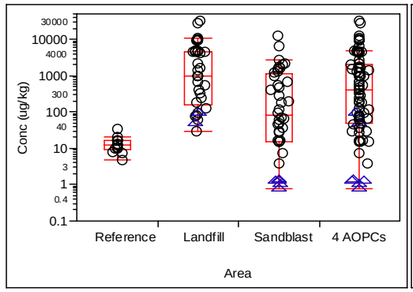
O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1p PAHs in Upland Soil.dwg Nov 17, 2010 - 8:30am

BENZO(A)ANTHRACENE



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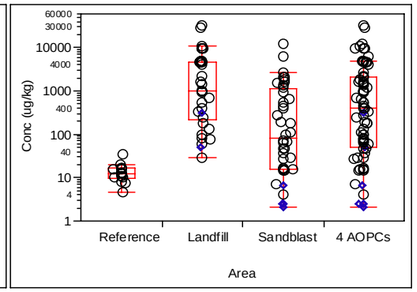
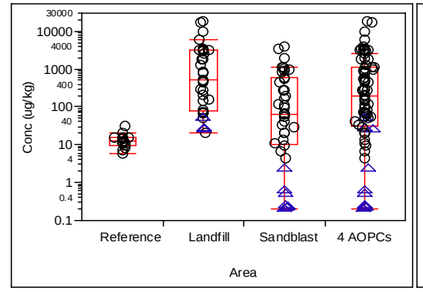


CENSORED AT MRL

BENZO(G,H,I)PERYLENE



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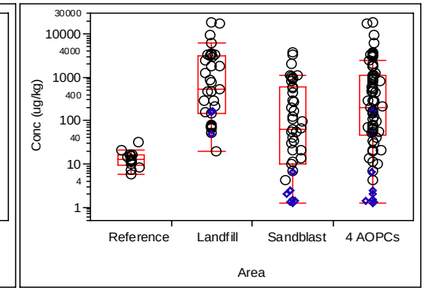
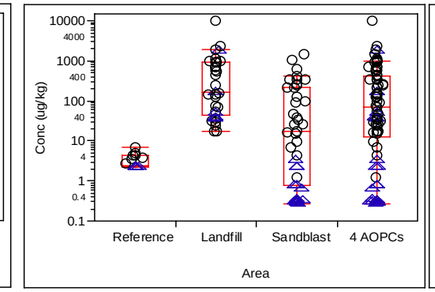


CENSORED AT MRL

DIBENZ(A,H)ANTHRACENE



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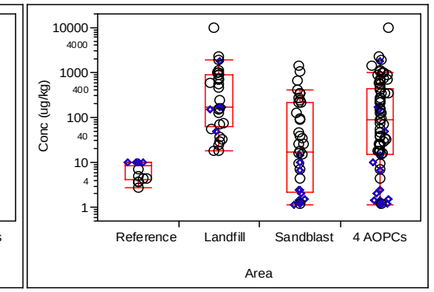
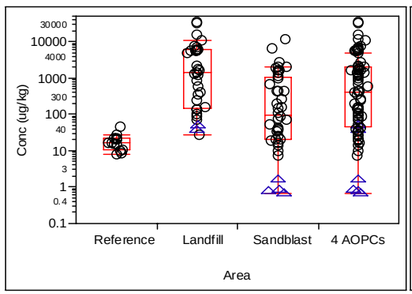


CENSORED AT MRL

BENZO(A)PYRENE



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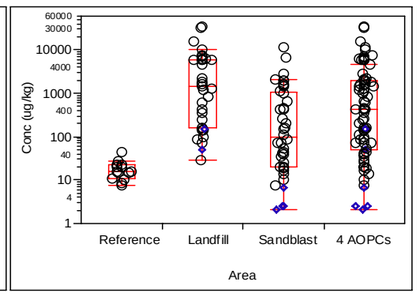
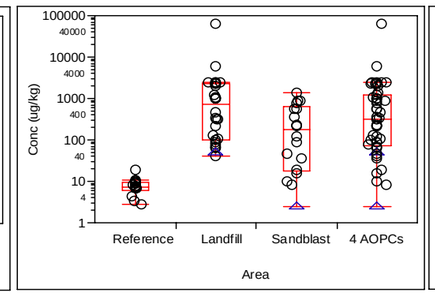


CENSORED AT MRL

BENZO(K)FLUORANTHENE



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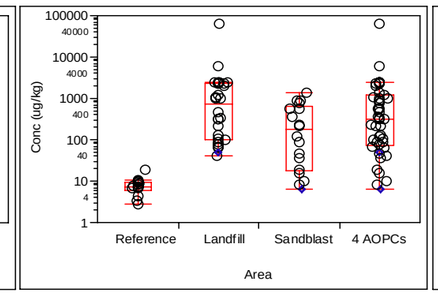
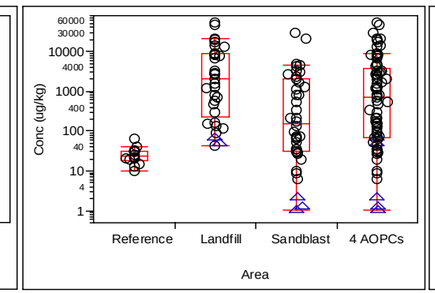


CENSORED AT MRL

FLUORANTHENE



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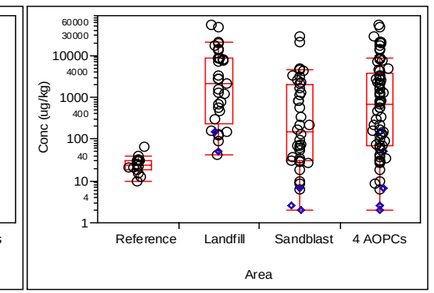
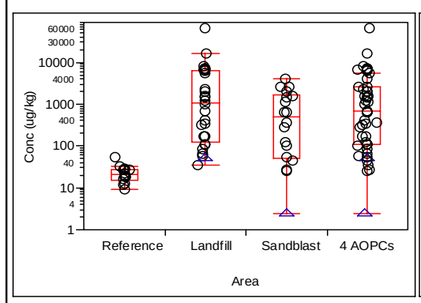


CENSORED AT MRL

BENZO(B)FLUORANTHENE



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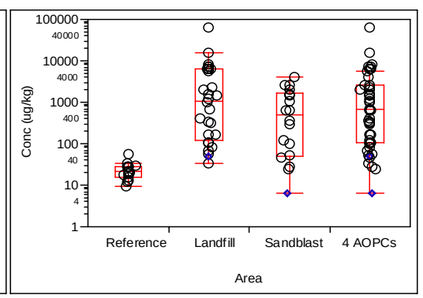

CENSORED AT MRL

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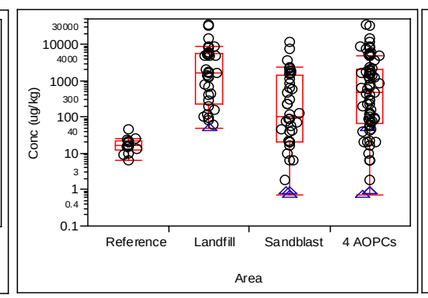

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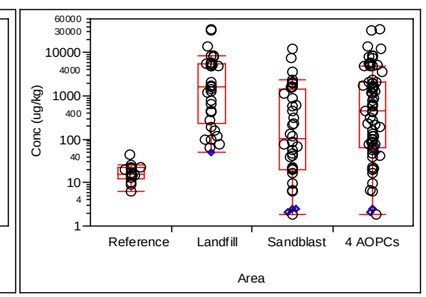
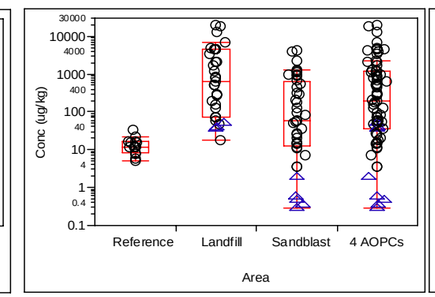


CENSORED AT MRL

INDENO(1,2,3-CD)PYRENE



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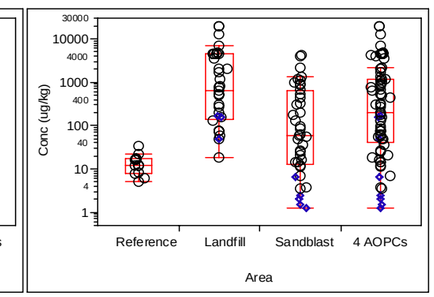

CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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PAHs IN UPLAND SOIL (0 - 3ft)

DRAWING NUMBER: FIG L-1q
CAD FILE NUMBER: FIG L-1q
SHEET: OF
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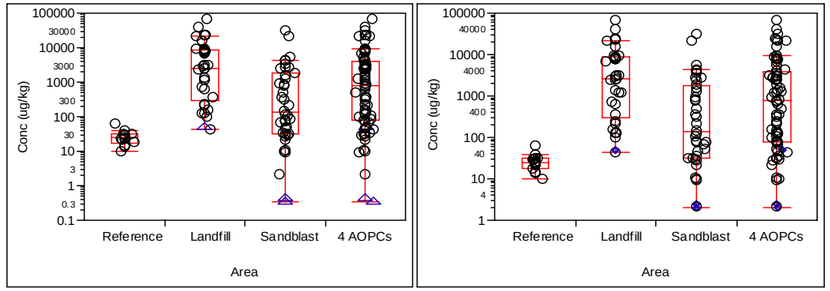
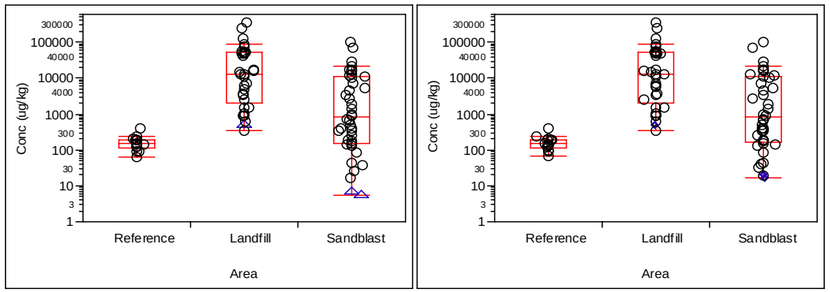
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1q PAHs in Upland Soil.dwg Nov 17, 2010 - 8:31am

PYRENE



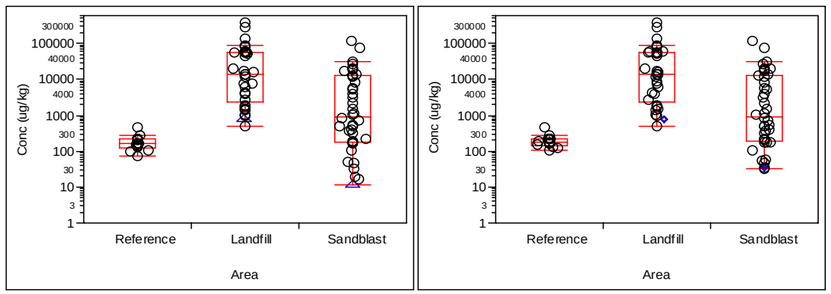
CENSORED AT MDL CENSORED AT MRL

TOTAL HPAHs



CENSORED AT MDL CENSORED AT MRL

tPAHs



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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UPLAND OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN UPLAND SOIL (0 - 3ft)

DRAWING NUMBER: FIG L-1r
CAD FILE NUMBER: FIG L-1r
SHEET: OF
REV.

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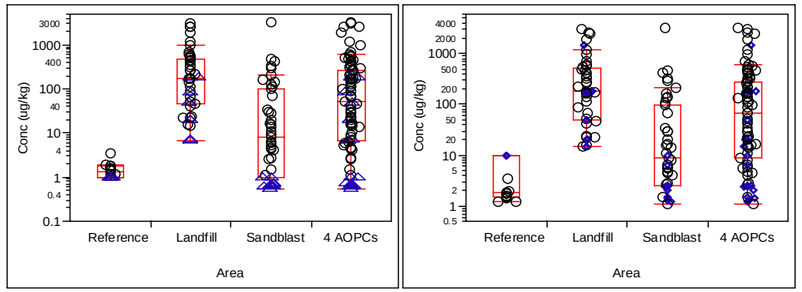
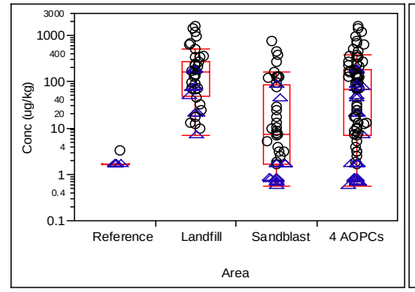


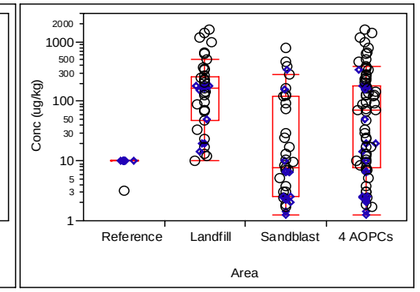
CENSORED AT MDL

CENSORED AT MRL

FLUORENE

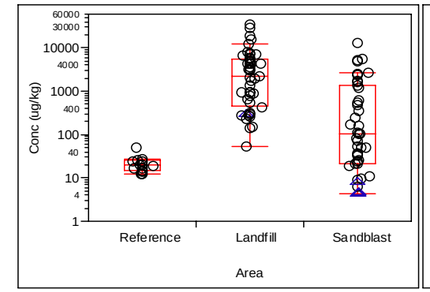


CENSORED AT MDL



CENSORED AT MRL

TOTAL LPAHs



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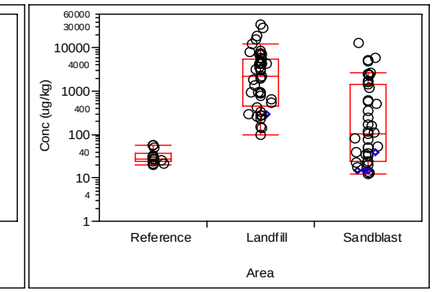
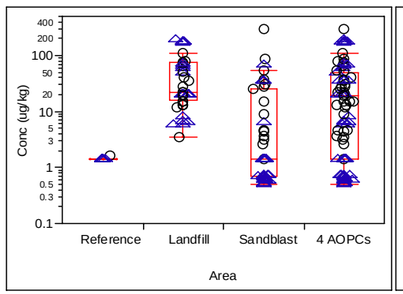


CENSORED AT MRL

ACENAPHTHYLENE



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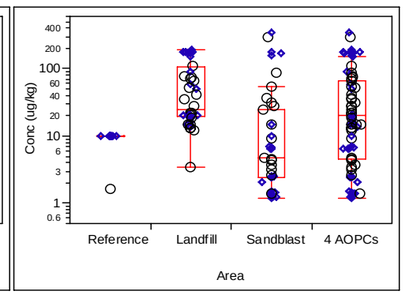
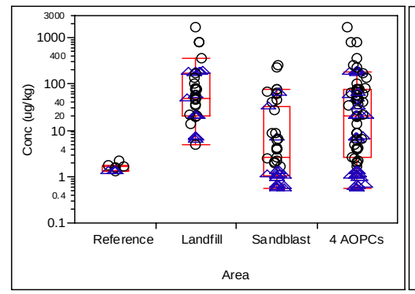
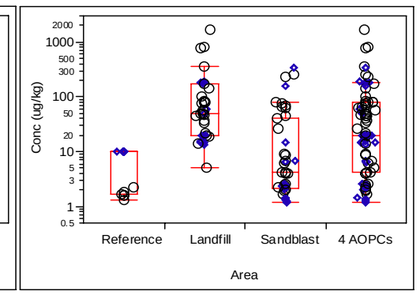


CENSORED AT MRL

NAPHTHALENE

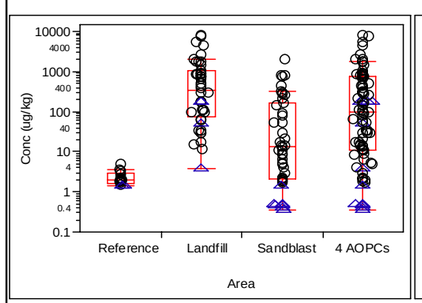


CENSORED AT MDL



CENSORED AT MRL

ANTHRACENE



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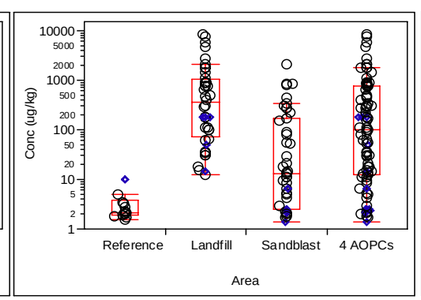
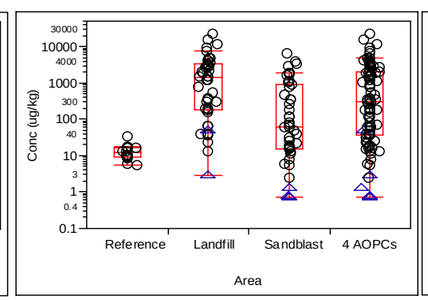


CENSORED AT MRL

PHENANTHRENE



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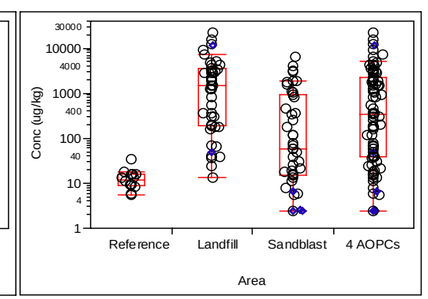

CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

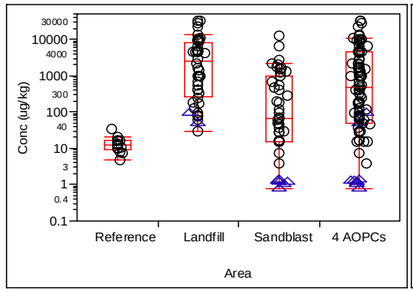
UPLAND OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN UPLAND SOIL (0 - 10ft)

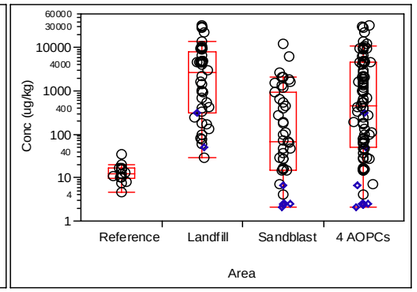
DRAWING NUMBER: FIG L-1s
CAD FILE NUMBER: FIG L-1s
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1s PAHs in Upland Soil.dwg Nov 17, 2010 - 8:31am

BENZO(A)ANTHRACENE

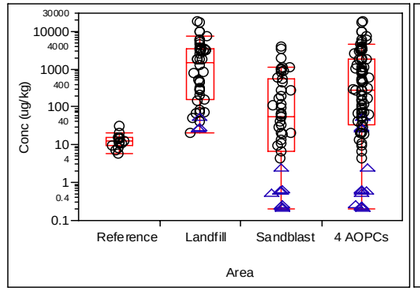


CENSORED AT MDL

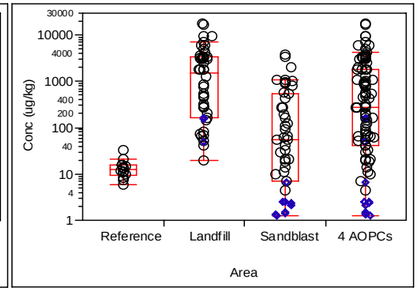


CENSORED AT MRL

BENZO(G,H,I)PERYLENE

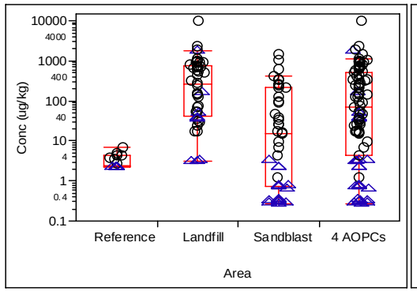


CENSORED AT MDL



CENSORED AT MRL

DIBENZ(A,H)ANTHRACENE



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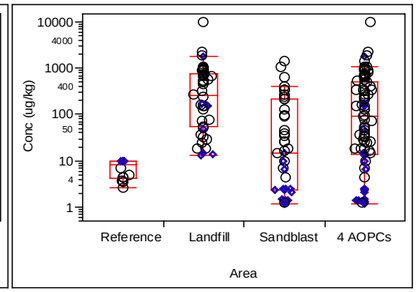
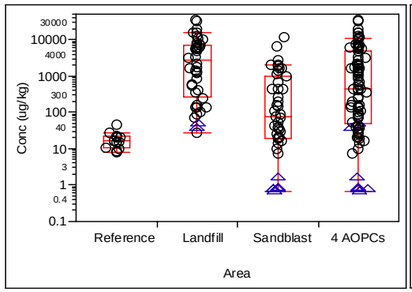


CENSORED AT MRL

BENZO(A)PYRENE



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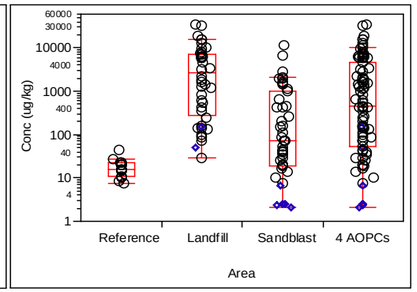
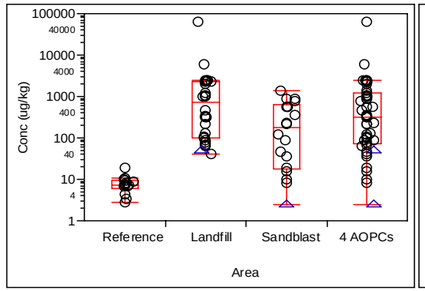


CENSORED AT MRL

BENZO(K)FLUORANTHENE



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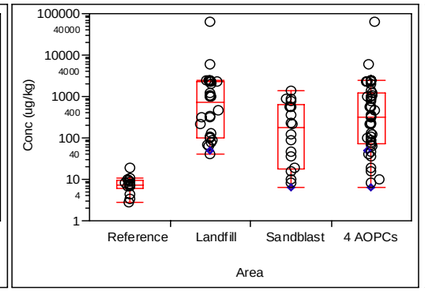
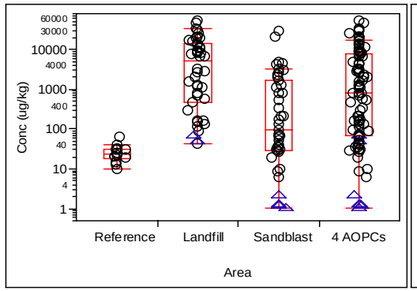


CENSORED AT MRL

FLUORANTHENE



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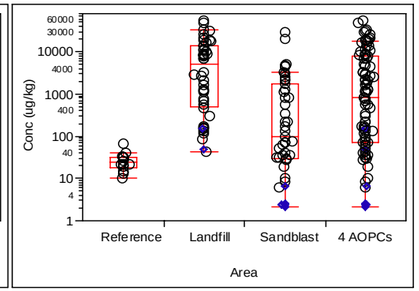
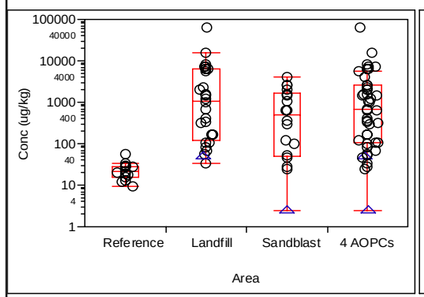


CENSORED AT MRL

BENZO(B)FLUORANTHENE



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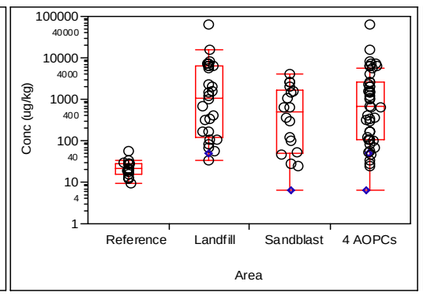
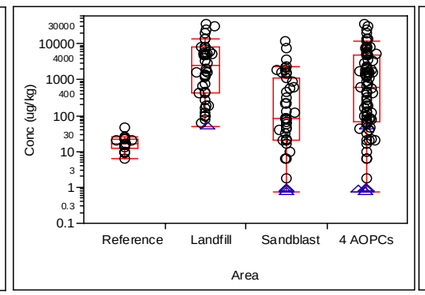


CENSORED AT MRL

CHRYSENE



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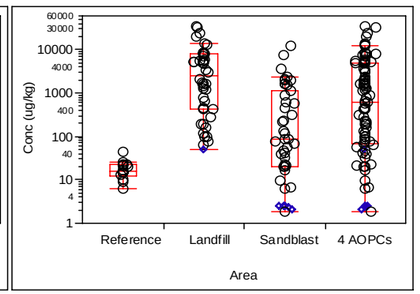
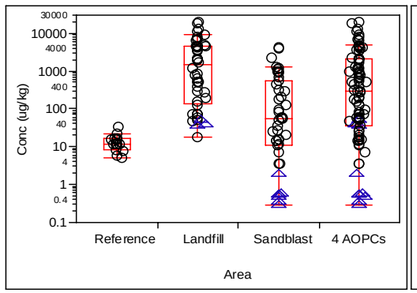


CENSORED AT MRL

INDENO(1,2,3-CD)PYRENE



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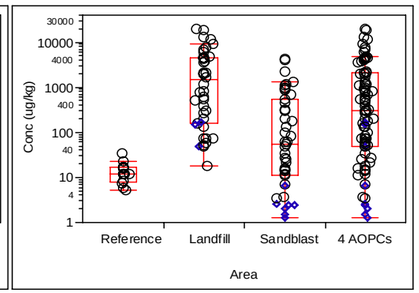

CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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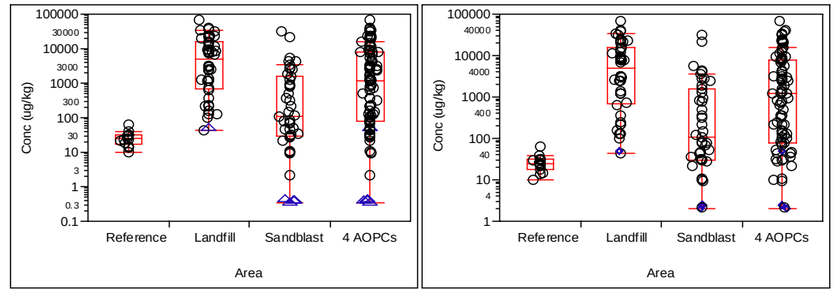
UPLAND OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN UPLAND SOIL (0 - 10ft)

DRAWING NUMBER: FIG L-1t
CAD FILE NUMBER: FIG L-1t
SHEET: OF
REV.

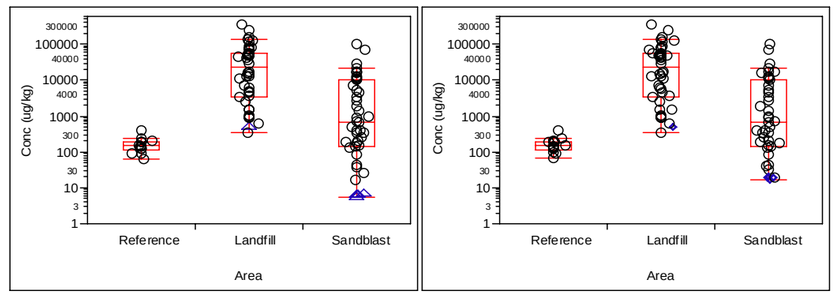
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1t PAHs in Upland Soil.dwg Nov 17, 2010 - 8:32am

PYRENE



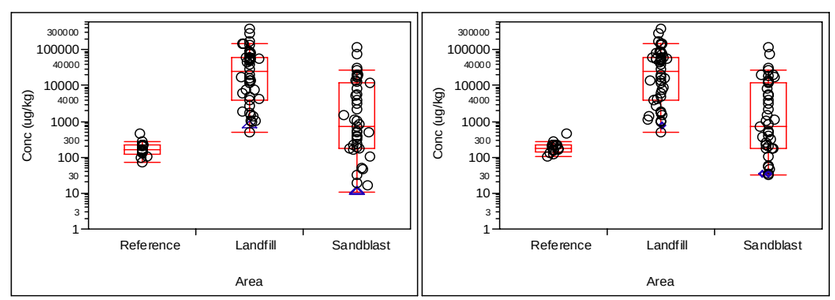
CENSORED AT MDL CENSORED AT MRL

TOTAL HPAHs



CENSORED AT MDL CENSORED AT MRL

tPAHs



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

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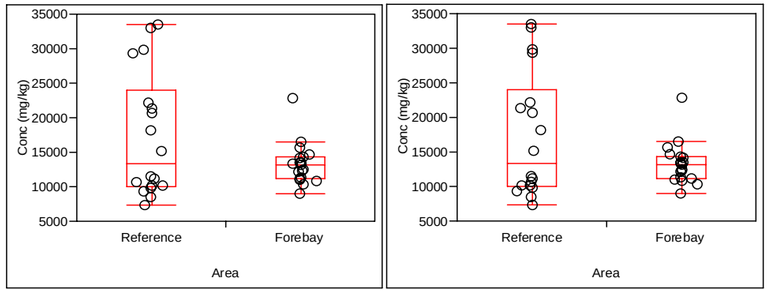
UPLAND OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN UPLAND SOIL (0 - 10ft)

DRAWING NUMBER: FIG L-1u
CAD FILE NUMBER: FIG L-1u
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-1u PAHs in Uplond Soil.dwg Nov 17, 2010 - 8:32am

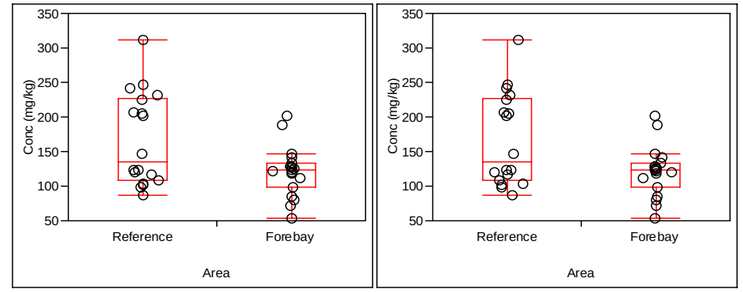
ALUMINUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

BARIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

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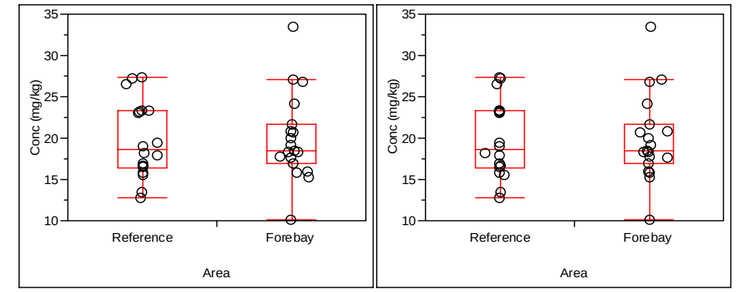
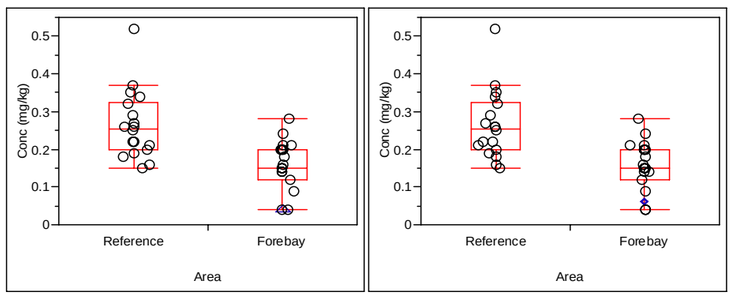


CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

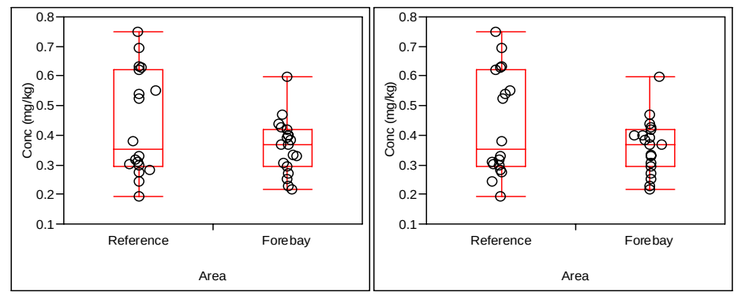
ANTIMONY



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

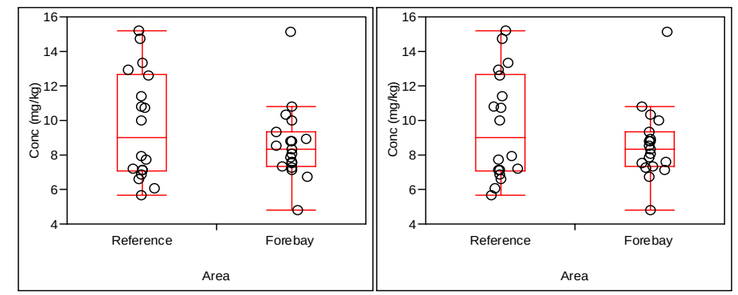
BERYLLIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

COBALT



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

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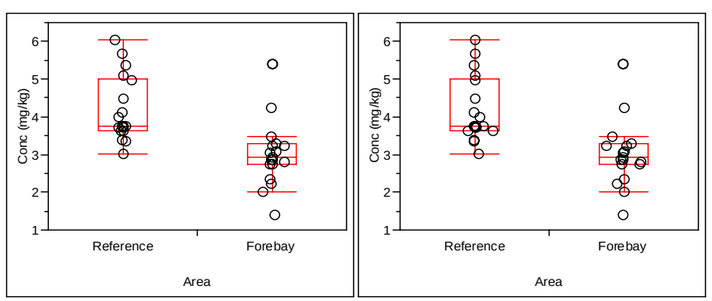
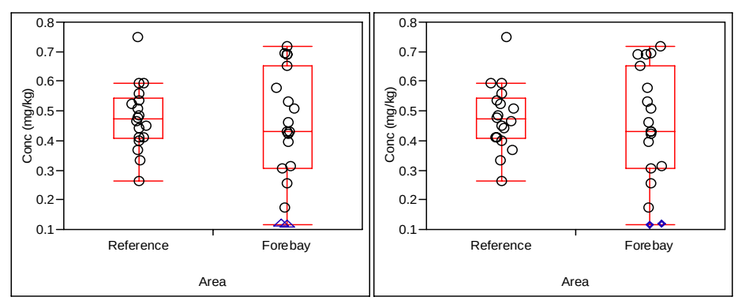


CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

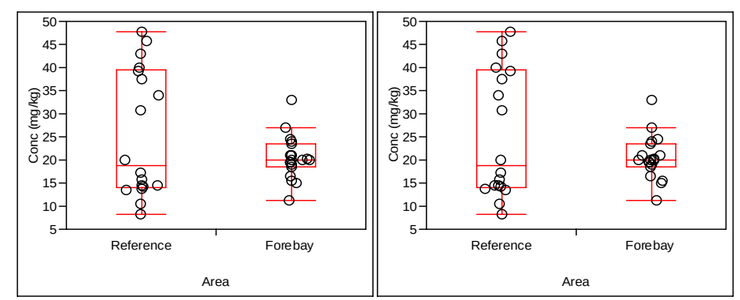
CADMIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

COPPER



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

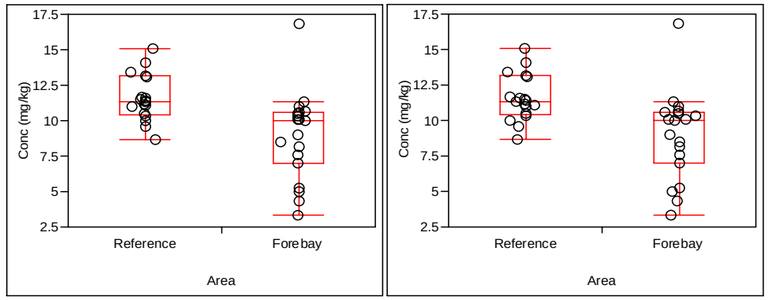
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SEDIMENT

DRAWING NUMBER: FIG L-2a
CAD FILE NUMBER: FIG L-2a
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-2a Metals in Sediment.dwg Nov 17, 2010 - 8:33am

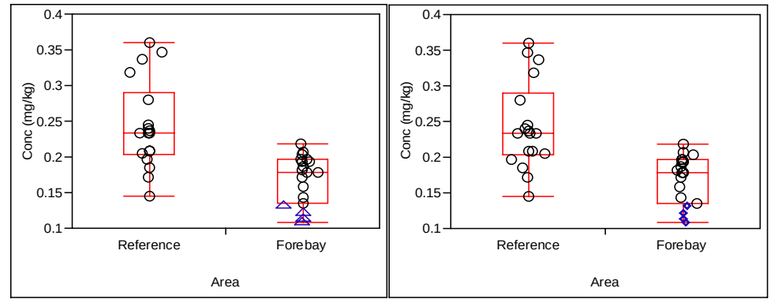
LEAD



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

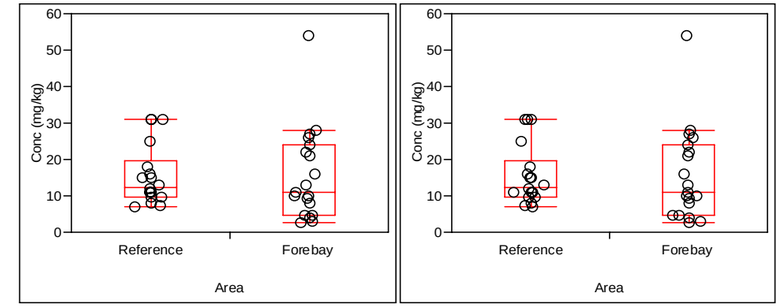
THALLIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

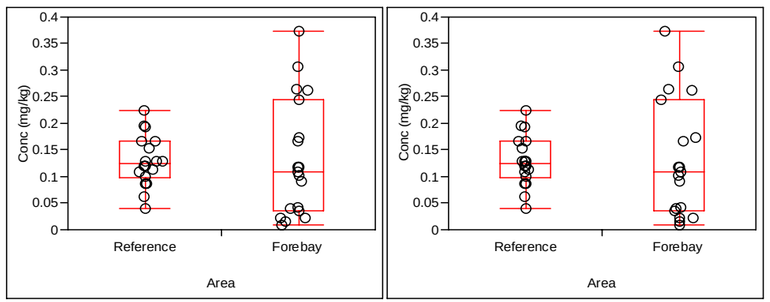
DIESEL RANGE ORGANICS



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

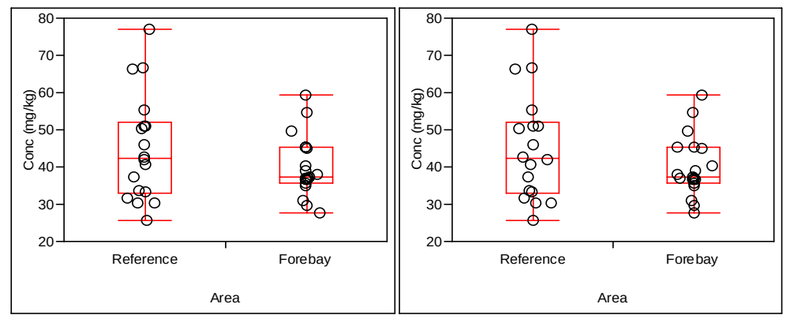
MERCURY



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

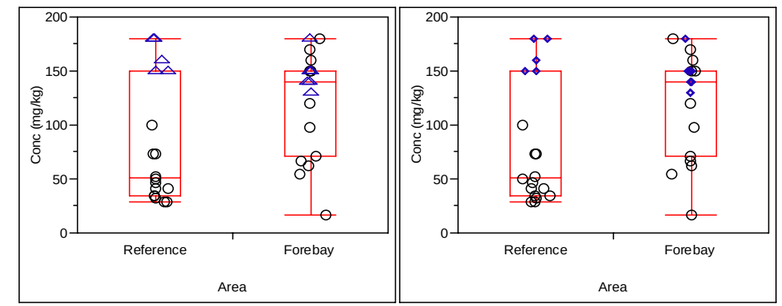
VANADIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

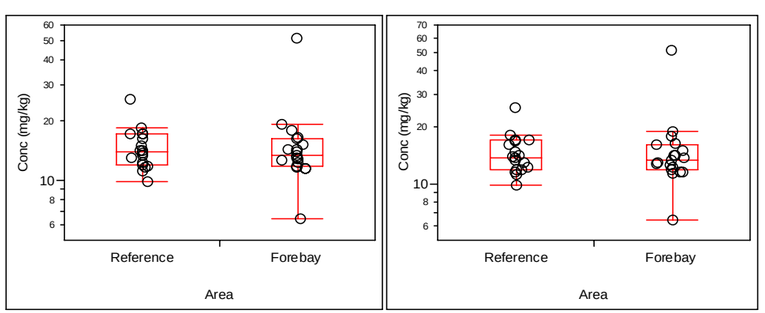
RESIDUAL RANGE ORGANICS



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

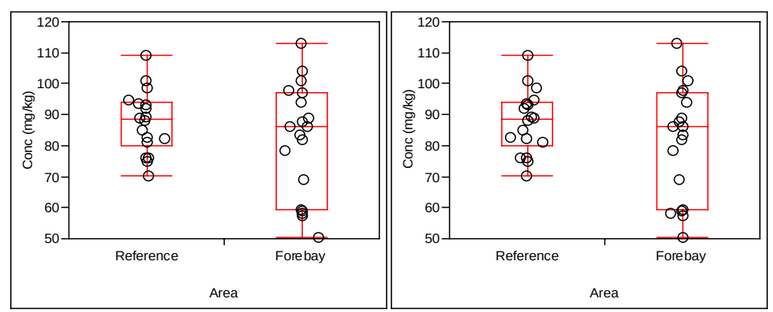
NICKEL



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

ZINC



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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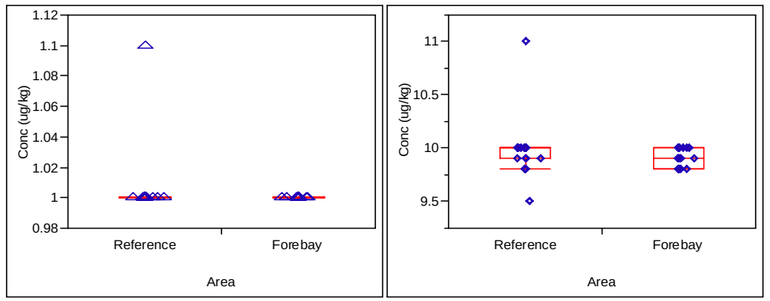
BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SEDIMENT

DRAWING NUMBER: FIG L-2b
CAD FILE NUMBER: FIG L-2b
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-2b Metals in Sediment.dwg Nov 17, 2010 - 8:33am

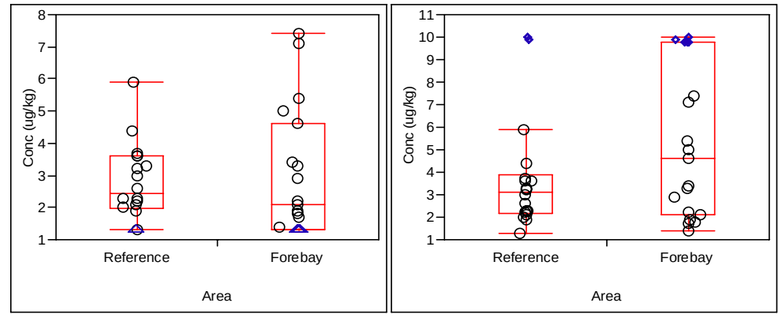
ACENAPHTHENE



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

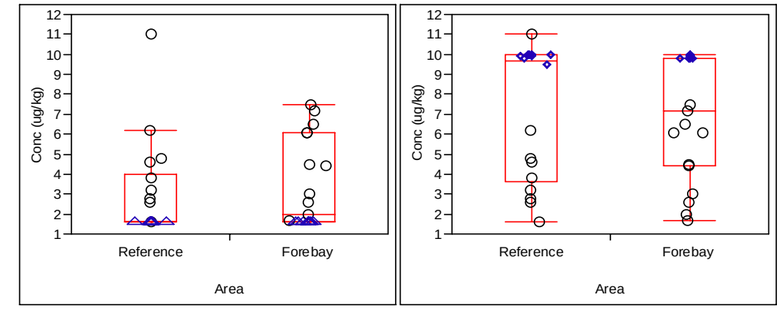
PHENANTHRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

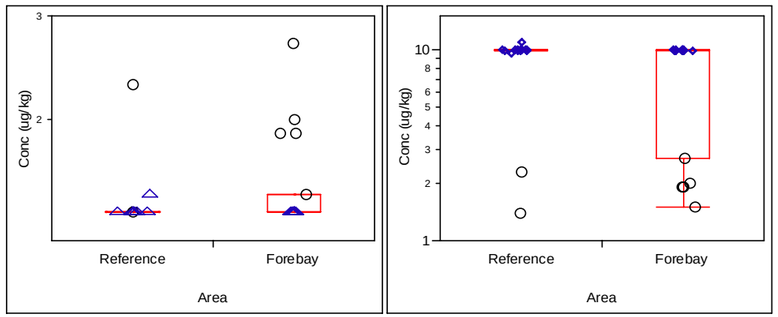
BENZO(A)PYRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

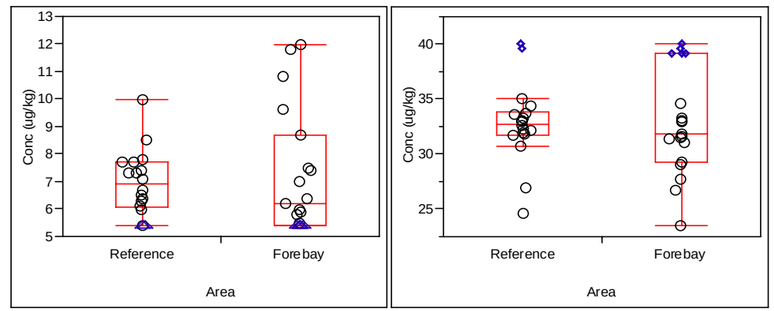
ANTHRACENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

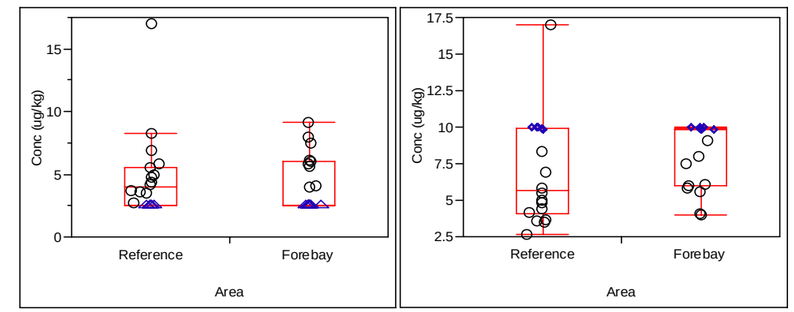
TOTAL LPAHs



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

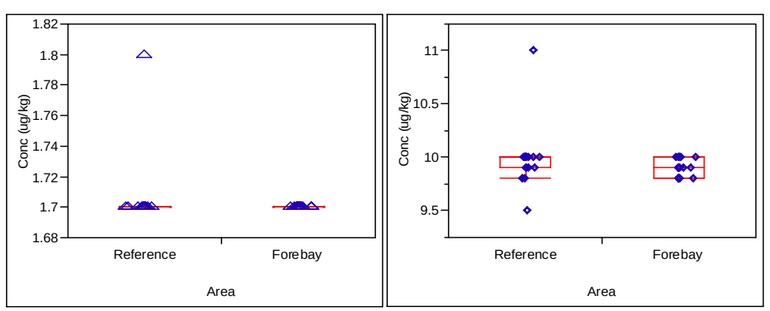
BENZO(B)FLUORANTHENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

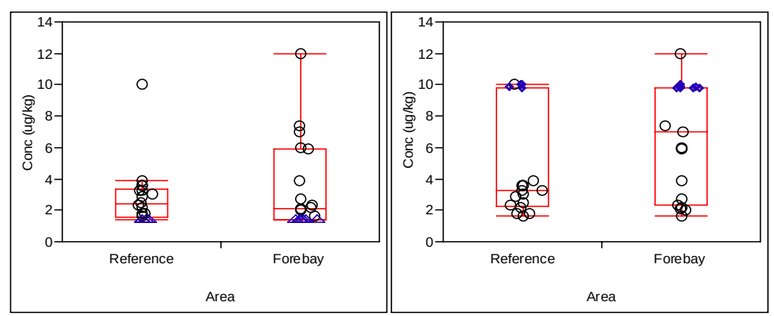
FLUORENE



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

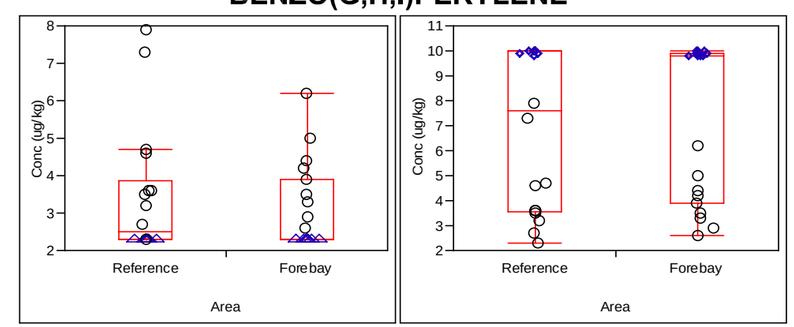
BENZO(A)ANTHRACENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

BENZO(G,H,I)PERYLENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN SEDIMENT

DRAWING NUMBER: FIG L-2c
CAD FILE NUMBER: FIG L-2c
SHEET: OF
REV.

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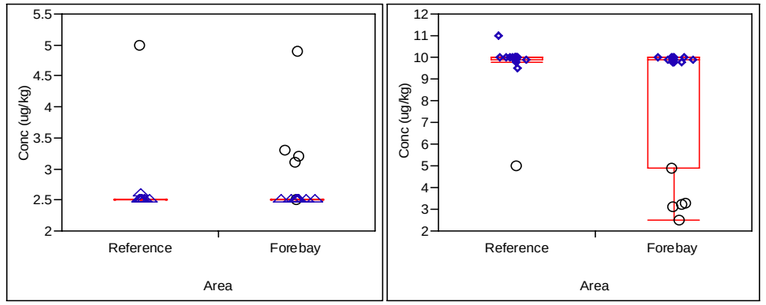
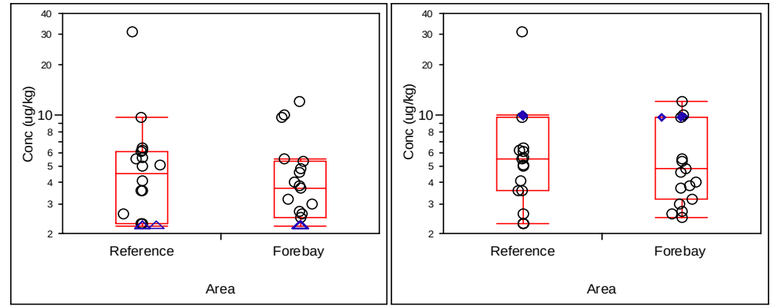
BENZO(K)FLUORANTHENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

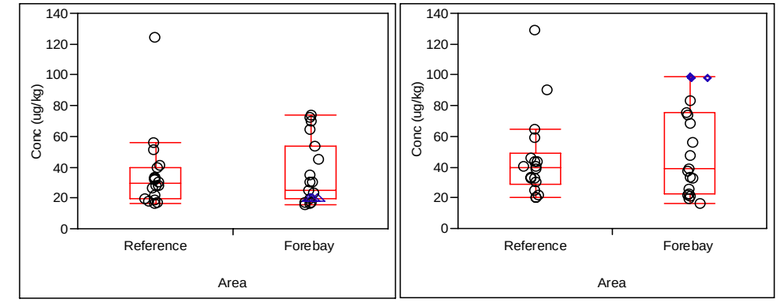
FLUORANTHENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

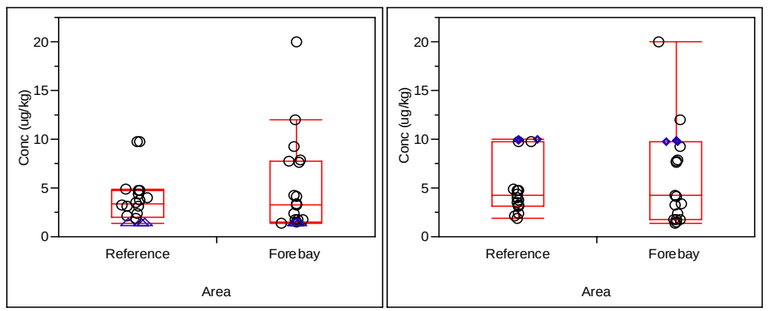
TOTAL HPAHs



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

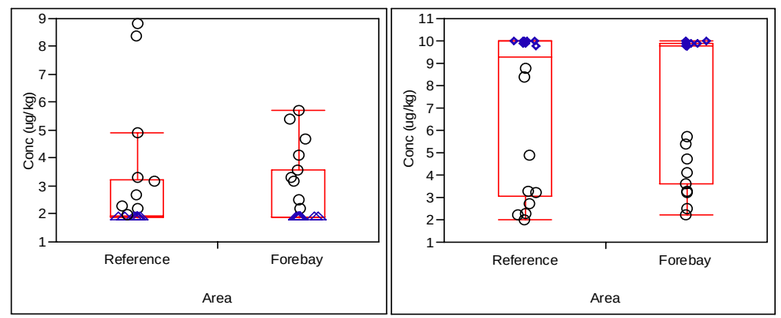
CHRYSENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

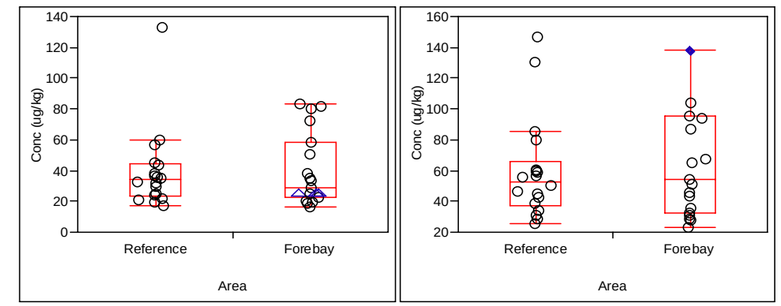
INDENO(1,2,3-CD)PYRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

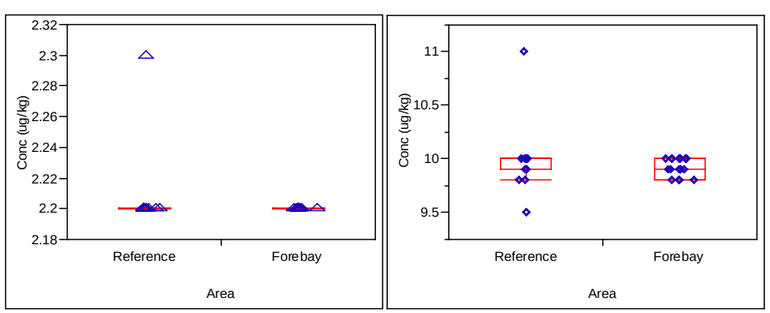
tPAHs



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

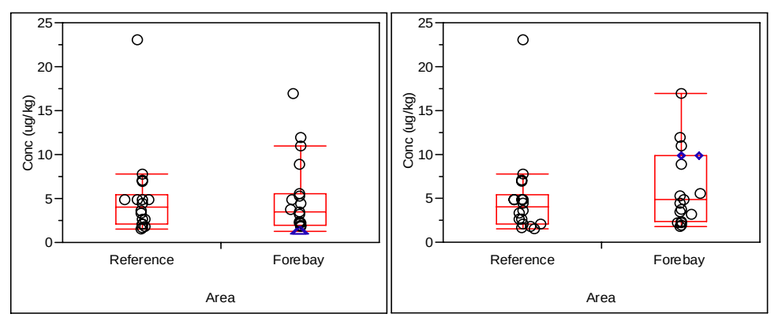
DIBENZ(A,H)ANTHRACENE



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

PYRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN SEDIMENT

DRAWING NUMBER: FIG L-2d
CAD FILE NUMBER: FIG L-2d
SHEET: OF
REV.

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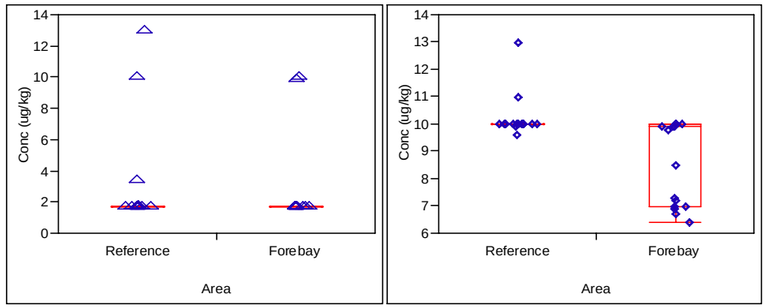
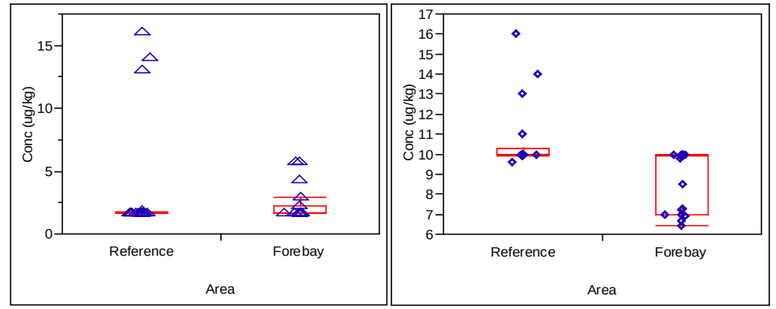
AROCLOR 1016



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

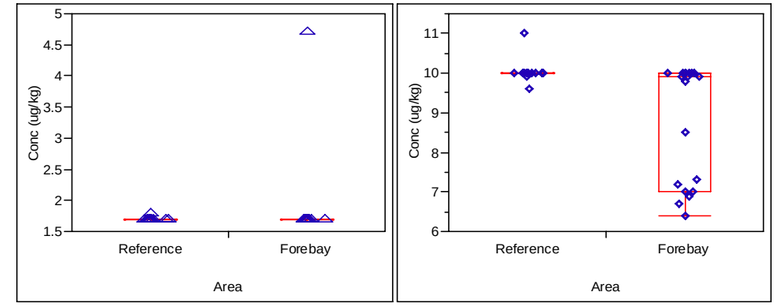
AROCLOR 1242



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

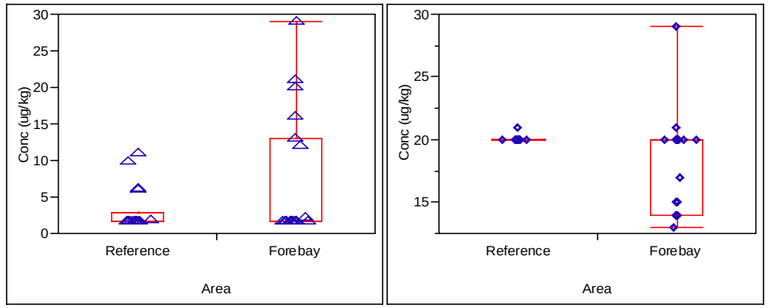
AROCLOR 1260



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

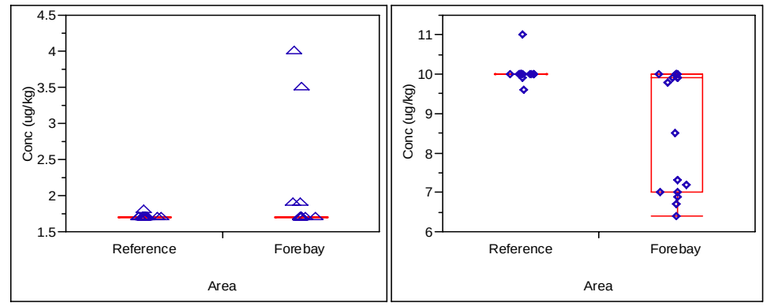
AROCLOR 1221



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

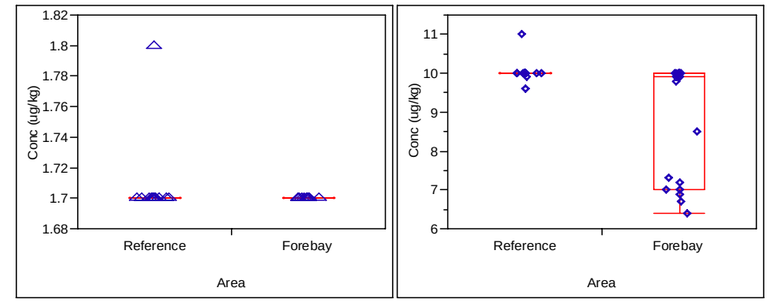
AROCLOR 1248



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

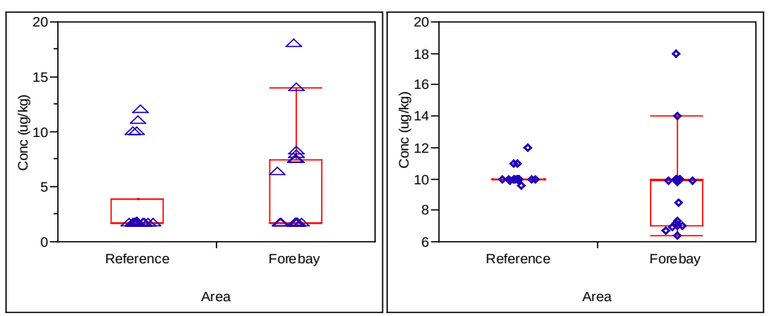
AROCLOR 1262



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

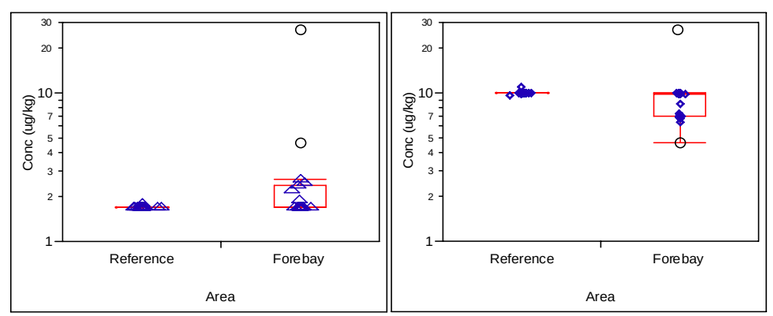
AROCLOR 1232



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

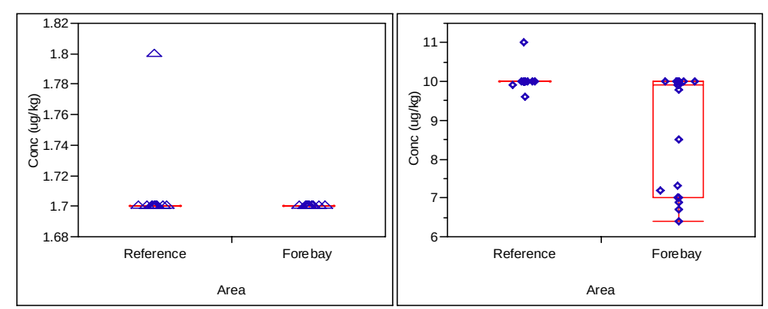
AROCLOR 1254



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

AROCLOR 1268



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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CASCADE LOCKS, OREGON

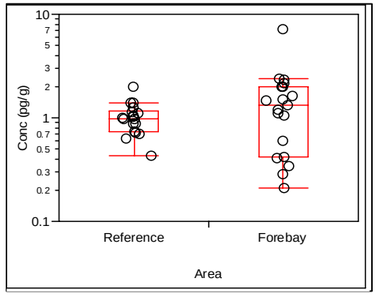
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PCB AROCLORS IN SEDIMENT

DRAWING NUMBER: FIG L-2e
CAD FILE NUMBER: FIG L-2e
SHEET: OF
REV.

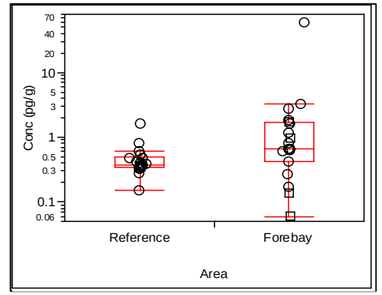
O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-2e PCB Aroclors in Sediment.dwg Nov 17, 2010 - 8:35am

PCB 77



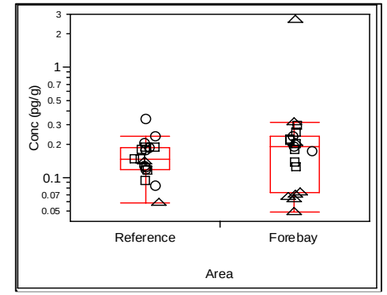
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 114



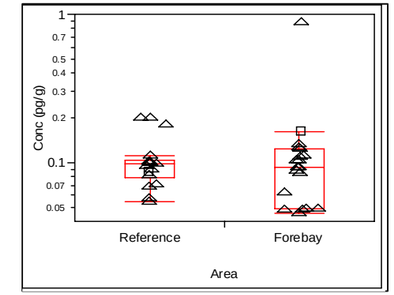
FOREBAY IS STATISTICALLY HIGHER

PCB 126



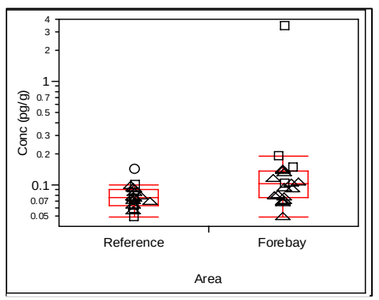
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 169



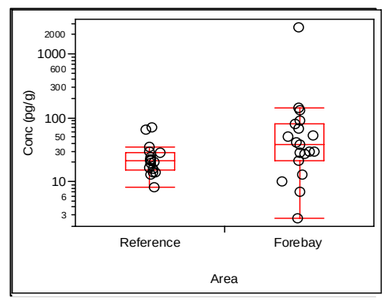
ALL SAMPLES ARE NON DETECTS

PCB 81



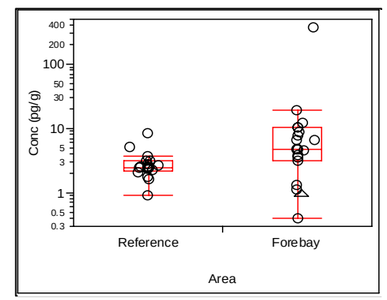
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 118



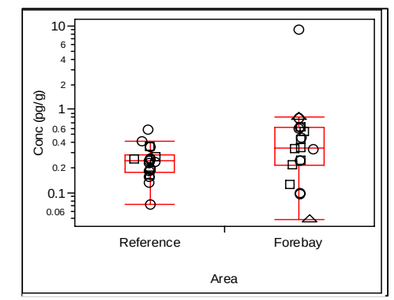
FOREBAY IS STATISTICALLY HIGHER

PCB 156+157



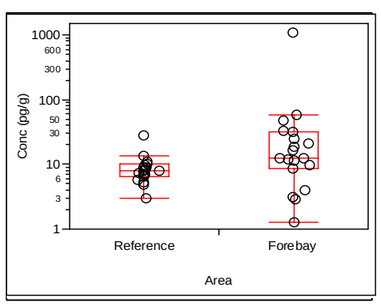
FOREBAY IS STATISTICALLY HIGHER

PCB 189



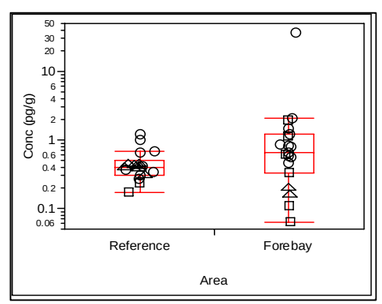
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 105



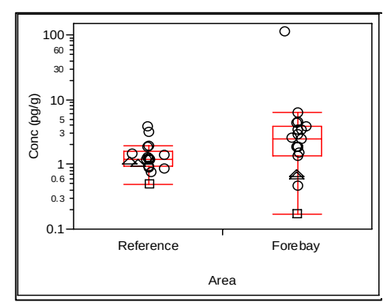
FOREBAY IS STATISTICALLY HIGHER

PCB 123



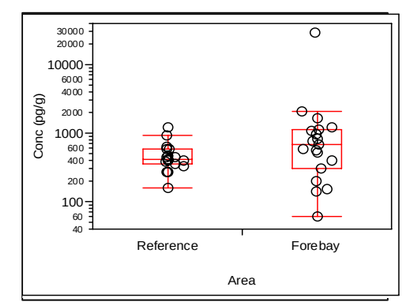
FOREBAY IS STATISTICALLY HIGHER

PCB 167



FOREBAY IS STATISTICALLY HIGHER

SUM 209 CONGENERS (KM-BASED)



FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Reported Detection Limit (RDL)
- □ EMPC Result, Censored at Reported Value

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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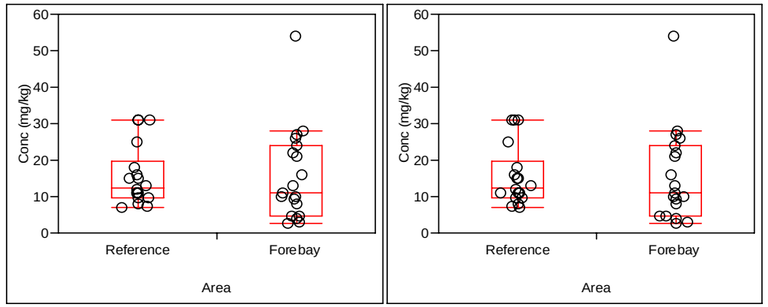
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PCB CONGENERS IN SEDIMENT

DRAWING NUMBER: FIG L-2f
CAD FILE NUMBER: FIG L-2f
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-2f PCB Congeners in Sediment.dwg Nov 12, 2010 - 3:38pm

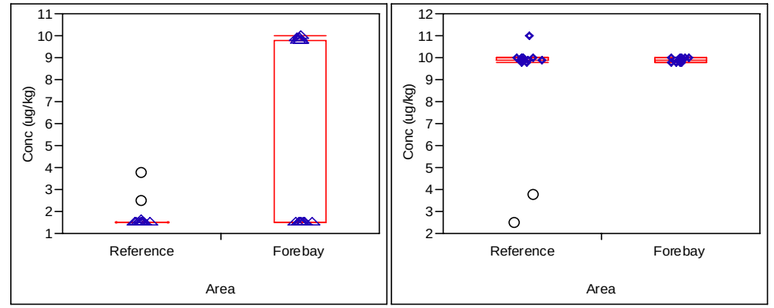
DIESEL RANGE ORGANICS



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

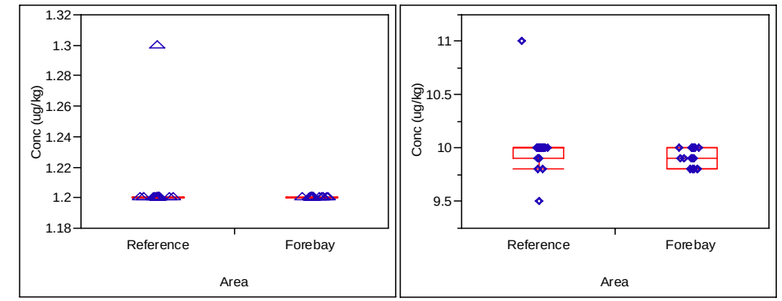
BUTYL BENZYL PHTHALATE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

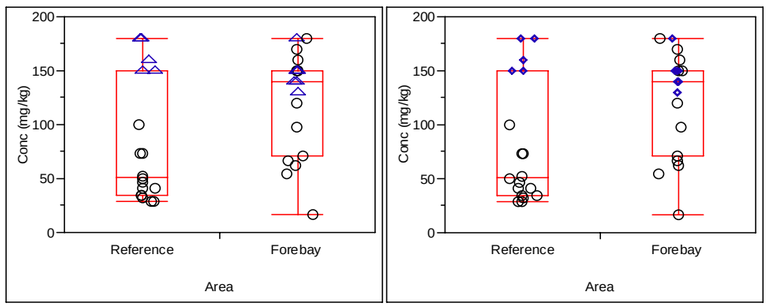
DI-N-OCTYL PHTHALATE



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

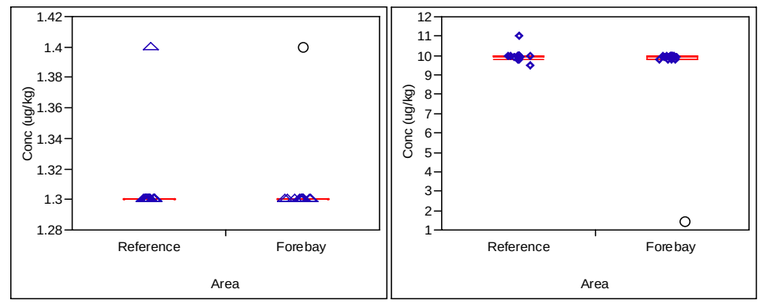
RESIDUAL RANGE ORGANICS



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

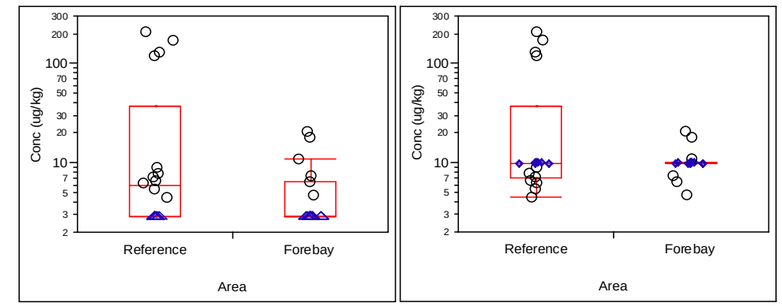
CARBAZOLE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

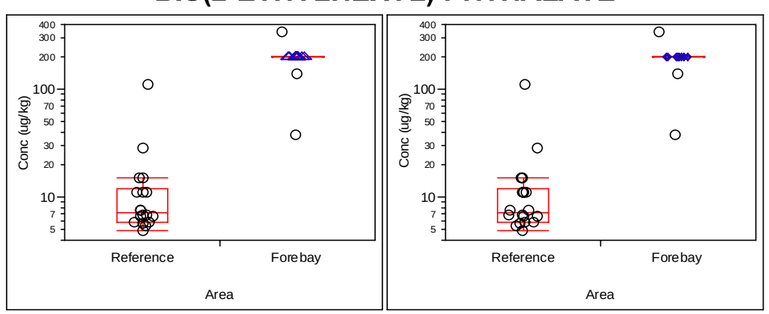
P-CRESOL (4-METHYLPHENOL)



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

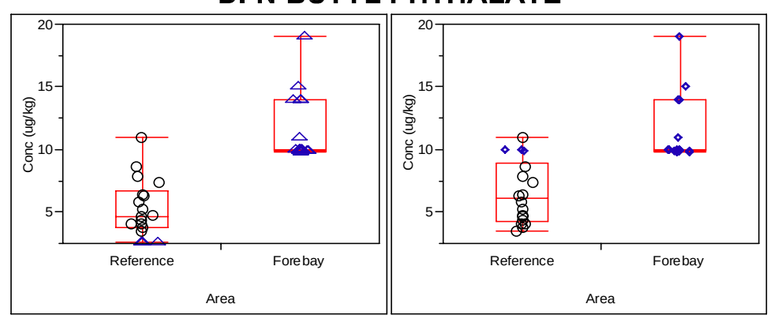
BIS(2-ETHYLHEXYL) PHTHALATE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

DI-N-BUTYL PHTHALATE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

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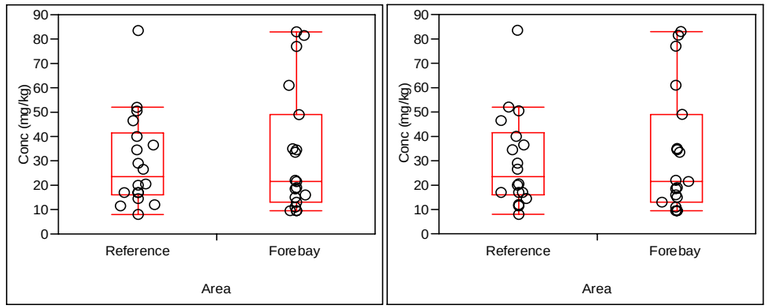
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
SVOCs IN SEDIMENT

DRAWING NUMBER: FIG L-2g
CAD FILE NUMBER: FIG L-2g
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-2g SVOCs in Sediment.dwg Nov 17, 2010 - 8:36am

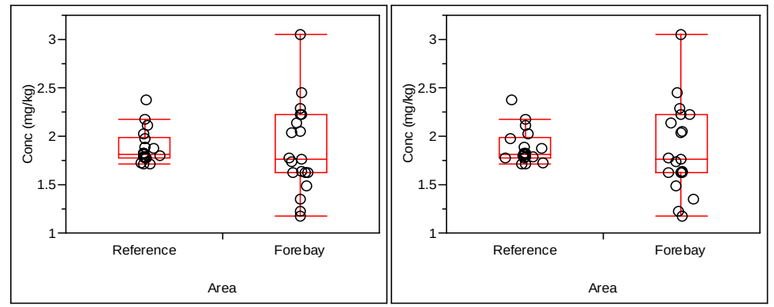
ALUMINUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

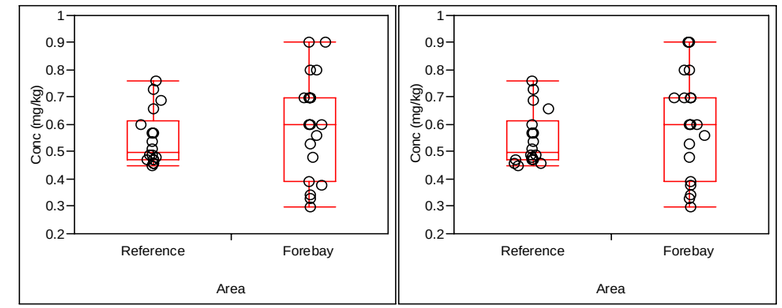
BARIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

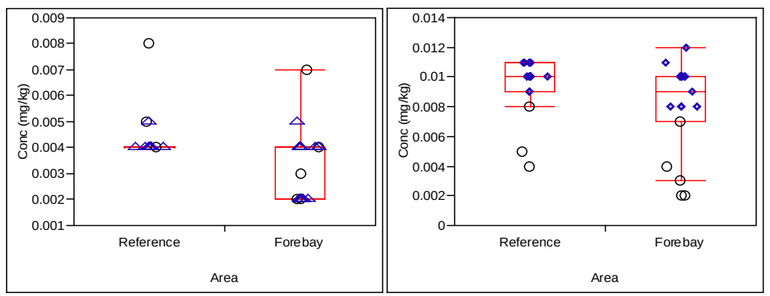
CHROMIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

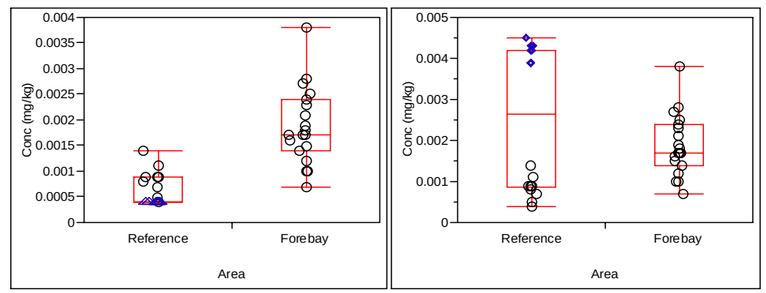
ANTIMONY



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

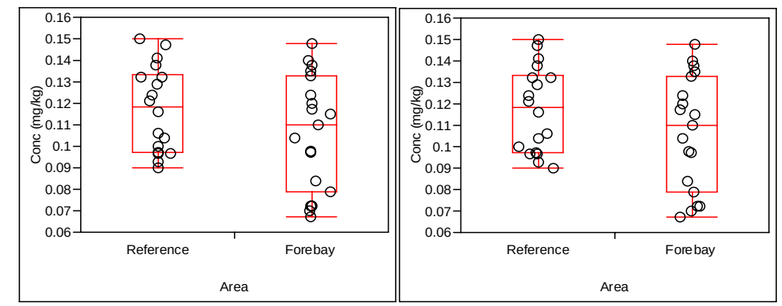
BERYLLIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

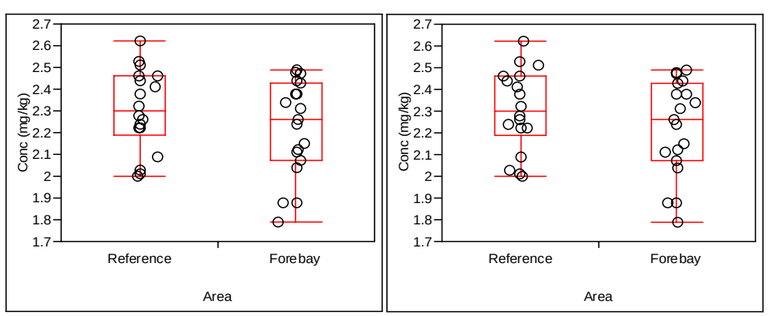
COBALT



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

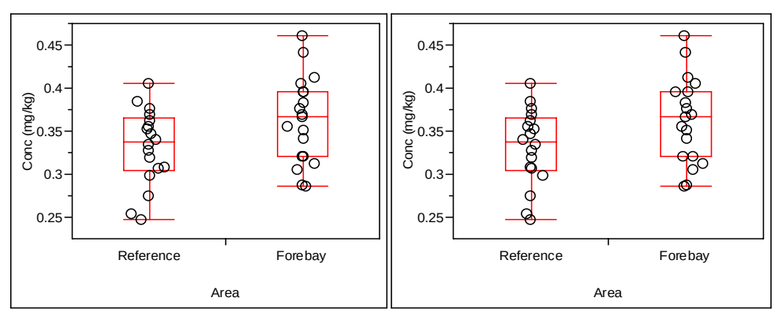
ARSENIC



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

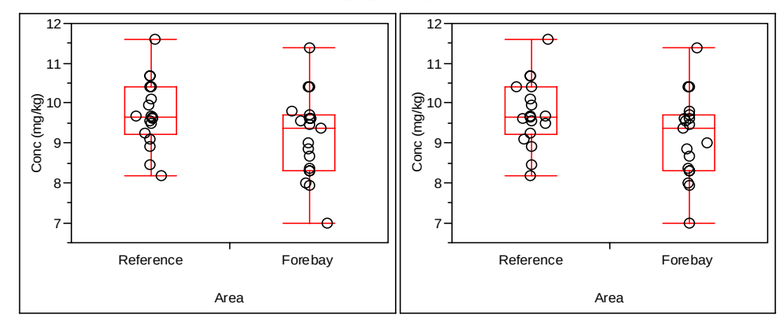
CADMIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

COPPER



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

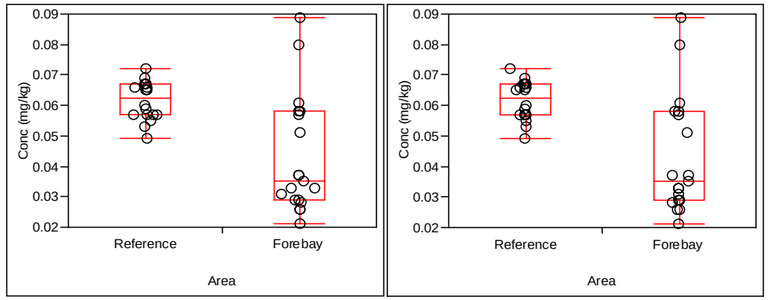
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN CLAM TISSUE

DRAWING NUMBER: FIG L-3a
CAD FILE NUMBER: FIG L-3a
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-3a Metals in Clam Tissue.dwg Nov 17, 2010 - 8:36am

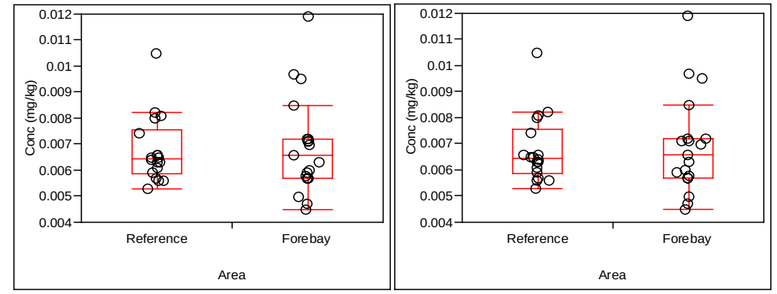
LEAD



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

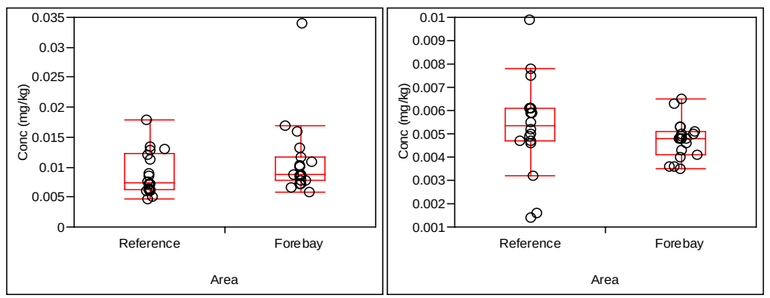
THALLIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

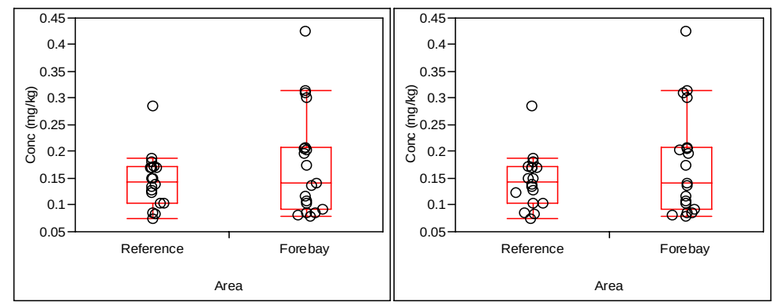
MERCURY



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

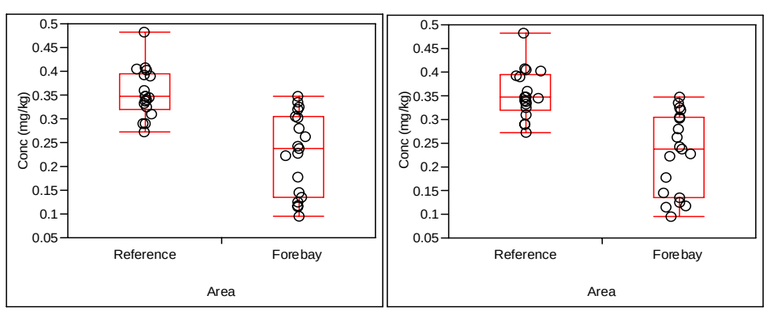
VANADIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

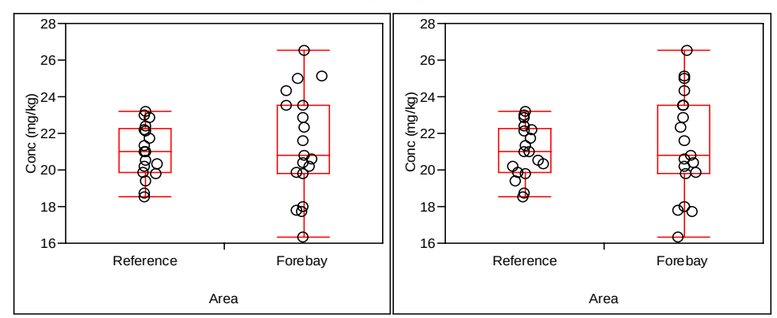
NICKEL



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

ZINC



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

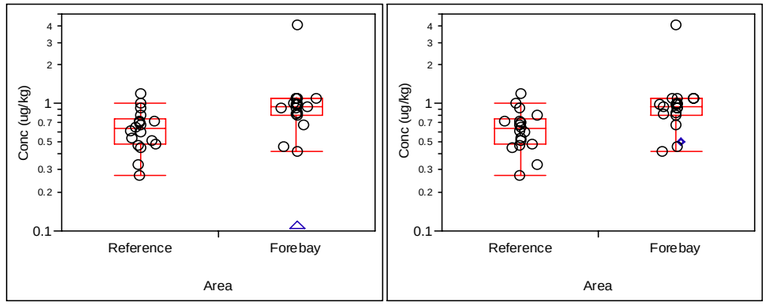
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN CLAM TISSUE

DRAWING NUMBER: FIG L-3b
CAD FILE NUMBER: FIG L-3b
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-3b Metals in Clam Tissue.dwg Nov 17, 2010 - 8:37am

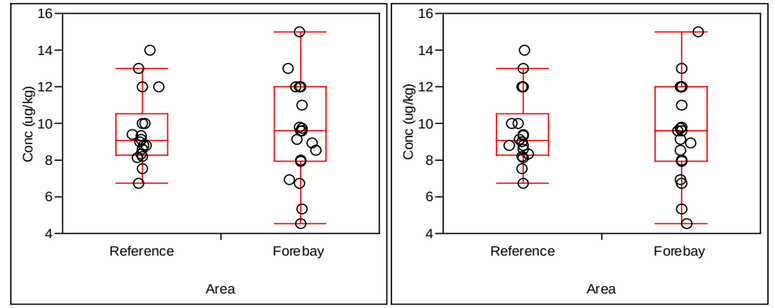
ACENAPHTHENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

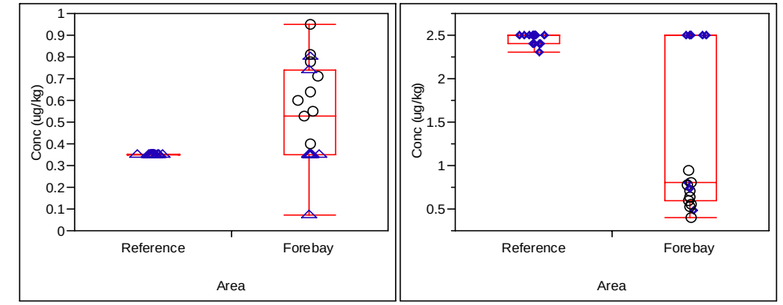
PHENANTHRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

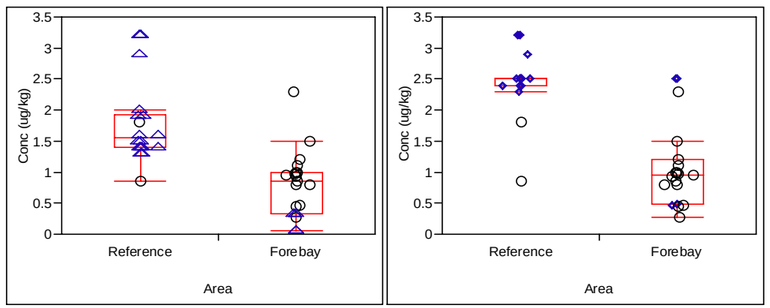
BENZO(B)FLUORANTHENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

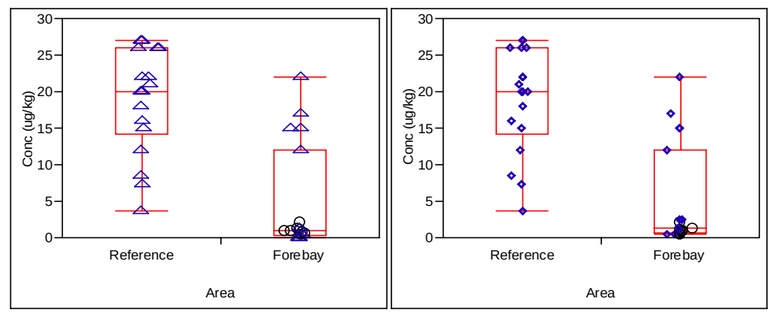
ANTHRACENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

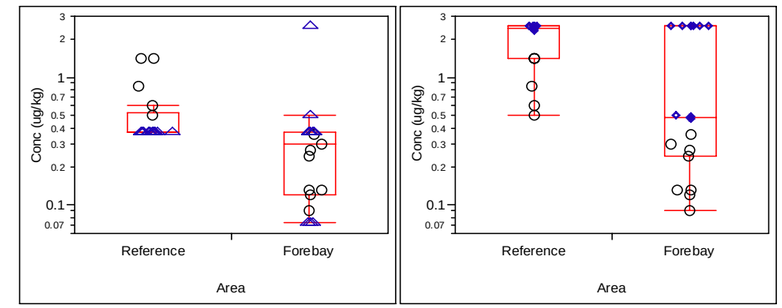
BENZO(A)ANTHRACENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

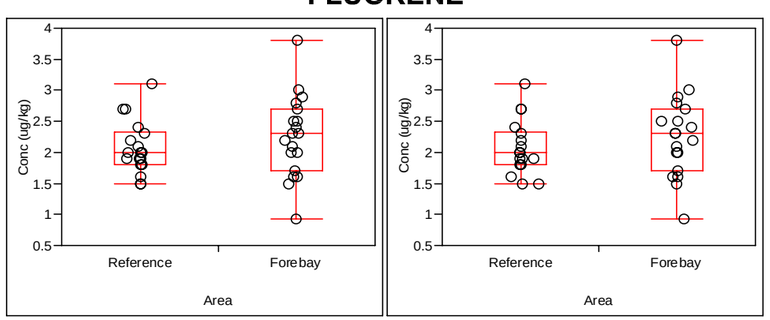
BENZO(G,H,I)PERYLENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

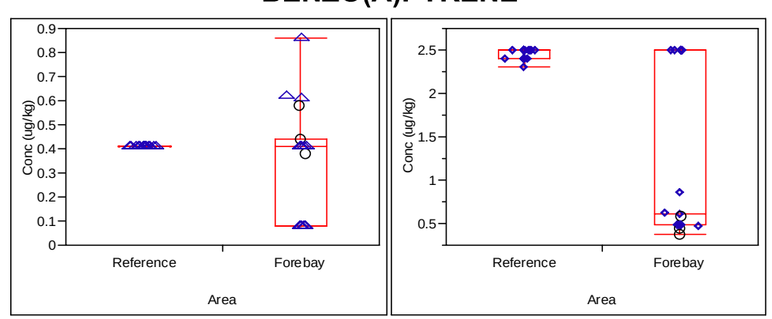
FLUORENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

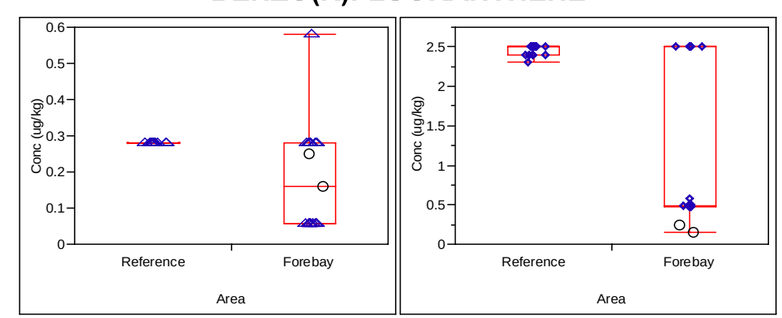
BENZO(A)PYRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

BENZO(K)FLUORANTHENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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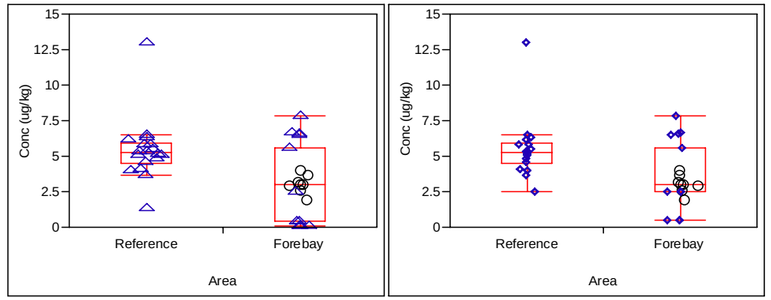
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN CLAM TISSUE

DRAWING NUMBER: FIG L-3c
CAD FILE NUMBER: FIG L-3c
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-3c PAHs in Clam Tissue.dwg Nov 17, 2010 - 8:37am

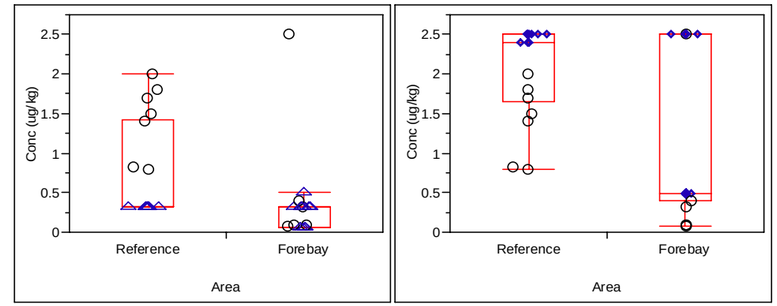
CHRYSENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

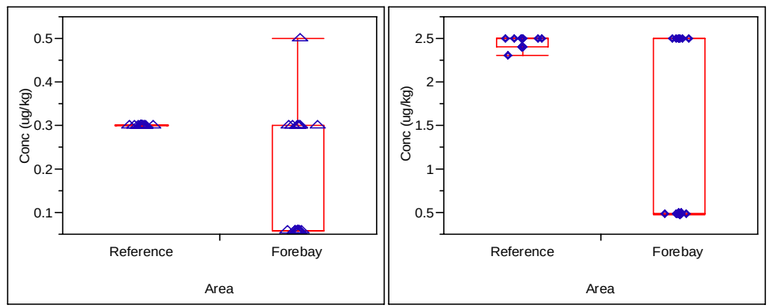
INDENO(1,2,3-CD)PYRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

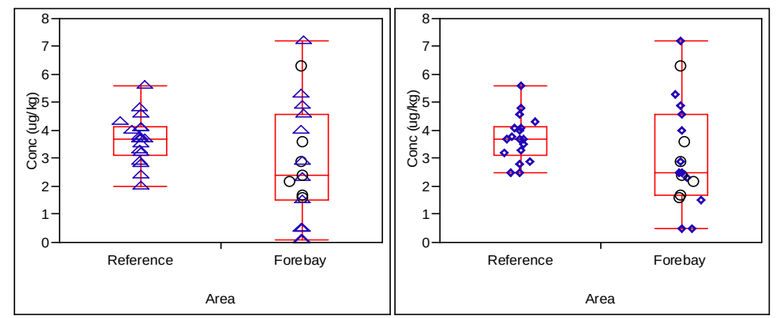
DIBENZ(A,H)ANTHRACENE



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

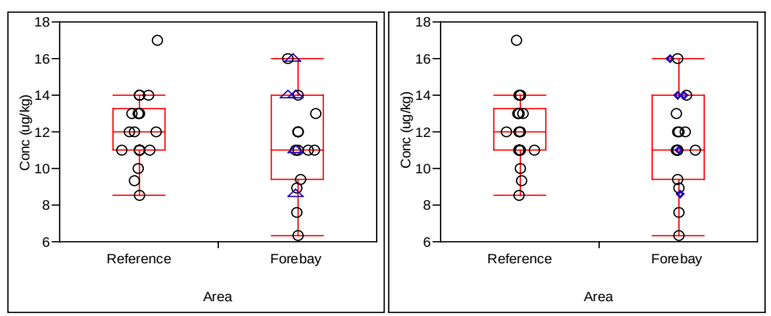
PYRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

FLUORANTHENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN CLAM TISSUE

DRAWING NUMBER: FIG L-3d
CAD FILE NUMBER: FIG L-3d
SHEET: OF
REV.

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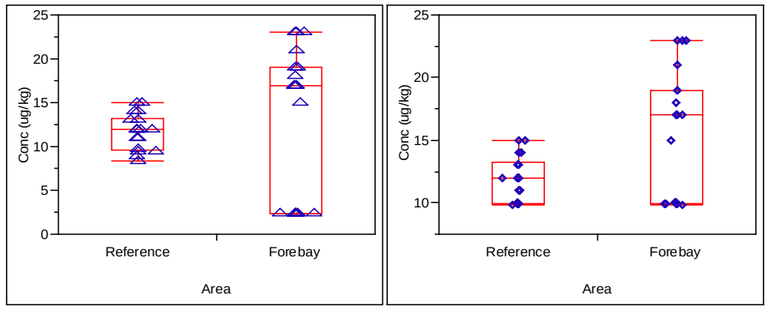
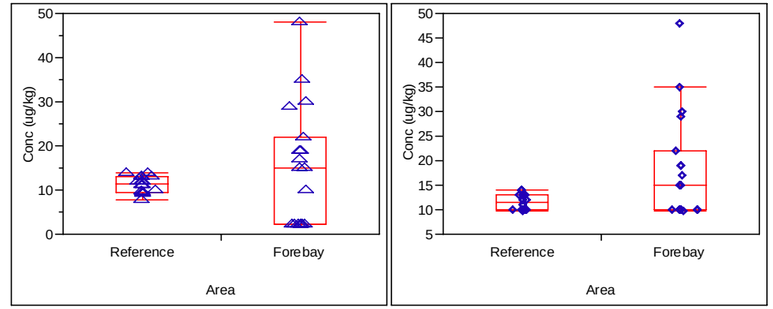
AROCLOR 1016



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

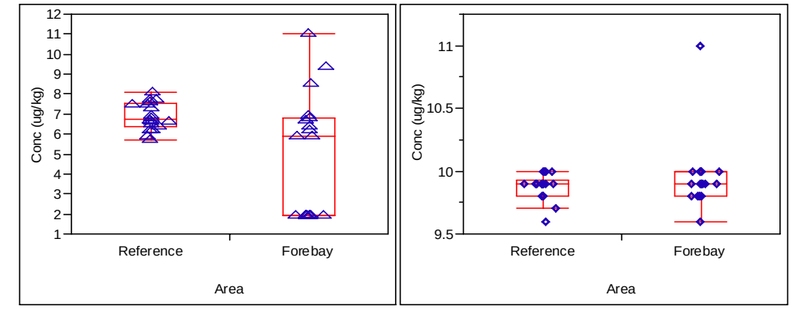
AROCLOR 1242



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

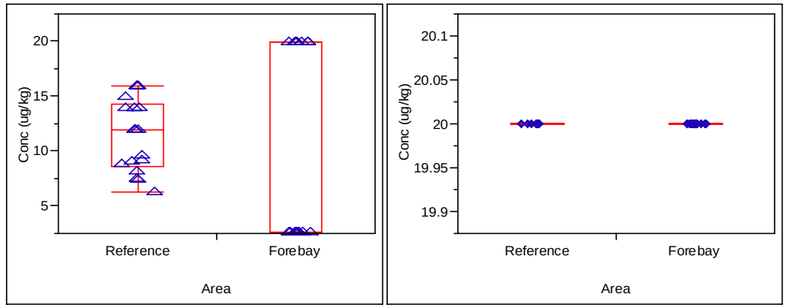
AROCLOR 1260



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

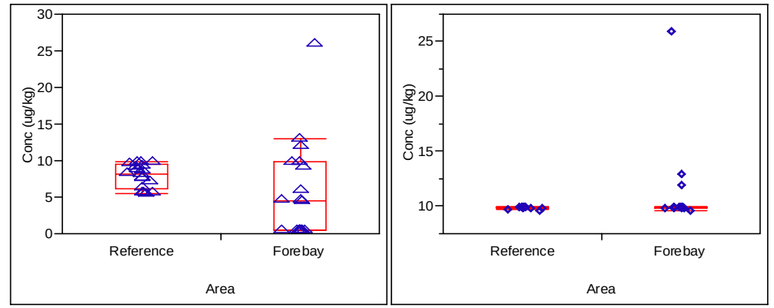
AROCLOR 1221



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

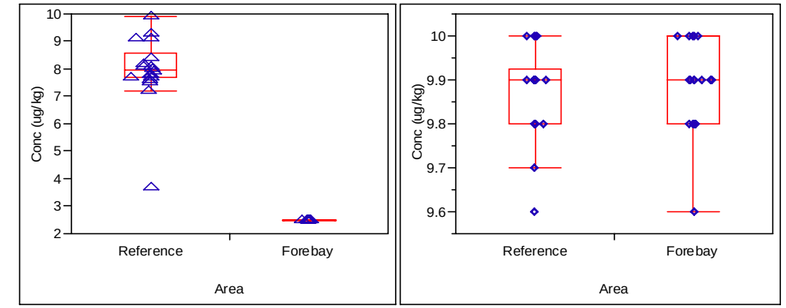
AROCLOR 1248



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

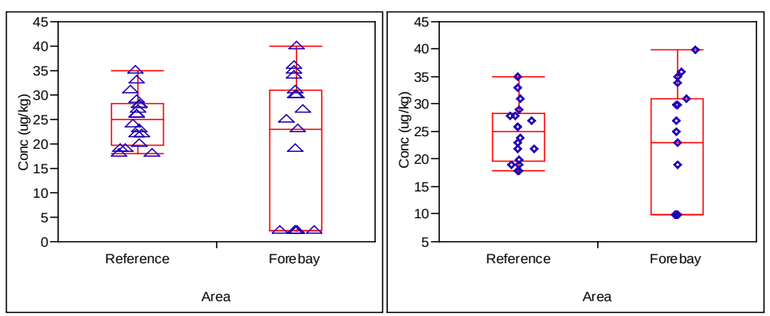
AROCLOR 1262



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

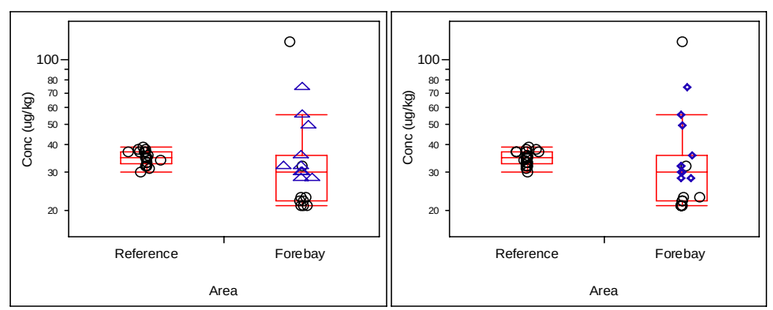
AROCLOR 1232



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

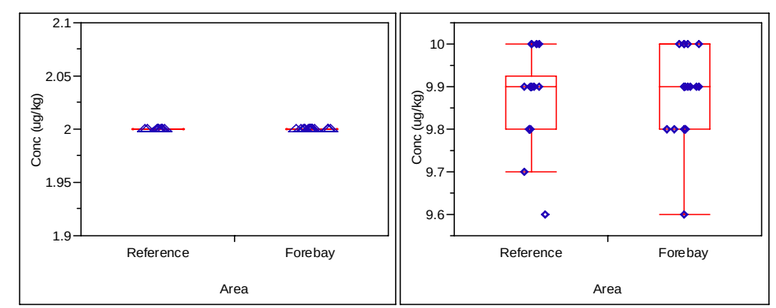
AROCLOR 1254



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

AROCLOR 1268



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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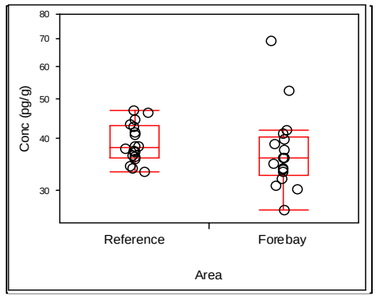
BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PCB AROCLORS IN CLAM TISSUE

DRAWING NUMBER: FIG L-3e
CAD FILE NUMBER: FIG L-3e
SHEET: OF
REV.

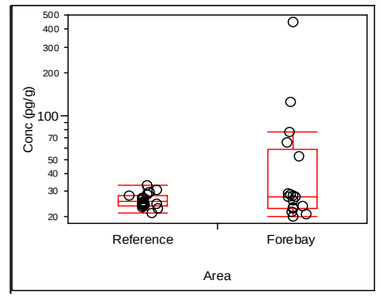
O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-3e PCB Aroclors in Clam Tissue.dwg Nov 17, 2010 - 8:38am

PCB 77



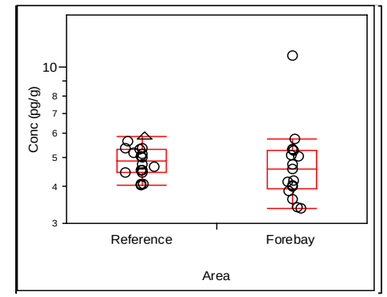
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 114



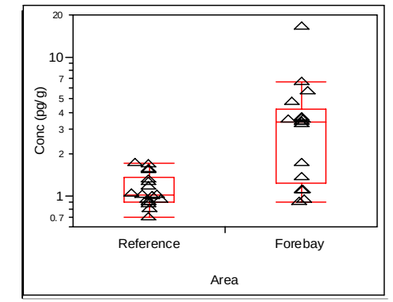
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 126



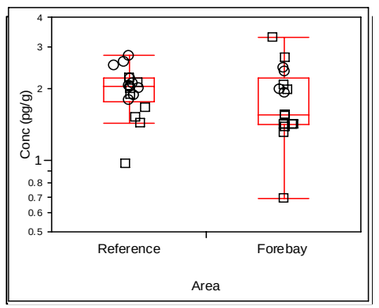
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 169



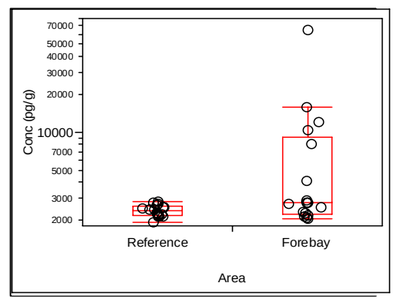
ALL SAMPLES ARE NON DETECTS

PCB 81



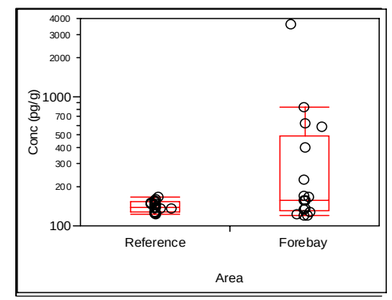
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 118



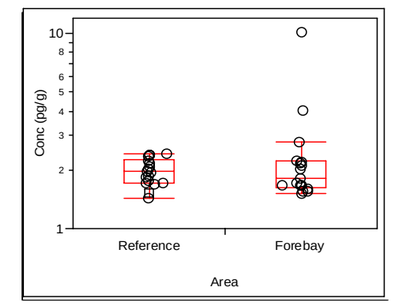
FOREBAY IS STATISTICALLY HIGHER

PCB 156+157



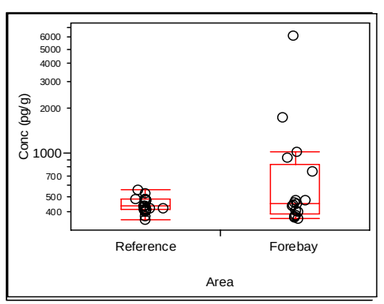
FOREBAY IS STATISTICALLY HIGHER

PCB 189



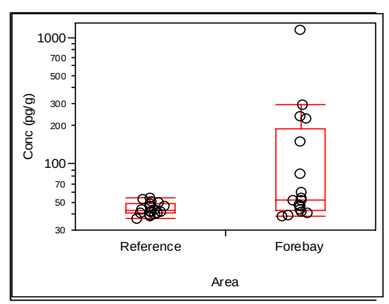
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 105



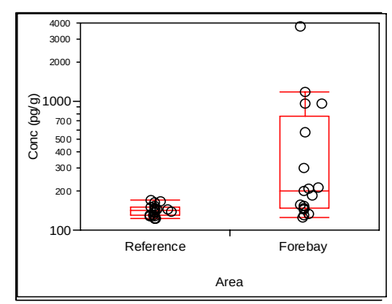
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 123



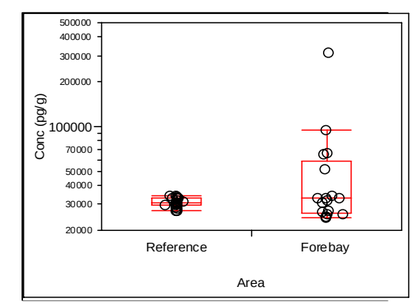
FOREBAY IS STATISTICALLY HIGHER

PCB 167



FOREBAY IS STATISTICALLY HIGHER

SUM 209 CONGENERS (KM-BASED)



FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Reported Detection Limit (RDL)
- □ EMPC Result, Censored at Reported Value

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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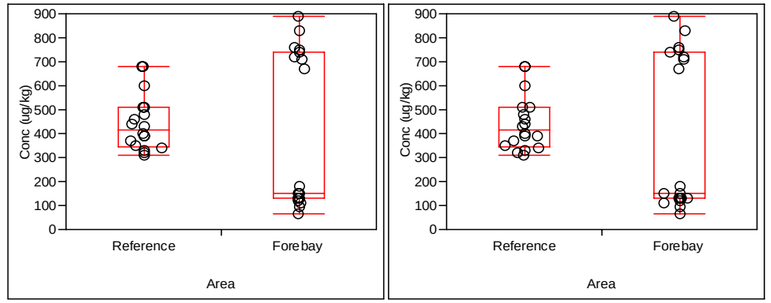
BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PCB CONGENERS IN CLAM TISSUE

DRAWING NUMBER: FIG L-3f
CAD FILE NUMBER: FIG L-3f
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-3f PCB Congeners in Clam Tissue.dwg Nov 12, 2010 - 2:47pm

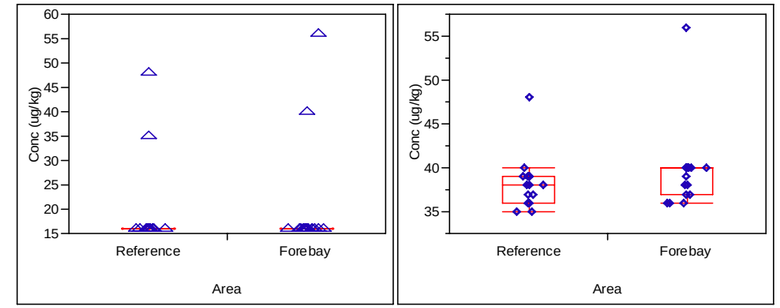
BIS(2-ETHYLHEXYL) PHTHALATE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

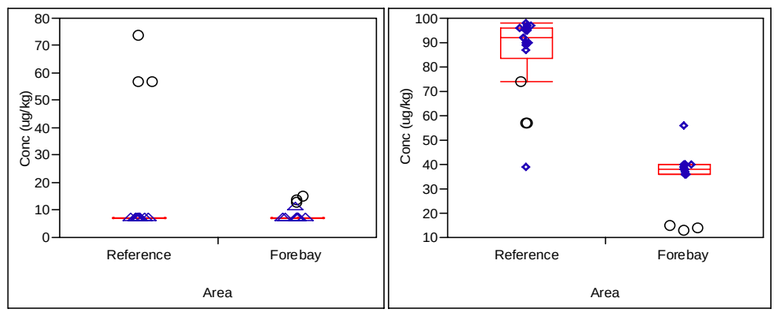
DI-N-BUTYL PHTHALATE



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

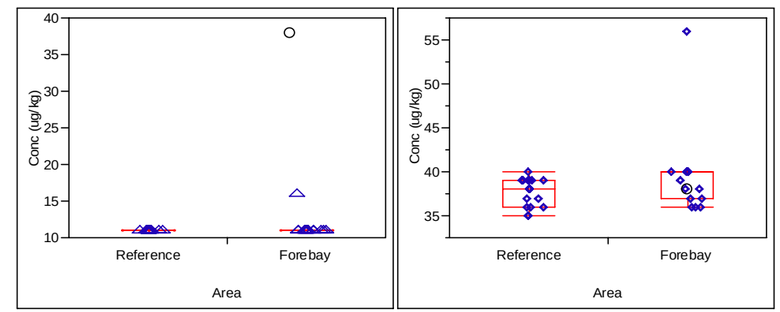
BUTYL BENZYL PHTHALATE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

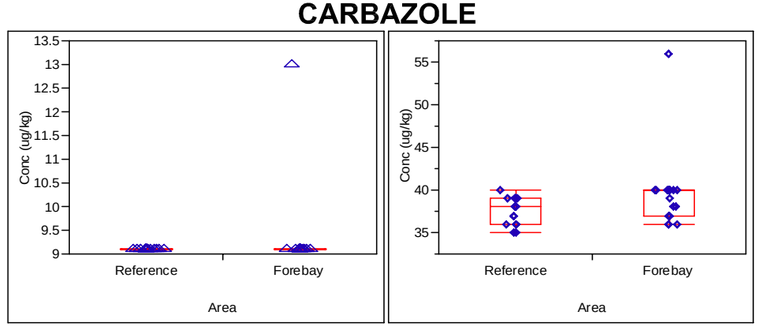
DI-N-OCTYL PHTHALATE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

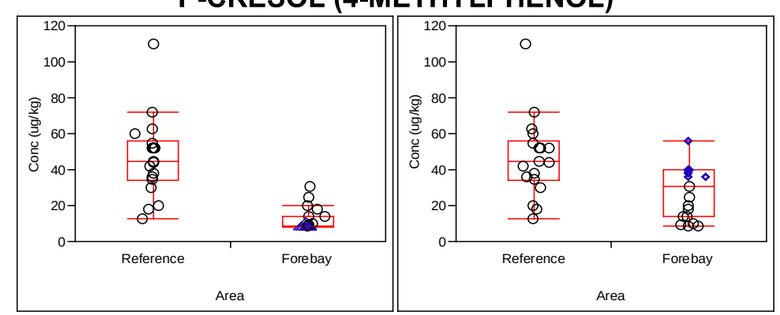
CARBAZOLE



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

P-CRESOL (4-METHYLPHENOL)



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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Portland, Oregon 97201-5814
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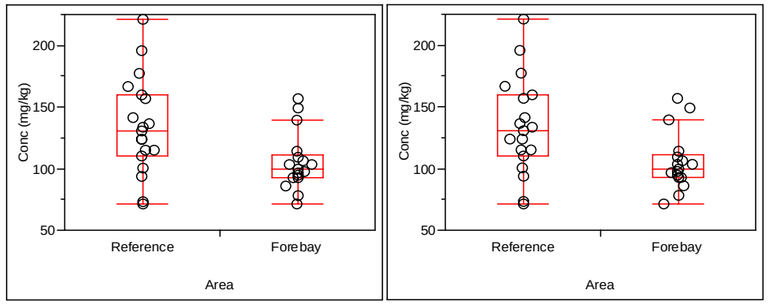
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
SVOCs IN CLAM TISSUE

DRAWING NUMBER: FIG L-3g
CAD FILE NUMBER: FIG L-3g
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-3g SVOCs in Clam Tissue.dwg Nov 17, 2010 - 8:39am

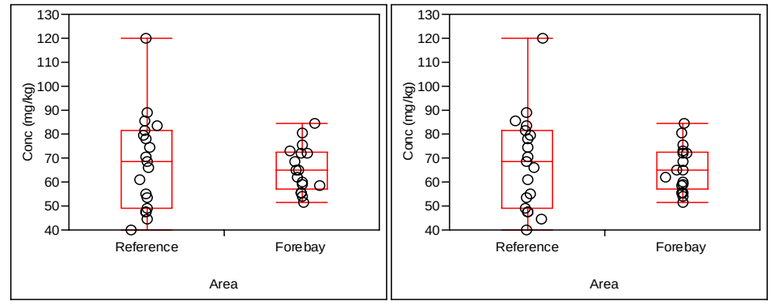
ALUMINUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

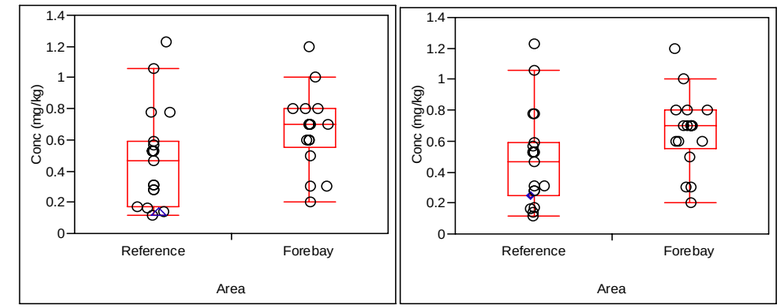
BARIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

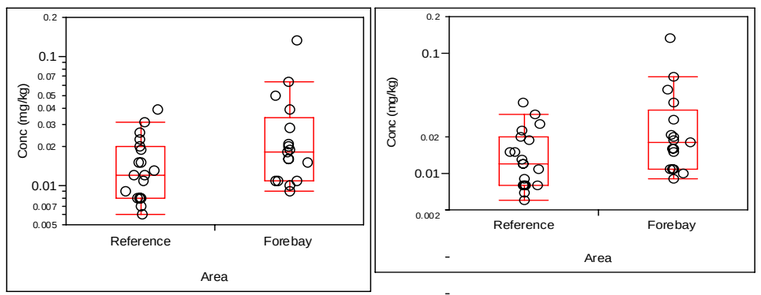
CHROMIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

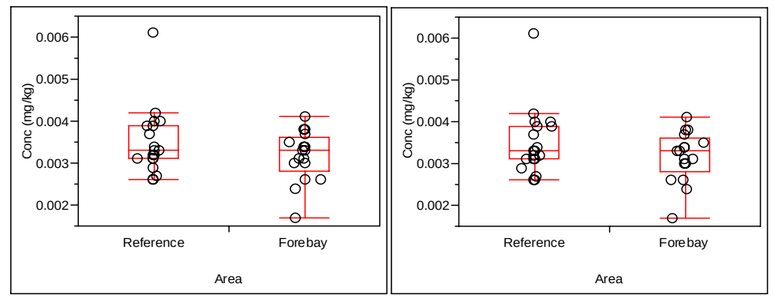
ANTIMONY



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

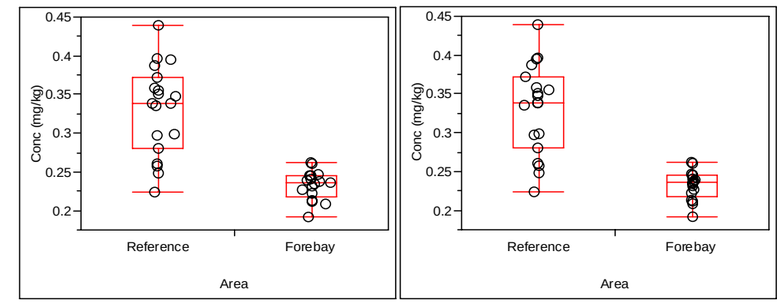
BERYLLIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

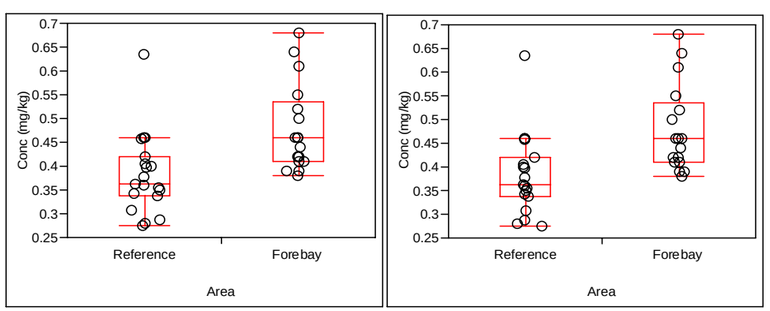
COBALT



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

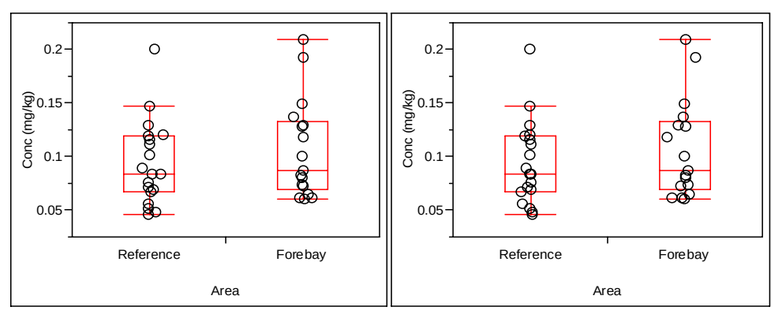
ARSENIC



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

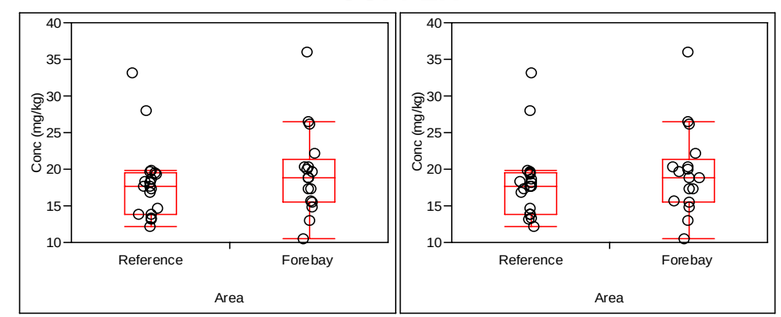
CADMIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

COPPER



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

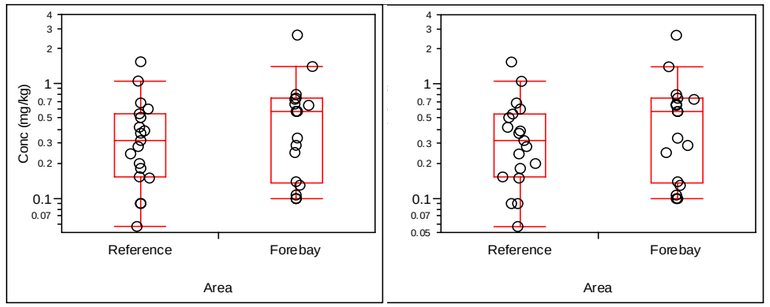
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN CRAYFISH TISSUE

DRAWING NUMBER: FIG L-4a
CAD FILE NUMBER: FIG L-4a
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-4a Metals in Crayfish Tissue.dwg Nov 17, 2010 - 8:39am

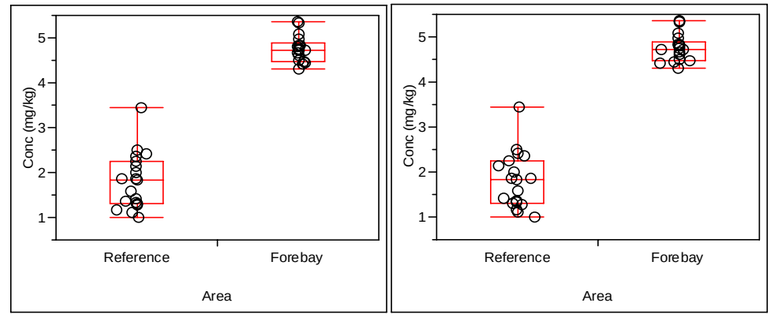
LEAD



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

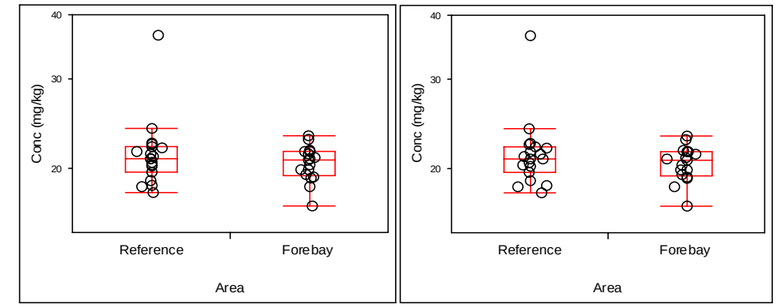
NICKEL



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

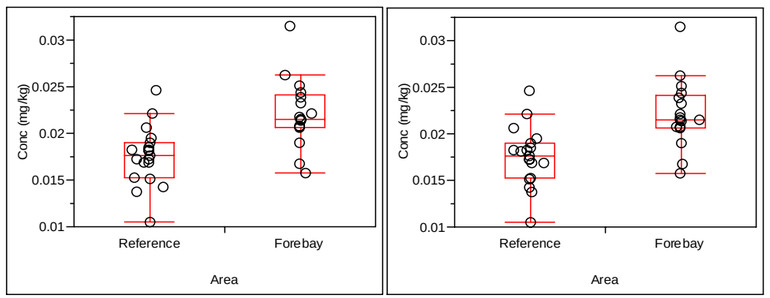
ZINC



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

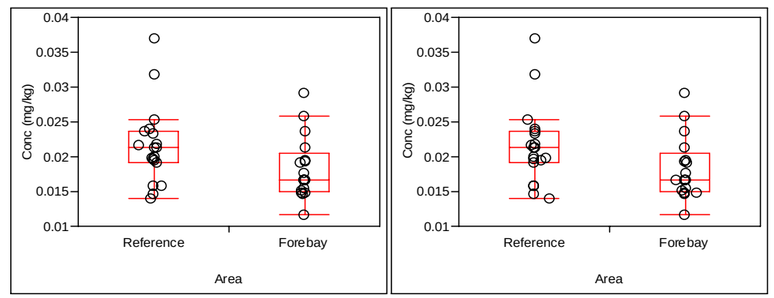
MERCURY



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

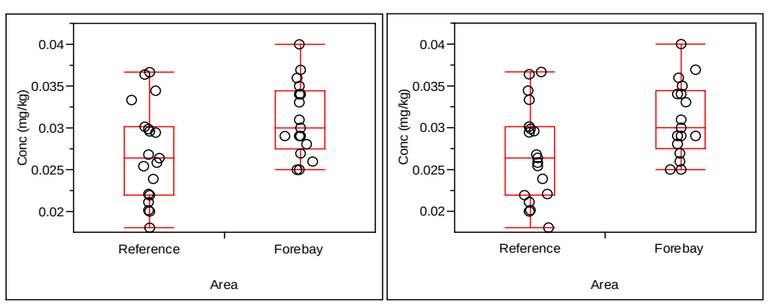
THALLIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

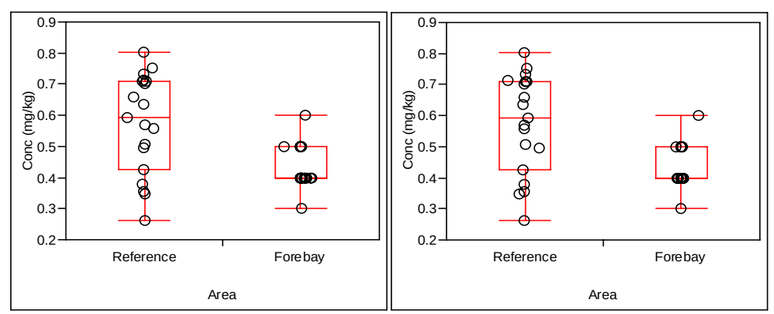
METHYL MERCURY



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

VANADIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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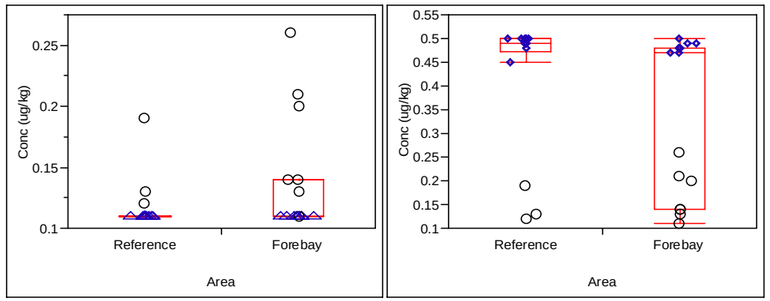
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN CRAYFISH TISSUE

DRAWING NUMBER: FIG L-4b
CAD FILE NUMBER: FIG L-4b
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-4b Metals in Crayfish Tissue.dwg Nov 17, 2010 - 8:40am

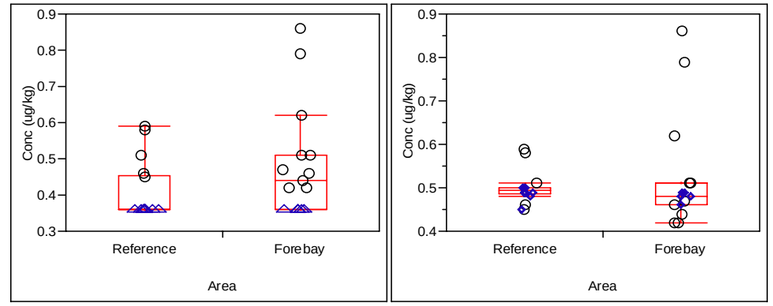
ACENAPHTHENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

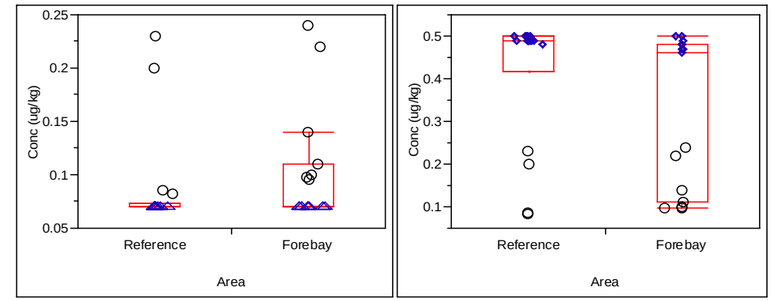
PHENANTHRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

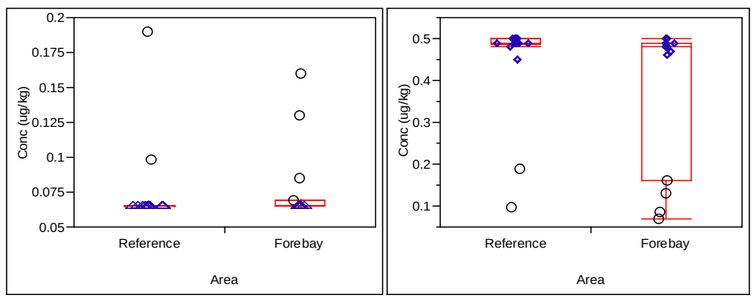
BENZO(B)FLUORANTHENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

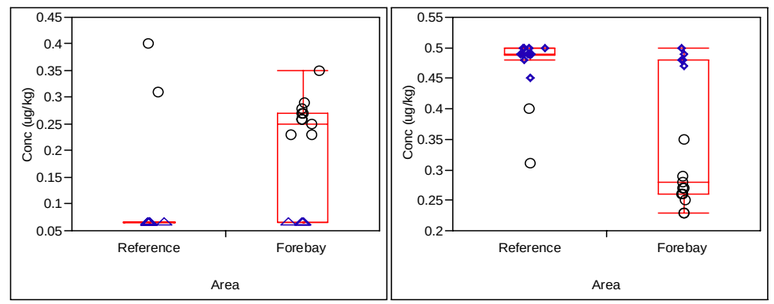
ANTHRACENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

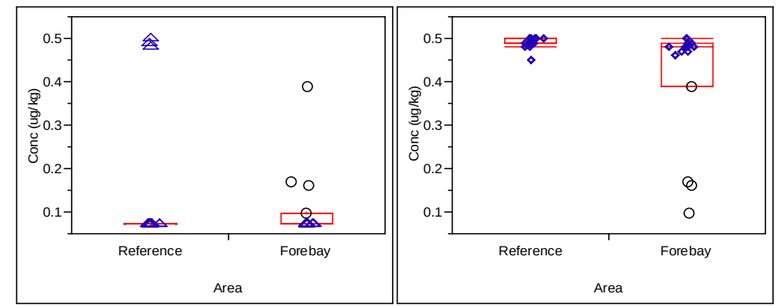
BENZO(A)ANTHRACENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

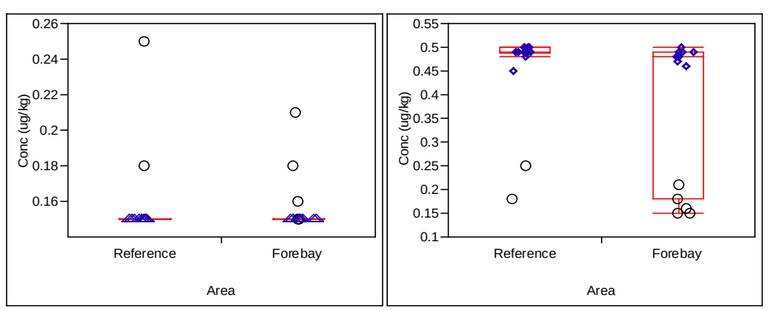
BENZO(G,H,I)PERYLENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

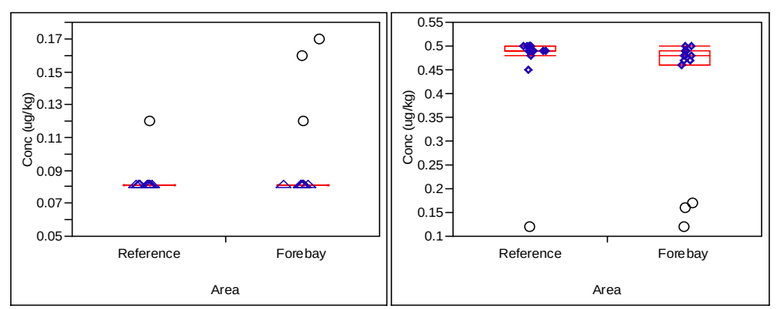
FLUORENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

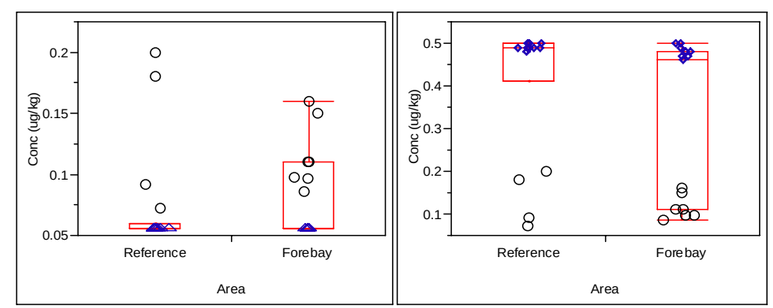
BENZO(A)PYRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

BENZO(K)FLUORANTHENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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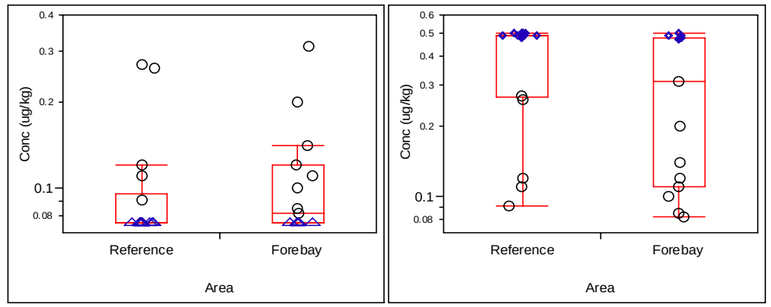
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN CRAYFISH TISSUE

DRAWING NUMBER: FIG L-4c
CAD FILE NUMBER: FIG L-4c
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-4c PAHs in Crayfish Tissue.dwg Nov 17, 2010 - 8:40am

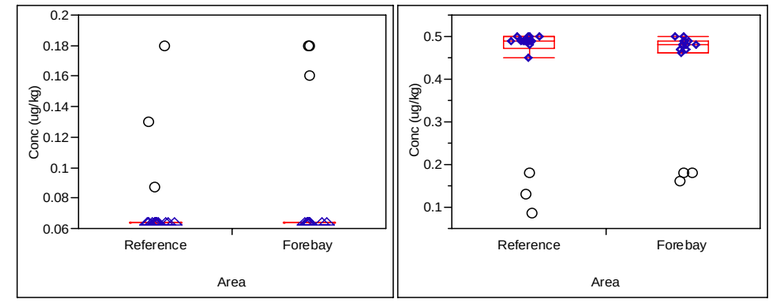
CHRYSENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

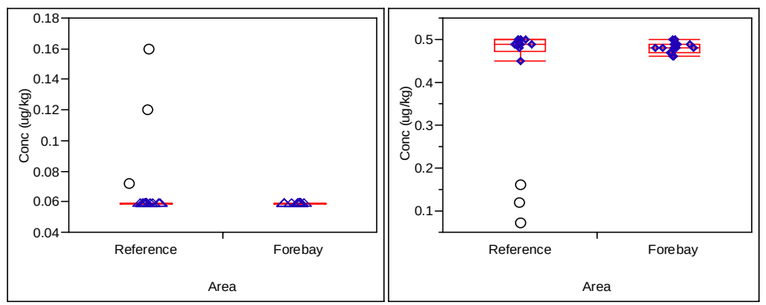
INDENO(1,2,3-CD)PYRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

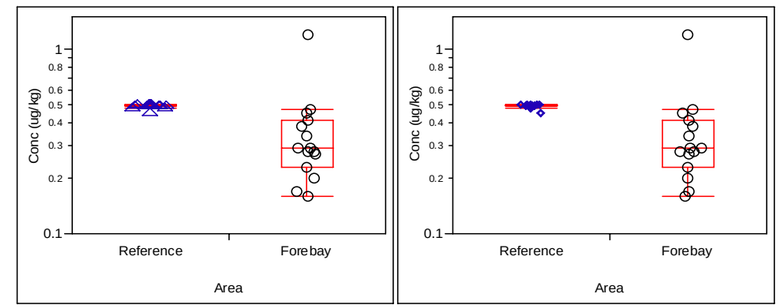
DIBENZ(A,H)ANTHRACENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

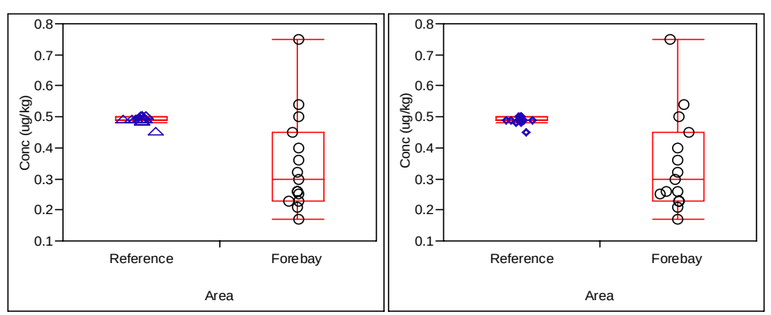
PYRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

FLUORANTHENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN CRAYFISH TISSUE

DRAWING NUMBER: FIG L-4d
CAD FILE NUMBER: FIG L-4d
SHEET: OF
REV.

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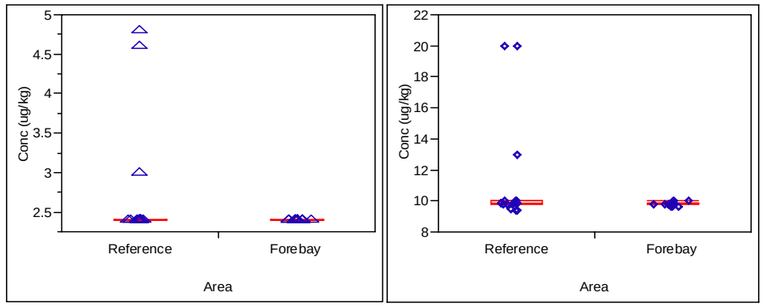
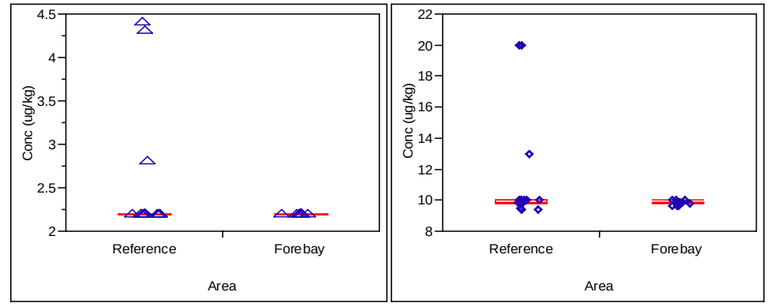
AROCLOR 1016



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

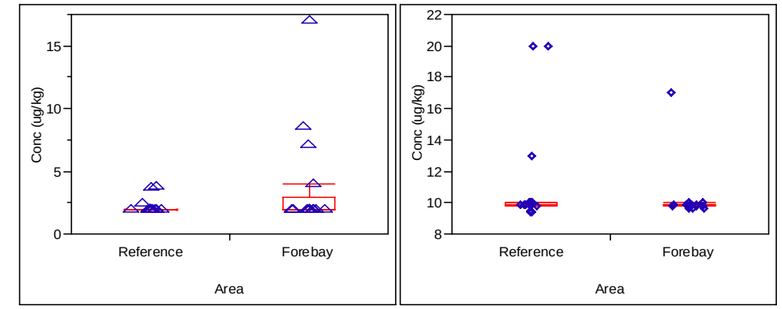
AROCLOR 1242



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

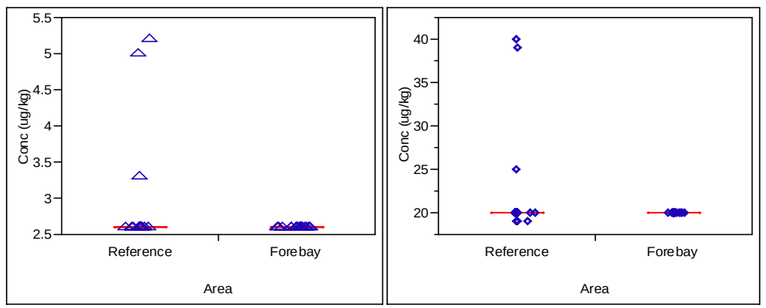
AROCLOR 1260



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

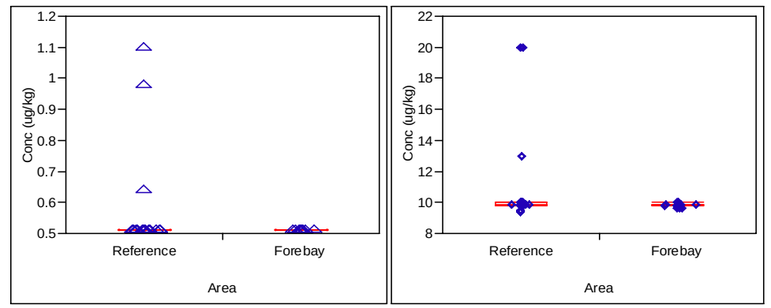
AROCLOR 1221



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

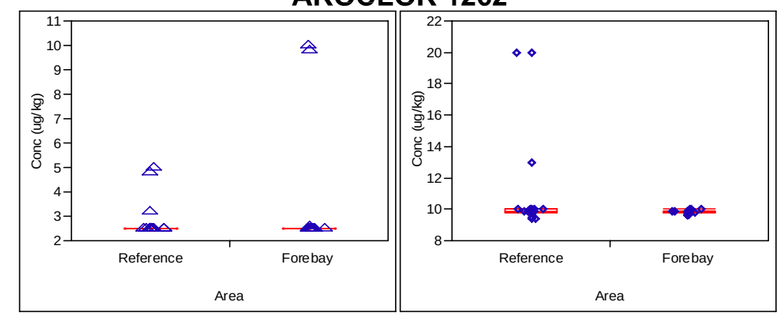
AROCLOR 1248



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

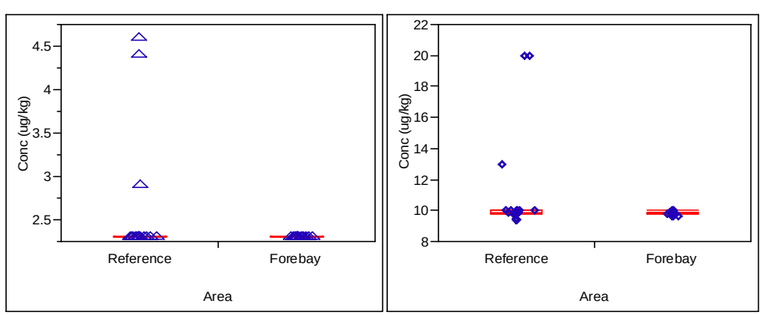
AROCLOR 1262



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

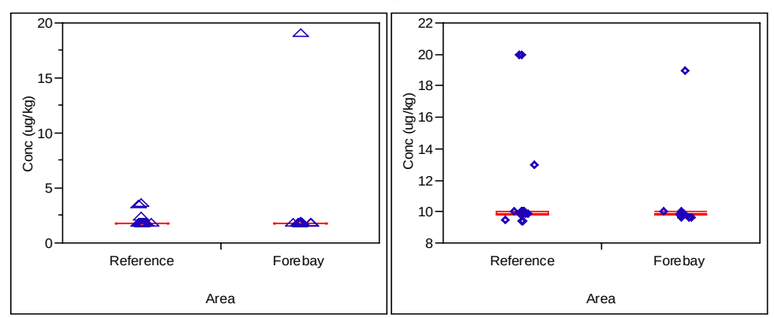
AROCLOR 1232



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

AROCLOR 1254



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

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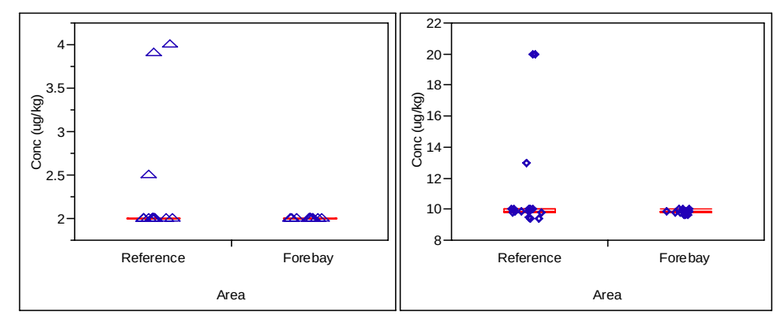

CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
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CASCADE LOCKS, OREGON

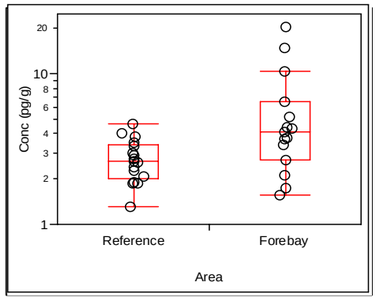
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PCB AROCLORS IN CRAYFISH TISSUE

DRAWING NUMBER: FIG L-4e
CAD FILE NUMBER: FIG L-4e
SHEET: OF
REV.

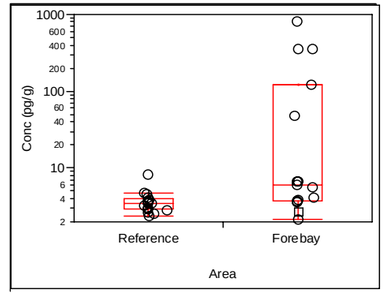
O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-4e PCB Aroclors in Crayfish Tissue.dwg Nov 17, 2010 - 8:41am

PCB 77



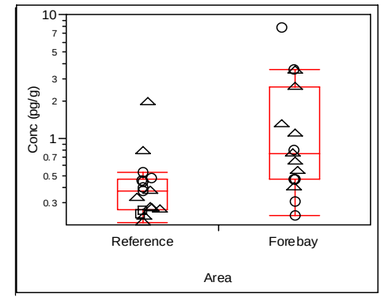
FOREBAY IS STATISTICALLY HIGHER

PCB 114



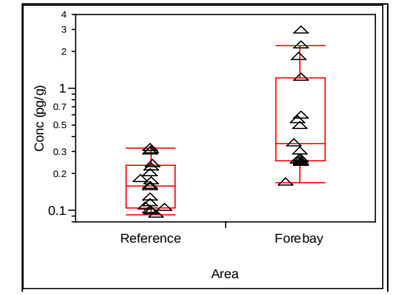
FOREBAY IS STATISTICALLY HIGHER

PCB 126



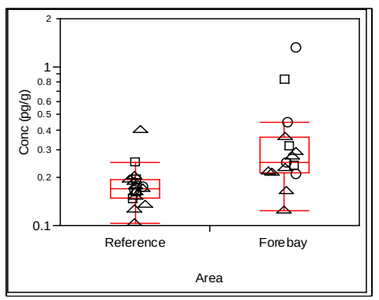
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 169



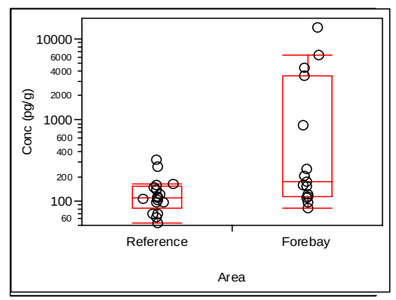
ALL SAMPLES ARE NON DETECTS

PCB 81



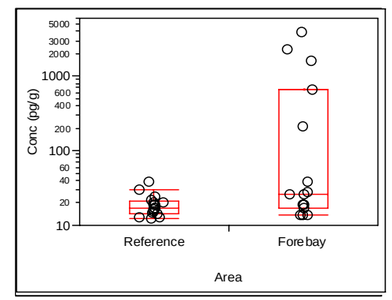
FOREBAY IS STATISTICALLY HIGHER

PCB 118



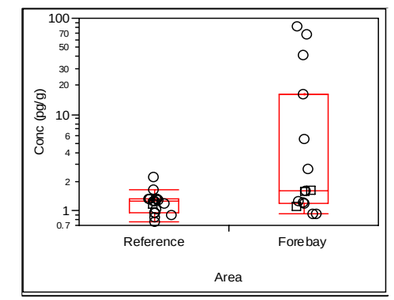
FOREBAY IS STATISTICALLY HIGHER

PCB 156+157



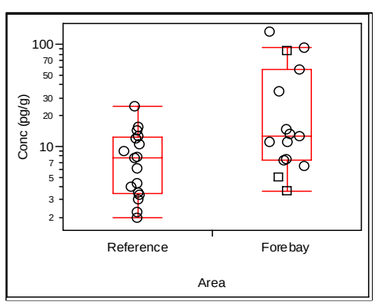
FOREBAY IS STATISTICALLY HIGHER

PCB 189



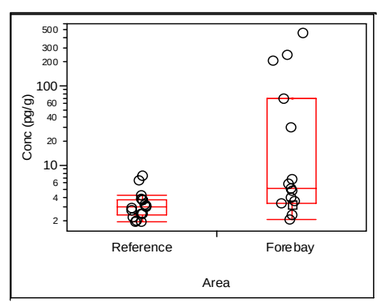
FOREBAY IS STATISTICALLY HIGHER

PCB 105



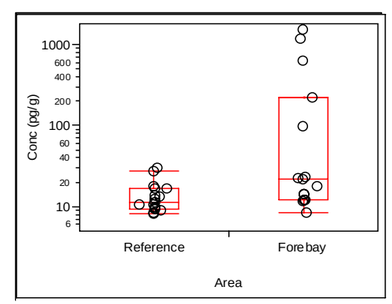
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 123



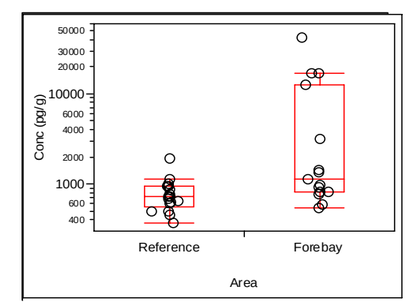
FOREBAY IS STATISTICALLY HIGHER

PCB 167



FOREBAY IS STATISTICALLY HIGHER

SUM 209 CONGENERS (KM-BASED)



FOREBAY IS STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Reported Detection Limit (RDL)
- □ EMPC Result, Censored at Reported Value

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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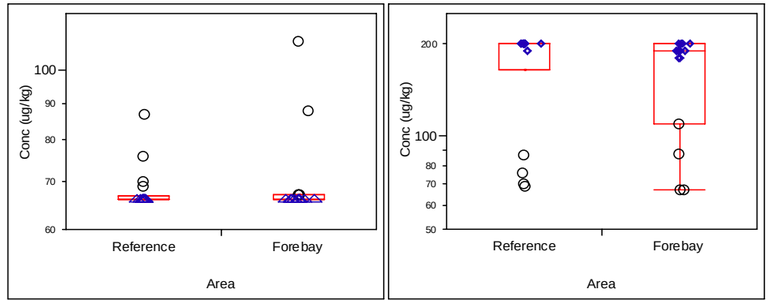
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PCB CONGENERS IN CRAYFISH TISSUE

DRAWING NUMBER: FIG L-4f
CAD FILE NUMBER: FIG L-4f
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-4f PCB Congeners in Crayfish Tissue.dwg Nov 12, 2010 - 2:49pm

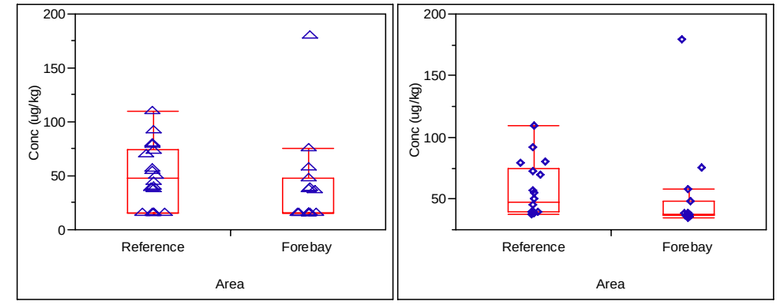
BIS(2-ETHYLHEXYL) PHTHALATE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

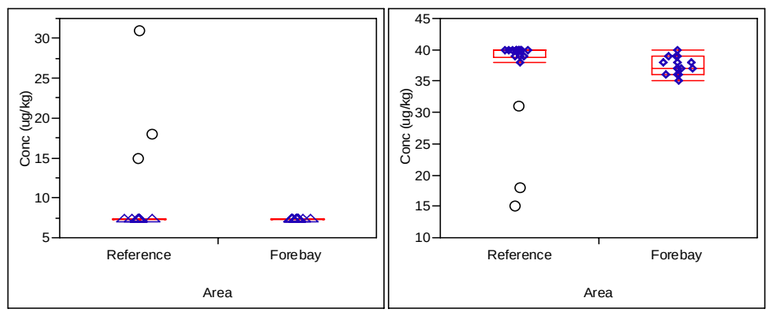
DI-N-BUTYL PHTHALATE



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

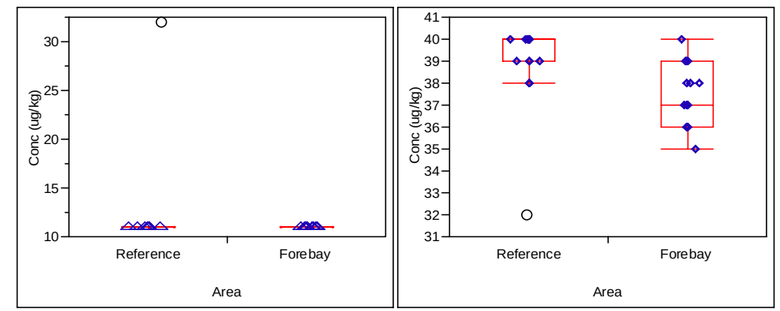
BUTYL BENZYL PHTHALATE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

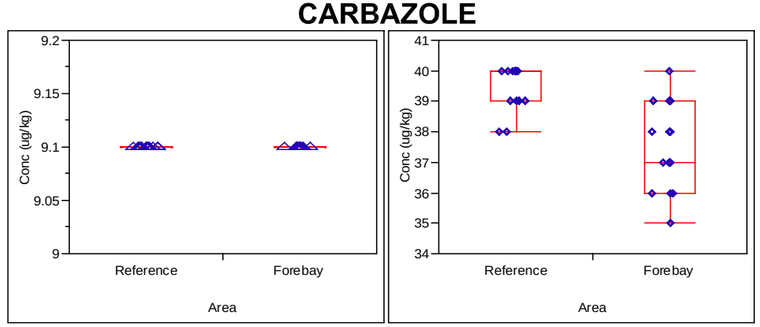
DI-N-OCTYL PHTHALATE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

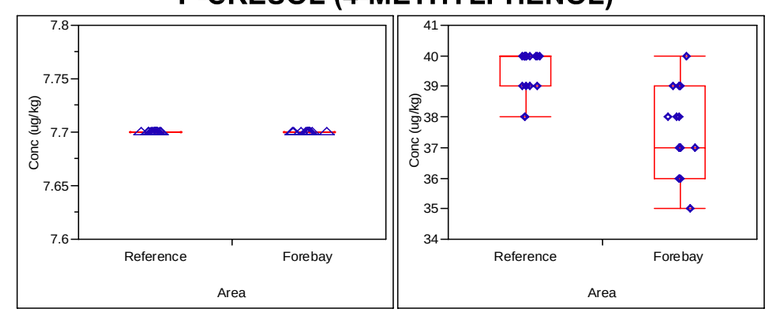
CARBAZOLE



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

P-CRESOL (4-METHYLPHENOL)



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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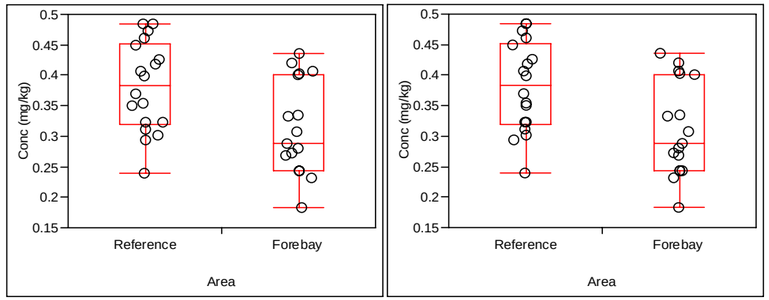
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
SVOCs IN CRAYFISH TISSUE

DRAWING NUMBER: FIG L-4g
CAD FILE NUMBER: FIG L-4g
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-4g SVOCs in Crayfish Tissue.dwg Nov 17, 2010 - 8:42am

ARSENIC

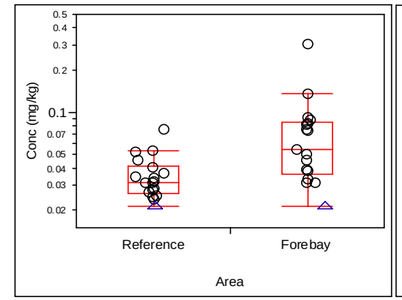


CENSORED AT MDL

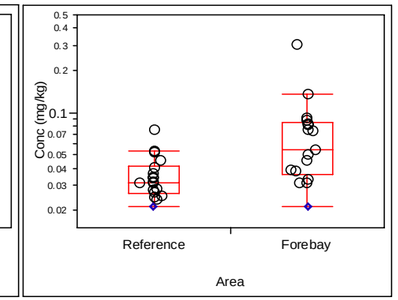
CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEAD



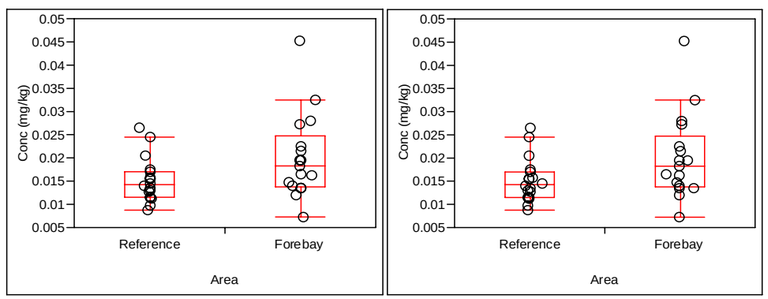
CENSORED AT MDL



CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

CADMIUM

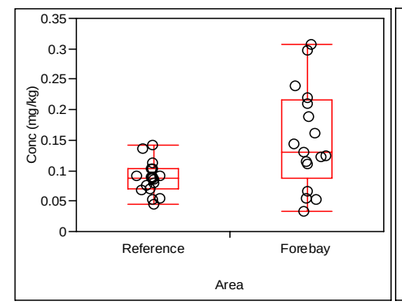


CENSORED AT MDL

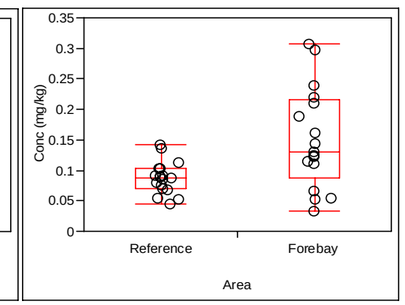
CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

MERCURY



CENSORED AT MDL



CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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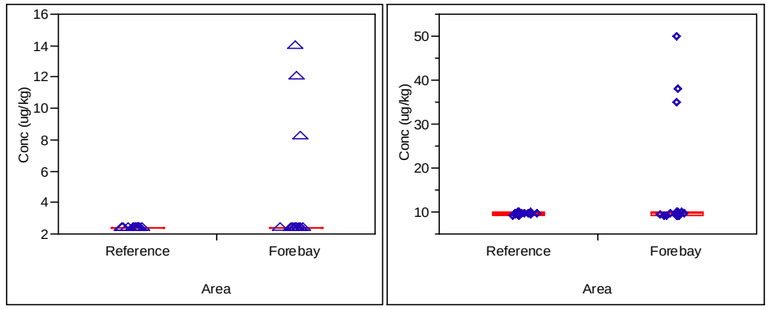
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SCULPIN TISSUE

DRAWING NUMBER: FIG L-5a
CAD FILE NUMBER: FIG L-5a
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-5a Metals in Sculpin Tissue.dwg Nov 17, 2010 - 8:42am

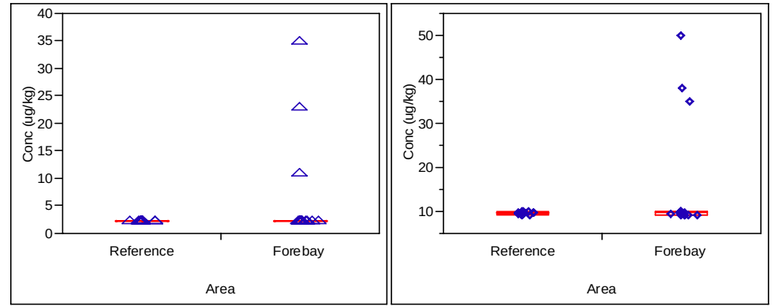
AROCLOR 1016



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

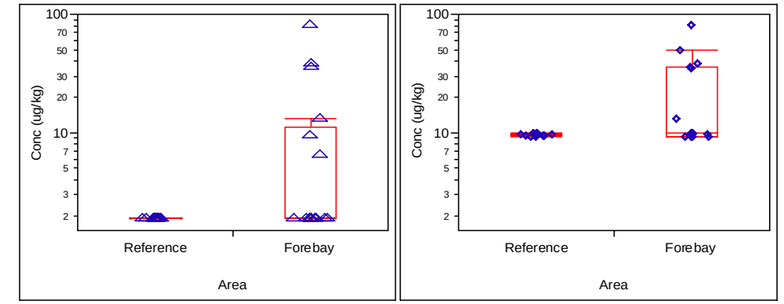
AROCLOR 1242



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

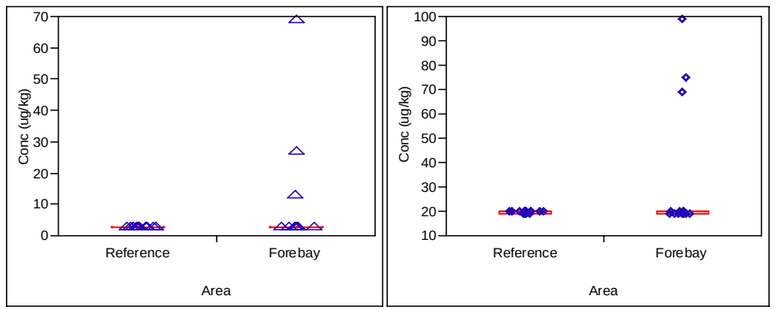
AROCLOR 1260



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

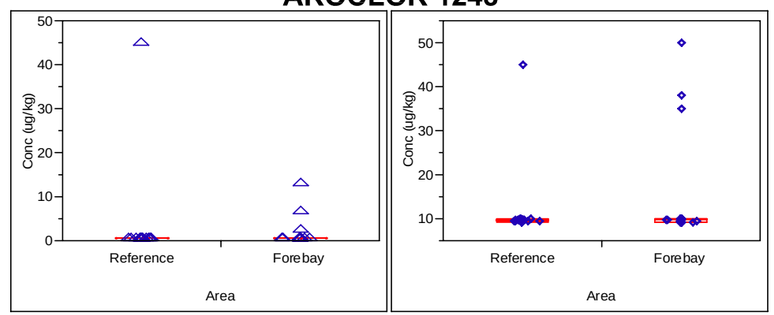
AROCLOR 1221



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

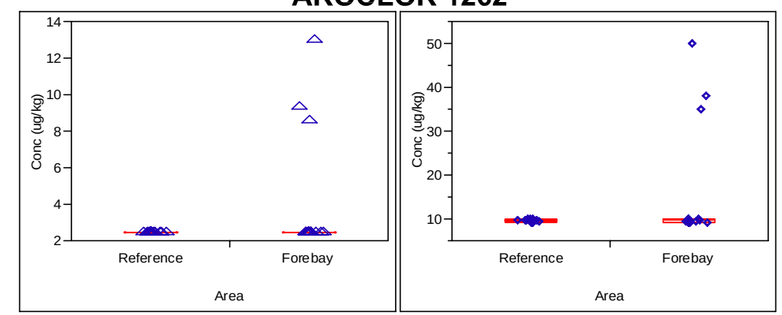
AROCLOR 1248



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

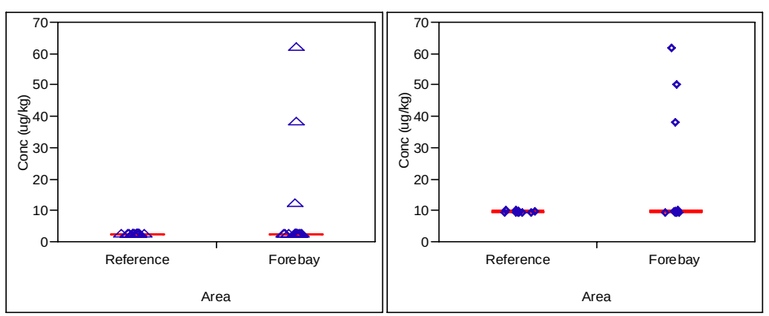
AROCLOR 1262



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

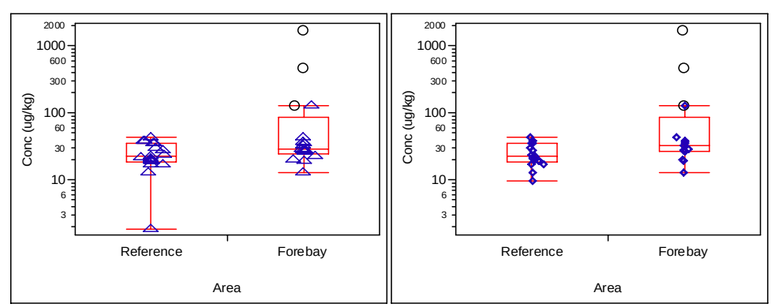
AROCLOR 1232



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

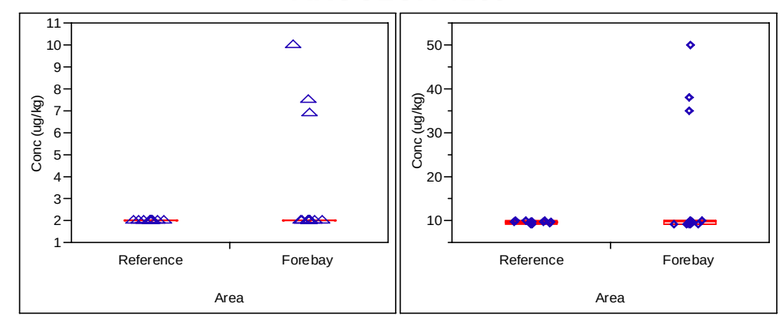
AROCLOR 1254



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

AROCLOR 1268



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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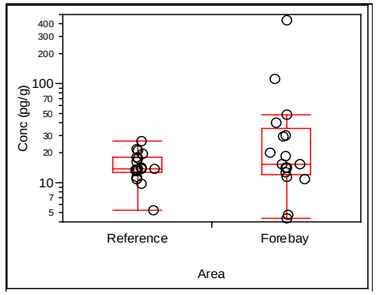
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PCB AROCLORS IN SCULPIN TISSUE

DRAWING NUMBER: FIG L-5b
CAD FILE NUMBER: FIG L-5b
SHEET: OF
REV.

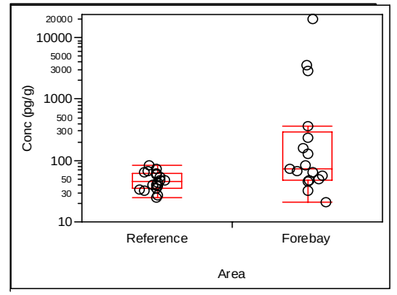
O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-5b PCB Aroclors in Sculpin Tissue.dwg Nov 17, 2010 - 8:43am

PCB 77



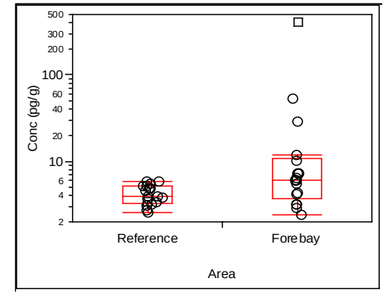
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 114



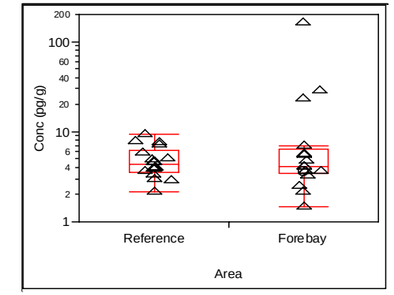
FOREBAY IS STATISTICALLY HIGHER

PCB 126



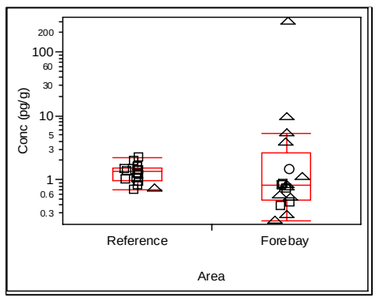
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 169



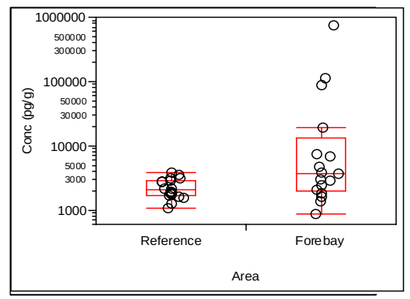
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 81



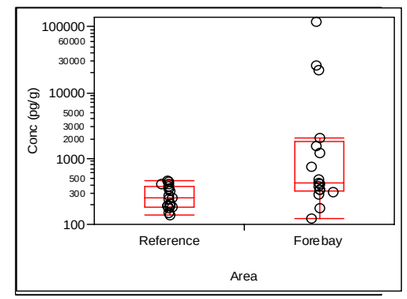
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 118



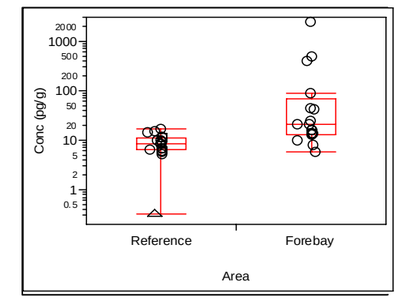
FOREBAY IS STATISTICALLY HIGHER

PCB 156+157



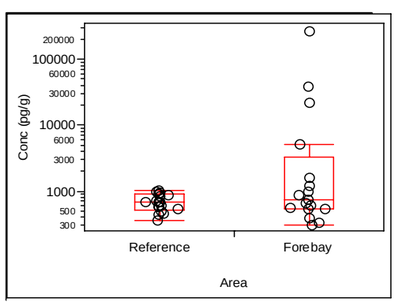
FOREBAY IS STATISTICALLY HIGHER

PCB 189



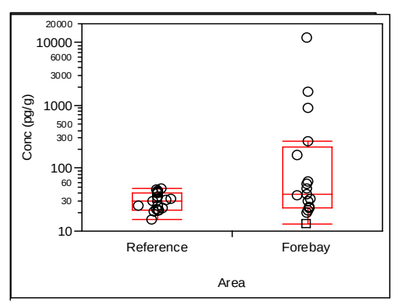
FOREBAY IS STATISTICALLY HIGHER

PCB 105



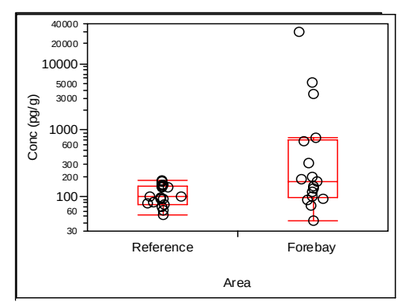
FOREBAY IS NOT STATISTICALLY HIGHER

PCB 123



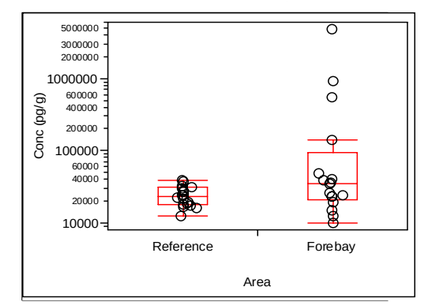
FOREBAY IS STATISTICALLY HIGHER

PCB 167



FOREBAY IS STATISTICALLY HIGHER

SUM 209 CONGENERS (KM-BASED)



FOREBAY IS STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Reported Detection Limit (RDL)
- □ EMPC Result, Censored at Reported Value

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

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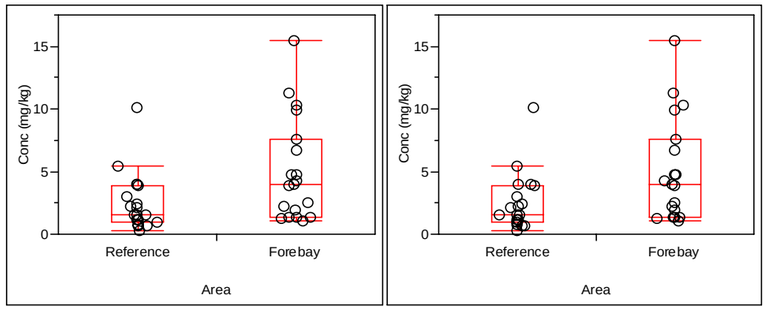
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PCB CONGENERS IN SCULPIN TISSUE

DRAWING NUMBER: FIG L-5c
CAD FILE NUMBER: FIG L-5c
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-5c PCB Congeners in Sculpin Tissue.dwg Nov 12, 2010 - 2:50pm

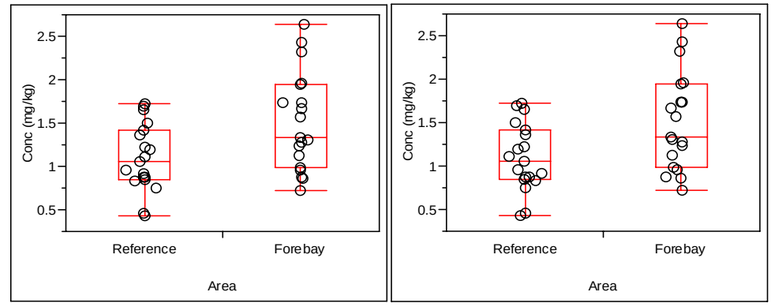
ALUMINUM



CENSORED AT MDL | CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

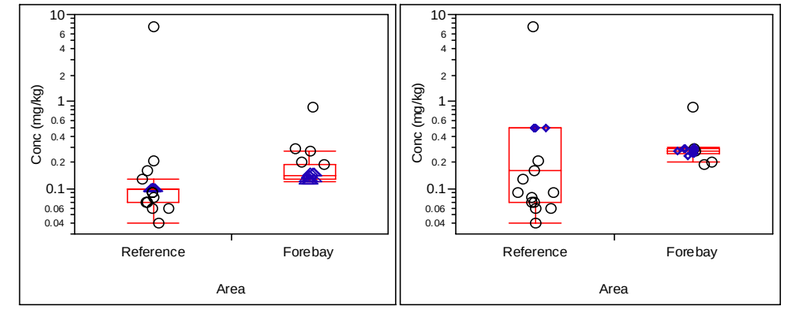
BARIUM



CENSORED AT MDL | CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

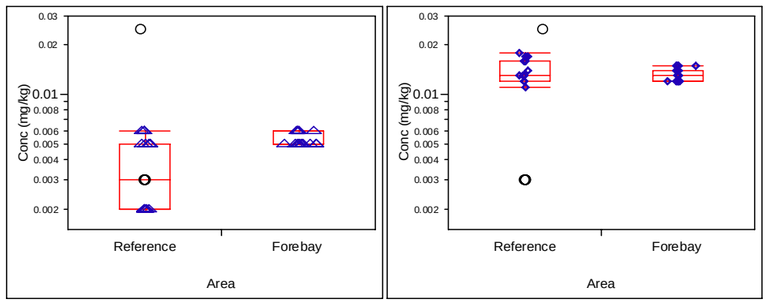
CHROMIUM



CENSORED AT MDL | CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

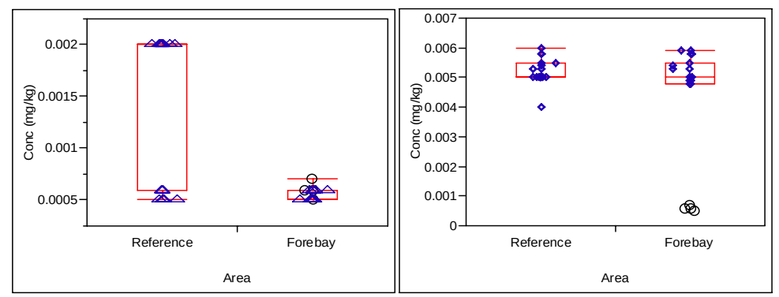
ANTIMONY



CENSORED AT MDL | CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

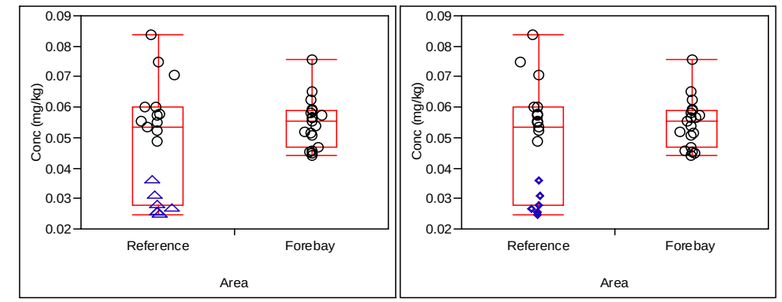
BERYLLIUM



CENSORED AT MDL | CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

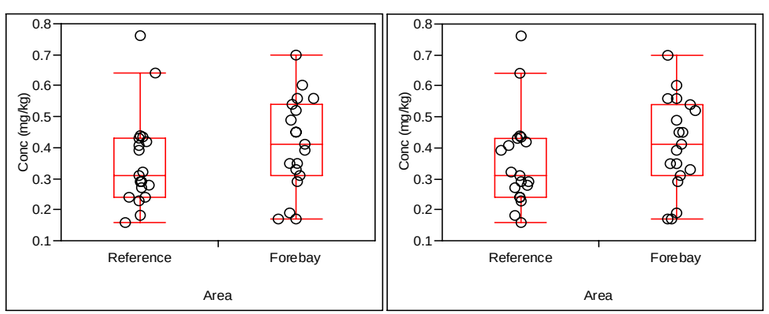
COBALT



CENSORED AT MDL | CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

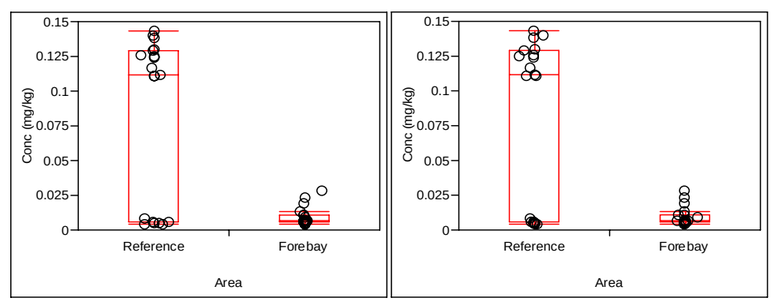
ARSENIC



CENSORED AT MDL | CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

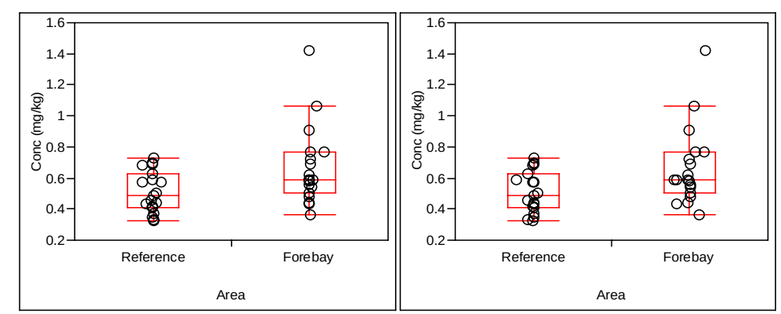
CADMIUM



CENSORED AT MDL | CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

COPPER



CENSORED AT MDL | CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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CASCADE LOCKS, OREGON

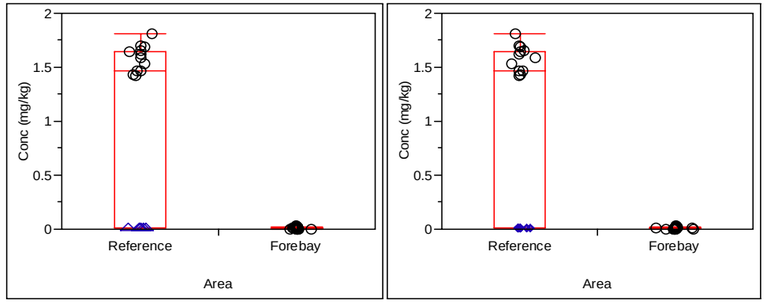
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIG L-6a
CAD FILE NUMBER: FIG L-6a
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-6a Metals in Smallmouth Bass Tissue.dwg Nov 17, 2010 - 8:44am

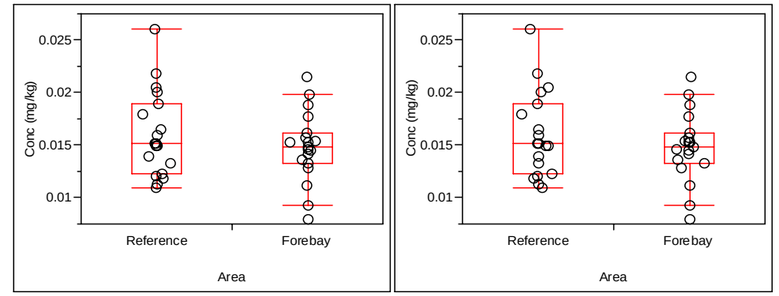
LEAD



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

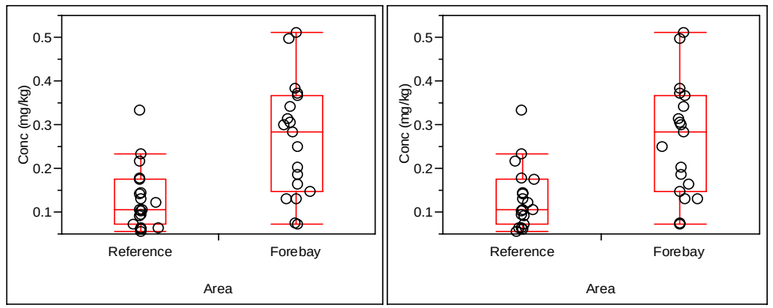
THALLIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

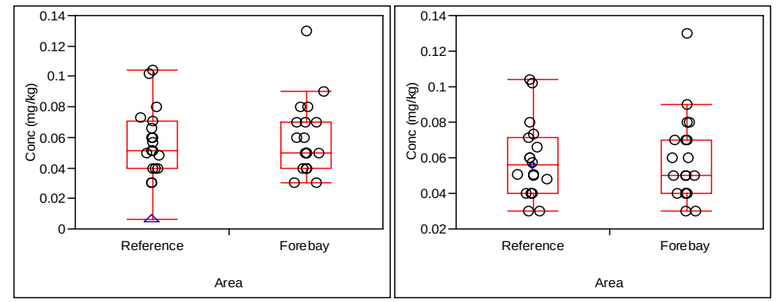
MERCURY



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

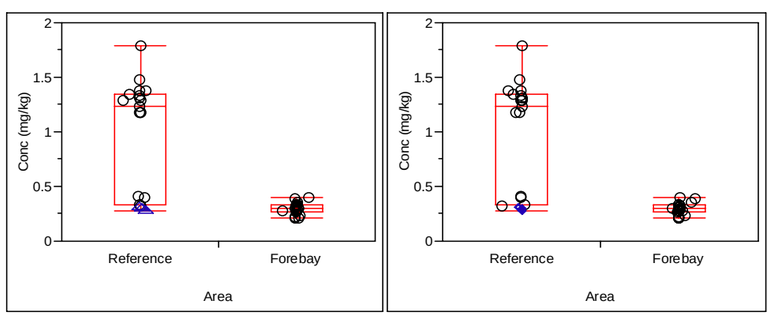
VANADIUM



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

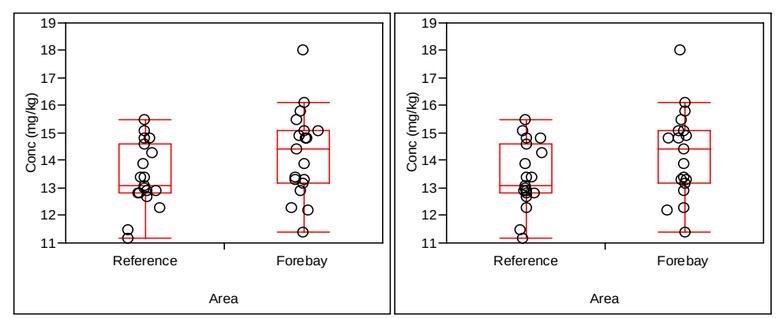
NICKEL



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

ZINC



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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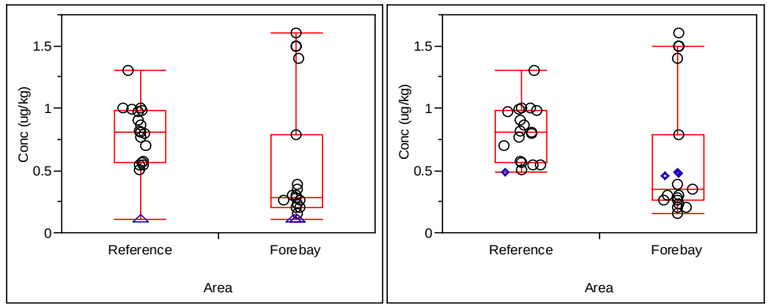
BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIG L-6b
CAD FILE NUMBER: FIG L-6b
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-6b Metals in Smallmouth Bass Tissue.dwg Nov 17, 2010 - 8:44am

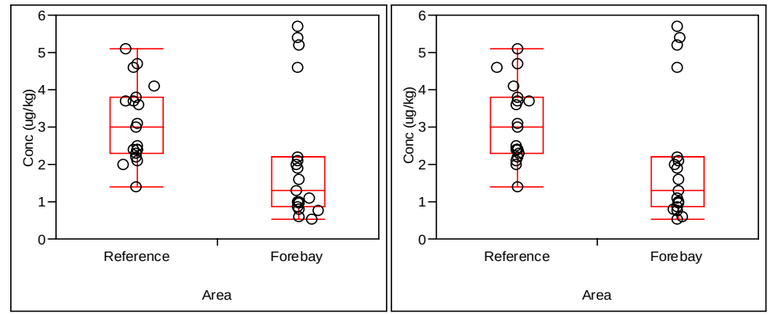
ACENAPHTHENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

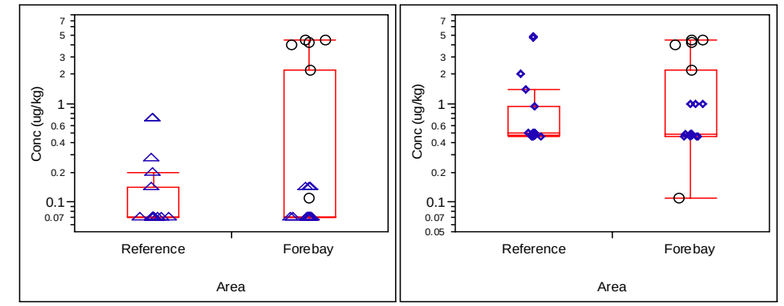
PHENANTHRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

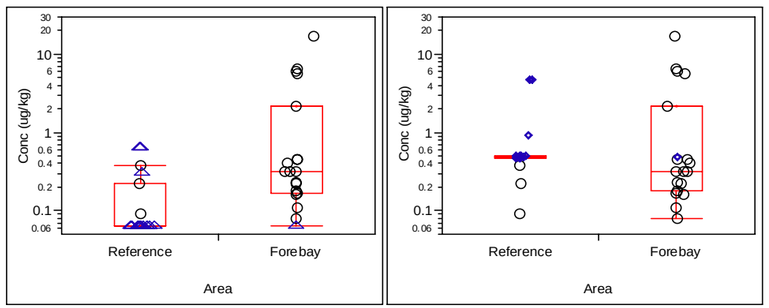
BENZO(B)FLUORANTHENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

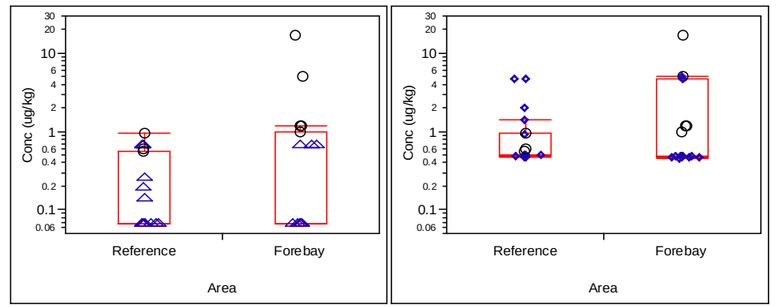
ANTHRACENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

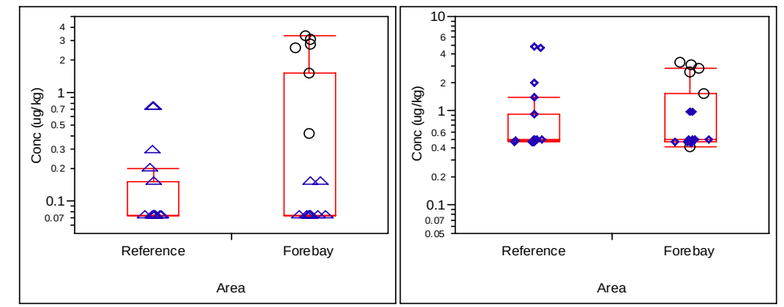
BENZO(A)ANTHRACENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

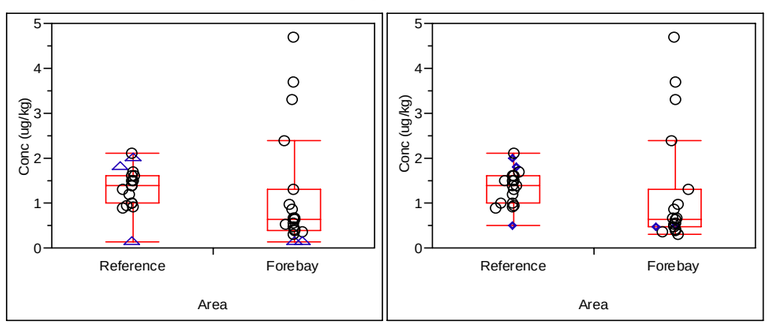
BENZO(G,H,I)PERYLENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

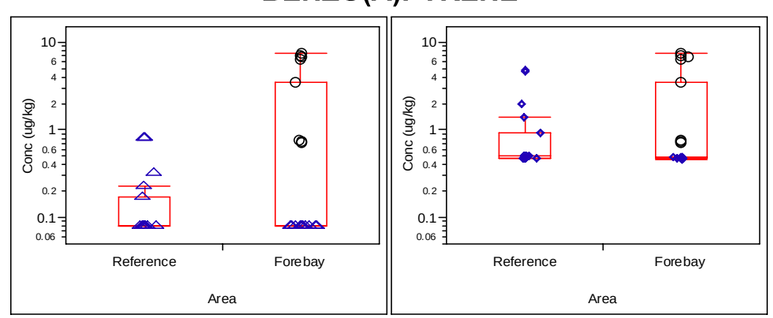
FLUORENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

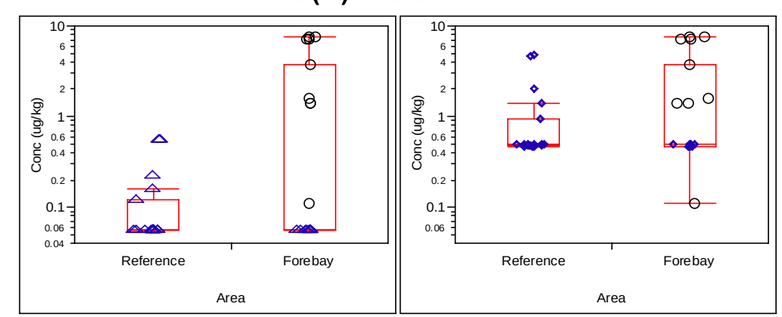
BENZO(A)PYRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

BENZO(K)FLUORANTHENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

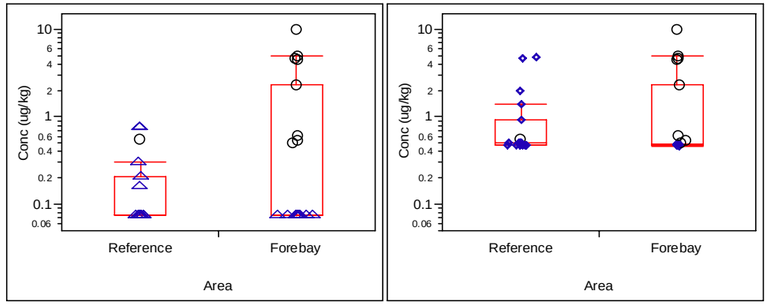
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIG L-6c
CAD FILE NUMBER: FIG L-6c
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-6c PAHs in Smallmouth Bass Tissue.dwg Nov 17, 2010 - 8:45am

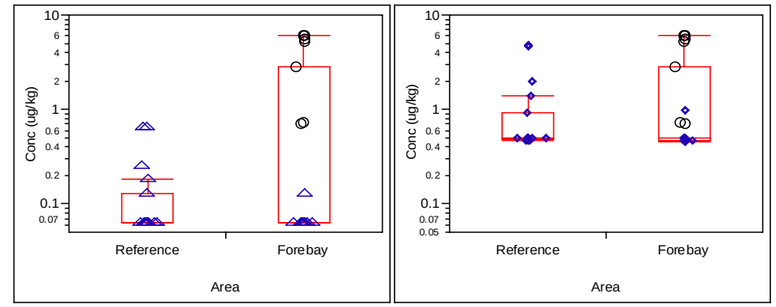
CHRYSENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

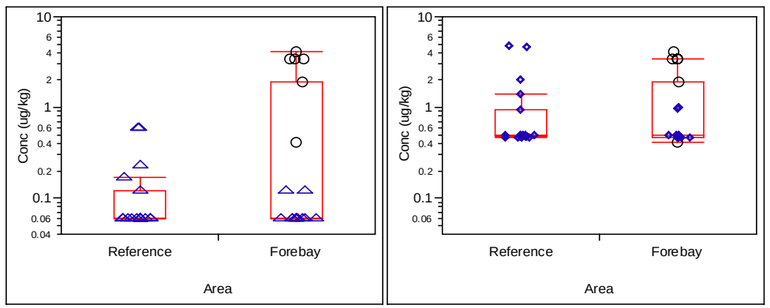
INDENO(1,2,3-CD)PYRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

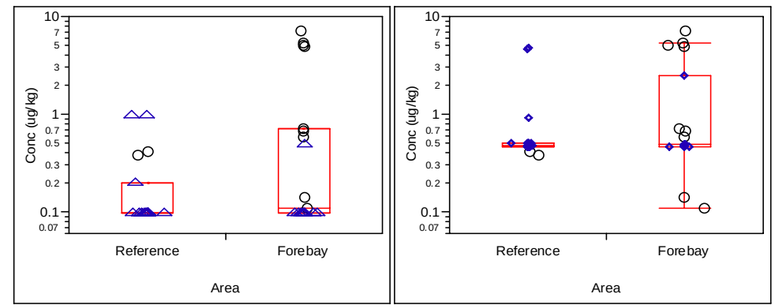
DIBENZ(A,H)ANTHRACENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

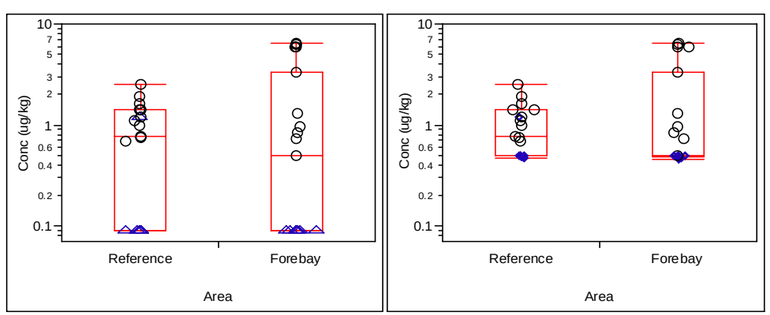
PYRENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

FLUORANTHENE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

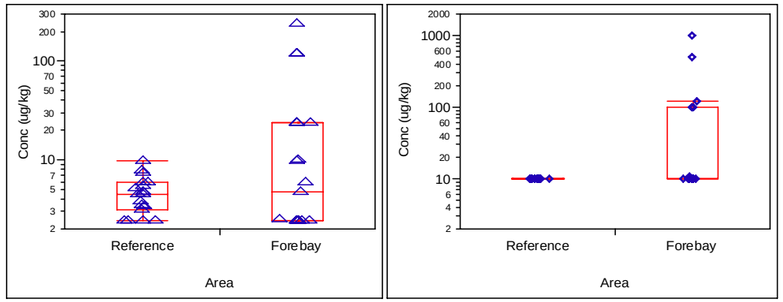
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIG L-6d
CAD FILE NUMBER: FIG L-6d
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-6d PAHs in Smallmouth Bass Tissue.dwg Nov 17, 2010 - 8:45am

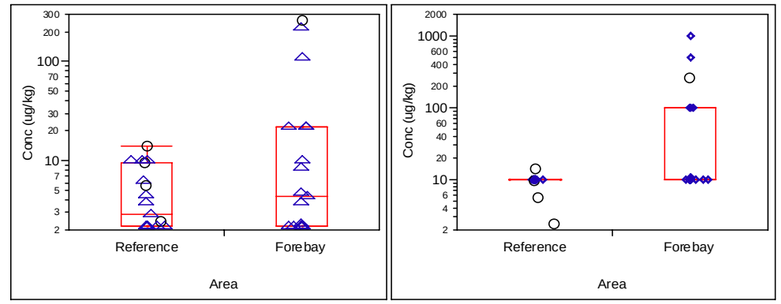
AROCLOR 1016



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

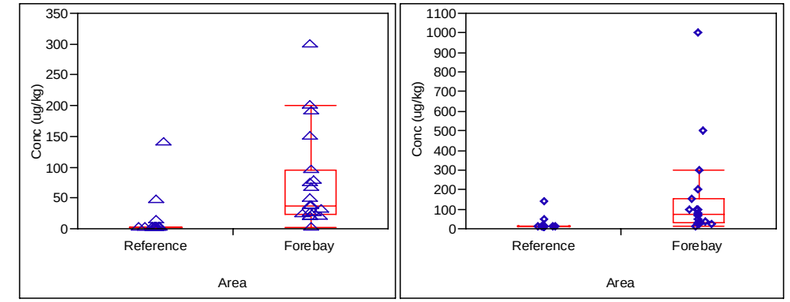
AROCLOR 1242



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

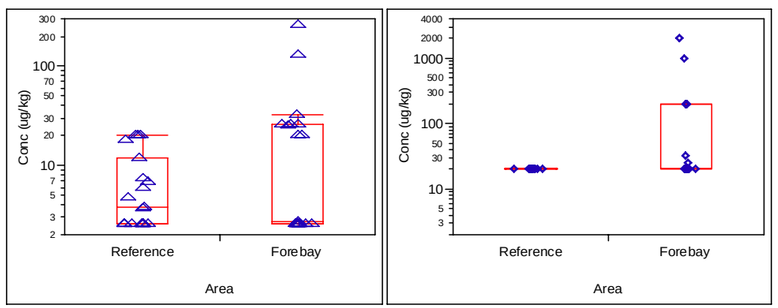
AROCLOR 1260



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

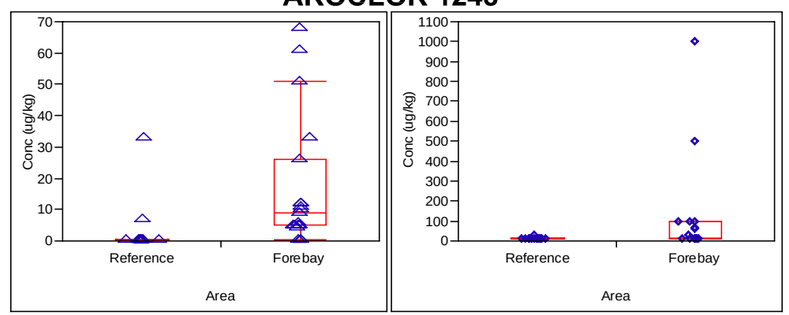
AROCLOR 1221



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

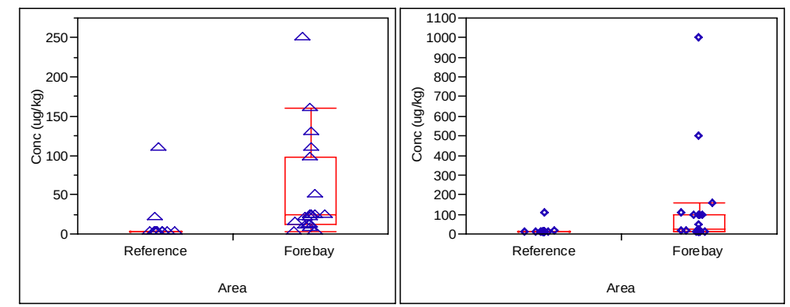
AROCLOR 1248



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

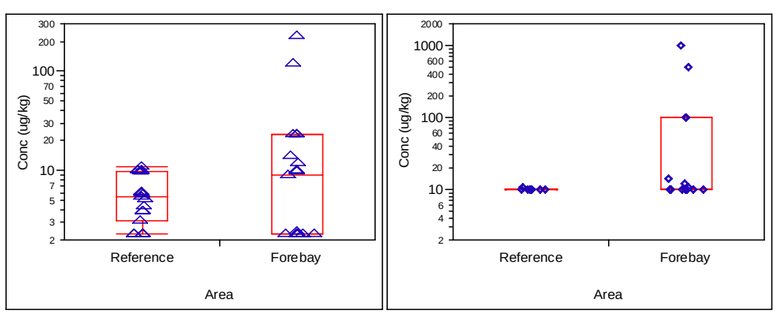
AROCLOR 1262



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

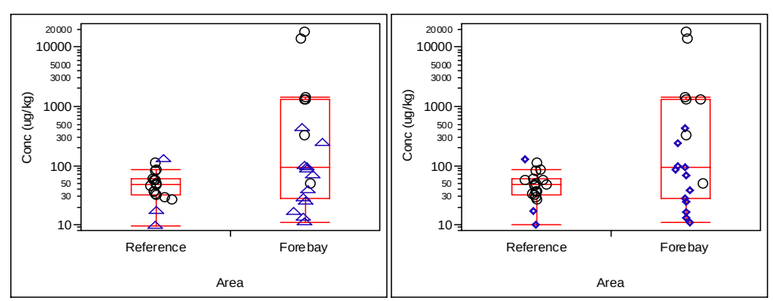
AROCLOR 1232



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

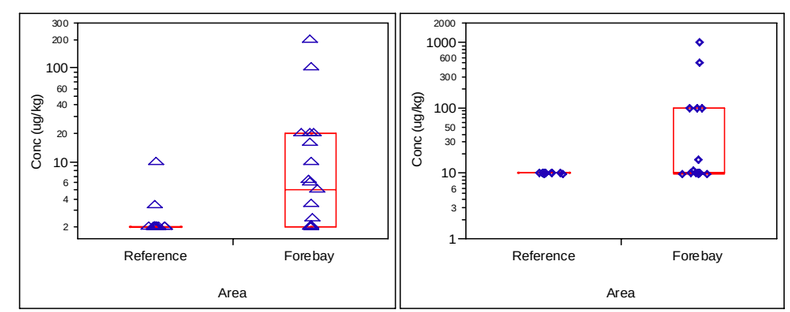
AROCLOR 1254



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

AROCLOR 1268



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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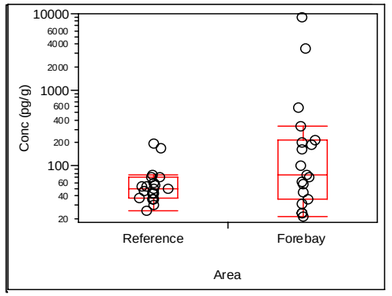
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PCB AROCLORS IN SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIG L-6e
CAD FILE NUMBER: FIG L-6e
SHEET: OF
REV.

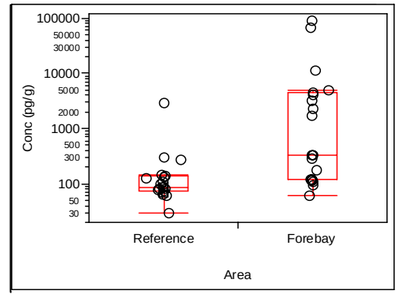
O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-6e PCB Aroclors in Smallmouth Bass Tissue.dwg Nov 17, 2010 - 8:46am

PCB 77



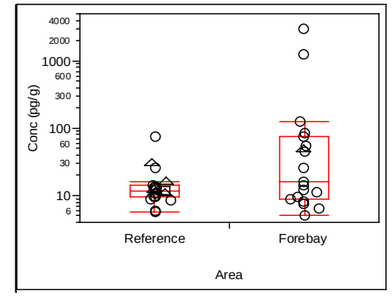
FOREBAY IS STATISTICALLY HIGHER

PCB 114



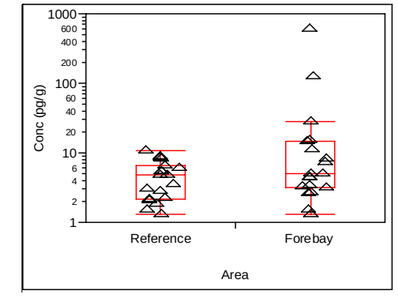
FOREBAY IS STATISTICALLY HIGHER

PCB 126



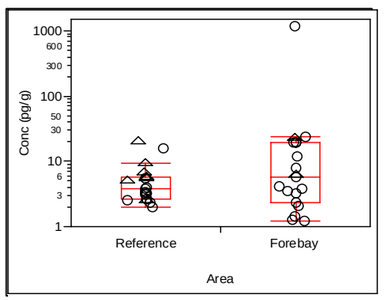
FOREBAY IS STATISTICALLY HIGHER

PCB 169



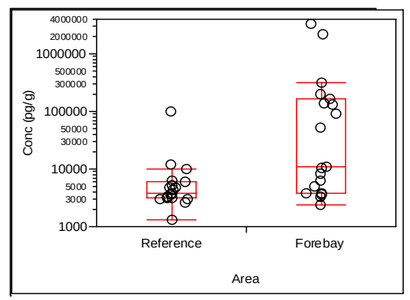
FOREBAY IS STATISTICALLY HIGHER

PCB 81



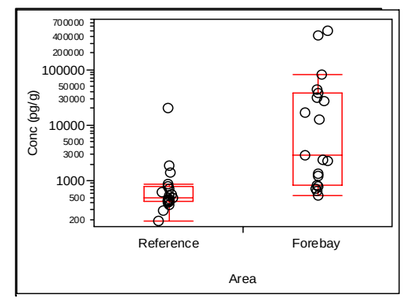
FOREBAY IS STATISTICALLY HIGHER

PCB 118



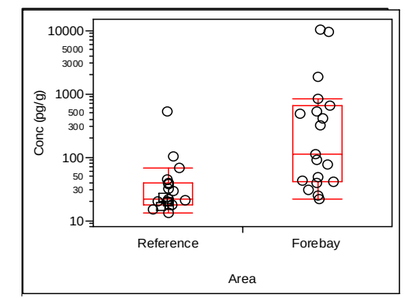
FOREBAY IS STATISTICALLY HIGHER

PCB 156+157



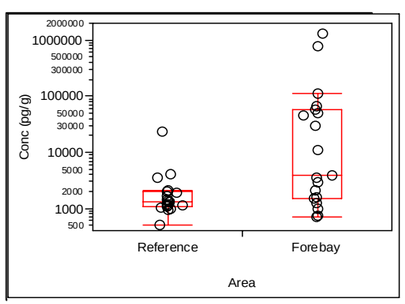
FOREBAY IS STATISTICALLY HIGHER

PCB 189



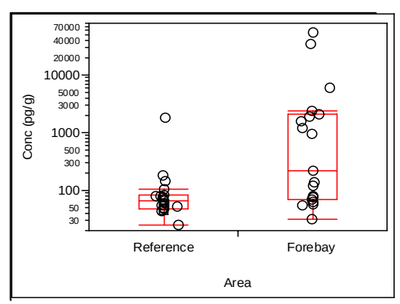
FOREBAY IS STATISTICALLY HIGHER

PCB 105



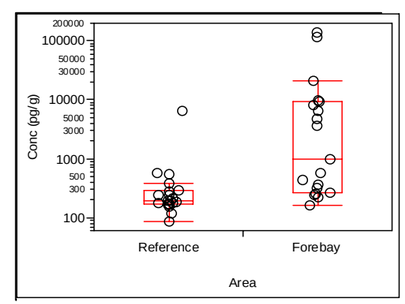
FOREBAY IS STATISTICALLY HIGHER

PCB 123



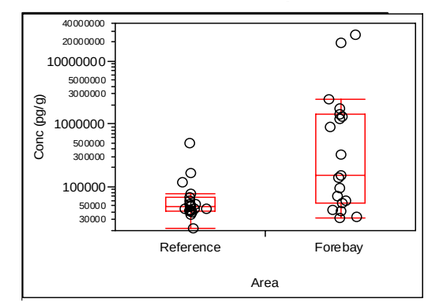
FOREBAY IS STATISTICALLY HIGHER

PCB 167



FOREBAY IS STATISTICALLY HIGHER

SUM 209 CONGENERS (KM-BASED)



FOREBAY IS STATISTICALLY HIGHER

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Reported Detection Limit (RDL)
- □ EMPC Result, Censored at Reported Value

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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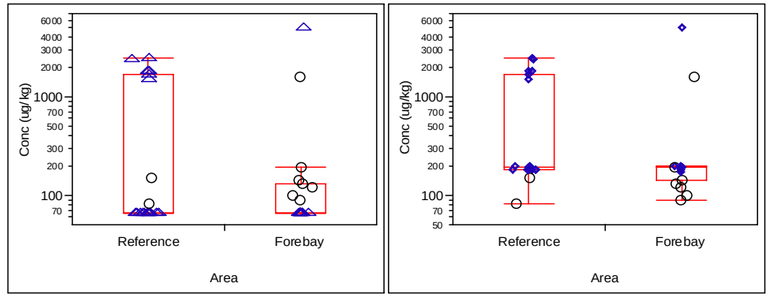
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PCB CONGENERS IN SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIG L-6f
CAD FILE NUMBER: FIG L-6f
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-6f PCB Congeners in Smallmouth Bass Tissue.dwg Nov 12, 2010 - 2:52pm

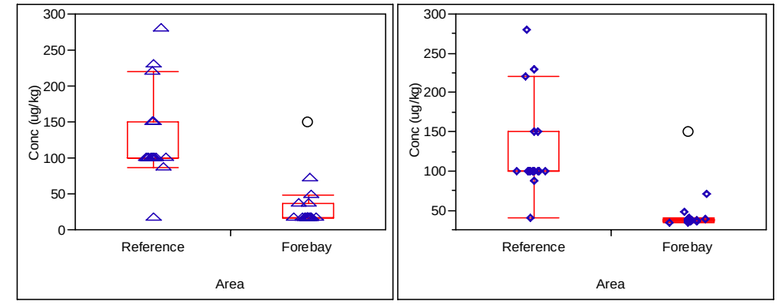
BIS(2-ETHYLHEXYL) PHTHALATE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS STATISTICALLY HIGHER

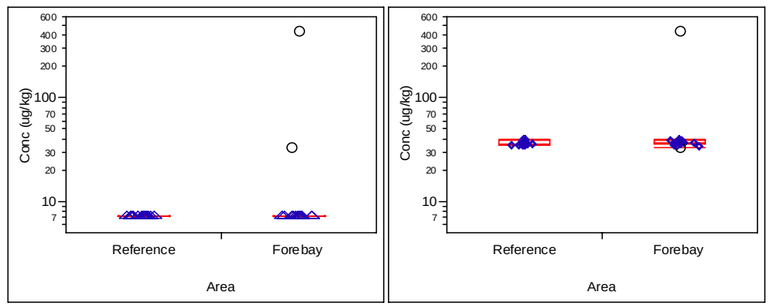
DI-N-BUTYL PHTHALATE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

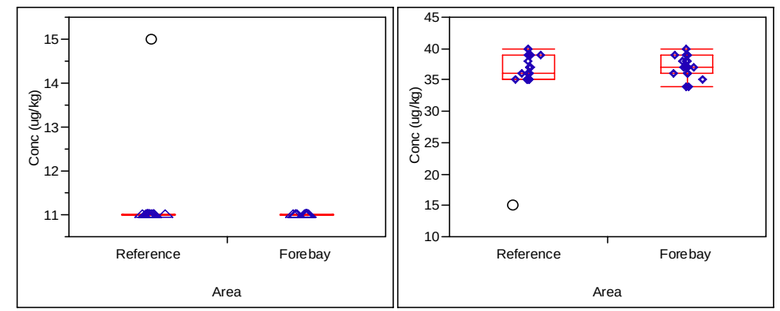
BUTYL BENZYL PHTHALATE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

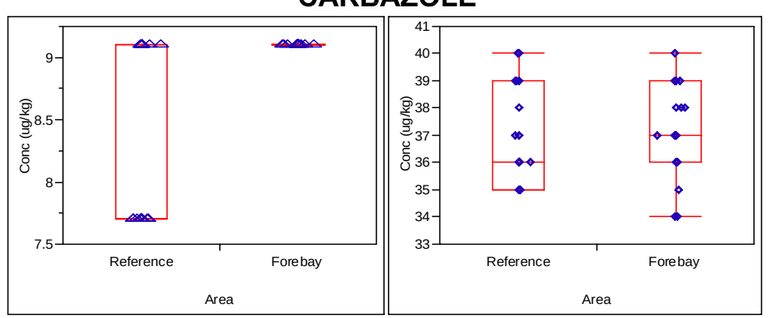
DI-N-OCTYL PHTHALATE



CENSORED AT MDL CENSORED AT MRL

FOREBAY IS NOT STATISTICALLY HIGHER

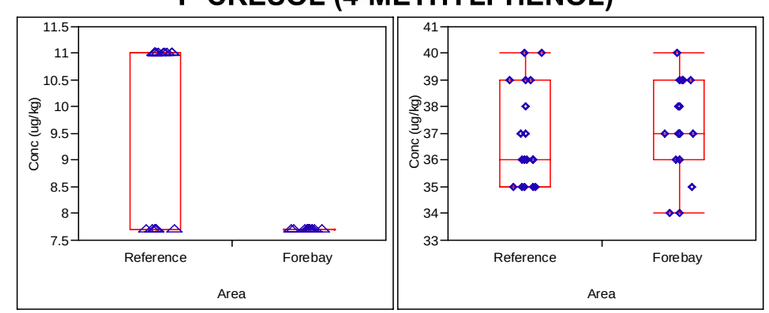
CARBAZOLE



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

P-CRESOL (4-METHYLPHENOL)



CENSORED AT MDL CENSORED AT MRL

ALL SAMPLES ARE NON DETECTS

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

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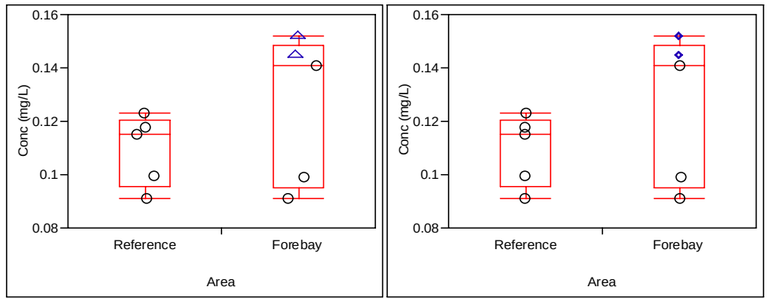
BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
SVOCs IN SMALLMOUTH BASS TISSUE

DRAWING NUMBER: FIG L-6g
CAD FILE NUMBER: FIG L-6g
SHEET: OF
REV.

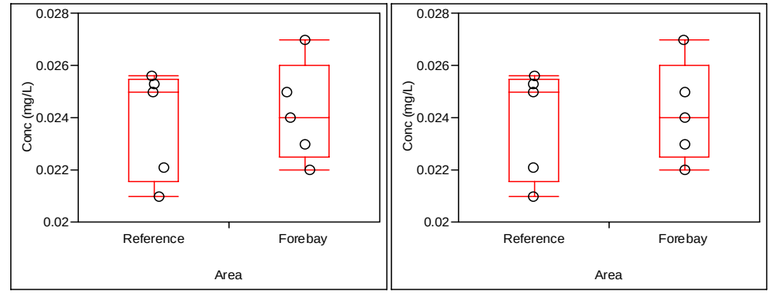
O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-6g SVOCs in Smallmouth Bass Tissue.dwg Nov 17, 2010 - 8:46am

ALUMINUM



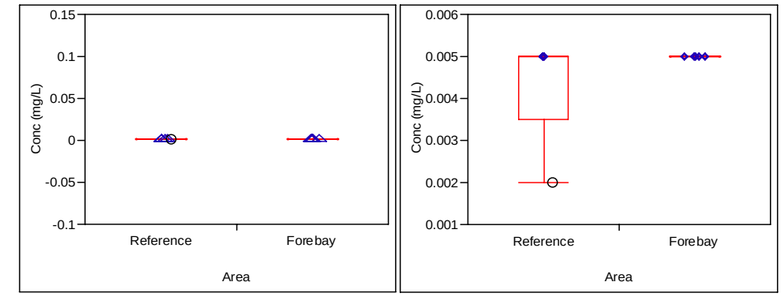
CENSORED AT MDL CENSORED AT MRL

BARIUM



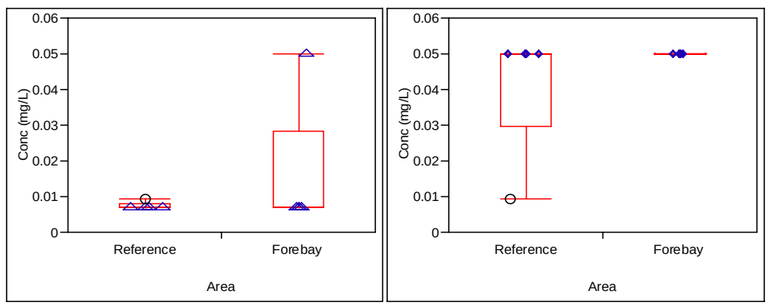
CENSORED AT MDL CENSORED AT MRL

CHROMIUM



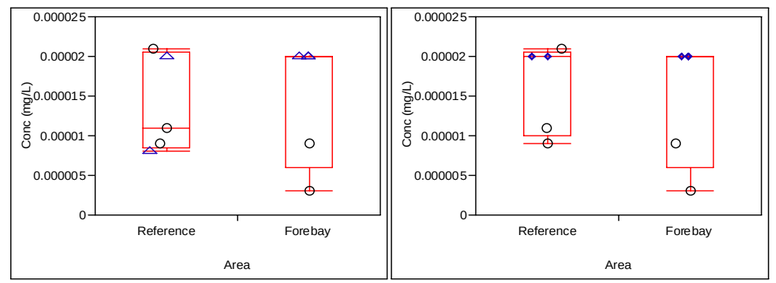
CENSORED AT MDL CENSORED AT MRL

ANTIMONY



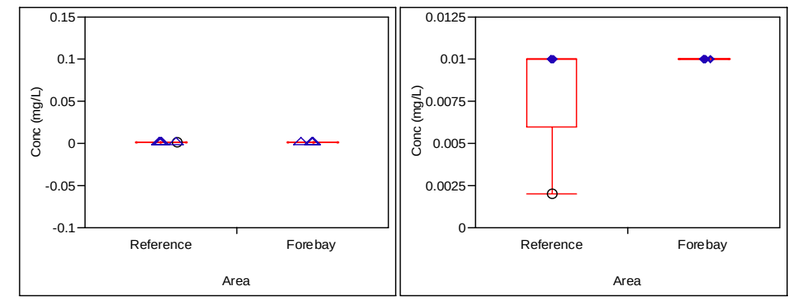
CENSORED AT MDL CENSORED AT MRL

BERYLLIUM



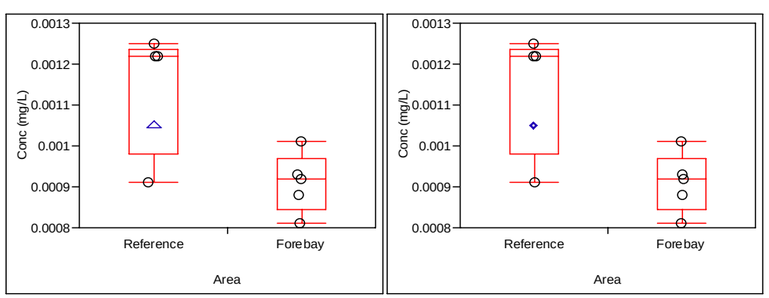
CENSORED AT MDL CENSORED AT MRL

COBALT



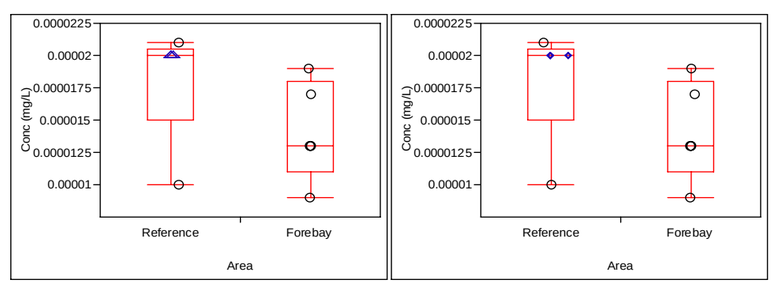
CENSORED AT MDL CENSORED AT MRL

ARSENIC



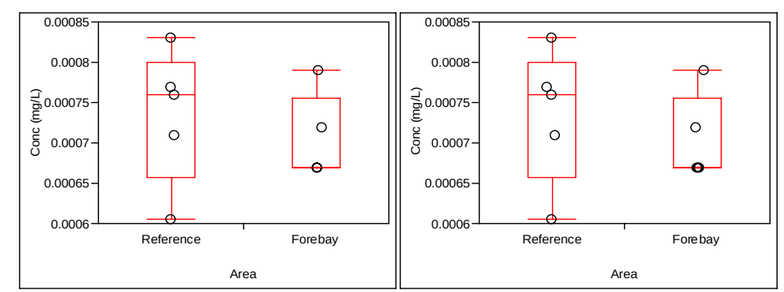
CENSORED AT MDL CENSORED AT MRL

CADMIUM



CENSORED AT MDL CENSORED AT MRL

COPPER



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

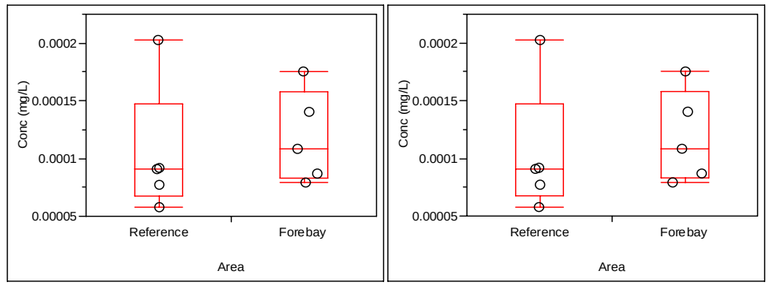
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
TOTAL METALS IN SURFACE WATER

DRAWING NUMBER: FIG L-7a
CAD FILE NUMBER: FIG L-7a
SHEET: OF
REV.

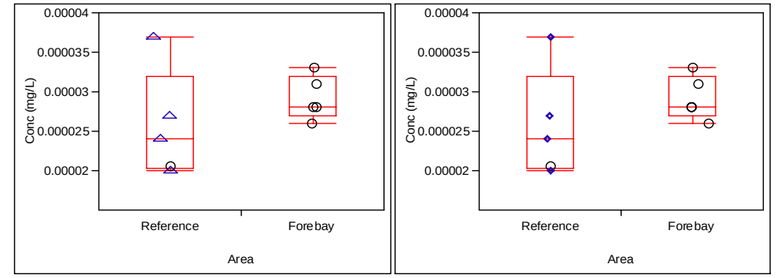
O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-7a Metals in Surface Water.dwg Nov 18, 2010 - 11:19am

LEAD



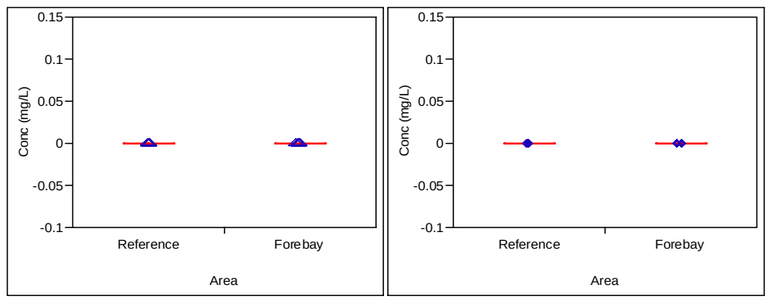
CENSORED AT MDL CENSORED AT MRL

THALLIUM



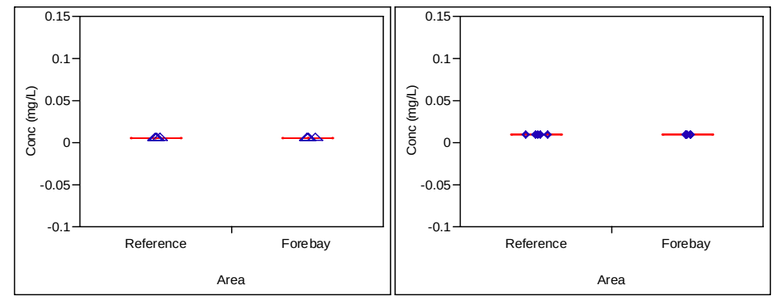
CENSORED AT MDL CENSORED AT MRL

MERCURY



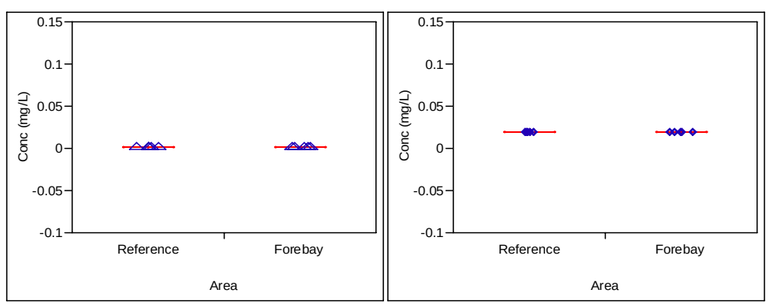
CENSORED AT MDL CENSORED AT MRL

VANADIUM



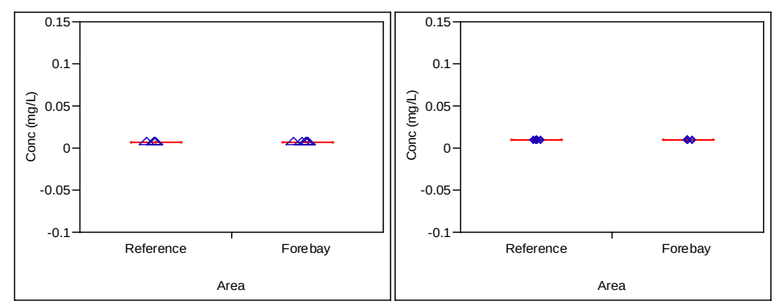
CENSORED AT MDL CENSORED AT MRL

NICKEL



CENSORED AT MDL CENSORED AT MRL

ZINC



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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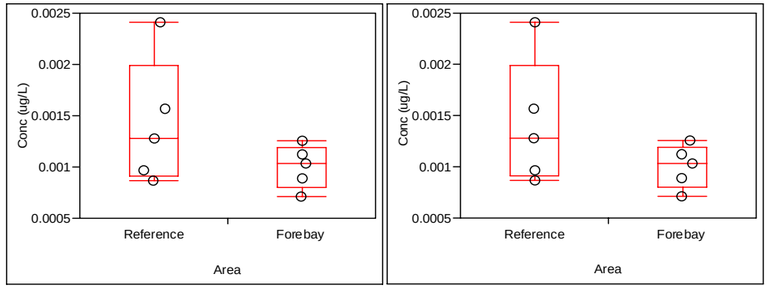
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
TOTAL METALS IN SURFACE WATER

DRAWING NUMBER: FIG L-7b
CAD FILE NUMBER: FIG L-7b
SHEET: OF
REV.

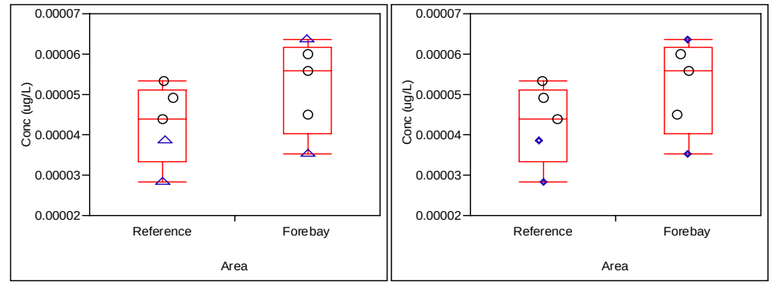
O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-7b Metals in Surface Water.dwg Nov 18, 2010 - 11:20am

ACENAPHTHENE



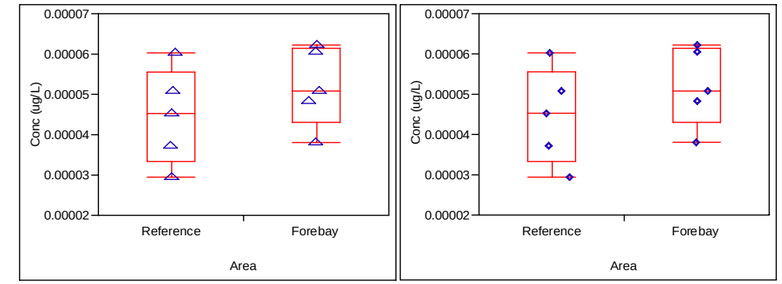
CENSORED AT MDL CENSORED AT MRL

BENZO(A)ANTHRACENE



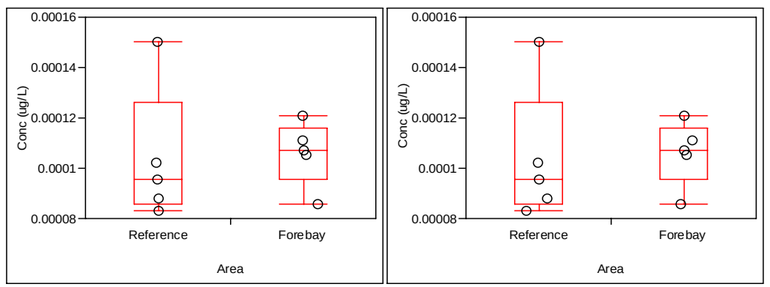
CENSORED AT MDL CENSORED AT MRL

BENZO(G,H,I)PERYLENE



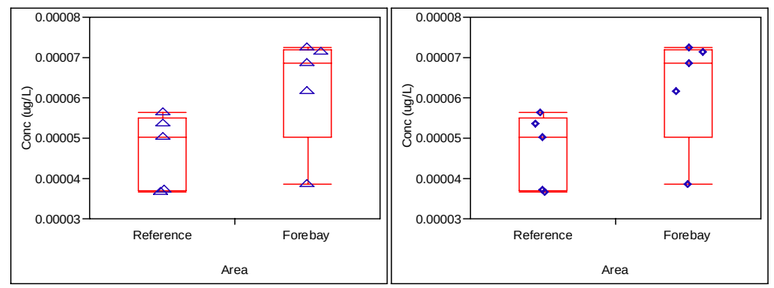
CENSORED AT MDL CENSORED AT MRL

ANTHRACENE



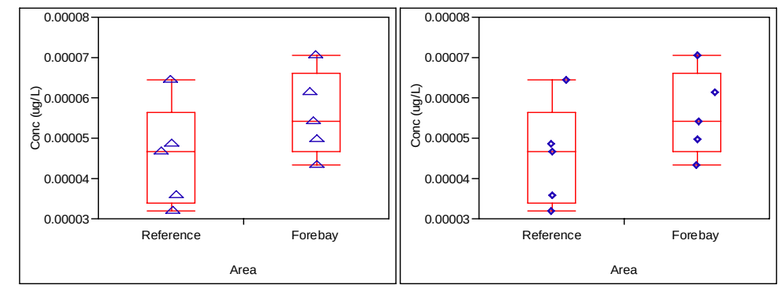
CENSORED AT MDL CENSORED AT MRL

BENZO(A)PYRENE



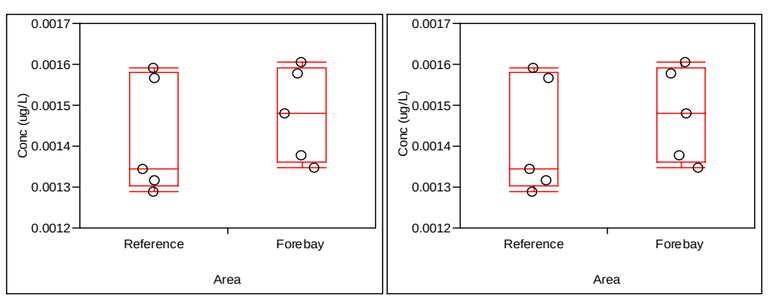
CENSORED AT MDL CENSORED AT MRL

BENZO(J,K)FLOURANTHENES



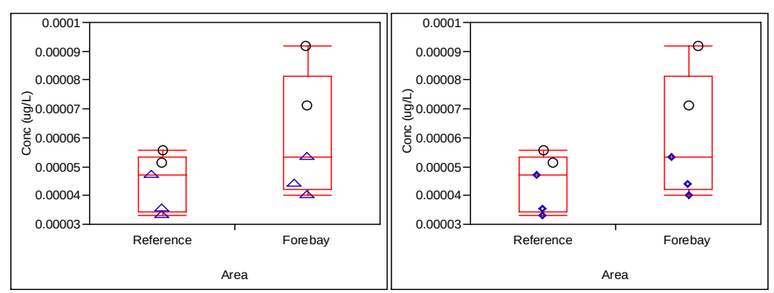
CENSORED AT MDL CENSORED AT MRL

PHENANTHRENE



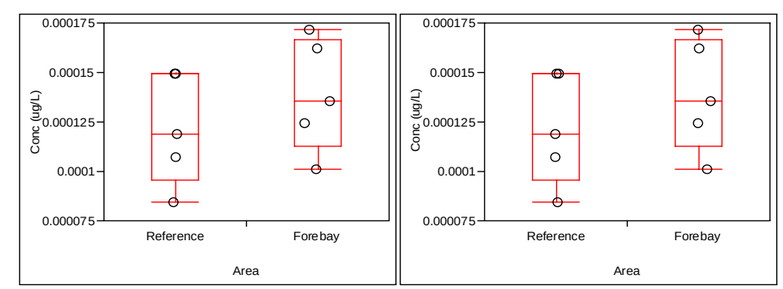
CENSORED AT MDL CENSORED AT MRL

BENZO(B)FLUORANTHENE



CENSORED AT MDL CENSORED AT MRL

CHRYSENE



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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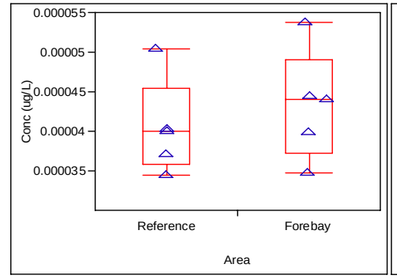
BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN SURFACE WATER

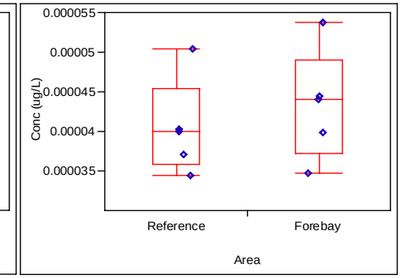
DRAWING NUMBER: FIG L-7c
CAD FILE NUMBER: FIG L-7c
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-7c PAHs in Surface Water.dwg Nov 17, 2010 - 8:48am

DIBENZ(A,H)ANTHRACENE

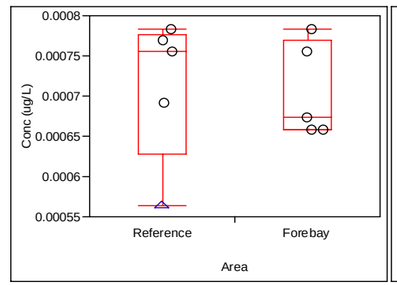


CENSORED AT MDL

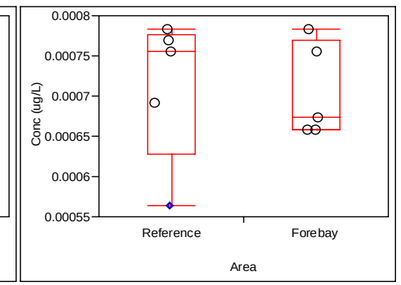


CENSORED AT MRL

FLUORANTHENE

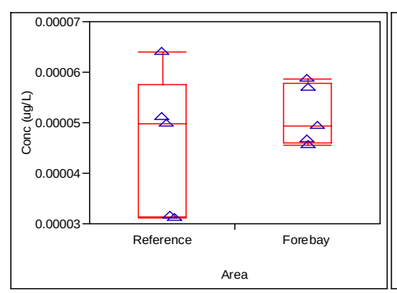


CENSORED AT MDL

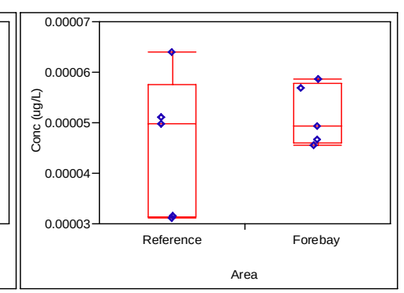


CENSORED AT MRL

INDENO(1,2,3-CD)PYRENE



CENSORED AT MDL



CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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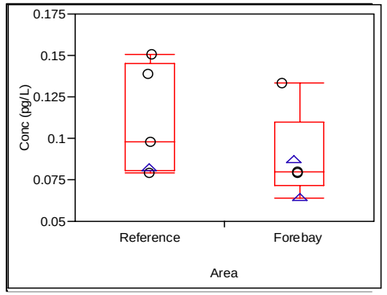
BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN SURFACE WATER

DRAWING NUMBER: FIG L-7d
CAD FILE NUMBER: FIG L-7d
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-7d PAHs in Surface Water.dwg Nov 17, 2010 - 8:49am

PCB 77



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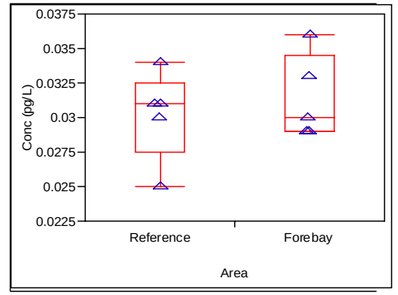

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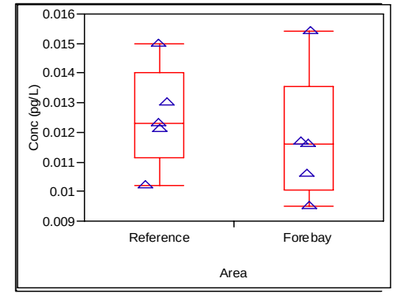

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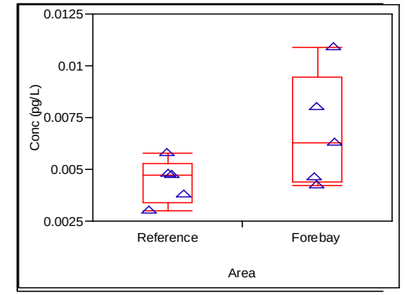

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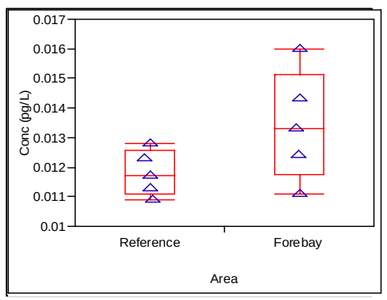

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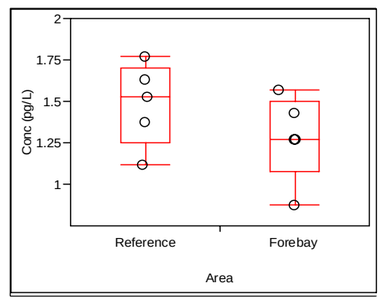
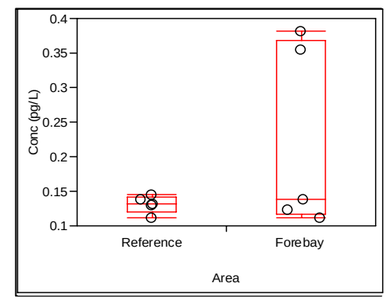


PCB 156+157



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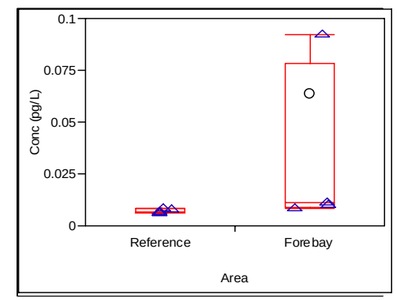

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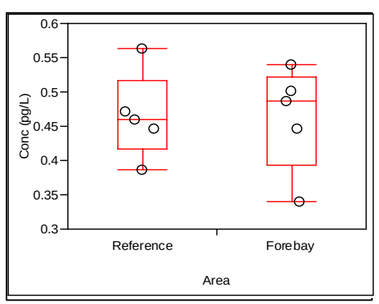

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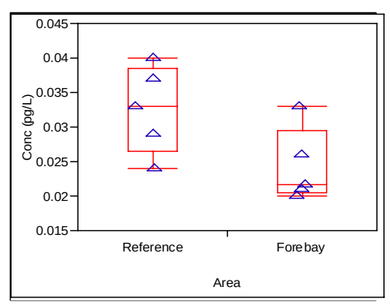
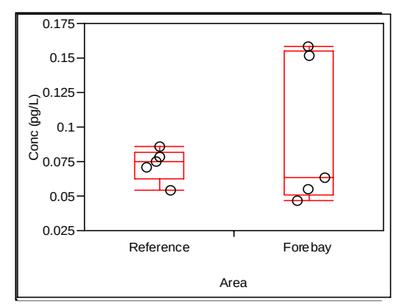
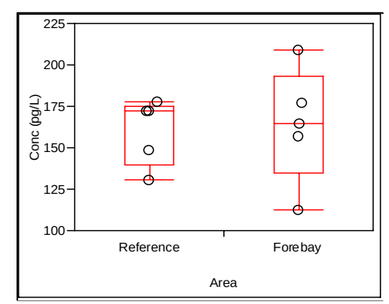


PCB 167



SUM 209 CONGENERS (KM-BASED)



LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Reported Detection Limit (RDL)
- □ EMPC Result, Censored at Reported Value

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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CASCADE LOCKS, OREGON

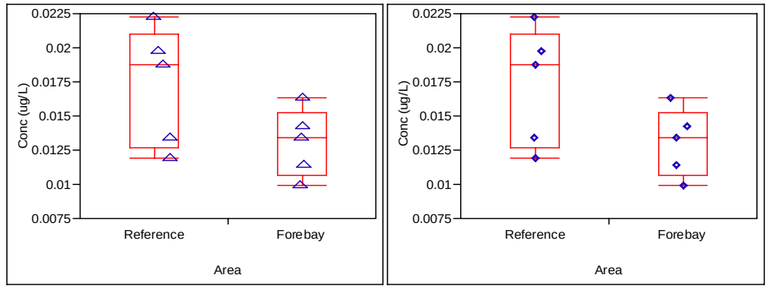
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PCB CONGENERS IN SURFACE WATER

DRAWING NUMBER: FIG L-7e
CAD FILE NUMBER: FIG L-7e
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-7e PCB Congeners in Surface Water.dwg Nov 12, 2010 - 4:11pm

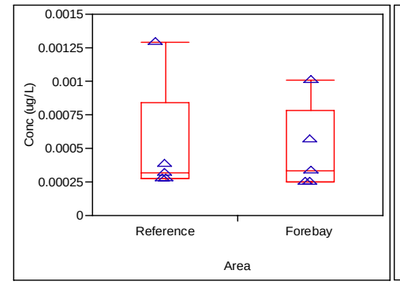
BIS(2-ETHYLHEXYL) PHTHALATE



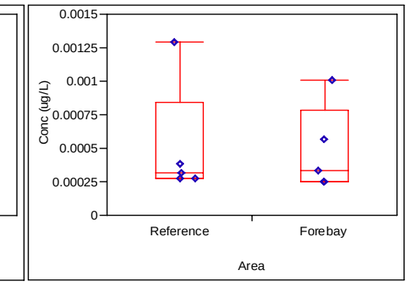
CENSORED AT MDL

CENSORED AT MRL

DI-N-OCTYL PHTHALATE

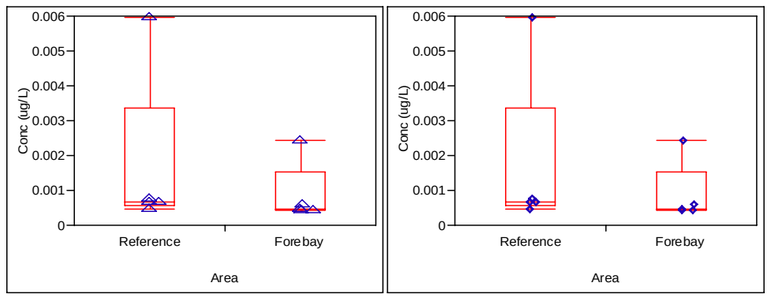


CENSORED AT MDL



CENSORED AT MRL

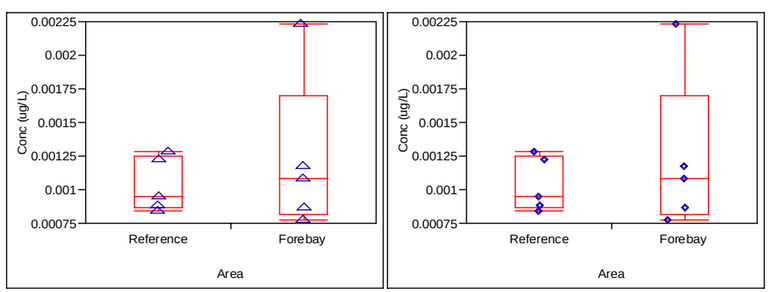
BUTYL BENZYL PHTHALATE



CENSORED AT MDL

CENSORED AT MRL

DI-N-BUTYL PHTHALATE



CENSORED AT MDL

CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

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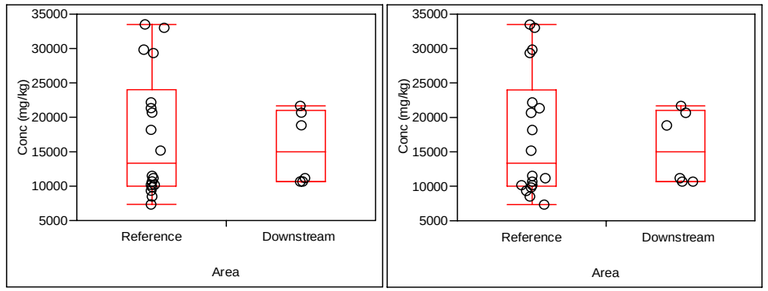
BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
SVOCs IN SURFACE WATER

DRAWING NUMBER: FIG L-7f
CAD FILE NUMBER: FIG L-7f
SHEET: OF
REV.

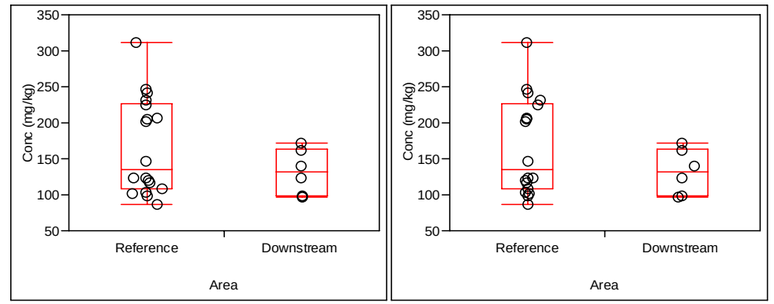
O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-7f SVOCs in Surface Water.dwg Nov 17, 2010 - 8:49am

ALUMINUM



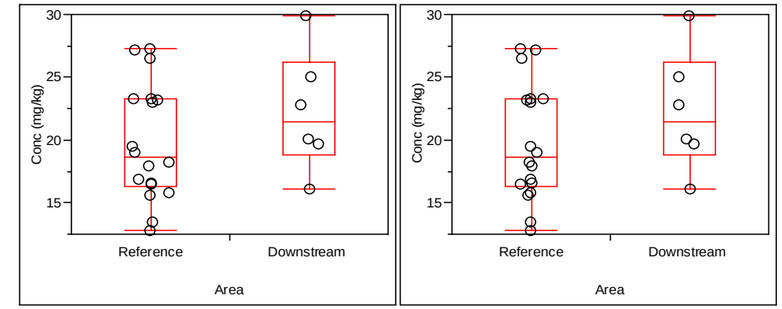
CENSORED AT MDL | CENSORED AT MRL

BARIUM



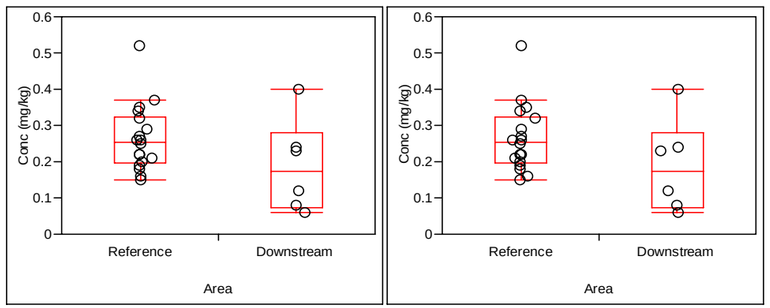
CENSORED AT MDL | CENSORED AT MRL

CHROMIUM



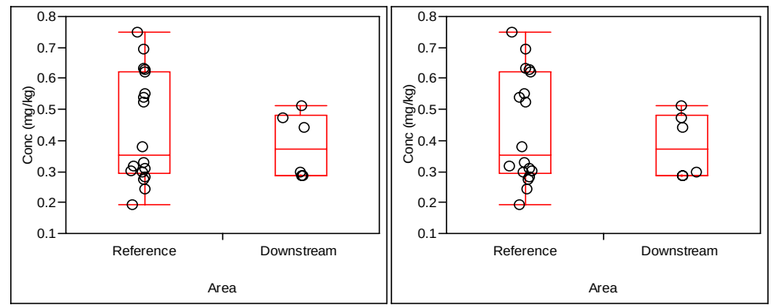
CENSORED AT MDL | CENSORED AT MRL

ANTIMONY



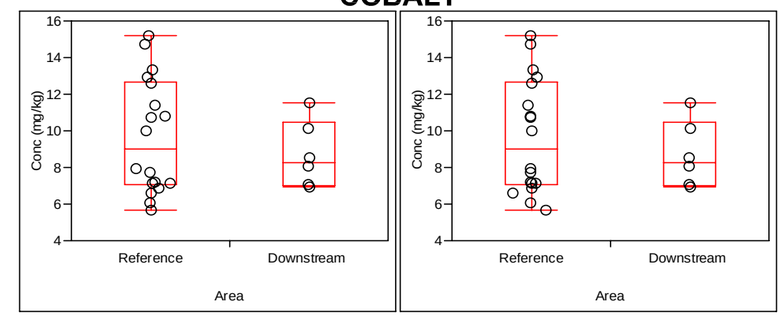
CENSORED AT MDL | CENSORED AT MRL

BERYLLIUM



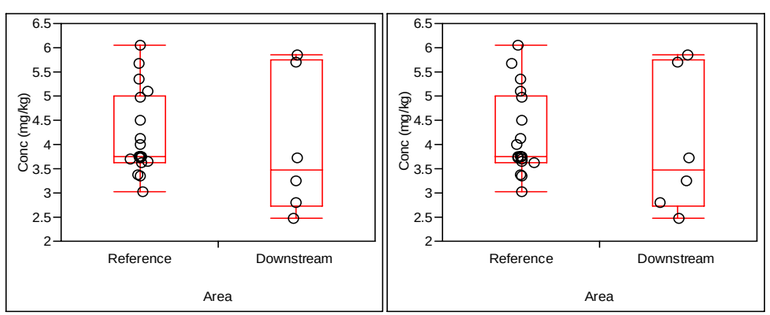
CENSORED AT MDL | CENSORED AT MRL

COBALT



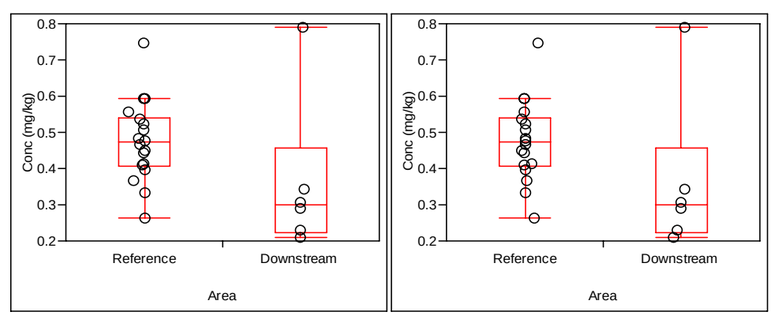
CENSORED AT MDL | CENSORED AT MRL

ARSENIC



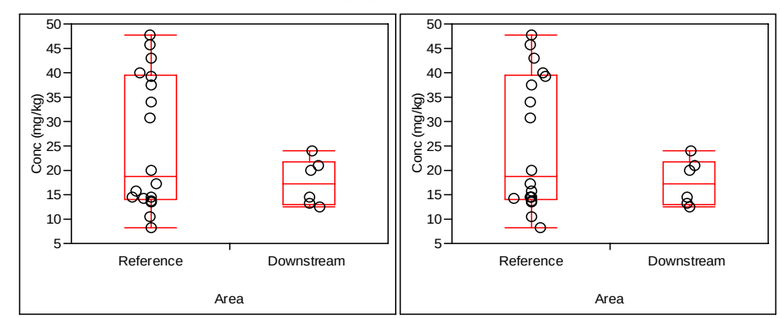
CENSORED AT MDL | CENSORED AT MRL

CADMIUM



CENSORED AT MDL | CENSORED AT MRL

COPPER



CENSORED AT MDL | CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

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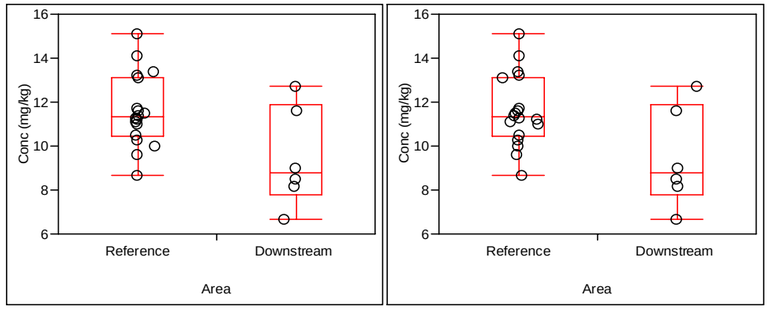
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN DOWNSTREAM SEDIMENT

DRAWING NUMBER: FIG L-8a
CAD FILE NUMBER: FIG L-8a
SHEET: OF
REV.

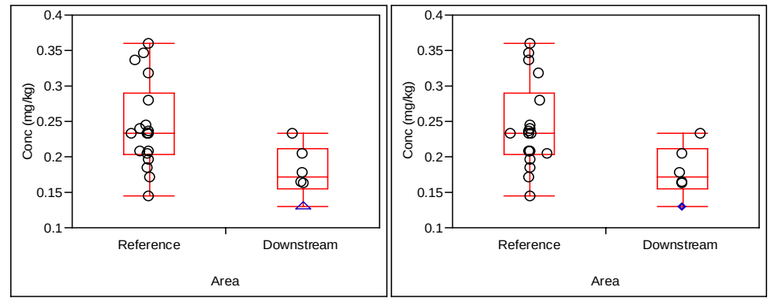
O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-8a Metals in Downstream Sediment.dwg Nov 17, 2010 - 8:50am

LEAD



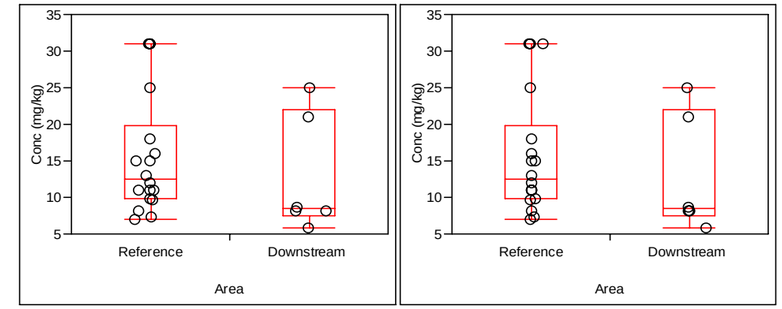
CENSORED AT MDL CENSORED AT MRL

THALLIUM



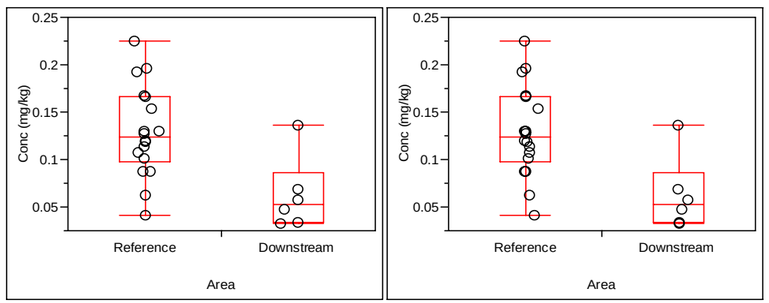
CENSORED AT MDL CENSORED AT MRL

DIESEL RANGE ORGANICS



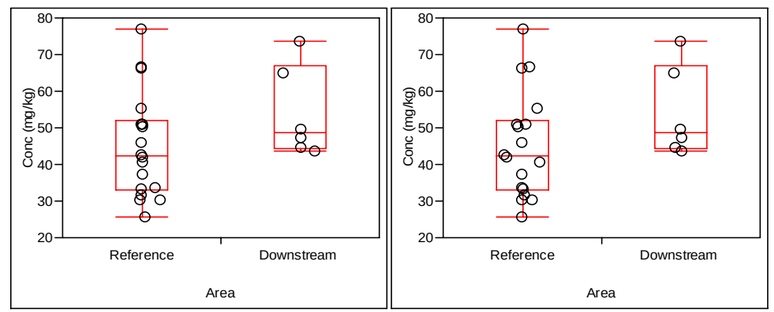
CENSORED AT MDL CENSORED AT MRL

MERCURY



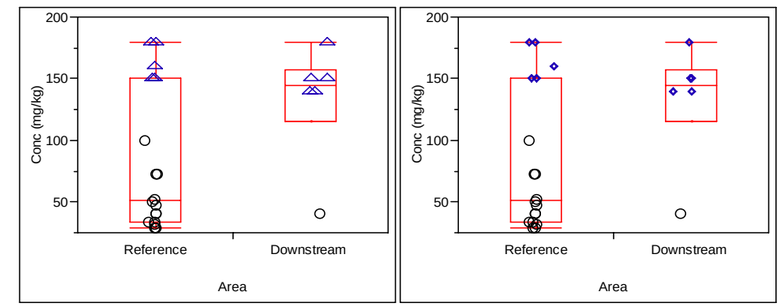
CENSORED AT MDL CENSORED AT MRL

VANADIUM



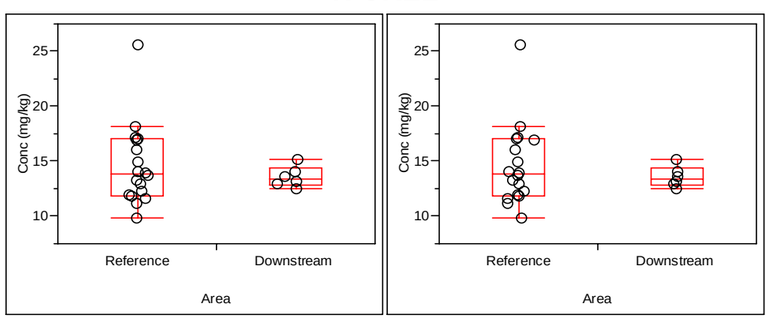
CENSORED AT MDL CENSORED AT MRL

RESIDUAL RANGE ORGANICS



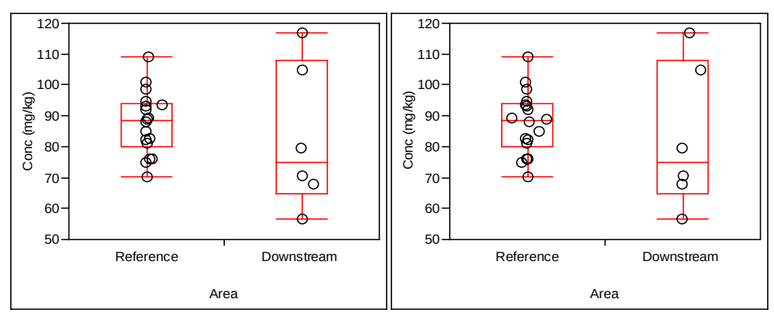
CENSORED AT MDL CENSORED AT MRL

NICKEL



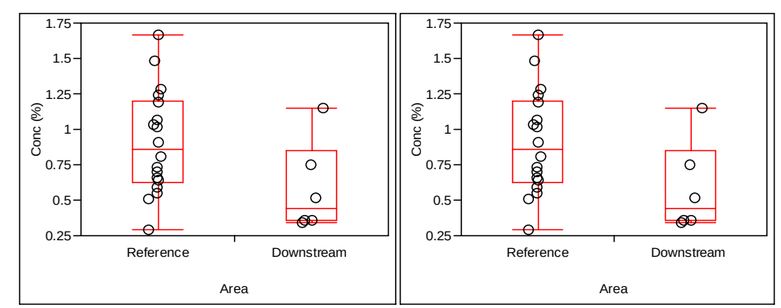
CENSORED AT MDL CENSORED AT MRL

ZINC



CENSORED AT MDL CENSORED AT MRL

TOTAL ORGANIC CARBON



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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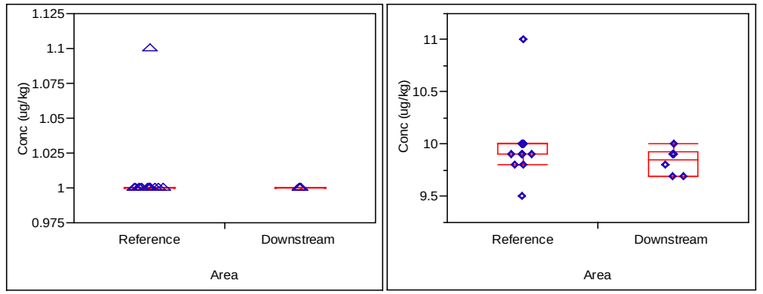
BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
METALS IN DOWNSTREAM SEDIMENT

DRAWING NUMBER: FIG L-8b
CAD FILE NUMBER: FIG L-8b
SHEET: OF
REV.

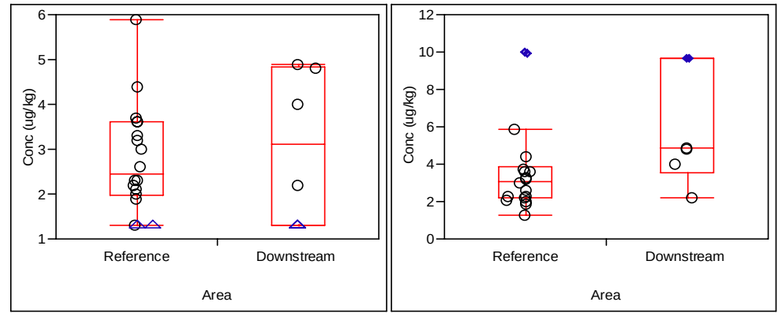
O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-8b Metals in Downstream Sediment.dwg Nov 17, 2010 - 8:50am

ACENAPHTHENE



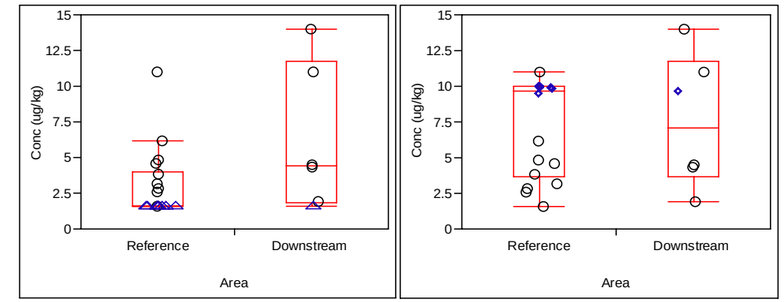
CENSORED AT MDL CENSORED AT MRL

PHENANTHRENE



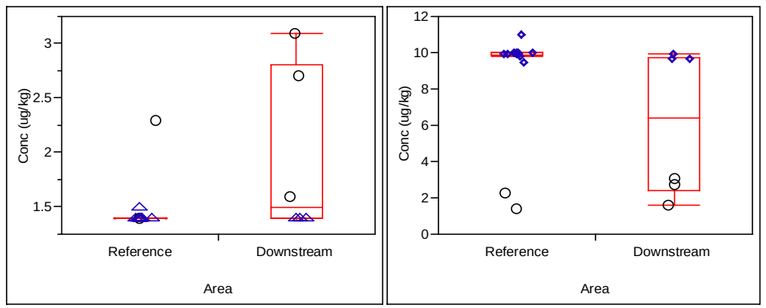
CENSORED AT MDL CENSORED AT MRL

BENZO(A)PYRENE



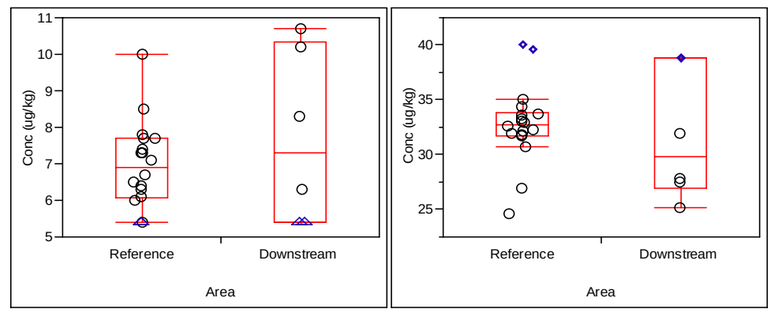
CENSORED AT MDL CENSORED AT MRL

ANTHRACENE



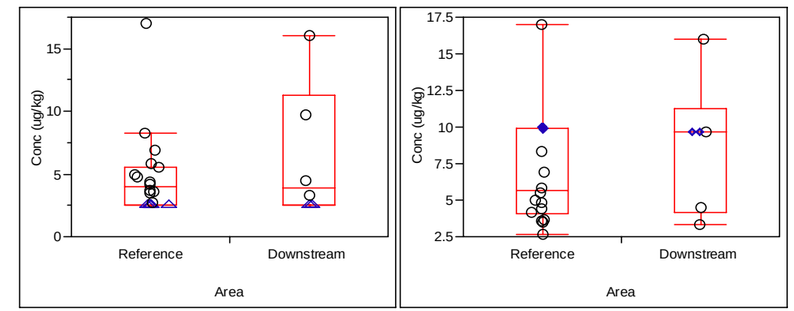
CENSORED AT MDL CENSORED AT MRL

LPAH



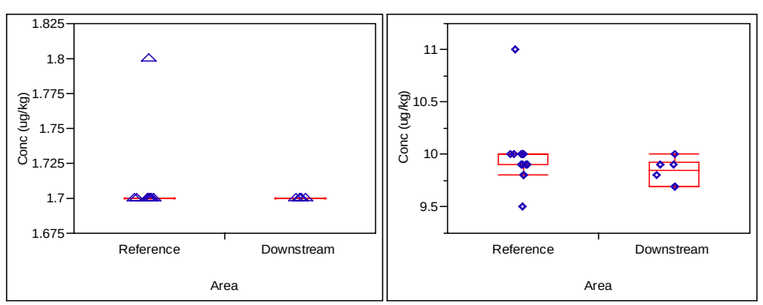
CENSORED AT MDL CENSORED AT MRL

BENZO(B)FLUORANTHENE



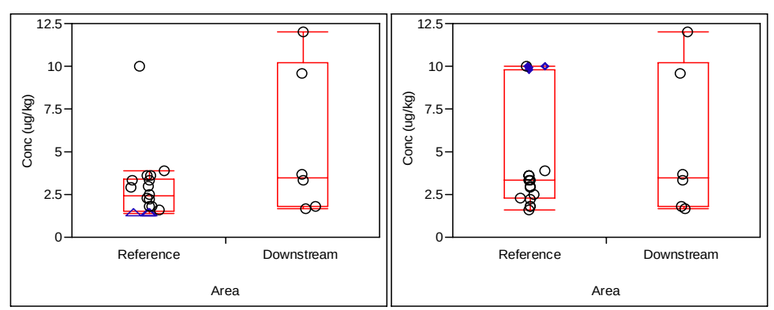
CENSORED AT MDL CENSORED AT MRL

FLUORENE



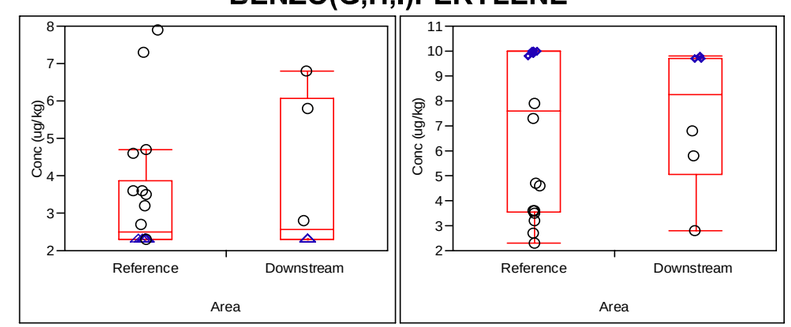
CENSORED AT MDL CENSORED AT MRL

BENZO(A)ANTHRACENE



CENSORED AT MDL CENSORED AT MRL

BENZO(G,H,I)PERYLENE



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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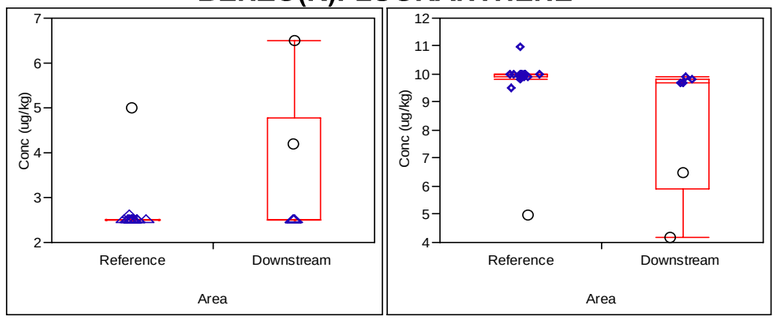
BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN DOWNSTREAM SEDIMENT

DRAWING NUMBER: FIG L-8c
CAD FILE NUMBER: FIG L-8c
SHEET: OF
REV.

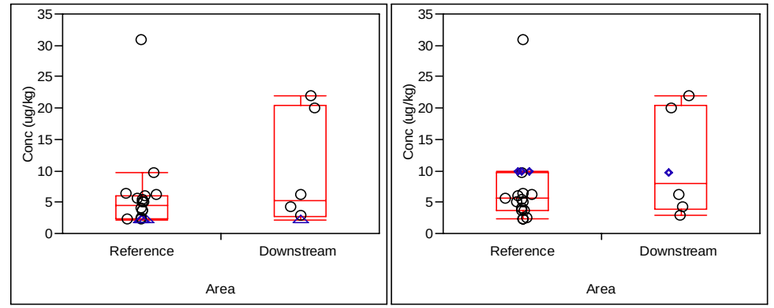
O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-8c PAHs in Downstream Sediment.dwg Nov 17, 2010 - 8:51am

BENZO(K)FLUORANTHENE



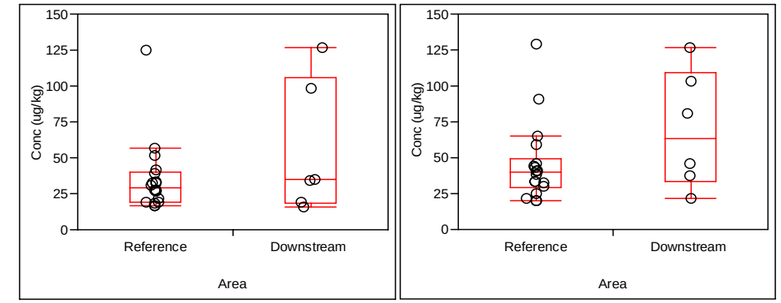
CENSORED AT MDL CENSORED AT MRL

FLUORANTHENE



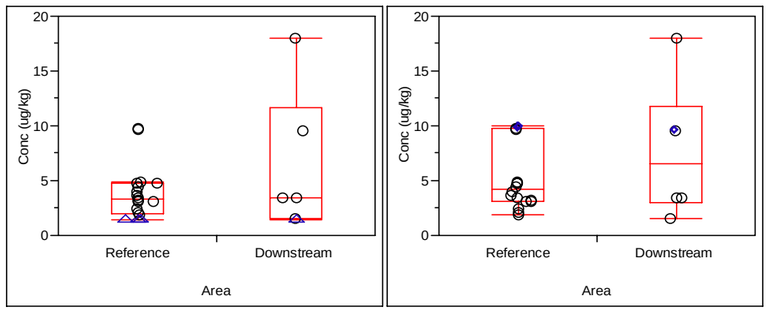
CENSORED AT MDL CENSORED AT MRL

TOTAL HPAHs



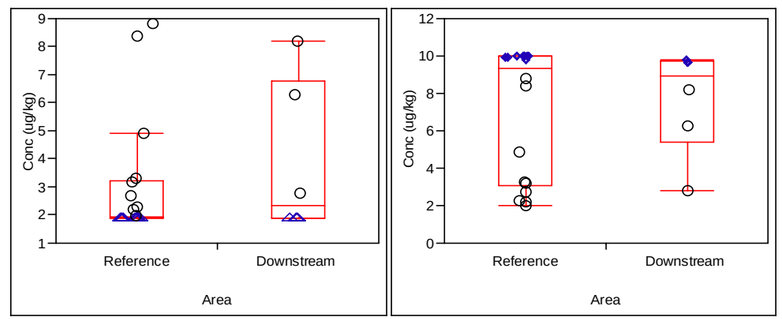
CENSORED AT MDL CENSORED AT MRL

CHRYSENE



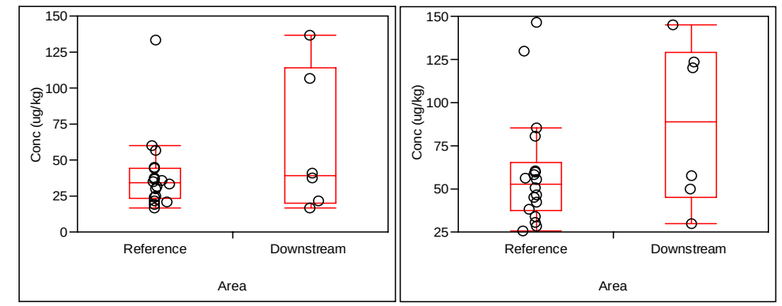
CENSORED AT MDL CENSORED AT MRL

INDENO(1,2,3-CD)PYRENE



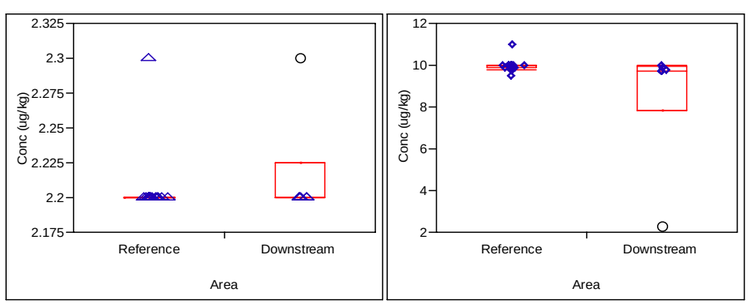
CENSORED AT MDL CENSORED AT MRL

tPAH



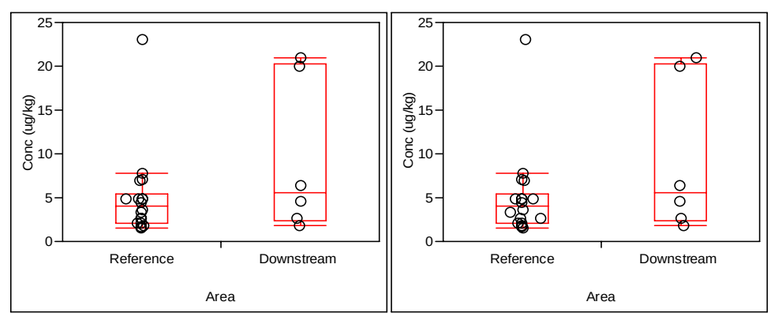
CENSORED AT MDL CENSORED AT MRL

DIBENZ(A,H)ANTHRACENE



CENSORED AT MDL CENSORED AT MRL

PYRENE



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No. 25696946	DESIGNED: LSM	PROJ. MANAGER: MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PAHs IN DOWNSTREAM SEDIMENT

DRAWING NUMBER: FIG L-8d
CAD FILE NUMBER: FIG L-8d
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-8d PAHs in Downstream Sediment.dwg Nov 17, 2010 - 8:52am

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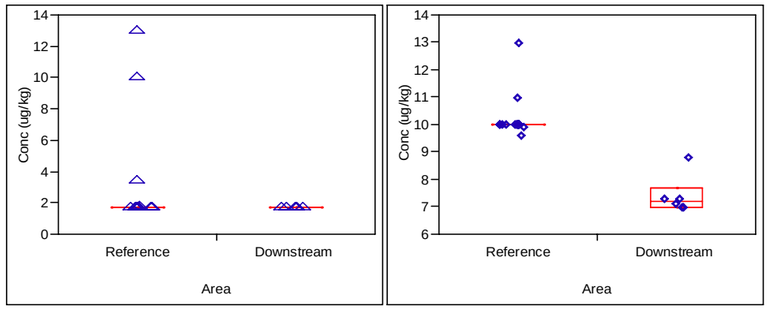

CENSORED AT MDL CENSORED AT MRL

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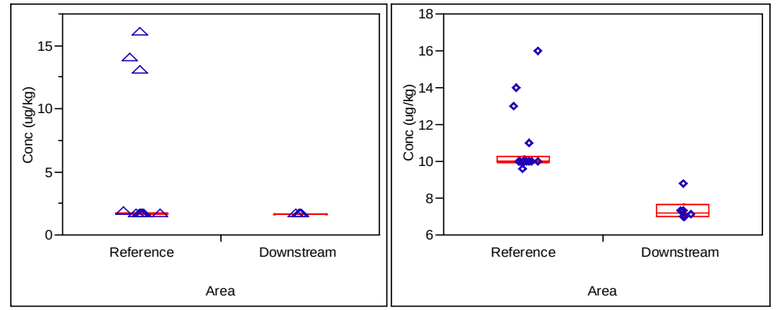
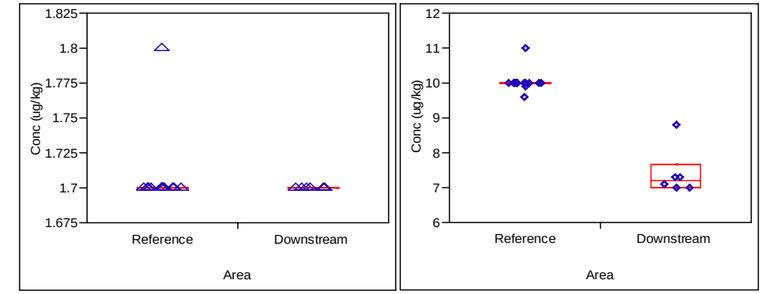


CENSORED AT MDL CENSORED AT MRL

AROCLOR 1260



CENSORED AT MDL CENSORED AT MRL

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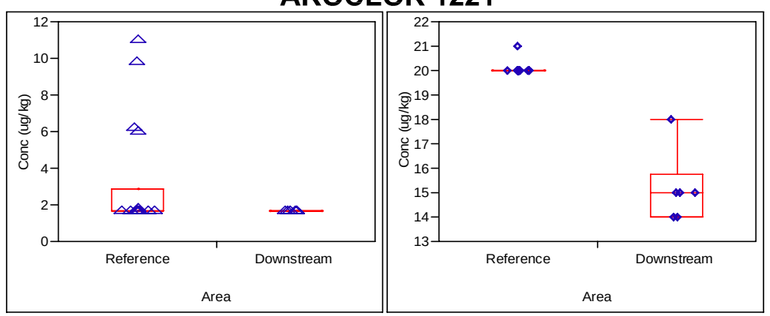

CENSORED AT MDL CENSORED AT MRL

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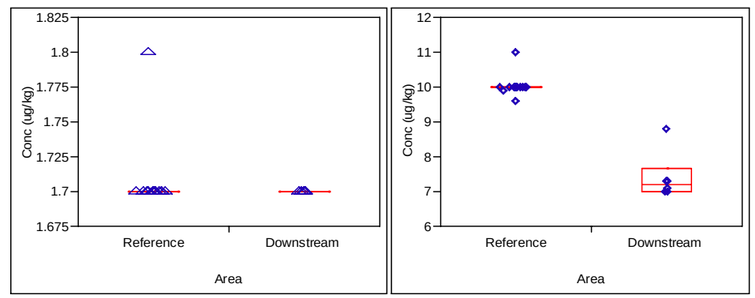

CENSORED AT MDL CENSORED AT MRL

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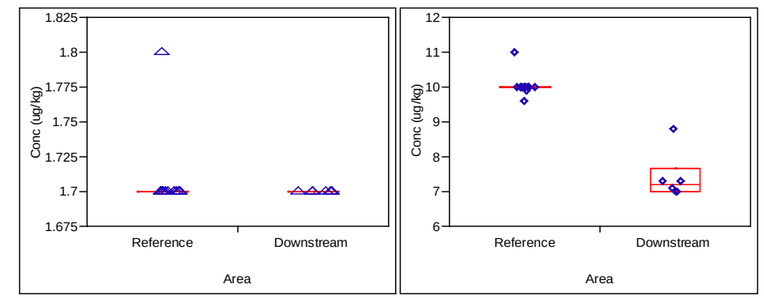

CENSORED AT MDL CENSORED AT MRL

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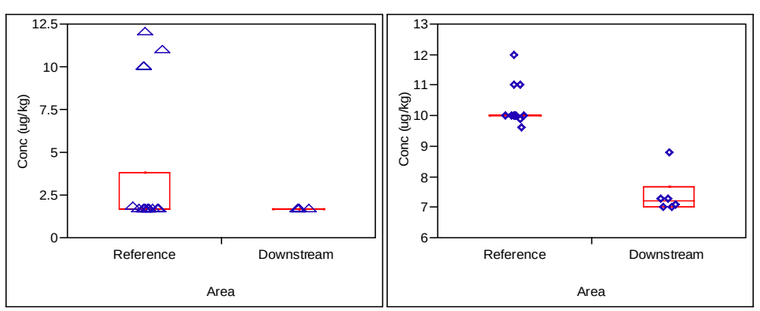
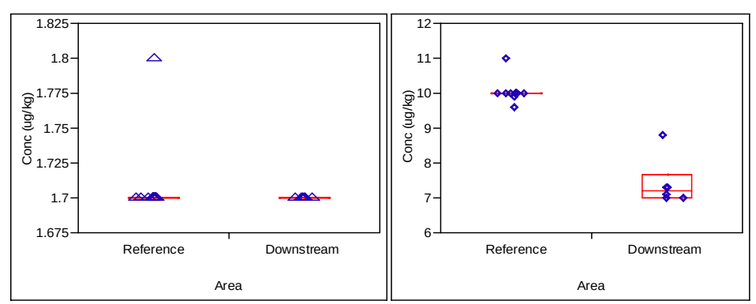


CENSORED AT MDL CENSORED AT MRL

AROCLOR 1254



CENSORED AT MDL CENSORED AT MRL

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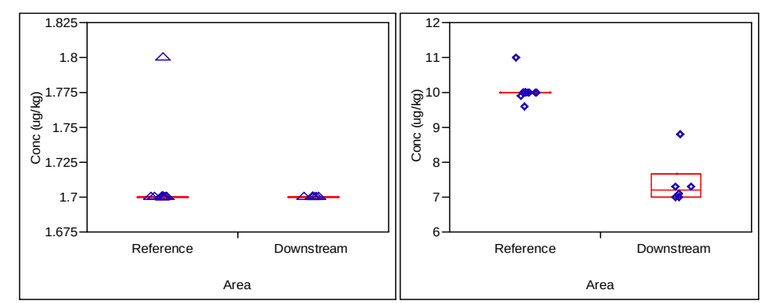

CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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BRADFORD ISLAND

CASCADE LOCKS, OREGON

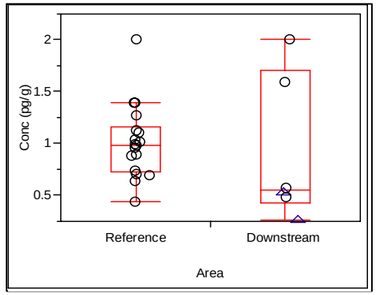
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PCB AROCLORS IN DOWNSTREAM SEDIMENT

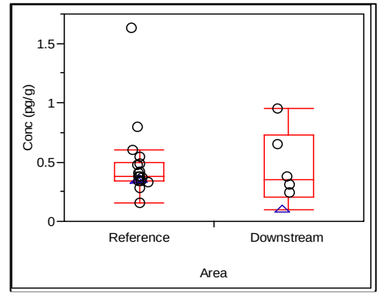
DRAWING NUMBER: FIG L-8e
CAD FILE NUMBER: FIG L-8e
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-8e PCB Aroclors in Downstream Sediment.dwg Nov 17, 2010 - 8:52am

PCB 77



PCB 114



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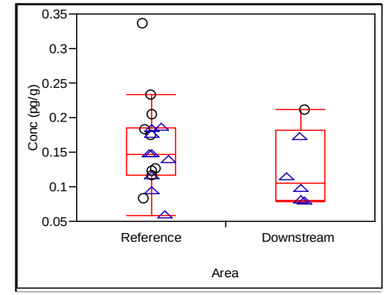
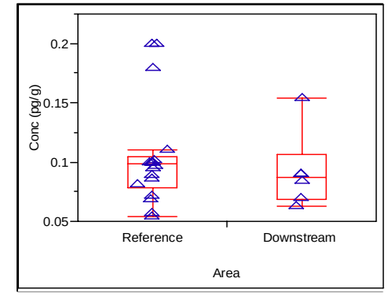
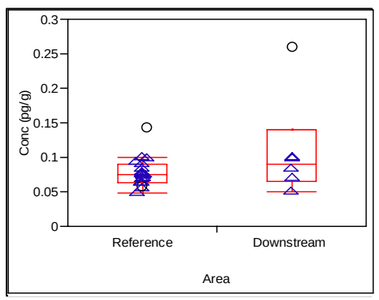


PCB 169



PCB 81



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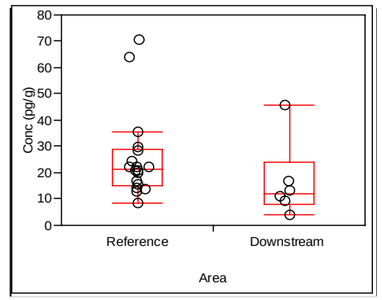
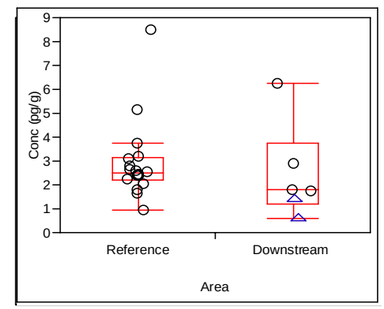


PCB 156+157



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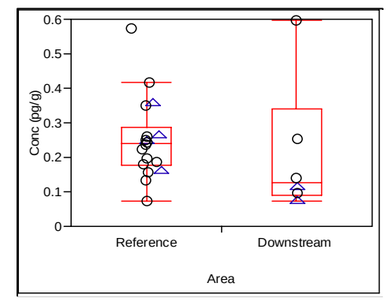
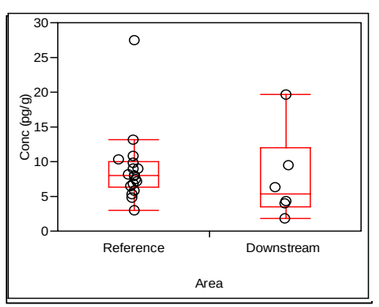
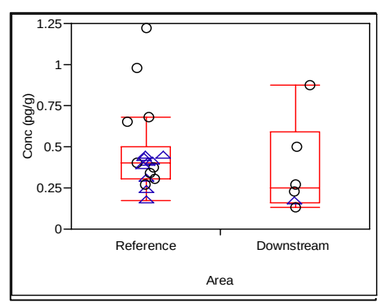


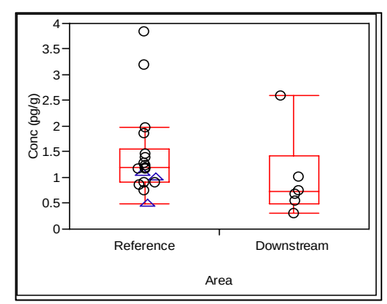
PCB 105



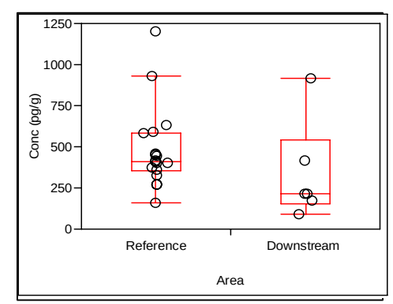
PCB 123



PCB 167



SUM 209 CONGENERS (KM-BASED)



LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Reported Detection Limit (RDL)
- □ EMPC Result, Censored at Reported Value

EMPC = The analyte was not positively identified; the associated numerical value is the Estimated Maximum Potential Concentration.

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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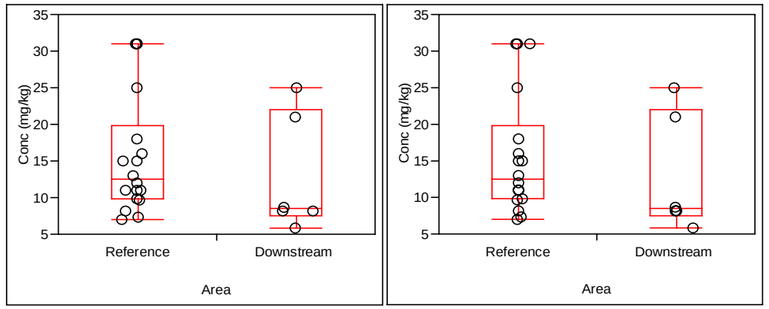
RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
PCB CONGENERS IN DOWNSTREAM SEDIMENT

DRAWING NUMBER: FIG L-8f
CAD FILE NUMBER: FIG L-8f
SHEET: OF
REV.

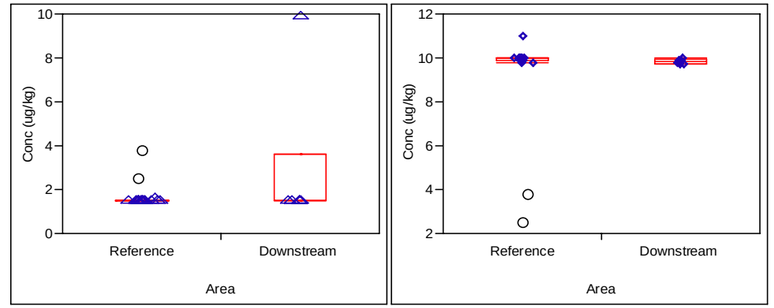
O:\25692709 USACE\53-F0072173.00 Bradford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-8f PCB Congeners in Downstream Sediment.dwg Nov 12, 2010 - 4:37pm

DIESEL RANGE ORGANICS



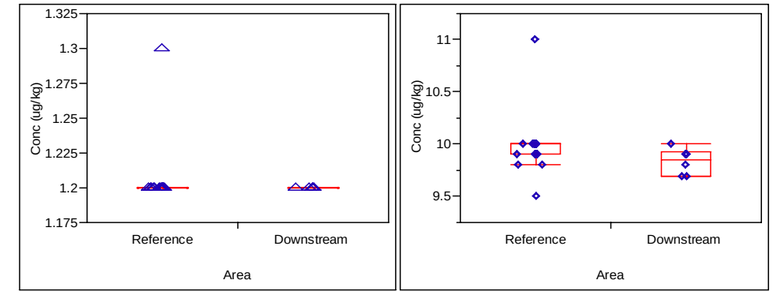
CENSORED AT MDL CENSORED AT MRL

BUTYL BENZYL PHTHALATE



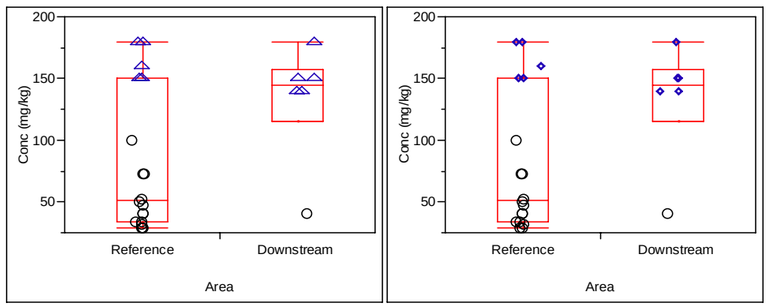
CENSORED AT MDL CENSORED AT MRL

DI-N-OCTYL PHTHALATE



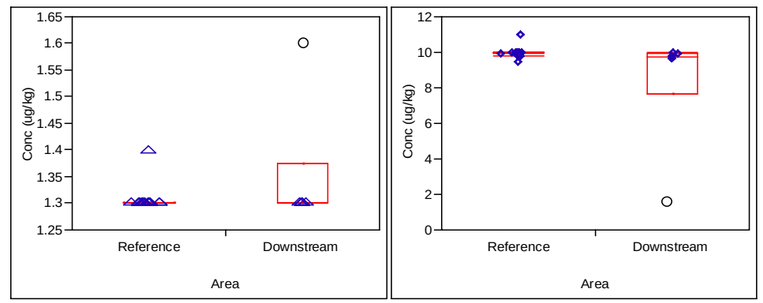
CENSORED AT MDL CENSORED AT MRL

RESIDUAL RANGE ORGANICS



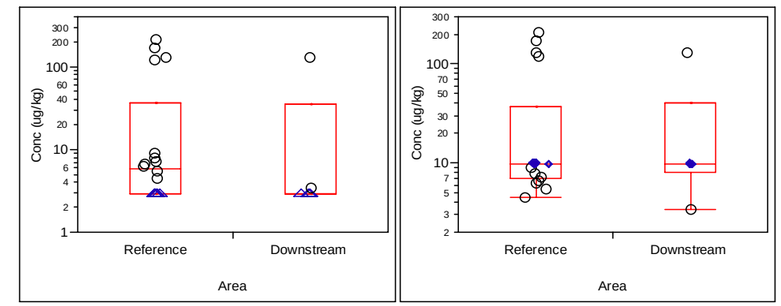
CENSORED AT MDL CENSORED AT MRL

CARBAZOLE



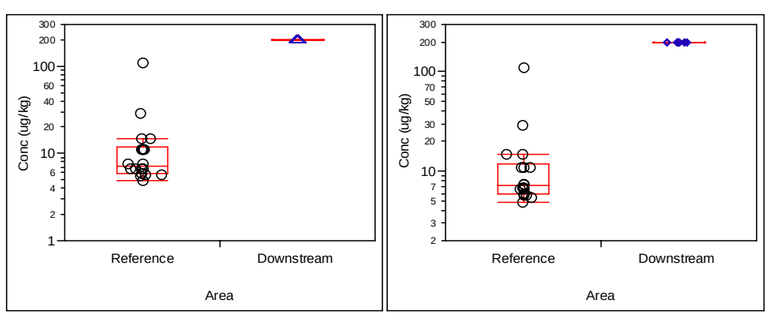
CENSORED AT MDL CENSORED AT MRL

P-CRESOL (4-METHYLPHENOL)



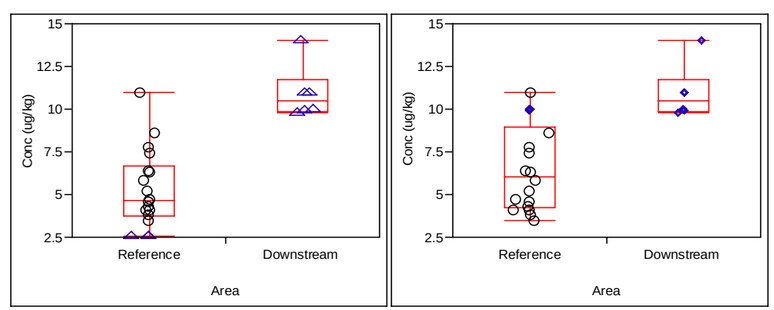
CENSORED AT MDL CENSORED AT MRL

BIS(2-ETHYLHEXYL) PHTHALATE



CENSORED AT MDL CENSORED AT MRL

DI-N-BUTYL PHTHALATE



CENSORED AT MDL CENSORED AT MRL

LEGEND

- ○ Detected Result
- △ Non-Detect, Censored at Method Detection Limit (MDL)
- ◇ Non-Detect, Censored at Method Reporting Limit (MRL)

No.	DATE	BY	REVISION

JOB No.	DESIGNED:	PROJ. MANAGER:
25696946	LSM	MP
SCALE:	DRAWN BY: HP	APPROVED BY: LSM
	CHECKED BY: LSM	DATE: NOV 2010

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RIVER OPERABLE UNIT

BRADFORD ISLAND POST-REMOVAL COMPARISON RESULTS
SVOCs IN DOWNSTREAM SEDIMENT

DRAWING NUMBER: FIG L-8g
CAD FILE NUMBER: FIG L-8g
SHEET: OF
REV.

O:\25692709 USACE\53-F0072173.00 Brdford1\Ft.Worth DT-02\RI Report_Working Folder\RI Text\Figures\Appendix_L\FIG L-8g SVOCs in Downstream Sediment.dwg Nov 17, 2010 - 8:53am

APPENDIX M

HUMAN HEALTH RISK SCREENING ASSESSMENT

Table M-1
Identification of COPCs in Soil at Landfill AOPC - Adult Outdoor Worker
Bradford Island -Upland Operable Unit
(1 of 3)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User Table M-5)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-7)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
INORGANICS (mg/kg)											
Antimony	n	27%	1.48	410	0.00361	0.149	0.398	0.152	0.402	N	C/SLV <1
Arsenic	c	100%	10.5	5.4	1.94	274	578	276	580	Y	C/SLV >1
Cadmium	c	74%	1.17	500	0.00234	0.106	-	0.108	0.00234	N	C/SLV <1
Lead	n	100%	511	800	0.639	0.853	-	1.49	0.639	Y	mm C/SLV >1
Mercury	n	80%	1.45	310	0.00468	0.00699	-	0.0117	0.00468	N	C/SLV <1
Silver	n	39%	0.450	5,100	0.0000882	0.00153	-	0.00162	0.0000882	N	C/SLV <1
Zinc	n	100%	417	310,000	0.00135	0.188	0.280	0.190	0.281	N	C/SLV <1
BUTYLTINS (ug/kg)											
Dibutyltin	n	22%	20.1	180,000	0.000112	0.00533	-	0.00544	0.000112	N	C/SLV <1
Monobutyltin	n	22%	38.0	180,000	0.000211	0.00231	-	0.00252	0.000211	N	C/SLV <1
Tributyltin	n	44%	60.1	180,000	0.000334	0.00331	-	0.00364	0.000334	N	C/SLV <1
PESTICIDES (ug/kg)											
4,4'-DDT	c	30%	11.8	7,700	0.00153	-	-	0.00153	0.00153	N	C/SLV <1
Chlordane (technical)	c	100%	1,560	7,200	0.217	-	-	0.217	0.217	N	C/SLV <1
Heptachlor	c	9%	2.86	480	0.00596	-	-	0.00596	0.00596	N	C/SLV <1
PCBs (ug/kg)											
Aroclor 1248	c	7%	364	740	0.492	-	-	0.492	0.492	N	C/SLV <1
Aroclor 1254	c	38%	31.1	740	0.0420	-	-	0.0420	0.0420	N	C/SLV <1
Aroclor 1260	c	83%	190	740	0.257	-	-	0.257	0.257	N	C/SLV <1
Total PCBs (Aroclors)	c	55%	410	740	0.554	-	-	0.554	0.554	N	C/SLV <1
HERBICIDES (ug/kg)											
2,4,5-T	n	14%	70.3	6,200,000	0.0000113	-	-	0.0000113	0.0000113	N	C/SLV <1
Dichloroprop	n	14%	174	4,900,000	0.0000355	-	-	0.0000355	0.0000355	N	C/SLV <1
MCPP	n	14%	11,200	620,000	0.0181	-	-	0.0181	0.0181	N	C/SLV <1
VOCs (ug/kg)											
1,2,4-Trimethylbenzene	n	15%	2,790	980,000	0.00285	0.347	-	0.350	0.00285	N	C/SLV <1
1,3,5-Trimethylbenzene	n	15%	1,110	1,600,000	0.000694	-	-	0.000694	0.000694	N	C/SLV <1
Naphthalene	c	15%	3,830	23,000	0.167	-	-	0.167	0.167	N	C/SLV <1
Tetrachloroethene (PCE)	c	58%	16.5	5,100	0.00324	30.1	4.06	NE	NE	N	C/SLV <1
Toluene	n	42%	1.64	77,000,000	0.0000000213	-	-	0.0000000213	0.0000000213	N	C/SLV <1
SVOCs (ug/kg)											
Benzoic Acid	n	36%	218	2,500,000,000	0.0000000872	-	-	0.0000000872	0.0000000872	N	C/SLV <1
Bis(2-ethylhexyl) Phthalate	c	90%	6,380	150,000	0.0425	1.15	3.92	NE	NE	N	C/SLV <1
Butyl Benzyl Phthalate	c	11%	34.9	910,000	0.0000384	-	-	0.0000384	0.0000384	N	C/SLV <1
Carbazole	c	72%	964	1,000,000	0.000964	-	-	0.000964	0.000964	N	C/SLV <1
Dibenzofuran	n	45%	164	1,000,000	0.000164	-	-	0.000164	0.000164	N	C/SLV <1
Diethyl Phthalate	n	18%	38.9	490,000,000	0.0000000794	0.0000301	0.0000514	0.0000302	0.0000514	N	C/SLV <1
Di-n-butyl Phthalate	n	14%	217	62,000,000	0.00000350	-	-	0.00000350	0.00000350	N	C/SLV <1

Table M-1
Identification of COPCs in Soil at Landfill AOPC - Adult Outdoor Worker
Bradford Island -Upland Operable Unit
(2 of 3)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User Table M-5)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-7)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
Pentachlorophenol	c	7%	98.8	13,000	0.00760	0.238	0.415	0.246	0.422	N	C/SLV <1
PAHs (ug/kg)											
2-Methylnaphthalene	n	31%	199	4,100,000	0.0000485	0.00117	0.000261	0.00122	0.000310	N	C/SLV <1
Acenaphthene	n	76%	913	61,000,000	0.0000150	0.0000718	0.000236	0.0000868	0.000251	N	C/SLV <1
Acenaphthylene	n	39%	34.9	23,000	0.00152	-	-	0.00152	0.00152	N	C/SLV <1
Anthracene	n	88%	1,930	170,000,000	0.0000114	-	-	0.0000114	0.0000114	N	C/SLV <1
Benzo(a)anthracene	c	94%	9,960	2,700	3.69	-	-	3.69	3.69	Y	C/SLV >1
Benzo(a)pyrene	c	94%	11,200	270	41.5	-	-	41.5	41.5	Y	C/SLV >1
Benzo(b)fluoranthene	c	96%	15,200	2,700	5.63	-	-	5.63	5.63	Y	C/SLV >1
Benzo(g,h,i)perylene	c	91%	5,820	27,000	0.216	-	-	0.216	0.216	N	C/SLV <1
Benzo(k)fluoranthene	c	96%	26,300	27,000	0.974	-	-	0.974	0.974	N	C/SLV <1
Benzofluoranthenes, Total	c	100%	31,300	2,700	11.6	-	-	11.6	11.6	Y	C/SLV >1
Chrysene	c	97%	11,000	270,000	0.0407	-	-	0.0407	0.0407	N	C/SLV <1
Dibenz(a,h)anthracene	c	85%	2,060	270	7.63	-	-	7.63	7.63	Y	C/SLV >1
Fluoranthene	n	94%	17,500	29,000,000	0.000603	-	-	0.000603	0.000603	N	C/SLV <1
Fluorene	n	67%	324	41,000,000	0.00000790	-	-	0.00000790	0.00000790	N	C/SLV <1
Indeno(1,2,3-cd)pyrene	c	91%	6,800	2,700	2.52	-	-	2.52	2.52	Y	C/SLV >1
Naphthalene	c	52%	157	23,000	0.00683	0.624	0.000130	0.630	0.00696	N	C/SLV <1
Phenanthrene	n	97%	5,780	170,000,000	0.0000340	0.0000537	0.0000712	0.0000877	0.000105	N	C/SLV <1
Pyrene	n	97%	18,800	21,000,000	0.000895	-	-	0.000895	0.000895	N	C/SLV <1
TPH (mg/kg)											
Diesel Range Organics	n	95%	1,000	70,000	0.0143	4.31	-	NE	0.0143	N	C/SLV <1
Gasoline Range Organics	n	27%	157	22,000	0.00714	0.604	-	0.611	0.00714	N	C/SLV <1
Residual Range Organics	n	95%	9,450	40,000	0.236	1.19	-	NE	0.236	N	C/SLV <1
Sum cPAH C/RBC (ELCR)					**6.1E-05**						
Sum non-carcinogenic C/RBC (HI)					**0.293**						
Sum carcinogenic C/RBC (ELCR)					**6.3E-05**						

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on Csoil/SLVsoil only (i.e. single medium).
ft bgs = feet below surface
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
max =maximum
MCL = maximum contaminant level
mg/kg = milligrams per kilogram
mm = multimedia

Table M-1
Identification of COPCs in Soil at Landfill AOPC - Adult Outdoor Worker
Bradford Island -Upland Operable Unit
(3 of 3)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User Table M-5)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-7)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		

n = non-carcinogen
NE = Multi-media was not evaluated since the chemical is already identified as a COPC.
NRWQC = national recommended water quality criteria
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/kg = micrograms per kilogram
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals
WQC = water quality criteria

Notes
Only detected chemicals with a detection frequency greater than 5% and inorganics greater than reference are shown in this table. Reporting limits for non-detected chemicals are evaluated separately.
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.
Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, and 4. Surrogates used as noted in Appendix J-4b.
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c.
For inorganics, the higher of the 95% Upper Prediction Limit (UPL) and lowest HH SLV was selected as the HH SLV. For all other analytes the heirarchy described above was used.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology.
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum cPAH C/RBC (ELCR) = includes only individual carcinogenic polyaromatic hydrocarbons selected as a COPC. Individual benzofluoranthenes, rather than total benzofluoranthenes, was used in the summation.
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Individual benzofluoranthenes, rather than total benzofluoranthenes, was used in the summation. Total aroclors, rather than individual aroclors, was used in the summation.
Ratios for SLVs based on Reference Upper Prediction Limits (UPLs) are not included in sum totals.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-2
Identification of COPCs in Soil at Landfill AOPC - Construction Worker
Bradford Island -Upland Operable Unit
(1 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-4)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-7)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
INORGANICS (mg/kg)											
Antimony	n	56%	2.05	410	0.00500	0.149	0.398	0.154	0.403	N	C/SLV <1
Cadmium	c	84%	1.37	150	0.00913	0.0000335	-	0.00917	0.00913	N	C/SLV <1
Lead	n	100%	796	800	0.995	-	-	0.995	0.995	N	C/SLV <1
Mercury	n	87%	1.02	93	0.0110	0.135	-	0.146	0.0110	N	C/SLV <1
Nickel	c	100%	455	6,100	0.0746	0.00000975	0.192	0.0746	0.266	N	C/SLV <1
Selenium	n	30%	0.262	5,100	0.0000514	0.0473	0.0501	0.0474	0.0502	N	C/SLV <1
Silver	n	62%	0.506	1,500	0.000337	0.000000276	-	0.000338	0.000337	N	C/SLV <1
Zinc	n	100%	245	310,000	0.000790	0.188	0.280	0.189	0.281	N	C/SLV <1
BUTYLTINS (ug/kg)											
Dibutyltin	n	9%	20.0	180,000	0.000111	0.00533	-	0.00544	0.000111	N	C/SLV <1
Monobutyltin	n	9%	38.0	180,000	0.000211	0.00231	-	0.00252	0.000211	N	C/SLV <1
Tributyltin	n	18%	27.1	180,000	0.000151	0.00331	-	0.00346	0.000151	N	C/SLV <1
PESTICIDES (ug/kg)											
4,4'-DDT	c	23%	10.5	58,000	0.000181	-	-	0.000181	0.000181	N	C/SLV <1
Chlordane (technical)	c	60%	1,220	55,000	0.0222	-	-	0.0222	0.0222	N	C/SLV <1
Heptachlor	c	7%	2.86	3,700	0.000773	-	-	0.000773	0.000773	N	C/SLV <1
PCBs (ug/kg)											
Aroclor 1254	c	37%	60.4	740	0.0816	-	-	0.0816	0.0816	N	C/SLV <1
Aroclor 1260	c	84%	161	740	0.218	-	-	0.218	0.218	N	C/SLV <1
Total PCBs (Aroclors)	c	84%	283	740	0.382	-	-	0.382	0.382	N	C/SLV <1
HERBICIDES (ug/kg)											
2,4,5-T	n	10%	67.8	6,200,000	0.0000109	-	-	0.0000109	0.0000109	N	C/SLV <1
Dichloroprop	n	10%	172	4,900,000	0.0000351	-	-	0.0000351	0.0000351	N	C/SLV <1
MCPP	n	10%	10,400	620,000	0.0168	-	-	0.0168	0.0168	N	C/SLV <1
VOCs (ug/kg)											
1,1-Dichloroethene	n	0%	-	12,000,000	-	-	-	-	-	Y	PCE is a COPC (1)
1,2,4-Trimethylbenzene	n	15%	1,620	2,000,000	0.000810	0.00306	-	0.00387	0.000810	N	C/SLV <1
1,3,5-Trimethylbenzene	n	11%	906	1,500,000	0.000604	-	-	0.000604	0.000604	N	C/SLV <1
cis-1,2-Dichloroethene	n	0%	-	3,100,000	-	-	-	-	-	Y	PCE is a COPC (1)
Ethylbenzene	c	7%	1,480	1,600,000	0.000925	-	-	0.000925	0.000925	N	C/SLV <1
m,p-Xylenes	n	7%	5,380	19,000,000	0.000283	-	-	0.000283	0.000283	N	C/SLV <1
Naphthalene	c	11%	2,980	580,000	0.00514	-	-	0.00514	0.00514	N	C/SLV <1
o-Xylene	n	9%	1,580	19,000,000	0.0000832	-	-	0.0000832	0.0000832	N	C/SLV <1
Tetrachloroethene (PCE)	c	71%	127,000	40,000	3.18	0.0117	4.06	3.19	7.23	Y	C/SLV >1

Table M-2
Identification of COPCs in Soil at Landfill AOPC - Construction Worker
Bradford Island -Upland Operable Unit
(2 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-4)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-7)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
Toluene	n	54%	42,100	24,000,000	0.00175	-	-	0.00175	0.00175	N	C/SLV <1
trans-1,2-Dichloroethene	n	0%	-	4,500,000	-	-	-	-	-	Y	PCE is a COPC (1)
Trichloroethene (TCE)	c	0%	-	43,000	-	-	-	-	-	Y	PCE is a COPC (1)
Vinyl Chloride	c	0%	-	30,000	-	0.000256	12.3	0.000256	NE	Y	PCE is a COPC (1)
SVOCs (ug/kg)											
Benzoic Acid	n	31%	176	2,500,000,000	0.0000000704	-	-	0.0000000704	0.0000000704	N	C/SLV <1
Bis(2-ethylhexyl) Phthalate	c	92%	4,260	1,200,000	0.00355	0.979	3.92	0.983	NE	N	C/SLV <1
Butyl Benzyl Phthalate	c	14%	42.7	910,000	0.0000469	-	-	0.0000469	0.0000469	N	C/SLV <1
Carbazole	c	72%	909	1,000,000	0.000909	-	-	0.000909	0.000909	N	C/SLV <1
Dibenzofuran	n	50%	138	1,000,000	0.000138	-	-	0.000138	0.000138	N	C/SLV <1
Diethyl Phthalate	n	17%	36.1	490,000,000	0.0000000737	0.0000301	0.0000514	0.0000302	0.0000514	N	C/SLV <1
Di-n-butyl Phthalate	n	11%	180	62,000,000	0.00000290	-	-	0.00000290	0.00000290	N	C/SLV <1
Pentachlorophenol	c	6%	90.7	100,000	0.000907	0.00215	0.415	0.00306	0.416	N	C/SLV <1
PAHs (ug/kg)											
2-Methylnaphthalene	n	33%	170	4,100,000	0.0000415	0.00117	0.000261	0.00121	0.000303	N	C/SLV <1
Acenaphthene	n	77%	915	19,000,000	0.0000482	0.0000718	0.000236	0.000120	0.000284	N	C/SLV <1
Acenaphthylene	n	43%	31.7	580,000	0.0000547	-	-	0.0000547	0.0000547	N	C/SLV <1
Anthracene	n	89%	2,370	93,000,000	0.0000255	-	-	0.0000255	0.0000255	N	C/SLV <1
Benzo(a)anthracene	c	95%	11,100	21,000	0.529	-	-	0.529	0.529	N	C/SLV <1
Benzo(a)pyrene	c	95%	10,800	2,100	5.14	-	-	5.14	5.14	Y	C/SLV >1
Benzo(b)fluoranthene	c	96%	15,200	21,000	0.724	-	-	0.724	0.724	N	C/SLV <1
Benzo(g,h,i)perylene	c	93%	5,540	210,000	0.0264	-	-	0.0264	0.0264	N	C/SLV <1
Benzo(k)fluoranthene	c	96%	26,300	210,000	0.125	-	-	0.125	0.125	N	C/SLV <1
Benzofluoranthenes, Total	c	100%	13,100	21,000	0.624	-	-	0.624	0.624	N	C/SLV <1
Chrysene	c	98%	11,000	2,100,000	0.00524	-	-	0.00524	0.00524	N	C/SLV <1
Dibenz(a,h)anthracene	c	82%	2,080	2,100	0.990	-	-	0.990	0.990	N	C/SLV <1
Fluoranthene	n	95%	17,900	8,900,000	0.00201	-	-	0.00201	0.00201	N	C/SLV <1
Fluorene	n	73%	500	12,000,000	0.0000417	-	-	0.0000417	0.0000417	N	C/SLV <1
Indeno(1,2,3-cd)pyrene	c	93%	6,510	21,000	0.310	-	-	0.310	0.310	N	C/SLV <1
Naphthalene	c	55%	319	580,000	0.000550	0.000175	0.000130	0.000725	0.000680	N	C/SLV <1
Phenanthrene	n	95%	5,700	93,000,000	0.0000613	0.0000537	0.0000712	0.000115	0.000132	N	C/SLV <1
Pyrene	n	98%	19,800	6,700,000	0.00296	-	-	0.00296	0.00296	N	C/SLV <1
TPH (mg/kg)											
Diesel Range Organics	n	88%	5,270	23,000	0.229	-	-	0.229	0.229	N	C/SLV <1
Gasoline Range Organics	n	27%	105	13,000	0.00808	0.00465	-	0.0127	0.00808	N	C/SLV <1
Residual Range Organics	n	94%	24,700	40,000	0.618	-	-	0.618	0.618	N	C/SLV <1
Sum cPAH C/RBC (ELCR)					**5.1E-06**						

Table M-2
Identification of COPCs in Soil at Landfill AOPC - Construction Worker
Bradford Island -Upland Operable Unit
(3 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-4)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-7)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
Sum non-carcinogenic C/RBC (HI)					**0.898**						
Sum carcinogenic C/RBC (ELCR)					**1.2E-05**						

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on Csoil/SLVsoil only (i.e. single medium).
ft bgs = feet below surface
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
max =maximum
MCL = maximum contaminant level
mg/kg = milligrams per kilogram
mm = multimedia
n = non-carcinogen
NE = multi-media was not evaluated since the chemical is already identified as a COPC.
NRWQC = national recommended water quality criteria
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/kg = micrograms per kilogram
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals
WQC = water quality criteria

Notes
Only detected chemicals with a detection frequency greater than 5% and inorganics greater than reference are shown in this table except for degradation products of PCE (see footnote 2). Reporting limits for non-detected chemicals are evaluated separately.
Construction Worker hierarchical SLV selection for soil: 1. DEQ Soil RBCs (Direct Contact Construction,. 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.
Screening Levels Values for Groundwater: 1. DEQ Groundwater in Excavation Construction/Excavation RBCs (Appendix J-4b), 2. USEPA Tapwater RSL, and 3. Surrogates used as noted in Appendix J-4b.

Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c.
For inorganics, the higher of the 95% Upper Prediction Limit (UPL) and lowest HH SLV was selected as the HH SLV. For all other analytes the heirarchy described above was used.

Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology.
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) Degradation products of PCE are retained as COPCs if PCE is identified as a COPC, even if not detected or detected at less than 5% frequency per DEQ (2010a).

Table M-2
Identification of COPCs in Soil at Landfill AOPC - Construction Worker
Bradford Island -Upland Operable Unit
(4 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-4)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-7)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum cPAH C/RBC (ELCR) = includes only individual carcinogenic polyaromatic hydrocarbons selected as a COPC. Individual benzofluoranthenes, rather than total benzofluoranthenes, was used in the summation.
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Individual benzofluoranthenes, rather than total benzofluoranthenes, was used in the summation. Total aroclors, rather than individual aroclors, was used in the summation.
Ratios for SLVs based on Reference Upper Prediction Limits (UPLs) are not included in sum totals.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-3
Identification of COPCs in Soil at Landfill AOPC - Excavation Worker
Bradford Island -Upland Operable Unit
(1 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-4)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-7)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
INORGANICS (mg/kg)											
Antimony	n	56%	2.05	410	0.00500	0.149	0.398	0.154	0.403	N	C/SLV <1
Cadmium	c	84%	1.37	4,300	0.000319	0.0000335	-	0.000352	0.000319	N	C/SLV <1
Lead	n	100%	796	800	0.995	-	-	0.995	0.995	N	C/SLV <1
Mercury	n	87%	1.02	2,600	0.000392	0.135	-	0.135	0.000392	N	C/SLV <1
Nickel	c	100%	455	20,000	0.0228	0.00000975	0.192	0.0228	0.215	N	C/SLV <1
Selenium	n	30%	0.262	5,100	0.0000514	0.0473	0.0501	0.0474	0.0502	N	C/SLV <1
Silver	n	62%	0.506	43,000	0.0000118	0.000000276	-	0.0000120	0.0000118	N	C/SLV <1
Zinc	n	100%	245	310,000	0.000790	0.188	0.280	0.189	0.281	N	C/SLV <1
BUTYLTINS (ug/kg)											
Dibutyltin	n	9%	20.0	180,000	0.000111	0.00533	-	0.00544	0.000111	N	C/SLV <1
Monobutyltin	n	9%	38.0	180,000	0.000211	0.00231	-	0.00252	0.000211	N	C/SLV <1
Tributyltin	n	18%	27	180,000	0.000151	0.00331	-	0.00346	0.000151	N	C/SLV <1
PESTICIDES (ug/kg)											
4,4'-DDT	c	23%	10.5	1,600,000	0.00000656	-	-	0.00000656	0.00000656	N	C/SLV <1
Chlordane (technical)	c	60%	1,220	1,500,000	0.000813	-	-	0.000813	0.000813	N	C/SLV <1
Heptachlor	c	7%	2.86	100,000	0.0000286	-	-	0.0000286	0.0000286	N	C/SLV <1
PCBs (ug/kg)											
Aroclor 1254	c	37%	60.4	740	0.0816	-	-	0.0816	0.0816	N	C/SLV <1
Aroclor 1260	c	84%	161	740	0.218	-	-	0.218	0.218	N	C/SLV <1
Total PCBs (Aroclors)	c	84%	283	740	0.382	-	-	0.382	0.382	N	C/SLV <1
HERBICIDES (ug/kg)											
2,4,5-T	n	10%	67.8	6,200,000	0.0000109	-	-	0.0000109	0.0000109	N	C/SLV <1
Dichloroprop	n	10%	172	4,900,000	0.0000351	-	-	0.0000351	0.0000351	N	C/SLV <1
MCPP	n	10%	10,400	620,000	0.0168	-	-	0.0168	0.0168	N	C/SLV <1
VOCs (ug/kg)											
1,2,4-Trimethylbenzene	n	15%	1,620	54,000,000	0.0000300	0.00306	-	0.00309	0.0000300	N	C/SLV <1
1,3,5-Trimethylbenzene	n	11%	906	42,000,000	0.0000216	-	-	0.0000216	0.0000216	N	C/SLV <1
Ethylbenzene	c	7%	1,480	44,000,000	0.0000336	-	-	0.0000336	0.0000336	N	C/SLV <1
m,p-Xylenes	n	7%	5,380	2,700,000	0.00199	-	-	0.00199	0.00199	N	C/SLV <1
Naphthalene	c	11%	2,980	16,000,000	0.000186	-	-	0.000186	0.000186	N	C/SLV <1
o-Xylene	n	9%	1,580	19,000,000	0.0000832	-	-	0.0000832	0.0000832	N	C/SLV <1
Tetrachloroethene (PCE)	c	71%	127,000	1,100,000	0.115	0.0117	4.06	0.127	NE	N	C/SLV <1
Toluene	n	54%	42,100	45,000,000	0.000936	-	-	0.000936	0.000936	N	C/SLV <1

Table M-3
Identification of COPCs in Soil at Landfill AOPC - Excavation Worker
Bradford Island -Upland Operable Unit
(2 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-4)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-7)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
SVOCs (ug/kg)											
Benzoic Acid	n	31%	176	2,500,000,000	0.0000000704	-	-	0.0000000704	0.0000000704	N	C/SLV <1
Bis(2-ethylhexyl) Phthalate	c	92%	4,260	33,000,000	0.000129	0.979	3.92	0.979	NE	N	C/SLV <1
Butyl Benzyl Phthalate	c	14%	42.7	910,000	0.0000469	-	-	0.0000469	0.0000469	N	C/SLV <1
Carbazole	c	72%	909	1,000,000	0.000909	-	-	0.000909	0.000909	N	C/SLV <1
Dibenzofuran	n	50%	138	1,000,000	0.000138	-	-	0.000138	0.000138	N	C/SLV <1
Diethyl Phthalate	n	17%	36.1	490,000,000	0.0000000737	0.0000301	0.0000514	0.0000302	0.0000514	N	C/SLV <1
Di-n-butyl Phthalate	n	11%	180	62,000,000	0.00000290	-	-	0.00000290	0.00000290	N	C/SLV <1
Pentachlorophenol	c	6%	90.7	2,900,000	0.0000313	0.00215	0.415	0.00219	0.415	N	C/SLV <1
PAHs (ug/kg)											
2-Methylnaphthalene	n	33%	170	4,100,000	0.0000415	0.00117	0.000261	0.00121	0.000303	N	C/SLV <1
Acenaphthene	n	77%	915	33,000,000	0.0000277	0.0000718	0.000236	0.000100	0.000264	N	C/SLV <1
Acenaphthylene	n	43%	31.7	16,000,000	0.00000198	-	-	0.00000198	0.00000198	N	C/SLV <1
Anthracene	n	89%	2,370	170,000,000	0.0000139	-	-	0.0000139	0.0000139	N	C/SLV <1
Benzo(a)anthracene	c	95%	11,100	590,000	0.0188	-	-	0.0188	0.0188	N	C/SLV <1
Benzo(a)pyrene	c	95%	10,800	59,000	0.183	-	-	0.183	0.183	N	C/SLV <1
Benzo(b)fluoranthene	c	96%	15,200	590,000	0.0258	-	-	0.0258	0.0258	N	C/SLV <1
Benzo(g,h,i)perylene	c	93%	5,540	5,900,000	0.000939	-	-	0.000939	0.000939	N	C/SLV <1
Benzo(k)fluoranthene	c	96%	26,300	5,900,000	0.00446	-	-	0.00446	0.00446	N	C/SLV <1
Benzofluoranthenes, Total	c	100%	13,100	590,000	0.0222	-	-	0.0222	0.0222	N	C/SLV <1
Chrysene	c	98%	11,000	59,000,000	0.000186	-	-	0.000186	0.000186	N	C/SLV <1
Dibenz(a,h)anthracene	c	82%	2,080	59,000	0.0353	-	-	0.0353	0.0353	N	C/SLV <1
Fluoranthene	n	95%	17,900	22,000,000	0.000814	-	-	0.000814	0.000814	N	C/SLV <1
Fluorene	n	73%	500	22,000,000	0.0000227	-	-	0.0000227	0.0000227	N	C/SLV <1
Indeno(1,2,3-cd)pyrene	c	93%	6,510	590,000	0.0110	-	-	0.0110	0.0110	N	C/SLV <1
Naphthalene	c	55%	319	16,000,000	0.0000199	0.000175	0.000130	0.000195	0.000150	N	C/SLV <1
Phenanthrene	n	95%	5,700	170,000,000	0.0000335	0.0000537	0.0000712	0.0000873	0.000105	N	C/SLV <1
Pyrene	n	98%	19,800	17,000,000	0.00116	-	-	0.00116	0.00116	N	C/SLV <1
TPH (mg/kg)											
Diesel Range Organics	n	88%	5,270	70,000	0.0753	-	-	0.0753	0.0753	N	C/SLV <1
Gasoline Range Organics	n	27%	105	22,000	0.00477	0.00465	-	0.00942	0.00477	N	C/SLV <1
Residual Range Organics	n	94%	24,700	40,000	0.618	-	-	0.618	0.618	N	C/SLV <1
Sum non-carcinogenic C/RBC (HI)					**0.726**						
Sum carcinogenic C/RBC (ELCR)					**8.0E-07**						

Green highlight = Retained as a COPC

Table M-3
Identification of COPCs in Soil at Landfill AOPC - Excavation Worker
Bradford Island -Upland Operable Unit
(3 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-4)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-7)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		

- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
ft bgs = feet below surface
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
max =maximum
MCL = maximum contaminant level
mg/kg = milligrams per kilogram
mm = multimedia
n = non-carcinogen
NE = multi-media was not evaluated since the chemical is already identified as a COPC.
NRWQC = national recommended water quality criteria
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/kg = micrograms per kilogram
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals
WQC = water quality criteria

Notes
Only detected chemicals with a detection frequency greater than 5% and inorganics greater than reference are shown in this table. Reporting limits for non-detected chemicals are evaluated separately.
Excavation Worker hierarchical SLV selection for soil: 1. DEQ Soil RBCs (Direct Contact Excavation), 2. USEPA Soil Industrial RSL, 3. Outdoor Worker SLV, and 4. Surrogate used as noted in Appendix J-4a.
Screening Levels Values for Groundwater: 1. DEQ Groundwater in Excavation Construction/Excavation RBCs (Appendix J-4b), 2. USEPA Tapwater RSL, and 3. Surrogates used as noted in Appendix J-4b.

Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c.
For inorganics, the higher of the 95% Upper Prediction Limit (UPL) and lowest HH SLV was selected as the HH SLV. For all other analytes the heirarchy described above was used.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology.
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Individual benzofluoranthenes, rather than total benzofluoranthenes, was used in the summation. Total aroclors, rather than individual aroclors, was used in the summation.
Ratios for SLVs based on Reference Upper Prediction Limits (UPLs) are not included in sum totals.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:

Table M-3
Identification of COPCs in Soil at Landfill AOPC - Excavation Worker
Bradford Island -Upland Operable Unit
(4 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-4)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-7)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		

[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-4
Identification of COPCs in Groundwater at Landfill AOPC - Construction and Excavation Workers
Bradford Island -Upland Operable Unit
(1 of 3)

Chemicals of Interest	Note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
					$\frac{C_{gw}}{SLV_{gw}}$ (direct contact)	$\frac{C_{soil}}{SLV_{soil}}$ (Construction Worker Table M-2)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})		
INORGANICS (mg/L)									
Antimony	n	42%	0.00223	0.015	0.149	0.00500	0.154	Y	C/SLV >0.1
Arsenic	c	81%	0.0104	5.8	0.00179	-	0.00179	N	carc C/SLV <1
Barium	n	100%	0.165	25,000	0.00000660	-	0.00000660	N	C/SLV <0.1
Beryllium	c	37%	0.000351	250	0.00000140	-	0.00000140	N	carc C/SLV <1
Cadmium	c	32%	0.00191	57	0.0000335	0.00913	0.00917	N	carc C/SLV <1
Chromium	c	37%	0.008	- (2)	-	-	-	N	C/SLV <1 (2)
Copper	n	58%	0.0454	5,000	0.00000908	-	0.00000908	N	C/SLV <0.1
Iron	n	94%	29.1	26	1.12	-	1.12	Y	C/SLV >0.1
Lead	n	60%	0.0128	- (2)	-	0.995	0.995	N	C/SLV <1 (2)
Manganese	n	98%	1.91	3,000	0.000637	-	0.000637	N	C/SLV <0.1
Mercury	n	17%	0.0000769	0.00057	0.135	0.0110	0.146	Y	C/SLV >0.1
Nickel	c	58%	0.117	12,000	0.00000975	0.0746	0.0746	N	carc C/SLV <1
Selenium	n	37%	0.00852	0.18	0.0473	0.0000514	0.0474	N	C/SLV <0.1
Silver	n	26%	0.000276	1,000	0.000000276	0.000337	0.000338	N	C/SLV <0.1
Thallium	n	47%	0.000238	0.002 (3)	0.119	-	0.119	Y	C/SLV >0.1
Zinc	n	79%	2.07	11	0.188	0.000790	0.189	Y	C/SLV >0.1
BUTYLTINS (ug/L)									
Dibutyltin	n	28%	0.0586	11	0.00533	0.000111	0.00544	N	C/SLV <0.1
Monobutyltin	n	18%	0.0254	11	0.00231	0.000211	0.00252	N	C/SLV <0.1
Tributyltin	n	75%	0.0364	11	0.00331	0.000151	0.00346	N	C/SLV <0.1
HERBICIDES (ug/L)									
4-Nitrophenol	n	13%	0.84	11,000	0.0000764	-	0.0000764	N	C/SLV <0.1
Pentachlorophenol	c	13%	0.112	52	0.00215	-	0.00215	N	carc C/SLV <1
VOCs (ug/L)									
1,2,4-Trimethylbenzene	n	9%	5.2	1,700	0.00306	0.000810	0.00387	N	C/SLV <0.1
Acetone	n	18%	10.2	22,000	0.000464	-	0.000464	N	C/SLV <0.1
Chloroform	c	14%	0.498	720	0.000692	-	0.000692	N	carc C/SLV <1
Isopropylbenzene	n	9%	3.42	680	0.00503	-	0.00503	N	C/SLV <0.1
n-Propylbenzene	n	9%	1.32	1,300	0.00102	-	0.00102	N	C/SLV <0.1
Tetrachloroethene (PCE)	c	23%	2.8	240	0.0117	3.18	NE	N	carc C/SLV <1
Vinyl Chloride	c	29%	0.307	1,200	0.000256	-	0.000256	N	carc C/SLV <1
SVOCs (ug/L)									
Bis(2-ethylhexyl) Phthalate	c	26%	4.7	4.8	0.979	0.00355	0.983	N	carc C/SLV <1
Diethyl Phthalate	n	13%	0.873	29,000	0.0000301	0.0000000737	0.0000302	N	C/SLV <0.1

Table M-4
Identification of COPCs in Groundwater at Landfill AOPC - Construction and Excavation Workers
Bradford Island -Upland Operable Unit
(2 of 3)

Chemicals of Interest	Note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
					$\frac{C_{gw}}{SLV_{gw}}$ (direct contact)	$\frac{C_{soil}}{SLV_{soil}}$ (Construction Worker Table M-2)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})		
Di-n-octyl Phthalate	n	13%	4.61	4.8	0.960	-	0.960	Y	C/SLV >0.1
Isophorone	c	9%	0.177	71	0.00249	-	0.00249	N	carc C/SLV <1
PAHs (ug/L)									
2-Methylnaphthalene	n	17%	0.175	150	0.00117	0.0000415	0.00121	N	C/SLV <0.1
Acenaphthene	n	9%	0.158	2,200	0.0000718	0.0000482	0.000120	N	C/SLV <0.1
Naphthalene	c	13%	0.0873	500	0.000175	0.000550	0.000725	N	carc C/SLV <1
Phenanthrene	n	9%	0.591	11,000	0.0000537	0.0000613	0.000115	N	C/SLV <0.1
TPH (mg/L)									
Gasoline Range Organics	n	30%	0.0604	13	0.00465	0.00808	0.0127	N	C/SLV <0.1
Residual Range Organics	n	49%	0.344	- (2)	-	0.618	0.618	N	C/SLV <1 (2)
Sum non-carcinogenic C/RBC (HI)					**2.74**				
Sum carcinogenic C/RBC (ELCR)					**1.0E-06**				

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
max =maximum
mg/L = milligrams per liter
n = non-carcinogen
NE = Multi-media was not evaluated since the chemical is already identified as a COPC.
PAHs = polyaromatic hydrocarbons
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
TPH = total petroleum hydrocarbon
ug/L = micrograms per liter
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table. Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately.
Total metal results are reported.

Table M-4
Identification of COPCs in Groundwater at Landfill AOPC - Construction and Excavation Workers
Bradford Island -Upland Operable Unit
(3 of 3)

Chemicals of Interest	Note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
					$\frac{C_{gw}}{SLV_{gw}}$ (direct contact)	$\frac{C_{soil}}{SLV_{soil}}$ (Construction Worker Table M-2)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})		

Construction Worker hierarchical SLV selection for soil: 1. DEQ Soil RBCs (Direct Contact Construction,. 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.
Screening Levels Values for Groundwater: 1. DEQ Groundwater in Excavation Construction/Excavation RBCs (Appendix J-4b), 2. USEPA Tapwater RSL, and 3. Surrogates used as noted in Appendix J-4b.

Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) At the request of DEQ, COPC selection for groundwater is done separately for the on-site groundwater ingestion pathway and the groundwater discharge to surface water pathway. Therefore, this screening accounts only for on-site upland exposure to groundwater.
(2) The SLV for these chemcials are not available due to exceeding the solubility point in water.
(3) DEQ Maximum Contaminant Level (MCL) was used as a surrogate.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:

[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media

For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-5
Identification of COPCs in Groundwater at Landfill AOPC - Potable Water User
Bradford Island -Upland Operable Unit
(1 of 3)

Chemicals of Interest	Note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
					$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-1)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})		
INORGANICS (mg/L)									
Antimony	n	42%	0.00223	0.015	0.149	0.00361	0.152	Y	C/SLV >0.1
Arsenic	c	81%	0.0104	0.000038	274	1.94	276	Y	carc C/SLV >1
Barium	n	100%	0.165	7.3	0.0226	-	0.0226	N	C/SLV <0.1
Beryllium	c	37%	0.000351	0.073	0.00481	-	0.00481	N	carc C/SLV <1
Cadmium	c	32%	0.00191	0.018	0.106	0.00234	0.108	N	carc C/SLV <1
Chromium	c	37%	0.008	55 (2)	0.000145	-	0.000145	N	carc C/SLV <1
Copper	n	58%	0.0454	1.5	0.0303	-	0.0303	N	C/SLV <0.1
Iron	n	94%	29.1	26	1.12	-	1.12	Y	C/SLV >0.1
Lead	n	60%	0.0128	0.015	0.853	0.639	1.49	Y	C/SLV >0.1
Manganese	n	98%	1.91	0.88	2.17	-	2.17	Y	C/SLV >0.1
Mercury	n	17%	0.0000769	0.011	0.00699	0.00468	0.0117	N	C/SLV <0.1
Nickel	c	58%	0.117	0.73	0.160	-	0.160	N	carc C/SLV <1
Selenium	n	37%	0.00852	0.18	0.0473	-	0.0473	N	C/SLV <0.1
Silver	n	26%	0.000276	0.18	0.00153	0.0000882	0.00162	N	C/SLV <0.1
Thallium	n	47%	0.000238	0.002	0.119	-	0.119	N	C/SLV >0.1
Zinc	n	79%	2.07	11	0.188	0.00135	0.190	Y	C/SLV >0.1
BUTYLTINS (ug/L)									
Dibutyltin	n	28%	0.0586	11	0.00533	0.000112	0.00544	N	C/SLV <0.1
Monobutyltin	n	18%	0.0254	11	0.00231	0.000211	0.00252	N	C/SLV <0.1
Tributyltin	n	75%	0.0364	11	0.00331	0.000334	0.00364	N	C/SLV <0.1
HERBICIDES (ug/L)									
4-Nitrophenol	n	13%	0.840	11,000	0.0000764	-	0.0000764	N	C/SLV <0.1
Pentachlorophenol	c	13%	0.112	0.47	0.238	-	0.238	N	carc C/SLV <1
VOCs (ug/L)									
1,1-Dichloroethene	n	0%	-	340	-	-	-	Y	PCE is a COPC (3)
1,2,4-Trimethylbenzene	n	9%	5.20	15	0.347	0.00285	0.350	Y	C/SLV >0.1
Acetone	n	18%	10.2	22,000	0.000464	-	0.000464	N	C/SLV <0.1
Chloroform	c	14%	0.498	0.19	2.62	-	2.62	Y	carc C/SLV >1
cis-1,2-Dichloroethene	n	4.6%	0.791	360	0.00220	-	0.00220	Y	PCE is a COPC (3)
Isopropylbenzene	n	9%	3.42	680	0.00503	-	0.00503	N	C/SLV <0.1
n-Propylbenzene	n	9%	1.32	1,300	0.00102	-	0.00102	N	C/SLV <0.1
Tetrachloroethene (PCE)	c	23%	2.80	0.093	30.1	0.00324	30.1	Y	carc C/SLV >1
trans-1,2-Dichloroethene	n	0%	-	110	-	-	-	Y	PCE is a COPC (3)

Table M-5
Identification of COPCs in Groundwater at Landfill AOPC - Potable Water User
Bradford Island -Upland Operable Unit
(2 of 3)

Chemicals of Interest	Note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
					$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-1)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})		
Trichloroethene (TCE)	c	0%	-	0.039	-	-	-	Y	PCE is a COPC (3)
Vinyl Chloride	c	29%	0.307	0.025	12.3	-	12.3	Y	carc C/SLV >1
SVOCs (ug/L)									
Bis(2-ethylhexyl) Phthalate	c	26%	4.70	4.1	1.15	0.0425	1.19	Y	carc C/SLV >1
Diethyl Phthalate	n	13%	0.873	29,000	0.0000301	0.0000000794	0.0000302	N	C/SLV <0.1
Di-n-octyl Phthalate	n	13%	4.61	4.1	1.12	-	1.12	Y	C/SLV >0.1
Isophorone	c	9%	0.177	71	0.00249	-	0.00249	N	carc C/SLV <1
PAHs (ug/L)									
2-Methylnaphthalene	n	17%	0.175	150	0.00117	0.0000485	0.00122	N	C/SLV <0.1
Acenaphthene	n	9%	0.158	2,200	0.0000718	0.0000150	0.0000868	N	C/SLV <0.1
Naphthalene	c	13%	0.0873	0.14	0.624	0.00683	0.630	N	carc C/SLV <1
Phenanthrene	n	9%	0.591	11,000	0.0000537	0.0000340	0.0000877	N	C/SLV <0.1
TPH (mg/L)									
Diesel Range Organics	n	67%	0.388	0.09	4.31	0.0143	4.33	Y	C/SLV >0.1
Gasoline Range Organics	n	30%	0.0604	0.1	0.604	0.00714	0.611	Y	C/SLV >0.1
Residual Range Organics	n	49%	0.344	0.29	1.19	0.236	1.42	Y	C/SLV >0.1
Sum non-carcinogenic C/RBC (HI)					**11.4**				
Sum carcinogenic C/RBC (ELCR)					**3.2E-04**				

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
max =maximum
MCL = maximum contaminant level
mg/L = milligrams per liter
mm = multimedia
n = non-carcinogen
PAHs = polyaromatic hydrocarbons
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
TPH = total petroleum hydrocarbon

Table M-5
Identification of COPCs in Groundwater at Landfill AOPC - Potable Water User
Bradford Island -Upland Operable Unit
(3 of 3)

Chemicals of Interest	Note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
					$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-1)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})		

ug/L = micrograms per liter
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table except for degradation products of PCE (see footnote 4). Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately.
Total metal results are reported.
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, 3. Surrogate used as noted in Appendix J-4a.
Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, 4. Surrogates used as noted in Appendix J-4b.

Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) At the request of DEQ, COPC selection for groundwater is done separately for the on-site groundwater ingestion pathway and the groundwater discharge to surface water pathway. Therefore, this screening accounts only for on-site upland exposure to groundwater.
(2) There is no SLV for chromium, but it is likely to exist in the trivalent form in the aerobic surface water environment
(3) Degradation products of PCE are retained as COPCs if PCE is identified as a COPC, even if not detected or detected at less than 5% frequency per DEQ (2010a).

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum cPAH C/RBC (ELCR) = includes only individual carcinogenic polyaromatic hydrocarbons selected as a COPC.
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV = summation of C/SLV of all carcinogens
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:

[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media

For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-6
Evaluation of Groundwater Discharge to Surface Water - Landfill AOPC
Bradford Island -Upland Operable Unit
(1 of 2)

Chemicals of Interest	Note	Groundwater		Seep Water		Surface Water		Reference Groundwater		Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Significant GW to SW Pathway ?
		Max Detected Value	Detection Rate	Min Detected Value	Max Detected Value	Min Detected Value	Max Detected Value	Min Detected Value	Max Detected Value		$\frac{C_{gw}}{SLV_{gw}}$ (Groundwater)	$\frac{C_{gw}}{SLV_{gw}}$ (Seep water)	$\frac{C_{gw}}{SLV_{gw}}$ (Surface water)	
INORGANICS (mg/L)														
Arsenic	c	0.0213	88%	0.000500	0.0128	0.000800	0.00117	0.00123	0.00168	0.000038	561	337	30.8	Moderate
Iron	n	36.6	91%	0.271	121	0.167	0.446	0.116	0.451	26	1.41	4.65	0.0172	No
Lead	n	0.0269	74%	0.000113	0.0257	0.000105	0.000407	0.000102	0.000248	0.015	1.79	1.71	0.0271	No
Manganese	n	5.38	100%	0.00890	3.24	0.00590	0.0136	0.204	0.259	0.88	6.11	3.68	0.0155	No
Mercury	n	0.0000300	40%	0.0000300	0.0000300	-	-	-	-	0.011	0.00273	0.00273	-	No
BUTYLTINS (ug/L)														
Dibutyltin	n	0.130	16%	-	-	-	-	-	-	11	0.0118	-	-	No
VOCs (ug/L)														
Chloroform	c	3.70	15%	0.740	2.80	-	-	-	-	0.19	19.5	14.7	-	No
Tetrachloroethene (PCE)	c	7.20	24%	0.150	4.40	-	-	-	-	0.093	77.4	47.3	-	No
PAHs (ug/L)														
Phenanthrene	n	3.90	10%	-	-	-	-	-	-	11,000	0.000355	-	-	No
TPH (mg/L)														
Diesel Range Organics	n	0.980	72%	0.0290	0.130	0.0260	0.0300	-	-	0.09	10.9	1.44	0.333	No
Gasoline Range Organics	n	0.120	38%	-	-	-	-	-	-	0.1				
Residual Range Organics	n	0.370	50%	0.130	0.130	-	-	-	-	0.29	1.28	0.448	-	No

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium
AOPC = area of potential concern
C = concentration
c = carcinogen
DEQ = Oregon Department of Environmental Quality
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C/SLV only (i.e. single medium).
Max =maximum
mg/L = milligrams per liter
MCL = maximum contaminant level
Min = Minimum
n = non-carcinogen
PAHs = polyaromatic hydrocarbons
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/L = micrograms per liter
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table. Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately
Total metal results are reported.
Hierarchy was developed to determine Screening Levels Values for Direct contact pathway to surface water; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential and Ingest), 2. USEPA tapwater RSL and 3. DEQ MCL.
Surrogates were assigned if an SLV was not available (see Appendix J-4).
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009

Table M-6
Evaluation of Groundwater Discharge to Surface Water - Landfill AOPC
Bradford Island -Upland Operable Unit
(2 of 2)

Chemicals of Interest	Note	Groundwater		Seep Water		Surface Water		Reference Groundwater		Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Significant GW to SW Pathway ?
		Max Detected Value	Detection Rate	Min Detected Value	Max Detected Value	Min Detected Value	Max Detected Value	Min Detected Value	Max Detected Value		$\frac{C_{gw}}{SLV_{gw}}$ (Groundwater)	$\frac{C_{gw}}{SLV_{gw}}$ (Seep water)	$\frac{C_{gw}}{SLV_{gw}}$ (Surface water)	

DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV

Table M-7
Identification of COPCs in Groundwater at Landfill AOPC - Discharge and Bioaccumulation
Bradford Island -Upland Operable Unit
(1 of 3)

Chemicals of Interest	Note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4c)	Site concentration(C) / SLV			Bioaccumulative Potential? (Y/N) (Table J-6)	Retain as a COPC, Y/N?	Rationale
					$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-1)	Multimedia (1) (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})			
INORGANICS (mg/L)										
Antimony	n	42%	0.00223	0.0056	0.398	0.00361	0.402	N	Y	C/SLV >0.1
Arsenic	c	81%	0.0104	0.000018	578	1.94	580	Y	Y	carc C/SLV>1
Barium	n	100%	0.165	1	0.165	-	0.165	N	Y	C/SLV >0.1
Beryllium	c	37%	0.000351	-	-	-	-	N	N	Not Bioaccumulative
Cadmium	c	32%	0.00191	-	-	0.00234	0.00234	N	N	Not Bioaccumulative
Chromium	c	37%	0.00800	- (2)	-	-	-	N	N	Not Bioaccumulative
Copper	n	58%	0.045	1.3	0.0349	-	0.0349	N	N	C/SLV <0.1
Iron	n	94%	29.1	0.3	97.0	-	97.0	N	N	See footnote (3)
Lead	n	60%	0.0128	-	-	0.639	0.639	Y	Y	No SLV
Manganese	n	98%	1.91	0.05	38.2	-	38.2	Y	N	See footnote (3)
Mercury	n	17%	0.000077	-	-	0.00468	0.00468	Y	Y	No SLV
Nickel	c	58%	0.117	0.61	0.192	-	0.192	N	N	carc C/SLV <1
Selenium	n	37%	0.0085	0.17	0.0501	-	0.0501	N	N	C/SLV <0.1
Silver	n	26%	0.000276	-	-	0.0000882	0.0000882	N	N	Not Bioaccumulative
Thallium	n	47%	0.000238	0.00024	0.992	-	0.992	Y	Y	C/SLV >0.1
Zinc	n	79%	2.07	7.4	0.280	0.00135	0.281	Y	Y	C/SLV >0.1
BUTYLTINS (ug/L)										
Dibutyltin	n	28%	0.0586	-	-	0.000112	0.000112	N	N	Not Bioaccumulative
Monobutyltin	n	18%	0.0254	-	-	0.000211	0.000211	N	N	Not Bioaccumulative
Tributyltin	n	75%	0.0364	-	-	0.000334	0.000334	Y	Y	No SLV
HERBICIDES (ug/L)										
4-Nitrophenol	n	13%	0.840	10,000	0.0000840	-	0.0000840	N	N	C/SLV <0.1
Pentachlorophenol	c	13%	0.112	0.27	0.415	-	0.415	Y	N	carc C/SLV <1
VOCs (ug/L)										
1,1-Dichloroethene	n	0%	-	330	-	-	-	N	Y	PCE is a COPC (4)
1,2,4-Trimethylbenzene	n	9%	5.20	-	-	0.00285	0.00285	Y	Y	No SLV
Acetone	n	18%	10.2	-	-	-	-	N	N	Not Bioaccumulative
Chloroform	c	14%	0.498	5.7	0.0874	-	0.0874	N	N	carc C/SLV <1
cis-1,2-Dichloroethene	n	4.6%	0.791	-	-	-	-	N	N	Not Bioaccumulative
Isopropylbenzene	n	9%	3.42	-	-	-	-	Y	Y	No SLV
n-Propylbenzene	n	9%	1.32	-	-	-	-	Y	Y	No SLV
Tetrachloroethene (PCE)	c	23%	2.80	0.69	4.06	0.00324	4.06	N	Y	carc C/SLV>1
trans-1,2-Dichloroethene	n	0%	-	140	-	-	-	N	Y	PCE is a COPC (4)
Trichloroethene (TCE)	c	0%	-	2.5	-	-	-	N	Y	PCE is a COPC (4)
Vinyl Chloride	c	29%	0.307	0.025	12.3	-	12.3	N	Y	carc C/SLV>1

Table M-7
Identification of COPCs in Groundwater at Landfill AOPC - Discharge and Bioaccumulation
Bradford Island -Upland Operable Unit
(2 of 3)

Chemicals of Interest	Note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4c)	Site concentration(C) / SLV			Bioaccumulative Potential? (Y/N) (Table J-6)	Retain as a COPC, Y/N?	Rationale
					$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-1)	Multimedia (1) (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})			
SVOCs (ug/L)										
Bis(2-ethylhexyl) Phthalate	c	26%	4.7	1.2	3.92	0.0425	3.96	Y	Y	carc C/SLV>1
Diethyl Phthalate	n	13%	0.873	17,000	0.0000514	0.0000000794	0.0000514	N	N	C/SLV <0.1
Di-n-octyl Phthalate	n	13%	4.61	1.2	3.84	-	3.84	Y	Y	C/SLV >0.1
Isophorone	c	9%	0.177	35	0.00506	-	0.00506	N	N	carc C/SLV <1
PAHs (ug/L)										
2-Methylnaphthalene	n	17%	0.175	670	0.000261	0.0000485	0.000310	Y	N	C/SLV <0.1
Acenaphthene	n	9%	0.158	670	0.000236	0.0000150	0.000251	Y	N	C/SLV <0.1
Naphthalene	c	13%	0.0873	670	0.000130	0.00683	0.00696	N	N	carc C/SLV <1
Phenanthrene	n	9%	0.591	8,300	0.0000712	0.0000340	0.000105	Y	N	C/SLV <0.1
TPH (mg/L)										
Diesel Range Organics	n	67%	0.388	-	-	0.0143	0.0143	NA	N	Evaluated as PAHs
Gasoline Range Organics	n	30%	0.0604	-	-	0.00714	0.00714	NA	N	Evaluated as VOCs
Residual Range Organics	n	49%	0.344	-	-	0.236	0.236	NA	N	Evaluated as PAHs
Sum non-carcinogenic C/RBC (HI)					**5.76**					
Sum carcinogenic C/RBC (ELCR)					**6.0E-04**					

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
max =maximum
mg/L = milligrams per liter
n = non-carcinogen
NA = not analyzed
NRWQC = national recommended water quality criteria
PAHs = polyaromatic hydrocarbons
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
TPH = total petroleum hydrocarbon
ug/L = micrograms per liter
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals
WQC = water quality criteria

Table M-7
Identification of COPCs in Groundwater at Landfill AOPC - Discharge and Bioaccumulation
Bradford Island -Upland Operable Unit
(3 of 3)

Chemicals of Interest	Note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4c)	Site concentration(C) / SLV			Bioaccumulative Potential? (Y/N) (Table J-6)	Retain as a COPC, Y/N?	Rationale
					$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-1)	Multimedia (1) (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})			

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table. Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately
Total metal results are reported.
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A, 33B, and 33C. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology.
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) At the request of DEQ, groundwater COPCs are selected separately for each pathway. This table provides COPCs selected for the pathway of groundwater discharge to surface water and subsequent use of surface water (river water) for ingestions plus fish consumption (bioaccumulation).
(2) There is no SLV for chromium, but it is likely to exist in the trivalent form in the aerobic surface water environment
(3) SLVs are based on aesthetic considerations and are not included in summations or as a COPCs.
(4) Degradation products of PCE are retained as COPCs if PCE is identified as a COPC, even if not detected or detected at less than 5% frequency per DEQ (2010a). If the chemcial lacks a Bioaccumulation based SLV and is not considered bioaccumulative, then it is not selected as a COPC.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately. Iron and manganese not included in summation, see footnote (3).
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-8
Identification of COPCs in Seepwater at Landfill AOPC - Potable Water User
Bradford Island -Upland Operable Unit
(1 of 2)

Chemicals of Interest	Note	Total / Dissolved	Max Detected Value	Detection Rate	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV: $\frac{C_{sp}}{SLV_{gw}}$ (Potable Water User)	Site concentration(C) / SLV: $\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-1)	Site concentration(C) / SLV: Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Retain as a COPC, Y/N?	Rationale
INORGANICS (mg/L)										
Antimony	n	Dissolved	0.00228	100%	0.015	0.152	0.00361	0.156	Y	C/SLV >0.1
Zinc	n	Dissolved	0.0856	100%	11	0.00778	0.00135	0.00913	N	C/SLV <0.1
Arsenic	c	Total	0.0128	80%	0.000038	337	1.94	339	Y	C/SLV >1
Barium	n	Total	0.0742	100%	7.3	0.0102	-	0.0102	N	C/SLV <0.1
Chromium	c	Total	0.00105	100%	55 (2)	0.0000191	-	0.0000191	N	carc C/SLV <1
Copper	n	Total	0.00272	100%	1.5	0.00181	-	0.00181	N	C/SLV <0.1
Iron	n	Total	121	100%	26	4.65	-	4.65	Y	C/SLV >0.1
Lead	n	Total	0.0257	80%	0.015	1.71	0.639	2.35	Y	C/SLV >0.1
Manganese	n	Total	3.24	100%	0.88	3.68	-	3.68	Y	C/SLV >0.1
Mercury	n	Total	0.0000300	50%	0.011	0.00273	0.00468	0.00740	N	C/SLV <0.1
Nickel	c	Total	0.00232	100%	0.73	0.00318	-	0.00318	N	carc C/SLV <1
Selenium	n	Total	0.00111	100%	0.18	0.00617	-	0.00617	N	C/SLV <0.1
VOCs (ug/L)										
1,1-Dichloroethene	n	Total	-	0%	340	-	-	-	Y	PCE is a COPC (3)
Chloroform	c	Total	2.80	40%	0.190	14.7	-	14.7	Y	C/SLV >1
cis-1,2-Dichloroethene	n	Total	-	0%	360	-	-	-	Y	PCE is a COPC (3)
Tetrachloroethene (PCE)	c	Total	4.40	60%	0.0930	47.3	0.00324	47.3	Y	C/SLV >1
trans-1,2-Dichloroethene	n	Total	-	0%	110	-	-	-	Y	PCE is a COPC (3)
Trichloroethene (TCE)	c	Total	-	0%	0.0390	-	-	-	Y	PCE is a COPC (3)
Vinyl Chloride	c	Total	-	0%	0.0250	-	-	-	Y	PCE is a COPC (3)
SVOCs (ug/L)										
Benzoic Acid	n	Total	5.90	100%	150,000	0.0000393	0.0000000872	0.0000394	N	C/SLV <0.1
TPH (mg/L)										
Diesel Range Organics	n	Total	0.130	40%	0.09	1.44	0.0143	1.46	Y	C/SLV >0.1
Residual Range Organics	n	Total	0.130	20%	0.290	0.448	0.236	0.685	Y	C/SLV >0.1
Sum non-carcinogenic C/RBC (HI)						**10.4**				
Sum carcinogenic C/RBC (ELCR)						**4.0E-04**				

Green highlight = Retained as a COPC
- = Not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality

Table M-8
Identification of COPCs in Seepwater at Landfill AOPC - Potable Water User
Bradford Island -Upland Operable Unit
(2 of 2)

Chemicals of Interest	Note	Total / Dissolved	Max Detected Value	Detection Rate	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
						$\frac{C_{sp}}{SLV_{gw}}$ (Potable Water User)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-1)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})		

ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{sp}/SLV_{gw} only (i.e. single medium).
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{sp}/SLV_{gw} only (i.e. single medium).
max =maximum
MCL = maximum contaminant level
mg/L = milligrams per liter
mm = multimedia
n = non-carcinogen
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
sp = seep water
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/L = micrograms per liter
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table except for degradation products of PCE (see footnote 3). Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately.
Dissolved metals were shown if total metals were non-detect.
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.
Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, and 4. Surrogates used as noted in Appendix J-4b.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology.
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) Seep water is evaluated as part of the groundwater discharge to surface water pathway.
(2) There is no SLV for chromium, but it is likely to exist in the trivalent form in the aerobic surface water environment
(3) Degradation products of PCE are retained as COPCs if PCE is identified as a COPC, even if not detected or detected at less than 5% frequency per DEQ (2010a).

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens

COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:

[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media

For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-9
Identification of COPCs in Seepwater at Landfill AOPC - Discharge and Bioaccumulation
Bradford Island -Upland Operable Unit
(1 of 2)

Chemicals of Interest	Note	Total / Dissolved	Max Detected Value	Detection Rate	Selected HH SLV (Table J-4c)	Site concentration(C) / SLV: $\frac{C_{sp}}{SLV_{gw}}$ (Bioaccumulation)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-1)	Multimedia (1) (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})	Bioaccumulative Potential? (Y/N) (Table J-7)	Retain as a COPC, Y/N?	Rationale
INORGANICS (mg/L)											
Antimony	n	Dissolved	0.00228	100%	0.0056	0.407	0.00361	0.411	N	N	C/SLV <1
Zinc	n	Dissolved	0.0856	100%	7.4	0.0116	0.00135	0.0129	Y	N	C/SLV <1
Arsenic	c	Total	0.0128	80%	0.000018	711	1.94	713	Y	Y	C/SLV >1
Barium	n	Total	0.0742	100%	1	0.0742	-	0.0742	N	N	C/SLV <1
Chromium	c	Total	0.00105	100%	- (2)	-	-	-	N	N	Not Bioaccumulative
Copper	n	Total	0.00272	100%	1.3	0.00209	-	0.00209	N	N	C/SLV <1
Iron	n	Total	121	100%	0.3	403	-	403	N	N	See footnote (3)
Lead	n	Total	0.0257	80%	-	-	0.639	0.639	Y	Y	No SLV
Manganese	n	Total	3.24	100%	0.05	64.8	-	64.8	Y	N	See footnote (3)
Mercury	n	Total	0.0000300	50%	-	-	0.00468	0.00468	Y	Y	No SLV
Nickel	c	Total	0.00232	100%	0.61	0.00380	-	0.00380	N	N	C/SLV <1
Selenium	n	Total	0.00111	100%	0.17	0.00653	-	0.00653	N	N	C/SLV <1
VOCs (ug/L)											
1,1-Dichloroethene	n	Total	-	0%	330	-	-	-	N	Y	PCE is a COPC (4)
Chloroform	c	Total	2.80	40%	5.7	0.491	-	0.491	No	N	C/SLV <1
cis-1,2-Dichloroethene	n	Total	-	0%	-	-	-	-	N	N	Not Bioaccumulative
Tetrachloroethene (PCE)	c	Total	4.40	60%	0.69	6.38	0.00324	6.38	No	Y	C/SLV >1
trans-1,2-Dichloroethene	n	Total	-	0%	140	-	-	-	N	Y	PCE is a COPC (4)
Trichloroethene (TCE)	c	Total	-	0%	2.5	-	-	-	N	Y	PCE is a COPC (4)
Vinyl Chloride	c	Total	-	0%	0.025	-	-	-	N	Y	PCE is a COPC (4)
SVOCs (ug/L)											
Benzoic Acid	n	Total	5.90	100%	-	-	0.0000000872	0.0000000872	N	N	Not Bioaccumulative
TPH (mg/L)											
Diesel Range Organics	n	Total	0.130	40%	-	-	0.0143	0.0143	NA	N	Evaluated as PAHs
Residual Range Organics	n	Total	0.130	20%	-	-	0.236	0.236	NA	N	Evaluated as PAHs
Sum non-carcinogenic C/RBC (HI)						**0.502**					
Sum carcinogenic C/RBC (ELCR)						**7.2E-04**					

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{sp}/SLV_{gw} only (i.e. single medium).
gw = groundwater
HH = human health

Table M-9
Identification of COPCs in Seepwater at Landfill AOPC - Discharge and Bioaccumulation
Bradford Island -Upland Operable Unit
(2 of 2)

Chemicals of Interest	Note	Total / Dissolved	Max Detected Value	Detection Rate	Selected HH SLV (Table J-4c)	Site concentration(C) / SLV			Bioaccumulative Potential? (Y/N) (Table J-7)	Retain as a COPC, Y/N?	Rationale
						$\frac{C_{sp}}{SLV_{gw}}$ (Bioaccumulation)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-1)	Multimedia (1) (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})			

HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{sp}/SLV_{gw} only (i.e. single medium).
max =maximum
mg/L = milligrams per liter
n = carcinogen
NRWQC = national recommended water quality criteria
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
sp = seep water
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/L = micrograms per liter
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals
WQC = water quality criteria

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table. Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately
Dissolved metals were shown if total metals were non-detect.
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
US Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology.
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) Seep water is evaluated as part of the groundwater discharge to surface water pathway.
(2) There is no SLV for chromium, but it is likely to exist in the trivalent form in the aerobic surface water environment
(3) SLVs are based on aesthetic considerations and are not included in summations or as a COPCs.
(4) Degradation products of PCE are retained as COPCs if PCE is identified as a COPC, even if not detected or detected at less than 5% frequency per DEQ (2010a). If the chemcial lacks a Buioaccumulation based SLV and is not considered bioaccumulative, then it is not selected as a COPC.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately. Iron and manganese not included in summation, see footnote (3).
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-10
Identification of COPCs in Shoreline Surface Water at Landfill AOPC - Potable Water User
Bradford Island -Upland Operable Unit
(1 of 2)

Chemicals of Interest	Note	Max Detected Value	Detection Rate	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
					$\frac{C_{sw}}{SLV_{sw}}$ (Potable Water User)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-1)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{sw})		
INORGANICS (mg/L)									
Arsenic	c	0.00117	75%	0.000038	30.8	1.94	32.7	Y	C/SLV >1
Iron	n	0.446	100%	26	0.0172	-	0.0172	N	C/SLV <1
Lead	n	0.000407	100%	0.015	0.0271	0.639	0.666	N	C/SLV <1
Manganese	n	0.0136	100%	0.88	0.0155	-	0.0155	N	C/SLV <1
TPH (mg/L)									
Diesel Range Organics	n	0.0300	50%	0.09	0.333	0.0143	0.348	N	C/SLV <1
Sum non-carcinogenic C/RBC (HI)					**0.366**				
Sum carcinogenic C/RBC (ELCR)					**3.1E-05**				

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{sw}/SLV_{sw} only (i.e. single medium).
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{sw}/SLV_{sw} only (i.e. single medium).
max =maximum
MCL = maximum contaminant level
mg/L = milligrams per liter
n = non-carcinogen
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
sw = surface water
TPH = total petroleum hydrocarbon
ug/L = micrograms per liter
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table. Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately.
Total metal results are reported.
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.
Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, 4. Surrogates used as noted in Appendix J-4b.
Sum nC/SLV = summation of C/SLV of all non-carcinogens

Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009

Table M-10
Identification of COPCs in Shoreline Surface Water at Landfill AOPC - Potable Water User
Bradford Island -Upland Operable Unit
(2 of 2)

Chemicals of Interest	Note	Max Detected Value	Detection Rate	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
					$\frac{C_{sw}}{SLV_{sw}}$ (Potable Water User)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-1)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{sw})		

DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) Surface water associated with the landfill AOPC refers to data from the two shoreline locations (S2, S4) and is evaluated as part of groundwater discharge to surface water pathway.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:

[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media

For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-11
Identification of COPCs in Shoreline Surface Water at Landfill AOPC - Discharge and Bioaccumulation
Bradford Island -Upland Operable Unit
(1 of 2)

Chemicals of Interest	Note	Max Detected Value	Detection Rate	Selected HH SLV (Table J-4c)	Site concentration(C) / SLV			Bioaccumulative Potential? (Y/N)	Retain as a COPC, Y/N?	Rationale
					$\frac{C_{sw}}{SLV_{sw}}$ (Bioaccumulation)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-1)	Multimedia (1) (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{sw})			
INORGANICS (mg/L)										
Arsenic	c	0.00117	75%	0.000018	65.0	1.94	66.9	Y	Y	C/SLV >1
Iron	n	0.446	100%	0.3	1.49	-	1.49	N	N	See footnote (2)
Lead	n	0.000407	100%	-	-	0.639	0.639	Y	Y	No SLV
Manganese	n	0.0136	100%	0.05	0.272	-	0.272	Y	N	See footnote (2)
TPH (mg/L)										
Diesel Range Organics	n	0.0300	50%	-	-	0.0143	0.0143	NA	N	Evaluated as PAHs
Sum non-carcinogenic C/RBC (HI)					**0**					
Sum carcinogenic C/RBC (ELCR)					**6.5E-05**					

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{sw}/SLV_{sw} only (i.e. single medium).
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{sw}/SLV_{sw} only (i.e. single medium).
max =maximum
mg/L = milligrams per liter
n = non-carcinogen
NRWQC = national recommended water quality criteria
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
sw = surface water
TPH = total petroleum hydrocarbon
ug/L = micrograms per liter
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
WQC = water quality criteria

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table. Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately.
Total metal results are reported.
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c.

Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology.

Table M-11
Identification of COPCs in Shoreline Surface Water at Landfill AOPC - Discharge and Bioaccumulation
Bradford Island -Upland Operable Unit
(2 of 2)

Chemicals of Interest	Note	Max Detected Value	Detection Rate	Selected HH SLV (Table J-4c)	Site concentration(C) / SLV			Bioaccumulative Potential? (Y/N)	Retain as a COPC, Y/N?	Rationale
					$\frac{C_{sw}}{SLV_{sw}}$ (Bioaccumulation)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-1)	Multimedia (1) (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{sw})			

USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) Surface water associated with the landfill AOPC refers to data from the two shoreline locations (S2, S4) and is evaluated as part of groundwater discharge to surface water pathway.
(2) SLVs are based on aesthetic considerations and are not included in summations or as COPCs.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately. Iron and manganese not included in summation, see footnote (2).
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens

COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-12
Summary of COPCs - Landfill AOPC
Bradford Island -Upland Operable Unit
(1 of 1)

Media	Receptor	HI	ELCR	COPCs
Soil	Adult Outdoor Worker	0.293	6.32E-05	Arsenic Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzofluoranthenes, Total Dibenz(a,h)anthracene Indeno(1,2,3-cd)pyrene Lead #
	Construction Worker	0.898	1.2E-05	Benzo(a)pyrene Tetrachloroethene (PCE) 1,1-Dichloroethene # cis-1,2-Dichloroethene # trans-1,2-Dichloroethene # Trichloroethene (TCE) Vinyl Chloride
	Excavation Worker	0.726	8.0E-07	No COPCs
Groundwater	Construction/Excavation Worker	2.74	1.0E-06	Antimony Iron Mercury Thallium # Zinc Di-n-octyl Phthalate
	Onsite Worker (Potable Water User)	11.4	**3.2E-04**	Arsenic Bis(2-ethylhexyl) Phthalate Chloroform Diesel Range Organics # Di-n-octyl Phthalate Manganese # Residual Range Organics # Tetrachloroethene (PCE) 1,2,4-Trimethylbenzene # Antimony # Gasoline Range Organics # Zinc # Lead # 1,1-Dichloroethene # cis-1,2-Dichloroethene # trans-1,2-Dichloroethene # Trichloroethene (TCE) Vinyl Chloride
	Subsistence Fisher and Recreational Fisher (Discharge and Bioaccumulation)	5.76	6.0E-04	Arsenic Bis(2-ethylhexyl) Phthalate Di-n-octyl Phthalate Tetrachloroethene (PCE) Vinyl Chloride Antimony # Barium # Thallium # Zinc # 1,2,4-Trimethylbenzene # Isopropylbenzene Lead # Mercury # n-Propylbenzene # Tributyltin 1,1-Dichloroethene # trans-1,2-Dichloroethene # Trichloroethene (TCE)
Seepwater	Onsite Worker (Potable Water User)	NE	NE	Arsenic Chloroform Diesel Range Organics # Lead # Manganese # Tetrachloroethene (PCE) Antimony # Residual Range Organics # 1,1-Dichloroethene # cis-1,2-Dichloroethene # trans-1,2-Dichloroethene # Trichloroethene (TCE) Vinyl Chloride
	Subsistence Fisher and Recreational Fisher (Discharge and Bioaccumulation)	NE	NE	Arsenic Tetrachloroethene (PCE) 1,1-Dichloroethene # trans-1,2-Dichloroethene # Trichloroethene (TCE) Vinyl Chloride Lead # Mercury #
Shoreline Surface Water	Onsite Worker (Potable Water User)	NE	NE	Arsenic
	Subsistence Fisher and Recreational Fisher (Discharge and Bioaccumulation)	NE	NE	Arsenic Lead #

Bold = COPCs ELCR >1E-04
# = non-carcinogenic COPC
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
COPC = chemicals of potential concern
ELCR = excess lifetime cancer risk
HI = hazard index
NE = Cumulative HI and ELCR not evaluated. These pathways were evaluated only to see if additional COPCs were identified for Landfill.
PCBs = polychlorinated biphenyls

Shaded indicates COPC rationales not based on C/SLV>1 (i.e., multi-media, C/SLV>0.1, degradation product, or No SLV) or the SLV was not available for the specific exposure pathways.

Table M-13
Identification of COPCs in Soil at Sandblast Area AOPC - Adult Outdoor Worker
Bradford Island -Upland Operable Unit
(1 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User Table M-18)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-19)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
INORGANICS (mg/kg)											
Antimony	n	73%	2.42	410	0.00590	-	-	0.00590	0.00590	N	C/SLV <1
Arsenic	c	99%	9.71	5.4	1.80	98.4	208	100	210	Y	C/SLV >1
Cadmium	c	89%	2.63	500	0.00526	-	-	0.00526	0.00526	N	C/SLV <1
Chromium	c	100%	579	190 (1)	3.05	-	-	3.05	3.05	Y	C/SLV >1
Lead - sieved <250um, 0-3 ft bgs	n	100%	418	800	0.523	-	-	0.523	0.523	N	C/SLV <1
Lead - sieved <2mm, 0-3 ft bgs	n	100%	303	800	0.379	-	-	0.379	0.379	N	C/SLV <1
Lead - unsieved, 0-3 ft bgs	n	100%	529	800	0.661	-	-	0.661	0.661	N	C/SLV <1
Lead - sieved <250um, 0-1 ft bgs	n	100%	921	800	1.15	-	-	1.15	1.15	Y	C/SLV >1
Lead - sieved <2mm, 0-1 ft bgs	n	100%	768	800	0.960	-	-	0.960	0.960	N	C/SLV <1
Lead - unsieved, 0-1 ft bgs	n	100%	3,260	800	4.08	-	-	4.08	4.08	Y	C/SLV >1
Nickel	c	100%	251	20,000	0.0126	-	-	0.0126	0.0126	N	C/SLV <1
Selenium	n	57%	0.479	5,100	0.0000939	-	-	0.0000939	0.0000939	N	C/SLV <1
Silver	n	96%	0.152	5,100	0.0000298	-	-	0.0000298	0.0000298	N	C/SLV <1
Zinc	n	100%	237	310,000	0.000765	-	-	0.000765	0.000765	N	C/SLV <1
BUTYLTINS (ug/kg)											
Dibutyltin	n	29%	26.6	180,000	0.000148	-	-	0.000148	0.000148	N	C/SLV <1
Monobutyltin	n	36%	8.62	180,000	0.0000479	0.00196	-	0.00201	0.0000479	N	C/SLV <1
Tributyltin	n	26%	248	180,000	0.00138	-	-	0.00138	0.00138	N	C/SLV <1
PESTICIDES (ug/kg)											
4,4'-DDD	c	5.4%	0.721	11,000	0.0000655	-	-	0.0000655	0.0000655	N	C/SLV <1
4,4'-DDE	c	19%	0.567	7,700	0.0000736	-	-	0.0000736	0.0000736	N	C/SLV <1
4,4'-DDT	c	60%	79.4	7,700	0.0103	-	-	0.0103	0.0103	N	C/SLV <1
BHC (delta)	n	5.4%	1.30	340	0.00382	-	-	0.00382	0.00382	N	C/SLV <1
BHC (gamma) Lindane	c	8%	1.06	2,000	0.000530	-	-	0.000530	0.000530	N	C/SLV <1
Chlordane (alpha)	c	12%	0.776	7,200	0.000108	-	-	0.000108	0.000108	N	C/SLV <1
Chlordane (gamma)	c	40%	20.4	7,200	0.00283	-	-	0.00283	0.00283	N	C/SLV <1
Dieldrin	c	5.4%	0.483	130	0.00372	-	-	0.00372	0.00372	N	C/SLV <1
Endosulfan I	n	14%	0.809	4,600,000	0.000000176	-	-	0.000000176	0.000000176	N	C/SLV <1
Endosulfan II	n	8%	0.447	4,600,000	0.0000000972	-	-	0.0000000972	0.0000000972	N	C/SLV <1
Endosulfan Sulfate	n	16%	0.889	4,600,000	0.000000193	-	-	0.000000193	0.000000193	N	C/SLV <1
Endrin	n	11%	3.89	230,000	0.0000169	-	-	0.0000169	0.0000169	N	C/SLV <1
Endrin Aldehyde	n	14%	3.44	230,000	0.0000150	-	-	0.0000150	0.0000150	N	C/SLV <1
Endrin Ketone	n	11%	2.88	230,000	0.0000125	-	-	0.0000125	0.0000125	N	C/SLV <1
Heptachlor	c	11%	0.415	480	0.000865	-	-	0.000865	0.000865	N	C/SLV <1
Methoxychlor	n	5.4%	1.04	3,100,000	0.000000335	-	-	0.000000335	0.000000335	N	C/SLV <1
PCBs (ug/kg)											
Aroclor 1254	c	14%	136	740	0.184	-	-	0.184	0.184	N	C/SLV <1
Aroclor 1260	c	84%	167	740	0.226	-	-	0.226	0.226	N	C/SLV <1
Total PCBs (Aroclors)	c	84%	419	740	0.566	-	-	0.566	0.566	N	C/SLV <1

Table M-13
Identification of COPCs in Soil at Sandblast Area AOPC - Adult Outdoor Worker
Bradford Island -Upland Operable Unit
(2 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User Table M-18)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-19)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
VOCs (ug/kg)											
1,1-Dichloroethene	n	0%	-	27,000,000	-	0.00618	0.00636	0.00618	0.00636	Y	PCE is a COPC (2)
1,2,4-Trimethylbenzene	n	46%	4,620	980,000	0.00471	-	-	0.00471	0.00471	N	C/SLV <1
1,3,5-Trimethylbenzene	n	17%	1,630	1,600,000	0.00102	-	-	0.00102	0.00102	N	C/SLV <1
2-Butanone (MEK)	n	41%	13.3	200,000,000	0.0000000665	-	-	0.0000000665	0.0000000665	N	C/SLV <1
2-Hexanone	n	7%	5.12	1,400,000	0.00000366	-	-	0.00000366	0.00000366	N	C/SLV <1
4-Isopropyltoluene	n	37%	20.1	53,000,000	0.000000379	-	-	0.000000379	0.000000379	N	C/SLV <1
4-Methyl-2-pentanone (MIBK)	n	20%	0.525	53,000,000	0.00000000991	-	-	0.00000000991	0.00000000991	N	C/SLV <1
Acetone	n	50%	122	630,000,000	0.000000194	-	-	0.000000194	0.000000194	N	C/SLV <1
Benzene	c	37%	0.463	34,000	0.0000136	-	-	0.0000136	0.0000136	N	C/SLV <1
Bromomethane	n	17%	1.11	700,000	0.00000159	-	-	0.00000159	0.00000159	N	C/SLV <1
Carbon Disulfide	n	52%	1.12	3,700,000	0.000000303	0.000255	-	0.000255	0.000000303	N	C/SLV <1
Chloroform	c	7%	5.70	17,000	0.000335	-	-	0.000335	0.000335	N	C/SLV <1
cis-1,2-Dichloroethene	n	4%	120	10,000,000	0.0000120	1.83	-	1.83	0.0000120	Y	PCE is a COPC (2)
Dichlorodifluoromethane	n	9%	6.74	780,000	0.00000864	-	-	0.00000864	0.00000864	N	C/SLV <1
Dichloromethane (Methylene Chloride)	c	37%	56.0	310,000	0.000181	0.0398	0.0380	0.0400	0.0382	N	C/SLV <1
Ethylbenzene	c	22%	4.69	140,000	0.0000335	-	-	0.0000335	0.0000335	N	C/SLV <1
m,p-Xylenes	n	24%	1,820	2,700,000	0.000674	-	-	0.000674	0.000674	N	C/SLV <1
Naphthalene	c	24%	1.94	23,000	0.0000843	-	-	0.0000843	0.0000843	N	C/SLV <1
n-Propylbenzene	n	7%	35.5	21,000,000	0.00000169	-	-	0.00000169	0.00000169	N	C/SLV <1
o-Xylene	n	11%	200	19,000,000	0.0000105	-	-	0.0000105	0.0000105	N	C/SLV <1
Tetrachloroethene (PCE)	c	11%	26,300	5,100	5.16	28.6	3.86	33.8	9.01	Y	C/SLV >1
Toluene	n	57%	9,360	77,000,000	0.000122	0.000278	0.000492	0.000400	0.000614	N	C/SLV <1
trans-1,2-Dichloroethene	n	2%	2.28	9,200,000	0.000000248	0.0155	0.0121	0.0155	0.0121	Y	PCE is a COPC (2)
Trichloroethene (TCE)	c	15%	1,780	3,900	0.456	85.9	1.34	NE	NE	Y	PCE is a COPC (2)
Vinyl Chloride	c	0%	-	3,900	-	44.0	44.0	44.0	44.0	Y	PCE is a COPC (2)
SVOCs (ug/kg)											
Benzoic Acid	n	31%	132	2,500,000,000	0.0000000528	-	-	0.0000000528	0.0000000528	N	C/SLV <1
Bis(2-ethylhexyl) Phthalate	c	73%	77,100	150,000	0.514	-	-	0.514	0.514	N	C/SLV <1
Butyl Benzyl Phthalate	c	15%	15.2	910,000	0.0000167	-	-	0.0000167	0.0000167	N	C/SLV <1
Carbazole	c	62%	112	1,000,000	0.000112	-	-	0.000112	0.000112	N	C/SLV <1
Dibenzofuran	n	60%	122	1,000,000	0.000122	-	-	0.000122	0.000122	N	C/SLV <1
Dimethyl Phthalate	n	8%	31.0	150,000	0.000207	-	-	0.000207	0.000207	N	C/SLV <1
Di-n-butyl Phthalate	n	36%	54.3	62,000,000	0.000000876	-	-	0.000000876	0.000000876	N	C/SLV <1
Di-n-octyl Phthalate	n	15%	22.5	150,000	0.000150	-	-	0.000150	0.000150	N	C/SLV <1
Pentachlorophenol	c	5.1%	13.3	13,000	0.00102	-	-	0.00102	0.00102	N	C/SLV <1
Phenol	n	13%	35.0	180,000,000	0.000000194	-	-	0.000000194	0.000000194	N	C/SLV <1
PAHs (ug/kg)											
2-Methylnaphthalene	n	45%	23.9	4,100,000	0.00000583	0.000555	0.000124	0.000561	0.000130	N	C/SLV <1
Acenaphthene	n	78%	652	61,000,000	0.0000107	0.00000614	0.0000201	0.0000168	0.0000308	N	C/SLV <1

Table M-13
Identification of COPCs in Soil at Sandblast Area AOPC - Adult Outdoor Worker
Bradford Island -Upland Operable Unit
(3 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User Table M-18)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-19)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
Acenaphthylene	n	40%	29.6	23,000	0.00129	-	-	0.00129	0.00129	N	C/SLV <1
Anthracene	n	88%	772	170,000,000	0.00000454	0.00000115	0.00000152	0.00000569	0.00000606	N	C/SLV <1
Benzo(a)anthracene	c	88%	2,450	2,700	0.907	-	-	0.907	0.907	N	C/SLV <1
Benzo(a)pyrene	c	90%	2,390	270	8.85	3.09	2.36	11.9	11.2	Y	C/SLV >1
Benzo(b)fluoranthene	c	94%	2,210	2,700	0.819	-	-	0.819	0.819	N	C/SLV <1
Benzo(g,h,i)perylene	c	83%	1,050	27,000	0.0389	-	-	0.0389	0.0389	N	C/SLV <1
Benzo(k)fluoranthene	c	94%	764	27,000	0.0283	-	-	0.0283	0.0283	N	C/SLV <1
Benzofluoranthenes, Total	c	91%	10,600	2,700	3.93	-	-	3.93	3.93	Y	C/SLV >1
Chrysene	c	93%	4,590	270,000	0.0170	-	-	0.0170	0.0170	N	C/SLV <1
Dibenz(a,h)anthracene	c	65%	238	270	0.881	2.31	0.373	NE	1.25	Y	mm C/SLV >1
Fluoranthene	n	93%	10,800	29,000,000	0.000372	0.0000207	0.000239	0.000393	0.000612	N	C/SLV <1
Fluorene	n	70%	227	41,000,000	0.00000554	0.0000127	0.0000173	0.0000182	0.0000228	N	C/SLV <1
Indeno(1,2,3-cd)pyrene	c	88%	1,160	2,700	0.430	0.275	2.10	0.704	NE	N	C/SLV <1
Naphthalene	c	60%	81.4	23,000	0.00354	-	-	0.00354	0.00354	N	C/SLV <1
Phenanthrene	n	95%	2,910	170,000,000	0.0000171	-	-	0.0000171	0.0000171	N	C/SLV <1
Pyrene	n	95%	11,700	21,000,000	0.000557	0.0000237	0.0000314	0.000581	0.000589	N	C/SLV <1
TPH (mg/kg)											
Diesel Range Organics	n	85%	266	70,000	0.00380	0.192	-	0.196	0.00380	N	C/SLV <1
Gasoline Range Organics	n	23%	1,030	22,000	0.0468	0.151	-	0.198	0.0468	N	C/SLV <1
Residual Range Organics	n	89%	577	40,000	0.0144	-	-	0.0144	0.0144	N	C/SLV <1
Sum cPAH C/RBC (ELCR)					**9.7E-06**						
Sum non-carcinogenic C/RBC (HI)					**0.0866**						
Sum carcinogenic C/RBC (ELCR)					**2.2E-05**						

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
ft bgs = feet below surface
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
max =maximum
MCL = maximum contaminant level
mg/kg = milligrams per kilogram
n = non-carcinogen
NE = Multi-media was not evaluated since the chemical is already identified as a COPC.
NRWQC = national recommended water quality criteria
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value

Table M-13
Identification of COPCs in Soil at Sandblast Area AOPC - Adult Outdoor Worker
Bradford Island -Upland Operable Unit
(4 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User Table M-18)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-19)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		

SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/kg = micrograms per kilogram
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals
WQC = water quality criteria

Notes
Only detected chemicals with a detection frequency greater than 5% and inorganics greater than reference are shown in this table except for degradation products of PCE (see footnote 5). Reporting limits for non-detected chemicals are evaluated separately.
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.
Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, and 4. Surrogates used as noted in Appendix J-4b.
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c.
For inorganics, the higher of the 95% Upper Prediction Limit (UPL) and lowest HH SLV was selected as the HH SLV. For all other analytes the heirarchy described above was used.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology.
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) Due to the lack of speciation data, the chromium in soil were compared to the more conservative hexavalent chromium SLVs.
(2) Degradation products of PCE are retained as COPCs if PCE is identified as a COPC, even if not detected or detected at less than 5% frequency per DEQ (2010a).

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum cPAH C/RBC (ELCR) = includes only individual carcinogenic polyaromatic hydrocarbons selected as a COPC. Individual benzofluoranthenes, rather than total benzofluoranthenes, was used in the summation.
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Individual benzofluoranthenes, rather than total benzofluoranthenes, was used in the summation. Total aroclors, rather than individual aroclors, was used in the summation.
Ratios for SLVs based on Reference Upper Prediction Limits (UPLs) are not included in sum totals.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-14
Identification of COPCs in Soil at Sandblast Area AOPC - Construction Worker
Bradford Island -Upland Operable Unit
(1 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-17)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-19)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
INORGANICS (mg/kg)											
Antimony	n	74%	2.36	410	0.00576	-	-	0.00576	0.00576	N	C/SLV <1
Arsenic	c	99%	9.86	13	0.758	0.000645	208	0.759	NE	N	C/SLV <1
Cadmium	c	86%	2.54	150	0.0169	-	-	0.0169	0.0169	N	C/SLV <1
Chromium	c	100%	560	920 (1)	0.609	-	-	0.609	0.609	N	C/SLV <1
Lead - sieved <250um	n	100%	418	800	0.523	-	-	0.523	0.523	N	C/SLV <1
Lead - sieved <2mm	n	100%	303	800	0.379	-	-	0.379	0.379	N	C/SLV <1
Lead - unsieved	n	100%	512	800	0.640	-	-	0.640	0.640	N	C/SLV <1
Nickel	c	100%	243	6,100	0.0398	-	-	0.0398	0.0398	N	C/SLV <1
Selenium	n	59%	0.476	5,100	0.0000933	-	-	0.0000933	0.0000933	N	C/SLV <1
Silver	n	96%	0.151	1,500	0.000101	-	-	0.000101	0.000101	N	C/SLV <1
Zinc	n	100%	231	310,000	0.000745	-	-	0.000745	0.000745	N	C/SLV <1
BUTYLTINS (ug/kg)											
Dibutyltin	n	29%	26.6	180,000	0.000148	-	-	0.000148	0.000148	N	C/SLV <1
Monobutyltin	n	36%	8.94	180,000	0.0000497	0.00196	-	0.00201	0.0000497	N	C/SLV <1
Tributyltin	n	26%	248	180,000	0.00138	-	-	0.00138	0.00138	N	C/SLV <1
PESTICIDES (ug/kg)											
4,4'-DDD	c	5.4%	0.721	83,000	0.00000869	-	-	0.00000869	0.00000869	N	C/SLV <1
4,4'-DDE	c	19%	0.567	58,000	0.00000978	-	-	0.00000978	0.00000978	N	C/SLV <1
4,4'-DDT	c	60%	79.4	58,000	0.00137	-	-	0.00137	0.00137	N	C/SLV <1
BHC (delta)	n	5.4%	1.30	2,600	0.000500	-	-	0.000500	0.000500	N	C/SLV <1
BHC (gamma) Lindane	c	8%	1.06	15,000	0.0000707	-	-	0.0000707	0.0000707	N	C/SLV <1
Chlordane (alpha)	c	12%	0.776	55,000	0.0000141	-	-	0.0000141	0.0000141	N	C/SLV <1
Chlordane (gamma)	c	40%	20.4	55,000	0.000371	-	-	0.000371	0.000371	N	C/SLV <1
Dieldrin	c	5.4%	0.483	1,000	0.000483	-	-	0.000483	0.000483	N	C/SLV <1
Endosulfan I	n	14%	0.809	1,400,000	0.000000578	-	-	0.000000578	0.000000578	N	C/SLV <1
Endosulfan II	n	8%	0.447	1,400,000	0.000000319	-	-	0.000000319	0.000000319	N	C/SLV <1
Endosulfan Sulfate	n	16%	0.889	1,400,000	0.000000635	-	-	0.000000635	0.000000635	N	C/SLV <1
Endrin	n	11%	3.89	71,000	0.0000548	-	-	0.0000548	0.0000548	N	C/SLV <1
Endrin Aldehyde	n	14%	3.44	71,000	0.0000485	-	-	0.0000485	0.0000485	N	C/SLV <1
Endrin Ketone	n	11%	2.88	71,000	0.0000406	-	-	0.0000406	0.0000406	N	C/SLV <1
Heptachlor	c	11%	0.415	3,700	0.000112	-	-	0.000112	0.000112	N	C/SLV <1
Methoxychlor	n	5.4%	1.04	3,100,000	0.000000335	-	-	0.000000335	0.000000335	N	C/SLV <1
PCBs (ug/kg)											
Aroclor 1254	c	14%	136	740	0.184	-	-	0.184	0.184	N	C/SLV <1
Aroclor 1260	c	84%	167	740	0.226	-	-	0.226	0.226	N	C/SLV <1

Table M-14
Identification of COPCs in Soil at Sandblast Area AOPC - Construction Worker
Bradford Island -Upland Operable Unit
(2 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-17)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-19)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
Total PCBs (Aroclors)	c	84%	419	740	0.566	-	-	0.566	0.566	N	C/SLV <1
VOCs (ug/kg)											
1,1,1-Trichloroethane (TCA)	n	6%	0.157	38,000,000	0.00000000413	0.00000173	-	0.00000173	0.00000000413	N	C/SLV <1
1,1-Dichloroethene	n	0%	-	12,000,000	-	0.0000488	0.00636	0.0000488	0.00636	Y	PCE is a COPC (2)
1,2,4-Trimethylbenzene	n	43%	4,340	2,000,000	0.00217	-	-	0.00217	0.00217	N	C/SLV <1
1,3,5-Trimethylbenzene	n	16%	1,530	1,500,000	0.00102	-	-	0.00102	0.00102	N	C/SLV <1
2-Butanone (MEK)	n	39%	12.4	200,000,000	0.0000000620	-	-	0.0000000620	0.0000000620	N	C/SLV <1
2-Hexanone	n	6%	5.08	1,400,000	0.00000363	-	-	0.00000363	0.00000363	N	C/SLV <1
4-Isopropyltoluene	n	35%	18.9	24,000,000	0.000000788	-	-	0.000000788	0.000000788	N	C/SLV <1
4-Methyl-2-pentanone (MIBK)	n	18%	0.519	53,000,000	0.00000000979	-	-	0.00000000979	0.00000000979	N	C/SLV <1
Acetone	n	47%	114	630,000,000	0.000000181	-	-	0.000000181	0.000000181	N	C/SLV <1
Benzene	c	39%	0.462	340,000	0.00000136	-	-	0.00000136	0.00000136	N	C/SLV <1
Bromomethane	n	16%	1.06	330,000	0.00000321	-	-	0.00000321	0.00000321	N	C/SLV <1
Carbon Disulfide	n	49%	1.05	3,700,000	0.000000284	0.000255	-	0.000255	0.000000284	N	C/SLV <1
Chloroform	c	6%	5.36	380,000	0.0000141	-	-	0.0000141	0.0000141	N	C/SLV <1
cis-1,2-Dichloroethene	n	8%	13.6	3,100,000	0.00000439	0.00548	-	0.00549	0.00000439	Y	PCE is a COPC (2)
Dichlorodifluoromethane	n	10%	6.06	780,000	0.00000777	-	-	0.00000777	0.00000777	N	C/SLV <1
Dichloromethane (Methylene Chloride)	c	35%	52.5	2,700,000	0.0000194	0.00000547	0.0380	0.0000249	0.0381	N	C/SLV <1
Ethylbenzene	c	20%	4.41	1,600,000	0.00000276	-	-	0.00000276	0.00000276	N	C/SLV <1
m,p-Xylenes	n	22%	1,710	19,000,000	0.0000900	-	-	0.0000900	0.0000900	N	C/SLV <1
Naphthalene	c	22%	1.79	580,000	0.00000309	-	-	0.00000309	0.00000309	N	C/SLV <1
n-Propylbenzene	n	6%	33.3	21,000,000	0.00000159	-	-	0.00000159	0.00000159	N	C/SLV <1
o-Xylene	n	10%	188	19,000,000	0.00000989	-	-	0.00000989	0.00000989	N	C/SLV <1
Tetrachloroethene (PCE)	c	16%	99,000	40,000	2.48	0.0111	3.86	2.49	6.33	Y	C/SLV >1
Toluene	n	53%	8,790	24,000,000	0.000366	0.00000305	0.000492	0.000369	0.000859	N	C/SLV <1
trans-1,2-Dichloroethene	n	2%	2.28	4,500,000	0.000000507	0.000121	0.0121	0.000122	0.0121	Y	PCE is a COPC (2)
Trichloroethene (TCE)	c	20%	1,630	43,000	0.0379	0.0209	1.34	0.0588	NE	Y	PCE is a COPC (2)
Vinyl Chloride	c	0%	-	30,000	-	0.000917	44.0	0.000917	44.0	Y	PCE is a COPC (2)
SVOCs (ug/kg)											
Benzoic Acid	n	29%	130	2,500,000,000	0.0000000520	-	-	0.0000000520	0.0000000520	N	C/SLV <1
Bis(2-ethylhexyl) Phthalate	c	74%	71,800	1,200,000	0.0598	-	-	0.0598	0.0598	N	C/SLV <1
Butyl Benzyl Phthalate	c	14%	14.3	910,000	0.0000157	-	-	0.0000157	0.0000157	N	C/SLV <1
Carbazole	c	57%	105	1,000,000	0.000105	-	-	0.000105	0.000105	N	C/SLV <1
Dibenzofuran	n	56%	114	1,000,000	0.000114	-	-	0.000114	0.000114	N	C/SLV <1
Dimethyl Phthalate	n	7%	31.0	1,200,000	0.0000258	-	-	0.0000258	0.0000258	N	C/SLV <1
Di-n-butyl Phthalate	n	33%	50.2	62,000,000	0.000000810	-	-	0.000000810	0.000000810	N	C/SLV <1

Table M-14
Identification of COPCs in Soil at Sandblast Area AOPC - Construction Worker
Bradford Island -Upland Operable Unit
(3 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-17)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-19)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
Di-n-octyl Phthalate	n	17%	24.3	1,200,000	0.0000203	-	-	0.0000203	0.0000203	N	C/SLV <1
Phenol	n	12%	35.0	180,000,000	0.000000194	-	-	0.000000194	0.000000194	N	C/SLV <1
PAHs (ug/kg)											
2-Methylnaphthalene	n	44%	22.4	4,100,000	0.00000546	0.000555	0.000124	0.000561	0.000130	N	C/SLV <1
Acenaphthene	n	74%	607	19,000,000	0.0000319	0.00000614	0.0000201	0.0000381	0.0000521	N	C/SLV <1
Acenaphthylene	n	37%	27.6	580,000	0.0000476	-	-	0.0000476	0.0000476	N	C/SLV <1
Anthracene	n	84%	723	93,000,000	0.00000777	0.00000115	0.00000152	0.00000892	0.00000929	N	C/SLV <1
Benzo(a)anthracene	c	84%	4,100	21,000	0.195	-	-	0.195	0.195	N	C/SLV <1
Benzo(a)pyrene	c	86%	3,980	2,100	1.90	0.0169	2.36	1.91	4.25	Y	C/SLV >1
Benzo(b)fluoranthene	c	94%	2,210	21,000	0.105	-	-	0.105	0.105	N	C/SLV <1
Benzo(g,h,i)perylene	c	79%	982	210,000	0.00468	-	-	0.00468	0.00468	N	C/SLV <1
Benzo(k)fluoranthene	c	94%	764	210,000	0.00364	-	-	0.00364	0.00364	N	C/SLV <1
Benzofluoranthenes, Total	c	84%	9,420	21,000	0.449	-	-	0.449	0.449	N	C/SLV <1
Chrysene	c	88%	4,290	2,100,000	0.00204	-	-	0.00204	0.00204	N	C/SLV <1
Dibenz(a,h)anthracene	c	61%	224	2,100	0.107	0.0320	0.373	0.139	0.479	N	C/SLV <1
Fluoranthene	n	88%	10,100	8,900,000	0.00113	0.0000207	0.000239	0.00116	0.00137	N	C/SLV <1
Fluorene	n	65%	212	12,000,000	0.0000177	0.0000127	0.0000173	0.0000303	0.0000349	N	C/SLV <1
Indeno(1,2,3-cd)pyrene	c	84%	1,880	21,000	0.0895	0.275	2.10	0.3644	NE	N	C/SLV <1
Naphthalene	c	56%	76.2	580,000	0.000131	-	-	0.000131	0.000131	N	C/SLV <1
Phenanthrene	n	91%	2,730	93,000,000	0.0000294	-	-	0.0000294	0.0000294	N	C/SLV <1
Pyrene	n	91%	10,900	6,700,000	0.00163	0.0000237	0.0000314	0.00165	0.00166	N	C/SLV <1
TPH (mg/kg)											
Diesel Range Organics	n	82%	256	23,000	0.0111	-	-	0.0111	0.0111	N	C/SLV <1
Gasoline Range Organics	n	21%	963	13,000	0.0741	0.00116	-	0.0752	0.0741	N	C/SLV <1
Residual Range Organics	n	86%	558	40,000	0.0140	-	-	0.0140	0.0140	N	C/SLV <1
Sum cPAH C/RBC (ELCR)					**1.9E-06**						
Sum non-carcinogenic C/RBC (HI)					**0.115**						
Sum carcinogenic C/RBC (ELCR)					**7.0E-06**						

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
ft bgs = feet below surface
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).

Table M-14
Identification of COPCs in Soil at Sandblast Area AOPC - Construction Worker
Bradford Island -Upland Operable Unit
(4 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-17)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-19)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		

max =maximum
MCL = maximum contaminant level
mg/kg = milligrams per kilogram
mm = multimedia
n = non-carcinogen
NE = multi-media was not evaluated since the chemical is already identified as a COPC.
NRWQC = national recommended water quality criteria
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/kg = micrograms per kilogram
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals
WQC = water quality criteria

Notes
Only detected chemicals with a detection frequency greater than 5% and inorganics greater than reference are shown in this table except for degradation products of PCE (see footnote 2). Reporting limits for non-detected chemicals are evaluated separately.
Construction Worker hierarchical SLV selection for soil: 1. DEQ Soil RBCs (Direct Contact Construction,. 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.
Screening Levels Values for Groundwater: 1. DEQ Groundwater in Excavation Construction/Excavation RBCs (Appendix J-4b), 2. USEPA Tapwater RSL, and 3. Surrogates used as noted in Appendix J-4b.
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c.
For inorganics, the higher of the 95% Upper Prediction Limit (UPL) and lowest HH SLV was selected as the HH SLV. For all other analytes the heirarchy described above was used.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology.
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) Due to the lack of speciation data, the chromium in soil were compared to the more conservative hexavalent chromium SLVs.
(2) Degradation products of PCE are retained as COPCs if PCE is identified as a COPC, even if not detected or detected at less than 5% frequency per DEQ (2010a).

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum cPAH C/RBC (ELCR) = includes only individual carcinogenic polyaromatic hydrocarbons selected as a COPC. Individual benzofluoranthenes, rather than total benzofluoranthenes, was used in the summation.
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Individual benzofluoranthenes, rather than total benzofluoranthenes, was used in the summation. Total aroclors, rather than individual aroclors, was used in the summation.
Ratios for SLVs based on Reference Upper Prediction Limits (UPLs) are not included in sum totals.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-15
Identification of COPCs in Soil at Sandblast Area AOPC - Excavation Worker
Bradford Island -Upland Operable Unit
(1 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-17)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-19)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
INORGANICS (mg/kg)											
Antimony	n	74%	2.36	410	0.00576	-	-	0.00576	0.00576	N	C/SLV <1
Arsenic	c	99%	9.86	370	0.0266	0.000645	208	0.0273	NE	N	C/SLV <1
Cadmium	c	86%	2.54	4,300	0.000591	-	-	0.000591	0.000591	N	C/SLV <1
Chromium	c	100%	560	26,000 (1)	0.0215	-	-	0.0215	0.0215	N	C/SLV <1
Lead - sieved <250um	n	100%	418	800	0.523	-	-	0.523	0.523	N	C/SLV <1
Lead - sieved <2mm	n	100%	303	800	0.379	-	-	0.379	0.379	N	C/SLV <1
Lead - unsieved	n	100%	512	800	0.640	-	-	0.640	0.640	N	C/SLV <1
Nickel	c	100%	243	20,000	0.0122	-	-	0.0122	0.0122	N	C/SLV <1
Selenium	n	59%	0.476	5,100	0.0000933	-	-	0.0000933	0.0000933	N	C/SLV <1
Silver	n	96%	0.151	43,000	0.00000351	-	-	0.00000351	0.00000351	N	C/SLV <1
Zinc	n	100%	231	310,000	0.000745	-	-	0.000745	0.000745	N	C/SLV <1
BUTYLTINS (ug/kg)											
Dibutyltin	n	29%	26.6	180,000	0.000148	-	-	0.000148	0.000148	N	C/SLV <1
Monobutyltin	n	36%	8.94	180,000	0.0000497	0.00196	-	0.00201	0.0000497	N	C/SLV <1
Tributyltin	n	26%	248	180,000	0.00138	-	-	0.00138	0.00138	N	C/SLV <1
PESTICIDES (ug/kg)											
4,4'-DDD	c	5.4%	0.721	2,300,000	0.000000313	-	-	0.000000313	0.000000313	N	C/SLV <1
4,4'-DDE	c	19%	0.567	1,600,000	0.000000354	-	-	0.000000354	0.000000354	N	C/SLV <1
4,4'-DDT	c	60%	79.4	1,600,000	0.0000496	-	-	0.0000496	0.0000496	N	C/SLV <1
BHC (delta)	n	5.4%	1.30	74,000	0.0000176	-	-	0.0000176	0.0000176	N	C/SLV <1
BHC (gamma) Lindane	c	8%	1.06	420,000	0.00000252	-	-	0.00000252	0.00000252	N	C/SLV <1
Chlordane (alpha)	c	12%	0.776	1,500,000	0.000000517	-	-	0.000000517	0.000000517	N	C/SLV <1
Chlordane (gamma)	c	40%	20.4	1,500,000	0.0000136	-	-	0.0000136	0.0000136	N	C/SLV <1
Dieldrin	c	5.4%	0.483	29,000	0.0000167	-	-	0.0000167	0.0000167	N	C/SLV <1
Endosulfan I	n	14%	0.809	40,000,000	0.0000000202	-	-	0.0000000202	0.0000000202	N	C/SLV <1
Endosulfan II	n	8%	0.447	40,000,000	0.0000000112	-	-	0.0000000112	0.0000000112	N	C/SLV <1
Endosulfan Sulfate	n	16%	0.889	40,000,000	0.0000000222	-	-	0.0000000222	0.0000000222	N	C/SLV <1
Endrin	n	11%	3.89	2,000,000	0.00000195	-	-	0.00000195	0.00000195	N	C/SLV <1
Endrin Aldehyde	n	14%	3.44	2,000,000	0.00000172	-	-	0.00000172	0.00000172	N	C/SLV <1
Endrin Ketone	n	11%	2.88	2,000,000	0.00000144	-	-	0.00000144	0.00000144	N	C/SLV <1
Heptachlor	c	11%	0.415	100,000	0.00000415	-	-	0.00000415	0.00000415	N	C/SLV <1
Methoxychlor	n	5.4%	1.04	3,100,000	0.000000335	-	-	0.000000335	0.000000335	N	C/SLV <1
PCBs (ug/kg)											

Table M-15
Identification of COPCs in Soil at Sandblast Area AOPC - Excavation Worker
Bradford Island -Upland Operable Unit
(2 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-17)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-19)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
Aroclor 1254	c	14%	136	740	0.184	-	-	0.184	0.184	N	C/SLV <1
Aroclor 1260	c	84%	167	740	0.226	-	-	0.226	0.226	N	C/SLV <1
Total PCBs (Aroclors)	c	84%	419	740	0.566	-	-	0.566	0.566	N	C/SLV <1
VOCs (ug/kg)											
1,1,1-Trichloroethane (TCA)	n	6%	0.157	38,000,000	0.00000000413	0.00000173	-	0.00000173	0.00000000413	N	C/SLV <1
1,2,4-Trimethylbenzene	n	43%	4,340	54,000,000	0.0000804	-	-	0.0000804	0.0000804	N	C/SLV <1
1,3,5-Trimethylbenzene	n	16%	1,530	42,000,000	0.0000364	-	-	0.0000364	0.0000364	N	C/SLV <1
2-Butanone (MEK)	n	39%	12.4	200,000,000	0.0000000620	-	-	0.0000000620	0.0000000620	N	C/SLV <1
2-Hexanone	n	6%	5.08	1,400,000	0.00000363	-	-	0.00000363	0.00000363	N	C/SLV <1
4-Isopropyltoluene	n	35%	18.9	24,000,000	0.000000788	-	-	0.000000788	0.000000788	N	C/SLV <1
4-Methyl-2-pentanone (MIBK)	n	18%	0.519	53,000,000	0.00000000979	-	-	0.00000000979	0.00000000979	N	C/SLV <1
Acetone	n	47%	114	630,000,000	0.000000181	-	-	0.000000181	0.000000181	N	C/SLV <1
Benzene	c	39%	0.462	9,500,000	0.0000000486	-	-	0.0000000486	0.0000000486	N	C/SLV <1
Bromomethane	n	16%	1.06	9,200,000	0.000000115	-	-	0.000000115	0.000000115	N	C/SLV <1
Carbon Disulfide	n	49%	1.05	3,700,000	0.000000284	0.000255	-	0.000255	0.000000284	N	C/SLV <1
Chloroform	c	6%	5.36	11,000,000	0.000000487	-	-	0.000000487	0.000000487	N	C/SLV <1
cis-1,2-Dichloroethene	n	8%	13.6	86,000,000	0.000000158	0.00548	-	0.00548	0.000000158	N	C/SLV <1
Dichlorodifluoromethane	n	10%	6.06	780,000	0.00000777	-	-	0.00000777	0.00000777	N	C/SLV <1
Dichloromethane (Methylene Chloride)	c	35%	52.5	75,000,000	0.000000700	0.00000547	0.0380	0.00000617	0.0380	N	C/SLV <1
Ethylbenzene	c	20%	4.41	44,000,000	0.000000100	-	-	0.000000100	0.000000100	N	C/SLV <1
m,p-Xylenes	n	22%	1,710	2,700,000	0.000633	-	-	0.000633	0.000633	N	C/SLV <1
Naphthalene	c	22%	1.79	16,000,000	0.000000112	-	-	0.000000112	0.000000112	N	C/SLV <1
n-Propylbenzene	n	6%	33.3	21,000,000	0.00000159	-	-	0.00000159	0.00000159	N	C/SLV <1
o-Xylene	n	10%	188	19,000,000	0.00000989	-	-	0.00000989	0.00000989	N	C/SLV <1
Tetrachloroethene (PCE)	c	16%	99,000	1,100,000	0.0900	0.0111	3.86	0.101	NE	N	C/SLV <1
Toluene	n	53%	8,790	45,000,000	0.000195	0.00000305	0.000492	0.000198	0.000688	N	C/SLV <1
Trichloroethene (TCE)	c	20%	1,630	1,200,000	0.00136	0.0209	1.34	0.0223	NE	N	C/SLV <1
SVOCs (ug/kg)											
Benzoic Acid	n	29%	130	2,500,000,000	0.0000000520	-	-	0.0000000520	0.0000000520	N	C/SLV <1
Bis(2-ethylhexyl) Phthalate	c	74%	71,800	33,000,000	0.00218	-	-	0.00218	0.00218	N	C/SLV <1
Butyl Benzyl Phthalate	c	14%	14.3	910,000	0.0000157	-	-	0.0000157	0.0000157	N	C/SLV <1
Carbazole	c	57%	105	1,000,000	0.000105	-	-	0.000105	0.000105	N	C/SLV <1
Dibenzofuran	n	56%	114	1,000,000	0.000114	-	-	0.000114	0.000114	N	C/SLV <1
Dimethyl Phthalate	n	7%	31.0	33,000,000	0.000000939	-	-	0.000000939	0.000000939	N	C/SLV <1
Di-n-butyl Phthalate	n	33%	50.2	62,000,000	0.000000810	-	-	0.000000810	0.000000810	N	C/SLV <1
Di-n-octyl Phthalate	n	17%	24.3	33,000,000	0.000000736	-	-	0.000000736	0.000000736	N	C/SLV <1

Table M-15
Identification of COPCs in Soil at Sandblast Area AOPC - Excavation Worker
Bradford Island -Upland Operable Unit
(3 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-17)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-19)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
Phenol	n	12%	35.0	180,000,000	0.000000194	-	-	0.000000194	0.000000194	N	C/SLV <1
PAHs (ug/kg)											
2-Methylnaphthalene	n	44%	22.4	4,100,000	0.00000546	0.000555	0.000124	0.000561	0.000130	N	C/SLV <1
Acenaphthene	n	74%	607	33,000,000	0.0000184	0.00000614	0.0000201	0.0000245	0.0000385	N	C/SLV <1
Acenaphthylene	n	37%	27.6	16,000,000	0.00000173	-	-	0.00000173	0.00000173	N	C/SLV <1
Anthracene	n	84%	723	170,000,000	0.00000425	0.00000115	0.00000152	0.00000540	0.00000577	N	C/SLV <1
Benzo(a)anthracene	c	84%	4,100	590,000	0.00695	-	-	0.00695	0.00695	N	C/SLV <1
Benzo(a)pyrene	c	86%	3,980	59,000	0.0675	0.0169	2.36	0.0843	NE	N	C/SLV <1
Benzo(b)fluoranthene	c	94%	2,210	590,000	0.00375	-	-	0.00375	0.00375	N	C/SLV <1
Benzo(g,h,i)perylene	c	79%	982	5,900,000	0.000166	-	-	0.000166	0.000166	N	C/SLV <1
Benzo(k)fluoranthene	c	94%	764	5,900,000	0.000129	-	-	0.000129	0.000129	N	C/SLV <1
Benzofluoranthenes, Total	c	84%	9,420	590,000	0.0160	-	-	0.0160	0.0160	N	C/SLV <1
Chrysene	c	88%	4,290	59,000,000	0.0000727	-	-	0.0000727	0.0000727	N	C/SLV <1
Dibenz(a,h)anthracene	c	61%	224	59,000	0.00380	0.0320	0.373	0.0357	0.377	N	C/SLV <1
Fluoranthene	n	88%	10,100	22,000,000	0.000459	0.0000207	0.000239	0.000480	0.000698	N	C/SLV <1
Fluorene	n	65%	212	22,000,000	0.00000964	0.0000127	0.0000173	0.0000223	0.0000269	N	C/SLV <1
Indeno(1,2,3-cd)pyrene	c	84%	1,880	590,000	0.00319	0.275	2.10	0.278	NE	N	C/SLV <1
Naphthalene	c	56%	76.2	16,000,000	0.00000476	-	-	0.00000476	0.00000476	N	C/SLV <1
Phenanthrene	n	91%	2,730	170,000,000	0.0000161	-	-	0.0000161	0.0000161	N	C/SLV <1
Pyrene	n	91%	10,900	17,000,000	0.000641	0.0000237	0.0000314	0.000665	0.000673	N	C/SLV <1
TPH (mg/kg)											
Diesel Range Organics	n	82%	256	70,000	0.00366	-	-	0.00366	0.00366	N	C/SLV <1
Gasoline Range Organics	n	21%	963	22,000	0.0438	0.00116	-	0.0449	0.0438	N	C/SLV <1
Residual Range Organics	n	86%	558	40,000	0.0140	-	-	0.0140	0.0140	N	C/SLV <1
Sum non-carcinogenic C/RBC (HI)					**0.0718**						
Sum carcinogenic C/RBC (ELCR)					**8.1E-07**						

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
ft bgs = feet below surface
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
max =maximum
MCL = maximum contaminant level

Table M-15
Identification of COPCs in Soil at Sandblast Area AOPC - Excavation Worker
Bradford Island -Upland Operable Unit
(4 of 4)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-17)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-19)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		

mg/kg = milligrams per kilogram
mm = multimedia
n = non-carcinogen
NE = multi-media was not evaluated since the chemical is already identified as a COPC.
NRWQC = national recommended water quality criteria
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/kg = micrograms per kilogram
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals
WQC = water quality criteria

Notes
Only detected chemicals with a detection frequency greater than 5% and inorganics greater than reference are shown in this table). Reporting limits for non-detected chemicals are evaluated separately.
Excavation Worker hierarchical SLV selection for soil: 1. DEQ Soil RBCs (Direct Contact Excavation), 2. USEPA Soil Industrial RSL, 3. Outdoor Worker SLV, and 4. Surrogate used as noted in Appendix J-4a
Screening Levels Values for Groundwater: 1. DEQ Groundwater in Excavation Construction/Excavation RBCs (Appendix J-4b), 2. USEPA Tapwater RSL, and 3. Surrogates used as noted in Appendix J-4b
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c
For inorganics, the higher of the 95% Upper Prediction Limit (UPL) and lowest HH SLV was selected as the HH SLV. For all other analytes the heirarchy described above was used.

Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pd
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) Due to the lack of speciation data, the chromium in soil were compared to the more conservative hexavalent chromium SLVs

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Individual benzofluoranthenes, rather than total benzofluoranthenes, was used in the summation. Total aroclors, rather than individual aroclors, was used in the summation
Ratios for SLVs based on Reference Upper Prediction Limits (UPLs) are not included in sum totals.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-16
Identification of COPCs in Soil Gas at Sandblast Area AOPC - Indoor Worker
Bradford Island -Upland Operable Unit
(1 of 2)

Chemicals of Interest	note	Max Detected Value	Detection Rate	Selected HH SLV (Table J-4d)	Site concentration(C) / SLV						Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil\ gas}}{SLV_{soil\ gas}}$	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-13)	$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User Table M-18)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-19)	Multimedia sum(C/SLV_{soil} +C/SLV_{gw} + C/SLV_{sg})	Multimedia sum(C/SLV_{soil} +C/SLV_{gw} + C/SLV_{sg})		
VOCs (ug/m3)												
1,1,1-Trichloroethane (TCA)	n	98.0	100%	22,000,000	0.00000445	-	0.000209	-	0.000213	0.00000445	N	C/SLV <1
1,1-Dichloroethene	n	-	0%	880,000	-	-	0.00618	0.00636	0.00618	0.00636	Y	PCE is a COPC (1)
1,2,4-Trimethylbenzene	n	18,500	100%	31,000	0.597	0.00471	-	-	0.601	0.601	N	C/SLV <1
1,3,5-Trimethylbenzene	n	6,250	100%	26,000	0.240	0.00102	-	-	0.241	0.241	N	C/SLV <1
1,3-Butadiene	c	210	80%	410	0.512	-	-	-	0.512	0.512	N	C/SLV <1
1,4-Dioxane	c	1.10	20%	1,600	0.000688	-	-	-	0.000688	0.000688	N	C/SLV <1
2,2,4-Trimethylpentane	n	1.80	20%	31,000	0.0000581	-	-	-	0.0000581	0.0000581	N	C/SLV <1
2-Butanone (MEK)	n	31.0	40%	22,000,000	0.00000141	0.0000000665	-	-	0.00000148	0.00000148	N	C/SLV <1
4-Ethyltoluene	n	9,150	100%	22,000,000	0.000416	-	-	-	0.000416	0.000416	N	C/SLV <1
4-Methyl-2-pentanone (MIBK)	n	2.10	20%	13,000,000	0.000000162	0.00000000991	-	-	0.000000171	0.000000171	N	C/SLV <1
Acetone	n	97.0	40%	140,000,000	0.000000693	0.000000194	-	-	0.000000887	0.000000887	N	C/SLV <1
Benzene	c	85.0	80%	1,600	0.0531	0.0000136	-	-	0.0531	0.0531	N	C/SLV <1
Carbon Disulfide	n	42.0	60%	3,100,000	0.0000135	0.000000303	0.000255	-	0.000269	0.0000139	N	C/SLV <1
Chloroform	c	0.750	20%	530	0.00142	0.000335	-	-	0.00175	0.00175	N	C/SLV <1
cis-1,2-Dichloroethene	n	330	100%	260,000	0.00127	0.0000120	1.83	-	NE	0.00128	Y	PCE is a COPC (1)
Cyclohexane	n	24.0	60%	26,000,000	0.000000923	-	-	-	0.000000923	0.000000923	N	C/SLV <1
Dichlorodifluoromethane	n	3.20	40%	880,000	0.00000364	0.00000864	-	-	0.0000123	0.0000123	N	C/SLV <1
Dichloromethane (Methylene Chloride)	c	1.80	20%	26,000	0.0000692	0.000181	0.0398	0.0380	0.0400	0.0383	N	C/SLV <1
Ethanol	n	13.0	40%	-	-	-	-	-	-	-	N	Not toxic
Ethylbenzene	c	1,550	100%	4,900	0.316	0.0000335	-	-	0.316	0.316	N	C/SLV <1
Heptane	n	87.0	80%	3,100,000	0.0000281	-	-	-	0.0000281	0.0000281	N	C/SLV <1
Hexane	n	110	80%	3,100,000	0.0000355	-	-	-	0.0000355	0.0000355	N	C/SLV <1
Isopropylbenzene	n	675	100%	1,800,000	0.000375	-	-	-	0.000375	0.000375	N	C/SLV <1
m,p-Xylenes	n	5,850	100%	440,000	0.0133	0.000674	-	-	0.0140	0.0140	N	C/SLV <1
n-Propylbenzene	n	2,300	100%	4,400,000	0.000523	0.00000169	-	-	0.000524	0.000524	N	C/SLV <1
o-Xylene	n	2,800	100%	3,100,000	0.000903	0.0000105	-	-	0.000914	0.000914	N	C/SLV <1
Tetrachloroethene (PCE)	c	34,000	100%	2,100	16.2	5.16	28.6	3.86	49.9	25.2	Y	C/SLV >1
Toluene	n	47,500	100%	22,000,000	0.00216	0.000122	0.000278	0.000492	0.00256	0.00277	N	C/SLV <1
trans-1,2-Dichloroethene	n	4.00	20%	260,000	0.0000154	0.000000248	0.0155	0.0121	0.0155	0.0122	Y	PCE is a COPC (1)
Trichloroethene (TCE)	c	610	100%	140	4.36	0.456	85.9	1.34	90.7	6.15	Y	C/SLV >1
Trichlorofluoromethane	n	2.20	20%	3,100,000	0.000000710	-	-	-	0.000000710	0.000000710	N	C/SLV <1
Vinyl Chloride	c	-	0%	2,800	-	-	44.0	44.0	44.0	44.0	Y	PCE is a COPC (1)
Sum non-carcinogenic C/RBC (HI)					**0.856**							
Sum carcinogenic C/RBC (ELCR)					**2.1E-05**							

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{sg}/SLV_{sg} only (i.e. single medium)
ESL = environmental screening level
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{sg}/SLV_{sg} only (i.e. single medium)

Table M-16
Identification of COPCs in Soil Gas at Sandblast Area AOPC - Indoor Worker
Bradford Island -Upland Operable Unit
(2 of 2)

Chemicals of Interest	note	Max Detected Value	Detection Rate	Selected HH SLV (Table J-4d)	Site concentration(C) / SLV						Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil\ gas}}{SLV_{soil\ gas}}$	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-13)	$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User Table M-18)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-19)	Multimedia sum(C/SLV_{soil} +C/SLV_{gw} + C/SLV_{sg})	Multimedia sum(C/SLV_{soil} +C/SLV_{gw} + C/SLV_{sg})		

max =maximum
MCL = maximum contaminant leve
mm = multimedia
n = noncarcinogen
NE = Multi-media was not evaluated since the chemical is already identified as a COPC
NRWQC = national recommended water quality criteria
RBC = risk based concentration
RSL = regional screening level
RWQCB = San Francisco Bay Regional Water Quality Control Boarc
sg = soil gas pathway
SLV = screening level value
ug/m3 = micrograms per cubic meter
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals
WQC = water quality criteria

Notes
Only detected chemicals with a detection frequency greater than 5% and inorganics greater than reference are shown in this table except for degradation products of PCE (see footnote 1). Reporting limits for non-detected chemicals are evaluated separatel
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, 3. Surrogate used as noted in Appendix J-4

Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, 4. Surrogates used as noted in Appendix J-4b.
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4
Hierarchy developed to select Screening Level Values for Soil gas; 1. DEQ Soil Gas Vapor Intrusion Occupational RBCs, 2. Adjusted USEPA Industrial Air RSLs, and 3. Surrogates used as noted in Appendix J-4c
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 200
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May

Footnotes
(1) Degradation products of PCE are retained as COPCs if PCE is identified as a COPC, even if not detected or detected at less than 5% frequency per DEQ (2010a).

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogen
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogen
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following condition
[C/SLV] > 1.0 for an individual chemical in a given mediur
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given mediur
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a)

Table M-17
Identification of COPCs in Groundwater at Sandblast Area AOPC - Construction and Excavation Workers
Bradford Island -Upland Operable Unit
(1 of 3)

Chemicals of Interest	note	Medium	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
						$\frac{C_{gw}}{SLV_{gw}}$ (direct contact)	$\frac{C_{soil}}{SLV_{soil}}$ (Construction Worker Table M-14)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})		
INORGANICS (mg/L)										
Arsenic	c	Groundwater	100%	0.00374	5.8	0.000645	0.758	0.759	N	carc C/SLV <1
Iron	n	Groundwater	80%	0.499	26	0.0192	-	0.0192	N	C/SLV <1
Vanadium	n	Groundwater	90%	0.00254	0.0026	0.977	-	0.977	Y	C/SLV >0.1
BUTYLTINS (ug/L)										
Monobutyltin	n	Groundwater	10%	0.0216	11	0.00196	0.0000497	0.00201	N	C/SLV <1
VOCs (ug/L)										
1,1,1-Trichloroethane (TCA)	n	Groundwater	40%	1.90	1,100,000	0.00000173	0.00000000413	0.00000173	N	C/SLV <1
1,1-Dichloroethane	c	Groundwater	40%	5.00	10,000	0.000500	-	0.000500	N	carc C/SLV <1
1,1-Dichloroethene	n	Groundwater	20%	2.10	43,000	0.0000488	-	0.0000488	N	C/SLV <1
Carbon Disulfide	n	Groundwater	100%	0.255	1,000	0.000255	0.000000284	0.000255	N	C/SLV <1
cis-1,2-Dichloroethene	n	Groundwater	75%	658	120,000	0.00548	0.00000439	0.00549	N	C/SLV <1
Dichloromethane (Methylene Chloride)	c	Groundwater	20%	0.175	32,000	0.00000547	0.0000194	0.0000249	N	carc C/SLV <1
Tetrachloroethene (PCE)	c	Groundwater	80%	2.66	240	0.0111	2.48	NE	N	carc C/SLV <1
Toluene	n	Groundwater	100%	0.640	210,000	0.00000305	0.000366	0.000369	N	C/SLV <1
trans-1,2-Dichloroethene	n	Groundwater	40%	1.70	14,000	0.000121	0.000000507	0.000122	N	C/SLV <1
Trichloroethene (TCE)	c	Groundwater	75%	3.35	160	0.0209	0.0379	0.0588	N	carc C/SLV <1
Vinyl Chloride	c	Groundwater	20%	1.10	1,200	0.000917	-	0.000917	N	carc C/SLV <1
TPH (mg/L)										
Diesel Range Organics	n	Groundwater	10%	0.0173	- (2)	-	0.0111	0.0111	N	C/SLV <1 (2)
Gasoline Range Organics	n	Groundwater	15%	0.0151	13	0.00116	0.0741	0.0752	N	C/SLV <1
PAHs (ug/L)										
2-Methylnaphthalene	n	Groundwater - DP	67%	0.0833	150	0.000555	0.00000546	0.000561	N	C/SLV <1
Acenaphthene	n	Groundwater - DP	56%	0.0135	2,200	0.00000614	0.0000319	0.0000381	N	C/SLV <1
Anthracene	n	Groundwater - DP	11%	0.0126	11,000	0.00000115	0.00000777	0.00000892	N	C/SLV <1
Benzo(a)pyrene	c	Groundwater - DP	11%	0.00895	0.53	0.0169	1.90	NE	N	carc C/SLV <1
Dibenz(a,h)anthracene	c	Groundwater - DP	11%	0.00671	0.21	0.0320	0.107	0.139	N	carc C/SLV <1
Fluoranthene	n	Groundwater - DP	11%	0.0311	1,500	0.0000207	0.00113	0.00116	N	C/SLV <1
Fluorene	n	Groundwater - DP	67%	0.0190	1,500	0.0000127	0.0000177	0.0000303	N	C/SLV <1
Indeno(1,2,3-cd)pyrene	c	Groundwater - DP	11%	0.00797	0.029	0.275	0.0895	0.364	N	carc C/SLV <1
Pyrene	n	Groundwater - DP	33%	0.0261	1,100	0.0000237	0.00163	0.00165	N	C/SLV <1
Sum non-carcinogenic C/RBC (HI)		**Groundwater**				**1.01**				
Sum carcinogenic C/RBC (ELCR)		**Groundwater**				**3.6E-07**				

Table M-17
Identification of COPCs in Groundwater at Sandblast Area AOPC - Construction and Excavation Workers
Bradford Island -Upland Operable Unit
(2 of 3)

Chemicals of Interest	note	Medium	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
						$\frac{C_{gw}}{SLV_{gw}}$ (direct contact)	$\frac{C_{soil}}{SLV_{soil}}$ (Construction Worker Table M-14)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})		

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
DP = direct push
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
max =maximum
mg/L = milligrams per liter
n = non-carcinogen
NE = Multi-media was not evaluated since the chemical is already identified as a COPC.
PAHs = polyaromatic hydrocarbons
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
TPH = total petroleum hydrocarbon
ug/L = micrograms per liter
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals

Notes

Only detected chemicals with a detection frequency greater than 5% are shown in this table. Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately.
Total metal results are reported.
Construction Worker hierarchical SLV selection for soil: 1. DEQ Soil RBCs (Direct Contact Construction,. 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.
Screening Levels Values for Groundwater: 1. DEQ Groundwater in Excavation Construction/Excavation RBCs (Appendix J-4b), 2. USEPA Tapwater RSL, and 3. Surrogates used as noted in Appendix J-4b.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes

(1) At the request of DEQ, COPC selection for groundwater is done separately for the on-site groundwater ingestion pathway and the groundwater discharge to surface water pathway. Therefore, this screening accounts only for on-site upland exposure to groundwater.
(2) The SLV for these chemcials are not available due to exceeding the solubility point in water.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens

COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium

Table M-17
Identification of COPCs in Groundwater at Sandblast Area AOPC - Construction and Excavation Workers
Bradford Island -Upland Operable Unit
(3 of 3)

Chemicals of Interest	note	Medium	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
						$\frac{C_{gw}}{SLV_{gw}}$ (direct contact)	$\frac{C_{soil}}{SLV_{soil}}$ (Construction Worker Table M-14)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})		

[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-18
Identification of COPCs in Groundwater at Sandblast Area AOPC - Potable Water User
Bradford Island -Upland Operable Unit
(1 of 3)

Chemicals of Interest	note	Medium	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV				Retain as a COPC, Y/N?	Rationale
						$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-13)	$\frac{C_{soil\ gas}}{SLV_{soil\ gas}}$ (Indoor Worker Table M-16)	Multimedia (1) sum(C/SLV_{soil} +C/SLV_{gw} + C/SLV_{sg})		
INORGANICS (mg/L)											
Arsenic	c	Groundwater	100%	0.00374	0.000038	98.4	1.80	-	100	Y	carc C/SLV >1
Iron	n	Groundwater	80%	0.499	26	0.0192	-	-	0.0192	N	C/SLV <0.1 (2)
Vanadium	n	Groundwater	90%	0.00254	0.0026	0.977	-	-	0.977	Y	C/SLV >0.1
BUTYLTINS (ug/L)											
Monobutyltin	n	Groundwater	10%	0.0216	11	0.00196	0.0000479	-	0.00201	N	C/SLV <0.1
VOCs (ug/L)											
1,1,1-Trichloroethane (TCA)	n	Groundwater	40%	1.90	9,100	0.000209	-	0.00000445	0.000213	N	C/SLV <0.1
1,1-Dichloroethane	c	Groundwater	40%	5.00	2.3	2.17	-	-	2.17	Y	carc C/SLV >1
1,1-Dichloroethene	n	Groundwater	20%	2.10	340	0.00618	-	-	0.00618	Y	PCE is a COPC (3)
Carbon Disulfide	n	Groundwater	100%	0.255	1,000	0.000255	0.000000303	0.0000135	0.000269	N	C/SLV <0.1
cis-1,2-Dichloroethene	n	Groundwater	75%	658	360	1.83	0.0000120	0.00127	1.83	Y	C/SLV >0.1
Dichloromethane (Methylene Chloride)	c	Groundwater	20%	0.175	4.4	0.0398	0.000181	0.0000692	0.0400	N	carc C/SLV <1
Tetrachloroethene (PCE)	c	Groundwater	80%	2.66	0.093	28.6	5.16	16.2	49.9	Y	carc C/SLV >1
Toluene	n	Groundwater	100%	0.640	2,300	0.000278	0.000122	0.00216	0.00256	N	C/SLV <0.1
trans-1,2-Dichloroethene	n	Groundwater	40%	1.70	110	0.0155	0.000000248	0.0000154	0.0155	Y	PCE is a COPC (3)
Trichloroethene (TCE)	c	Groundwater	75%	3.35	0.039	85.9	0.456	4.36	90.7	Y	carc C/SLV >1
Vinyl Chloride	c	Groundwater	20%	1.10	0.025	44.0	-	-	44.0	Y	carc C/SLV >1
TPH (mg/L)											
Diesel Range Organics	n	Groundwater	10%	0.0173	0.09	0.192	0.00380	-	0.196	Y	C/SLV >0.1
Gasoline Range Organics	n	Groundwater	15%	0.0151	0.1	0.151	0.0468	-	0.198	Y	C/SLV >0.1
PAHs (ug/L)											
2-Methylnaphthalene	n	Groundwater - DP	67%	0.0833	150	0.000555	0.00000583	-	0.000561	N	C/SLV <0.1
Acenaphthene	n	Groundwater - DP	56%	0.0135	2,200	0.00000614	0.0000107	-	0.0000168	N	C/SLV <0.1
Anthracene	n	Groundwater - DP	11%	0.0126	11,000	0.00000115	0.00000454	-	0.00000569	N	C/SLV <0.1
Benzo(a)pyrene	c	Groundwater - DP	11%	0.00895	0.0029	3.09	8.85	-	11.9	Y	carc C/SLV >1
Dibenz(a,h)anthracene	c	Groundwater - DP	11%	0.00671	0.0029	2.31	0.881	-	3.20	Y	carc C/SLV >1
Fluoranthene	n	Groundwater - DP	11%	0.0311	1,500	0.0000207	0.000372	-	0.000393	N	C/SLV <0.1
Fluorene	n	Groundwater - DP	67%	0.0190	1,500	0.0000127	0.00000554	-	0.0000182	N	C/SLV <0.1
Indeno(1,2,3-cd)pyrene	c	Groundwater - DP	11%	0.00797	0.029	0.275	0.430	-	0.704	N	carc C/SLV <1
Pyrene	n	Groundwater - DP	33%	0.0261	1,100	0.0000237	0.000557	-	0.000581	N	C/SLV <0.1
Sum cPAH C/RBC (ELCR)						**5.4E-06**					
Sum non-carcinogenic C/RBC (HI)		**Groundwater**				**3.17**					
Sum carcinogenic C/RBC (ELCR)		**Groundwater**				**2.6E-04**					

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration

Table M-18
Identification of COPCs in Groundwater at Sandblast Area AOPC - Potable Water User
Bradford Island -Upland Operable Unit
(2 of 3)

Chemicals of Interest	note	Medium	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV				Retain as a COPC, Y/N?	Rationale
						$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-13)	$\frac{C_{soil\ gas}}{SLV_{soil\ gas}}$ (Indoor Worker Table M-16)	Multimedia (1) sum(C/SLV_{soil} +C/SLV_{gw} + C/SLV_{sg})		

c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
DP = direct push
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
max =maximum
MCL = maximum contaminant level
mg/L = milligrams per liter
n = non-carcinogen
PAHs = polyaromatic hydrocarbons
RBC = risk based concentration
RSL = regional screening level
sg = soil gas
SLV = screening level value
TPH = total petroleum hydrocarbon
ug/L = micrograms per liter
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table except for degradation products of PCE (see footnote 2). Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately.
Total metal results are reported.
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.
Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, 4. Surrogates used as noted in Appendix J-4b.
Hierarchy developed to select Screening Level Values for Soil gas; 1. DEQ Soil Gas Vapor Intrusion Occupational RBCs, 2. Adjusted USEPA Industrial Air RSLs, and 3. Surrogates used as noted in Appendix J-4d.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) At the request of DEQ, COPC selection for groundwater is done separately for the on-site groundwater ingestion pathway and the groundwater discharge to surface water pathway. Therefore, this screening accounts only for on-site upland exposure to groundwater.
(2) SLV is based on aesthetic considerations and is not included in summations or as COPCs.
(3) Degradation products of PCE are retained as COPCs if PCE is identified as a COPC, even if not detected or detected at less than 5% frequency per DEQ (2010a).

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum cPAH C/RBC (ELCR) = includes only individual carcinogenic polyaromatic hydrocarbons selected as a COPC.
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium

Table M-18
Identification of COPCs in Groundwater at Sandblast Area AOPC - Potable Water User
Bradford Island -Upland Operable Unit
(3 of 3)

Chemicals of Interest	note	Medium	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV				Retain as a COPC, Y/N?	Rationale
						$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-13)	$\frac{C_{soil\ gas}}{SLV_{soil\ gas}}$ (Indoor Worker Table M-16)	Multimedia (1) sum(C/SLV_{soil} +C/SLV_{gw} + C/SLV_{sg})		

[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-19
Identification of COPCs in Groundwater at Sandblast Area AOPC - Discharge and Bioaccumulation
Bradford Island -Upland Operable Unit
(1 of 2)

Chemicals of Interest	note	Medium	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4c)	Site concentration(C) / SLV: C_{gw}/SLV_{gw} (Bioaccumulation)	C_{soil}/SLV_{soil} (Occupational Worker Table M-13)	$C_{soil\ gas}/SLV_{soil\ gas}$ (Indoor Worker Table M-16)	Multimedia (1) sum(C/SLV_{soil} +C/SLV_{gw} + C/SLV_{sg})	Bioaccumulative Potential? (Y/N) (Table J-6)	Retain as a COPC, Y/N?	Rationale
INORGANICS (mg/L)												
Arsenic	c	Groundwater	100%	0.00374	0.000018	208	1.80	-	210	Y	Y	C/SLV >1
Iron	n	Groundwater	80%	0.499	0.3	1.66	-	-	1.66	N	N	See footnote (2)
Vanadium	n	Groundwater	90%	0.00254	-	-	-	-	-	NA	Y	No SLV
BUTYLTINS (ug/L)												
Monobutyltin	n	Groundwater	10%	0.0216	-	-	0.0000479	-	0.0000479	N	N	Not Bioaccumulative
VOCs (ug/L)												
1,1,1-Trichloroethane (TCA)	n	Groundwater	40%	1.90	-	-	-	0.00000445	0.00000445	N	N	Not Bioaccumulative
1,1-Dichloroethane	c	Groundwater	40%	5.00	-	-	-	-	-	N	N	Not Bioaccumulative
1,1-Dichloroethene	n	Groundwater	20%	2.10	330	0.00636	-	-	0.00636	N	Y	PCE is a COPC (3)
Carbon Disulfide	n	Groundwater	100%	0.255	-	-	0.000000303	0.0000135	0.0000139	N	N	Not Bioaccumulative
cis-1,2-Dichloroethene	n	Groundwater	75%	658	-	-	0.0000120	0.00127	0.00128	N	Y	PCE is a COPC (3)
Dichloromethane (Methylene Chloride)	c	Groundwater	20%	0.175	4.6	0.0380	0.000181	0.0000692	0.0383	N	N	C/SLV <1
Tetrachloroethene (PCE)	c	Groundwater	80%	2.66	0.69	3.86	5.16	16.2	25.2	N	Y	C/SLV >1
Toluene	n	Groundwater	100%	0.640	1,300	0.000492	0.000122	0.00216	0.00277	N	N	C/SLV <1
trans-1,2-Dichloroethene	n	Groundwater	40%	1.70	140	0.0121	0.000000248	0.0000154	0.0122	N	Y	PCE is a COPC (3)
Trichloroethene (TCE)	c	Groundwater	75%	3.35	2.5	1.34	0.456	4.36	6.15	N	Y	C/SLV >1
Vinyl Chloride	c	Groundwater	20%	1.10	0.025	44.0	-	-	44.0	N	Y	C/SLV >1
TPH (mg/L)												
Diesel Range Organics	n	Groundwater	10%	0.0173	-	-	0.00380	-	0.00380	NA	N	Evaluated as PAHs
Gasoline Range Organics	n	Groundwater	15%	0.0151	-	-	0.0468	-	0.0468	NA	N	Evaluated as VOCs
PAHs (ug/L)												
2-Methylnaphthalene	n	Groundwater - DP	67%	0.0833	670	0.000124	0.00000583	-	0.000130	Y	N	C/SLV <1
Acenaphthene	n	Groundwater - DP	56%	0.0135	670	0.0000201	0.0000107	-	0.0000308	Y	N	C/SLV <1
Anthracene	n	Groundwater - DP	11%	0.0126	8,300	0.00000152	0.00000454	-	0.00000606	Y	N	C/SLV <1
Benzo(a)pyrene	c	Groundwater - DP	11%	0.00895	0.0038	2.36	8.85	-	11.2	Y	Y	C/SLV >1
Dibenz(a,h)anthracene	c	Groundwater - DP	11%	0.00671	0.018	0.373	0.881	-	1.25	Y	Y	mm C/SLV >1
Fluoranthene	n	Groundwater - DP	11%	0.0311	130	0.000239	0.000372	-	0.000612	Y	N	C/SLV <1
Fluorene	n	Groundwater - DP	67%	0.0190	1,100	0.0000173	0.00000554	-	0.0000228	Y	N	C/SLV <1
Indeno(1,2,3-cd)pyrene	c	Groundwater - DP	11%	0.00797	0.0038	2.10	0.430	-	2.53	Y	Y	C/SLV >1
Pyrene	n	Groundwater - DP	33%	0.0261	830	0.0000314	0.000557	-	0.000589	Y	N	C/SLV <1
Sum non-carcinogenic C/RBC (HI)		**Groundwater**				**0.0194**						
Sum carcinogenic C/RBC (ELCR)		**Groundwater**				**2.6E-04**						

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
DP = direct push
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium)
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium)
max =maximum

Table M-19
Identification of COPCs in Groundwater at Sandblast Area AOPC - Discharge and Bioaccumulation
Bradford Island -Upland Operable Unit
(2 of 2)

Chemicals of Interest	note	Medium	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4c)	Site concentration(C) / SLV				Bioaccumulative Potential? (Y/N) (Table J-6)	Retain as a COPC, Y/N?	Rationale
						$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-13)	$\frac{C_{soil\ gas}}{SLV_{soil\ gas}}$ (Indoor Worker Table M-16)	Multimedia (1) sum(C/SLV_{soil} +C/SLV_{gw} + C/SLV_{sg})			

mg/L = milligrams per liter
n = non-carcinogen
NA = not analyzed
NRWQC = national recommended water quality criteria
PAHs = polyaromatic hydrocarbons
RBC = risk based concentration
RSL = regional screening level
sg = soil gas
SLV = screening level value
TPH = total petroleum hydrocarbon
ug/L = micrograms per liter
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals
WQC = water quality criteria

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table. Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separatel
Total metal results are reported.
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4
Hierarchy developed to select Screening Level Values for Soil gas; 1. DEQ Soil Gas Vapor Intrusion Occupational RBCs, 2. Adjusted USEPA Industrial Air RSLs, and 3. Surrogates used as noted in Appendix J-4
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 200
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technolog
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May

Footnotes
(1) At the request of DEQ, groundwater COPCs are selected separately for each pathway. This table provides COPCs selected for the pathway of groundwater discharge to surface water and subsequent use of surface water (river water) for ingestions plus fish consumption (bioaccumulation
(2) SLVs is based on aesthetic considerations and are not included as a COPC.
(3) Degradation products of PCE are retained as COPCs if PCE is identified as a COPC, even if not detected or detected at less than 5% frequency per DEQ (2010a).

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SL
Sum cPAH C/RBC (ELCR) = includes only individual carcinogenic polyaromatic hydrocarbons selected as a COPC
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Iron not included in summation, see footnote (3
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogen
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following condition
[C/SLV] > 1.0 for an individual chemical in a given mediun
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given mediur
[Sum C/SLV] >1.0 for a single chemical in multiple medi
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a)

Table M-20
Summary of COPCs - Sandblast Area AOPC
Bradford Island -Upland Operable Unit
(1 of 1)

Media	Receptor	HI	ELCR	COPCs
Soil	Occupational Outdoor Worker	0.0866	2.2E-05	Arsenic Benzo(a)pyrene Benzofluoranthenes, Total Chromium Lead # Tetrachloroethene (PCE) 1,1-Dichloroethene # cis-1,2-Dichloroethene # Dibenz(a,h)anthracene trans-1,2-Dichloroethene # Trichloroethene (TCE) Vinyl Chloride
	Construction Worker	0.115	7.0E-06	Benzo(a)pyrene Tetrachloroethene (PCE) 1,1-Dichloroethene # cis-1,2-Dichloroethene # trans-1,2-Dichloroethene # Trichloroethene (TCE) Vinyl Chloride
	Excavation Worker	0.0718	8.1E-07	No COPCs
Soil Gas	Indoor Worker	0.856	2.1E-05	Tetrachloroethene (PCE) Trichloroethene (TCE) 1,1-Dichloroethene # cis-1,2-Dichloroethene # trans-1,2-Dichloroethene # Vinyl Chloride
Groundwater	**Construction/Excavation Worker**	1.01	3.6E-07	Vanadium #
	Potable Water User	3.17	**2.6E-04**	1,1-Dichloroethane Arsenic Benzo(a)pyrene Dibenz(a,h)anthracene Tetrachloroethene (PCE) Trichloroethene (TCE) Vinyl Chloride cis-1,2-Dichloroethene # Diesel Range Organics # Gasoline Range Organics # Vanadium # 1,1-Dichloroethene # trans-1,2-Dichloroethene #
	Discharge and Bioaccumulation	NE	NE	Arsenic Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Tetrachloroethene (PCE) Trichloroethene (TCE) Vinyl Chloride Dibenz(a,h)anthracene Vanadium # 1,1-Dichloroethene # cis-1,2-Dichloroethene # trans-1,2-Dichloroethene #

Bold = COPCs ELCR >1E-04
- = not evaluated
= non-carcinogenic COPC
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
COPC = chemicals of potential concern
ELCR = excess lifetime cancer risk
HI = hazard index

NE = Cumulative HI and ELCR not evaluated. These pathways were evaluated only to see if additional COPCs were identified for Sandblast.

PCBs = polychlorinated biphenyls

Shaded indicates COPC rationales not based on C/SLV>1 (i.e., multi-media, C/SLV>0.1, degradation product, or No SLV) or the SLV was not available for the specific exposure pathways.

Table M-21
Identification of COPCs in Soil at Pistol Range AOPC - Adult Outdoor Worker, Construction Worker, and Excavation Worker
Bradford Island -Upland Operable Unit
(1 of 1)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
					$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User Table M-23)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-24)	Multimedia (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})		
INORGANICS (mg/kg)											
Lead	n	100%	365	800	0.456	0.833	-	1.29	0.456	Y	mm C/SLV >1
Nickel	c	100%	25.9	6,100	0.00425	0.0686	0.0821	0.0729	0.0864	N	carc C/SLV <1
Zinc	n	100%	148	310,000	0.000477	0.0135	0.0201	0.0140	0.0206	N	C/SLV <1
Sum non-carcinogenic C/RBC (HI)					**0.000477**						
Sum carcinogenic C/RBC (ELCR)					**4.2E-09**						

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
ft bgs = feet below surface
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
max =maximum
MCL = maximum contaminant level
mg/kg = milligrams per kilogram
mm = multimedia
n = noncarcinogen
NRWQC = national recommended water quality criteria
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
WQC = water quality criteria

Notes
Only detected chemicals with a detection frequency greater than 5% and inorganics greater than reference are shown in this table. Reporting limits for non-detected chemicals are evaluated separately
Outdoor Occupational, Construction, and Excavation Worker hierarchical SLV selection for soil: 1. minimum DEQ Soil RBCs (Ingest Occupational, Volatilize Outdoor, Ingest Construction, and Ingest Excavation), 2. USEPA Soil Industrial RSL, 3. Surrogate used as noted in Appendix J-4a
Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, 4. Surrogates used as noted in Appendix J-4b.
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-22
Identification of COPCs in Groundwater at Pistol Range AOPC - Construction and Excavation Workers
Bradford Island -Upland Operable Unit
(1 of 2)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
					C_{gw} / SLV_{gw} (direct contact)	C_{soil} / SLV_{soil} (Table M-21)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})		
INORGANICS (mg/L)									
Copper	n	100%	0.0548	5,000	0.0000110	-	0.0000110	N	C/SLV <1
Lead	n	100%	0.0125	- (2)	-	0.456	0.456	N	C/SLV <1
Nickel	c	100%	0.0501	12,000	0.00000418	0.00425	0.00425	N	carc C/SLV <1
Zinc	n	100%	0.149	11	0.0135	0.000477	0.0140	N	C/SLV<1
Sum non-carcinogenic C/RBC (HI)					**0.0136**				
Sum carcinogenic C/RBC (ELCR)					**4.2E-12**				

- = not evaluated since chemical was not detected in this medium at detection frequency >5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
max =maximum
mg/L = milligrams per liter
mm = multimedia
n = non-carcinogen
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table. Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately.
Total metal results are reported.
Construction Worker hierarchical SLV selection for soil: 1. DEQ Soil RBCs (Direct Contact Construction,. 2. USEPA Soil Industrial RSL, 3. Surrogate used as noted in Appendix J-4a.
Screening Levels Values for Groundwater: 1. DEQ Groundwater in Excavation Construction/Excavation RBCs (Appendix J-4b), 2. USEPA Tapwater RSL, 3. DEQ MCL
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) At the Request of DEQ, COPC selection for groundwater is done separately for the on-site groundwater ingestion pathway and the groundwater discharge to surface water pathway. Therefore, this screening accounts only for on-site upland exposure to groundwater.
(2) The SLV for these chemcials are not available due to exceeding the solubility point in water.

COPC Selection

Table M-22
Identification of COPCs in Groundwater at Pistol Range AOPC - Construction and Excavation Workers
Bradford Island -Upland Operable Unit
(2 of 2)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
					$\frac{C_{gw}}{SLV_{gw}}$ (direct contact)	$\frac{C_{soil}}{SLV_{soil}}$ (Table M-21)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})		

C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:

[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media

For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-23
Identification of COPCs in Groundwater at Pistol Range AOPC - Potable Water User
Bradford Island -Upland Operable Unit
(1 of 2)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
					C_{gw} / SLV_{gw} (Potable Water User)	C_{soil} / SLV_{soil} (Table M-21)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})		
INORGANICS (mg/L)									
Copper	n	100%	0.0548	1.5	0.0365	-	0.0365	N	C/SLV <1
Lead	n	100%	0.0125	0.015	0.833	0.456	1.29	Y	mm C/SLV >1
Nickel	c	100%	0.0501	0.73	0.0686	0.00425	0.0729	N	carc C/SLV <1
Zinc	n	100%	0.149	11	0.0135	0.000477	0.0140	N	C/SLV <1
Sum non-carcinogenic C/RBC (HI)					**0.0501**				
Sum carcinogenic C/RBC (ELCR)					**6.9E-08**				

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
max =maximum
MCL = maximum contaminant level
mg/L = milligrams per liter
mm = multimedia
n = non-carcinogen
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table. Reporting limits for non-detected chemicals are evaluated separately.
Total metal results are reported.
Outdoor Occupational, Construction, and Excavation Worker hierarchical SLV selection for soil: 1. minimum DEQ Soil RBCs (Ingest Occupational, Volatilize Outdoor, Ingest Construction, and Ingest Excavation), 2. USEPA Soil Industrial RSL, 3. Surrogate used as noted in Appendix J-4a.
Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, 4. Surrogates used as noted in Appendix J-4b.

Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes

Table M-23
Identification of COPCs in Groundwater at Pistol Range AOPC - Potable Water User
Bradford Island -Upland Operable Unit
(2 of 2)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
					$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User)	$\frac{C_{soil}}{SLV_{soil}}$ (Table M-21)	Multimedia (1) (direct contact) sum(C/SLV_{soil} +C/SLV_{gw})		

(1) At the Request of DEQ, COPC selection for groundwater is done separately for the on-site groundwater ingestion pathway and the groundwater discharge to surface water pathway. Therefore, this screening accounts only for on-site upland exposure to groundwater.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:

[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media

For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-24
Identification of COPCs in Groundwater at Pistol Range AOPC - Discharge and Bioaccumulation
Bradford Island -Upland Operable Unit
(1 of 2)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4c)	Site concentration(C) / SLV			Bioaccumulative Potential? (Y/N)	Retain as a COPC, Y/N?	Rationale (2)
					$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation)	$\frac{C_{soil}}{SLV_{soil}}$ (Table M-21)	Multimedia (1) (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})			
INORGANICS (mg/L)										
Copper	n	100%	0.0548	1.3	0.0422	-	0.0422	N	N	C/SLV <1
Lead	n	100%	0.0125	-	-	0.456	0.456	Y	Y	No SLV
Nickel	c	100%	0.0501	0.61	0.0821	0.00425	0.0864	N	N	carc C/SLV <1
Zinc	n	100%	0.149	7.4	0.0201	0.000477	0.0206	Y	N	C/SLV <1

- = not evaluated since chemical was not detected in this medium at detection frequency >5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
max =maximum
mg/L = milligrams per liter
n = non-carcinogen
NRWQC = national recommended water quality criteria
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
WQC = water quality criteria

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table. Reporting limits for non-detected chemicals are evaluated separately.
Total metal results are reported.
Outdoor Occupational, Construction, and Excavation Worker hierarchical SLV selection for soil: 1. minimum DEQ Soil RBCs (Ingest Occupational, Volatilize Outdoor, Ingest Construction, and Ingest Excavation), 2. USEPA Soil Industrial RSL, 3. Surrogate used as noted in Appendix J-4a.
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology.
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) At the Request of DEQ, groundwater COPCs are selected separately for each pathway. This table provides COPCs selected for the pathway of groundwater discharge to surface water and subsequent use of surface water (river water) for ingestions plus fish consumption (bioaccumulation).

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV

Table M-24
Identification of COPCs in Groundwater at Pistol Range AOPC - Discharge and Bioaccumulation
Bradford Island -Upland Operable Unit
(2 of 2)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4c)	Site concentration(C) / SLV			Bioaccumulative Potential? (Y/N)	Retain as a COPC, Y/N?	Rationale (2)
					$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation)	$\frac{C_{soil}}{SLV_{soil}}$ (Table M-21)	Multimedia (1) (bioaccumulation) sum(C/SLV_{soil} +C/SLV_{gw})			

Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:

[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media

For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-25
Identification of COPCs in Sediment at Pistol Range AOPC - Fish Consumer
Bradford Island -Upland Operable Unit
(1 of 1)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4e)	Site concentration(C) / SLV $\frac{C_{sed}}{SLV_{sed}}$	Bioaccumulative Potential? (Y/N) (Table J-6)	Retain as a COPC, Y/N?	Rationale
INORGANICS (mg/kg)								
Copper	n	100%	25.4	55.6 (1)	0.457	N	N	C/SLV<1
Lead	n	100%	33.0	14.5 (1)	2.28	Y	Y	C/SLV >1
Nickel	c	100%	15.4	21.2 (1)	0.726	N	N	carc C/SLV <1
Zinc	n	100%	174	106 (1)	1.64	Y	Y	C/SLV >1

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{soil}/SLV_{sed} only (i.e. single medium).
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{soil}/SLV_{sed} only (i.e. single medium).
max =maximum
mg/kg = milligrams per kilogram
n = non-carcinogen
SLV = screening level value
sed = sediment
UCL = 95% upper confidence limit

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table. Reporting limits for non-detected chemicals are evaluated separately.
Hierarchy was developed to determine Screening Levels Values for Sediment; 1. Minimum of DEQ HH Bioaccumulative SLVs and 2. Surrogates as used in Appendix J-4e.
Oregon Department of Environmental Quality (DEQ) 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.

Footnotes
(1) Reference Sediment 95% Upper Prediction Limit (UPL) was used as the Selected HH SLV; see Appendix L-4, Sediment

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum non-carcinogenic C/SLV (ELCR) = summation of C/SLV of all non-carcinogens
Ratios for SLVs based on Reference Upper Prediction Limits (UPLs) are not included in sum totals. Since all selected HH SLVs are based on UPLs, sum totals are not shown.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5%, inorganic site concentration exceeds reference and one of the following
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-26
Summary of COPCs - Pistol Range AOPC
Bradford Island -Upland Operable Unit
(1 of 1)

Media	Receptor	HI	ELCR	COPCs
Soil	Adult Outdoor Worker, Construction Worker, Excavation Worker	0.000477	4.2E-09	Lead #
Groundwater	Construction/Excavation Worker	0.0136	4.2E-12	None
	Potable Water User	0.0501	6.9E-08	Lead #
	Discharge and Bioaccumulation	NE	NE	Lead #
Sediment	Wader	NE	NE	Lead # Zinc #

Bold = COPCs ELCR >1E-04
# = non-carcinogenic COPC
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
COPC = chemicals of potential concern
ELCR = excess lifetime cancer risk
HI = hazard index
NE = Cumulative HI and ELCR not evaluated. These pathways were evaluated only to see if additional COPCs were identified for Pistol Range.
PCBs = polychlorinated biphenyls
Shaded indicates COPC rationales not based on C/SLV>1 (multi-media, C/SLV>0.1, degradation product, or No SLV)

Table M-27
Identification of COPCs in Soil at Bulb Slope AOPC - Occupational Outdoor Worker
Bradford Island -Upland Operable Unit
(1 of 2)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV $\frac{C_{soil}}{SLV_{soil}}$	Retain as a COPC, Y/N?	Rationale
INORGANICS (mg/kg)							
Lead	n	100%	307	800	0.384	N	C/SLV <1
Mercury	n	100%	0.720	310	0.00232	N	C/SLV <1
PCBs (ug/kg)							
Aroclor 1260	c	67%	108	740	0.146	N	carc C/SLV <1
Total PCBs (Aroclors)	c	67%	104	740	0.140	N	carc C/SLV <1
TPH (mg/kg)							
Diesel Range Organics	n	100%	102	70,000	0.00146	N	C/SLV <1
Residual Range Organics	n	100%	232	40,000	0.00580	N	C/SLV <1
Sum non-carcinogenic C/RBC (HI)					**0.00958**		
Sum carcinogenic C/RBC (ELCR)					**1.4E-07**		

AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
ft bgs = feet below surface
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
max =maximum
mg/kg = milligrams per kilogram
n = non-carcinogen
PCBs = polychlorinated biphenyls
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
TPH = total petroleum hydrocarbon
ug/kg = micrograms per kilogram
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency

Notes

Only detected chemicals with a detection frequency greater than 5% and inorganics greater than reference are shown in this table. Reporting limits for non-detected chemicals are evaluated separately.

Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, 3. Surrogate used as noted in Appendix J-4a.
For inorganics, the higher of the 95% Upper Prediction Limit (UPL) and lowest HH SLV was selected as the HH SLV. For all other analytes the heirarchy described above was used.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Table M-27
Identification of COPCs in Soil at Bulb Slope AOPC - Occupational Outdoor Worker
Bradford Island -Upland Operable Unit
(2 of 2)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV $\frac{C_{soil}}{SLV_{soil}}$	Retain as a COPC, Y/N?	Rationale

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Total aroclors, rather than individual aroclors, was used in the summation.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:

[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media

For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-28
Identification of COPCs in Soil at All Four AOPCs Combined - Adult Outdoor Worker
Bradford Island -Upland Operable Unit
(1 of 4)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV: $\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User Table M-32)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-33)	Multimedia (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} + C/SLV_{gw})	Retain as a COPC, Y/N?	Rationale
INORGANICS (mg/kg)												
Antimony	n	60%	N	1.64	410	0.00400	0.149	0.398	0.153	0.402	N	C/SLV <1
Arsenic	c	94%	Y	8.20	5.4	1.52	217	457	218	459	Y	carc C/SLV >1
Cadmium	c	86%	N	1.67	500	0.00334	0.106	-	0.109	0.00334	N	carc C/SLV <1
Chromium	c	100%	Y	510	190 (1)	2.68	0.000145	-	2.68	2.68	Y	carc C/SLV >1
Lead - sieved <250um (2)	n	100%	N	418	800	0.523	-	-	0.523	0.523	N	C/SLV <1
Lead - sieved <2mm (3)	n	100%	N	303	800	0.379	-	-	0.379	0.379	N	C/SLV <1
Lead - unsieved (4)	n	100%	Y	396	800	0.495	0.853	-	1.35	0.495	Y	mm C/SLV >1
Mercury	n	71%	N	0.330	310	0.00106	0.00699	-	0.00806	0.00106	N	C/SLV <1
Nickel	c	100%	N	234	20,000	0.0117	0.160	0.192	0.172	0.204	N	carc C/SLV <1
Selenium	n	49%	N	0.431	5,100	0.0000845	0.0473	0.0501	0.0474	0.0502	N	C/SLV <1
Silver	n	83%	N	0.207	5,100	0.0000406	0.00153	-	0.00157	0.0000406	N	C/SLV <1
Zinc	n	100%	N	172	310,000	0.000555	0.188	0.280	0.189	0.280	N	C/SLV <1
BUTYLTINS (ug/kg)												
Dibutyltin	n	28%	N	14.7	180,000	0.0000817	0.00533	-	0.00541	0.0000817	N	C/SLV <1
Monobutyltin	n	34%	N	8.72	180,000	0.0000484	0.00185	-	0.00189	0.0000484	N	C/SLV <1
Tributyltin	n	28%	N	219	180,000	0.00122	0.00325	-	0.00446	0.00122	N	C/SLV <1
PESTICIDES (ug/kg)												
4,4'-DDE	c	13%	N	1.18	7,700	0.000153	-	-	0.000153	0.000153	N	carc C/SLV <1
4,4'-DDT	c	48%	N	19.3	7,700	0.00251	-	-	0.00251	0.00251	N	carc C/SLV <1
Chlordane (alpha)	c	9%	N	0.952	7,200	0.000132	-	-	0.000132	0.000132	N	carc C/SLV <1
Chlordane (gamma)	c	22%	N	11.8	7,200	0.00164	-	-	0.00164	0.00164	N	carc C/SLV <1
Chlordane (technical)	c	20%	N	902	7,200	0.125	-	-	0.125	0.125	N	carc C/SLV <1
Endosulfan I	n	8%	N	0.547	4,600,000	0.000000119	-	-	0.000000119	0.000000119	N	C/SLV <1
Endosulfan II	n	7%	N	0.756	4,600,000	0.000000164	-	-	0.000000164	0.000000164	N	C/SLV <1
Endosulfan Sulfate	n	12%	N	1.01	4,600,000	0.000000220	-	-	0.000000220	0.000000220	N	C/SLV <1
Endrin Aldehyde	n	8%	N	2.86	230,000	0.0000124	-	-	0.0000124	0.0000124	N	C/SLV <1
Endrin Ketone	n	7%	N	2.50	230,000	0.0000109	-	-	0.0000109	0.0000109	N	C/SLV <1
Endrin	n	7%	N	3.21	230,000	0.0000140	-	-	0.0000140	0.0000140	N	C/SLV <1
Heptachlor	c	10%	N	0.477	480	0.000994	-	-	0.000994	0.000994	N	carc C/SLV <1
PCBs (ug/kg)												
Aroclor 1254	c	18%	N	147	740	0.199	-	-	0.199	0.199	N	carc C/SLV <1
Aroclor 1260	c	82%	N	123	740	0.166	-	-	0.166	0.166	N	carc C/SLV <1
Total PCBs (Aroclors)	c	82%	N	325	740	0.439	-	-	0.439	0.439	N	carc C/SLV <1
HERBICIDES (ug/kg)												
2,4,5-T	n	8%	N	66.9	6,200,000	0.0000108	-	-	0.0000108	0.0000108	N	C/SLV <1
Dichloroprop	n	8%	N	172	4,900,000	0.0000351	-	-	0.0000351	0.0000351	N	C/SLV <1
MCPP	n	8%	N	10,200	620,000	0.0165	-	-	0.0165	0.0165	N	C/SLV <1
VOCs (ug/kg)												
1,1-Dichloroethene	n	0%	Y	-	27,000,000	-	0.00618	0.00636	0.00618	0.00636	Y	PCE is a COPC (5)
1,2,4-Trimethylbenzene	n	36%	N	2,860	980,000	0.00292	0.347	-	0.350	0.00292	N	C/SLV <1

Table M-28
Identification of COPCs in Soil at All Four AOPCs Combined - Adult Outdoor Worker
Bradford Island -Upland Operable Unit
(2 of 4)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
						$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User Table M-32)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-33)	Multimedia (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} + C/SLV_{gw})		
1,3,5-Trimethylbenzene	n	17%	N	417	1,600,000	0.000261	-	-	0.000261	0.000261	N	C/SLV <1
2-Butanone (MEK)	n	29%	N	10.4	200,000,000	0.0000000520	-	-	0.0000000520	0.0000000520	N	C/SLV <1
4-Isopropyltoluene	n	26%	N	14.7	53,000,000	0.000000277	-	-	0.000000277	0.000000277	N	C/SLV <1
4-Methyl-2-pentanone (MIBK)	n	14%	N	0.518	53,000,000	0.00000000977	-	-	0.00000000977	0.00000000977	N	C/SLV <1
Acetone	n	35%	N	90.8	630,000,000	0.000000144	0.000449	-	0.000449	0.000000144	N	C/SLV <1
Benzene	c	26%	N	0.412	34,000	0.0000121	-	-	0.0000121	0.0000121	N	carc C/SLV <1
Bromomethane	n	12%	N	1.01	700,000	0.00000144	-	-	0.00000144	0.00000144	N	C/SLV <1
Carbon Disulfide	n	36%	N	1.00	3,700,000	0.000000270	0.000988	-	0.000988	0.000000270	N	C/SLV <1
cis-1,2-Dichloroethene	n	3%	Y	120	10,000,000	0.0000120	0.919	-	0.919	0.0000120	Y	PCE is a COPC (5)
Dichlorodifluoromethane	n	6%	N	5.04	780,000	0.00000646	-	-	0.00000646	0.00000646	N	C/SLV <1
Dichloromethane (Methylene Chloride)	c	27%	N	40.3	310,000	0.000130	-	-	0.000130	0.000130	N	carc C/SLV <1
Ethylbenzene	c	17%	N	308	140,000	0.00220	-	-	0.00220	0.00220	N	carc C/SLV <1
m,p-Xylenes	n	18%	N	1,460	2,700,000	0.000541	-	-	0.000541	0.000541	N	C/SLV <1
Naphthalene	c	21%	N	960	23,000	0.0417	-	-	0.0417	0.0417	N	carc C/SLV <1
o-Xylene	n	7%	N	131	19,000,000	0.00000689	-	-	0.00000689	0.00000689	N	C/SLV <1
Tetrachloroethene (PCE)	c	27%	Y	44,400	5,100	8.71	18.7	2.52	27.4	11.2	Y	carc C/SLV >1
Toluene	n	51%	N	4,060	77,000,000	0.0000527	0.000169	0.000298	0.000221	0.000351	N	C/SLV <1
trans-1,2-Dichloroethene	n	2%	Y	2.28	9,200,000	0.000000248	0.00617	0.00485	0.00617	0.00485	Y	PCE is a COPC (5)
Trichloroethene (TCE)	c	11%	Y	833	3,900	0.214	29.2	0.456	NE	0.670	Y	PCE is a COPC (5)
Vinyl Chloride	c	0%	Y	-	3,900	-	16.5	16.5	16.5	16.5	Y	PCE is a COPC (5)
SVOCs (ug/kg)												
Benzoic Acid	n	33%	N	122	2,500,000,000	0.0000000488	-	-	0.0000000488	0.0000000488	N	C/SLV <1
Bis(2-ethylhexyl) Phthalate	c	80%	N	31,300	150,000	0.209	1.15	3.92	NE	NE	N	carc C/SLV <1
Butyl Benzyl Phthalate	c	13%	N	15.4	910,000	0.0000169	-	-	0.0000169	0.0000169	N	carc C/SLV <1
Carbazole	c	66%	N	312	1,000,000	0.000312	-	-	0.000312	0.000312	N	carc C/SLV <1
Dibenzofuran	n	54%	N	83.4	1,000,000	0.0000834	-	-	0.0000834	0.0000834	N	C/SLV <1
Diethyl Phthalate	n	9%	N	15.6	490,000,000	0.0000000318	-	-	0.0000000	0.0000000	N	C/SLV <1
Di-n-butyl Phthalate	n	27%	N	105	62,000,000	0.00000169	-	-	0.00000169	0.00000169	N	C/SLV <1
Di-n-octyl Phthalate	n	9%	N	19.4	150,000	0.000129	-	-	NE	NE	N	C/SLV <1
Pentachlorophenol	c	6%	N	24.8	13,000	0.00191	0.238	0.415	0.240	0.417	N	carc C/SLV <1
Phenol	n	7%	N	35.0	180,000,000	0.000000194	-	-	0.000000194	0.000000194	N	C/SLV <1
PAHs (ug/kg)												
2-Methylnaphthalene	n	39%	N	155	4,100,000	0.0000378	0.00117	0.000261	0.00120	0.000299	N	C/SLV <1
Acenaphthene	n	77%	N	564	61,000,000	0.00000925	0.0000718	0.000236	0.0000811	0.000245	N	C/SLV <1
Acenaphthylene	n	40%	N	26.2	23,000	0.00114	-	-	0.00114	0.00114	N	C/SLV <1
Anthracene	n	88%	N	1,250	170,000,000	0.00000735	-	-	0.00000735	0.00000735	N	C/SLV <1
Benzo(a)anthracene	c	90%	Y	5,260	2,700	1.95	-	-	1.95	1.95	Y	carc C/SLV >1
Benzo(a)pyrene	c	92%	Y	7,150	270	26.5	-	-	26.5	26.5	Y	carc C/SLV >1
Benzo(b)fluoranthene	c	96%	Y	9,750	2,700	3.61	-	-	3.61	3.61	Y	carc C/SLV >1
Benzo(g,h,i)perylene	c	86%	N	3,690	27,000	0.137	-	-	0.137	0.137	N	carc C/SLV <1
Benzo(k)fluoranthene	c	96%	N	11,000	27,000	0.407	-	-	0.407	0.407	N	carc C/SLV <1
Benzofluoranthenes, Total	c	93%	Y	17,600	2,700	6.52	-	-	6.52	6.52	Y	carc C/SLV >1

Table M-28
Identification of COPCs in Soil at All Four AOPCs Combined - Adult Outdoor Worker
Bradford Island -Upland Operable Unit
(3 of 4)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
						$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User Table M-32)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-33)	Multimedia (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} + C/SLV_{gw})		
Chrysene	c	95%	N	5,790	270,000	0.0214	-	-	0.0214	0.0214	N	carc C/SLV <1
Dibenz(a,h)anthracene	c	74%	Y	1,040	270	3.85	-	-	3.85	3.85	Y	carc C/SLV >1
Fluoranthene	n	93%	N	11,900	29,000,000	0.000410	-	-	0.000410	0.000410	N	C/SLV <1
Fluorene	n	68%	N	191	41,000,000	0.00000466	-	-	0.00000466	0.00000466	N	C/SLV <1
Indeno(1,2,3-cd)pyrene	c	89%	Y	3,480	2,700	1.29	-	-	1.29	1.29	Y	carc C/SLV >1
Naphthalene	c	56%	N	161	23,000	0.00700	0.624	0.000130	0.631	0.00713	N	carc C/SLV <1
Phenanthrene	n	96%	N	3,870	170,000,000	0.0000228	0.0000441	0.0000584	0.0000669	0.0000812	N	C/SLV <1
Pyrene	n	96%	N	10,400	21,000,000	0.000495	-	-	0.000495	0.000495	N	C/SLV <1
TPH (mg/kg)												
Diesel Range Organics	n	88%	N	473	70,000	0.00676	3.09	-	NE	0.00676	N	C/SLV <1
Gasoline Range Organics	n	24%	N	782	22,000	0.0355	0.474	-	0.510	0.0355	N	C/SLV <1
Residual Range Organics	n	91%	N	2,030	40,000	0.0508	0.900	-	0.951	0.0508	N	C/SLV <1
Sum cPAH C/RBC (ELCR)						**3.7E-05**						
Sum non-carcinogenic C/RBC (HI)						**0.123**						
Sum carcinogenic C/RBC (ELCR)						**5.0E-05**						

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
ft bgs = feet below surface
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
max =maximum
MCL = maximum contaminant level
mg/kg = milligrams per kilogram
mm = multimedia
n = non-carcinogen
NE = multi-media was not evaluated since the chemical is already identified as a COPC.
NRWQC = national recommended water quality criteria
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/kg = micrograms per kilogram
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals
WQC = water quality criteria

Notes
Only detected chemicals with a detection frequency greater than 5% and inorganics greater than reference are shown in this table except for degradation products of PCE (see footnote 5). Reporting limits for non-detected chemicals are evaluated separately.
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.

Table M-28
Identification of COPCs in Soil at All Four AOPCs Combined - Adult Outdoor Worker
Bradford Island -Upland Operable Unit
(4 of 4)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
						$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User Table M-32)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-33)	Multimedia (direct contact) $sum(C/SLV_{soil} + C/SLV_{gw})$	Multimedia (bioaccumulation) $sum(C/SLV_{soil} + C/SLV_{gw})$		

Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, and 4. Surrogates used as noted in Appendix J-4b.
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c.
For inorganics, the higher of the 95% Upper Prediction Limit (UPL) and lowest HH SLV was selected as the HH SLV. For all other analytes the heirarchy described above was used.

Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology.
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) Due to the lack of speciation data, the chromium in soil were compared to the more conservative hexavalent chromium SLVs.
(2) Lead in sieved soil samples corresponding to 250 micrometers or less size fraction.
(3) Lead in sieved soil samples corresponding to 2 millimeters or less size fraction.
(4) Lead in unsieved soil samples.
(5) Degradation products of PCE are retained as COPCs if PCE is identified as a COPC, even if not detected or detected at less than 5% frequency per DEQ (2010a).

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum cPAH C/RBC (ELCR) = includes only individual carcinogenic polyaromatic hydrocarbons selected as a COPC. Individual benzofluoranthenes, rather than total benzofluoranthenes, was used in the summation.
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Individual benzofluoranthenes, rather than total benzofluoranthenes, was used in the summation. Total aroclors, rather than individual aroclors, was used in the summation.
Ratios for SLVs based on Reference Upper Prediction Limits (UPLs) are not included in sum totals.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-29
Identification of COPCs in Soil at All Four AOPCs Combined - Construction Worker
Bradford Island -Upland Operable Unit
(1 of 4)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
						$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-31)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-33)	Multimedia (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} + C/SLV_{gw})		
INORGANICS (mg/kg)												
Antimony	n	66%	N	1.71	410	0.00417	0.149	0.398	0.153	0.402	N	C/SLV <1
Arsenic	c	95%	N	7.85	13	0.604	0.00142	457	0.605	NE	N	carc C/SLV <1
Cadmium	c	85%	N	1.66	150	0.0111	0.0000335	-	0.0111	0.0111	N	carc C/SLV <1
Chromium	c	100%	N	501	920 (1)	0.545	-	-	0.545	0.545	N	carc C/SLV <1
Lead - sieved <250um (2)	n	100%	N	418	800	0.523	-	-	0.523	0.523	N	C/SLV <1
Lead - sieved <2mm (3)	n	100%	N	303	800	0.379	-	-	0.379	0.379	N	C/SLV <1
Lead - unsieved (4)	n	100%	N	396	800	0.495	-	-	0.495	0.495	N	C/SLV <1
Mercury	n	75%	N	0.315	93	0.00339	0.135	-	0.1383	0.00339	N	C/SLV <1
Nickel	c	100%	N	243	6,100	0.0398	0.00000975	0.192	0.0398	0.232	N	carc C/SLV <1
Selenium	n	50%	N	0.385	5,100	0.0000755	0.0473	0.0501	0.047	0.0502	N	C/SLV <1
Silver	n	85%	N	0.255	1,500	0.000170	0.000000276	-	0.000170	0.000170	N	C/SLV <1
Zinc	n	100%	N	175	310,000	0.000565	0.188	0.280	0.189	0.280	N	C/SLV <1
BUTYLTINS (ug/kg)												
Dibutyltin	n	24%	N	12.6	180,000	0.0000700	0.00533	-	0.00540	0.0000700	N	C/SLV <1
Monobutyltin	n	29%	N	7.36	180,000	0.0000409	0.00185	-	0.00189	0.0000409	N	C/SLV <1
Tributyltin	n	24%	N	186	180,000	0.00103	0.00325	-	0.00428	0.00103	N	C/SLV <1
PESTICIDES (ug/kg)												
4,4'-DDE	c	12%	N	1.09	58,000	0.0000188	-	-	0.0000188	0.0000188	N	carc C/SLV <1
4,4'-DDT	c	43%	N	17.3	58,000	0.000298	-	-	0.000298	0.000298	N	carc C/SLV <1
Chlordane (alpha)	c	9%	N	0.952	55,000	0.0000173	-	-	0.0000173	0.0000173	N	carc C/SLV <1
Chlordane (gamma)	c	22%	N	11.8	55,000	0.000215	-	-	0.000215	0.000215	N	carc C/SLV <1
Chlordane (technical)	c	27%	N	329	55,000	0.00598	-	-	0.00598	0.00598	N	carc C/SLV <1
Endosulfan I	n	7%	N	0.504	1,400,000	0.000000360	-	-	0.000000360	0.000000360	N	C/SLV <1
Endosulfan II	n	6%	N	0.706	1,400,000	0.000000504	-	-	0.000000504	0.000000504	N	C/SLV <1
Endosulfan Sulfate	n	10%	N	0.967	1,400,000	0.000000691	-	-	0.000000691	0.000000691	N	C/SLV <1
Endrin Aldehyde	n	7%	N	2.76	71,000	0.0000389	-	-	0.0000389	0.0000389	N	C/SLV <1
Endrin Ketone	n	6%	N	2.43	71,000	0.0000342	-	-	0.0000342	0.0000342	N	C/SLV <1
Endrin	n	6%	N	3.09	71,000	0.0000435	-	-	0.0000435	0.0000435	N	C/SLV <1
Heptachlor	c	9%	N	0.445	3,700	0.000120	-	-	0.000120	0.000120	N	carc C/SLV <1
PCBs (ug/kg)												
Aroclor 1254	c	20%	N	138	740	0.186	-	-	0.186	0.186	N	carc C/SLV <1
Aroclor 1260	c	82%	N	119	740	0.161	-	-	0.161	0.161	N	carc C/SLV <1
Total PCBs (Aroclors)	c	82%	N	254	740	0.343	-	-	0.343	0.343	N	carc C/SLV <1
HERBICIDES (ug/kg)												
2,4,5-T	n	6%	N	66.0	6,200,000	0.0000106	-	-	0.0000106	0.0000106	N	C/SLV <1
Dichloroprop	n	6%	N	171	4,900,000	0.0000349	-	-	0.0000349	0.0000349	N	C/SLV <1
MCPP	n	6%	N	10,000	620,000	0.0161	-	-	0.0161	0.0161	N	C/SLV <1
VOCs (ug/kg)												
1,1-Dichloroethene	n	0%	Y	-	12,000,000	-	-	0.00636	-	0.00636	Y	PCE is a COPC (5)
1,2,4-Trimethylbenzene	n	33%	N	2,490	2,000,000	0.00125	0.00306	-	0.00430	0.00125	N	C/SLV <1

Table M-29
Identification of COPCs in Soil at All Four AOPCs Combined - Construction Worker
Bradford Island -Upland Operable Unit
(2 of 4)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
						$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-31)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-33)	Multimedia (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} + C/SLV_{gw})		
1,3,5-Trimethylbenzene	n	14%	N	362	1,500,000	0.000241	-	-	0.000241	0.000241	N	C/SLV <1
2-Butanone (MEK)	n	25%	N	9.00	200,000,000	0.0000000450	-	-	0.0000000450	0.0000000450	N	C/SLV <1
4-Isopropyltoluene	n	24%	N	12.7	24,000,000	0.000000529	-	-	0.000000529	0.000000529	N	C/SLV <1
4-Methyl-2-pentanone (MIBK)	n	12%	N	0.507	53,000,000	0.00000000957	-	-	0.00000000957	0.00000000957	N	C/SLV <1
Acetone	n	30%	N	78.9	630,000,000	0.000000125	0.000449	-	0.000449	0.000000125	N	C/SLV <1
Benzene	c	25%	N	0.374	340,000	0.00000110	-	-	0.00000110	0.00000110	N	carc C/SLV <1
Bromomethane	n	11%	N	0.902	330,000	0.00000273	-	-	0.00000273	0.00000273	N	C/SLV <1
Carbon Disulfide	n	32%	N	0.858	3,700,000	0.000000232	0.000988	-	0.000988	0.000000232	N	C/SLV <1
cis-1,2-Dichloroethene	n	5.3%	Y	10.8	3,100,000	0.00000348	0.00276	-	0.00276	0.00000348	Y	PCE is a COPC (5)
Dichlorodifluoromethane	n	8%	N	4.08	780,000	0.00000523	-	-	0.00000523	0.00000523	N	C/SLV <1
Dichloromethane (Methylene Chloride)	c	24%	N	34.8	2,700,000	0.0000129	-	-	0.0000129	0.0000129	N	carc C/SLV <1
Ethylbenzene	c	16%	N	266	1,600,000	0.000166	-	-	0.000166	0.000166	N	carc C/SLV <1
m,p-Xylenes	n	17%	N	1,260	19,000,000	0.0000663	-	-	0.0000663	0.0000663	N	C/SLV <1
Naphthalene	c	18%	N	834	580,000	0.00144	-	-	0.00144	0.00144	N	carc C/SLV <1
o-Xylene	n	10%	N	508	19,000,000	0.0000267	-	-	0.0000267	0.0000267	N	C/SLV <1
Tetrachloroethene (PCE)	c	39%	Y	53,300	40,000	1.33	0.00725	2.52	1.34	3.9	Y	carc C/SLV >1
Toluene	n	54%	N	12,400	24,000,000	0.000517	0.00000185	0.000298	0.000519	0.000815	N	C/SLV <1
trans-1,2-Dichloroethene	n	1%	Y	2.28	4,500,000	0.000000507	0.0000485	0.00485	0.0000490	0.00485	Y	PCE is a COPC (5)
Trichloroethene (TCE)	c	13%	Y	710	43,000	0.0165	0.00713	0.456	0.0236	0.473	Y	PCE is a COPC (5)
Vinyl Chloride	c	0%	Y	-	30,000	-	0.000344	16.5	0.000344	16.5	Y	PCE is a COPC (5)
SVOCs (ug/kg)												
Benzoic Acid	n	30%	N	110	2,500,000,000	0.0000000440	-	-	0.0000000440	0.0000000440	N	C/SLV <1
Bis(2-ethylhexyl) Phthalate	c	82%	N	27,500	1,200,000	0.0229	0.979	3.92	1.00	NE	N	carc C/SLV <1
Butyl Benzyl Phthalate	c	14%	N	26.1	910,000	0.0000287	-	-	0.0000287	0.0000287	N	carc C/SLV <1
Carbazole	c	64%	N	322	1,000,000	0.000322	-	-	0.000322	0.000322	N	carc C/SLV <1
Dibenzofuran	n	53%	N	81.3	1,000,000	0.0000813	-	-	0.0000813	0.0000813	N	C/SLV <1
Diethyl Phthalate	n	9%	N	14.9	490,000,000	0.0000000304	-	-	0.0000000	0.0000000	N	C/SLV <1
Di-n-butyl Phthalate	n	23%	N	91.9	62,000,000	0.00000148	-	-	0.00000148	0.00000148	N	C/SLV <1
Di-n-octyl Phthalate	n	9%	N	20.0	1,200,000	0.0000167	-	-	NE	NE	N	C/SLV <1
Pentachlorophenol	c	5.1%	N	22.4	100,000	0.000224	0.00215	0.415	0.00238	0.415	N	carc C/SLV <1
Phenol	n	6%	N	4.98	180,000,000	0.0000000277	-	-	0.0000000277	0.0000000277	N	C/SLV <1
PAHs (ug/kg)												
2-Methylnaphthalene	n	39%	N	136	4,100,000	0.0000332	0.00117	0.000261	0.00120	0.000294	N	C/SLV <1
Acenaphthene	n	76%	N	584	19,000,000	0.0000307	0.0000718	0.000236	0.000103	0.000267	N	C/SLV <1
Acenaphthylene	n	40%	N	25.2	580,000	0.0000434	-	-	0.0000434	0.0000434	N	C/SLV <1
Anthracene	n	86%	N	1,320	93,000,000	0.0000142	-	-	0.0000142	0.0000142	N	C/SLV <1
Benzo(a)anthracene	c	90%	N	6,320	21,000	0.301	-	-	0.301	0.301	N	carc C/SLV <1
Benzo(a)pyrene	c	91%	Y	7,420	2,100	3.53	-	-	3.53	3.53	Y	carc C/SLV >1
Benzo(b)fluoranthene	c	96%	N	9,750	21,000	0.464	-	-	0.464	0.464	N	carc C/SLV <1
Benzo(g,h,i)perylene	c	86%	N	3,140	210,000	0.0150	-	-	0.0150	0.0150	N	carc C/SLV <1
Benzo(k)fluoranthene	c	96%	N	11,000	210,000	0.0524	-	-	0.0524	0.0524	N	carc C/SLV <1
Benzofluoranthenes, Total	c	90%	N	9,480	21,000	0.451	-	-	0.451	0.451	N	carc C/SLV <1

Table M-29
Identification of COPCs in Soil at All Four AOPCs Combined - Construction Worker
Bradford Island -Upland Operable Unit
(3 of 4)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
						$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-31)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-33)	Multimedia (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} + C/SLV_{gw})		
Chrysene	c	93%	N	6,340	2,100,000	0.00302	-	-	0.00302	0.00302	N	carc C/SLV <1
Dibenz(a,h)anthracene	c	71%	N	924	2,100	0.440	-	-	0.440	0.440	N	carc C/SLV <1
Fluoranthene	n	92%	N	12,800	8,900,000	0.00144	-	-	0.00144	0.00144	N	C/SLV <1
Fluorene	n	69%	N	211	12,000,000	0.0000176	-	-	0.0000176	0.0000176	N	C/SLV <1
Indeno(1,2,3-cd)pyrene	c	89%	N	3,680	21,000	0.175	-	-	0.175	0.175	N	carc C/SLV <1
Naphthalene	c	55%	N	219	580,000	0.000378	0.000175	0.000130	0.000552	0.000508	N	carc C/SLV <1
Phenanthrene	n	93%	N	4,060	93,000,000	0.0000437	0.0000441	0.0000584	0.0000877	0.000102	N	C/SLV <1
Pyrene	n	94%	N	14,100	6,700,000	0.00210	-	-	0.00210	0.00210	N	C/SLV <1
TPH (mg/kg)												
Diesel Range Organics	n	85%	N	1,190	23,000	0.0517	-	-	NE	0.0517	N	C/SLV <1
Gasoline Range Organics	n	23%	N	448	13,000	0.0345	0.00365	-	0.0381	0.0345	N	C/SLV <1
Residual Range Organics	n	89%	N	5,450	40,000	0.136	-	-	0.136	0.136	N	C/SLV <1
Sum cPAH C/RBC (ELCR)						**3.5E-06**						
Sum non-carcinogenic C/RBC (HI)						**0.254**						
Sum carcinogenic C/RBC (ELCR)						**7.3E-06**						

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
ft bgs = feet below surface
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
max =maximum
MCL = maximum contaminant level
mg/kg = milligrams per kilogram
n = non-carcinogen
NE = multi-media was not evaluated since the chemical is already identified as a COPC.
NRWQC = national recommended water quality criteria
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/kg = micrograms per kilogram
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals
WQC = water quality criteria

Notes
Only detected chemicals with a detection frequency greater than 5% and inorganics greater than reference are shown in this table except for degradation products of PCE (see footnote 5). Reporting limits for non-detected chemicals are evaluated separately.

Table M-29
Identification of COPCs in Soil at All Four AOPCs Combined - Construction Worker
Bradford Island -Upland Operable Unit
(4 of 4)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
						$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-31)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-33)	Multimedia (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})	Multimedia (bioaccumulation) sum(C/SLV_{soil} + C/SLV_{gw})		

Construction Worker hierarchical SLV selection for soil: 1. DEQ Soil RBCs (Direct Contact Construction,. 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.
Screening Levels Values for Groundwater: 1. DEQ Groundwater in Excavation Construction/Excavation RBCs (Appendix J-4b), 2. USEPA Tapwater RSL, and 3. Surrogates used as noted in Appendix J-4b.
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c.
For inorganics, the higher of the 95% Upper Prediction Limit (UPL) and lowest HH SLV was selected as the HH SLV. For all other analytes the heirarchy described above was used.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology.
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) Due to the lack of speciation data, the chromium in soil were compared to the more conservative hexavalent chromium SLVs.
(2) Lead in sieved soil samples corresponding to 250 micrometers or less size fraction.
(3) Lead in sieved soil samples corresponding to 2 millimeters or less size fraction.
(4) Lead in unsieved soil samples.
(5) Degradation products of PCE are retained as COPCs if PCE is identified as a COPC, even if not detected or detected at less than 5% frequency per DEQ (2010a).

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum cPAH C/RBC (ELCR) = includes only individual carcinogenic polyaromatic hydrocarbons selected as a COPC. Individual benzofluoranthenes, rather than total benzofluoranthenes, was used in the summation.
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Individual benzofluoranthenes, rather than total benzofluoranthenes, was used in the summation. Total aroclors, rather than individual aroclors, was used in the summation.
Ratios for SLVs based on Reference Upper Prediction Limits (UPLs) are not included in sum totals.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-30
Identification of COPCs in Soil at All Four AOPCs Combined - Excavation Worker
Bradford Island -Upland Operable Unit
(1 of 4)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
						$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-31)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-33)	Multimedia (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})	Multimedia (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})		
INORGANICS (mg/kg)												
Antimony	n	66%	N	1.71	410	0.00417	0.149	0.398	0.153	0.402	N	C/SLV <1
Arsenic	c	95%	N	7.85	370	0.0212	0.00142	457	0.0226	NE	N	carc C/SLV <1
Cadmium	c	85%	N	1.66	4,300	0.000386	0.0000335	-	0.000420	0.000386	N	carc C/SLV <1
Chromium	c	100%	N	501	26,000 (1)	0.0193	-	-	0.0193	0.0193	N	carc C/SLV <1
Lead - sieved <250um (2)	n	100%	N	418	800	0.523	-	-	0.523	0.523	N	C/SLV <1
Lead - sieved <2mm (3)	n	100%	N	303	800	0.379	-	-	0.379	0.379	N	C/SLV <1
Lead - unsieved (4)	n	100%	N	396	800	0.495	-	-	0.495	0.495	N	C/SLV <1
Mercury	n	75%	N	0.315	2,600	0.000121	0.135	-	0.1350	0.000121	N	C/SLV <1
Nickel	c	100%	N	243	20,000	0.0122	0.00000975	0.192	0.0122	0.204	N	carc C/SLV <1
Selenium	n	50%	N	0.385	5,100	0.0000755	0.0473	0.0501	0.047	0.0502	N	C/SLV <1
Silver	n	85%	N	0.255	43,000	0.00000593	0.000000276	-	0.00000621	0.00000593	N	C/SLV <1
Zinc	n	100%	N	175	310,000	0.000565	0.188	0.280	0.189	0.280	N	C/SLV <1
BUTYLTINS (ug/kg)												
Dibutyltin	n	24%	N	12.6	180,000	0.0000700	0.00533	-	0.00540	0.0000700	N	C/SLV <1
Monobutyltin	n	29%	N	7.36	180,000	0.0000409	0.00185	-	0.00189	0.0000409	N	C/SLV <1
Tributyltin	n	24%	N	186	180,000	0.00103	0.00325	-	0.00428	0.00103	N	C/SLV <1
PESTICIDES (ug/kg)												
4,4'-DDE	c	12%	N	1.09	1,600,000	0.000000681	-	-	0.000000681	0.000000681	N	carc C/SLV <1
4,4'-DDT	c	43%	N	17.3	1,600,000	0.0000108	-	-	0.0000108	0.0000108	N	carc C/SLV <1
Chlordane (alpha)	c	9%	N	0.952	1,500,000	0.000000635	-	-	0.000000635	0.000000635	N	carc C/SLV <1
Chlordane (gamma)	c	22%	N	11.8	1,500,000	0.00000787	-	-	0.00000787	0.00000787	N	carc C/SLV <1
Chlordane (technical)	c	27%	N	329	1,500,000	0.000219	-	-	0.000219	0.000219	N	carc C/SLV <1
Endosulfan I	n	7%	N	0.504	40,000,000	0.0000000126	-	-	0.0000000126	0.0000000126	N	C/SLV <1
Endosulfan II	n	6%	N	0.706	40,000,000	0.0000000177	-	-	0.0000000177	0.0000000177	N	C/SLV <1
Endosulfan Sulfate	n	10%	N	0.967	40,000,000	0.0000000242	-	-	0.0000000242	0.0000000242	N	C/SLV <1
Endrin Aldehyde	n	7%	N	2.76	2,000,000	0.00000138	-	-	0.00000138	0.00000138	N	C/SLV <1
Endrin Ketone	n	6%	N	2.43	2,000,000	0.00000122	-	-	0.00000122	0.00000122	N	C/SLV <1
Endrin	n	6%	N	3.09	2,000,000	0.00000155	-	-	0.00000155	0.00000155	N	C/SLV <1
Heptachlor	c	9%	N	0.445	100,000	0.00000445	-	-	0.00000445	0.00000445	N	carc C/SLV <1
PCBs (ug/kg)												
Aroclor 1254	c	20%	N	138	740	0.186	-	-	0.186	0.186	N	carc C/SLV <1
Aroclor 1260	c	82%	N	119	740	0.161	-	-	0.161	0.161	N	carc C/SLV <1
Total PCBs (Aroclors)	c	82%	N	254	740	0.343	-	-	0.343	0.343	N	carc C/SLV <1
HERBICIDES (ug/kg)												
2,4,5-T	n	6%	N	66.0	6,200,000	0.0000106	-	-	0.0000106	0.0000106	N	C/SLV <1
Dichloroprop	n	6%	N	171	4,900,000	0.0000349	-	-	0.0000349	0.0000349	N	C/SLV <1
MCPP	n	6%	N	10,000	620,000	0.0161	-	-	0.0161	0.0161	N	C/SLV <1
VOCs (ug/kg)												
1,2,4-Trimethylbenzene	n	33%	N	2,490	54,000,000	0.0000461	0.00306	-	0.00310	0.0000461	N	C/SLV <1
1,3,5-Trimethylbenzene	n	14%	N	362	42,000,000	0.00000862	-	-	0.00000862	0.00000862	N	C/SLV <1

Table M-30
Identification of COPCs in Soil at All Four AOPCs Combined - Excavation Worker
Bradford Island -Upland Operable Unit
(2 of 4)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
						$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-31)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-33)	Multimedia (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})	Multimedia (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})		
2-Butanone (MEK)	n	25%	N	9.00	200,000,000	0.0000000450	-	-	0.0000000450	0.0000000450	N	C/SLV <1
4-Isopropyltoluene	n	24%	N	12.7	24,000,000	0.000000529	-	-	0.000000529	0.000000529	N	C/SLV <1
4-Methyl-2-pentanone (MIBK)	n	12%	N	0.507	53,000,000	0.00000000957	-	-	0.00000000957	0.00000000957	N	C/SLV <1
Acetone	n	30%	N	78.9	630,000,000	0.000000125	0.000449	-	0.000449	0.000000125	N	C/SLV <1
Benzene	c	25%	N	0.374	9,500,000	0.0000000394	-	-	0.0000000394	0.0000000394	N	carc C/SLV <1
Bromomethane	n	11%	N	0.902	9,200,000	0.0000000980	-	-	0.0000000980	0.0000000980	N	C/SLV <1
Carbon Disulfide	n	32%	N	0.858	3,700,000	0.000000232	0.000988	-	0.000988	0.000000232	N	C/SLV <1
cis-1,2-Dichloroethene	n	5.3%	N	10.8	86,000,000	0.000000126	0.00276	-	0.00276	0.000000126	N	C/SLV <1
Dichlorodifluoromethane	n	8%	N	4.08	780,000	0.00000523	-	-	0.00000523	0.00000523	N	C/SLV <1
Dichloromethane (Methylene Chloride)	c	24%	N	34.8	75,000,000	0.000000464	-	-	0.000000464	0.000000464	N	carc C/SLV <1
Ethylbenzene	c	16%	N	266	44,000,000	0.00000605	-	-	0.00000605	0.00000605	N	carc C/SLV <1
m,p-Xylenes	n	17%	N	1,260	2,700,000	0.000467	-	-	0.000467	0.000467	N	C/SLV <1
Naphthalene	c	18%	N	834	16,000,000	0.0000521	-	-	0.0000521	0.0000521	N	carc C/SLV <1
o-Xylene	n	10%	N	508	19,000,000	0.0000267	-	-	0.0000267	0.0000267	N	C/SLV <1
Tetrachloroethene (PCE)	c	39%	N	53,300	1,100,000	0.0485	0.00725	2.52	0.0557	NE	N	carc C/SLV <1
Toluene	n	54%	N	12,400	45,000,000	0.000276	0.00000185	0.000298	0.000277	0.000574	N	C/SLV <1
Trichloroethene (TCE)	c	13%	N	710	1,200,000	0.000592	0.00713	0.456	0.00772	0.457	N	carc C/SLV <1
SVOCs (ug/kg)												
Benzoic Acid	n	30%	N	110	2,500,000,000	0.0000000440	-	-	0.0000000440	0.0000000440	N	C/SLV <1
Bis(2-ethylhexyl) Phthalate	c	82%	N	27,500	33,000,000	0.000833	0.979	3.92	0.980	NE	N	carc C/SLV <1
Butyl Benzyl Phthalate	c	14%	N	26.1	910,000	0.0000287	-	-	0.0000287	0.0000287	N	carc C/SLV <1
Carbazole	c	64%	N	322	1,000,000	0.000322	-	-	0.000322	0.000322	N	carc C/SLV <1
Dibenzofuran	n	53%	N	81.3	1,000,000	0.0000813	-	-	0.0000813	0.0000813	N	C/SLV <1
Diethyl Phthalate	n	9%	N	14.9	490,000,000	0.0000000304	-	-	0.0000000	0.0000000	N	C/SLV <1
Di-n-butyl Phthalate	n	23%	N	91.9	62,000,000	0.00000148	-	-	0.00000148	0.00000148	N	C/SLV <1
Di-n-octyl Phthalate	n	9%	N	20.0	33,000,000	0.000000606	-	-	NE	NE	N	C/SLV <1
Pentachlorophenol	c	5.1%	N	22.4	2,900,000	0.00000772	0.00215	0.415	0.00216	0.415	N	carc C/SLV <1
Phenol	n	6%	N	4.98	180,000,000	0.0000000277	-	-	0.0000000277	0.0000000277	N	C/SLV <1
PAHs (ug/kg)												
2-Methylnaphthalene	n	39%	N	136	4,100,000	0.0000332	0.00117	0.000261	0.00120	0.000294	N	C/SLV <1
Acenaphthene	n	76%	N	584	33,000,000	0.0000177	0.0000718	0.000236	0.0000895	0.000254	N	C/SLV <1
Acenaphthylene	n	40%	N	25.2	16,000,000	0.00000158	-	-	0.00000158	0.00000158	N	C/SLV <1
Anthracene	n	86%	N	1,320	170,000,000	0.00000776	-	-	0.00000776	0.00000776	N	C/SLV <1
Benzo(a)anthracene	c	90%	N	6,320	590,000	0.0107	-	-	0.0107	0.0107	N	carc C/SLV <1
Benzo(a)pyrene	c	91%	N	7,420	59,000	0.126	-	-	0.126	0.126	N	carc C/SLV <1
Benzo(b)fluoranthene	c	96%	N	9,750	590,000	0.0165	-	-	0.0165	0.0165	N	carc C/SLV <1
Benzo(g,h,i)perylene	c	86%	N	3,140	5,900,000	0.000532	-	-	0.000532	0.000532	N	carc C/SLV <1
Benzo(k)fluoranthene	c	96%	N	11,000	5,900,000	0.00186	-	-	0.00186	0.00186	N	carc C/SLV <1
Benzofluoranthenes, Total	c	90%	N	9,480	590,000	0.0161	-	-	0.0161	0.0161	N	carc C/SLV <1
Chrysene	c	93%	N	6,340	59,000,000	0.000107	-	-	0.000107	0.000107	N	carc C/SLV <1
Dibenz(a,h)anthracene	c	71%	N	924	59,000	0.0157	-	-	0.0157	0.0157	N	carc C/SLV <1
Fluoranthene	n	92%	N	12,800	22,000,000	0.000582	-	-	0.000582	0.000582	N	C/SLV <1
Fluorene	n	69%	N	211	22,000,000	0.00000959	-	-	0.00000959	0.00000959	N	C/SLV <1

Table M-30
Identification of COPCs in Soil at All Four AOPCs Combined - Excavation Worker
Bradford Island -Upland Operable Unit
(3 of 4)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
						$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-31)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-33)	Multimedia (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})	Multimedia (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})		
Indeno(1,2,3-cd)pyrene	c	89%	N	3,680	590,000	0.00624	-	-	0.00624	0.00624	N	carc C/SLV <1
Naphthalene	c	55%	N	219	16,000,000	0.0000137	0.000175	0.000130	0.000188	0.000144	N	carc C/SLV <1
Phenanthrene	n	93%	N	4,060	170,000,000	0.0000239	0.0000441	0.0000584	0.0000680	0.0000823	N	C/SLV <1
Pyrene	n	94%	N	14,100	17,000,000	0.000829	-	-	0.000829	0.000829	N	C/SLV <1
TPH (mg/kg)												
Diesel Range Organics	n	85%	N	1,190	70,000	0.0170	-	-	NE	0.0170	N	C/SLV <1
Gasoline Range Organics	n	23%	N	448	22,000	0.0204	0.00365	-	0.0240	0.0204	N	C/SLV <1
Residual Range Organics	n	89%	N	5,450	40,000	0.136	-	-	0.136	0.136	N	C/SLV <1
Sum non-carcinogenic C/RBC (HI)						**0.198**						
Sum carcinogenic C/RBC (ELCR)						**6.2E-07**						

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
ft bgs = feet below surface
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{soil}/SLV_{soil} only (i.e. single medium).
max =maximum
MCL = maximum contaminant level
mg/kg = milligrams per kilogram
n = non-carcinogen
NE = multi-media was not evaluated since the chemical is already identified as a COPC.
NRWQC = national recommended water quality criteria
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/kg = micrograms per kilogram
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals
WQC = water quality criteria

Notes
Only detected chemicals with a detection frequency greater than 5% and inorganics greater than reference are shown in this table. Reporting limits for non-detected chemicals are evaluated separately.
Excavation Worker hierarchical SLV selection for soil: 1. DEQ Soil RBCs (Direct Contact Excavation), 2. USEPA Soil Industrial RSL, 3. Outdoor Worker SLV, and 4. Surrogate used as noted in Appendix J-4a.
Screening Levels Values for Groundwater: 1. DEQ Groundwater in Excavation Construction/Excavation RBCs (Appendix J-4b), 2. USEPA Tapwater RSL, and 3. Surrogates used as noted in Appendix J-4b.
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c.
For inorganics, the higher of the 95% Upper Prediction Limit (UPL) and lowest HH SLV was selected as the HH SLV. For all other analytes the heirarchy described above was used.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf

Table M-30
Identification of COPCs in Soil at All Four AOPCs Combined - Excavation Worker
Bradford Island -Upland Operable Unit
(4 of 4)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4a)	Site concentration(C) / SLV					Retain as a COPC, Y/N?	Rationale
						$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Direct Contact Table M-31)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Table M-33)	Multimedia (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})	Multimedia (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})		

United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology.
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) Due to the lack of speciation data, the chromium in soil were compared to the more conservative hexavalent chromium SLVs.
(2) Lead in sieved soil samples corresponding to 250 micrometers or less size fraction.
(3) Lead in sieved soil samples corresponding to 2 millimeters or less size fraction.
(4) Lead in unsieved soil samples.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Individual benzofluoranthenes, rather than total benzofluoranthenes, was used in the summation. Total aroclors, rather than individual aroclors, was used in the summation.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-31
Identification of COPCs in Groundwater at All Four AOPCs Combined - Construction and Excavation Workers
Bradford Island -Upland Operable Unit
(1 of 3)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV: $\frac{C_{gw}}{SLV_{gw}}$ (direct contact)	$\frac{C_{soil}}{SLV_{soil}}$ (Construction Worker Table M-29)	Multimedia (1) (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})	Retain as a COPC, Y/N?	Rationale
INORGANICS (mg/L)										
Antimony	n	42%	Y	0.00223	0.015	0.149	0.00417	0.153	Y	C/SLV >0.1
Arsenic	c	86%	N	0.00823	5.8	0.00142	0.604	0.605	N	carc C/SLV <1
Barium	n	100%	N	0.165	25,000	0.00000660	-	0.00000660	N	C/SLV <0.1
Beryllium	c	37%	N	0.000351	250	0.00000140	-	0.00000140	N	carc C/SLV <1
Cadmium	c	32%	N	0.00191	57	0.0000335	0.0111	0.0111	N	carc C/SLV <1
Chromium	c	37%	N	0.00800	- (2)	-	0.545	0.545	N	C/SLV <1 (2)
Copper	n	58%	N	0.0438	5,000	0.00000876	-	0.00000876	N	C/SLV <0.1
Iron	n	90%	Y	17.0	26	0.654	-	0.654	Y	C/SLV >0.1
Lead	n	60%	N	0.0128	- (2)	-	0.495	0.495	N	C/SLV <1 (2)
Manganese	n	98%	N	1.91	3,000	0.000637	-	0.000637	N	C/SLV <0.1
Mercury	n	17%	Y	0.0000769	0.00057	0.135	0.00339	0.138	Y	C/SLV >0.1
Nickel	c	58%	N	0.117	12,000	0.00000975	0.0398	0.0398	N	carc C/SLV <1
Selenium	n	37%	N	0.00852	0.18	0.0473	0.0000755	0.0474	N	C/SLV <0.1
Silver	n	26%	N	0.000276	1,000	0.000000276	0.000170	0.000170	N	C/SLV <0.1
Thallium	n	47%	Y	0.000238	0.002	0.119	-	0.119	Y	C/SLV >0.1
Vanadium	n	90%	Y	0.00254	0.0026	0.977	-	0.977	Y	C/SLV >0.1
Zinc	n	79%	Y	2.07	11	0.188	0.000565	0.189	Y	C/SLV >0.1
BUTYLTINS (ug/L)										
Dibutyltin	n	28%	N	0.0586	11	0.00533	0.0000700	0.00540	N	C/SLV <0.1
Monobutyltin	n	15%	N	0.0203	11	0.00185	0.0000409	0.00189	N	C/SLV <0.1
Tributyltin	n	75%	N	0.0357	11	0.00325	0.00103	0.00428	N	C/SLV <0.1
HERBICIDES (ug/L)										
4-Nitrophenol	n	13%	N	0.840	11,000	0.0000764	-	0.0000764	N	C/SLV <0.1
Pentachlorophenol	c	13%	N	0.112	52	0.00215	-	0.00215	N	carc C/SLV <1
VOCs (ug/L)										
1,1,1-Trichloroethane (TCA)	n	7%	N	0.821	1,100,000	0.000000746	-	0.000000746	N	C/SLV <0.1
1,1-Dichloroethane	c	7%	N	2.00	10,000	0.000200	-	0.000200	N	carc C/SLV <1
1,2,4-Trimethylbenzene	n	7%	N	5.20	1,700	0.00306	0.00125	0.00430	N	C/SLV <0.1
Acetone	n	15%	N	9.88	22,000	0.000449	0.000000125	0.000449	N	C/SLV <0.1
Carbon Disulfide	n	22%	N	0.988	1,000	0.000988	0.000000232	0.000988	N	C/SLV <0.1
Chloroform	c	12%	N	0.392	720	0.000544	-	0.000544	N	carc C/SLV <1
cis-1,2-Dichloroethene	n	38%	N	331	120,000	0.00276	0.00000348	0.00276	N	C/SLV <0.1
Isopropylbenzene	n	7%	N	3.38	680	0.00497	-	0.00497	N	C/SLV <0.1
n-Propylbenzene	n	7%	N	1.30	1,300	0.00100	-	0.00100	N	C/SLV <0.1

Table M-31
Identification of COPCs in Groundwater at All Four AOPCs Combined - Construction and Excavation Workers
Bradford Island -Upland Operable Unit
(2 of 3)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV: $\frac{C_{gw}}{SLV_{gw}}$ (direct contact)	Site concentration(C) / SLV: $\frac{C_{soil}}{SLV_{soil}}$ (Construction Worker Table M-29)	Site concentration(C) / SLV: Multimedia (1) (direct contact) sum($C/SLV_{soil} + C/SLV_{gw}$)	Retain as a COPC, Y/N?	Rationale
Tetrachloroethene (PCE)	c	38%	N	1.74	240	0.00725	1.33	NE	N	carc C/SLV <1
Toluene	n	19%	N	0.388	210,000	0.00000185	0.000517	0.000519	N	C/SLV <0.1
trans-1,2-Dichloroethene	n	7%	N	0.679	14,000	0.0000485	0.000000507	0.0000490	N	C/SLV <0.1
Trichloroethene (TCE)	c	36%	N	1.14	160	0.00713	0.0165	0.0236	N	carc C/SLV <1
Vinyl Chloride	c	26%	N	0.413	1,200	0.000344	-	0.000344	N	carc C/SLV <1
SVOCs (ug/L)										
Bis(2-ethylhexyl) Phthalate	c	26%	N	4.70	4.8	0.979	0.0229	1.00	N	carc C/SLV <1
Diethyl Phthalate	n	13%	N	0.873	29,000	0.0000301	0.0000000304	0.0000301	N	C/SLV <0.1
Di-n-octyl Phthalate	n	13%	Y	4.61	4.8	0.960	0.0000167	0.960	Y	C/SLV >0.1
Isophorone	c	9%	N	0.177	71	0.00249	-	0.00249	N	carc C/SLV <1
PAHs (ug/L)										
2-Methylnaphthalene	n	17%	N	0.175	150	0.00117	0.0000332	0.00120	N	C/SLV <0.1
Acenaphthene	n	9%	N	0.158	2,200	0.0000718	0.0000307	0.000103	N	C/SLV <0.1
Naphthalene	c	13%	N	0.0873	500	0.000175	0.000378	0.000552	N	carc C/SLV <1
Phenanthrene	n	8%	N	0.485	11,000	0.0000441	0.0000437	0.0000877	N	C/SLV <0.1
TPH (mg/L)										
Diesel Range Organics	n	52%	N	0.278	- (2)	-	0.0517	0.0517	N	C/SLV <1 (2)
Gasoline Range Organics	n	26%	N	0.0474	13	0.00365	0.0345	0.0381	N	C/SLV <0.1
Residual Range Organics	n	36%	N	0.261	- (2)	-	0.136	0.136	N	C/SLV <1 (2)
Sum non-carcinogenic C/RBC (HI)						**3.26**				
Sum carcinogenic C/RBC (ELCR)						**1.0E-06**				

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
max =maximum
mg/L = milligrams per liter
n = non-carcinogen
NE = multi-media was not evaluated since the chemical is already identified as a COPC.
PAHs = polyaromatic hydrocarbons

Table M-31
Identification of COPCs in Groundwater at All Four AOPCs Combined - Construction and Excavation Workers
Bradford Island -Upland Operable Unit
(3 of 3)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
						$\frac{C_{gw}}{SLV_{gw}}$ (direct contact)	$\frac{C_{soil}}{SLV_{soil}}$ (Construction Worker Table M-29)	Multimedia (1) (direct contact) sum(C/SLV_{soil} + C/SLV_{gw})		

RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
TPH = total petroleum hydrocarbon
ug/L = micrograms per liter
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table. Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately.
Total metal results are reported.
Construction Worker hierarchical SLV selection for soil: 1. DEQ Soil RBCs (Direct Contact Construction,. 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.
Screening Levels Values for Groundwater: 1. DEQ Groundwater in Excavation Construction/Excavation RBCs (Appendix J-4b), 2. USEPA Tapwater RSL, and 3. Surrogates used as noted in Appendix J-4b.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) At the request of DEQ, COPC selection for groundwater is done separately for the on-site groundwater ingestion pathway and the groundwater discharge to surface water pathway. Therefore, this screening accounts only for on-site upland exposure to groundwater.
(2) The SLV for these chemcials are not available due to exceeding the solubility point in water.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:

[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media

For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-32
Identification of COPCs in Groundwater at All Four AOPCs Combined - Potable Water User
Bradford Island -Upland Operable Unit
(1 of 3)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV: $\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-28)	$\frac{C_{soil\ gas}}{SLV_{soil\ gas}}$ (Indoor Worker Table M-16)	Multimedia (1) sum(C/SLV_{soil} + C/SLV_{gw} + C/SLV_{sg})	Retain as a COPC, Y/N?	Rationale
INORGANICS (mg/L)											
Antimony	n	42%	Y	0.00223	0.015	0.149	0.00400	-	0.153	Y	C/SLV >0.1
Arsenic	c	86%	Y	0.00823	0.000038	217	1.52	-	218	Y	carc C/SLV >1
Barium	n	100%	N	0.165	7.3	0.0226	-	-	0.0226	N	C/SLV <0.1
Beryllium	c	37%	N	0.000351	0.073	0.00481	-	-	0.00481	N	carc C/SLV <1
Cadmium	c	32%	N	0.00191	0.018	0.106	0.00334	-	0.109	N	carc C/SLV <1
Chromium	c	37%	N	0.00800	55 (2)	0.000145	2.68	-	NE	N	carc C/SLV <1
Copper	n	58%	N	0.0438	1.5	0.0292	-	-	0.0292	N	C/SLV <0.1
Iron	n	90%	Y	17.0	26	0.654	-	-	0.654	Y	C/SLV >0.1
Lead	n	60%	Y	0.0128	0.015	0.853	0.495 (3)	-	1.35	Y	C/SLV >0.1
Manganese	n	98%	Y	1.91	0.88	2.17	-	-	2.17	Y	C/SLV >0.1
Mercury	n	17%	N	0.0000769	0.011	0.00699	0.00106	-	0.00806	N	C/SLV <0.1
Nickel	c	58%	N	0.117	0.73	0.160	0.0117	-	0.172	N	carc C/SLV <1
Selenium	n	37%	N	0.00852	0.18	0.0473	0.0000845	-	0.0474	N	C/SLV <0.1
Silver	n	26%	N	0.000276	0.18	0.00153	0.0000406	-	0.00157	N	C/SLV <0.1
Thallium	n	47%	Y	0.000238	0.002	0.119	-	-	0.119	Y	C/SLV >0.1
Vanadium	n	90%	Y	0.00254	0.0026	0.977	-	-	0.977	Y	C/SLV >0.1
Zinc	n	79%	Y	2.07	11	0.188	0.000555	-	0.189	Y	C/SLV >0.1
BUTYLTINS (ug/L)											
Dibutyltin	n	28%	N	0.0586	11	0.00533	0.0000817	-	0.00541	N	C/SLV <0.1
Monobutyltin	n	15%	N	0.0203	11	0.00185	0.0000484	-	0.00189	N	C/SLV <0.1
Tributyltin	n	75%	N	0.0357	11	0.00325	0.00122	-	0.00446	N	C/SLV <0.1
HERBICIDES (ug/L)											
4-Nitrophenol	n	13%	N	0.840	11,000	0.0000764	-	-	0.0000764	N	C/SLV <0.1
Pentachlorophenol	c	13%	N	0.112	0.47	0.238	0.00191	-	0.240	N	carc C/SLV <1
VOCs (ug/L)											
1,1,1-Trichloroethane (TCA)	n	7%	N	0.821	9,100	0.0000902	-	0.00000445	0.0000947	N	C/SLV <0.1
1,1-Dichloroethane	c	7%	Y	2.00	2.3	0.870	-	-	0.870	N	carc C/SLV <1
1,1-Dichloroethene	n	4%	Y	2.10	340	0.00618	-	-	0.00618	Y	PCE is a COPC (4)
1,2,4-Trimethylbenzene	n	7%	Y	5.20	15	0.347	0.00292	0.597	0.946	Y	C/SLV >0.1
Acetone	n	15%	N	9.88	22,000	0.000449	0.000000144	0.000000693	0.000450	N	C/SLV <0.1
Carbon Disulfide	n	22%	N	0.988	1,000	0.000988	0.000000270	0.0000135	0.00100	N	C/SLV <0.1
Chloroform	c	12%	Y	0.392	0.19	2.06	-	0.00142	2.06	Y	carc C/SLV >1
cis-1,2-Dichloroethene	n	38%	Y	331	360	0.919	0.0000120	0.00127	0.921	Y	C/SLV >0.1
Isopropylbenzene	n	7%	N	3.38	680	0.00497	-	0.000375	0.00535	N	C/SLV <0.1
n-Propylbenzene	n	7%	N	1.30	1,300	0.00100	-	0.000523	0.00152	N	C/SLV <0.1
Tetrachloroethene (PCE)	c	38%	Y	1.74	0.093	18.7	8.71	16.2	43.6	Y	carc C/SLV >1

Table M-32
Identification of COPCs in Groundwater at All Four AOPCs Combined - Potable Water User
Bradford Island -Upland Operable Unit
(2 of 3)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV: $\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-28)	$\frac{C_{soil\ gas}}{SLV_{soil\ gas}}$ (Indoor Worker Table M-16)	Multimedia (1) sum(C/SLV_{soil} + C/SLV_{gw} + C/SLV_{sg})	Retain as a COPC, Y/N?	Rationale
Toluene	n	19%	N	0.388	2,300	0.000169	0.0000527	0.00216	0.00238	N	C/SLV <0.1
trans-1,2-Dichloroethene	n	7%	Y	0.679	110	0.00617	0.000000248	0.0000154	0.00619	Y	PCE is a COPC (4)
Trichloroethene (TCE)	c	36%	Y	1.14	0.039	29.2	0.214	4.36	33.8	Y	carc C/SLV >1
Vinyl Chloride	c	26%	Y	0.413	0.025	16.5	-	-	16.5	Y	carc C/SLV >1
SVOCs (ug/L)											
Bis(2-ethylhexyl) Phthalate	c	26%	Y	4.70	4.1	1.15	0.209	-	1.36	Y	carc C/SLV >1
Diethyl Phthalate	n	13%	N	0.873	29,000	0.0000301	0.0000000318	-	0.0000301	N	C/SLV <0.1
Di-n-octyl Phthalate	n	13%	Y	4.61	4.1	1.12	0.000129	-	1.12	Y	C/SLV >0.1
Isophorone	c	9%	N	0.177	71	0.00249	-	-	0.00249	N	carc C/SLV <1
PAHs (ug/L)											
2-Methylnaphthalene	n	17%	N	0.175	150	0.00117	0.0000378	-	0.00120	N	C/SLV <0.1
Acenaphthene	n	9%	N	0.158	2,200	0.0000718	0.00000925	-	0.0000811	N	C/SLV <0.1
Naphthalene	c	13%	N	0.0873	0.14	0.624	0.00700	-	0.631	N	carc C/SLV <1
Phenanthrene	n	8%	N	0.485	11,000	0.0000441	0.0000228	-	0.0000669	N	C/SLV <0.1
TPH (mg/L)											
Diesel Range Organics	n	52%	Y	0.278	0.09	3.09	0.00676	-	3.10	Y	C/SLV >0.1
Gasoline Range Organics	n	26%	Y	0.0474	0.1	0.474	0.0355	-	0.510	Y	C/SLV >0.1
Residual Range Organics	n	36%	Y	0.261	0.29	0.900	0.0508	-	0.951	Y	C/SLV >0.1
Sum non-carcinogenic C/RBC (HI)						**11.2**					
Sum carcinogenic C/RBC (ELCR)						**2.9E-04**					

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
max =maximum
MCL = maximum contaminant level
mg/L = milligrams per liter
n = non-carcinogen
NE = multi-media was not evaluated since the chemical is already identified as a COPC.
PAHs = polyaromatic hydrocarbons
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon

Table M-32
Identification of COPCs in Groundwater at All Four AOPCs Combined - Potable Water User
Bradford Island -Upland Operable Unit
(3 of 3)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV				Retain as a COPC, Y/N?	Rationale
						$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-28)	$\frac{C_{soil\ gas}}{SLV_{soil\ gas}}$ (Indoor Worker Table M-16)	Multimedia (1) $sum(C/SLV_{soil} + C/SLV_{gw} + C/SLV_{sg})$		

ug/L = micrograms per liter
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals

Notes
Only detected chemicals with a detection frequency greater than 5% are shown in this table except for degradation products of PCE (see footnote 4). Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately.
Total metal results are reported.
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, 3. Surrogate used as noted in Appendix J-4a.
Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, 4. Surrogates used as noted in Appendix J-4b.
Hierarchy developed to select Screening Level Values for Soil gas; 1. DEQ Soil Gas Vapor Intrusion Occupational RBCs, 2. Adjusted USEPA Industrial Air RSLs, and 3. Surrogates used as noted in Appendix J-4d.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) At the request of DEQ, COPC selection for groundwater is done separately for the on-site groundwater ingestion pathway and the groundwater discharge to surface water pathway. Therefore, this screening accounts only for on-site upland exposure to groundwater.
(2) Chromium in water is likely to be Cr III because of aerobic conditions.
(3) Lead- unseived soil C/SLV was used.
(4) Degradation products of PCE are retained as COPCs if PCE is identified as a COPC, even if not detected or detected at less than 5% frequency per DEQ (2010a).

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-33
Identification of COPCs in Groundwater at All Four AOPCs Combined - Discharge and Bioaccumulation
Bradford Island -Upland Operable Unit
(1 of 3)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4c)	Site concentration(C) / SLV				Bioaccumulative Potential? (Y/N) (Table J-6)	Retain as a COPC, Y/N?	Rationale
						$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-28)	$\frac{C_{soil\ gas}}{SLV_{soil\ gas}}$ (Indoor Worker Table M-16)	Multimedia (1) sum(C/SLV_{soil} + C/SLV_{gw} + C/SLV_{sg})			
INORGANICS (mg/L)												
Antimony	n	42%	Y	0.00223	0.0056	0.398	0.00400	-	0.402	N	Y	C/SLV >0.1
Arsenic	c	86%	Y	0.00823	0.000018	457	1.52	-	459	Y	Y	carc C/SLV >1
Barium	n	100%	Y	0.165	1	0.165	-	-	0.165	N	Y	C/SLV >0.1
Beryllium	c	37%	N	0.000351	-	-	-	-	-	N	N	Not Bioaccumulative
Cadmium	c	32%	N	0.00191	-	-	0.00334	-	0.00334	N	N	Not Bioaccumulative
Chromium	c	37%	N	0.00800	- (2)	-	2.68	-	2.68	N	N	Not Bioaccumulative
Copper	n	58%	N	0.0438	1.3	0.0337	-	-	0.0337	N	N	C/SLV <0.1
Iron	n	90%	N	17.0	0.3	56.7	-	-	-	N	N	See footnote (3)
Lead	n	60%	Y	0.0128	-	-	0.495 (4)	-	0.495	Y	Y	No SLV
Manganese	n	98%	N	1.91	0.05	38.2	-	-	38.2	Y	N	See footnote (3)
Mercury	n	17%	Y	0.0000769	-	-	0.00106	-	0.00106	Y	Y	No SLV
Nickel	c	58%	N	0.117	0.61	0.192	0.0117	-	0.204	N	N	carc C/SLV <1
Selenium	n	37%	N	0.00852	0.17	0.0501	0.0000845	-	0.0502	N	N	C/SLV <0.1
Silver	n	26%	N	0.000276	-	-	0.0000406	-	0.0000406	N	N	Not Bioaccumulative
Thallium	n	47%	Y	0.000238	0.00024	0.992	-	-	0.992	Y	Y	C/SLV >0.1
Vanadium	n	90%	Y	0.00254	-	-	-	-	-	NA	Y	No SLV
Zinc	n	79%	Y	2.07	7.4	0.280	0.000555	-	0.280	Y	Y	C/SLV >0.1
BUTYLTINS (ug/L)												
Dibutyltin	n	28%	N	0.0586	-	-	0.0000817	-	0.0000817	N	N	Not Bioaccumulative
Monobutyltin	n	15%	N	0.0203	-	-	0.0000484	-	0.0000484	N	N	Not Bioaccumulative
Tributyltin	n	75%	Y	0.0357	-	-	0.00122	-	0.00122	Y	Y	No SLV
HERBICIDES (ug/L)												
4-Nitrophenol	n	13%	N	0.840	10,000	0.000084	-	-	0.0000840	N	N	C/SLV <0.1
Pentachlorophenol	c	13%	N	0.112	0.27	0.415	0.00191	-	0.417	Y	N	carc C/SLV <1
VOCs (ug/L)												
1,1,1-Trichloroethane (TCA)	n	7%	N	0.821	-	-	-	0.00000445	0.00000445	N	N	Not Bioaccumulative
1,1-Dichloroethane	c	7%	N	2.00	-	-	-	-	-	N	N	Not Bioaccumulative
1,1-Dichloroethene	n	4%	Y	2.10	330	0.00636	-	-	0.00636	N	Y	PCE is COPC (5)
1,2,4-Trimethylbenzene	n	7%	Y	5.20	-	-	0.00292	0.597	0.600	Y	Y	No SLV
Acetone	n	15%	N	9.88	-	-	0.000000144	0.000000693	0.000000837	N	N	Not Bioaccumulative
Carbon Disulfide	n	22%	N	0.988	-	-	0.000000270	0.0000135	0.0000138	N	N	Not Bioaccumulative
Chloroform	c	12%	N	0.392	5.7	0.0688	-	0.00142	0.0702	N	N	carc C/SLV <1
cis-1,2-Dichloroethene	n	38%	Y	331	-	-	0.0000120	0.00127	0.00128	N	Y	PCE is COPC (5)
Isopropylbenzene	n	7%	Y	3.38	-	-	-	0.000375	0.000375	Y	Y	No SLV
n-Propylbenzene	n	7%	Y	1.30	-	-	-	0.000523	0.000523	Y	Y	No SLV
Tetrachloroethene (PCE)	c	38%	Y	1.74	0.69	2.52	8.71	16.2	27.4	N	Y	carc C/SLV >1
Toluene	n	19%	N	0.388	1,300	0.000298	0.0000527	0.00216	0.00251	N	N	C/SLV <0.1
trans-1,2-Dichloroethene	n	7%	Y	0.679	140	0.00485	0.000000248	0.0000154	0.00487	N	Y	PCE is COPC (5)
Trichloroethene (TCE)	c	36%	Y	1.14	2.5	0.456	0.214	4.36	NE	N	Y	PCE is COPC (5)
Vinyl Chloride	c	26%	Y	0.413	0.025	16.5	-	-	16.5	N	Y	carc C/SLV >1

Table M-33
Identification of COPCs in Groundwater at All Four AOPCs Combined - Discharge and Bioaccumulation
Bradford Island -Upland Operable Unit
(2 of 3)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4c)	Site concentration(C) / SLV				Bioaccumulative Potential? (Y/N) (Table J-6)	Retain as a COPC, Y/N?	Rationale
						$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-28)	$\frac{C_{soil\ gas}}{SLV_{soil\ gas}}$ (Indoor Worker Table M-16)	Multimedia (1) sum(C/SLV_{soil} + C/SLV_{gw} + C/SLV_{sg})			
SVOCs (ug/L)												
Bis(2-ethylhexyl) Phthalate	c	26%	Y	4.70	1.2	3.92	0.209	-	4.13	Y	Y	carc C/SLV >1
Diethyl Phthalate	n	13%	N	0.873	17,000	0.0000514	0.0000000318	-	0.0000514	N	N	C/SLV <0.1
Di-n-octyl Phthalate	n	13%	Y	4.61	1.2	3.84	0.000129	-	3.84	Y	Y	C/SLV >0.1
Isophorone	c	9%	N	0.177	35	0.00506	-	-	0.00506	N	N	carc C/SLV <1
PAHs (ug/L)												
2-Methylnaphthalene	n	17%	N	0.175	670	0.000261	0.0000378	-	0.000299	Y	N	C/SLV <0.1
Acenaphthene	n	9%	N	0.158	670	0.000236	0.00000925	-	0.000245	Y	N	C/SLV <0.1
Naphthalene	c	13%	N	0.0873	670	0.000130	0.00700	-	0.00713	N	N	carc C/SLV <1
Phenanthrene	n	8%	N	0.485	8,300	0.0000584	0.0000228	-	0.0000812	Y	N	C/SLV <0.1
TPH (mg/L)							-					
Diesel Range Organics	n	52%	N	0.278	-	-	0.00676	-	0.00676	NA	N	Evaluated as PAHs
Gasoline Range Organics	n	26%	N	0.0474	-	-	0.0355	-	0.0355	NA	N	Evaluated as VOCs
Residual Range Organics	n	36%	N	0.261	-	-	0.0508	-	0.0508	NA	N	Evaluated as PAHs
Sum non-carcinogenic C/RBC (HI)						**5.77**						
Sum carcinogenic C/RBC (ELCR)						**4.8E-04**						

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency greater than 5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
gw = groundwater
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
max =maximum
mg/L = milligrams per liter
n = non-carcinogen
NE = multi-media was not evaluated since the chemical is already identified as a COPC.
NRWQC = national recommended water quality criteria
PAHs = polyaromatic hydrocarbons
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
sg = soil gas
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/L = micrograms per liter
UCL = 95% upper confidence limit
USEPA = United States Environmental Protection Agency
VOCs = volatile organic chemicals
WQC = water quality criteria

Table M-33
Identification of COPCs in Groundwater at All Four AOPCs Combined - Discharge and Bioaccumulation
Bradford Island -Upland Operable Unit
(3 of 3)

Chemicals of Interest	note	Detection Rate	Already an AOPC-specific COPC? Y/N	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4c)	Site concentration(C) / SLV				Bioaccumulative Potential? (Y/N) (Table J-6)	Retain as a COPC, Y/N?	Rationale
						$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation)	$\frac{C_{soil}}{SLV_{soil}}$ (Occupational Worker Table M-28)	$\frac{C_{soil\ gas}}{SLV_{soil\ gas}}$ (Indoor Worker Table M-16)	Multimedia (1) sum(C/SLV_{soil} + C/SLV_{gw} + C/SLV_{sg})			

Notes

Only detected chemicals with a detection frequency greater than 5% are shown in this table except for degradation products of PCE (see footnote 5). Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately.
Total metal results are reported.
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a.
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c.
Hierarchy developed to select Screening Level Values for Soil gas; 1. DEQ Soil Gas Vapor Intrusion Occupational RBCs, 2. Adjusted USEPA Industrial Air RSLs, and 3. Surrogates used as noted in Appendix J-4d.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology.

Footnotes
(1) At the request of DEQ, COPC selection for groundwater is done separately for the on-site groundwater ingestion pathway and the groundwater discharge to surface water pathway. Therefore, this screening accounts only for on-site upland exposure to groundwater.
(2) There is no SLV for chromium, but it is likely to exist in the trivalent form in the aerobic surface water environment
(3) SLVs are based on aesthetic considerations and are not included in summations or as a COPCs.
(4) Lead- unseived soil C/SLV was used.
(5) Degradation products of PCE are retained as COPCs if PCE is identified as a COPC, even if not detected or detected at less than 5% frequency per DEQ (2010a).

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately. Iron and manganese not included in summation, see footnote (3).
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if detection frequency exceeds 5% and sample size is greater than 20, inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-34
Summary of COPCs - All Four AOPCs Combined
Bradford Island -Upland Operable Unit
(1 of 1)

Media	Receptor	HI	ELCR	COPCs
Soil	Adult Outdoor Worker	0.123	5.0E-05	Arsenic Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzofluoranthenes, Total Chromium Dibenz(a,h)anthracene Indeno(1,2,3-cd)pyrene Tetrachloroethene (PCE) Lead # Trichloroethene (TCE) 1,1-Dichloroethene # cis-1,2-Dichloroethene # trans-1,2-Dichloroethene # Vinyl Chloride
	Construction Worker	0.254	7.3E-06	Benzo(a)pyrene Tetrachloroethene (PCE) 1,1-Dichloroethene # cis-1,2-Dichloroethene # trans-1,2-Dichloroethene # Trichloroethene (TCE) Vinyl Chloride
	Excavation Worker	0.198	6.2E-07	No COPCs
Groundwater	Construction/Excavation Worker	3.26	1.0E-06	Antimony # Iron # Mercury # Thallium # Vanadium # Zinc # Di-n-octyl Phthalate
	Potable Water User	11.2	**2.9E-04**	Arsenic Bis(2-ethylhexyl) Phthalate Chloroform Diesel Range Organics # Di-n-octyl Phthalate Manganese # Tetrachloroethene (PCE) Trichloroethene (TCE) Vinyl Chloride 1,2,4-Trimethylbenzene # Antimony # cis-1,2-Dichloroethene # Gasoline Range Organics # Iron # Lead # Residual Range Organics # Thallium # Vanadium # Zinc # 1,1-Dichloroethene # trans-1,2-Dichloroethene #
	Discharge and Bioaccumulation	NE	NE	Arsenic Bis(2-ethylhexyl) Phthalate Di-n-octyl Phthalate # Tetrachloroethene (PCE) Antimony # Barium # Thallium # Zinc # 1,2,4-Trimethylbenzene # Isopropylbenzene # Lead # Mercury # n-Propylbenzene # Tributyltin # Vanadium # 1,1-Dichloroethene # cis-1,2-Dichloroethene # trans-1,2-Dichloroethene # Trichloroethene (TCE) Vinyl Chloride

Bold = COPCs ELCR >1E-04
- = Not evaluated
= non-carcinogenic COPC
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
COPC = chemicals of potential concern
ELCR = excess lifetime cancer risk
HI = hazard index
NE = Cumulative HI and ELCR not evaluated. These pathways were evaluated only to see if additional COPCs were identified for All Four Combined AOPCs.
PCBs = polychlorinated biphenyls
Shaded indicates COPC rationales not based on C/SLV>1 (multi-media, C/SLV>0.1, degradation product, or No SLV)

Table M-35
Identification of COPCs in Tissue at Forebay AOPC – Subsistence Fisher
Bradford Island - River Operable Unit
(1 of 4)

Medium	Chemicals of Interest	note	IUPAC #	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4f)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
							$\frac{C_{tissue}}{SLV_{tissue}}$	$\frac{C_{sw}}{SLV_{sw}}$ (Potable Water User Table M-39)	Multimedia (direct contact) sum(C/SLV_{sw} + C/SLV_{tissue})		
INORGANICS (mg/kg ww)											
Tissue - Crayfish	Antimony	n	-	100%	0.0420	64 (1)	0.000656	-	0.000656	N	C/SLV <0.1
Tissue - Crayfish	Arsenic	c	-	100%	0.519	0.00076	683	26.6	709	Y	carc C/SLV >1
Tissue - Crayfish	Chromium	c	-	100%	0.764	20 (1)	0.0382	-	0.0382	N	carc C/SLV <1
Tissue - Crayfish	Mercury	n	-	100%	0.0237	0.049	0.484	-	0.484	N	C/SLV <1
Tissue - Crayfish	Methyl Mercury	n	-	100%	0.0329	0.049	0.671	-	0.671	N	C/SLV <1
Tissue - Crayfish	Nickel	c	-	100%	4.88	460 (1)	0.0106	-	0.0106	N	carc C/SLV <1
PCBs (ug/kg ww)											
Tissue - Crayfish	3,3',4,4'-Tetrachlorobiphenyl	c	77	100%	0.00867	0.076	0.114	0.0000256	0.114	N	carc C/SLV <1 (2)
Tissue - Crayfish	3,4,4',5-Tetrachlorobiphenyl	c	81	27%	0.000452	0.025	0.0181	-	0.0181	N	carc C/SLV <1 (2)
Tissue - Crayfish	2,3,3',4,4'-Pentachlorobiphenyl	c	105	80%	0.0908	0.25	0.363	0.000104	0.363	N	carc C/SLV <1 (2)
Tissue - Crayfish	2,3,4,4',5-Pentachlorobiphenyl	c	114	93%	0.697	0.25	2.79	-	2.79	Y	carc C/SLV >1
Tissue - Crayfish	2,3',4,4',5-Pentachlorobiphenyl	c	118	100%	11.9	0.25	47.6	0.000302	47.6	Y	carc C/SLV >1
Tissue - Crayfish	2,3',4,4',5'-Pentachlorobiphenyl	c	123	93%	0.412	0.25	1.65	-	1.65	Y	carc C/SLV >1
Tissue - Crayfish	3,3',4,4',5-Pentachlorobiphenyl	c	126	47%	0.00208	0.000076	27.4	-	27.4	Y	carc C/SLV >1
Tissue - Crayfish	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	c	156 + 157 (3)	100%	3.53	0.25	14.1	0.000355	14.1	Y	carc C/SLV >1
Tissue - Crayfish	2,3',4,4',5,5'-Hexachlorobiphenyl	c	167	100%	1.49	0.25	5.96	0.00000304	5.96	Y	carc C/SLV >1
Tissue - Crayfish	2,3,3',4,4',5,5'-Heptachlorobiphenyl	c	189	80%	0.0821	0.25	0.328	0.0000127	0.328	N	carc C/SLV <1 (2)
Tissue - Crayfish	Total PCBs As Congeners (KM, capped; NDs at MDL)	c	-	100%	36.5	0.57	64.0	0.00123	64.0	Y	carc C/SLV >1
Tissue - Crayfish	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	c	-	100%	0.00117	0.0000076	153	-	153	Y	carc C/SLV >1
SVOCs (ug/kg ww)											
Tissue - Crayfish	Bis(2-ethylhexyl) Phthalate	c	-	27%	77.4	81.9 (1)	0.945	-	0.945	N	carc C/SLV <1
PAHs (ug/kg ww)											
Tissue - Crayfish	Acenaphthene	n	-	47%	0.160	15,000	0.0000107	0.000000581	0.0000112	N	C/SLV <1
Tissue - Crayfish	Anthracene	n	-	27%	0.0940	15,000	0.00000627	0.0000000110	0.00000628	N	C/SLV <1
Tissue - Crayfish	Benzo(a)anthracene	c	-	67%	0.273	1.57 (1)	0.174	0.00207	0.176	N	carc C/SLV <1
Tissue - Crayfish	Benzo(a)pyrene	c	-	20%	0.135	0.157 (1)	0.859	-	0.859	N	carc C/SLV <1
Tissue - Crayfish	Benzo(b)fluoranthene	c	-	47%	0.140	1.57 (1)	0.0891	0.00316	0.0923	N	carc C/SLV <1
Tissue - Crayfish	Benzo(g,h,i)perylene	c	-	27%	0.165	15.7 (1)	0.0105	-	0.0105	N	carc C/SLV <1
Tissue - Crayfish	Benzo(k)fluoranthene	c	-	47%	0.111	15.7 (1)	0.00706	-	0.00706	N	carc C/SLV <1
Tissue - Crayfish	Chrysene	c	-	53%	0.144	157 (1)	0.000916	0.0000591	0.000976	N	carc C/SLV <1
Tissue - Crayfish	Fluoranthene	n	-	100%	0.426	20,000	0.0000213	0.000000523	0.0000218	N	C/SLV <1
Tissue - Crayfish	Fluorene	n	-	33%	0.165	15,000	0.0000110	-	0.0000110	N	C/SLV <1
Tissue - Crayfish	Indeno(1,2,3-cd)pyrene	c	-	20%	0.166	1.57 (1)	0.106	-	0.106	N	carc C/SLV <1
Tissue - Crayfish	Phenanthrene	n	-	67%	0.576	15,000	0.0000384	0.000000146	0.0000385	N	C/SLV <1

Table M-35
Identification of COPCs in Tissue at Forebay AOPC – Subsistence Fisher
Bradford Island - River Operable Unit
(2 of 4)

Medium	Chemicals of Interest	note	IUPAC #	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4f)	Site concentration(C) / SLV: $\frac{C_{tissue}}{SLV_{tissue}}$	Site concentration(C) / SLV: $\frac{C_{sw}}{SLV_{sw}}$ (Potable Water User Table M-39)	Site concentration(C) / SLV: Multimedia (direct contact) sum(C/SLV_{sw} + C/SLV_{tissue})	Retain as a COPC, Y/N?	Rationale
Tissue - Crayfish	Pyrene	n	-	100%	0.468	15,000	0.0000312	-	0.0000312	N	C/SLV <1
Tissue - Crayfish	**Sum non-carcinogenic C/RBC (HI)**						**0.672**				
Tissue - Crayfish	**Sum carcinogenic C/RBC (ELCR)**						**7.5E-04**				
INORGANICS (mg/kg ww)											
Tissue - Smallmouth Bass	Aluminum	n	-	100%	7.11	18,500 (1)	0.000384	0.00381	0.00420	N	C/SLV <0.1
Tissue - Smallmouth Bass	Barium	n	-	100%	1.73	4 (1)	0.433	0.00370	0.436	Y	C/SLV >0.1
Tissue - Smallmouth Bass	Copper	n	-	100%	0.764	260 (1)	0.00294	0.000527	0.00347	N	C/SLV <0.1
Tissue - Smallmouth Bass	Mercury	n	-	100%	0.317	0.049	6.47	-	6.47	Y	C/SLV >0.1
Tissue - Smallmouth Bass	Zinc	n	-	100%	14.9	1,000 (1)	0.0149	0.000682	0.0156	N	C/SLV <0.1
PCBs (ug/kg ww)											
Tissue - Smallmouth Bass	Aroclor 1242	c	-	5.3%	260	0.57	456	-	456	Y	carc C/SLV >1
Tissue - Smallmouth Bass	Aroclor 1254	c	-	37%	4,047	0.57	7,100	-	7,100	Y	carc C/SLV >1
Tissue - Smallmouth Bass	Total PCBs As Aroclors (NDs at MDL)	c	-	37%	4,100	0.57	7,193	-	7,193	Y	carc C/SLV >1
Tissue - Smallmouth Bass	3,3',4,4'-Tetrachlorobiphenyl	c	77	100%	5.64	0.076	74.2	0.0000256	74.2	Y	carc C/SLV >1
Tissue - Smallmouth Bass	3,4,4',5-Tetrachlorobiphenyl	c	81	89%	0.691	0.025	27.6	-	27.6	Y	carc C/SLV >1
Tissue - Smallmouth Bass	2,3,3',4,4'-Pentachlorobiphenyl	c	105	100%	887	0.25	3,548	0.000104	3,548	Y	carc C/SLV >1
Tissue - Smallmouth Bass	2,3,4,4',5-Pentachlorobiphenyl	c	114	100%	65.6	0.25	262	-	262	Y	carc C/SLV >1
Tissue - Smallmouth Bass	2,3',4,4',5-Pentachlorobiphenyl	c	118	100%	2,310	0.25	9,240	0.000302	9,240	Y	carc C/SLV >1
Tissue - Smallmouth Bass	2,3',4,4',5'-Pentachlorobiphenyl	c	123	100%	38.7	0.25	155	-	155	Y	carc C/SLV >1
Tissue - Smallmouth Bass	3,3',4,4',5-Pentachlorobiphenyl	c	126	95%	1.92	0.000076	25,263	-	25,263	Y	carc C/SLV >1
Tissue - Smallmouth Bass	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	c	156 + 157 (3)	100%	375	0.25	1,500	0.000355	1,500	Y	carc C/SLV >1
Tissue - Smallmouth Bass	2,3',4,4',5,5'-Hexachlorobiphenyl	c	167	100%	108	0.25	432	0.00000304	432	Y	carc C/SLV >1
Tissue - Smallmouth Bass	2,3,3',4,4',5,5'-Heptachlorobiphenyl	c	189	100%	8.14	0.25	32.6	0.0000127	32.6	Y	carc C/SLV >1
Tissue - Smallmouth Bass	Total PCBs As Congeners (KM, capped; NDs at MDL)	c	-	100%	19,314	0.57	33,884	0.00123	33,884	Y	carc C/SLV >1
Tissue - Smallmouth Bass	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	c	-	100%	0.307	0.0000076	40,421	-	40,421	Y	carc C/SLV >1
SVOCs (ug/kg ww)											
Tissue - Smallmouth Bass	Bis(2-ethylhexyl) Phthalate	c	-	37%	349	81.9 (1)	4.26	-	4.26	Y	carc C/SLV >1
Tissue - Smallmouth Bass	Butyl Benzyl Phthalate	c	-	11%	239	604 (1)	0.396	-	0.396	N	carc C/SLV <1
Tissue - Smallmouth Bass	Di-n-butyl Phthalate	n	-	5.3%	150	49,157 (1)	0.00305	-	0.00305	N	C/SLV <0.1
PAHs (ug/kg ww)											
Tissue - Smallmouth Bass	Acenaphthene	n	-	84%	1.07	15,000	0.0000713	0.000000581	0.0000719	N	C/SLV <0.1
Tissue - Smallmouth Bass	Anthracene	n	-	95%	11.8	15,000	0.000785	0.0000000110	0.000785	N	C/SLV <0.1
Tissue - Smallmouth Bass	Benzo(a)anthracene	c	-	26%	3.69	1.57 (1)	2.35	0.00207	2.35	Y	carc C/SLV >1
Tissue - Smallmouth Bass	Benzo(a)pyrene	c	-	42%	3.25	0.157 (1)	20.7	-	20.7	Y	carc C/SLV >1
Tissue - Smallmouth Bass	Benzo(b)fluoranthene	c	-	32%	4.21	1.57 (1)	2.68	0.00316	2.68	Y	carc C/SLV >1
Tissue - Smallmouth Bass	Benzo(g,h,i)perylene	c	-	32%	1.46	15.7 (1)	0.0929	-	0.0929	N	carc C/SLV <1

Table M-35
Identification of COPCs in Tissue at Forebay AOPC – Subsistence Fisher
Bradford Island - River Operable Unit
(3 of 4)

Medium	Chemicals of Interest	note	IUPAC #	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4f)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
							$\frac{C_{tissue}}{SLV_{tissue}}$	$\frac{C_{sw}}{SLV_{sw}}$ (Potable Water User Table M-39)	Multimedia (direct contact) sum(C/SLV_{sw} + C/SLV_{tissue})		
Tissue - Smallmouth Bass	Benzo(k)fluoranthene	c	-	47%	3.29	15.7 (1)	0.209	-	0.209	N	carc C/SLV <1
Tissue - Smallmouth Bass	Chrysene	c	-	42%	2.81	157 (1)	0.0179	0.0000591	0.0179	N	carc C/SLV <1
Tissue - Smallmouth Bass	Dibenz(a,h)anthracene	c	-	32%	1.72	0.157 (1)	10.9	-	10.9	Y	carc C/SLV >1
Tissue - Smallmouth Bass	Fluoranthene	n	-	53%	3.03	20,000	0.000152	0.000000523	0.000152	N	C/SLV <0.1
Tissue - Smallmouth Bass	Fluorene	n	-	89%	2.52	15,000	0.000168	-	0.000168	N	C/SLV <0.1
Tissue - Smallmouth Bass	Indeno(1,2,3-cd)pyrene	c	-	37%	2.76	1.57 (1)	1.76	-	1.76	Y	carc C/SLV >1
Tissue - Smallmouth Bass	Phenanthrene	n	-	100%	2.88	15,000	0.000192	0.000000146	0.000192	N	C/SLV <0.1
Tissue - Smallmouth Bass	Pyrene	n	-	47%	2.30	15,000	0.000153	-	0.000153	N	C/SLV <0.1
Tissue - Smallmouth Bass	**Sum cPAH C/RBC (ELCR)**						**3.8E-05**				
Tissue - Smallmouth Bass	**Sum non-carcinogenic C/RBC (HI)**						**6.92**				
Tissue - Smallmouth Bass	**Sum carcinogenic C/RBC (ELCR)**						**3.4E-02**				

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
ATL = acceptable tissue level
BCF = bioconcentration factor
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{tissue}/SLV_{tissue} only (i.e. single medium).
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{tissue}/SLV_{tissue} only (i.e. single medium).
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
max =maximum
MCL = maximum contaminant level
MDL = method detection limit
mg/kg = milligrams per kilogram
n = non-carcinogen
ND = non detect
PAHs = polyaromatic hydrocarbons
PCBs =polychlorinated biphenyls
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
SVOCs = semivolatile organic chemicals
sw = surface water
UCL = 95% upper confidence limit
ug/kg = micrograms per kilogram
USEPA = United States Environmental Protection Agency
ww = wet weight

Notes
Only detected chemicals with a detection frequency greater than 5% and inorganics greater than reference (see Table 8-3) are shown in this table. Reporting limits for non-detected chemicals are evaluated separately.
Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, 4. Surrogates used as noted in Appendix J-4b.
Hierarchy was developed to determine Screening Levels Values for Tissue; 1. Minimum of DEQ HH Bioaccumulative ATLs (human subsistence/tribal) (Appendix J-4f).

Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf

Table M-35
Identification of COPCs in Tissue at Forebay AOPC – Subsistence Fisher
Bradford Island - River Operable Unit
(4 of 4)

Medium	Chemicals of Interest	note	IUPAC #	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4f)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
							$\frac{C_{tissue}}{SLV_{tissue}}$	$\frac{C_{sw}}{SLV_{sw}}$ (Potable Water User Table M-39)	Multimedia (direct contact) sum(C/SLV_{sw} + C/SLV_{tissue})		

United States Environmental Protection Agency (USEPA) 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) SLVs were calculated ATLs using DEQ Methodology (DEQ 2007); see Section 11.3.4.1.1 and Appendix J-2.
(2) An individual dioxin-like congener may not qualify as a COPC based on DEQ's screening methodology. However, all dioxin-like congeners are retained as COPCs since they contribute to Total PCBs as Congeners and TEQs which are selected as COPCs
(3) PCB Congener 157 co-elutes with PCB Congener 156.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum cPAH C/RBC (ELCR) = includes only individual carcinogenic polyaromatic hydrocarbons selected as a COPC. Only shown for a receptor if cPAH(s) have been selected as COPC.
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. If methyl mercury was available, it was the only form of mercury used in the summation, otherwise total mercury was usec
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Total PCBs As Congeners were the only form of PCB that were used in the summation.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if-inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-36
Identification of COPCs in Sediment at Forebay AOPC – Subsistence Fisher
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest	note	IUPAC #	Detection Rate (1)	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4e)	Site concentration(C) / SLV: C_{sed} / SLV_{sed}	Site concentration(C) / SLV: C_{sw} / SLV_{sw} (Potable Water User Table M-39)	Site concentration(C) / SLV: Multimedia (direct contact) sum(C/SLV_{sed} + C/SLV_{sw})	Bioaccumulative Potential? (Y/N)	Retain as a COPC, Y/N?	Rationale
INORGANICS (mg/kg)											
Arsenic	c	-	100%	Statistically ≤ to Reference Area (see Table 7-18 in RI)					Y	N	≤ Reference UPL
Barium	n	-	100%	Statistically ≤ to Reference Area (see Table 7-18 in RI)					N	N	≤ Reference UPL
Mercury	n	-	100%	Statistically ≤ to Reference Area (see Table 7-18 in RI)					Y	N	≤ Reference UPL
PCBs (ug/kg dw)											
Aroclor 1254	c	-	11%	27.0	0.048	563	-	563	Y	Y	carc C/SLV >1
Total PCBs As Aroclors (NDs at MDL)	c	-	11%	28.7	0.048	598	-	598	Y	Y	carc C/SLV >1
3,3',4,4'-Tetrachlorobiphenyl	c	77	100%	0.00223	0.0064	0.348	0.0000256	0.348	Y	N	carc C/SLV <1 (2)
2,3,3',4,4'-Pentachlorobiphenyl	c	105	100%	0.318	0.021	15.1	0.000104	15.1	Y	Y	carc C/SLV >1
2,3,4,4',5-Pentachlorobiphenyl	c	114	79%	0.0238	0.021	1.13	-	1.13	Y	Y	carc C/SLV >1
2,3',4,4',5-Pentachlorobiphenyl	c	118	100%	0.783	0.026	30.1	0.000302	30.1	Y	Y	carc C/SLV >1
2,3',4,4',5'-Pentachlorobiphenyl	c	123	58%	0.0146	0.026	0.562	-	0.562	Y	N	carc C/SLV <1 (2)
3,3',4,4',5-Pentachlorobiphenyl	c	126	16%	0.000188	0.0000062	30.3	-	30.3	Y	Y	carc C/SLV >1
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	c	156 + 157 (3)	95%	0.149	0.026	5.73	0.000355	5.73	Y	Y	carc C/SLV >1
2,3',4,4',5,5'-Hexachlorobiphenyl	c	167	84%	0.0449	0.026	1.73	0.00000304	1.73	Y	Y	carc C/SLV >1
2,3,3',4,4',5,5'-Heptachlorobiphenyl	c	189	47%	0.00169	0.14	0.0121	0.0000127	0.0121	Y	N	carc C/SLV <1 (2)
Total PCBs As Congeners (KM, capped; NDs at MDL)	c	-	100%	3.59	0.048	74.7	0.00123	74.7	Y	Y	carc C/SLV >1
PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	c	-	100%	0.0000895	0.0000011	81.4	0.000127	81.4	Y	Y	carc C/SLV >1
SVOCs (ug/kg dw)											
Bis(2-ethylhexyl) Phthalate	c	-	16%	180	-	-	-	-	Y	Y	No SLV
PAHs (ug/kg dw)											
Benzo(a)anthracene	c	-	63%	4.68	47,000 (4)	0.0000996	0.00207	0.00217	Y	N	carc C/SLV <1
Benzo(a)pyrene	c	-	58%	4.52	47,000 (4)	0.0000962	-	0.0000962	Y	N	carc C/SLV <1
Benzo(b)fluoranthene	c	-	47%	5.73	47,000 (4)	0.000122	0.00316	0.00328	Y	N	carc C/SLV <1
Indeno(1,2,3-cd)pyrene	c	-	47%	3.47	47,000 (4)	0.0000738	-	0.0000738	Y	N	carc C/SLV <1
Sum non-carcinogenic C/RBC (HI)						-					
Sum carcinogenic C/RBC (ELCR)						**7.5E-05**					

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality

Table M-36
Identification of COPCs in Sediment at Forebay AOPC – Subsistence Fisher
Bradford Island - River Operable Unit
(2 of 2)

dw = dry weight
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{sed}/SLV_{sed} only (i.e. single medium).
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{sed}/SLV_{sed} only (i.e. single medium).
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
max =maximum
MCL = maximum contaminant level
MDL = method detection limit
mg/kg = milligrams per kilogram
n = non-carcinogen
NA = not applicable
ND = non detect
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
RBC = risk based concentration
RSL = regional screening level
sed = sediment
SLV = screening level value
SVOCs = semivolatile organic chemicals
sw = surface water
TPH = total petroleum hydrocarbon
UCL = 95% upper confidence limit
ug/kg = micrograms per kilogram
USEPA = United States Environmental Protection Agency

Notes
Only Subsitence Tissue COPCs with a detection frequency >5% are shown in this table (see Table M-35). Reporting limits for non-detected chemicals are evaluated separately.
Sum non-carcinogenic is not calculated because there are no non-carcinogenic Chemicals of Interest.
Hierarchy was developed to determine Screening Levels Values for Sediment; 1. DEQ HH Subsistence Bioaccumulative SLVs and 2. Surrogates used as noted in Appendix J-4e.
Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, 4. Surrogates used as noted in Appendix J-4b.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) Sample size was less than 20 so detection frequency was not taken into consideration for COPC selection.
(2) An individual dioxin-like congener may not qualify as a COPC based on DEQ's screening methodology. However, all dioxin-like congeners are retained as COPCs since they contribute to Total PCBs as Congeners and TEQs which are selected as COPCs.
(3) PCB Congener 157 co-elutes with PCB Congener 156.
(4) Non-cancer based sediment SLVs may not be adequately protective of cancer endpoint.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Total PCBs As Congeners were the only form of PCB that were used in the summation.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if-inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-37
Identification of COPCs in Tissue at Forebay AOPC – Recreational Fisher
Bradford Island - River Operable Unit
(1 of 4)

Medium	Chemicals of Interest	note	IUPAC #	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4f)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
							$\frac{C_{tissue}}{SLV_{tissue}}$	$\frac{C_{sw}}{SLV_{sw}}$ (Potable Water User Table M-39)	Multimedia (direct contact) sum(C/SLV_{sw} + C/SLV_{tissue})		
INORGANICS (mg/kg ww)											
Tissue - Crayfish	Antimony	n	-	100%	0.0420	64 (1)	0.000656	-	0.000656	N	C/SLV <0.1
Tissue - Crayfish	Arsenic	c	-	100%	0.519	0.0062	83.7	26.6	110	Y	carc C/SLV >1
Tissue - Crayfish	Chromium	c	-	100%	0.764	20 (1)	0.0382	-	0.0382	N	carc C/SLV <1
Tissue - Crayfish	Mercury	n	-	100%	0.0237	0.4	0.0593	-	0.0593	N	C/SLV <1
Tissue - Crayfish	Methyl Mercury	n	-	100%	0.0329	0.4	0.0823	-	0.0823	N	C/SLV <1
Tissue - Crayfish	Nickel	c	-	100%	4.88	460 (1)	0.0106	-	0.0106	N	carc C/SLV <1
PCBs (ug/kg ww)											
Tissue - Crayfish	3,3',4,4'-Tetrachlorobiphenyl	c	77	100%	0.00867	0.62	0.0140	0.0000256	0.0140	Y	carc C/SLV <1 (2)
Tissue - Crayfish	3,4,4',5-Tetrachlorobiphenyl	c	81	27%	0.000452	0.21	0.00215	-	0.00215	Y	carc C/SLV <1 (2)
Tissue - Crayfish	2,3,3',4,4'-Pentachlorobiphenyl	c	105	80%	0.0908	2.1	0.0432	0.000104	0.0433	Y	carc C/SLV <1 (2)
Tissue - Crayfish	2,3,4,4',5-Pentachlorobiphenyl	c	114	93%	0.697	2.1	0.332	-	0.332	Y	carc C/SLV <1 (2)
Tissue - Crayfish	2,3',4,4',5-Pentachlorobiphenyl	c	118	100%	11.9	2.1	5.67	0.000302	5.67	Y	carc C/SLV >1
Tissue - Crayfish	2,3',4,4',5'-Pentachlorobiphenyl	c	123	93%	0.412	2.1	0.196	-	0.196	Y	carc C/SLV <1 (2)
Tissue - Crayfish	3,3',4,4',5-Pentachlorobiphenyl	c	126	47%	0.00208	0.00062	3.35	-	3.35	Y	carc C/SLV >1
Tissue - Crayfish	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	c	156 + 157 (3)	100%	3.53	2.1	1.68	0.000355	1.68	Y	carc C/SLV >1
Tissue - Crayfish	2,3',4,4',5,5'-Hexachlorobiphenyl	c	167	100%	1.49	2.1	0.710	0.00000304	0.710	Y	carc C/SLV <1 (2)
Tissue - Crayfish	2,3,3',4,4',5,5'-Heptachlorobiphenyl	c	189	80%	0.0821	2.1	0.0391	0.0000127	0.0391	Y	carc C/SLV <1 (2)
Tissue - Crayfish	Total PCBs As Congeners (KM, capped; NDs at MDL)	c	-	100%	36.5	4.7	7.77	0.00123	7.77	Y	carc C/SLV >1
Tissue - Crayfish	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	c	-	100%	0.00117	0.000062	18.8	-	18.8	Y	carc C/SLV >1
SVOCs (ug/kg ww)											
Tissue - Crayfish	Bis(2-ethylhexyl) Phthalate	c	-	27%	77.4	667 (1)	0.116	-	0.116	N	carc C/SLV <1
PAHs (ug/kg ww)											
Tissue - Crayfish	Acenaphthene	n	-	47%	0.160	120,000	0.00000133	0.000000581	0.00000191	N	C/SLV <1
Tissue - Crayfish	Anthracene	n	-	27%	0.0940	120,000	0.000000783	0.0000000110	0.000000794	N	C/SLV <1
Tissue - Crayfish	Benzo(a)anthracene	c	-	67%	0.273	12.8 (1)	0.0214	0.00207	0.0234	N	carc C/SLV <1
Tissue - Crayfish	Benzo(a)pyrene	c	-	20%	0.135	1.28 (1)	0.106	-	0.106	N	carc C/SLV <1
Tissue - Crayfish	Benzo(b)fluoranthene	c	-	47%	0.140	12.8 (1)	0.0110	0.00316	0.0141	N	carc C/SLV <1
Tissue - Crayfish	Benzo(g,h,i)perylene	c	-	27%	0.165	128 (1)	0.00129	-	0.00129	N	carc C/SLV <1
Tissue - Crayfish	Benzo(k)fluoranthene	c	-	47%	0.111	128 (1)	0.000868	-	0.000868	N	carc C/SLV <1
Tissue - Crayfish	Chrysene	c	-	53%	0.144	1,279 (1)	0.000113	0.0000591	0.000172	N	carc C/SLV <1
Tissue - Crayfish	Fluoranthene	n	-	100%	0.426	160,000	0.00000266	0.000000523	0.00000319	N	C/SLV <1
Tissue - Crayfish	Fluorene	n	-	33%	0.165	120,000	0.00000138	-	0.00000138	N	C/SLV <1
Tissue - Crayfish	Indeno(1,2,3-cd)pyrene	c	-	20%	0.166	12.8 (1)	0.0130	-	0.0130	N	carc C/SLV <1

Table M-37
Identification of COPCs in Tissue at Forebay AOPC – Recreational Fisher
Bradford Island - River Operable Unit
(2 of 4)

Medium	Chemicals of Interest	note	IUPAC #	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4f)	Site concentration(C) / SLV: $\frac{C_{tissue}}{SLV_{tissue}}$	Site concentration(C) / SLV: $\frac{C_{sw}}{SLV_{sw}}$ (Potable Water User Table M-39)	Site concentration(C) / SLV: Multimedia (direct contact) sum(C/SLV_{sw} + C/SLV_{tissue})	Retain as a COPC, Y/N?	Rationale
Tissue - Crayfish	Phenanthrene	n	-	67%	0.576	120,000	0.00000480	0.000000146	0.00000495	N	C/SLV <1
Tissue - Crayfish	Pyrene	n	-	100%	0.468	120,000	0.00000390	-	0.00000390	N	C/SLV <1
Tissue - Crayfish	**Sum non-carcinogenic C/RBC (HI)**						**0.0829**				
Tissue - Crayfish	**Sum carcinogenic C/RBC (ELCR)**						**9.2E-05**				
INORGANICS (mg/kg ww)											
Tissue - Smallmouth Bass	Aluminum	n	-	100%	7.11	18,500 (1)	0.000384	0.00381	0.00420	N	C/SLV <0.1
Tissue - Smallmouth Bass	Barium	n	-	100%	1.73	4 (1)	0.433	0.00370	0.436	Y	C/SLV >0.1
Tissue - Smallmouth Bass	Copper	n	-	100%	0.764	260 (1)	0.0029	0.000527	0.00347	N	C/SLV <0.1
Tissue - Smallmouth Bass	Mercury	n	-	100%	0.317	0.4	0.793	-	0.793	Y	C/SLV >0.1
Tissue - Smallmouth Bass	Zinc	n	-	100%	14.9	1,000 (1)	0.0149	0.000682	0.0156	N	C/SLV <0.1
PCBs (ug/kg ww)											
Tissue - Smallmouth Bass	Aroclor 1242	c	-	5.3%	260	4.7	55.3	-	55.3	Y	carc C/SLV >1
Tissue - Smallmouth Bass	Aroclor 1254	c	-	37%	4,047	4.7	861	-	861	Y	carc C/SLV >1
Tissue - Smallmouth Bass	Total PCBs As Aroclors (NDs at MDL)	c	-	37%	4,100	4.7	872	-	872	Y	carc C/SLV >1
Tissue - Smallmouth Bass	3,3',4,4'-Tetrachlorobiphenyl	c	77	100%	5.64	0.62	9.10	0.0000256	9.10	Y	carc C/SLV >1
Tissue - Smallmouth Bass	3,4,4',5-Tetrachlorobiphenyl	c	81	89%	0.691	0.21	3.29	-	3.29	Y	carc C/SLV >1
Tissue - Smallmouth Bass	2,3,3',4,4'-Pentachlorobiphenyl	c	105	100%	887	2.1	422	0.000104	422	Y	carc C/SLV >1
Tissue - Smallmouth Bass	2,3,4,4',5-Pentachlorobiphenyl	c	114	100%	65.6	2.1	31.2	-	31.2	Y	carc C/SLV >1
Tissue - Smallmouth Bass	2,3',4,4',5-Pentachlorobiphenyl	c	118	100%	2,310	2.1	1,100	0.000302	1,100	Y	carc C/SLV >1
Tissue - Smallmouth Bass	2,3',4,4',5'-Pentachlorobiphenyl	c	123	100%	38.7	2.1	18.4	-	18.4	Y	carc C/SLV >1
Tissue - Smallmouth Bass	3,3',4,4',5-Pentachlorobiphenyl	c	126	95%	1.92	0.00062	3,097	-	3,097	Y	carc C/SLV >1
Tissue - Smallmouth Bass	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	c	156 + 157 (3)	100%	375	2.1	179	0.000355	179	Y	carc C/SLV >1
Tissue - Smallmouth Bass	2,3',4,4',5,5'-Hexachlorobiphenyl	c	167	100%	108	2.1	51.4	0.00000304	51.4	Y	carc C/SLV >1
Tissue - Smallmouth Bass	2,3,3',4,4',5,5'-Heptachlorobiphenyl	c	189	100%	8.14	2.1	3.88	0.0000127	3.88	Y	carc C/SLV >1
Tissue - Smallmouth Bass	Total PCBs As Congeners (KM, capped; NDs at MDL)	c	-	100%	19,314	4.7	4,109	0.00123	4,109	Y	carc C/SLV >1
Tissue - Smallmouth Bass	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	c	-	100%	0.307	0.000062	4,955	-	4,955	Y	carc C/SLV >1
SVOCs (ug/kg ww)											
Tissue - Smallmouth Bass	Bis(2-ethylhexyl) Phthalate	c	-	37%	349	667 (1)	0.524	-	0.524	N	carc C/SLV <1
Tissue - Smallmouth Bass	Butyl Benzyl Phthalate	c	-	11%	239	4,912 (1)	0.0487	-	0.0487	N	carc C/SLV <1
Tissue - Smallmouth Bass	Di-n-butyl Phthalate	n	-	5.3%	150	400,000 (1)	0.000375	-	0.000375	N	C/SLV <1
PAHs (ug/kg ww)											
Tissue - Smallmouth Bass	Acenaphthene	n	-	84%	1.07	120,000	0.00000892	0.000000581	0.00000950	N	C/SLV <1
Tissue - Smallmouth Bass	Anthracene	n	-	95%	11.8	120,000	0.0000981	0.0000000110	0.0000981	N	C/SLV <1
Tissue - Smallmouth Bass	Benzo(a)anthracene	c	-	26%	3.69	12.8 (1)	0.288	0.00207	0.291	N	carc C/SLV <1
Tissue - Smallmouth Bass	Benzo(a)pyrene	c	-	42%	3.25	1.28 (1)	2.55	-	2.55	Y	carc C/SLV >1
Tissue - Smallmouth Bass	Benzo(b)fluoranthene	c	-	32%	4.21	12.8 (1)	0.329	0.00316	0.332	N	carc C/SLV <1

Table M-37
Identification of COPCs in Tissue at Forebay AOPC – Recreational Fisher
Bradford Island - River Operable Unit
(3 of 4)

Medium	Chemicals of Interest	note	IUPAC #	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4f)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
							$\frac{C_{tissue}}{SLV_{tissue}}$	$\frac{C_{sw}}{SLV_{sw}}$ (Potable Water User Table M-39)	Multimedia (direct contact) sum(C/SLV_{sw} + C/SLV_{tissue})		
Tissue - Smallmouth Bass	Benzo(g,h,i)perylene	c	-	32%	1.46	128 (1)	0.0114	-	0.0114	N	carc C/SLV <1
Tissue - Smallmouth Bass	Benzo(k)fluoranthene	c	-	47%	3.29	128 (1)	0.0257	-	0.0257	N	carc C/SLV <1
Tissue - Smallmouth Bass	Chrysene	c	-	42%	2.81	1,279 (1)	0.00220	0.0000591	0.00226	N	carc C/SLV <1
Tissue - Smallmouth Bass	Dibenz(a,h)anthracene	c	-	32%	1.72	1.28 (1)	1.35	-	1.35	Y	carc C/SLV >1
Tissue - Smallmouth Bass	Fluoranthene	n	-	53%	3.03	160,000	0.0000189	0.000000523	0.0000195	N	C/SLV <1
Tissue - Smallmouth Bass	Fluorene	n	-	89%	2.52	120,000	0.0000210	-	0.0000210	N	C/SLV <1
Tissue - Smallmouth Bass	Indeno(1,2,3-cd)pyrene	c	-	37%	2.76	12.8 (1)	0.216	-	0.216	N	carc C/SLV <1
Tissue - Smallmouth Bass	Phenanthrene	n	-	100%	2.88	120,000	0.0000240	0.000000146	0.0000241	N	C/SLV <1
Tissue - Smallmouth Bass	Pyrene	n	-	47%	2.30	120,000	0.0000192	-	0.0000192	N	C/SLV <1
Tissue - Smallmouth Bass	**Sum cPAH C/RBC (ELCR)**						**3.9E-06**				
Tissue - Smallmouth Bass	**Sum non-carcinogenic C/RBC (HI)**						**1.24**				
Tissue - Smallmouth Bass	**Sum carcinogenic C/RBC (ELCR)**						**4.1E-03**				

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
ATL = acceptable tissue level
BCF = bioconcentration factor
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{tissue}/SLV_{tissue} only (i.e. single medium).
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{tissue}/SLV_{tissue} only (i.e. single medium).
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
max =maximum
MCL = maximum contaminant level
MDL = method detection limit
mg/kg = milligrams per kilogram
n = non-carcinogen
ND = non detect
PAHs = polyaromatic hydrocarbons
PCBs =polychlorinated biphenyls
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
SVOCs = semivolatile organic chemicals
sw = surface water
UCL = 95% upper confidence limit
ug/kg = micrograms per kilogram
USEPA = United States Environmental Protection Agency
ww = wet weight

Notes
Only detected chemicals with a detection frequency greater than 5% and inorganics greater than reference are shown in this table. Reporting limits for non-detected chemicals are evaluated separately.
Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, 4. Surrogates used as noted in Appendix J-4b.
Hierarchy was developed to determine Screening Levels Values for Tissue; 1. Minimum of DEQ HH Bioaccumulative ATLs (human general/recreational) (Appendix J-4f).
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31.

Table M-37
Identification of COPCs in Tissue at Forebay AOPC – Recreational Fisher
Bradford Island - River Operable Unit
(4 of 4)

Medium	Chemicals of Interest	note	IUPAC #	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4f)	Site concentration(C) / SLV			Retain as a COPC, Y/N?	Rationale
							$\frac{C_{tissue}}{SLV_{tissue}}$	$\frac{C_{sw}}{SLV_{sw}}$ (Potable Water User Table M-39)	Multimedia (direct contact) sum(C/SLV_{sw} + C/SLV_{tissue})		

DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) SLVs were calculated ATLs using DEQ Methodology (DEQ 2007); see Section 11.3.4.1.1 and Appendix J-2.
(2) An individual dioxin-like congener may not qualify as a COPC based on DEQ's screening methodology. However, all dioxin-like congeners are retained as COPCs since they contribute to Total PCBs as Congeners and TEQs which are selected as COPCs
(2) PCB Congener 157 co-elutes with PCB Congener 156.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum cPAH C/RBC (ELCR) = includes only individual carcinogenic polyaromatic hydrocarbons selected as a COPC. Only shown for a receptor if cPAH(s) have been selected as COPC.
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. If methyl mercury was available, it was the only form of mercury used in the summation, otherwise total mercury was usec
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Total PCBs As Congeners were the only form of PCB that were used in the summation.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-38
Identification of COPCs in Sediment at Forebay AOPC – Recreational Fisher
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest	note	IUPAC #	Detection Rate (1)	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4e)	Site concentration(C) / SLV: C_{sed} / SLV_{sed}	Site concentration(C) / SLV: C_{sw} / SLV_{sw} (Potable Water User Table M-39)	Site concentration(C) / SLV: Multimedia (direct contact) sum(C/SLV_{sed} + C/SLV_{sw})	Bioaccumulative Potential? (Y/N)	Retain as a COPC, Y/N?	Rationale
INORGANICS (mg/kg)											
Arsenic	c	-	100%	Statistically ≤ to Reference Area (see Table 7-18 in RI)					Y	N	≤ Reference UPL
Barium	n	-	100%	Statistically ≤ to Reference Area (see Table 7-18 in RI)					N	N	≤ Reference UPL
Mercury	n	-	100%	Statistically ≤ to Reference Area (see Table 7-18 in RI)					Y	N	≤ Reference UPL
PCBs (ug/kg dw)											
Aroclor 1254	c	-	11%	27.0	0.39	69.2	-	69.2	Y	Y	carc C/SLV >1
Total PCBs As Aroclors (NDs at MDL)	c	-	11%	28.7	0.39	73.6	-	73.6	Y	Y	carc C/SLV >1
3,3',4,4'-Tetrachlorobiphenyl	c	77	100%	0.00223	0.052	0.0429	0.0000256	0.0429	Y	Y	carc C/SLV <1 (2)
2,3,3',4,4'-Pentachlorobiphenyl	c	105	100%	0.318	0.17	1.87	0.000104	1.87	Y	Y	carc C/SLV >1
2,3,4,4',5-Pentachlorobiphenyl	c	114	79%	0.0238	0.17	0.140	-	0.140	Y	Y	carc C/SLV <1 (2)
2,3',4,4',5-Pentachlorobiphenyl	c	118	100%	0.783	0.12	6.53	0.000302	6.53	Y	Y	carc C/SLV >1
2,3',4,4',5'-Pentachlorobiphenyl	c	123	58%	0.0146	0.21	0.0695	-	0.0695	Y	Y	carc C/SLV <1 (2)
3,3',4,4',5-Pentachlorobiphenyl	c	126	16%	0.000188	0.00005	3.76	-	3.76	Y	Y	carc C/SLV >1
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	c	156 + 157 (3)	95%	0.149	0.21	0.710	0.000355	0.710	Y	Y	carc C/SLV <1 (2)
2,3',4,4',5,5'-Hexachlorobiphenyl	c	167	84%	0.0449	0.21	0.214	0.00000304	0.214	Y	Y	carc C/SLV <1 (2)
2,3,3',4,4',5,5'-Heptachlorobiphenyl	c	189	47%	0.00169	1.2	0.00141	0.0000127	0.00142	Y	Y	carc C/SLV <1 (2)
Total PCBs As Congeners (KM, capped; NDs at MDL)	c	-	100%	3.59	0.39	9.19	0.00123	9.19	Y	Y	carc C/SLV >1
PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	c	-	100%	0.0000895	0.0000091	9.84	0.000127	9.84	Y	Y	carc C/SLV >1
PAHs (ug/kg dw)											
Benzo(a)pyrene	c	-	58%	4.52	380,000 (4)	0.0000119	-	0.0000119	Y	N	carc C/SLV <1
Sum non-carcinogenic C/RBC (HI)						**-**					
Sum carcinogenic C/RBC (ELCR)						**9.2E-06**					

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
AOPC = area of potential concern
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
dw = dry weight
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{sed}/SLV_{sed} only (i.e. single medium).
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{sed}/SLV_{sed} only (i.e. single medium).
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
max =maximum

Table M-38
Identification of COPCs in Sediment at Forebay AOPC – Recreational Fisher
Bradford Island - River Operable Unit
(2 of 2)

MCL = maximum contaminant level
MDL = method detection limit
mg/kg = milligrams per kilogram
n = non-carcinogen
NA = not applicable
ND = non detect
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
RBC = risk based concentration
RSL = regional screening level
sed = sediment
SLV = screening level value
SVOCs = semivolatile organic chemicals
sw = surface water
UCL = 95% upper confidence limit
ug/kg = micrograms per kilogram
USEPA = United States Environmental Protection Agency

Notes
Only detected chemicals with a detection frequency greater than 5% and were selected as a Tissue COPC are shown in this table. Reporting limits for non-detected chemicals are evaluated separately.
Sum non-carcinogenic is not calculated because there are no non-carcinogenic Chemicals of Interest.
Hierarchy was developed to determine Screening Levels Values for Sediment; 1. DEQ HH General/Recreational Bioaccumulative SLVs and 2. Surrogates used as noted in Appendix J-4e.
Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, 4. Surrogates used as noted in Appendix J-4b.
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) Sample size was less than 20 so detection frequency was not taken into consideration for COPC selection.
(2) An individual dioxin-like congener may not qualify as a COPC based on DEQ's screening methodology. However, all dioxin-like congeners are retained as COPCs since they contribute to Total PCBs as Congeners and TEQs which are selected as COPCs.
(3) PCB Congener 157 co-elutes with PCB Congener 156.
(4) Non-cancer based sediment SLVs may not be adequately protective of cancer endpoint.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Total PCBs As Congeners were the only form of PCB that were used in the summation.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-39
Identification of COPCs in Surface Water at Forebay AOPC - Potable Water User
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest	note	Total/ Dissolved	IUPAC #	Max Detected Value	Detection Rate	Reference Area Min Detected Value	Reference Area Max Detected Value	Higher than Reference Range Y/N?	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV $\frac{C_{sw}}{SLV_{sw}}$ (Potable Water User Table M-39)	$\frac{C_{crayfish}}{SLV_{crayfish}}$ (Subsistence Table M-35)	$\frac{C_{sm\ bass}}{SLV_{sm\ bass}}$ (Subsistence Table M-35)	Multimedia (direct contact) sum(C/SLV_{sw} + C/SLV_{tissue})	Retain as a COPC, Y/N?	Rationale
INORGANICS (ug/L)															
Zinc	n	Dissolved	-	7.50	20%	-	-	-	11,000	0.000682	-	0.0149	0.0156	N	C/SLV <1
Aluminum	n	Total	-	141	60%	91.0	123	Y	37,000	0.00381	-	0.000384	0.00420	N	C/SLV <1
Arsenic	c	Total	-	1.01	100%	0.910	1.25	N	0.038	26.6	683	-	709	Y	carc C/SLV >1
Barium	n	Total	-	27.0	100%	21.0	25.6	Y	7,300	0.00370	-	0.433	0.436	N	C/SLV <1
Beryllium	c	Total	-	0.00900	40%	0.00900	0.0210	N	73	0.000123	-	-	0.000123	N	carc C/SLV <1
Cadmium	c	Total	-	0.0190	100%	0.0100	0.0210	N	18	0.00106	-	-	0.00106	N	carc C/SLV <1
Copper	n	Total	-	0.790	100%	0.605	0.830	N	1,500	0.000527	-	0.00294	0.00347	N	C/SLV <1
Lead	n	Total	-	0.175	100%	0.0580	0.203	N	15	0.0117	-	-	0.0117	N	C/SLV <1
Thallium	n	Total	-	0.0330	100%	0.0205	0.0205	Y	2	0.0165	-	-	0.0165	N	C/SLV <1
PCBs (pg/L)															
3,3',4,4'-Tetrachlorobiphenyl	c	C+F	77	0.133	60%	0.0790	0.151	N	5,200	0.0000256	0.114	74.2	74.3	Y	mm C/SLV >1
2,3,3',4,4'-Pentachlorobiphenyl	c	C+F	105	0.540	100%	0.387	0.563	N	5,200	0.000104	0.363	3,548	3,548	Y	mm C/SLV >1
2,3',4,4',5-Pentachlorobiphenyl	c	C+F	118	1.57	100%	1.12	1.77	N	5,200	0.000302	47.6	9,240	9,288	Y	mm C/SLV >1
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	c	C+F	156 + 157 (1)	0.355	100%	0.111	0.145	Y	1,000	0.000355	14.1	1,500	1,514	Y	mm C/SLV >1
2,3',4,4',5,5'-Hexachlorobiphenyl	c	C+F	167	0.158	100%	0.0540	0.0860	Y	52,000	0.00000304	5.96	432	438	Y	mm C/SLV >1
2,3,3',4,4',5,5'-Heptachlorobiphenyl	c	C+F	189	0.0662	20%	-	-	-	5,200	0.0000127	0.328	32.6	32.9	Y	mm C/SLV >1
Total PCBs As Congeners (KM, capped; NDs at MDL)	c	C+F	-	209	100%	130	178	Y	170,000	0.00123	64.0	33,884	33,948	Y	mm C/SLV >1
PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	c	C+F	-	0.0000559	100%	0.0000356	0.0000566	N	0.440	0.000127	153	40,421	40,574	Y	mm C/SLV >1
PAHs (ng/L)															
Acenaphthene	n	C+F	-	1.28	100%	0.888	2.43	N	2,200,000	0.000000581	0.0000107	0.0000713	0.0000826	N	C/SLV <1
Anthracene	n	C+F	-	0.121	100%	0.0832	0.150	N	11,000,000	0.0000000110	0.00000627	0.000785	0.000791	N	C/SLV <1
Benzo(a)anthracene	c	C+F	-	0.0600	60%	0.0491	0.0533	Y	29	0.00207	0.174	2.35	NE	N	carc C/SLV <1
Benzo(b)fluoranthene	c	C+F	-	0.0917	40%	0.0599	0.0669	Y	29	0.00316	0.0891	2.68	NE	N	carc C/SLV <1
Chrysene	c	C+F	-	0.171	100%	0.0843	0.149	Y	2,900	0.0000591	0.000916	0.0179	0.0189	N	carc C/SLV <1
Fluoranthene	n	C+F	-	0.784	100%	0.692	0.783	Y	1,500,000	0.000000523	0.0000213	0.000152	0.000173	N	C/SLV <1
Phenanthrene	n	C+F	-	1.61	100%	1.29	1.59	Y	11,000,000	0.000000146	0.0000384	0.000192	0.000231	N	C/SLV <1
TPH (ug/L)															
Diesel Range Organics	n	Total	-	15.0	40%	13.0	19.0	N	90	0.167	-	-	0.167	N	C/SLV <1
Sum non-carcinogenic C/RBC (HI)										**0.192**					
Sum carcinogenic C/RBC (ELCR)										**2.7E-05**					

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
ATL = acceptable tissue level
C = concentration
c = carcinogen
C+F = column and filter
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
max =maximum
MCL = maximum contaminant level
MDL = method detection limit
min = minimum
mm = multimedia
n = non-carcinogen

Table M-39
Identification of COPCs in Surface Water at Forebay AOPC - Potable Water User
Bradford Island - River Operable Unit
(2 of 2)

NE = Multi-media was not evaluated since the chemical is already identified as a COPC.
ND = non detect
ng/L = nanograms per liter
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
pg/L = picograms per liter
RBC = risk based concentration
RSL = regional screening level
SLV = screening level value
sm bass = smallmouth bass
sw = surface water
TPH = total petroleum hydrocarbon
ug/L = micrograms per Liter
USEPA = United States Environmental Protection Agency

Notes
All detected chemicals are shown in this table. Reporting limits for non-detected chemicals are evaluated separately. Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected
Dissolved metals were shown if total metals were non-detect.
Potable Water User hierarchy was developed to determine Screening Levels Values for groundwater; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, 4. Surrogates used as noted in Appendix J-4b
Hierarchy was developed to determine Screening Levels Values for Tissue; 1. Minimum of DEQ HH Bioaccumulative ATLs (human subsistence/tribal) (Appendix J-4f)
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 200
DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
United States Environmental Protection Agency (USEPA) 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May

Footnotes
(1) PCB Congener 157 co-elutes with PCB Congener 156.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum cPAH C/RBC (ELCR) = includes only individual carcinogenic polyaromatic hydrocarbons selected as a COPC
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Total PCBs As Congeners were the only form of PCB that were used in the summatior
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given mediun
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-40
Identification of COPCs in Surface Water at Forebay AOPC - Bioaccumulation Exposure
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest	note	Total/ Dissolved	IUPAC #	Max Detected Value	Detection Rate	Reference Area Min Detected Value	Reference Area Max Detected Value	Higher than Reference Range Y/N?	Selected HH SLV (Table J-4b)	Site concentration(C) / SLV $\frac{C_{sw}}{SLV_{sw}}$ (Bioaccumulation)	Bioaccumulative Potential? (Y/N)	Retain as a COPC, Y/N?	Rationale
INORGANICS (ug/L)													
Zinc	n	Dissolved	-	7.50	20%	-	-	-	7,400	0.00101	Y	N	C/SLV <1
Aluminum	n	Total	-	141	60%	91.0	123	Y	-	-	Y	Y	No SLV
Arsenic	c	Total	-	1.01	100%	0.910	1.25	N	0.018	56.1	Y	Y	carc C/SLV >1
Barium	n	Total	-	27.0	100%	21.0	25.6	Y	1,000	0.0270	N	N	C/SLV <1
Beryllium	c	Total	-	0.00900	40%	0.00900	0.0210	N	-	-	N	N	Not Bioaccumulative
Cadmium	c	Total	-	0.0190	100%	0.0100	0.0210	N	-	-	N	N	Not Bioaccumulative
Copper	n	Total	-	0.790	100%	0.605	0.830	N	1,300	0.000608	N	N	C/SLV <1
Lead	n	Total	-	0.175	100%	0.0580	0.203	N	-	-	Y	Y	No SLV
Thallium	n	Total	-	0.0330	100%	0.0205	0.0205	Y	0.24	0.138	Y	N	C/SLV <1
PCBs (pg/L)													
3,3',4,4'-Tetrachlorobiphenyl	c	C+F	77	0.133	60%	0.0790	0.151	N	-	-	Y	Y	No SLV
2,3,3',4,4'-Pentachlorobiphenyl	c	C+F	105	0.540	100%	0.387	0.563	N	-	-	Y	Y	No SLV
2,3',4,4',5-Pentachlorobiphenyl	c	C+F	118	1.57	100%	1.12	1.77	N	-	-	Y	Y	No SLV
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	c	C+F	156 + 157 (1)	0.355	100%	0.111	0.145	Y	-	-	Y	Y	No SLV
2,3',4,4',5,5'-Hexachlorobiphenyl	c	C+F	167	0.158	100%	0.0540	0.0860	Y	-	-	Y	Y	No SLV
2,3,3',4,4',5,5'-Heptachlorobiphenyl	c	C+F	189	0.0662	20%	-	-	-	-	-	Y	Y	No SLV
Total PCBs As Congeners (KM, capped; NDs at MDL)	c	C+F	-	209	100%	130	178	Y	64	3.26	Y	Y	carc C/SLV >1
PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	c	C+F	-	0.0000559	100%	0.0000356	0.0000566	N	0.005	0.0112	Y	N	carc C/SLV <1 (2)
PAHs (ng/L)													
Acenaphthene	n	C+F	-	1.28	100%	0.888	2.43	N	670,000	0.00000191	Y	N	C/SLV <1
Anthracene	n	C+F	-	0.121	100%	0.0832	0.150	N	8,300,000	0.0000000146	Y	N	C/SLV <1
Benzo(a)anthracene	c	C+F	-	0.0600	60%	0.0491	0.0533	Y	3.8	0.0158	Y	N	carc C/SLV <1
Benzo(b)fluoranthene	c	C+F	-	0.0917	40%	0.0599	0.0669	Y	3.8	0.0241	Y	N	carc C/SLV <1
Chrysene	c	C+F	-	0.171	100%	0.0843	0.149	Y	3.8	0.0451	Y	N	carc C/SLV <1
Fluoranthene	n	C+F	-	0.784	100%	0.692	0.783	Y	130,000	0.00000603	Y	N	C/SLV <1
Phenanthrene	n	C+F	-	1.61	100%	1.29	1.59	Y	8,300,000	0.000000193	Y	N	C/SLV <1
TPH (ug/L)													
Diesel Range Organics	n	Total	-	15.0	40%	13.0	19.0	N	-	-	NA	N	Evaluated as PAHs
Sum non-carcinogenic C/RBC (HI)										**0.166**			
Sum carcinogenic C/RBC (ELCR)										**5.9E-05**			

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
C = concentration
c = carcinogen
C+F = Column + Filter
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
HH = human health

Table M-40
Identification of COPCs in Surface Water at Forebay AOPC - Bioaccumulation Exposure
Bradford Island - River Operable Unit
(2 of 2)

HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{gw}/SLV_{gw} only (i.e. single medium).
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
max =maximum
min = minimum
n = non-carcinogen
ND = non detect
ng/L = nanograms per liter
NRWQC = national recommended water quality criteria
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
pg/L = picograms per liter
SLV = screening level value
sw = surface water
TPH = total petroleum hydrocarbon
ug/L = micrograms per liter
USEPA = United States Environmental Protection Agency
WQC = water quality criteria

Notes
All detected chemicals are shown in this table. Reporting limits for non-detected chemicals are evaluated separately. Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected.
Dissolved metals were shown if total metals were non-detect.
Hierarchy was developed to determine Screening Levels Values for Bioaccumulation pathway for groundwater; 1. Min USEPA NRWQC for water + organism and organism only, 2. Min DEQ WQC Table 33A, 3. Min DEQ WQC Table 33B, and 4. Surrogates used as noted in Appendix J-4c
Oregon Department of Environmental Quality (DEQ) 2009. Oregon Administrative Rule (OAR) 340-041. Chapter 340, Division 41: Water Quality Standards: Beneficial Uses, Policies, and Criteria for Oregon. Tables 33A and 33B. November
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
United States Environmental Protection Agency (USEPA) 2009. National Recommended Water Quality Criteria. United States Office of Water, Environmental Protection Agency, Office of Science and Technology

Footnotes
(1) PCB Congener 157 co-elutes with PCB Congener 156.
(2) An individual dioxin-like congener may not qualify as a COPC based on DEQ's screening methodology. However, all dioxin-like congeners are retained as COPCs since they contribute to Total PCBs as Congeners and TEQs which are selected as COPCs

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.
Sum carcinogenic C/SLV = summation of C/SLV of all carcinogens. Total PCB as Congeners was used in the summation since Dioxin-like Congener C/SLV are not available.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-41
Identification of COPCs in Sediment at Eagle Creek - Direct Contact
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest [2]	note	Max Detected Value	Detection Rate	Reference UPL (Table I-20a)	Site Concentrations Exceed Reference?	Retain as a COPC, Y/N (1,2,3)?	Rationale
PCBs (ug/kg dw)							
Aroclor 1248	c	76.0	50%	1.80 [4]	Y	Y	Detected COI [3]
Total PCBs As Aroclors (NDs at MDL)	c	77.7	50%	1.80 [4]	Y	Y	Detected COI [3]
SVOCs (ug/kg dw)							
Carbazole	c	2.20	50%	1.40 [4]	Y	Y	Detected COI [3]
PAHs (ug/kg dw)							
Anthracene	n	2.60	50%	2.30	Y	Y	Detected COI [3]
Benzo(a)anthracene	c	6.60	50%	10.0	N	Y	Detected COI [3]
Benzo(a)pyrene	c	7.10	50%	11.0	N	Y	Detected COI [3]
Benzo(b)fluoranthene	c	11.0	50%	17.0	N	Y	Detected COI [3]
Benzo(g,h,i)perylene	c	5.00	50%	7.90	N	Y	Detected COI [3]
Benzo(k)fluoranthene	c	3.40	50%	5.00	N	Y	Detected COI [3]
Chrysene	c	13.0	100%	9.80	Y	Y	Detected COI [3]
Fluoranthene	n	11.0	50%	31.0	N	Y	Detected COI [3]
Indeno(1,2,3-cd)pyrene	c	4.60	50%	8.80	N	Y	Detected COI [3]
Phenanthrene	n	6.50	100%	5.90	Y	Y	Detected COI [3]
Pyrene	n	17.0	100%	12.7	Y	Y	Detected COI [3]
TPH (mg/kg dw)							
Diesel Range Organics	n	13.0	100%	31.7	N	Y	Detected COI [3]

This table does not include metals because they were detected below the reference area (Table L-7)
Green highlight = Retained as a COPC
- = Not Evaluated
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
dw = dry weight
HH = human health
max = maximum
MDL = method detection limit
mg/kg = milligrams per kilogram
n = non-carcinogen
ND = non detect
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon

Table M-41
Identification of COPCs in Sediment at Eagle Creek - Direct Contact
Bradford Island - River Operable Unit
(2 of 2)

ug/kg = micrograms per kilogram
UPL = 95% upper prediction limit

Notes
Only detected chemicals are shown in this table. Reporting limits for non-detected chemicals are evaluated separately.

Footnotes
(1) COPCs from Eagle Creek Sediment will be retained for evaluation of direct contact with sediment for waders.
(2) All Inorganics are lower than reference area and are eliminated as COPCs.
(3) All detected organic COIs are retained as COPCs.
(4) For analytes with no detections (0% detection rate), the maximum method detection limit (MDL) was assessed as the non-parametric UPL.

COPC Selection
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if -inorganic site concentration exceeds reference, and all detected organic compounds.

Table M-42
Identification of COPCs in Tissue at Goose Island - Subsistence Fisher
Bradford Island - River Operable Unit
(1 of 2)

Medium	Chemicals of Interest	note	IUPAC #	Max Detected Value	Detection Rate	Selected HH SLV (Table J-4f)	Site concentration(C) / SLV $\frac{C_{tissue}}{SLV_{tissue}}$	Retain as a COPC, Y/N?	Rationale
INORGANICS (mg/kg ww)									
Tissue - Crayfish	Mercury	n	-	0.0359	100%	0.049	0.733	N	C/SLV <1
PCBs (ug/kg ww)									
Tissue - Crayfish	3,3',4,4'-Tetrachlorobiphenyl	c	77	0.00226	100%	0.076	0.0297	N	carc C/SLV <1 (2)
Tissue - Crayfish	2,3,3',4,4'-Pentachlorobiphenyl	c	105	0.00624	100%	0.25	0.0250	N	carc C/SLV <1 (2)
Tissue - Crayfish	2,3,4,4',5-Pentachlorobiphenyl	c	114	0.00235	100%	0.25	0.00940	N	carc C/SLV <1 (2)
Tissue - Crayfish	2,3',4,4',5-Pentachlorobiphenyl	c	118	0.0870	100%	0.25	0.348	N	carc C/SLV <1 (2)
Tissue - Crayfish	2,3',4,4',5'-Pentachlorobiphenyl	c	123	0.00256	100%	0.25	0.0102	N	carc C/SLV <1 (2)
Tissue - Crayfish	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	c	156 + 157 (1)	0.0133	100%	0.25	0.0532	N	carc C/SLV <1 (2)
Tissue - Crayfish	2,3',4,4',5,5'-Hexachlorobiphenyl	c	167	0.0112	100%	0.25	0.0448	N	carc C/SLV <1 (2)
Tissue - Crayfish	2,3,3',4,4',5,5'-Heptachlorobiphenyl	c	189	0.000662	100%	0.25	0.00265	N	carc C/SLV <1 (2)
Tissue - Crayfish	Total PCBs As Congeners (KM, capped; NDs at MDL)	c	-	0.587	100%	0.57	1.03	Y	carc C/SLV >1
Tissue - Crayfish	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	c	-	0.00000482	100%	0.0000076	0.634	N	carc C/SLV <1 (2)
PAHs (ug/kg ww)									
Tissue - Crayfish	Anthracene	n	-	0.430	100%	15,000	0.0000287	N	C/SLV <1
Tissue - Crayfish	Benzo(b)fluoranthene	c	-	0.150	100%	1.57 (3)	0.0955	N	C/SLV <1
Tissue - Crayfish	Benzo(g,h,i)perylene	c	-	0.110	100%	16 (3)	0.00700	N	C/SLV <1
Tissue - Crayfish	Benzo(k)fluoranthene	c	-	0.110	100%	16 (3)	0.00700	N	C/SLV <1
Tissue - Crayfish	Fluorene	n	-	0.510	100%	15,000	0.0000340	N	C/SLV <1
Tissue - Crayfish	Indeno(1,2,3-cd)pyrene	c	-	0.150	100%	1.57 (3)	0.0955	N	C/SLV <1
Tissue - Crayfish	Phenanthrene	n	-	0.820	100%	15,000	0.0000547	N	C/SLV <1
Sum non-carcinogenic C/RBC (HI)							0.733		
Sum carcinogenic C/RBC (ELCR)							1.2E-06		

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
ATL = acceptable tissue level
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{tissue}/SLV_{tissue} only (i.e. single medium).
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{tissue}/SLV_{tissue} only (i.e. single medium).
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
max =maximum

Table M-42
Identification of COPCs in Tissue at Goose Island - Subsistence Fisher
Bradford Island - River Operable Unit
(2 of 2)

mg/kg = milligrams per kilogram
n = non-carcinogen
PAHs = polyaromatic hydrocarbons
PCBs =polychlorinated biphenyls
SLV = screening level value
ug/kg = micrograms per kilogram
ww = wet weight

Notes
Only detected chemicals -are shown in this table. Reporting limits for non-detected chemicals are evaluated separately.
Hierarchy was developed to determine Screening Levels Values for Tissue; 1. Minimum of DEQ HH Bioaccumulative ATLs (human subsistence/tribal) (Appendix J-4f).
Oregon Department of Environmental Quality (DEQ) 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.

Footnotes
(1) PCB Congener 157 co-elutes with PCB Congener 156.

(2) An individual dioxin-like congener may not qualify as a COPC based on DEQ's screening methodology. However, all dioxin-like congeners are retained as COPCs since they contribute to Total PCBs as Congeners and TEQs which are selected as COPCs.
(3) SLVs were calculated ATLs using DEQ Methodology (DEQ 2007); see Appendix J-2.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Total PCBs As Congeners were the only form of PCB that were used in the summation.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if -inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-43
Identification of COPCs in Sediment at Goose Island - Subsistence Fisher
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest	note	IUPAC #	Max Detected Value	Detection Rate (1)	Selected HH SLV (Table J-4e)	Site concentration(C) / SLV $\frac{C_{sed}}{SLV_{sed}}$	Bioaccumulative Potential? (Y/N) (Table J-6)	Retain as a COPC, Y/N?	Rationale
INORGANICS (mg/kg dw)									
Barium	n	-	131	100%	Sed ≤ to Reference Area (see Table L-7)		N	N	≤ Reference UPL
Mercury	n	-	0.181	100%	Sed ≤ to Reference Area (see Table L-7)		Y	N	≤ Reference UPL
PCBs (ug/kg dw)									
Aroclor 1254	c	-	9.90	50%	0.048	206	Y	Y	carc C/SLV >1
Total PCBs As Aroclors (NDs at MDL)	c	-	12.6	50%	0.048	263	Y	Y	carc C/SLV >1
3,3',4,4'-Tetrachlorobiphenyl	c	77	0.00353	100%	0.0064	0.552	Y	N	carc C/SLV <1 (2)
3,4,4',5-Tetrachlorobiphenyl	c	81	0.000135	50%	0.0021	0.0643	Y	N	carc C/SLV <1 (2)
2,3,3',4,4'-Pentachlorobiphenyl	c	105	0.0277	100%	0.021	1.32	Y	Y	carc C/SLV >1
2,3,4,4',5-Pentachlorobiphenyl	c	114	0.00137	100%	0.021	0.0652	Y	N	carc C/SLV <1 (2)
2,3',4,4',5-Pentachlorobiphenyl	c	118	0.0695	100%	0.026	2.67	Y	Y	carc C/SLV >1
2,3',4,4',5'-Pentachlorobiphenyl	c	123	0.000963	50%	0.026	0.0370	Y	N	carc C/SLV <1 (2)
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	c	156 + 157 (3)	0.0104	100%	0.026	0.400	Y	N	carc C/SLV <1 (2)
2,3',4,4',5,5'-Hexachlorobiphenyl	c	167	0.00402	100%	0.026	0.155	Y	N	carc C/SLV <1 (2)
2,3,3',4,4',5,5'-Heptachlorobiphenyl	c	189	0.000869	100%	0.14	0.00621	Y	N	carc C/SLV <1 (2)
Total PCBs As Congeners (KM, capped; NDs at MDL)	c	-	1.34	100%	0.048	27.9	Y	Y	carc C/SLV >1
PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	c	-	0.00000467	100%	0.0000011	4.24	Y	Y	carc C/SLV >1
SVOCs (ug/kg dw)									
Bis(2-ethylhexyl) Phthalate	c	-	13.0	100%	-	-	Y	Y	No SLV
PAHs (ug/kg dw)									
Benzo(a)anthracene	c	-	7.80	100%	47,000 (4)	0.000166	Y	N	carc C/SLV <1
Benzo(a)pyrene	c	-	13.0	100%	47,000 (4)	0.000277	Y	N	carc C/SLV <1
Benzo(b)fluoranthene	c	-	15.0	100%	47,000 (4)	0.000319	Y	N	carc C/SLV <1
Indeno(1,2,3-cd)pyrene	c	-	7.10	100%	47,000 (4)	0.000151	Y	N	carc C/SLV <1
Sum non-carcinogenic C/RBC (HI)						-			
Sum carcinogenic C/RBC (ELCR)						2.8E-05			

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
C = concentration
c = carcinogen
COPC = chemical of potential concern
dw = dry weight

Table M-43
Identification of COPCs in Sediment at Goose Island - Subsistence Fisher
Bradford Island - River Operable Unit
(2 of 2)

ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{sed}/SLV_{sed} only (i.e. single medium).
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{sed}/SLV_{sed} only (i.e. single medium).
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
max =maximum
mg/kg = milligrams per kilogram
n = non-carcinogen
NA = not applicable
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
sed = sediment
SLV = screening level value
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/kg = micrograms per kilogram
UPL = 95% upper prediction limit

Notes
Only detected chemicals selected as a Goose Island-Crayfish Tissue COPC or Forebay-Smallmouth Bass Tissue COPC are shown in this table. Reporting limits for non-detected chemicals are evaluated separately.
Sum non-carcinogenic is not calculated because there are no non-carcinogenic Chemicals of Interest.
Hierarchy was developed to determine Screening Levels Values for Sediment; 1. DEQ HH Subsistence Bioaccumulative SLVs and 2. Surrogates used as noted in Appendix J-4e.
Oregon Department of Environmental Quality (DEQ) 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.

Footnotes
(1) Sample size was less than 20 so detection frequency was not taken into consideration for COPC selection.
(2) An individual dioxin-like congener may not qualify as a COPC based on DEQ's screening methodology. However, all dioxin-like congeners are retained as COPCs since they contribute to Total PCBs as Congeners and TEQs which are selected as COPCs.
(3) PCB Congener 157 co-elutes with PCB Congener 156.
(4) Non-cancer based sediment SLVs may not be adequately protective of cancer endpoint.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Total PCBs As Congeners were the only form of PCB that were used in the summation.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if-inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-44
Identification of COPCs in Tissue at Goose Island - Recreational Fisher
Bradford Island - River Operable Unit
(1 of 2)

Medium	Chemicals of Interest	note	IUPAC #	Max Detected Value	Detection Rate	Selected HH SLV (Table J-4f)	Site concentration(C) / SLV $\frac{C_{tissue}}{SLV_{tissue}}$	Retain as a COPC, Y/N?	Rationale
INORGANICS (mg/kg ww)									
Tissue - Crayfish	Mercury	n	-	0.0359	100%	0.4	0.0898	N	C/SLV <1
PCBs (ug/kg ww)									
Tissue - Crayfish	3,3',4,4'-Tetrachlorobiphenyl	c	77	0.00226	100%	0.62	0.00365	N	carc C/SLV <1 (1)
Tissue - Crayfish	2,3,3',4,4'-Pentachlorobiphenyl	c	105	0.00624	100%	2.1	0.00297	N	carc C/SLV <1 (1)
Tissue - Crayfish	2,3,4,4',5-Pentachlorobiphenyl	c	114	0.00235	100%	2.1	0.00112	N	carc C/SLV <1 (1)
Tissue - Crayfish	2,3',4,4',5-Pentachlorobiphenyl	c	118	0.0870	100%	2.1	0.0414	N	carc C/SLV <1 (1)
Tissue - Crayfish	2,3',4,4',5'-Pentachlorobiphenyl	c	123	0.00256	100%	2.1	0.00122	N	carc C/SLV <1 (1)
Tissue - Crayfish	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	c	156 + 157 (2)	0.0133	100%	2.1	0.00633	N	carc C/SLV <1 (1)
Tissue - Crayfish	2,3',4,4',5,5'-Hexachlorobiphenyl	c	167	0.0112	100%	2.1	0.00533	N	carc C/SLV <1 (1)
Tissue - Crayfish	2,3,3',4,4',5,5'-Heptachlorobiphenyl	c	189	0.000662	100%	2.1	0.000315	N	carc C/SLV <1 (1)
Tissue - Crayfish	Total PCBs As Congeners (KM, capped; NDs at MDL)	c	-	0.587	100%	4.7	0.125	N	carc C/SLV <1 (1)
Tissue - Crayfish	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	c	-	0.00000482	100%	0.000062	0.0778	N	carc C/SLV <1 (1)
PAHs (ug/kg ww)									
Tissue - Crayfish	Anthracene	n	-	0.430	100%	120,000	0.00000358	N	C/SLV <1
Tissue - Crayfish	Benzo(b)fluoranthene	c	-	0.150	100%	12.8 (3)	0.0117	N	carc C/SLV <1
Tissue - Crayfish	Benzo(g,h,i)perylene	c	-	0.110	100%	128 (3)	0.000860	N	carc C/SLV <1
Tissue - Crayfish	Benzo(k)fluoranthene	c	-	0.110	100%	128 (3)	0.000860	N	carc C/SLV <1
Tissue - Crayfish	Fluorene	n	-	0.510	100%	120,000	0.00000425	N	C/SLV <1
Tissue - Crayfish	Indeno(1,2,3-cd)pyrene	c	-	0.150	100%	12.8 (3)	0.0117	N	carc C/SLV <1
Tissue - Crayfish	Phenanthrene	n	-	0.820	100%	120,000	0.00000683	N	C/SLV <1
Sum non-carcinogenic C/RBC (HI)							0.0898		
Sum carcinogenic C/RBC (ELCR)							1.5E-07		

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
ATL = acceptable tissue level
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{tissue}/SLV_{tissue} only (i.e. single medium).
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{tissue}/SLV_{tissue} only (i.e. single medium).
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
max =maximum

Table M-44
Identification of COPCs in Tissue at Goose Island - Recreational Fisher
Bradford Island - River Operable Unit
(2 of 2)

mg/kg = milligrams per kilogram
n = non-carcinogen
PAHs = polyaromatic hydrocarbons
PCBs =polychlorinated biphenyls
SLV = screening level value
ug/kg = micrograms per kilogram
ww = wet weight

Notes
Only detected chemicals-are shown in this table. Reporting limits for non-detected chemicals are evaluated separately.
Hierarchy was developed to determine Screening Levels Values for Tissue; 1. Minimum of DEQ HH Bioaccumulative ATLs (human general/recreational) (Appendix J-4f).
Oregon Department of Environmental Quality (DEQ) 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.

Footnotes

(1) An individual dioxin-like congener may not qualify as a COPC based on DEQ's screening methodology. However, all dioxin-like congeners are retained as COPCs since they contribute to Total PCBs as Congeners and TEQs which are selected as COPCs.
(2) PCB Congener 157 co-elutes with PCB Congener 156.
(3) SLVs were calculated ATLs using DEQ Methodology (DEQ 2007); see Appendix J-2.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Total PCBs As Congeners were the only form of PCB that were used in the summation.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if-inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-45
Identification of COPCs in Sediment at Goose Island - Recreational Fisher
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest	note	IUPAC #	Max Detected Value	Detection Rate (1)	Selected HH SLV (Table J-4e)	Site concentration(C) / SLV $\frac{C_{sed}}{SLV_{sed}}$	Bioaccumulative Potential? (Y/N) (Table J-6)	Retain as a COPC, Y/N?	Rationale
INORGANICS (mg/kg dw)									
Barium	n	-	131	100%	Sed ≤ to Reference Area (see Table L-7)		N	N	≤ Reference UPL
Mercury	n	-	0.181	100%	Sed ≤ to Reference Area (see Table L-7)		Y	N	≤ Reference UPL
PCBs (ug/kg dw)									
Aroclor 1254	c	-	9.90	50%	0.39	25.4	Y	Y	carc C/SLV >1 (2)
Total PCBs As Aroclors (NDs at MDL)	c	-	12.6	50%	0.39	32.3	Y	Y	carc C/SLV >1 (2)
3,3',4,4'-Tetrachlorobiphenyl	c	77	0.00353	100%	0.052	0.0679	Y	N	carc C/SLV <1 (2)
3,4,4',5-Tetrachlorobiphenyl	c	81	0.000135	50%	0.017	0.00794	Y	N	carc C/SLV <1 (2)
2,3,3',4,4'-Pentachlorobiphenyl	c	105	0.0277	100%	0.17	0.163	Y	N	carc C/SLV <1 (2)
2,3,4,4',5-Pentachlorobiphenyl	c	114	0.00137	100%	0.17	0.00806	Y	N	carc C/SLV <1 (2)
2,3',4,4',5-Pentachlorobiphenyl	c	118	0.0695	100%	0.12	0.579	Y	N	carc C/SLV <1 (2)
2,3',4,4',5'-Pentachlorobiphenyl	c	123	0.000963	50%	0.21	0.00459	Y	N	carc C/SLV <1 (2)
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	c	156 + 157 (3)	0.0104	100%	0.21	0.0495	Y	N	carc C/SLV <1 (2)
2,3',4,4',5,5'-Hexachlorobiphenyl	c	167	0.00402	100%	0.21	0.0191	Y	N	carc C/SLV <1 (2)
2,3,3',4,4',5,5'-Heptachlorobiphenyl	c	189	0.000869	100%	1.2	0.000724	Y	N	carc C/SLV <1 (2)
Total PCBs As Congeners (KM, capped; NDs at MDL)	c	-	1.34	100%	0.39	3.44	Y	Y	carc C/SLV >1 (2)
PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	c	-	0.00000467	100%	0.0000091	0.513	N	N	carc C/SLV <1 (2)
PAHs (ug/kg dw)									
Benzo(a)pyrene	c	-	13.0	100%	380,000 (4)	0.0000342	Y	N	carc C/SLV <1
Sum non-carcinogenic C/RBC (HI)						-			
Sum carcinogenic C/RBC (ELCR)						3.4E-06			

Green highlight = Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
C = concentration
c = carcinogen
COPC = chemical of potential concern
dw = dry weight
ELCR = excess lifetime cancer risk = screening level estimate of carcinogenic risk based on C_{sed}/SLV_{sed} only (i.e. single medium).
HH = human health
HI = hazard index = screening level estimate of non-carcinogenic risk based on C_{sed}/SLV_{sed} only (i.e. single medium).
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
max =maximum
mg/kg = milligrams per kilogram

Table M-45
Identification of COPCs in Sediment at Goose Island - Recreational Fisher
Bradford Island - River Operable Unit
(2 of 2)

n = non-carcinogen
NA = not applicable
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
sed = sediment
SLV = screening level value
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/kg = micrograms per kilogram
UPL = 95% upper prediction limit

Notes
Only detected chemicals selected as a Goose Island-Crayfish Tissue COPC or Forebay-Smallmouth Bass Tissue COPC are shown in this table. Reporting limits for non-detected chemicals are evaluated separately.
Sum non-carcinogenic is not calculated because there are no non-carcinogenic Chemicals of Interest.
Hierarchy was developed to determine Screening Levels Values for Sediment; 1. DEQ HH General/Recreational Bioaccumulative SLVs and 2. Surrogates used as noted in Appendix J-4e.
Oregon Department of Environmental Quality (DEQ) 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.

Footnotes
(1) Sample size was less than 20 so detection frequency was not taken into consideration for COPC selection.
(2) An individual dioxin-like congener may not qualify as a COPC based on DEQ's screening methodology. However, all dioxin-like congeners are retained as COPCs since they contribute to Total PCBs as Congeners and TEQs which are selected as COPCs.
(3) PCB Congener 157 co-elutes with PCB Congener 156.
(4) Non-cancer based sediment SLVs may not be adequately protective of cancer endpoint.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens
Sum carcinogenic C/SLV (ELCR) = summation of C/SLV of all carcinogens. Total PCBs As Congeners were the only form of PCB that were used in the summation.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if-inorganic site concentration exceeds reference and one of the following conditions:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium

For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table M-46
Summary of COPCs - Forebay AOPC
Bradford Island - River Operable Unit
(1 of 3)

Media	Receptor	HI	ELCR	COPCs
Random Forebay Tissue - Crayfish	Subsistence Fisher	0.672	7.5E-04	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl 2,3',4,4',5,5'-Hexachlorobiphenyl 2,3',4,4',5'-Pentachlorobiphenyl 2,3,4,4',5-Pentachlorobiphenyl 2,3',4,4',5-Pentachlorobiphenyl 3,3',4,4',5-Pentachlorobiphenyl Arsenic Total PCBs As Congeners (KM, capped; NDs at MDL) Total PCBs As Mammalian TEQ (KM, capped; NDs at MDL)
Random Forebay Tissue - Smallmouth Bass	Subsistence Fisher	6.92	3.4E-02	2,3,3',4,4',5,5'-Heptachlorobiphenyl **2,3,3',4,4',5-Hexachlorobiphenyl +** **2,3,3',4,4',5'-Hexachlorobiphenyl** **2,3,3',4,4'-Pentachlorobiphenyl** 2,3',4,4',5,5'-Hexachlorobiphenyl **2,3',4,4',5'-Pentachlorobiphenyl** 2,3,4,4',5-Pentachlorobiphenyl 2,3',4,4',5-Pentachlorobiphenyl **3,3',4,4',5-Pentachlorobiphenyl** 3,3',4,4'-Tetrachlorobiphenyl 3,4,4',5-Tetrachlorobiphenyl Aroclor 1242 **Aroclor 1254** **Barium** Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Bis(2-ethylhexyl) Phthalate Dibenz(a,h)anthracene Indeno(1,2,3-cd)pyrene Mercury [#] **Total PCBs As Aroclors** **(NDs at MDL)** **Total PCBs As Congeners** **(KM, capped; NDs at MDL)** **Total PCBs As Mammalian TEQ** **(KM, capped; NDs at MDL)**
Random Forebay Sediment	Subsistence Fisher	-	7.5E-05	2,3,3',4,4',5,5'-Heptachlorobiphenyl 2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl 2,3,3',4,4'-Pentachlorobiphenyl 2,3',4,4',5,5'-Hexachlorobiphenyl 2,3',4,4',5'-Pentachlorobiphenyl 2,3,4,4',5-Pentachlorobiphenyl 2,3',4,4',5-Pentachlorobiphenyl 3,3',4,4',5-Pentachlorobiphenyl Aroclor 1254 Bis(2-ethylhexyl) Phthalate Total PCBs As Aroclors (NDs at MDL) Total PCBs As Congeners (KM, capped; NDs at MDL) Total PCBs As Mammalian TEQ (KM, capped; NDs at MDL)

Table M-46
Summary of COPCs - Forebay AOPC
Bradford Island - River Operable Unit
(2 of 3)

Media	Receptor	HI	ELCR	COPCs
Random Forebay Tissue - Crayfish	Recreational Fisher	0.0829	9.2E-05	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl 2,3,3',4,4',5,5'-Heptachlorobiphenyl 2,3,3',4,4'-Pentachlorobiphenyl 2,3',4,4',5,5'-Hexachlorobiphenyl 2,3,4,4',5-Pentachlorobiphenyl 2,3',4,4',5'-Pentachlorobiphenyl 2,3',4,4',5-Pentachlorobiphenyl 3,3',4,4',5-Pentachlorobiphenyl 3,3',4,4'-Tetrachlorobiphenyl 3,4,4',5-Tetrachlorobiphenyl Arsenic Total PCBs As Congeners (KM, capped; NDs at MDL) Total PCBs As Mammalian TEQ (KM, capped; NDs at MDL)
Random Forebay Tissue - Smallmouth Bass	Recreational Fisher	1.24	4.1E-03	2,3,3',4,4',5,5'-Heptachlorobiphenyl 2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl 2,3,3',4,4'-Pentachlorobiphenyl 2,3',4,4',5,5'-Hexachlorobiphenyl **2,3',4,4',5'-Pentachlorobiphenyl** 2,3,4,4',5-Pentachlorobiphenyl 2,3',4,4',5-Pentachlorobiphenyl **3,3',4,4',5-Pentachlorobiphenyl** 3,3',4,4'-Tetrachlorobiphenyl 3,4,4',5-Tetrachlorobiphenyl Aroclor 1242 Aroclor 1254 Barium # Benzo(a)pyrene Dibenz(a,h)anthracene Mercury # Total PCBs As Aroclors (NDs at MDL) **Total PCBs As Congeners** **(KM, capped; NDs at MDL)** **Total PCBs As Mammalian TEQ** **(KM, capped; NDs at MDL)**
Random Forebay Sediment	Recreational Fisher	-	9.2E-06	2,3,3',4,4',5,5'-Heptachlorobiphenyl 2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl 2,3,3',4,4'-Pentachlorobiphenyl 2,3',4,4',5,5'-Hexachlorobiphenyl 2,3',4,4',5'-Pentachlorobiphenyl 2,3,4,4',5-Pentachlorobiphenyl 2,3',4,4',5-Pentachlorobiphenyl 3,3',4,4',5-Pentachlorobiphenyl 3,3',4,4'-Tetrachlorobiphenyl Aroclor 1254 Total PCBs As Aroclors (NDs at MDL) Total PCBs As Congeners (KM, capped; NDs at MDL) Total PCBs As Mammalian TEQ (KM, capped; NDs at MDL)

Table M-46
Summary of COPCs - Forebay AOPC
Bradford Island - River Operable Unit
(3 of 3)

Media	Receptor	HI	ELCR	COPCs
Forebay Surface Water	Potable Water User	0.192	2.7E-05	2,3,3',4,4',5,5'-Heptachlorobiphenyl 2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl 2,3,3',4,4'-Pentachlorobiphenyl 2,3',4,4',5,5'-Hexachlorobiphenyl 2,3',4,4',5-Pentachlorobiphenyl 3,3',4,4'-Tetrachlorobiphenyl Arsenic Total PCBs As Congeners (KM, capped; NDs at MDL) Total PCBs As Mammalian TEQ (KM, capped; NDs at MDL)
	Bioaccumulation	NE	NE	2,3,3',4,4',5,5'-Heptachlorobiphenyl 2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl 2,3,3',4,4'-Pentachlorobiphenyl 2,3',4,4',5,5'-Hexachlorobiphenyl 2,3',4,4',5-Pentachlorobiphenyl 3,3',4,4'-Tetrachlorobiphenyl Aluminum Arsenic Lead Total PCBs As Congeners (KM, capped; NDs at MDL) Total PCBs As Mammalian TEQ (KM, capped; NDs at MDL)
Eagle Creek Sediment	Wader	NE	NE	Anthracene # Aroclor 1248 Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(k)fluoranthene Carbazole Chrysene Diesel Range Organics # Fluoranthene # Indeno(1,2,3-cd)pyrene Phenanthrene # Pyrene # Total PCBs As Aroclors (NDs at MDL)
Goose Island Tissue - Crayfish	Subsistence Fisher	NE	NE	Total PCBs As Congeners (KM, capped; NDs at MDL)
Goose Island Sediment	Subsistence Fisher	NE	NE	2,3,3',4,4'-Pentachlorobiphenyl 2,3',4,4',5-Pentachlorobiphenyl Aroclor 1254 Bis(2-ethylhexyl) Phthalate Total PCBs As Aroclors (NDs at MDL) Total PCBs As Congeners (KM, capped; NDs at MDL) Total PCBs As Mammalian TEQ (KM, capped; NDs at MDL)
Goose Island Tissue - Crayfish	Recreational Fisher	NE	NE	None
Goose Island Sediment	Recreational Fisher	NE	NE	Aroclor 1254 Total PCBs As Aroclors (NDs at MDL) Total PCBs As Congeners (KM, capped; NDs at MDL)

Bold = COPCs with ELCR >1E-04 or HQ >10
-- = no data
= non-carcinogenic COPC
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV.
COPC = chemicals of potential concern
ELCR = excess lifetime cancer risk based on Sum of C/SLV x 1E-06 for carcinogenic COPCs
HI = hazard index based on Sum of C/SLV for non-carcinogenic COPCs
HQ = hazard quotient
NE = Cumulative HI and ELCR not evaluated. These pathways were evaluated only to see if additional COPCs were identified for River OU.
PCBs = polychlorinated biphenyls

APPENDIX N

ECOLOGICAL RISK SCREENING ASSESSMENT

Table N-1
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Plants
Bradford Island - Upland Operable Unit
(1 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	Concern for Threatened or Endangered Plants? (Tij>1)	Concern for Non-threatened or Endangered Plants? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)							
Antimony	0-1 ft	4.20	5	0.840	No	No	No
Cadmium	0-1 ft	2.09	32	0.0653	No	No	No
Lead	0-1 ft	741	120	6.18	Yes	Yes	**Yes**
Mercury	0-1 ft	4.15	0.3	13.8	Yes	Yes	**Yes**
Silver	0-1 ft	1.50	560	0.00268	No	No	No
Zinc	0-1 ft	635	160	3.97	Yes	No	**Yes**
Antimony	0-3 ft	4.20	5	0.840	No	No	No
Arsenic	0-3 ft	30.1	18	1.67	Yes	No	**Yes**
Cadmium	0-3 ft	3.54	32	0.111	No	No	No
Lead	0-3 ft	1,660	120	13.8	Yes	Yes	**Yes**
Mercury	0-3 ft	4.15	0.3	13.8	Yes	Yes	**Yes**
Silver	0-3 ft	1.50	560	0.00268	No	No	No
Zinc	0-3 ft	1,140	160	7.13	Yes	Yes	**Yes**
BUTYLTINS (ug/kg)							
Dibutyltin	0-1 ft	20.2	NA	- -	- -	- -	Yes - No SLV
Monobutyltin	0-1 ft	38.0	NA	- -	- -	- -	Yes - No SLV
Tributyltin	0-1 ft	165	NA	- -	- -	- -	Yes - No SLV
Dibutyltin	0-3 ft	20.2	NA	- -	- -	- -	Yes - No SLV
Monobutyltin	0-3 ft	38.0	NA	- -	- -	- -	Yes - No SLV
Tributyltin	0-3 ft	165	NA	- -	- -	- -	Yes - No SLV
PESTICIDES (ug/kg)							
4,4'-DDT	0-1 ft	28.0	NA	- -	- -	- -	Yes - No SLV
Total DDTs	0-1 ft	29.9	NA	- -	- -	- -	Yes - No SLV
Chlordane (technical)	0-1 ft	1,560	NA	- -	- -	- -	Yes - No SLV
4,4'-DDT	0-3 ft	28.0	NA	- -	- -	- -	Yes - No SLV
Total DDTs	0-3 ft	29.9	NA	- -	- -	- -	Yes - No SLV
Chlordane (technical)	0-3 ft	1,560	NA	- -	- -	- -	Yes - No SLV
Heptachlor	0-3 ft	3.07	1,000	0.00307	No	No	No

Table N-1
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Plants
Bradford Island - Upland Operable Unit
(2 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	Concern for Threatened or Endangered Plants? (Tij>1)	Concern for Non-threatened or Endangered Plants? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
PCBs (ug/kg)							
Aroclor 1248	0-1 ft	968	40,000	0.0242	No	No	No
Aroclor 1254	0-1 ft	78.6	40,000	0.00197	No	No	No
Aroclor 1260	0-1 ft	660	40,000	0.0165	No	No	No
Total PCBs (Aroclors)	0-1 ft	996	40,000	0.0249	No	No	No
Aroclor 1248	0-3 ft	968	40,000	0.0242	No	No	No
Aroclor 1254	0-3 ft	86.1	40,000	0.00215	No	No	No
Aroclor 1260	0-3 ft	660	40,000	0.0165	No	No	No
Total PCBs (Aroclors)	0-3 ft	996	40,000	0.0249	No	No	No
HERBICIDES (ug/kg)							
2,4,5-T	0-1 ft	93.0	NA	- -	- -	- -	Yes - No SLV
Dichloroprop	0-1 ft	180	NA	- -	- -	- -	Yes - No SLV
MCPP	0-1 ft	14,000	NA	- -	- -	- -	Yes - No SLV
2,4,5-T	0-3 ft	93.0	NA	- -	- -	- -	Yes - No SLV
Dichloroprop	0-3 ft	180	NA	- -	- -	- -	Yes - No SLV
MCPP	0-3 ft	14,000	NA	- -	- -	- -	Yes - No SLV
VOCs (ug/kg)							
1,2,4-Trimethylbenzene	0-1 ft	14,300	200,000	0.0715	No	No	No
1,3,5-Trimethylbenzene	0-1 ft	5,410	200,000	0.0271	No	No	No
Dichloromethane (Methylene Chloride)	0-1 ft	1,000	NA	- -	- -	- -	Yes - No SLV
Ethylbenzene	0-1 ft	2,700	NA	- -	- -	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	9,800	NA	- -	- -	- -	Yes - No SLV
Naphthalene	0-1 ft	8,360	10,000	0.836	No	No	No
Tetrachloroethene (PCE)	0-1 ft	65.0	10,000	0.00650	No	No	No
Toluene	0-1 ft	5.30	200,000	0.0000265	No	No	No
1,2,4-Trimethylbenzene	0-3 ft	14,300	200,000	0.0715	No	No	No
1,3,5-Trimethylbenzene	0-3 ft	5,410	200,000	0.0271	No	No	No
Dichloromethane (Methylene Chloride)	0-3 ft	1,000	NA	- -	- -	- -	Yes - No SLV
Naphthalene	0-3 ft	8,360	10,000	0.836	No	No	No
Tetrachloroethene (PCE)	0-3 ft	65.0	10,000	0.00650	No	No	No

Table N-1
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Plants
Bradford Island - Upland Operable Unit
(3 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	Concern for Threatened or Endangered Plants? (Tij>1)	Concern for Non-threatened or Endangered Plants? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
Toluene	0-3 ft	5.30	200,000	0.0000265	No	No	No
SVOCs (ug/kg)							
Benzoic Acid	0-1 ft	553	200,000	0.00277	No	No	No
Bis(2-ethylhexyl) Phthalate	0-1 ft	21,000	NA	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-1 ft	68.7	200,000	0.000344	No	No	No
Carbazole	0-1 ft	2,650	NA	- -	- -	- -	Yes - No SLV
Dibenzofuran	0-1 ft	810	NA	- -	- -	- -	Yes - No SLV
Diethyl Phthalate	0-1 ft	73.4	100,000	0.000734	No	No	No
Di-n-butyl Phthalate	0-1 ft	1,800	200,000	0.00900	No	No	No
Pentachlorophenol	0-1 ft	201	5,000	0.0402	No	No	No
Benzoic Acid	0-3 ft	553	200,000	0.00277	No	No	No
Bis(2-ethylhexyl) Phthalate	0-3 ft	21,000	NA	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-3 ft	68.7	200,000	0.000344	No	No	No
Carbazole	0-3 ft	2,840	NA	- -	- -	- -	Yes - No SLV
Dibenzofuran	0-3 ft	810	NA	- -	- -	- -	Yes - No SLV
Diethyl Phthalate	0-3 ft	73.4	100,000	0.000734	No	No	No
Di-n-butyl Phthalate	0-3 ft	1,800	200,000	0.00900	No	No	No
Pentachlorophenol	0-3 ft	201	5,000	0.0402	No	No	No
PAHs (ug/kg)							
2-Methylnaphthalene	0-1 ft	1,530	NA (6)	0.153	No	No	No
Acenaphthene	0-1 ft	2,600	20,000	0.130	No	No	No
Acenaphthylene	0-1 ft	78.1	NA (6)	0.00781	No	No	No
Anthracene	0-1 ft	2,700	NA (6)	0.270	No	No	No
Fluorene	0-1 ft	1,200	NA (6)	0.120	No	No	No
Naphthalene	0-1 ft	823	10,000	0.0823	No	No	No
Phenanthrene	0-1 ft	12,000	NA (6)	1.20	Yes	No	**Yes**
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	18,674	NA (6)	1.87	Yes	No	**Yes**
Benzo(a)anthracene	0-1 ft	32,000	1,200	26.7	Yes	Yes	**Yes**
Benzo(a)pyrene	0-1 ft	33,000	1,200	27.5	Yes	Yes	**Yes**

Table N-1
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Plants
Bradford Island - Upland Operable Unit
(4 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	Concern for Threatened or Endangered Plants? (Tij>1)	Concern for Non-threatened or Endangered Plants? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
Benzo(b)fluoranthene	0-1 ft	65,000	1,200	54.2	Yes	Yes	**Yes**
Benzo(g,h,i)perylene	0-1 ft	18,000	NA (7)	15.0	Yes	Yes	**Yes**
Benzo(k)fluoranthene	0-1 ft	65,000	1,200	54.2	Yes	Yes	**Yes**
Benzofluoranthenes, Total	0-1 ft	14,700	NA (7)	12.3	Yes	Yes	**Yes**
Chrysene	0-1 ft	32,000	1,200	26.7	Yes	Yes	**Yes**
Dibenz(a,h)anthracene	0-1 ft	9,900	1,200	8.25	Yes	Yes	**Yes**
Fluoranthene	0-1 ft	54,000	NA (7)	45.0	Yes	Yes	**Yes**
Indeno(1,2,3-cd)pyrene	0-1 ft	19,000	1,200	15.8	Yes	Yes	**Yes**
Pyrene	0-1 ft	40,000	NA (7)	33.3	Yes	Yes	**Yes**
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	367,900	1,200	307	Yes	Yes	**Yes**
2-Methylnaphthalene	0-3 ft	1,530	NA (6)	0.153	No	No	No
Acenaphthene	0-3 ft	2,600	20,000	0.130	No	No	No
Acenaphthylene	0-3 ft	111	NA (6)	0.0111	No	No	No
Anthracene	0-3 ft	8,440	NA (6)	0.844	No	No	No
Fluorene	0-3 ft	1,610	NA (6)	0.161	No	No	No
Naphthalene	0-3 ft	823	10,000	0.0823	No	No	No
Phenanthrene	0-3 ft	21,900	NA (6)	2.19	Yes	No	**Yes**
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	34,767	NA (6)	3.48	Yes	No	**Yes**
Benzo(a)anthracene	0-3 ft	32,000	1,200	26.7	Yes	Yes	**Yes**
Benzo(a)pyrene	0-3 ft	34,000	1,200	28.3	Yes	Yes	**Yes**
Benzo(b)fluoranthene	0-3 ft	65,000	1,200	54.2	Yes	Yes	**Yes**
Benzo(g,h,i)perylene	0-3 ft	18,000	NA (7)	15.0	Yes	Yes	**Yes**
Benzo(k)fluoranthene	0-3 ft	65,000	1,200	54.2	Yes	Yes	**Yes**
Benzofluoranthenes, Total	0-3 ft	31,300	NA (7)	26.1	Yes	Yes	**Yes**
Chrysene	0-3 ft	35,300	1,200	29.4	Yes	Yes	**Yes**
Dibenz(a,h)anthracene	0-3 ft	9,900	1,200	8.25	Yes	Yes	**Yes**
Fluoranthene	0-3 ft	54,000	NA (7)	45.0	Yes	Yes	**Yes**
Indeno(1,2,3-cd)pyrene	0-3 ft	20,000	1,200	16.7	Yes	Yes	**Yes**

Table N-1
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Plants
Bradford Island - Upland Operable Unit
(5 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	Concern for Threatened or Endangered Plants? (Tij>1)	Concern for Non-threatened or Endangered Plants? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
Pyrene	0-3 ft	67,100	NA (7)	55.9	Yes	Yes	**Yes**
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	367,900	1,200	307	Yes	Yes	**Yes**
TPH (mg/kg)							
Diesel Range Organics	0-1 ft	1,000	NA	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	23,900	NA	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	9,450	NA	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	1,000	NA	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	23,900	NA	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	9,450	NA	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

Hierarchy of Terrestrial Plant SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.

(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(3) Efroymson RA, ME Wil, GW Suter II, and AC Wooten. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. ORNL. ES/ER/TM-85/R3.

Table N-1
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Plants
Bradford Island - Upland Operable Unit
(6 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	Concern for Threatened or Endangered Plants? (Tij>1)	Concern for Non-threatened or Endangered Plants? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)

(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Individual COIs in a Given Media

(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.

Where: Cij = concentration of contaminant *i* in medium *j*

SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .

Tij = Risk ratios for contaminant *i* in medium *j*

Q = Receptor designator

Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).

Q = 1 for terrestrial T&E species and all aquatic species

Q = 5 for all common terrestrial species

For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

(6) The SLV for naphthalene was used to screen the individual and total LPAHs without SLVs.

(7) The SLV for the benzo(a)pyrene was used to screen the individual HPAHs without SLVs.

Table N-2
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(1 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij>1)	Chemical is a Concern for Non-threatened or Endangered Invertebrates? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)							
Antimony	0-1 ft	4.20	78	0.0538	No	No	No
Cadmium	0-1 ft	2.09	140	0.0149	No	No	No
Lead	0-1 ft	741	1,700	0.436	No	No	No
Mercury	0-1 ft	4.15	0.1	41.5	Yes	Yes	**Yes**
Silver	0-1 ft	1.50	50	0.0300	No	No	No
Zinc	0-1 ft	635	120	5.29	Yes	Yes	**Yes**
Antimony	0-3 ft	4.20	78	0.0538	No	No	No
Arsenic	0-3 ft	30.1	60	0.502	No	No	No
Cadmium	0-3 ft	3.54	140	0.0253	No	No	No
Lead	0-3 ft	1,660	1,700	0.976	No	No	No
Mercury	0-3 ft	4.15	0.1	41.5	Yes	Yes	**Yes**
Silver	0-3 ft	1.50	50	0.0300	No	No	No
Zinc	0-3 ft	1,140	120	9.50	Yes	Yes	**Yes**
BUTYLTINS (ug/kg)							
Dibutyltin	0-1 ft	20.2	NA	- -	- -	- -	Yes - No SLV
Monobutyltin	0-1 ft	38.0	NA	- -	- -	- -	Yes - No SLV
Tributyltin	0-1 ft	165	NA	- -	- -	- -	Yes - No SLV
Dibutyltin	0-3 ft	20.2	NA	- -	- -	- -	Yes - No SLV
Monobutyltin	0-3 ft	38.0	NA	- -	- -	- -	Yes - No SLV
Tributyltin	0-3 ft	165	NA	- -	- -	- -	Yes - No SLV
PESTICIDES (ug/kg)							
4,4'-DDT	0-1 ft	28.0	NA	- -	- -	- -	Yes - No SLV
Total DDTs	0-1 ft	29.9	NA	- -	- -	- -	Yes - No SLV
Chlordane (technical)	0-1 ft	1,560	NA	- -	- -	- -	Yes - No SLV
4,4'-DDT	0-3 ft	28.0	NA	- -	- -	- -	Yes - No SLV
Total DDTs	0-3 ft	29.9	NA	- -	- -	- -	Yes - No SLV
Chlordane (technical)	0-3 ft	1,560	NA	- -	- -	- -	Yes - No SLV
Heptachlor	0-3 ft	3.07	NA	- -	- -	- -	Yes - No SLV
PCBs (ug/kg)							
Aroclor 1248	0-1 ft	968	2,510	0.386	No	No	No
Aroclor 1254	0-1 ft	78.6	2,510	0.0313	No	No	No

Table N-2
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(2 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij>1)	Chemical is a Concern for Non-threatened or Endangered Invertebrates? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
Aroclor 1260	0-1 ft	660	2,510	0.263	No	No	No
Total PCBs (Aroclors)	0-1 ft	996	2,510	0.397	No	No	No
Aroclor 1248	0-3 ft	968	2,510	0.386	No	No	No
Aroclor 1254	0-3 ft	86.1	2,510	0.0343	No	No	No
Aroclor 1260	0-3 ft	660	2,510	0.263	No	No	No
Total PCBs (Aroclors)	0-3 ft	996	2,510	0.397	No	No	No
HERBICIDES (ug/kg)							
2,4,5-T	0-1 ft	93.0	NA	- -	- -	- -	Yes - No SLV
Dichloroprop	0-1 ft	180	NA	- -	- -	- -	Yes - No SLV
MCPP	0-1 ft	14,000	NA	- -	- -	- -	Yes - No SLV
2,4,5-T	0-3 ft	93.0	NA	- -	- -	- -	Yes - No SLV
Dichloroprop	0-3 ft	180	NA	- -	- -	- -	Yes - No SLV
MCPP	0-3 ft	14,000	NA	- -	- -	- -	Yes - No SLV
VOCs (ug/kg)							
1,2,4-Trimethylbenzene	0-1 ft	14,300	NA	- -	- -	- -	Yes - No SLV
1,3,5-Trimethylbenzene	0-1 ft	5,410	NA	- -	- -	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-1 ft	1,000	NA	- -	- -	- -	Yes - No SLV
Ethylbenzene	0-1 ft	2,700	2,260	1.19	Yes	No	**Yes**
m,p-Xylenes	0-1 ft	9,800	NA	- -	- -	- -	Yes - No SLV
Naphthalene	0-1 ft	8,360	NA (6)	0.288	No	No	No
Tetrachloroethene (PCE)	0-1 ft	65.0	NA	- -	- -	- -	Yes - No SLV
Toluene	0-1 ft	5.30	NA	- -	- -	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-3 ft	14,300	NA	- -	- -	- -	Yes - No SLV
1,3,5-Trimethylbenzene	0-3 ft	5,410	NA	- -	- -	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-3 ft	1,000	NA	- -	- -	- -	Yes - No SLV
Naphthalene	0-3 ft	8,360	NA (6)	0.288	No	No	No
Tetrachloroethene (PCE)	0-3 ft	65.0	NA	- -	- -	- -	Yes - No SLV
Toluene	0-3 ft	5.30	NA	- -	- -	- -	Yes - No SLV
SVOCs (ug/kg)							
Benzoic Acid	0-1 ft	553	NA	- -	- -	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-1 ft	21,000	NA	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-1 ft	68.7	NA	- -	- -	- -	Yes - No SLV

Table N-2
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(3 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij>1)	Chemical is a Concern for Non-threatened or Endangered Invertebrates? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
Carbazole	0-1 ft	2,650	2,260	1.17	Yes	No	**Yes**
Dibenzofuran	0-1 ft	810	NA	- -	- -	- -	Yes - No SLV
Diethyl Phthalate	0-1 ft	73.4	NA	- -	- -	- -	Yes - No SLV
Di-n-butyl Phthalate	0-1 ft	1,800	NA	- -	- -	- -	Yes - No SLV
Pentachlorophenol	0-1 ft	201	31,000	0.00648	No	No	No
Benzoic Acid	0-3 ft	553	NA	- -	- -	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-3 ft	21,000	NA	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-3 ft	68.7	NA	- -	- -	- -	Yes - No SLV
Carbazole	0-3 ft	2,840	2,260	1.26	Yes	No	**Yes**
Dibenzofuran	0-3 ft	810	NA	- -	- -	- -	Yes - No SLV
Diethyl Phthalate	0-3 ft	73.4	NA	- -	- -	- -	Yes - No SLV
Di-n-butyl Phthalate	0-3 ft	1,800	NA	- -	- -	- -	Yes - No SLV
Pentachlorophenol	0-3 ft	201	31,000	0.00648	No	No	No
PAHs (ug/kg)							
2-Methylnaphthalene	0-1 ft	1,530	NA (6)	0.0528	No	No	No
Acenaphthene	0-1 ft	2,600	NA (6)	0.0897	No	No	No
Acenaphthylene	0-1 ft	78.1	NA (6)	0.00269	No	No	No
Anthracene	0-1 ft	2,700	NA (6)	0.0931	No	No	No
Fluorene	0-1 ft	1,200	NA (6)	0.0414	No	No	No
Naphthalene	0-1 ft	823	NA (6)	0.0284	No	No	No
Phenanthrene	0-1 ft	12,000	NA (6)	0.414	No	No	No
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	18,674	29,000	0.644	No	No	No
Benzo(a)anthracene	0-1 ft	32,000	NA (7)	1.78	Yes	No	**Yes**
Benzo(a)pyrene	0-1 ft	33,000	NA (7)	1.83	Yes	No	**Yes**
Benzo(b)fluoranthene	0-1 ft	65,000	NA (7)	3.61	Yes	No	**Yes**
Benzo(g,h,i)perylene	0-1 ft	18,000	NA (7)	1.00	Yes	No	**Yes**
Benzo(k)fluoranthene	0-1 ft	65,000	NA (7)	3.61	Yes	No	**Yes**
Benzofluoranthenes, Total	0-1 ft	14,700	NA (7)	0.817	No	No	No
Chrysene	0-1 ft	32,000	NA (7)	1.78	Yes	No	**Yes**

Table N-2
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(4 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij>1)	Chemical is a Concern for Non-threatened or Endangered Invertebrates? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
Dibenz(a,h)anthracene	0-1 ft	9,900	NA (7)	0.550	No	No	No
Fluoranthene	0-1 ft	54,000	NA (7)	3.00	Yes	No	**Yes**
Indeno(1,2,3-cd)pyrene	0-1 ft	19,000	NA (7)	1.06	Yes	No	**Yes**
Pyrene	0-1 ft	40,000	NA (7)	2.22	Yes	No	**Yes**
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	367,900	18,000	20.4	Yes	Yes	**Yes**
2-Methylnaphthalene	0-3 ft	1,530	NA (6)	0.0528	No	No	No
Acenaphthene	0-3 ft	2,600	NA (6)	0.0897	No	No	No
Acenaphthylene	0-3 ft	111	NA (6)	0.00383	No	No	No
Anthracene	0-3 ft	8,440	NA (6)	0.291	No	No	No
Fluorene	0-3 ft	1,610	NA (6)	0.0555	No	No	No
Naphthalene	0-3 ft	823	NA (6)	0.0284	No	No	No
Phenanthrene	0-3 ft	21,900	NA (6)	0.755	No	No	No
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	34,767	29,000	1.20	Yes	No	**Yes**
Benzo(a)anthracene	0-3 ft	32,000	NA (7)	1.78	Yes	No	**Yes**
Benzo(a)pyrene	0-3 ft	34,000	NA (7)	1.89	Yes	No	**Yes**
Benzo(b)fluoranthene	0-3 ft	65,000	NA (7)	3.61	Yes	No	**Yes**
Benzo(g,h,i)perylene	0-3 ft	18,000	NA (7)	1.00	Yes	No	**Yes**
Benzo(k)fluoranthene	0-3 ft	65,000	NA (7)	3.61	Yes	No	**Yes**
Benzofluoranthenes, Total	0-3 ft	31,300	NA (7)	1.74	Yes	No	**Yes**
Chrysene	0-3 ft	35,300	NA (7)	1.96	Yes	No	**Yes**
Dibenz(a,h)anthracene	0-3 ft	9,900	NA (7)	0.550	No	No	No
Fluoranthene	0-3 ft	54,000	NA (7)	3.00	Yes	No	**Yes**
Indeno(1,2,3-cd)pyrene	0-3 ft	20,000	NA (7)	1.11	Yes	No	**Yes**
Pyrene	0-3 ft	67,100	NA (7)	3.73	Yes	No	**Yes**
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	367,900	18,000	20.4	Yes	Yes	**Yes**
TPH (mg/kg)							
Diesel Range Organics	0-1 ft	1,000	NA	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	23,900	NA	- -	- -	- -	Yes - No SLV

Table N-2
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(5 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij>1)	Chemical is a Concern for Non-threatened or Endangered Invertebrates? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
Residual Range Organics	0-1 ft	9,450	NA	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	1,000	NA	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	23,900	NA	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	9,450	NA	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

Hierarchy of Terrestrial Invertebrate SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(3) RA Efroymson. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process, Nov 1997 Revision. ORNL ES/ER/TM-126/R2.

(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .

Table N-2
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(6 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij>1)	Chemical is a Concern for Non-threatened or Endangered Invertebrates? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)

Tij = Risk ratios for contaminant *i* in medium *j*

Q = Receptor designator

Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).

Q = 1 for terrestrial T&E species and all aquatic species

Q = 5 for all common terrestrial species

For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

(6) The SLV for Total LPAHs was used to screen the individual LPAHs to determine which individuals are driving Total LPAH risk, if any.

(7) The SLV for Total HPAHs was used to screen the individual HPAHs to determine which individuals are driving Total HPAH risk, if any.

Table N-3
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(1 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)									
Antimony	0-1 ft	1.36	0.176	7.7	Yes	Yes	No	--	**Yes**
Cadmium	0-1 ft	0.974	0.77	1.26	Yes	No	Yes	Yes	**Yes**
Lead	0-1 ft	332	25.5	13.0	Yes	Yes	Yes	Yes	**Yes**
Mercury	0-1 ft	1.57	0.066	23.8	Yes	Yes	Yes	Yes	**Yes**
Silver	0-1 ft	0.468	4.2	0.111	No	No	Yes	Yes	No
Zinc	0-1 ft	207	71.7	2.89	Yes	No	Yes	Yes	**Yes**
Antimony	0-3 ft	1.48	0.176	8.4	Yes	Yes	No	--	**Yes**
Arsenic	0-3 ft	10.5	43	0.244	No	No	Yes	Yes	No
Cadmium	0-3 ft	1.17	0.77	1.52	Yes	No	Yes	Yes	**Yes**
Lead	0-3 ft	511	25.5	20.0	Yes	Yes	Yes	Yes	**Yes**
Mercury	0-3 ft	1.45	0.066	22.0	Yes	Yes	Yes	Yes	**Yes**
Silver	0-3 ft	0.450	4.2	0.107	No	No	Yes	Yes	No
Zinc	0-3 ft	417	71.7	5.82	Yes	Yes	Yes	Yes	**Yes**
BUTYLTINS (ug/kg)									
Dibutyltin	0-1 ft	20.2	28,000	0.000721	No	No	No	--	No
Monobutyltin	0-1 ft	38.0	28,000	0.00136	No	No	No	--	No
Tributyltin	0-1 ft	165	28,000	0.00589	No	No	Yes	No	**Yes-Bio**
Dibutyltin	0-3 ft	20.1	28,000	0.000718	No	No	No	--	No
Monobutyltin	0-3 ft	38.0	28,000	0.00136	No	No	No	--	No
Tributyltin	0-3 ft	60.1	28,000	0.00215	No	No	Yes	No	**Yes-Bio**
PESTICIDES (ug/kg)									
4,4'-DDT	0-1 ft	12.2	93	0.131	No	No	Yes	Yes	No
Total DDTs	0-1 ft	13.9	93	0.149	No	No	Yes	Yes	No
Chlordane (technical)	0-1 ft	1,560	9,000	0.173	No	No	Yes	No	**Yes-Bio**
4,4'-DDT	0-3 ft	11.8	93	0.127	No	No	Yes	Yes	No
Total DDTs	0-3 ft	13.3	93	0.14	No	No	Yes	Yes	No
Chlordane (technical)	0-3 ft	1,560	9,000	0.173	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-3 ft	2.86	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
PCBs (ug/kg)									
Aroclor 1248	0-1 ft	386	655	0.589	No	No	Yes	Yes	No
Aroclor 1254	0-1 ft	22.5	655	0.0344	No	No	Yes	Yes	No
Aroclor 1260	0-1 ft	251	655	0.383	No	No	Yes	Yes	No
Total PCBs (Aroclors)	0-1 ft	429	655	0.655	No	No	Yes	Yes	No
Aroclor 1248	0-3 ft	364	655	0.556	No	No	Yes	Yes	No
Aroclor 1254	0-3 ft	31.1	655	0.0475	No	No	Yes	Yes	No

Table N-3
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(2 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
Aroclor 1260	0-3 ft	190	655	0.290	No	No	Yes	Yes	No
Total PCBs (Aroclors)	0-3 ft	410	655	0.626	No	No	Yes	Yes	No
HERBICIDES (ug/kg)									
2,4,5-T	0-1 ft	71.6	93	0.770	No	No	No	- -	No
Dichloroprop	0-1 ft	175	93	1.88	Yes	No	No	- -	**Yes**
MCPP	0-1 ft	11,700	93	126	Yes	Yes	No	- -	**Yes**
2,4,5-T	0-3 ft	70.3	93	0.756	No	No	No	- -	No
Dichloroprop	0-3 ft	174	93	1.87	Yes	No	No	- -	**Yes**
MCPP	0-3 ft	11,200	93	120	Yes	Yes	No	- -	**Yes**
VOCs (ug/kg)									
1,2,4-Trimethylbenzene	0-1 ft	3,030	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
1,3,5-Trimethylbenzene	0-1 ft	1,200	NA	- -	- -	- -	No	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-1 ft	12	NA	- -	- -	- -	No	- -	Yes - No SLV
Ethylbenzene	0-1 ft	2,700	NA	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	9,800	NA	- -	- -	- -	No	- -	Yes - No SLV
Naphthalene	0-1 ft	4,190	NA	- -	- -	- -	No	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-1 ft	16.7	NA	- -	- -	- -	No	- -	Yes - No SLV
Toluene	0-1 ft	1.80	NA	- -	- -	- -	No	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-3 ft	2,790	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
1,3,5-Trimethylbenzene	0-3 ft	1,110	NA	- -	- -	- -	No	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-3 ft	12	NA	- -	- -	- -	No	- -	Yes - No SLV
Naphthalene	0-3 ft	3,830	NA	- -	- -	- -	No	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-3 ft	16.5	NA	- -	- -	- -	No	- -	Yes - No SLV
Toluene	0-3 ft	1.64	NA	- -	- -	- -	No	- -	Yes - No SLV
SVOCs (ug/kg)									
Benzoic Acid	0-1 ft	200	NA	- -	- -	- -	No	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-1 ft	9,680	4,500	2.15	Yes	No	Yes	No	**Yes**
Butyl Benzyl Phthalate	0-1 ft	36.6	450	0.0813	No	No	Yes	No	**Yes-Bio**
Carbazole	0-1 ft	751	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-1 ft	152	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Diethyl Phthalate	0-1 ft	50.0	NA	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-1 ft	232	450	0.516	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-1 ft	103	2,100	0.0490	No	No	Yes	Yes	No
Benzoic Acid	0-3 ft	218	NA	- -	- -	- -	No	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-3 ft	6,380	4,500	1.42	Yes	No	Yes	No	**Yes**
Butyl Benzyl Phthalate	0-3 ft	34.9	450	0.0776	No	No	Yes	No	**Yes-Bio**

Table N-3
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(3 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
Carbazole	0-3 ft	964	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-3 ft	164	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Diethyl Phthalate	0-3 ft	38.9	NA	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-3 ft	217	450	0.482	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-3 ft	99	2,100	0.0470	No	No	Yes	Yes	No
PAHs (ug/kg)									
2-Methylnaphthalene	0-1 ft	213	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthene	0-1 ft	713	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthylene	0-1 ft	29.2	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Anthracene	0-1 ft	924	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluorene	0-1 ft	222	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Naphthalene	0-1 ft	172	NA	- -	- -	- -	No	- -	Yes - No SLV
Phenanthrene	0-1 ft	3,660	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	5,810	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)anthracene	0-1 ft	8,340	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)pyrene	0-1 ft	8,700	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(b)fluoranthene	0-1 ft	16,000	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(g,h,i)perylene	0-1 ft	4,590	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(k)fluoranthene	0-1 ft	30,200	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzofluoranthenes, Total	0-1 ft	14,700	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Chrysene	0-1 ft	8,400	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenz(a,h)anthracene	0-1 ft	4,230	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluoranthene	0-1 ft	14,500	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Indeno(1,2,3-cd)pyrene	0-1 ft	5,040	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Pyrene	0-1 ft	12,300	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	90,158	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
2-Methylnaphthalene	0-3 ft	199	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthene	0-3 ft	913	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthylene	0-3 ft	34.9	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Anthracene	0-3 ft	1,930	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluorene	0-3 ft	324	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Naphthalene	0-3 ft	157	NA	- -	- -	- -	No	- -	Yes - No SLV
Phenanthrene	0-3 ft	5,780	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	9,226	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)anthracene	0-3 ft	9,960	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)pyrene	0-3 ft	11,200	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**

Table N-3
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(4 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
Benzo(b)fluoranthene	0-3 ft	15,200	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(g,h,i)perylene	0-3 ft	5,820	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(k)fluoranthene	0-3 ft	26,300	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzofluoranthenes, Total	0-3 ft	31,300	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Chrysene	0-3 ft	11,000	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenz(a,h)anthracene	0-3 ft	2,060	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluoranthene	0-3 ft	17,500	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Indeno(1,2,3-cd)pyrene	0-3 ft	6,800	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Pyrene	0-3 ft	18,800	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	101,525	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
TPH (mg/kg)									
Diesel Range Organics	0-1 ft	3670	NA	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	307	NA	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	17,700	NA	- -	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	3340	NA	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	157	NA	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	16,000	NA	- -	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).

Hierarchy of Avian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.

Table N-3
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(5 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)

(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.

(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.

(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Individual COIs in a Given Media

(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.

Where: Cij = concentration of contaminant *i* in medium *j*

SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .

Tij = Risk ratios for contaminant *i* in medium *j*

Q = Receptor designator

Assumptions: Cij = Lower of 95% UCL and maximum concentration for wildlife species (birds and mammals).

Q = 1 for terrestrial T&E species and all aquatic species

Q = 5 for all common terrestrial species

For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-4
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(1 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
INORGANICS (mg/kg)									
Antimony	0-1 ft	1.36	0.27	5.037	Yes	Yes	No	--	**Yes**
Cadmium	0-1 ft	0.974	0.36	2.71	Yes	No	Yes	Yes	No
Lead	0-1 ft	332	56	5.93	Yes	Yes	Yes	Yes	**Yes**
Mercury	0-1 ft	1.57	0.146	10.8	Yes	Yes	Yes	Yes	**Yes**
Silver	0-1 ft	0.468	14	0.0334	No	No	Yes	Yes	No
Zinc	0-1 ft	207	79	2.62	Yes	No	Yes	Yes	No
Antimony	0-3 ft	1.48	0.27	5.48	Yes	Yes	No	--	**Yes**
Arsenic	0-3 ft	10.5	46	0.228	No	No	Yes	Yes	No
Cadmium	0-3 ft	1.17	0.36	3.25	Yes	No	Yes	Yes	No
Lead	0-3 ft	511	56	9.13	Yes	Yes	Yes	Yes	**Yes**
Mercury	0-3 ft	1.45	0.146	9.93	Yes	Yes	Yes	Yes	**Yes**
Silver	0-3 ft	0.450	14	0.0321	No	No	Yes	Yes	No
Zinc	0-3 ft	417	79	5.28	Yes	Yes	Yes	Yes	**Yes**
BUTYLTINS (ug/kg)									
Dibutyltin	0-1 ft	20.2	1,300,000	0.0000155	No	No	No	--	No
Monobutyltin	0-1 ft	38.0	1,300,000	0.0000292	No	No	No	--	No
Tributyltin	0-1 ft	165	1,300,000	0.000127	No	No	Yes	No	**Yes-Bio**
Dibutyltin	0-3 ft	20.1	1,300,000	0.0000155	No	No	No	--	No
Monobutyltin	0-3 ft	38.0	1,300,000	0.0000292	No	No	No	--	No
Tributyltin	0-3 ft	60.1	1,300,000	0.0000462	No	No	Yes	No	**Yes-Bio**
PESTICIDES (ug/kg)									
4,4'-DDT	0-1 ft	12.2	21	0.581	No	No	Yes	Yes	No
Total DDTs	0-1 ft	13.9	21	0.661	No	No	Yes	Yes	No
Chlordane (technical)	0-1 ft	1,560	250,000	0.00624	No	No	Yes	No	**Yes-Bio**
4,4'-DDT	0-3 ft	11.8	21	0.562	No	No	Yes	Yes	No
Total DDTs	0-3 ft	13.3	21	0.635	No	No	Yes	Yes	No
Chlordane (technical)	0-3 ft	1,560	250,000	0.00624	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-3 ft	2.86	15,000	0.000191	No	No	Yes	No	**Yes-Bio**
PCBs (ug/kg)									
Aroclor 1248	0-1 ft	386	371	1.04	Yes	No	Yes	Yes	No
Aroclor 1254	0-1 ft	22.5	371	0.0606	No	No	Yes	Yes	No
Aroclor 1260	0-1 ft	251	371	0.677	No	No	Yes	Yes	No
Total PCBs (Aroclors)	0-1 ft	429	371	1.16	Yes	No	Yes	Yes	No
Aroclor 1248	0-3 ft	364	371	0.981	No	No	Yes	Yes	No
Aroclor 1254	0-3 ft	31.1	371	0.0838	No	No	Yes	Yes	No
Aroclor 1260	0-3 ft	190	371	0.512	No	No	Yes	Yes	No

Table N-4
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(2 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
Total PCBs (Aroclors)	0-3 ft	410	371	1.10	Yes	No	Yes	Yes	No
HERBICIDES (ug/kg)									
2,4,5-T	0-1 ft	71.6	21	3.41	Yes	No	No	--	No
Dichloroprop	0-1 ft	175	21	8.33	Yes	Yes	No	--	**Yes**
MCPP	0-1 ft	11,700	21	557	Yes	Yes	No	--	**Yes**
2,4,5-T	0-3 ft	70.3	21	3.35	Yes	No	No	--	No
Dichloroprop	0-3 ft	174	21	8.29	Yes	Yes	No	--	**Yes**
MCPP	0-3 ft	11,200	21	533	Yes	Yes	No	--	**Yes**
VOCs (ug/kg)									
1,2,4-Trimethylbenzene	0-1 ft	3,030	1,440,000	0.00210	No	No	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-1 ft	1,200	1,440,000	0.000833	No	No	No	- -	No
Dichloromethane (Methylene Chloride)	0-1 ft	12	730,000	0.0000164	No	No	No	- -	No
Ethylbenzene	0-1 ft	2,700	NA	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	9,800	120,000	0.0817	No	No	No	- -	No
Naphthalene	0-1 ft	4,190	NA (6)	0.0419	No	No	No	- -	No
Tetrachloroethene (PCE)	0-1 ft	16.7	80,000	0.000209	No	No	No	- -	No
Toluene	0-1 ft	1.80	1,440,000	0.00000125	No	No	No	- -	No
1,2,4-Trimethylbenzene	0-3 ft	2,790	1,440,000	0.00194	No	No	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-3 ft	1,110	1,440,000	0.000771	No	No	No	- -	No
Dichloromethane (Methylene Chloride)	0-3 ft	12	730,000	0.0000164	No	No	No	- -	No
Naphthalene	0-3 ft	3,830	NA (6)	0.0383	No	No	No	- -	No
Tetrachloroethene (PCE)	0-3 ft	16.5	80,000	0.000206	No	No	No	- -	No
Toluene	0-3 ft	1.64	1,440,000	0.00000114	No	No	No	- -	No
SVOCs (ug/kg)									
Benzoic Acid	0-1 ft	200	1,440,000	0.000139	No	No	No	- -	No
Bis(2-ethylhexyl) Phthalate	0-1 ft	9,680	1,020,000	0.00949	No	No	Yes	No	**Yes-Bio**
Butyl Benzyl Phthalate	0-1 ft	36.6	30,000,000	0.00000122	No	No	Yes	No	**Yes-Bio**
Carbazole	0-1 ft	751	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-1 ft	152	2	76.0	Yes	Yes	Yes	No	**Yes**
Diethyl Phthalate	0-1 ft	50.0	250,000,000	0.000000200	No	No	No	- -	No
Di-n-butyl Phthalate	0-1 ft	232	30,000,000	0.00000773	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-1 ft	103	2,800	0.0368	No	No	Yes	Yes	No
Benzoic Acid	0-3 ft	218	1,440,000	0.000151	No	No	No	- -	No
Bis(2-ethylhexyl) Phthalate	0-3 ft	6,380	1,020,000	0.00625	No	No	Yes	No	**Yes-Bio**
Butyl Benzyl Phthalate	0-3 ft	34.9	30,000,000	0.00000116	No	No	Yes	No	**Yes-Bio**
Carbazole	0-3 ft	964	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-3 ft	164	2	82.0	Yes	Yes	Yes	No	**Yes**

Table N-4
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(3 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
Diethyl Phthalate	0-3 ft	38.9	250,000,000	0.000000156	No	No	No	- -	No
Di-n-butyl Phthalate	0-3 ft	217	30,000,000	0.00000723	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-3 ft	99	2,800	0.0353	No	No	Yes	Yes	No
PAHs (ug/kg)									
2-Methylnaphthalene	0-1 ft	213	NA (6)	0.00213	No	No	Yes	Incl in tLPAH	No
Acenaphthene	0-1 ft	713	NA (6)	0.00713	No	No	Yes	Incl in tLPAH	No
Acenaphthylene	0-1 ft	29.2	NA (6)	0.000292	No	No	Yes	Incl in tLPAH	No
Anthracene	0-1 ft	924	NA (6)	0.00924	No	No	Yes	Incl in tLPAH	No
Fluorene	0-1 ft	222	NA (6)	0.00222	No	No	Yes	Incl in tLPAH	No
Naphthalene	0-1 ft	172	NA (6)	0.00172	No	No	No	- -	No
Phenanthrene	0-1 ft	3,660	NA (6)	0.0366	No	No	Yes	Incl in tLPAH	No
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	5,810	100,000	0.0581	No	No	Yes	Yes	No
Benzo(a)anthracene	0-1 ft	8,340	NA (7)	7.58	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Benzo(a)pyrene	0-1 ft	8,700	NA (7)	7.91	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Benzo(b)fluoranthene	0-1 ft	16,000	NA (7)	14.5	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Benzo(g,h,i)perylene	0-1 ft	4,590	NA (7)	4.17	Yes	No	Yes	Incl in tHPAH	No
Benzo(k)fluoranthene	0-1 ft	30,200	NA (7)	27.5	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Benzofluoranthenes, Total	0-1 ft	14,700	NA (7)	13.4	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Chrysene	0-1 ft	8,400	NA (7)	7.64	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Dibenz(a,h)anthracene	0-1 ft	4,230	NA (7)	3.85	Yes	No	Yes	Incl in tHPAH	No
Fluoranthene	0-1 ft	14,500	NA (7)	13.2	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Indeno(1,2,3-cd)pyrene	0-1 ft	5,040	NA (7)	4.58	Yes	No	Yes	Incl in tHPAH	No
Pyrene	0-1 ft	12,300	NA (7)	11.2	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	90,158	1,100	82.0	Yes	Yes	Yes	Yes	**Yes**
2-Methylnaphthalene	0-3 ft	199	NA (6)	0.00199	No	No	Yes	Incl in tLPAH	No
Acenaphthene	0-3 ft	913	NA (6)	0.00913	No	No	Yes	Incl in tLPAH	No
Acenaphthylene	0-3 ft	34.9	NA (6)	0.000349	No	No	Yes	Incl in tLPAH	No
Anthracene	0-3 ft	1,930	NA (6)	0.0193	No	No	Yes	Incl in tLPAH	No
Fluorene	0-3 ft	324	NA (6)	0.00324	No	No	Yes	Incl in tLPAH	No
Naphthalene	0-3 ft	157	NA (6)	0.00157	No	No	No	- -	No
Phenanthrene	0-3 ft	5,780	NA (6)	0.0578	No	No	Yes	Incl in tLPAH	No
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	9,226	100,000	0.0923	No	No	Yes	Yes	No

Table N-4
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(4 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
Benzo(a)anthracene	0-3 ft	9,960	NA (7)	9.05	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Benzo(a)pyrene	0-3 ft	11,200	NA (7)	10.2	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Benzo(b)fluoranthene	0-3 ft	15,200	NA (7)	13.8	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Benzo(g,h,i)perylene	0-3 ft	5,820	NA (7)	5.29	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Benzo(k)fluoranthene	0-3 ft	26,300	NA (7)	23.9	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Benzofluoranthenes, Total	0-3 ft	31,300	NA (7)	28.5	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Chrysene	0-3 ft	11,000	NA (7)	10.0	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Dibenz(a,h)anthracene	0-3 ft	2,060	NA (7)	1.87	Yes	No	Yes	Incl in tHPAH	No
Fluoranthene	0-3 ft	17,500	NA (7)	15.9	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Indeno(1,2,3-cd)pyrene	0-3 ft	6,800	NA (7)	6.18	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Pyrene	0-3 ft	18,800	NA (7)	17.1	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	101,525	1,100	92.3	Yes	Yes	Yes	Yes	**Yes**
TPH (mg/kg)									
Diesel Range Organics	0-1 ft	3670	NA	- -	- -	- -			Yes - No SLV
Gasoline Range Organics	0-1 ft	307	NA	- -	- -	- -			Yes - No SLV
Residual Range Organics	0-1 ft	17,700	NA	- -	- -	- -			Yes - No SLV
Diesel Range Organics	0-3 ft	3340	NA	- -	- -	- -			Yes - No SLV
Gasoline Range Organics	0-3 ft	157	NA	- -	- -	- -			Yes - No SLV
Residual Range Organics	0-3 ft	16,000	NA	- -	- -	- -			Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
Incl in tHPAH = COI is included in the Total HPAH Screening
Incl in tLPAH = COI is included in the Total LPAH Screening
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

Table N-4
Identification of CPECs in Soil at Landfill AOPC - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(5 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)

(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).

Hierarchy of Mammalian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Lower of 95% UCL and maximum concentration for wildlife species (birds and mammals).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).
(6) The SLV for Total LPAHs was used to screen the individual LPAHs to determine which individuals are driving Total LPAH risk, if any.
(7) The SLV for Total HPAHs was used to screen the individual HPAHs to determine which individuals are driving Total HPAH risk, if any.

Table N-5
Identification of CPECs in Groundwater, Seep Water, and Surface Water at Landfill AOPC - Individual COIs for Aquatic Organisms
Bradford Island - Upland Operable Unit
(1 of 3)

Chemicals of Interest	Medium	Dissolved or Total (D or T)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	Chemical is a Concern for Aquatic Organisms (Tij>1)?	Is COI Bioaccum-ulative?	COI is Identified as a CPEC? (9) (Q = 1)
INORGANICS (mg/L)								
Arsenic	Groundwater	D	0.00749	0.15	0.0499	No	Yes	**Yes-Bio**
Barium	Groundwater	D	0.134	0.004	33.5	Yes	No	**Yes**
Calcium	Groundwater	D	91.6	116	0.790	No	No	No
Iron	Groundwater	D	31.0	1.0	31.0	Yes	No	**Yes**
Lead	Groundwater	D	0.000524	0.0014	0.365	No	Yes	**Yes-Bio**
Magnesium	Groundwater	D	16.3	82	0.199	No	No	No
Manganese	Groundwater	D	3.50	0.12	29.2	Yes	No	**Yes**
Nickel	Groundwater	D	0.0186	0.034	0.551	No	No	No
Potassium	Groundwater	D	7.47	53	0.141	No	No	No
Sodium	Groundwater	D	648	680	0.953	No	No	No
Zinc	Groundwater	D	0.196	0.077	2.56	Yes	Yes	**Yes**
Antimony	Seep Water	D	0.00228	1.00	0.00228	No	No	No
Arsenic	Seep Water	D	0.00100	0.15	0.00667	No	Yes	**Yes-Bio**
Barium	Seep Water	D	0.277	0.004	69.3	Yes	No	**Yes**
Calcium	Seep Water	D	76.4	116	0.659	No	No	No
Copper	Seep Water	D	0.00109	0.006	0.188	No	No	No
Iron	Seep Water	D	3.21	1.0	3.21	Yes	No	**Yes**
Lead	Seep Water	D	0.0000650	0.0014	0.0452	No	Yes	**Yes-Bio**
Magnesium	Seep Water	D	16.6	82	0.202	No	No	No
Manganese	Seep Water	D	1.48	0.12	12.3	Yes	No	**Yes**
Nickel	Seep Water	D	0.00222	0.034	0.0658	No	No	No
Potassium	Seep Water	D	4.16	53	0.0785	No	No	No
Sodium	Seep Water	D	19.7	680	0.0290	No	No	No
Zinc	Seep Water	D	0.0856	0.077	1.12	Yes	Yes	**Yes**
Arsenic	Surface Water	D	0.00101	0.15	0.00673	No	Yes	**Yes-Bio**
Calcium	Surface Water	D	20.5	116	0.177	No	No	No
Iron	Surface Water	D	0.00920	1.0	0.00920	No	No	No
Lead	Surface Water	D	0.0000160	0.0014	0.0111	No	Yes	**Yes-Bio**
Magnesium	Surface Water	D	6.33	82	0.0772	No	No	No
Manganese	Surface Water	D	0.00101	0.12	0.00842	No	No	No
Potassium	Surface Water	D	1.51	53	0.0285	No	No	No
Sodium	Surface Water	D	7.90	680	0.0116	No	No	No
BUTYLTINS (ug/L)								
Dibutyltin	Groundwater	T	0.0586	0.063	0.930	No	No	No

Table N-5
Identification of CPECs in Groundwater, Seep Water, and Surface Water at Landfill AOPC - Individual COIs for Aquatic Organisms
Bradford Island - Upland Operable Unit
(2 of 3)

Chemicals of Interest	Medium	Dissolved or Total (D or T)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	Chemical is a Concern for Aquatic Organisms (Tij>1)?	Is COI Bioaccum-ulative?	COI is Identified as a CPEC? (9) (Q = 1)
Monobutyltin	Groundwater	T	0.0254	0.063	0.403	No	No	No
Tributyltin	Groundwater	T	0.0364	0.063	0.578	No	Yes	**Yes-Bio**
HERBICIDES (ug/L)								
4-Nitrophenol	Groundwater	T	0.840	150	0.00560	No	No	No
Pentachlorophenol	Groundwater	T	0.112	15	0.00747	No	Yes	**Yes-Bio**
VOCs (ug/L)								
1,2,4-Trimethylbenzene	Groundwater	T	5.20	7.3	0.712	No	Yes	**Yes-Bio**
Acetone	Groundwater	T	10.2	1,500	0.00680	No	No	No
Chloroform	Groundwater	T	0.498	1,240	0.000402	No	No	No
Isopropylbenzene	Groundwater	T	3.42	7.3	0.468	No	Yes	**Yes-Bio**
n-Propylbenzene	Groundwater	T	1.32	7.3	0.181	No	Yes	**Yes-Bio**
Tetrachloroethene (PCE)	Groundwater	T	2.80	840	0.00333	No	No	No
Vinyl Chloride	Groundwater	T	0.307	1,300	0.000236	No	No	No
Chloroform	Seep Water	T	2.80	1,240	0.00226	No	No	No
Tetrachloroethene (PCE)	Seep Water	T	4.40	840	0.00524	No	No	No
SVOCs (ug/L)								
Bis(2-ethylhexyl) Phthalate	Groundwater	T	4.70	3.0	1.57	Yes	Yes	**Yes**
Diethyl Phthalate	Groundwater	T	0.873	210	0.00416	No	No	No
Di-n-octyl Phthalate	Groundwater	T	4.61	708	0.00651	No	Yes	**Yes-Bio**
Isophorone	Groundwater	T	0.177	2,340	0.0000756	No	No	No
Benzoic Acid	Seep Water	T	5.88	42	0.140	No	No	No
PAHs (ug/L)								
2-Methylnaphthalene	Groundwater	T	0.175	72.16	0.00243	No	Yes	**Yes-Bio**
Acenaphthene	Groundwater	T	0.158	55.85	0.002829	No	Yes	**Yes-Bio**
Naphthalene	Groundwater	T	0.0873	193.5	0.000451	No	No	No
Phenanthrene	Groundwater	T	0.591	6.3	0.0938	No	Yes	**Yes-Bio**
TPH (mg/L)								
Diesel Range Organics	Groundwater	T	0.388	NA	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	Groundwater	T	0.0604	NA	- -	- -	- -	Yes - No SLV
Residual Range Organics	Groundwater	T	0.344	NA	- -	- -	- -	Yes - No SLV
Diesel Range Organics	Seep Water	T	0.130	NA	- -	- -	- -	Yes - No SLV
Residual Range Organics	Seep Water	T	0.130	NA	- -	- -	- -	Yes - No SLV
Diesel Range Organics	Surface Water	T	0.0300	NA	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest

Table N-5
Identification of CPECs in Groundwater, Seep Water, and Surface Water at Landfill AOPC - Individual COIs for Aquatic Organisms
Bradford Island - Upland Operable Unit
(3 of 3)

Chemicals of Interest	Medium	Dissolved or Total (D or T)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	Chemical is a Concern for Aquatic Organisms (Tij>1)?	Is COI Bioaccum-ulative?	COI is Identified as a CPEC? (9) (Q = 1)

NA = not available
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) In addition to seep water and surface water concentrations, concentrations in groundwater were compared to Selected Level II SLVs for surface water as a conservative measure (in the event that groundwater discharges to surface water).

Hierarchy of Aquatic Organisms SLV Selection (see Appendix J-5b)
(2) USEPA 2009. National Recommended Water Quality Criteria. Office of Water and Office of Science and Technology.
(3) Oregon Department of Environmental Quality (DEQ). Water Quality Criteria for freshwater organisms (Oregon Administrative rules, section 340-041, Table 33A).
(4) DEQ 1998. Updated 2001. Guidance for Ecological risk Assessment: Levels I,II,III,IV. Waste Management and Cleanup Division.
(5) Suter GW II, and CL Tsao. 1996. Toxicological Benchmarks for Screening of Potential Contaminants of Concern for Effects on Aquatic Biota on Oak Ridge Reservation: 1996 Revision. ORNL, Oak Ridge, TN. 104pp. ES/ER/TM-96/R2.
(6) USEPA 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. November. EPA-600-R-02-013.
(7) Canadian Council of Resource and Environment Ministers. 2007. Canadian Water Quality Guidelines for the Protection of Aquatic Life. December Accessed on 1/20/10 at http://ceqg-rcqe.ccme.ca/.
(8) Buchman, M.F., 2008. NOAA Screening Quick Reference Tables, NOAA OR&R Report 08-1, Seattle WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration, 34 pages.

Individual COIs in a Given Media
(9) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLV ij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Lower of Maximum detected concentration and 95% UCL (for aquatic receptors).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-6
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Plants
Bradford Island - Upland Operable Unit
(1 of 5)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)								
Antimony	0-1 ft	4.20	5	0.840	0.00242	No	No	No
Cadmium	0-1 ft	2.09	32	0.0653	0.000188	No	No	No
Lead	0-1 ft	741	120	6.18	0.0178	No	No	No
Mercury	0-1 ft	4.15	0.3	13.8	0.0399	Yes	No	**Yes**
Silver	0-1 ft	1.50	560	0.00268	0.00000773	No	No	No
Zinc	0-1 ft	635	160	3.97	0.0114	No	No	No
Antimony	0-3 ft	4.20	5	0.840	0.00209	No	No	No
Arsenic	0-3 ft	30.1	18	1.67	0.00416	No	No	No
Cadmium	0-3 ft	3.54	32	0.111	0.000275	No	No	No
Lead	0-3 ft	1,660	120	13.8	0.0344	Yes	No	**Yes**
Mercury	0-3 ft	4.15	0.3	13.8	0.0344	Yes	No	**Yes**
Silver	0-3 ft	1.50	560	0.00268	0.00000667	No	No	No
Zinc	0-3 ft	1,140	160	7.13	0.0177	No	No	No
BUTYLTINS (ug/kg)								
Dibutyltin	0-1 ft	20.2	NA	- -	- -	- -	- -	Yes - No SLV
Monobutyltin	0-1 ft	38.0	NA	- -	- -	- -	- -	Yes - No SLV
Tributyltin	0-1 ft	165	NA	- -	- -	- -	- -	Yes - No SLV
Dibutyltin	0-3 ft	20.2	NA	- -	- -	- -	- -	Yes - No SLV
Monobutyltin	0-3 ft	38.0	NA	- -	- -	- -	- -	Yes - No SLV
Tributyltin	0-3 ft	165	NA	- -	- -	- -	- -	Yes - No SLV
PESTICIDES (ug/kg)								
4,4'-DDT	0-1 ft	28.0	NA	- -	- -	- -	- -	Yes - No SLV
Total DDTs	0-1 ft	29.9	NA	- -	- -	- -	- -	Yes - No SLV
Chlordane (technical)	0-1 ft	1,560	NA	- -	- -	- -	- -	Yes - No SLV
4,4'-DDT	0-3 ft	28.0	NA	- -	- -	- -	- -	Yes - No SLV
Total DDTs	0-3 ft	29.9	NA	- -	- -	- -	- -	Yes - No SLV
Chlordane (technical)	0-3 ft	1,560	NA	- -	- -	- -	- -	Yes - No SLV
Heptachlor	0-3 ft	3.07	1,000	0.00307	0.00000764	No	No	No
PCBs (ug/kg)								
Aroclor 1248	0-1 ft	968	40,000	0.0242	0.0000698	No	No	No
Aroclor 1254	0-1 ft	78.6	40,000	0.00197	0.00000567	No	No	No
Aroclor 1260	0-1 ft	660	40,000	0.0165	0.0000476	No	No	No
Aroclor 1248	0-3 ft	968	40,000	0.0242	0.0000602	No	No	No

Table N-6
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Plants
Bradford Island - Upland Operable Unit
(2 of 5)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
Aroclor 1254	0-3 ft	86.1	40,000	0.00215	0.00000536	No	No	No
Aroclor 1260	0-3 ft	660	40,000	0.0165	0.0000411	No	No	No
HERBICIDES (ug/kg)								
2,4,5-T	0-1 ft	93.0	NA	- -	- -	- -	- -	Yes - No SLV
Dichloroprop	0-1 ft	180	NA	- -	- -	- -	- -	Yes - No SLV
MCPP	0-1 ft	14,000	NA	- -	- -	- -	- -	Yes - No SLV
2,4,5-T	0-3 ft	93.0	NA	- -	- -	- -	- -	Yes - No SLV
Dichloroprop	0-3 ft	180	NA	- -	- -	- -	- -	Yes - No SLV
MCPP	0-3 ft	14,000	NA	- -	- -	- -	- -	Yes - No SLV
VOCs (ug/kg)								
1,2,4-Trimethylbenzene	0-1 ft	14,300	200,000	0.0715	0.000206	No	No	No
1,3,5-Trimethylbenzene	0-1 ft	5,410	200,000	0.0271	0.0000780	No	No	No
Dichloromethane (Methylene Chloride)	0-1 ft	1,000	NA	- -	- -	- -	- -	Yes - No SLV
Ethylbenzene	0-1 ft	2,700	NA	- -	- -	- -	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	9,800	NA	- -	- -	- -	- -	Yes - No SLV
Naphthalene	0-1 ft	8,360	10,000	0.836	0.00241	No	No	No
Tetrachloroethene (PCE)	0-1 ft	65.0	10,000	0.00650	0.0000187	No	No	No
Toluene	0-1 ft	5.30	200,000	0.0000265	0.0000000764	No	No	No
1,2,4-Trimethylbenzene	0-3 ft	14,300	200,000	0.07150	0.000178	No	No	No
1,3,5-Trimethylbenzene	0-3 ft	5,410	200,000	0.0271	0.0000673	No	No	No
Dichloromethane (Methylene Chloride)	0-3 ft	1,000	NA	- -	- -	- -	- -	Yes - No SLV
Naphthalene	0-3 ft	8,360	10,000	0.836	0.00208	No	No	No
Tetrachloroethene (PCE)	0-3 ft	65.0	10,000	0.00650	0.0000162	No	No	No
Toluene	0-3 ft	5.30	200,000	0.0000265	0.0000000660	No	No	No
SVOCs (ug/kg)								
Benzoic Acid	0-1 ft	553	200,000	0.00277	0.00000797	No	No	No
Bis(2-ethylhexyl) Phthalate	0-1 ft	21,000	NA	- -	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-1 ft	68.7	200,000	0.000344	0.000000991	No	No	No
Carbazole	0-1 ft	2,650	NA	- -	- -	- -	- -	Yes - No SLV
Dibenzofuran	0-1 ft	810	NA	- -	- -	- -	- -	Yes - No SLV
Diethyl Phthalate	0-1 ft	73.4	100,000	0.000734	0.00000212	No	No	No
Di-n-butyl Phthalate	0-1 ft	1,800	200,000	0.00900	0.0000260	No	No	No
Pentachlorophenol	0-1 ft	201	5,000	0.0402	0.000116	No	No	No
Benzoic Acid	0-3 ft	553	200,000	0.00277	0.00000688	No	No	No

Table N-6
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Plants
Bradford Island - Upland Operable Unit
(3 of 5)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
Bis(2-ethylhexyl) Phthalate	0-3 ft	21,000	NA	- -	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-3 ft	68.7	200,000	0.000344	0.000000855	No	No	No
Carbazole	0-3 ft	2,840	NA	- -	- -	- -	- -	Yes - No SLV
Dibenzofuran	0-3 ft	810	NA	- -	- -	- -	- -	Yes - No SLV
Diethyl Phthalate	0-3 ft	73.4	100,000	0.000734	0.00000183	No	No	No
Di-n-butyl Phthalate	0-3 ft	1,800	200,000	0.00900	0.0000224	No	No	No
Pentachlorophenol	0-3 ft	201	5,000	0.0402	0.000100	No	No	No
PAHs (ug/kg)								
2-Methylnaphthalene	0-1 ft	1,530	NA (6)	0.153	0.000441	No	No	No
Acenaphthene	0-1 ft	2,600	20,000	0.130	0.000375	No	No	No
Acenaphthylene	0-1 ft	78.1	NA (6)	0.00781	0.0000225	No	No	No
Anthracene	0-1 ft	2,700	NA (6)	0.270	0.000779	No	No	No
Fluorene	0-1 ft	1,200	NA (6)	0.120	0.000346	No	No	No
Naphthalene	0-1 ft	823	10,000	0.082	0.000237	No	No	No
Phenanthrene	0-1 ft	12,000	NA (6)	1.20	0.00346	No	No	No
Benzo(a)anthracene	0-1 ft	32,000	1,200	26.7	0.0769	Yes	No	**Yes**
Benzo(a)pyrene	0-1 ft	33,000	1,200	27.5	0.0793	Yes	No	**Yes**
Benzo(b)fluoranthene	0-1 ft	65,000	1,200	54.2	0.156	Yes	Yes	**Yes**
Benzo(g,h,i)perylene	0-1 ft	18,000	NA (7)	15.0	0.0433	Yes	No	**Yes**
Benzo(k)fluoranthene	0-1 ft	65,000	1,200	54.2	0.156	Yes	Yes	**Yes**
Benzofluoranthenes, Total	0-1 ft	14,700	NA (7)	12.3	0.0353	Yes	No	**Yes**
Chrysene	0-1 ft	32,000	1,200	26.7	0.0769	Yes	No	**Yes**
Dibenz(a,h)anthracene	0-1 ft	9,900	1,200	8.25	0.0238	No	No	No
Fluoranthene	0-1 ft	54,000	NA (7)	45.0	0.130	Yes	No	**Yes**
Indeno(1,2,3-cd)pyrene	0-1 ft	19,000	1,200	15.8	0.0457	Yes	No	**Yes**
Pyrene	0-1 ft	40,000	NA (7)	33.3	0.0961	Yes	No	**Yes**
2-Methylnaphthalene	0-3 ft	1,530	NA (6)	0.153	0.000381	No	No	No
Acenaphthene	0-3 ft	2,600	20,000	0.130	0.000324	No	No	No
Acenaphthylene	0-3 ft	111	NA (6)	0.0111	0.0000276	No	No	No
Anthracene	0-3 ft	8,440	NA (6)	0.844	0.00210	No	No	No
Fluorene	0-3 ft	1,610	NA (6)	0.161	0.000401	No	No	No
Naphthalene	0-3 ft	823	10,000	0.082	0.000205	No	No	No

Table N-6
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Plants
Bradford Island - Upland Operable Unit
(4 of 5)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
Phenanthrene	0-3 ft	21,900	NA (6)	2.19	0.00545	No	No	No
Benzo(a)anthracene	0-3 ft	32,000	1,200	26.7	0.0664	Yes	No	**Yes**
Benzo(a)pyrene	0-3 ft	34,000	1,200	28.3	0.0705	Yes	No	**Yes**
Benzo(b)fluoranthene	0-3 ft	65,000	1,200	54.2	0.135	Yes	Yes	**Yes**
Benzo(g,h,i)perylene	0-3 ft	18,000	NA (7)	15.0	0.0373	Yes	No	**Yes**
Benzo(k)fluoranthene	0-3 ft	65,000	1,200	54.2	0.135	Yes	Yes	**Yes**
Benzofluoranthenes, Total	0-3 ft	31,300	NA (7)	26.1	0.0649	Yes	No	**Yes**
Chrysene	0-3 ft	35,300	1,200	29.4	0.0732	Yes	No	**Yes**
Dibenz(a,h)anthracene	0-3 ft	9,900	1,200	8.25	0.0205	No	No	No
Fluoranthene	0-3 ft	54,000	NA (7)	45.0	0.112	Yes	No	**Yes**
Indeno(1,2,3-cd)pyrene	0-3 ft	20,000	1,200	16.7	0.0415	Yes	No	**Yes**
Pyrene	0-3 ft	67,100	NA (7)	55.9	0.139	Yes	Yes	**Yes**
TPH (mg/kg)								
Diesel Range Organics	0-1 ft	1,000	NA	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	23,900	NA	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	9,450	NA	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	1,000	NA	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	23,900	NA	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	9,450	NA	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
NA = not available
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

Hierarchy of Terrestrial Plant SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.

(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.

(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.

Table N-6
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Plants
Bradford Island - Upland Operable Unit
(5 of 5)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)

(3) Efroymson RA, ME Wil, GW Suter II, and AC Wooten. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. ORNL. ES/ER/TM-85/R3.
(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 37
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 347
0-3 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 39
Tj (0-3 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 402
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).
(6) The SLV for naphthalene was used to screen the individual and total LPAHs without SLVs.
(7) The SLV for the benzo(a)pyrene was used to screen the individual HPAHs without SLVs.

Table N-7
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(1 of 5)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)								
Antimony	0-1 ft	4.20	78	0.0538	0.00075	No	No	No
Cadmium	0-1 ft	2.09	140	0.0149	0.00021	No	No	No
Lead	0-1 ft	741	1,700	0.436	0.00614	No	No	No
Mercury	0-1 ft	4.15	0.1	41.5	0.585	Yes	Yes	**Yes**
Silver	0-1 ft	1.50	50	0.0300	0.00042	No	No	No
Zinc	0-1 ft	635	120	5.29	0.0745	Yes	No	**Yes**
Antimony	0-3 ft	4.20	78	0.0538	0.000709	No	No	No
Arsenic	0-3 ft	30.1	60	0.502	0.00660	No	No	No
Cadmium	0-3 ft	3.54	140	0.0253	0.000333	No	No	No
Lead	0-3 ft	1,660	1,700	0.976	0.0128	No	No	No
Mercury	0-3 ft	4.15	0.1	41.5	0.546	Yes	Yes	**Yes**
Silver	0-3 ft	1.50	50	0.0300	0.000395	No	No	No
Zinc	0-3 ft	1,140	120	9.50	0.125	Yes	No	**Yes**
BUTYLTINS (ug/kg)								
Dibutyltin	0-1 ft	20.2	NA	- -	- -	- -	- -	Yes - No SLV
Monobutyltin	0-1 ft	38.0	NA	- -	- -	- -	- -	Yes - No SLV
Tributyltin	0-1 ft	165	NA	- -	- -	- -	- -	Yes - No SLV
Dibutyltin	0-3 ft	20.2	NA	- -	- -	- -	- -	Yes - No SLV
Monobutyltin	0-3 ft	38.0	NA	- -	- -	- -	- -	Yes - No SLV
Tributyltin	0-3 ft	165	NA	- -	- -	- -	- -	Yes - No SLV
PESTICIDES (ug/kg)								
4,4'-DDT	0-1 ft	28.0	NA	- -	- -	- -	- -	Yes - No SLV
Total DDTs	0-1 ft	29.9	NA	- -	- -	- -	- -	Yes - No SLV
Chlordane (technical)	0-1 ft	1,560	NA	- -	- -	- -	- -	Yes - No SLV
4,4'-DDT	0-3 ft	28.0	NA	- -	- -	- -	- -	Yes - No SLV
Total DDTs	0-3 ft	29.9	NA	- -	- -	- -	- -	Yes - No SLV
Chlordane (technical)	0-3 ft	1,560	NA	- -	- -	- -	- -	Yes - No SLV
Heptachlor	0-3 ft	3.07	NA	- -	- -	- -	- -	Yes - No SLV
PCBs (ug/kg)								
Aroclor 1248	0-1 ft	968	2,510	0.386	0.00543	No	No	No
Aroclor 1254	0-1 ft	78.6	2,510	0.0313	0.000441	No	No	No
Aroclor 1260	0-1 ft	660	2,510	0.263	0.00370	No	No	No
Aroclor 1248	0-3 ft	968	2,510	0.386	0.00507	No	No	No
Aroclor 1254	0-3 ft	86.1	2,510	0.0343	0.000451	No	No	No

Table N-7
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(2 of 5)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
Aroclor 1260	0-3 ft	660	2,510	0.263	0.00346	No	No	No
HERBICIDES (ug/kg)								
2,4,5-T	0-1 ft	93.0	NA	- -	- -	- -	- -	Yes - No SLV
Dichloroprop	0-1 ft	180	NA	- -	- -	- -	- -	Yes - No SLV
MCPP	0-1 ft	14,000	NA	- -	- -	- -	- -	Yes - No SLV
2,4,5-T	0-3 ft	93.0	NA	- -	- -	- -	- -	Yes - No SLV
Dichloroprop	0-3 ft	180	NA	- -	- -	- -	- -	Yes - No SLV
MCPP	0-3 ft	14,000	NA	- -	- -	- -	- -	Yes - No SLV
VOCs (ug/kg)								
1,2,4-Trimethylbenzene	0-1 ft	14,300	NA	- -	- -	- -	- -	Yes - No SLV
1,3,5-Trimethylbenzene	0-1 ft	5,410	NA	- -	- -	- -	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-1 ft	1,000	NA	- -	- -	- -	- -	Yes - No SLV
Ethylbenzene	0-1 ft	2,700	2,260	1.19	0.0168	No	No	No
m,p-Xylenes	0-1 ft	9,800	NA	- -	- -	- -	- -	Yes - No SLV
Naphthalene	0-1 ft	8,360	NA	- -	- -	- -	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-1 ft	65.0	NA	- -	- -	- -	- -	Yes - No SLV
Toluene	0-1 ft	5.30	NA	- -	- -	- -	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-3 ft	14,300	NA	- -	- -	- -	- -	Yes - No SLV
1,3,5-Trimethylbenzene	0-3 ft	5,410	NA	- -	- -	- -	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-3 ft	1,000	NA	- -	- -	- -	- -	Yes - No SLV
Naphthalene	0-3 ft	8,360	NA	- -	- -	- -	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-3 ft	65.0	NA	- -	- -	- -	- -	Yes - No SLV
Toluene	0-3 ft	5.30	NA	- -	- -	- -	- -	Yes - No SLV
SVOCs (ug/kg)								
Benzoic Acid	0-1 ft	553	NA	- -	- -	- -	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-1 ft	21,000	NA	- -	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-1 ft	68.7	NA	- -	- -	- -	- -	Yes - No SLV
Carbazole	0-1 ft	2,650	2,260	1.17	0.0165	No	No	No
Dibenzofuran	0-1 ft	810	NA	- -	- -	- -	- -	Yes - No SLV
Diethyl Phthalate	0-1 ft	73.4	NA	- -	- -	- -	- -	Yes - No SLV
Di-n-butyl Phthalate	0-1 ft	1,800	NA	- -	- -	- -	- -	Yes - No SLV
Pentachlorophenol	0-1 ft	201	31,000	0.00648	0.0000913	No	No	No
Benzoic Acid	0-3 ft	553	NA	- -	- -	- -	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-3 ft	21,000	NA	- -	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-3 ft	68.7	NA	- -	- -	- -	- -	Yes - No SLV

Table N-7
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(3 of 5)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
Carbazole	0-3 ft	2,840	2,260	1.26	0.0165	No	No	No
Dibenzofuran	0-3 ft	810	NA	- -	- -	- -	- -	Yes - No SLV
Diethyl Phthalate	0-3 ft	73.4	NA	- -	- -	- -	- -	Yes - No SLV
Di-n-butyl Phthalate	0-3 ft	1,800	NA	- -	- -	- -	- -	Yes - No SLV
Pentachlorophenol	0-3 ft	201	31,000	0.00648	0.0000853	No	No	No
PAHs (ug/kg)								
2-Methylnaphthalene	0-1 ft	1,530	NA	- -	- -	- -	- -	Incl in tLPAH
Acenaphthene	0-1 ft	2,600	NA	- -	- -	- -	- -	Incl in tLPAH
Acenaphthylene	0-1 ft	78.1	NA	- -	- -	- -	- -	Incl in tLPAH
Anthracene	0-1 ft	2,700	NA	- -	- -	- -	- -	Incl in tLPAH
Fluorene	0-1 ft	1,200	NA	- -	- -	- -	- -	Incl in tLPAH
Naphthalene	0-1 ft	823	NA	- -	- -	- -	- -	Incl in tLPAH
Phenanthrene	0-1 ft	12,000	NA	- -	- -	- -	- -	Incl in tLPAH
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	18,674	29,000	0.644	0.00907	No	No	No
Benzo(a)anthracene	0-1 ft	32,000	NA	- -	- -	- -	- -	Incl in tHPAH
Benzo(a)pyrene	0-1 ft	33,000	NA	- -	- -	- -	- -	Incl in tHPAH
Benzo(b)fluoranthene	0-1 ft	65,000	NA	- -	- -	- -	- -	Incl in tHPAH
Benzo(g,h,i)perylene	0-1 ft	18,000	NA	- -	- -	- -	- -	Incl in tHPAH
Benzo(k)fluoranthene	0-1 ft	65,000	NA	- -	- -	- -	- -	Incl in tHPAH
Benzofluoranthenes, Total	0-1 ft	14,700	NA	- -	- -	- -	- -	Incl in tHPAH
Chrysene	0-1 ft	32,000	NA	- -	- -	- -	- -	Incl in tHPAH
Dibenz(a,h)anthracene	0-1 ft	9,900	NA	- -	- -	- -	- -	Incl in tHPAH
Fluoranthene	0-1 ft	54,000	NA	- -	- -	- -	- -	Incl in tHPAH
Indeno(1,2,3-cd)pyrene	0-1 ft	19,000	NA	- -	- -	- -	- -	Incl in tHPAH
Pyrene	0-1 ft	40,000	NA	- -	- -	- -	- -	Incl in tHPAH
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	367,900	18,000	20.4	0.288	Yes	No	**Yes**
2-Methylnaphthalene	0-3 ft	1,530	NA	- -	- -	- -	- -	Incl in tLPAH
Acenaphthene	0-3 ft	2,600	NA	- -	- -	- -	- -	Incl in tLPAH
Acenaphthylene	0-3 ft	111	NA	- -	- -	- -	- -	Incl in tLPAH
Anthracene	0-3 ft	8,440	NA	- -	- -	- -	- -	Incl in tLPAH
Fluorene	0-3 ft	1,610	NA	- -	- -	- -	- -	Incl in tLPAH
Naphthalene	0-3 ft	823	NA	- -	- -	- -	- -	Incl in tLPAH
Phenanthrene	0-3 ft	21,900	NA	- -	- -	- -	- -	Incl in tLPAH
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	34,767	29,000	1.20	0.0158	No	No	No
Benzo(a)anthracene	0-3 ft	32,000	NA	- -	- -	- -	- -	Incl in tHPAH

Table N-7
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(4 of 5)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
Benzo(a)pyrene	0-3 ft	34,000	NA	- -	- -	- -	- -	Incl in tHPAH
Benzo(b)fluoranthene	0-3 ft	65,000	NA	- -	- -	- -	- -	Incl in tHPAH
Benzo(g,h,i)perylene	0-3 ft	18,000	NA	- -	- -	- -	- -	Incl in tHPAH
Benzo(k)fluoranthene	0-3 ft	65,000	NA	- -	- -	- -	- -	Incl in tHPAH
Benzofluoranthenes, Total	0-3 ft	31,300	NA	- -	- -	- -	- -	Incl in tHPAH
Chrysene	0-3 ft	35,300	NA	- -	- -	- -	- -	Incl in tHPAH
Dibenz(a,h)anthracene	0-3 ft	9,900	NA	- -	- -	- -	- -	Incl in tHPAH
Fluoranthene	0-3 ft	54,000	NA	- -	- -	- -	- -	Incl in tHPAH
Indeno(1,2,3-cd)pyrene	0-3 ft	20,000	NA	- -	- -	- -	- -	Incl in tHPAH
Pyrene	0-3 ft	67,100	NA	- -	- -	- -	- -	Incl in tHPAH
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	367,900	18,000	20.4	0.269	Yes	No	**Yes**
TPH (mg/kg)								
Diesel Range Organics	0-1 ft	1,000	NA	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	23,900	NA	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	9,450	NA	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	1,000	NA	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	23,900	NA	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	9,450	NA	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
Incl in tHPAH = COI is included in the Total HPAH Screening
Incl in tLPAH = COI is included in the Total LPAH Screening
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

Hierarchy of Terrestrial Invertebrate SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.

Table N-7
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(5 of 5)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)

(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.

(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.

(3) RA Efroymson. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process, Nov 1997 Revision. ORNL ES/ER/TM-126/R2.

(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Multiple COIs Simultaneously within a Given Medium

(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.

Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific

Q = Receptor designator

0-1 ft bgs Soil Interval

Nij = total number of *i* contaminants in medium *j* = 14

Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 71.5

0-3 ft bgs Soil Interval

Nij = total number of *i* contaminants in medium *j* = 14

Tj (0-3 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 76.2

Assumptions: Q = 1 for terrestrial T&E species and all aquatic species

Q = 5 for all common terrestrial species

For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-8
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(1 of 4)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)										
Antimony	0-1 ft	1.36	0.176	7.73	0.0426	No	No	No	--	No
Cadmium	0-1 ft	0.974	0.77	1.26	0.00697	No	No	Yes	Yes	No
Lead	0-1 ft	332	25.5	13.0	0.0718	Yes	No	Yes	Yes	**Yes**
Mercury	0-1 ft	1.57	0.066	23.8	0.131	Yes	No	Yes	Yes	**Yes**
Silver	0-1 ft	0.468	4.2	0.111	0.000614	No	No	Yes	Yes	No
Zinc	0-1 ft	207	71.7	2.89	0.0159	No	No	Yes	Yes	No
Antimony	0-3 ft	1.48	0.176	8.41	0.0456	Yes	No	No	--	**Yes**
Arsenic	0-3 ft	10.5	43	0.244	0.00132	No	No	Yes	Yes	No
Cadmium	0-3 ft	1.17	0.77	1.52	0.00824	No	No	Yes	Yes	No
Lead	0-3 ft	511	25.5	20.0	0.109	Yes	No	Yes	Yes	**Yes**
Mercury	0-3 ft	1.45	0.066	22.0	0.119	Yes	No	Yes	Yes	**Yes**
Silver	0-3 ft	0.450	4.2	0.107	0.000581	No	No	Yes	Yes	No
Zinc	0-3 ft	417	71.7	5.82	0.0315	No	No	Yes	Yes	No
BUTYLTINS (ug/kg)										
Dibutyltin	0-1 ft	20.2	28,000	0.000721	0.00000398	No	No	No	--	No
Monobutyltin	0-1 ft	38.0	28,000	0.00136	0.00000748	No	No	No	--	No
Tributyltin	0-1 ft	165	28,000	0.00589	0.0000325	No	No	Yes	No	**Yes-Bio**
Dibutyltin	0-3 ft	20.1	28,000	0.000718	0.00000389	No	No	No	--	No
Monobutyltin	0-3 ft	38.0	28,000	0.00136	0.00000736	No	No	No	--	No
Tributyltin	0-3 ft	60.1	28,000	0.00215	0.0000116	No	No	Yes	No	**Yes-Bio**
PESTICIDES (ug/kg)										
4,4'-DDT	0-1 ft	12.2	93	0.131	0.000723	No	No	Yes	Yes	No
Total DDTs	0-1 ft	13.9	93	0.149	0.000823	No	No	Yes	Yes	No
Chlordane (technical)	0-1 ft	1,560	9,000	0.173	0.000956	No	No	Yes	No	**Yes-Bio**
4,4'-DDT	0-3 ft	11.8	93	0.127	0.000688	No	No	Yes	Yes	No
Total DDTs	0-3 ft	13.3	93	0.143	0.000778	No	No	Yes	Yes	No
Chlordane (technical)	0-3 ft	1,560	9,000	0.173	0.000940	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-3 ft	2.86	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
PCBs (ug/kg)										
Aroclor 1248	0-1 ft	386	655	0.589	0.00325	No	No	Yes	Yes	No
Aroclor 1254	0-1 ft	22.5	655	0.0344	0.000189	No	No	Yes	Yes	No
Aroclor 1260	0-1 ft	251	655	0.383	0.00211	No	No	Yes	Yes	No
Aroclor 1248	0-3 ft	364	655	0.556	0.00301	No	No	Yes	Yes	No
Aroclor 1254	0-3 ft	31.1	655	0.0475	0.000257	No	No	Yes	Yes	No
Aroclor 1260	0-3 ft	190	655	0.290	0.00157	No	No	Yes	Yes	No
HERBICIDES (ug/kg)										
2,4,5-T	0-1 ft	71.6	93	0.770	0.00424	No	No	No	- -	No
Dichloroprop	0-1 ft	175	93	1.88	0.0104	No	No	No	- -	No
MCPP	0-1 ft	11,700	93	126	0.694	Yes	Yes	No	- -	**Yes**
2,4,5-T	0-3 ft	70.3	93	0.756	0.00410	No	No	No	- -	No

Table N-8
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(2 of 4)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
Dichloroprop	0-3 ft	174	93	1.87	0.0101	No	No	No	- -	No
MCPP	0-3 ft	11,200	93	120	0.653	Yes	Yes	No	- -	**Yes**
VOCs (ug/kg)										
1,2,4-Trimethylbenzene	0-1 ft	3,030	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
1,3,5-Trimethylbenzene	0-1 ft	1,200	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-1 ft	12	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Ethylbenzene	0-1 ft	2,700	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	9,800	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Naphthalene	0-1 ft	4,190	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-1 ft	16.7	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Toluene	0-1 ft	1.80	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-3 ft	2,790	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
1,3,5-Trimethylbenzene	0-3 ft	1,110	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-3 ft	12	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Naphthalene	0-3 ft	3,830	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-3 ft	16.5	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Toluene	0-3 ft	1.64	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
SVOCs (ug/kg)										
Benzoic Acid	0-1 ft	200	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-1 ft	9,680	4,500	2.15	0.0119	No	No	Yes	No	**Yes-Bio**
Butyl Benzyl Phthalate	0-1 ft	36.6	450	0.0813	0.000448	No	No	Yes	No	**Yes-Bio**
Carbazole	0-1 ft	751	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-1 ft	152	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Diethyl Phthalate	0-1 ft	50.0	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-1 ft	232	450	0.516	0.00284	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-1 ft	103	2,100	0.0490	0.000270	No	No	Yes	Yes	No
Benzoic Acid	0-3 ft	218	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-3 ft	6,380	4,500	1.42	0.00769	No	No	Yes	No	**Yes-Bio**
Butyl Benzyl Phthalate	0-3 ft	34.9	450	0.0776	0.000421	No	No	Yes	No	**Yes-Bio**
Carbazole	0-3 ft	964	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-3 ft	164	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Diethyl Phthalate	0-3 ft	38.9	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-3 ft	217	450	0.482	0.00262	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-3 ft	99	2,100	0.0470	0.000255	No	No	Yes	Yes	No
PAHs (ug/kg)										
2-Methylnaphthalene	0-1 ft	213	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthene	0-1 ft	713	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthylene	0-1 ft	29.2	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Anthracene	0-1 ft	924	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluorene	0-1 ft	222	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Naphthalene	0-1 ft	172	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Phenanthrene	0-1 ft	3,660	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**

Table N-8
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(3 of 4)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	5,810	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)anthracene	0-1 ft	8,340	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)pyrene	0-1 ft	8,700	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(b)fluoranthene	0-1 ft	16,000	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(g,h,i)perylene	0-1 ft	4,590	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(k)fluoranthene	0-1 ft	30,200	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzofluoranthenes, Total	0-1 ft	14,700	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Chrysene	0-1 ft	8,400	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenz(a,h)anthracene	0-1 ft	4,230	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluoranthene	0-1 ft	14,500	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Indeno(1,2,3-cd)pyrene	0-1 ft	5,040	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Pyrene	0-1 ft	12,300	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	90,158	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
2-Methylnaphthalene	0-3 ft	199	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthene	0-3 ft	913	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthylene	0-3 ft	34.9	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Anthracene	0-3 ft	1,930	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluorene	0-3 ft	324	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Naphthalene	0-3 ft	157	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Phenanthrene	0-3 ft	5,780	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	9,226	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)anthracene	0-3 ft	9,960	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)pyrene	0-3 ft	11,200	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(b)fluoranthene	0-3 ft	15,200	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(g,h,i)perylene	0-3 ft	5,820	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(k)fluoranthene	0-3 ft	26,300	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzofluoranthenes, Total	0-3 ft	31,300	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Chrysene	0-3 ft	11,000	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenz(a,h)anthracene	0-3 ft	2,060	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluoranthene	0-3 ft	17,500	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Indeno(1,2,3-cd)pyrene	0-3 ft	6,800	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Pyrene	0-3 ft	18,800	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	101,525	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
TPH (mg/kg)										
Diesel Range Organics	0-1 ft	3670	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	307	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	17,700	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	3340	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	157	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	16,000	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).

Table N-8
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(4 of 4)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)

CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.

Hierarchy of Avian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7
72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 21
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 181
0-3 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 22
Tj (0-3 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 184
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-9
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(1 of 4)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
INORGANICS (mg/kg)										
Antimony	0-1 ft	1.36	0.27	5.04	0.00666	No	No	No	--	No
Cadmium	0-1 ft	0.974	0.36	2.71	0.00358	No	No	Yes	Yes	No
Lead	0-1 ft	332	56	5.93	0.00784	No	No	Yes	Yes	No
Mercury	0-1 ft	1.57	0.146	10.8	0.0142	No	No	Yes	Yes	No
Silver	0-1 ft	0.468	14	0.0334	0.0000442	No	No	Yes	Yes	No
Zinc	0-1 ft	207	79	2.62	0.00346	No	No	Yes	Yes	No
Antimony	0-3 ft	1.48	0.27	5.48	0.00726	No	No	No	--	No
Arsenic	0-3 ft	10.5	46	0.228	0.000302	No	No	Yes	Yes	No
Cadmium	0-3 ft	1.17	0.36	3.25	0.00430	No	No	Yes	Yes	No
Lead	0-3 ft	511	56	9.13	0.0121	No	No	Yes	Yes	No
Mercury	0-3 ft	1.45	0.146	9.93	0.0132	No	No	Yes	Yes	No
Silver	0-3 ft	0.450	14	0.0321	0.0000426	No	No	Yes	Yes	No
Zinc	0-3 ft	417	79	5.28	0.00699	No	No	Yes	Yes	No
BUTYLTINS (ug/kg)										
Dibutyltin	0-1 ft	20.2	1,300,000	0.0000155	0.0000000205	No	No	No	--	No
Monobutyltin	0-1 ft	38.0	1,300,000	0.0000292	0.0000000386	No	No	No	--	No
Tributyltin	0-1 ft	165	1,300,000	0.000127	0.000000168	No	No	Yes	No	**Yes-Bio**
Dibutyltin	0-3 ft	20.1	1,300,000	0.0000155	0.0000000205	No	No	No	--	No
Monobutyltin	0-3 ft	38.0	1,300,000	0.0000292	0.0000000387	No	No	No	--	No
Tributyltin	0-3 ft	60.1	1,300,000	0.0000462	0.0000000612	No	No	Yes	No	**Yes-Bio**
PESTICIDES (ug/kg)										
4,4'-DDT	0-1 ft	12.2	21	0.581	0.000768	No	No	Yes	Yes	No
Total DDTs	0-1 ft	13.9	21	0.661	0.000874	No	No	Yes	Yes	No
Chlordane (technical)	0-1 ft	1,560	250,000	0.00624	0.00000825	No	No	Yes	No	**Yes-Bio**
4,4'-DDT	0-3 ft	11.8	21	0.562	0.000744	No	No	Yes	Yes	No
Total DDTs	0-3 ft	13.3	21	0.635	0.000841	No	No	Yes	Yes	No
Chlordane (technical)	0-3 ft	1,560	250,000	0.00624	0.00000827	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-3 ft	2.86	15,000	0.000191	0.000000253	No	No	Yes	No	**Yes-Bio**
PCBs (ug/kg)										
Aroclor 1248	0-1 ft	386	371	1.04	0.00138	No	No	Yes	Yes	No
Aroclor 1254	0-1 ft	22.5	371	0.0606	0.0000802	No	No	Yes	Yes	No
Aroclor 1260	0-1 ft	251	371	0.677	0.000894	No	No	Yes	Yes	No
Aroclor 1248	0-3 ft	364	371	0.981	0.00130	No	No	Yes	Yes	No
Aroclor 1254	0-3 ft	31.1	371	0.0838	0.000111	No	No	Yes	Yes	No
Aroclor 1260	0-3 ft	190	371	0.512	0.000678	No	No	Yes	Yes	No
HERBICIDES (ug/kg)										
2,4,5-T	0-1 ft	71.6	21	3.41	0.00451	No	No	No	--	No
Dichloroprop	0-1 ft	175	21	8.33	0.0110	No	No	No	--	No
MCPP	0-1 ft	11,700	21	557	0.736	No	No	No	--	No
2,4,5-T	0-3 ft	70.3	21	3.35	0.00443	No	No	No	--	No
Dichloroprop	0-3 ft	174	21	8.29	0.0110	No	No	No	--	No
MCPP	0-3 ft	11,200	21	533	0.706	No	No	No	--	No

Table N-9
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(2 of 4)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
VOCs (ug/kg)										
1,2,4-Trimethylbenzene	0-1 ft	3,030	1,440,000	0.00210	0.00000278	No	No	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-1 ft	1,200	1,440,000	0.000833	0.00000110	No	No	No	- -	No
Dichloromethane (Methylene Chloride)	0-1 ft	12	730,000	0.0000164	0.0000000217	No	No	No	- -	No
Ethylbenzene	0-1 ft	2,700	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	9,800	120,000	0.0817	0.000108	No	No	No	- -	No
Naphthalene	0-1 ft	4,190	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-1 ft	16.7	80,000	0.000209	0.000000276	No	No	No	- -	No
Toluene	0-1 ft	1.80	1,440,000	0.00000125	0.00000000165	No	No	No	- -	No
1,2,4-Trimethylbenzene	0-3 ft	2,790	1,440,000	0.00194	0.00000257	No	No	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-3 ft	1,110	1,440,000	0.000771	0.00000102	No	No	No	- -	No
Dichloromethane (Methylene Chloride)	0-3 ft	12	730,000	0.0000164	0.0000000218	No	No	No	- -	No
Naphthalene	0-3 ft	3,830	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-3 ft	16.5	80,000	0.000206	0.000000273	No	No	No	- -	No
Toluene	0-3 ft	1.64	1,440,000	0.00000114	0.00000000151	No	No	No	- -	No
SVOCs (ug/kg)										
Benzoic Acid	0-1 ft	200	1,440,000	0.000139	0.000000184	No	No	No	- -	No
Bis(2-ethylhexyl) Phthalate	0-1 ft	9,680	1,020,000	0.00949	0.0000125	No	No	Yes	No	**Yes-Bio**
Butyl Benzyl Phthalate	0-1 ft	36.6	30,000,000	0.00000122	0.00000000161	No	No	Yes	No	**Yes-Bio**
Carbazole	0-1 ft	751	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-1 ft	152	2	76.0	0.100	No	No	Yes	No	**Yes-Bio**
Diethyl Phthalate	0-1 ft	50.0	250,000,000	0.000000200	0.000000000264	No	No	No	- -	No
Di-n-butyl Phthalate	0-1 ft	232	30,000,000	0.00000773	0.00000001022	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-1 ft	103	2,800	0.0368	0.0000486	No	No	Yes	Yes	No
Benzoic Acid	0-3 ft	218	1,440,000	0.000151	0.000000201	No	No	No	- -	No
Bis(2-ethylhexyl) Phthalate	0-3 ft	6,380	1,020,000	0.00625	0.00000829	No	No	Yes	No	**Yes-Bio**
Butyl Benzyl Phthalate	0-3 ft	34.9	30,000,000	0.00000116	0.00000000154	No	No	Yes	No	**Yes-Bio**
Carbazole	0-3 ft	964	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-3 ft	164	2	82.0	0.109	No	No	Yes	No	**Yes-Bio**
Diethyl Phthalate	0-3 ft	38.9	250,000,000	0.000000156	0.000000000206	No	No	No	- -	No
Di-n-butyl Phthalate	0-3 ft	217	30,000,000	0.00000723	0.00000000958	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-3 ft	99	2,800	0.0353	0.0000467	No	No	Yes	Yes	No
PAHs (ug/kg)										
2-Methylnaphthalene	0-1 ft	213	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Acenaphthene	0-1 ft	713	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Acenaphthylene	0-1 ft	29.2	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Anthracene	0-1 ft	924	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Fluorene	0-1 ft	222	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Naphthalene	0-1 ft	172	NA	- -	- -	- -	- -	No	- -	No
Phenanthrene	0-1 ft	3,660	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	5,810	100,000	0.0581	0.0000768	No	No	Yes	Yes	No
Benzo(a)anthracene	0-1 ft	8,340	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(a)pyrene	0-1 ft	8,700	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No

Table N-9
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(3 of 4)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
Benzo(b)fluoranthene	0-1 ft	16,000	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(g,h,i)perylene	0-1 ft	4,590	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(k)fluoranthene	0-1 ft	30,200	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzofluoranthenes, Total	0-1 ft	14,700	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Chrysene	0-1 ft	8,400	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Dibenz(a,h)anthracene	0-1 ft	4,230	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Fluoranthene	0-1 ft	14,500	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Indeno(1,2,3-cd)pyrene	0-1 ft	5,040	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Pyrene	0-1 ft	12,300	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	90,158	1,100	82.0	0.108	No	No	Yes	Yes	No
2-Methylnaphthalene	0-3 ft	199	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Acenaphthene	0-3 ft	913	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Acenaphthylene	0-3 ft	34.9	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Anthracene	0-3 ft	1,930	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Fluorene	0-3 ft	324	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Naphthalene	0-3 ft	157	NA	- -	- -	- -	- -	No	- -	No
Phenanthrene	0-3 ft	5,780	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	9,226	100,000	0.092	0.000122	No	No	Yes	Yes	No
Benzo(a)anthracene	0-3 ft	9,960	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(a)pyrene	0-3 ft	11,200	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(b)fluoranthene	0-3 ft	15,200	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(g,h,i)perylene	0-3 ft	5,820	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(k)fluoranthene	0-3 ft	26,300	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzofluoranthenes, Total	0-3 ft	31,300	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Chrysene	0-3 ft	11,000	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Dibenz(a,h)anthracene	0-3 ft	2,060	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Fluoranthene	0-3 ft	17,500	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Indeno(1,2,3-cd)pyrene	0-3 ft	6,800	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Pyrene	0-3 ft	18,800	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	101,525	1,100	92.3	0.122	No	No	Yes	Yes	No
TPH (mg/kg)										
Diesel Range Organics	0-1 ft	3670	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	307	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	17,700	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	3340	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	157	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	16,000	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons

Table N-9
Identification of CPECs in Soil at Landfill AOPC - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(4 of 4)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)

Incl in tHPAH = COI is included in the Total HPAH Screening
Incl in tLPAH = COI is included in the Total LPAH Screening
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).

Hierarchy of Mammalian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 32
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 757
0-3 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 33
Tj (0-3 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 755
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-10
Identification of CPECs in Groundwater, Seep Water, and Surface Water at Landfill AOPC - Multiple COIs for Aquatic Organisms
Bradford Island - Upland Operable Unit
(1 of 3)

Chemicals of Interest	Medium	Dissolved or Total (D or T)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	(Tij/Tj) (9)	Chemical is a Concern for Aquatic Organisms? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Is COI Bioaccum-ulative?	COI is Identified as a CPEC? (9) (Q = 1)
INORGANICS (mg/L)									
Arsenic	Groundwater	D	0.00749	0.15	0.0499	0.000479	No	Yes	**Yes-Bio**
Barium	Groundwater	D	0.134	0.004	33.5	0.321	Yes	No	**Yes**
Calcium	Groundwater	D	91.6	116	0.790	0.00757	No	No	No
Iron	Groundwater	D	31.0	1.0	31.0	0.297	Yes	No	**Yes**
Lead	Groundwater	D	0.000524	0.0014	0.365	0.00350	No	Yes	**Yes-Bio**
Magnesium	Groundwater	D	16.3	82	0.199	0.00191	No	No	No
Manganese	Groundwater	D	3.50	0.12	29.2	0.280	Yes	No	**Yes**
Nickel	Groundwater	D	0.0186	0.034	0.551	0.00529	No	No	No
Potassium	Groundwater	D	7.47	53	0.141	0.00135	No	No	No
Sodium	Groundwater	D	648	680	0.953	0.00914	No	No	No
Zinc	Groundwater	D	0.196	0.077	2.56	0.0245	No	Yes	**Yes-Bio**
Antimony	Seep Water	D	0.00228	1.00	0.00228	0.0000261	No	No	No
Arsenic	Seep Water	D	0.00100	0.15	0.00667	0.0000763	No	Yes	**Yes-Bio**
Barium	Seep Water	D	0.277	0.004	69.3	0.793	Yes	No	**Yes**
Calcium	Seep Water	D	76.4	116	0.659	0.00754	No	No	No
Copper	Seep Water	D	0.00109	0.006	0.188	0.00216	No	No	No
Iron	Seep Water	D	3.21	1.0	3.21	0.0368	No	No	No
Lead	Seep Water	D	0.0000650	0.0014	0.0452	0.000518	No	Yes	**Yes-Bio**
Magnesium	Seep Water	D	16.6	82	0.202	0.00232	No	No	No
Manganese	Seep Water	D	1.48	0.12	12.3	0.141	Yes	No	**Yes**
Nickel	Seep Water	D	0.00222	0.034	0.0658	0.000753	No	No	No
Potassium	Seep Water	D	4.16	53	0.0785	0.000899	No	No	No
Sodium	Seep Water	D	19.7	680	0.0290	0.000332	No	No	No
Zinc	Seep Water	D	0.0856	0.077	1.12	0.0128	No	Yes	**Yes-Bio**
Arsenic	Surface Water	D	0.00101	0.15	0.00673	0.0204	No	Yes	**Yes-Bio**
Calcium	Surface Water	D	20.5	116	0.177	0.536	No	No	No
Iron	Surface Water	D	0.00920	1.0	0.00920	0.0279	No	No	No
Lead	Surface Water	D	0.0000160	0.0014	0.0111	0.0338	No	Yes	**Yes-Bio**
Magnesium	Surface Water	D	6.33	82	0.0772	0.234	No	No	No
Manganese	Surface Water	D	0.00101	0.12	0.00842	0.0255	No	No	No
Potassium	Surface Water	D	1.51	53	0.0285	0.0865	No	No	No
Sodium	Surface Water	D	7.90	680	0.0116	0.0353	No	No	No
BUTYLTINS (ug/L)									
Dibutyltin	Groundwater	T	0.0586	0.063	0.930	0.00892	No	No	No
Monobutyltin	Groundwater	T	0.0254	0.063	0.403	0.00387	No	No	No

Table N-10
Identification of CPECs in Groundwater, Seep Water, and Surface Water at Landfill AOPC - Multiple COIs for Aquatic Organisms
Bradford Island - Upland Operable Unit
(2 of 3)

Chemicals of Interest	Medium	Dissolved or Total (D or T)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	(Tij/Tj) (9)	Chemical is a Concern for Aquatic Organisms? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Is COI Bioaccum-ulative?	COI is Identified as a CPEC? (9) (Q = 1)
Tributyltin	Groundwater	T	0.0364	0.063	0.578	0.00554	No	Yes	**Yes-Bio**
HERBICIDES (ug/L)									
4-Nitrophenol	Groundwater	T	0.840	150	0.00560	0.0000537	No	No	No
Pentachlorophenol	Groundwater	T	0.112	15	0.00747	0.0000716	No	Yes	**Yes-Bio**
VOCs (ug/L)									
1,2,4-Trimethylbenzene	Groundwater	T	5.20	7.3	0.712	0.00683	No	Yes	**Yes-Bio**
Acetone	Groundwater	T	10.2	1,500	0.00680	0.0000652	No	No	No
Chloroform	Groundwater	T	0.498	1,240	0.000402	0.00000385	No	No	No
Isopropylbenzene	Groundwater	T	3.42	7.3	0.468	0.00449	No	Yes	**Yes-Bio**
n-Propylbenzene	Groundwater	T	1.32	7.3	0.181	0.00173	No	Yes	**Yes-Bio**
Tetrachloroethene (PCE)	Groundwater	T	2.80	840	0.00333	0.0000320	No	No	No
Vinyl Chloride	Groundwater	T	0.307	1,300	0.000236	0.00000227	No	No	No
Chloroform	Seep Water	T	2.80	1,240	0.00226	0.0000259	No	No	No
Tetrachloroethene (PCE)	Seep Water	T	4.40	840	0.00524	0.0000600	No	No	No
SVOCs (ug/L)									
Bis(2-ethylhexyl) Phthalate	Groundwater	T	4.70	3.0	1.57	0.0150	No	Yes	**Yes-Bio**
Diethyl Phthalate	Groundwater	T	0.873	210	0.00416	0.0000399	No	No	No
Di-n-octyl Phthalate	Groundwater	T	4.61	708	0.00651	0.0000625	No	Yes	**Yes-Bio**
Isophorone	Groundwater	T	0.177	2,340	0.0000756	0.000000726	No	No	No
Benzoic Acid	Seep Water	T	5.88	42	0.140	0.00160	No	No	No
PAHs (ug/L)									
2-Methylnaphthalene	Groundwater	T	0.175	72.16	0.00243	0.0000233	No	Yes	**Yes-Bio**
Acenaphthene	Groundwater	T	0.158	55.85	0.00283	0.0000271	No	Yes	**Yes-Bio**
Naphthalene	Groundwater	T	0.0873	193.5	0.000451	0.00000433	No	No	No
Phenanthrene	Groundwater	T	0.591	6.3	0.0938	0.000900	No	Yes	**Yes-Bio**
TPH (mg/L)									
Diesel Range Organics	Groundwater	T	0.388	NA	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	Groundwater	T	0.0604	NA	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	Groundwater	T	0.344	NA	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	Seep Water	T	0.130	NA	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	Seep Water	T	0.130	NA	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	Surface Water	T	0.0300	NA	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
NA = not available
SLV = screening level value

Table N-10
Identification of CPECs in Groundwater, Seep Water, and Surface Water at Landfill AOPC - Multiple COIs for Aquatic Organisms
Bradford Island - Upland Operable Unit
(3 of 3)

Chemicals of Interest	Medium	Dissolved or Total (D or T)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	(Tij/Tj) (9)	Chemical is a Concern for Aquatic Organisms? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Is COI Bioaccum-ulative?	COI is Identified as a CPEC? (9) (Q = 1)

T&E = threatened and endangered
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) In addition to seep water and surface water concentrations, concentrations in groundwater were compared to Selected Level II SLVs for surface water as a conservative measure (in the event that groundwater discharges to surface water).

Hierarchy of Aquatic Organisms SLV Selection (see Appendix J-5b)
(2) USEPA 2009. National Recommended Water Quality Criteria. Office of Water and Office of Science and Technology.
(3) Oregon Department of Environmental Quality (DEQ). Water Quality Criteria for freshwater organisms (Oregon Administrative rules, section 340-041, Table 33A).
(4) DEQ 1998. Updated 2001. Guidance for Ecological risk Assessment: Levels I,II,III,IV. Waste Management and Cleanup Division.
(5) Suter GW II, and CL Tsao. 1996. Toxicological Benchmarks for Screening of Potential Contaminants of Concern for Effects on Aquatic Biota on Oak Ridge Reservation: 1996 Revision. ORNL, Oak Ridge, TN. 104pp. ES/ER/TM-96/R2.
(6) USEPA 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. November. EPA-600-R-02-
(7) Canadian Council of Resource and Environment Ministers. 2007. Canadian Water Quality Guidelines for the Protection of Aquatic Life. December Accessed on 1/20/10 at http://ceqg-
(8) Buchman, M.F., 2008. NOAA Screening Quick Reference Tables, NOAA OR&R Report 08-1, Seattle WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration, 34 pages.

Multiple COIs Simultaneously within a Given Medium
(9) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
Groundwater
Nij = total number of i contaminants in medium j = 31
Tj (GW) = sum of toxicity ratios for all contaminants in medium j = 104
Seep Water
Nij = total number of i contaminants in medium j = 16
Tj (Seep) = sum of toxicity ratios for all contaminants in medium j = 87.3
Surface Water
Nij = total number of *i* contaminants in medium *j* = 8
Tj (SW) = sum of toxicity ratios for all contaminants in medium *j* = 0.330
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-11
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Plants
Bradford Island - Upland Operable Unit
(1 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	Concern for Threatened or Endangered Plants? (Tij>1)	Concern for Non-threatened or Endangered Plants? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)							
Antimony	0-1 ft	13.7	5	2.74	Yes	No	**Yes**
Arsenic	0-1 ft	80.9	18	4.49	Yes	No	**Yes**
Cadmium	0-1 ft	17.3	32	0.541	No	No	No
Chromium	0-1 ft	2,650	28.1	94.3	Yes	Yes	**Yes**
Lead	0-1 ft	3,260	120	27.2	Yes	Yes	**Yes**
Nickel	0-1 ft	1,060	38	27.9	Yes	Yes	**Yes**
Selenium	0-1 ft	0.900	0.52	1.73	Yes	No	**Yes**
Silver	0-1 ft	0.431	560	0.000770	No	No	No
Zinc	0-1 ft	1,160	160	7.25	Yes	Yes	**Yes**
Antimony	0-3 ft	13.7	5	2.74	Yes	No	**Yes**
Arsenic	0-3 ft	80.9	18	4.49	Yes	No	**Yes**
Cadmium	0-3 ft	17.3	32	0.541	No	No	No
Chromium	0-3 ft	2,650	28.1	94.3	Yes	Yes	**Yes**
Lead	0-3 ft	3,260	120	27.2	Yes	Yes	**Yes**
Nickel	0-3 ft	1,060	38	27.9	Yes	Yes	**Yes**
Selenium	0-3 ft	0.900	0.52	1.73	Yes	No	**Yes**
Silver	0-3 ft	0.431	560	0.000770	No	No	No
Zinc	0-3 ft	1,160	160	7.25	Yes	Yes	**Yes**
BUTYLTINS (ug/kg)							
Dibutyltin	0-1 ft	210	NA	- -	- -	- -	Yes - No SLV
Monobutyltin	0-1 ft	108	NA	- -	- -	- -	Yes - No SLV
Tributyltin	0-1 ft	1,860	NA	- -	- -	- -	Yes - No SLV
Dibutyltin	0-3 ft	210	NA	- -	- -	- -	Yes - No SLV
Monobutyltin	0-3 ft	108	NA	- -	- -	- -	Yes - No SLV
Tributyltin	0-3 ft	1,860	NA	- -	- -	- -	Yes - No SLV
PESTICIDES (ug/kg)							
4,4'-DDD	0-1 ft	0.990	NA	- -	- -	- -	Yes - No SLV
4,4'-DDE	0-1 ft	2.44	NA	- -	- -	- -	Yes - No SLV
4,4'-DDT	0-1 ft	140	NA	- -	- -	- -	Yes - No SLV
Total DDTs	0-1 ft	144	NA	- -	- -	- -	Yes - No SLV
BHC (delta)	0-1 ft	3.03	NA	- -	- -	- -	Yes - No SLV
BHC (gamma) Lindane	0-1 ft	9.68	NA	- -	- -	- -	Yes - No SLV
Chlordane (alpha)	0-1 ft	1.50	NA	- -	- -	- -	Yes - No SLV
Chlordane (gamma)	0-1 ft	97.0	NA	- -	- -	- -	Yes - No SLV
Dieldrin	0-1 ft	0.823	NA	- -	- -	- -	Yes - No SLV
Endosulfan I	0-1 ft	6.45	NA	- -	- -	- -	Yes - No SLV
Endosulfan II	0-1 ft	1.99	NA	- -	- -	- -	Yes - No SLV
Endosulfan Sulfate	0-1 ft	3.30	NA	- -	- -	- -	Yes - No SLV

Table N-11
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Plants
Bradford Island - Upland Operable Unit
(2 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	Concern for Threatened or Endangered Plants? (Tij>1)	Concern for Non-threatened or Endangered Plants? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
Endrin	0-1 ft	17.0	NA	- -	- -	- -	Yes - No SLV
Endrin Aldehyde	0-1 ft	16.0	NA	- -	- -	- -	Yes - No SLV
Endrin Ketone	0-1 ft	13.0	NA	- -	- -	- -	Yes - No SLV
Heptachlor	0-1 ft	2.90	1,000	0.00290	No	No	No
Methoxychlor	0-1 ft	1.20	NA	- -	- -	- -	Yes - No SLV
4,4'-DDD	0-3 ft	0.990	NA	- -	- -	- -	Yes - No SLV
4,4'-DDE	0-3 ft	2.44	NA	- -	- -	- -	Yes - No SLV
4,4'-DDT	0-3 ft	140	NA	- -	- -	- -	Yes - No SLV
Total DDTs	0-3 ft	144	NA	- -	- -	- -	Yes - No SLV
BHC (delta)	0-3 ft	3.03	NA	- -	- -	- -	Yes - No SLV
BHC (gamma) Lindane	0-3 ft	9.68	NA	- -	- -	- -	Yes - No SLV
Chlordane (alpha)	0-3 ft	1.50	NA	- -	- -	- -	Yes - No SLV
Chlordane (gamma)	0-3 ft	97.0	NA	- -	- -	- -	Yes - No SLV
Dieldrin	0-3 ft	0.823	NA	- -	- -	- -	Yes - No SLV
Endosulfan I	0-3 ft	6.45	NA	- -	- -	- -	Yes - No SLV
Endosulfan II	0-3 ft	1.99	NA	- -	- -	- -	Yes - No SLV
Endosulfan Sulfate	0-3 ft	3.30	NA	- -	- -	- -	Yes - No SLV
Endrin	0-3 ft	17.0	NA	- -	- -	- -	Yes - No SLV
Endrin Aldehyde	0-3 ft	16.0	NA	- -	- -	- -	Yes - No SLV
Endrin Ketone	0-3 ft	13.0	NA	- -	- -	- -	Yes - No SLV
Heptachlor	0-3 ft	2.90	1,000	0.00290	No	No	No
Methoxychlor	0-3 ft	1.20	NA	- -	- -	- -	Yes - No SLV
PCBs (ug/kg)							
Aroclor 1254	0-1 ft	1,700	40,000	0.0425	No	No	No
Aroclor 1260	0-1 ft	690	40,000	0.0173	No	No	No
Total PCBs (Aroclors)	0-1 ft	2,140	40,000	0.0535	No	No	No
Aroclor 1254	0-3 ft	1,700	40,000	0.0425	No	No	No
Aroclor 1260	0-3 ft	690	40,000	0.0173	No	No	No
Total PCBs (Aroclors)	0-3 ft	2,140	40,000	0.0535	No	No	No
VOCs (ug/kg)							
1,1,1-Trichloroethane (TCA)	0-1 ft	0.580	NA	- -	- -	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-1 ft	0.523	200,000	0.00000262	No	No	No
1,3,5-Trimethylbenzene	0-1 ft	0.125	200,000	0.000000625	No	No	No
2-Butanone (MEK)	0-1 ft	50.0	NA	- -	- -	- -	Yes - No SLV
2-Hexanone	0-1 ft	8.80	NA	- -	- -	- -	Yes - No SLV
4-Isopropyltoluene	0-1 ft	12.0	200,000	0.0000600	No	No	No
4-Methyl-2-pentanone (MIBK)	0-1 ft	1.20	NA	- -	- -	- -	Yes - No SLV
Acetone	0-1 ft	540	NA	- -	- -	- -	Yes - No SLV
Benzene	0-1 ft	1.20	NA	- -	- -	- -	Yes - No SLV

Table N-11
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Plants
Bradford Island - Upland Operable Unit
(3 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	Concern for Threatened or Endangered Plants? (Tij>1)	Concern for Non-threatened or Endangered Plants? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
Bromomethane	0-1 ft	5.00	NA	- -	- -	- -	Yes - No SLV
Carbon Disulfide	0-1 ft	6.90	NA	- -	- -	- -	Yes - No SLV
Chloroform	0-1 ft	19.0	NA	- -	- -	- -	Yes - No SLV
Chloromethane	0-1 ft	0.250	NA	- -	- -	- -	Yes - No SLV
Dichlorodifluoromethane	0-1 ft	94.0	NA	- -	- -	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-1 ft	460	NA	- -	- -	- -	Yes - No SLV
Ethylbenzene	0-1 ft	0.320	NA	- -	- -	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	0.440	NA	- -	- -	- -	Yes - No SLV
Naphthalene	0-1 ft	1.50	10,000	0.000150	No	No	No
o-Xylene	0-1 ft	0.180	1,000	0.000180	No	No	No
Tetrachloroethene (PCE)	0-1 ft	3.10	10,000	0.000310	No	No	No
Toluene	0-1 ft	5.80	200,000	0.0000290	No	No	No
Trichloroethene (TCE)	0-1 ft	0.171	NA	- -	- -	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-3 ft	14,300	200,000	0.0715	No	No	No
1,3,5-Trimethylbenzene	0-3 ft	6,500	200,000	0.0325	No	No	No
2-Butanone (MEK)	0-3 ft	50.0	NA	- -	- -	- -	Yes - No SLV
2-Hexanone	0-3 ft	8.80	NA	- -	- -	- -	Yes - No SLV
4-Isopropyltoluene	0-3 ft	161	200,000	0.000805	No	No	No
4-Methyl-2-pentanone (MIBK)	0-3 ft	1.20	NA	- -	- -	- -	Yes - No SLV
Acetone	0-3 ft	540	NA	- -	- -	- -	Yes - No SLV
Benzene	0-3 ft	1.20	NA	- -	- -	- -	Yes - No SLV
Bromomethane	0-3 ft	5.00	NA	- -	- -	- -	Yes - No SLV
Carbon Disulfide	0-3 ft	6.90	NA	- -	- -	- -	Yes - No SLV
Chloroform	0-3 ft	19.0	NA	- -	- -	- -	Yes - No SLV
Dichlorodifluoromethane	0-3 ft	94.0	NA	- -	- -	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-3 ft	460	NA	- -	- -	- -	Yes - No SLV
Ethylbenzene	0-3 ft	37.4	NA	- -	- -	- -	Yes - No SLV
m,p-Xylenes	0-3 ft	7,400	NA	- -	- -	- -	Yes - No SLV
Naphthalene	0-3 ft	19.5	10,000	0.00195	No	No	No
n-Propylbenzene	0-3 ft	122	NA	- -	- -	- -	Yes - No SLV
o-Xylene	0-3 ft	3,200	1,000	3.20	Yes	No	**Yes**
Tetrachloroethene (PCE)	0-3 ft	420,000	10,000	42.0	Yes	Yes	**Yes**
Toluene	0-3 ft	39,000	200,000	0.195	No	No	No
Trichloroethene (TCE)	0-3 ft	6,080	NA	- -	- -	- -	Yes - No SLV
SVOCs (ug/kg)							
Benzoic Acid	0-1 ft	980	200,000	0.00490	No	No	No
Bis(2-ethylhexyl) Phthalate	0-1 ft	260,000	NA	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-1 ft	124	200,000	0.000620	No	No	No
Carbazole	0-1 ft	530	NA	- -	- -	- -	Yes - No SLV

Table N-11
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Plants
Bradford Island - Upland Operable Unit
(4 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	Concern for Threatened or Endangered Plants? (Tij>1)	Concern for Non-threatened or Endangered Plants? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
Dibenzofuran	0-1 ft	220	NA	- -	- -	- -	Yes - No SLV
Dimethyl Phthalate	0-1 ft	41.0	NA	- -	- -	- -	Yes - No SLV
Di-n-butyl Phthalate	0-1 ft	280	200,000	0.00140	No	No	No
Di-n-octyl Phthalate	0-1 ft	127	200,000	0.000635	No	No	No
Pentachlorophenol	0-1 ft	32.0	5,000	0.00640	No	No	No
Phenol	0-1 ft	3.70	70,000	0.0000529	No	No	No
Benzoic Acid	0-3 ft	980	200,000	0.00490	No	No	No
Bis(2-ethylhexyl) Phthalate	0-3 ft	260,000	NA	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-3 ft	124	200,000	0.000620	No	No	No
Carbazole	0-3 ft	530	NA	- -	- -	- -	Yes - No SLV
Dibenzofuran	0-3 ft	485	NA	- -	- -	- -	Yes - No SLV
Dimethyl Phthalate	0-3 ft	41.0	NA	- -	- -	- -	Yes - No SLV
Di-n-butyl Phthalate	0-3 ft	280	200,000	0.00140	No	No	No
Di-n-octyl Phthalate	0-3 ft	127	200,000	0.000635	No	No	No
Pentachlorophenol	0-3 ft	32.0	5,000	0.00640	No	No	No
Phenol	0-3 ft	35.0	70,000	0.0005000	No	No	No
PAHs (ug/kg)							
2-Methylnaphthalene	0-1 ft	150	NA (6)	0.0150	No	No	No
Acenaphthene	0-1 ft	470	20,000	0.0235	No	No	No
Acenaphthylene	0-1 ft	87.7	NA (6)	0.00877	No	No	No
Anthracene	0-1 ft	832	NA (6)	0.0832	No	No	No
Fluorene	0-1 ft	462	NA (6)	0.0462	No	No	No
Naphthalene	0-1 ft	1.5	10,000	0.000150	No	No	No
Phenanthrene	0-1 ft	4,000	NA (6)	0.400	No	No	No
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	5,687	NA (6)	0.569	No	No	No
Benzo(a)anthracene	0-1 ft	6,440	1,200	5.37	Yes	Yes	**Yes**
Benzo(a)pyrene	0-1 ft	6,470	1,200	5.39	Yes	Yes	**Yes**
Benzo(b)fluoranthene	0-1 ft	4,100	1,200	3.42	Yes	No	**Yes**
Benzo(g,h,i)perylene	0-1 ft	3,830	NA (7)	3.19	Yes	No	**Yes**
Benzo(k)fluoranthene	0-1 ft	1,400	1,200	1.17	Yes	No	**Yes**
Benzofluoranthenes, Total	0-1 ft	12,100	NA (7)	10.1	Yes	Yes	**Yes**
Chrysene	0-1 ft	7,590	1,200	6.33	Yes	Yes	**Yes**
Dibenz(a,h)anthracene	0-1 ft	1,430	1,200	1.19	Yes	No	**Yes**
Fluoranthene	0-1 ft	20,700	NA (7)	17.3	Yes	Yes	**Yes**
Indeno(1,2,3-cd)pyrene	0-1 ft	3,910	1,200	3.26	Yes	No	**Yes**
Pyrene	0-1 ft	21,900	NA (7)	18.3	Yes	Yes	**Yes**
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	72,270	1,200	60.2	Yes	Yes	**Yes**

Table N-11
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Plants
Bradford Island - Upland Operable Unit
(5 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	Concern for Threatened or Endangered Plants? (Tij>1)	Concern for Non-threatened or Endangered Plants? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
2-Methylnaphthalene	0-3 ft	150	NA (6)	0.0150	No	No	No
Acenaphthene	0-3 ft	3,200	20,000	0.160	No	No	No
Acenaphthylene	0-3 ft	295	NA (6)	0.0295	No	No	No
Anthracene	0-3 ft	2,040	NA (6)	0.204	No	No	No
Fluorene	0-3 ft	779	NA (6)	0.0779	No	No	No
Naphthalene	0-3 ft	19.5	10,000	0.00195	No	No	No
Phenanthrene	0-3 ft	6,550	NA (6)	0.655	No	No	No
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	13,120	NA (6)	1.31	Yes	No	**Yes**
Benzo(a)anthracene	0-3 ft	12,300	1,200	10.3	Yes	Yes	**Yes**
Benzo(a)pyrene	0-3 ft	11,700	1,200	9.75	Yes	Yes	**Yes**
Benzo(b)fluoranthene	0-3 ft	4,100	1,200	3.42	Yes	No	**Yes**
Benzo(g,h,i)perylene	0-3 ft	3,830	NA (7)	3.19	Yes	No	**Yes**
Benzo(k)fluoranthene	0-3 ft	1,400	1,200	1.17	Yes	No	**Yes**
Benzofluoranthenes, Total	0-3 ft	16,300	NA (7)	13.6	Yes	Yes	**Yes**
Chrysene	0-3 ft	12,000	1,200	10.0	Yes	Yes	**Yes**
Dibenz(a,h)anthracene	0-3 ft	1,430	1,200	1.19	Yes	No	**Yes**
Fluoranthene	0-3 ft	28,600	NA (7)	23.8	Yes	Yes	**Yes**
Indeno(1,2,3-cd)pyrene	0-3 ft	4,170	1,200	3.48	Yes	No	**Yes**
Pyrene	0-3 ft	32,000	NA (7)	26.7	Yes	Yes	**Yes**
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	105,200	1,200	87.7	Yes	Yes	**Yes**
TPH (mg/kg)							
Diesel Range Organics	0-1 ft	1,090	NA	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	3.49	NA	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	2,300	NA	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	1,440	NA	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	3,960	NA	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	2,300	NA	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
For lead, the maximum concentration is from unseived samples.
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit
NA = not available

Table N-11
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Plants
Bradford Island - Upland Operable Unit
(6 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	Concern for Threatened or Endangered Plants? (Tij>1)	Concern for Non-threatened or Endangered Plants? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)

ND = non detect
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

Hierarchy of Terrestrial Plant SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(3) Efroymson RA, ME Wil, GW Suter II, and AC Wooten. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. ORNL. ES/ER/TM-85/R3.

(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j*.
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).
(6) The SLV for naphthalene was used to screen the individual and total LPAHs without SLVs.
(7) The SLV for the benzo(a)pyrene was used to screen the individual HPAHs without SLVs.

Table N-12
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(1 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij>1)	Chemical is a Concern for Non-threatened or Endangered Invertebrates? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)							
Antimony	0-1 ft	13.7	78	0.176	No	No	No
Arsenic	0-1 ft	80.9	60	1.35	Yes	No	**Yes**
Cadmium	0-1 ft	17.3	140	0.124	No	No	No
Chromium	0-1 ft	2,650	28.1	94.3	Yes	Yes	**Yes**
Lead	0-1 ft	3,260	1,700	1.92	Yes	No	**Yes**
Nickel	0-1 ft	1,060	280	3.79	Yes	No	**Yes**
Selenium	0-1 ft	0.900	4.1	0.220	No	No	No
Silver	0-1 ft	0.431	50	0.00862	No	No	No
Zinc	0-1 ft	1,160	120	9.67	Yes	Yes	**Yes**
Antimony	0-3 ft	13.7	78	0.176	No	No	No
Arsenic	0-3 ft	80.9	60	1.35	Yes	No	**Yes**
Cadmium	0-3 ft	17.3	140	0.124	No	No	No
Chromium	0-3 ft	2,650	28.1	94.3	Yes	Yes	**Yes**
Lead	0-3 ft	3,260	1,700	1.92	Yes	No	**Yes**
Nickel	0-3 ft	1,060	280	3.79	Yes	No	**Yes**
Selenium	0-3 ft	0.900	4.1	0.220	No	No	No
Silver	0-3 ft	0.431	50	0.008620	No	No	No
Zinc	0-3 ft	1,160	120	9.67	Yes	Yes	**Yes**
BUTYLTINS (ug/kg)							
Dibutyltin	0-1 ft	210	NA	- -	- -	- -	Yes - No SLV
Monobutyltin	0-1 ft	108	NA	- -	- -	- -	Yes - No SLV
Tributyltin	0-1 ft	1,860	NA	- -	- -	- -	Yes - No SLV
Dibutyltin	0-3 ft	210	NA	- -	- -	- -	Yes - No SLV
Monobutyltin	0-3 ft	108	NA	- -	- -	- -	Yes - No SLV
Tributyltin	0-3 ft	1,860	NA	- -	- -	- -	Yes - No SLV
PESTICIDES (ug/kg)							
4,4'-DDD	0-1 ft	0.990	NA	- -	- -	- -	Yes - No SLV
4,4'-DDE	0-1 ft	2.44	NA	- -	- -	- -	Yes - No SLV
4,4'-DDT	0-1 ft	140	NA	- -	- -	- -	Yes - No SLV
Total DDTs	0-1 ft	144	NA	- -	- -	- -	Yes - No SLV
BHC (delta)	0-1 ft	3.03	NA	- -	- -	- -	Yes - No SLV
BHC (gamma) Lindane	0-1 ft	9.68	NA	- -	- -	- -	Yes - No SLV
Chlordane (alpha)	0-1 ft	1.50	NA	- -	- -	- -	Yes - No SLV
Chlordane (gamma)	0-1 ft	97.0	NA	- -	- -	- -	Yes - No SLV
Dieldrin	0-1 ft	0.823	NA	- -	- -	- -	Yes - No SLV
Endosulfan I	0-1 ft	6.45	NA	- -	- -	- -	Yes - No SLV
Endosulfan II	0-1 ft	1.99	NA	- -	- -	- -	Yes - No SLV
Endosulfan Sulfate	0-1 ft	3.30	NA	- -	- -	- -	Yes - No SLV

Table N-12
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(2 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij>1)	Chemical is a Concern for Non-threatened or Endangered Invertebrates? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
Endrin	0-1 ft	17.0	NA	- -	- -	- -	Yes - No SLV
Endrin Aldehyde	0-1 ft	16.0	NA	- -	- -	- -	Yes - No SLV
Endrin Ketone	0-1 ft	13.0	NA	- -	- -	- -	Yes - No SLV
Heptachlor	0-1 ft	2.90	NA	- -	- -	- -	Yes - No SLV
Methoxychlor	0-1 ft	1.20	NA	- -	- -	- -	Yes - No SLV
4,4'-DDD	0-3 ft	0.990	NA	- -	- -	- -	Yes - No SLV
4,4'-DDE	0-3 ft	2.44	NA	- -	- -	- -	Yes - No SLV
4,4'-DDT	0-3 ft	140	NA	- -	- -	- -	Yes - No SLV
Total DDTs	0-3 ft	144	NA	- -	- -	- -	Yes - No SLV
BHC (delta)	0-3 ft	3.03	NA	- -	- -	- -	Yes - No SLV
BHC (gamma) Lindane	0-3 ft	9.68	NA	- -	- -	- -	Yes - No SLV
Chlordane (alpha)	0-3 ft	1.50	NA	- -	- -	- -	Yes - No SLV
Chlordane (gamma)	0-3 ft	97.0	NA	- -	- -	- -	Yes - No SLV
Dieldrin	0-3 ft	0.823	NA	- -	- -	- -	Yes - No SLV
Endosulfan I	0-3 ft	6.45	NA	- -	- -	- -	Yes - No SLV
Endosulfan II	0-3 ft	1.99	NA	- -	- -	- -	Yes - No SLV
Endosulfan Sulfate	0-3 ft	3.30	NA	- -	- -	- -	Yes - No SLV
Endrin	0-3 ft	17.0	NA	- -	- -	- -	Yes - No SLV
Endrin Aldehyde	0-3 ft	16.0	NA	- -	- -	- -	Yes - No SLV
Endrin Ketone	0-3 ft	13.0	NA	- -	- -	- -	Yes - No SLV
Heptachlor	0-3 ft	2.90	NA	- -	- -	- -	Yes - No SLV
Methoxychlor	0-3 ft	1.20	NA	- -	- -	- -	Yes - No SLV
PCBs (ug/kg)							
Aroclor 1254	0-1 ft	1,700	2,510	0.677	No	No	No
Aroclor 1260	0-1 ft	690	2,510	0.275	No	No	No
Total PCBs (Aroclors)	0-1 ft	2,140	2,510	0.853	No	No	No
Aroclor 1254	0-3 ft	1,700	2,510	0.677	No	No	No
Aroclor 1260	0-3 ft	690	2,510	0.275	No	No	No
Total PCBs (Aroclors)	0-3 ft	2,140	2,510	0.853	No	No	No
VOCs (ug/kg)							
1,1,1-Trichloroethane (TCA)	0-1 ft	0.580	NA	- -	- -	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-1 ft	0.523	NA	- -	- -	- -	Yes - No SLV
1,3,5-Trimethylbenzene	0-1 ft	0.125	NA	- -	- -	- -	Yes - No SLV
2-Butanone (MEK)	0-1 ft	50.0	NA	- -	- -	- -	Yes - No SLV
2-Hexanone	0-1 ft	8.80	NA	- -	- -	- -	Yes - No SLV
4-Isopropyltoluene	0-1 ft	12.0	NA	- -	- -	- -	Yes - No SLV
4-Methyl-2-pentanone (MIBK)	0-1 ft	1.20	NA	- -	- -	- -	Yes - No SLV
Acetone	0-1 ft	540	NA	- -	- -	- -	Yes - No SLV
Benzene	0-1 ft	1.20	NA	- -	- -	- -	Yes - No SLV

Table N-12
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(3 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij>1)	Chemical is a Concern for Non-threatened or Endangered Invertebrates? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
Bromomethane	0-1 ft	5.00	NA	- -	- -	- -	Yes - No SLV
Carbon Disulfide	0-1 ft	6.90	NA	- -	- -	- -	Yes - No SLV
Chloroform	0-1 ft	19.0	NA	- -	- -	- -	Yes - No SLV
Chloromethane	0-1 ft	0.250	NA	- -	- -	- -	Yes - No SLV
Dichlorodifluoromethane	0-1 ft	94.0	NA	- -	- -	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-1 ft	460	NA	- -	- -	- -	Yes - No SLV
Ethylbenzene	0-1 ft	0.320	2,260	0.000142	No	No	No
m,p-Xylenes	0-1 ft	0.440	NA	- -	- -	- -	Yes - No SLV
Naphthalene	0-1 ft	1.50	NA (6)	0.0000517	No	No	No
o-Xylene	0-1 ft	0.180	NA	- -	- -	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-1 ft	3.10	NA	- -	- -	- -	Yes - No SLV
Toluene	0-1 ft	5.80	NA	- -	- -	- -	Yes - No SLV
Trichloroethene (TCE)	0-1 ft	0.171	NA	- -	- -	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-3 ft	14,300	NA	- -	- -	- -	Yes - No SLV
1,3,5-Trimethylbenzene	0-3 ft	6,500	NA	- -	- -	- -	Yes - No SLV
2-Butanone (MEK)	0-3 ft	50.0	NA	- -	- -	- -	Yes - No SLV
2-Hexanone	0-3 ft	8.80	NA	- -	- -	- -	Yes - No SLV
4-Isopropyltoluene	0-3 ft	161	NA	- -	- -	- -	Yes - No SLV
4-Methyl-2-pentanone (MIBK)	0-3 ft	1.20	NA	- -	- -	- -	Yes - No SLV
Acetone	0-3 ft	540	NA	- -	- -	- -	Yes - No SLV
Benzene	0-3 ft	1.20	NA	- -	- -	- -	Yes - No SLV
Bromomethane	0-3 ft	5.00	NA	- -	- -	- -	Yes - No SLV
Carbon Disulfide	0-3 ft	6.90	NA	- -	- -	- -	Yes - No SLV
Chloroform	0-3 ft	19.0	NA	- -	- -	- -	Yes - No SLV
Dichlorodifluoromethane	0-3 ft	94.0	NA	- -	- -	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-3 ft	460	NA	- -	- -	- -	Yes - No SLV
Ethylbenzene	0-3 ft	37.4	2,260	0.0165	No	No	No
m,p-Xylenes	0-3 ft	7,400	NA	- -	- -	- -	Yes - No SLV
Naphthalene	0-3 ft	19.5	NA (6)	0.000672	No	No	No
n-Propylbenzene	0-3 ft	122	NA	- -	- -	- -	Yes - No SLV
o-Xylene	0-3 ft	3,200	NA	- -	- -	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-3 ft	420,000	NA	- -	- -	- -	Yes - No SLV
Toluene	0-3 ft	39,000	NA	- -	- -	- -	Yes - No SLV
Trichloroethene (TCE)	0-3 ft	6,080	NA	- -	- -	- -	Yes - No SLV
SVOCs (ug/kg)							
Benzoic Acid	0-1 ft	980	NA	- -	- -	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-1 ft	260,000	NA	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-1 ft	124	NA	- -	- -	- -	Yes - No SLV

Table N-12
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(4 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij>1)	Chemical is a Concern for Non-threatened or Endangered Invertebrates? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
Carbazole	0-1 ft	530	2,260	0.235	No	No	No
Dibenzofuran	0-1 ft	220	NA	- -	- -	- -	Yes - No SLV
Dimethyl Phthalate	0-1 ft	41.0	200,000	0.000205	No	No	No
Di-n-butyl Phthalate	0-1 ft	280	NA	- -	- -	- -	Yes - No SLV
Di-n-octyl Phthalate	0-1 ft	127	NA	- -	- -	- -	Yes - No SLV
Pentachlorophenol	0-1 ft	32.0	31,000	0.00103	No	No	No
Phenol	0-1 ft	3.70	30,000	0.000123	No	No	No
Benzoic Acid	0-3 ft	980	NA	- -	- -	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-3 ft	260,000	NA	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-3 ft	124	NA	- -	- -	- -	Yes - No SLV
Carbazole	0-3 ft	530	2,260	0.235	No	No	No
Dibenzofuran	0-3 ft	485	NA	- -	- -	- -	Yes - No SLV
Dimethyl Phthalate	0-3 ft	41.0	200,000	0.000205	No	No	No
Di-n-butyl Phthalate	0-3 ft	280	NA	- -	- -	- -	Yes - No SLV
Di-n-octyl Phthalate	0-3 ft	127	NA	- -	- -	- -	Yes - No SLV
Pentachlorophenol	0-3 ft	32.0	31,000	0.00103	No	No	No
Phenol	0-3 ft	35.0	30,000	0.00117	No	No	No
PAHs (ug/kg)							
2-Methylnaphthalene	0-1 ft	150	NA (6)	0.00517	No	No	No
Acenaphthene	0-1 ft	470	NA (6)	0.0162	No	No	No
Acenaphthylene	0-1 ft	87.7	NA (6)	0.00302	No	No	No
Anthracene	0-1 ft	832	NA (6)	0.0287	No	No	No
Fluorene	0-1 ft	462	NA (6)	0.0159	No	No	No
Naphthalene	0-1 ft	1.5	NA (6)	0.0000517	No	No	No
Phenanthrene	0-1 ft	4,000	NA (6)	0.138	No	No	No
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	5,687	29,000	0.196	No	No	No
Benzo(a)anthracene	0-1 ft	6,440	NA (7)	0.358	No	No	No
Benzo(a)pyrene	0-1 ft	6,470	NA (7)	0.359	No	No	No
Benzo(b)fluoranthene	0-1 ft	4,100	NA (7)	0.228	No	No	No
Benzo(g,h,i)perylene	0-1 ft	3,830	NA (7)	0.213	No	No	No
Benzo(k)fluoranthene	0-1 ft	1,400	NA (7)	0.0778	No	No	No
Benzofluoranthenes, Total	0-1 ft	12,100	NA (7)	0.672	No	No	No
Chrysene	0-1 ft	7,590	NA (7)	0.422	No	No	No
Dibenz(a,h)anthracene	0-1 ft	1,430	NA (7)	0.0794	No	No	No
Fluoranthene	0-1 ft	20,700	NA (7)	1.15	Yes	No	**Yes**

Table N-12
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(5 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij>1)	Chemical is a Concern for Non-threatened or Endangered Invertebrates? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
Indeno(1,2,3-cd)pyrene	0-1 ft	3,910	NA (7)	0.217	No	No	No
Pyrene	0-1 ft	21,900	NA (7)	1.22	Yes	No	**Yes**
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	72,270	18,000	4.02	Yes	No	**Yes**
2-Methylnaphthalene	0-3 ft	150	NA (6)	0.00517	No	No	No
Acenaphthene	0-3 ft	3,200	NA (6)	0.110	No	No	No
Acenaphthylene	0-3 ft	295	NA (6)	0.0102	No	No	No
Anthracene	0-3 ft	2,040	NA (6)	0.0703	No	No	No
Fluorene	0-3 ft	779	NA (6)	0.0269	No	No	No
Naphthalene	0-3 ft	19.5	NA (6)	0.000672	No	No	No
Phenanthrene	0-3 ft	6,550	NA (6)	0.226	No	No	No
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	13,120	29,000	0.452	No	No	No
Benzo(a)anthracene	0-3 ft	12,300	NA (7)	0.683	No	No	No
Benzo(a)pyrene	0-3 ft	11,700	NA (7)	0.650	No	No	No
Benzo(b)fluoranthene	0-3 ft	4,100	NA (7)	0.228	No	No	No
Benzo(g,h,i)perylene	0-3 ft	3,830	NA (7)	0.213	No	No	No
Benzo(k)fluoranthene	0-3 ft	1,400	NA (7)	0.0778	No	No	No
Benzofluoranthenes, Total	0-3 ft	16,300	NA (7)	0.906	No	No	No
Chrysene	0-3 ft	12,000	NA (7)	0.667	No	No	No
Dibenz(a,h)anthracene	0-3 ft	1,430	NA (7)	0.0794	No	No	No
Fluoranthene	0-3 ft	28,600	NA (7)	1.59	Yes	No	**Yes**
Indeno(1,2,3-cd)pyrene	0-3 ft	4,170	NA (7)	0.232	No	No	No
Pyrene	0-3 ft	32,000	NA (7)	1.78	Yes	No	**Yes**
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	105,200	18,000	5.84	Yes	Yes	**Yes**
TPH (mg/kg)							
Diesel Range Organics	0-1 ft	1,090	NA	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	3.49	NA	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	2,300	NA	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	1,440	NA	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	3,960	NA	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	2,300	NA	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
For lead, the maximum concentration is from unseived samples.
CPEC = chemical of potential ecological concern
COI = chemical of interest

Table N-12
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(6 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij>1)	Chemical is a Concern for Non-threatened or Endangered Invertebrates? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)

HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

Hierarchy of Terrestrial Invertebrate SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(3) RA Efroymson. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process, Nov 1997 Revision. ORNL ES/ER/TM-126/R2.

(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).
(6) The SLV for Total LPAHs was used to screen the individual LPAHs to determine which individuals are driving Total LPAH risk, if any.
(7) The SLV for Total HPAHs was used to screen the individual HPAHs to determine which individuals are driving Total HPAH risk, if any.

Table N-13
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(1 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)									
Antimony	0-1 ft	2.94	0.176	16.7	Yes	Yes	No	- -	**Yes**
Arsenic	0-1 ft	15.1	43	0.351	No	No	Yes	Yes	No
Cadmium	0-1 ft	3.20	0.77	4.16	Yes	No	Yes	Yes	**Yes**
Chromium	0-1 ft	720	28.1	25.6	Yes	Yes	Yes	Yes	**Yes**
Lead	0-1 ft	465	25.5	18.2	Yes	Yes	Yes	Yes	**Yes**
Nickel	0-1 ft	353	210	1.68	Yes	No	Yes	Yes	**Yes**
Selenium	0-1 ft	0.466	1.2	0.388	No	No	Yes	Yes	No
Silver	0-1 ft	0.187	4.2	0.0445	No	No	Yes	Yes	No
Zinc	0-1 ft	212	71.7	2.96	Yes	No	Yes	Yes	**Yes**
Antimony	0-3 ft	2.42	0.176	13.8	Yes	Yes	No	- -	**Yes**
Arsenic	0-3 ft	9.71	43	0.226	No	No	Yes	Yes	No
Cadmium	0-3 ft	2.63	0.77	3.42	Yes	No	Yes	Yes	**Yes**
Chromium	0-3 ft	579	28.1	20.6	Yes	Yes	Yes	Yes	**Yes**
Lead	0-3 ft	529	25.5	20.7	Yes	Yes	Yes	Yes	**Yes**
Nickel	0-3 ft	251	210	1.20	Yes	No	Yes	Yes	**Yes**
Selenium	0-3 ft	0.479	1.2	0.399	No	No	Yes	Yes	No
Silver	0-3 ft	0.152	4.2	0.0362	No	No	Yes	Yes	No
Zinc	0-3 ft	237	71.7	3.31	Yes	No	Yes	Yes	**Yes**
BUTYLTINS (ug/kg)									
Dibutyltin	0-1 ft	34.6	28,000	0.00124	No	No	No	- -	No
Monobutyltin	0-1 ft	11.0	28,000	0.000393	No	No	No	- -	No
Tributyltin	0-1 ft	481	28,000	0.0172	No	No	Yes	No	**Yes-Bio**
Dibutyltin	0-3 ft	26.6	28,000	0.000950	No	No	No	- -	No
Monobutyltin	0-3 ft	8.62	28,000	0.000308	No	No	No	- -	No
Tributyltin	0-3 ft	248	28,000	0.00886	No	No	Yes	No	**Yes-Bio**
PESTICIDES (ug/kg)									
4,4'-DDD	0-1 ft	0.729	93	0.00784	No	No	Yes	Yes	No
4,4'-DDE	0-1 ft	0.632	93	0.00680	No	No	Yes	Yes	No
4,4'-DDT	0-1 ft	32.3	93	0.347	No	No	Yes	Yes	No
Total DDTs	0-1 ft	96	93	1.03	Yes	No	Yes	Yes	**Yes**
BHC (delta)	0-1 ft	1.54	8,000	0.000193	No	No	Yes	No	**Yes-Bio**
BHC (gamma) Lindane	0-1 ft	9.68	8,000	0.00121	No	No	Yes	No	**Yes-Bio**
Chlordane (alpha)	0-1 ft	0.815	9,000	0.0000906	No	No	Yes	No	**Yes-Bio**
Chlordane (gamma)	0-1 ft	30.3	9,000	0.00337	No	No	Yes	No	**Yes-Bio**
Dieldrin	0-1 ft	0.488	22	0.0222	No	No	Yes	Yes	No
Endosulfan I	0-1 ft	2.69	42,000	0.0000640	No	No	Yes	No	**Yes-Bio**
Endosulfan II	0-1 ft	0.495	42,000	0.0000118	No	No	Yes	No	**Yes-Bio**
Endosulfan Sulfate	0-1 ft	0.953	42,000	0.0000227	No	No	Yes	No	**Yes-Bio**

Table N-13
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(2 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
Endrin	0-1 ft	5.04	22	0.229	No	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-1 ft	3.87	22	0.176	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-1 ft	3.09	22	0.140	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-1 ft	0.464	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Methoxychlor	0-1 ft	1.05	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
4,4'-DDD	0-3 ft	0.721	93	0.00775	No	No	Yes	Yes	No
4,4'-DDE	0-3 ft	0.567	93	0.00610	No	No	Yes	Yes	No
4,4'-DDT	0-3 ft	79.4	93	0.854	No	No	Yes	Yes	No
Total DDTs	0-3 ft	82	93	0.880	No	No	Yes	Yes	No
BHC (delta)	0-3 ft	1.30	8,000	0.000163	No	No	Yes	No	**Yes-Bio**
BHC (gamma) Lindane	0-3 ft	1.06	8,000	0.000133	No	No	Yes	No	**Yes-Bio**
Chlordane (alpha)	0-3 ft	0.776	9,000	0.0000862	No	No	Yes	No	**Yes-Bio**
Chlordane (gamma)	0-3 ft	20.4	9,000	0.00227	No	No	Yes	No	**Yes-Bio**
Dieldrin	0-3 ft	0.483	22	0.0220	No	No	Yes	Yes	No
Endosulfan I	0-3 ft	0.809	42,000	0.0000193	No	No	Yes	No	**Yes-Bio**
Endosulfan II	0-3 ft	0.447	42,000	0.0000106	No	No	Yes	No	**Yes-Bio**
Endosulfan Sulfate	0-3 ft	0.889	42,000	0.0000212	No	No	Yes	No	**Yes-Bio**
Endrin	0-3 ft	3.89	22	0.177	No	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-3 ft	3.44	22	0.156	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-3 ft	2.88	22	0.131	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-3 ft	0.415	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Methoxychlor	0-3 ft	1.04	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
PCBs (ug/kg)									
Aroclor 1254	0-1 ft	292	655	0.446	No	No	Yes	Yes	No
Aroclor 1260	0-1 ft	203	655	0.310	No	No	Yes	Yes	No
Total PCBs (Aroclors)	0-1 ft	514	655	0.784	No	No	Yes	Yes	No
Aroclor 1254	0-3 ft	136	655	0.208	No	No	Yes	Yes	No
Aroclor 1260	0-3 ft	167	655	0.255	No	No	Yes	Yes	No
Total PCBs (Aroclors)	0-3 ft	419	655	0.640	No	No	Yes	Yes	No
VOCs (ug/kg)									
1,1,1-Trichloroethane (TCA)	0-1 ft	0.503	NA	- -	- -	- -	No	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-1 ft	0.230	NA	- -	- -	- -	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-1 ft	0.0621	NA	- -	- -	- -	No	- -	Yes - No SLV
2-Butanone (MEK)	0-1 ft	16.5	NA	- -	- -	- -	No	- -	Yes - No SLV
2-Hexanone	0-1 ft	5.25	NA	- -	- -	- -	No	- -	Yes - No SLV
4-Isopropyltoluene	0-1 ft	1.33	NA	- -	- -	- -	Yes	No	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-1 ft	0.574	NA	- -	- -	- -	No	- -	Yes - No SLV
Acetone	0-1 ft	156	NA	- -	- -	- -	No	- -	Yes - No SLV
Benzene	0-1 ft	0.524	NA	- -	- -	- -	No	- -	Yes - No SLV

Table N-13
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(3 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
Bromomethane	0-1 ft	1.44	NA	- -	- -	- -	No	- -	Yes - No SLV
Carbon Disulfide	0-1 ft	1.14	NA	- -	- -	- -	No	- -	Yes - No SLV
Chloroform	0-1 ft	6.86	NA	- -	- -	- -	No	- -	Yes - No SLV
Chloromethane	0-1 ft	0.234	NA	- -	- -	- -	No	- -	Yes - No SLV
Dichlorodifluoromethane	0-1 ft	8.15	NA	- -	- -	- -	No	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-1 ft	140	NA	- -	- -	- -	No	- -	Yes - No SLV
Ethylbenzene	0-1 ft	0.132	NA	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	0.240	NA	- -	- -	- -	No	- -	Yes - No SLV
Naphthalene	0-1 ft	0.610	NA	- -	- -	- -	No	- -	Yes - No SLV
o-Xylene	0-1 ft	0.172	NA	- -	- -	- -	No	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-1 ft	1.38	NA	- -	- -	- -	No	- -	Yes - No SLV
Toluene	0-1 ft	1.11	NA	- -	- -	- -	No	- -	Yes - No SLV
Trichloroethene (TCE)	0-1 ft	0.0766	NA	- -	- -	- -	No	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-3 ft	4,620	NA	- -	- -	- -	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-3 ft	1,630	NA	- -	- -	- -	No	- -	Yes - No SLV
2-Butanone (MEK)	0-3 ft	13.3	NA	- -	- -	- -	No	- -	Yes - No SLV
2-Hexanone	0-3 ft	5.12	NA	- -	- -	- -	No	- -	Yes - No SLV
4-Isopropyltoluene	0-3 ft	20.1	NA	- -	- -	- -	Yes	No	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-3 ft	0.525	NA	- -	- -	- -	No	- -	Yes - No SLV
Acetone	0-3 ft	122	NA	- -	- -	- -	No	- -	Yes - No SLV
Benzene	0-3 ft	0.463	NA	- -	- -	- -	No	- -	Yes - No SLV
Bromomethane	0-3 ft	1.11	NA	- -	- -	- -	No	- -	Yes - No SLV
Carbon Disulfide	0-3 ft	1.12	NA	- -	- -	- -	No	- -	Yes - No SLV
Chloroform	0-3 ft	5.70	NA	- -	- -	- -	No	- -	Yes - No SLV
Dichlorodifluoromethane	0-3 ft	6.74	NA	- -	- -	- -	No	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-3 ft	56.0	NA	- -	- -	- -	No	- -	Yes - No SLV
Ethylbenzene	0-3 ft	4.69	NA	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-3 ft	1,820	NA	- -	- -	- -	No	- -	Yes - No SLV
Naphthalene	0-3 ft	1.94	NA	- -	- -	- -	No	- -	Yes - No SLV
n-Propylbenzene	0-3 ft	35.5	NA	- -	- -	- -	No	No SLV	**Yes-Bio**
o-Xylene	0-3 ft	200	NA	- -	- -	- -	No	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-3 ft	26,300	NA	- -	- -	- -	No	- -	Yes - No SLV
Toluene	0-3 ft	9,360	NA	- -	- -	- -	No	- -	Yes - No SLV
Trichloroethene (TCE)	0-3 ft	1,780	NA	- -	- -	- -	No	- -	Yes - No SLV
SVOCs (ug/kg)									
Benzoic Acid	0-1 ft	166	NA	- -	- -	- -	No	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-1 ft	98,000	4,500	21.8	Yes	Yes	Yes	No	**Yes**
Butyl Benzyl Phthalate	0-1 ft	17.1	450	0.0380	No	No	Yes	No	**Yes-Bio**
Carbazole	0-1 ft	144	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**

Table N-13
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(4 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
Dibenzofuran	0-1 ft	42.4	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dimethyl Phthalate	0-1 ft	31.4	NA	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-1 ft	80.4	450	0.179	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-1 ft	25.1	450	0.0558	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-1 ft	14.1	2,100	0.0067	No	No	Yes	Yes	No
Phenol	0-1 ft	2.28	NA	- -	- -	- -	No	- -	Yes - No SLV
Benzoic Acid	0-3 ft	132	NA	- -	- -	- -	No	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-3 ft	77,100	4,500	17.1	Yes	Yes	Yes	No	**Yes**
Butyl Benzyl Phthalate	0-3 ft	15.2	450	0.0338	No	No	Yes	No	**Yes-Bio**
Carbazole	0-3 ft	112	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-3 ft	122	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dimethyl Phthalate	0-3 ft	31.0	NA	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-3 ft	54.3	450	0.121	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-3 ft	22.5	450	0.0500	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-3 ft	13.3	2,100	0.00633	No	No	Yes	Yes	No
Phenol	0-3 ft	35.0	NA	- -	- -	- -	No	- -	Yes - No SLV
PAHs (ug/kg)									
2-Methylnaphthalene	0-1 ft	27.4	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthene	0-1 ft	172	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthylene	0-1 ft	17.4	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Anthracene	0-1 ft	338	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluorene	0-1 ft	154	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Naphthalene	0-1 ft	108	NA	- -	- -	- -	No	- -	Yes - No SLV
Phenanthrene	0-1 ft	1,260	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	1,849	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)anthracene	0-1 ft	1,750	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)pyrene	0-1 ft	1,760	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(b)fluoranthene	0-1 ft	1,950	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(g,h,i)perylene	0-1 ft	1,070	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(k)fluoranthene	0-1 ft	676	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzofluoranthenes, Total	0-1 ft	7,760	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Chrysene	0-1 ft	2,070	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenz(a,h)anthracene	0-1 ft	244	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluoranthene	0-1 ft	4,640	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Indeno(1,2,3-cd)pyrene	0-1 ft	1,130	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Pyrene	0-1 ft	4,780	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	18,577	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
2-Methylnaphthalene	0-3 ft	23.9	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**

Table N-13
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(5 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
Acenaphthene	0-3 ft	652	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthylene	0-3 ft	29.6	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Anthracene	0-3 ft	772	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluorene	0-3 ft	227	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Naphthalene	0-3 ft	81.4	NA	- -	- -	- -	No	- -	Yes - No SLV
Phenanthrene	0-3 ft	2,910	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	5,036	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)anthracene	0-3 ft	2,450	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)pyrene	0-3 ft	2,390	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(b)fluoranthene	0-3 ft	2,210	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(g,h,i)perylene	0-3 ft	1,050	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(k)fluoranthene	0-3 ft	764	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzofluoranthenes, Total	0-3 ft	10,600	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Chrysene	0-3 ft	4,590	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenz(a,h)anthracene	0-3 ft	238	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluoranthene	0-3 ft	10,800	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Indeno(1,2,3-cd)pyrene	0-3 ft	1,160	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Pyrene	0-3 ft	11,700	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	40,758	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
TPH (mg/kg)									
Diesel Range Organics	0-1 ft	229	NA	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	2.29	NA	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	671	NA	- -	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	266	NA	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	1,030	NA	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	577	NA	- -	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
For lead, the 95% UCL and maximum concentrations are from unseived samples.
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered

Table N-13
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(6 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)

UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).

Hierarchy of Avian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Lower of 95% UCL and maximum concentration for wildlife species (birds and mammals).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-14
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(1 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
INORGANICS (mg/kg)									
Antimony	0-1 ft	2.94	0.27	10.9	Yes	Yes	No	- -	**Yes**
Arsenic	0-1 ft	15.1	46	0.328	No	No	Yes	Yes	No
Cadmium	0-1 ft	3.20	0.36	8.89	Yes	Yes	Yes	Yes	**Yes**
Chromium	0-1 ft	720	34	21.2	Yes	Yes	Yes	Yes	**Yes**
Lead	0-1 ft	465	56	8.30	Yes	Yes	Yes	Yes	**Yes**
Nickel	0-1 ft	353	130	2.72	Yes	No	Yes	Yes	No
Selenium	0-1 ft	0.466	0.63	0.740	No	No	Yes	Yes	No
Silver	0-1 ft	0.187	14	0.0134	No	No	Yes	Yes	No
Zinc	0-1 ft	212	79	2.68	Yes	No	Yes	Yes	No
Antimony	0-3 ft	2.42	0.27	8.96	Yes	Yes	No	- -	**Yes**
Arsenic	0-3 ft	9.71	46	0.211	No	No	Yes	Yes	No
Cadmium	0-3 ft	2.63	0.36	7.31	Yes	Yes	Yes	Yes	**Yes**
Chromium	0-3 ft	579	34	17.0	Yes	Yes	Yes	Yes	**Yes**
Lead	0-3 ft	529	56	9.45	Yes	Yes	Yes	Yes	**Yes**
Nickel	0-3 ft	251	130	1.93	Yes	No	Yes	Yes	No
Selenium	0-3 ft	0.479	0.63	0.760	No	No	Yes	Yes	No
Silver	0-3 ft	0.152	14	0.0109	No	No	Yes	Yes	No
Zinc	0-3 ft	237	79	3.00	Yes	No	Yes	Yes	No
BUTYLTINS (ug/kg)									
Dibutyltin	0-1 ft	34.6	1,300,000	0.0000266	No	No	No	- -	No
Monobutyltin	0-1 ft	11.0	1,300,000	0.00000846	No	No	No	- -	No
Tributyltin	0-1 ft	481	1,300,000	0.000370	No	No	Yes	No	**Yes-Bio**
Dibutyltin	0-3 ft	26.6	1,300,000	0.0000205	No	No	No	- -	No
Monobutyltin	0-3 ft	8.62	1,300,000	0.00000663	No	No	No	- -	No
Tributyltin	0-3 ft	248	1,300,000	0.000191	No	No	Yes	No	**Yes-Bio**
PESTICIDES (ug/kg)									
4,4'-DDD	0-1 ft	0.729	21	0.0347	No	No	Yes	Yes	No
4,4'-DDE	0-1 ft	0.632	21	0.0301	No	No	Yes	Yes	No
4,4'-DDT	0-1 ft	32.3	21	1.54	Yes	No	Yes	Yes	No
Total DDTs	0-1 ft	96	21	4.56	Yes	No	Yes	Yes	No
BHC (delta)	0-1 ft	1.54	1,000,000	0.00000154	No	No	Yes	No	**Yes-Bio**
BHC (gamma) Lindane	0-1 ft	9.68	1,000,000	0.00000968	No	No	Yes	No	**Yes-Bio**
Chlordane (alpha)	0-1 ft	0.815	250,000	0.00000326	No	No	Yes	No	**Yes-Bio**
Chlordane (gamma)	0-1 ft	30.3	250,000	0.000121	No	No	Yes	No	**Yes-Bio**
Dieldrin	0-1 ft	0.488	4.9	0.100	No	No	Yes	Yes	No
Endosulfan I	0-1 ft	2.69	20,000	0.000135	No	No	Yes	No	**Yes-Bio**
Endosulfan II	0-1 ft	0.495	20,000	0.000025	No	No	Yes	No	**Yes-Bio**

Table N-14
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(2 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
Endosulfan Sulfate	0-1 ft	0.953	20,000	0.0000477	No	No	Yes	No	**Yes-Bio**
Endrin	0-1 ft	5.04	4.9	1.03	Yes	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-1 ft	3.87	4.9	0.79	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-1 ft	3.09	4.9	0.631	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-1 ft	0.464	15,000	0.0000309	No	No	Yes	No SLV	**Yes-Bio**
Methoxychlor	0-1 ft	1.05	500,000	0.00000210	No	No	Yes	No SLV	**Yes-Bio**
4,4'-DDD	0-3 ft	0.721	21	0.0343	No	No	Yes	Yes	No
4,4'-DDE	0-3 ft	0.567	21	0.0270	No	No	Yes	Yes	No
4,4'-DDT	0-3 ft	79.4	21	3.78	Yes	No	Yes	Yes	No
Total DDTs	0-3 ft	82	21	3.90	Yes	No	Yes	Yes	No
BHC (delta)	0-3 ft	1.30	1,000,000	0.00000130	No	No	Yes	No	**Yes-Bio**
BHC (gamma) Lindane	0-3 ft	1.06	1,000,000	0.00000106	No	No	Yes	No	**Yes-Bio**
Chlordane (alpha)	0-3 ft	0.776	250,000	0.00000310	No	No	Yes	No	**Yes-Bio**
Chlordane (gamma)	0-3 ft	20.4	250,000	0.0000816	No	No	Yes	No	**Yes-Bio**
Dieldrin	0-3 ft	0.483	4.9	0.0986	No	No	Yes	Yes	No
Endosulfan I	0-3 ft	0.809	20,000	0.0000405	No	No	Yes	No	**Yes-Bio**
Endosulfan II	0-3 ft	0.447	20,000	0.0000224	No	No	Yes	No	**Yes-Bio**
Endosulfan Sulfate	0-3 ft	0.889	20,000	0.0000445	No	No	Yes	No	**Yes-Bio**
Endrin	0-3 ft	3.89	4.9	0.794	No	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-3 ft	3.44	4.9	0.702	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-3 ft	2.88	4.9	0.588	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-3 ft	0.415	15,000	0.0000277	No	No	Yes	No SLV	**Yes-Bio**
Methoxychlor	0-3 ft	1.04	500,000	0.00000208	No	No	Yes	No SLV	**Yes-Bio**
PCBs (ug/kg)									
Aroclor 1254	0-1 ft	292	371	0.787	No	No	Yes	Yes	No
Aroclor 1260	0-1 ft	203	371	0.547	No	No	Yes	Yes	No
Total PCBs (Aroclors)	0-1 ft	514	371	1.38	Yes	No	Yes	Yes	No
Aroclor 1254	0-3 ft	136	371	0.367	No	No	Yes	Yes	No
Aroclor 1260	0-3 ft	167	371	0.450	No	No	Yes	Yes	No
Total PCBs (Aroclors)	0-3 ft	419	371	1.130	Yes	No	Yes	Yes	No
VOCs (ug/kg)									
1,1,1-Trichloroethane (TCA)	0-1 ft	0.503	55,550,000	0.00000000905	No	No	No	- -	No
1,2,4-Trimethylbenzene	0-1 ft	0.230	1,440,000	0.000000160	No	No	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-1 ft	0.0621	1,440,000	0.0000000431	No	No	No	- -	No
2-Butanone (MEK)	0-1 ft	16.5	200,000,000	0.0000000825	No	No	No	- -	No
2-Hexanone	0-1 ft	5.25	1,250,000	0.00000420	No	No	No	- -	No
4-Isopropyltoluene	0-1 ft	1.33	NA	- -	- -	- -	Yes	No	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-1 ft	0.574	1,250,000	0.000000459	No	No	No	- -	No
Acetone	0-1 ft	156	1,250,000	0.000125	No	No	No	- -	No

Table N-14
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(3 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
Benzene	0-1 ft	0.524	3,300,000	0.000000159	No	No	No	- -	No
Bromomethane	0-1 ft	1.44	730,000	0.00000197	No	No	No	- -	No
Carbon Disulfide	0-1 ft	1.14	2,000,000	0.000000570	No	No	No	- -	No
Chloroform	0-1 ft	6.86	1,875,000	0.00000366	No	No	No	- -	No
Chloromethane	0-1 ft	0.234	730,000	0.000000321	No	No	No	- -	No
Dichlorodifluoromethane	0-1 ft	8.15	730,000	0.0000112	No	No	No	- -	No
Dichloromethane (Methylene Chloride)	0-1 ft	140	730,000	0.000192	No	No	No	- -	No
Ethylbenzene	0-1 ft	0.132	NA	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	0.240	120,000	0.00000200	No	No	No	- -	No
Naphthalene	0-1 ft	0.610	NA	- -	- -	- -	No	- -	Yes - No SLV
o-Xylene	0-1 ft	0.172	120,000	0.00000143	No	No	No	- -	No
Tetrachloroethene (PCE)	0-1 ft	1.38	80,000	0.0000173	No	No	No	- -	No
Toluene	0-1 ft	1.11	1,440,000	0.000000771	No	No	No	- -	No
Trichloroethene (TCE)	0-1 ft	0.0766	40,000	0.00000192	No	No	No	- -	No
1,2,4-Trimethylbenzene	0-3 ft	4,620	1,440,000	0.00321	No	No	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-3 ft	1,630	1,440,000	0.00113	No	No	No	- -	No
2-Butanone (MEK)	0-3 ft	13.3	200,000,000	0.0000000665	No	No	No	- -	No
2-Hexanone	0-3 ft	5.12	1,250,000	0.00000410	No	No	No	- -	No
4-Isopropyltoluene	0-3 ft	20.1	NA	- -	- -	- -	Yes	No	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-3 ft	0.525	1,250,000	0.000000420	No	No	No	- -	No
Acetone	0-3 ft	122	1,250,000	0.0000976	No	No	No	- -	No
Benzene	0-3 ft	0.463	3,300,000	0.000000140	No	No	No	- -	No
Bromomethane	0-3 ft	1.11	730,000	0.00000152	No	No	No	- -	No
Carbon Disulfide	0-3 ft	1.12	2,000,000	0.000000560	No	No	No	- -	No
Chloroform	0-3 ft	5.70	1,875,000	0.00000304	No	No	No	- -	No
Dichlorodifluoromethane	0-3 ft	6.74	730,000	0.00000923	No	No	No	- -	No
Dichloromethane (Methylene Chloride)	0-3 ft	56.0	730,000	0.0000767	No	No	No	- -	No
Ethylbenzene	0-3 ft	4.69	NA	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-3 ft	1,820	120,000	0.0152	No	No	No	- -	No
Naphthalene	0-3 ft	1.94	NA	- -	- -	- -	No	- -	Yes - No SLV
n-Propylbenzene	0-3 ft	35.5	NA	- -	- -	- -	No	No SLV	**Yes-Bio**
o-Xylene	0-3 ft	200	120,000	0.00167	No	No	No	- -	No
Tetrachloroethene (PCE)	0-3 ft	26,300	80,000	0.329	No	No	No	- -	No
Toluene	0-3 ft	9,360	1,440,000	0.00650	No	No	No	- -	No
Trichloroethene (TCE)	0-3 ft	1,780	40,000	0.0445	No	No	No	- -	No
SVOCs (ug/kg)									
Benzoic Acid	0-1 ft	166	1,440,000	0.000115	No	No	No	- -	No
Bis(2-ethylhexyl) Phthalate	0-1 ft	98,000	1,020,000	0.0961	No	No	Yes	No	**Yes-Bio**
Butyl Benzyl Phthalate	0-1 ft	17.1	30,000,000	0.000000570	No	No	Yes	No	**Yes-Bio**

Table N-14
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(4 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
Carbazole	0-1 ft	144	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-1 ft	42.4	2	21.2	Yes	Yes	Yes	No	**Yes**
Dimethyl Phthalate	0-1 ft	31.4	NA	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-1 ft	80.4	30,000,000	0.00000268	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-1 ft	25.1	30,000,000	0.00000084	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-1 ft	14.1	2,800	0.00504	No	No	Yes	Yes	No
Phenol	0-1 ft	2.28	NA	- -	- -	- -	No	- -	Yes - No SLV
Benzoic Acid	0-3 ft	132	1,440,000	0.0000917	No	No	No	- -	No
Bis(2-ethylhexyl) Phthalate	0-3 ft	77,100	1,020,000	0.0756	No	No	Yes	No	**Yes-Bio**
Butyl Benzyl Phthalate	0-3 ft	15.2	30,000,000	0.000000507	No	No	Yes	No	**Yes-Bio**
Carbazole	0-3 ft	112	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-3 ft	122	2	61.0	Yes	Yes	Yes	No	**Yes**
Dimethyl Phthalate	0-3 ft	31.0	NA	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-3 ft	54.3	30,000,000	0.00000181	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-3 ft	22.5	30,000,000	0.000000750	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-3 ft	13.3	2,800	0.00475	No	No	Yes	Yes	No
Phenol	0-3 ft	35.0	NA	- -	- -	- -	No	- -	Yes - No SLV
PAHs (ug/kg)									
2-Methylnaphthalene	0-1 ft	27.4	NA (6)	0.000274	No	No	Yes	Incl in tLPAH	No
Acenaphthene	0-1 ft	172	NA (6)	0.00172	No	No	Yes	Incl in tLPAH	No
Acenaphthylene	0-1 ft	17.4	NA (6)	0.000174	No	No	Yes	Incl in tLPAH	No
Anthracene	0-1 ft	338	NA (6)	0.00338	No	No	Yes	Incl in tLPAH	No
Fluorene	0-1 ft	154	NA (6)	0.00154	No	No	Yes	Incl in tLPAH	No
Naphthalene	0-1 ft	108	NA (6)	0.00108	No	No	No	- -	No
Phenanthrene	0-1 ft	1,260	NA (6)	0.0126	No	No	Yes	Incl in tLPAH	No
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	1,849	100,000	0.0185	No	No	Yes	Yes	No
Benzo(a)anthracene	0-1 ft	1,750	NA (7)	1.59	Yes	No	Yes	Incl in tHPAH	No
Benzo(a)pyrene	0-1 ft	1,760	NA (7)	1.60	Yes	No	Yes	Incl in tHPAH	No
Benzo(b)fluoranthene	0-1 ft	1,950	NA (7)	1.77	Yes	No	Yes	Incl in tHPAH	No
Benzo(g,h,i)perylene	0-1 ft	1,070	NA (7)	0.973	No	No	Yes	Incl in tHPAH	No
Benzo(k)fluoranthene	0-1 ft	676	NA (7)	0.615	No	No	Yes	Incl in tHPAH	No
Benzofluoranthenes, Total	0-1 ft	7,760	NA (7)	7.05	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Chrysene	0-1 ft	2,070	NA (7)	1.88	Yes	No	Yes	Incl in tHPAH	No
Dibenz(a,h)anthracene	0-1 ft	244	NA (7)	0.222	No	No	Yes	Incl in tHPAH	No
Fluoranthene	0-1 ft	4,640	NA (7)	4.22	Yes	No	Yes	Incl in tHPAH	No

Table N-14
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(5 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
Indeno(1,2,3-cd)pyrene	0-1 ft	1,130	NA (7)	1.03	Yes	No	Yes	Incl in tHPAH	No
Pyrene	0-1 ft	4,780	NA (7)	4.35	Yes	No	Yes	Incl in tHPAH	No
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	18,577	1,100	16.9	Yes	Yes	Yes	Yes	**Yes**
2-Methylnaphthalene	0-3 ft	23.9	NA (6)	0.000239	No	No	Yes	Incl in tLPAH	No
Acenaphthene	0-3 ft	652	NA (6)	0.00652	No	No	Yes	Incl in tLPAH	No
Acenaphthylene	0-3 ft	29.6	NA (6)	0.000296	No	No	Yes	Incl in tLPAH	No
Anthracene	0-3 ft	772	NA (6)	0.00772	No	No	Yes	Incl in tLPAH	No
Fluorene	0-3 ft	227	NA (6)	0.00227	No	No	Yes	Incl in tLPAH	No
Naphthalene	0-3 ft	81.4	NA (6)	0.000814	No	No	No	- -	No
Phenanthrene	0-3 ft	2,910	NA (6)	0.0291	No	No	Yes	Incl in tLPAH	No
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	5,036	100,000	0.0504	No	No	Yes	Yes	No
Benzo(a)anthracene	0-3 ft	2,450	NA (7)	2.23	Yes	No	Yes	Incl in tHPAH	No
Benzo(a)pyrene	0-3 ft	2,390	NA (7)	2.17	Yes	No	Yes	Incl in tHPAH	No
Benzo(b)fluoranthene	0-3 ft	2,210	NA (7)	2.01	Yes	No	Yes	Incl in tHPAH	No
Benzo(g,h,i)perylene	0-3 ft	1,050	NA (7)	0.955	No	No	Yes	Incl in tHPAH	No
Benzo(k)fluoranthene	0-3 ft	764	NA (7)	0.695	No	No	Yes	Incl in tHPAH	No
Benzofluoranthenes, Total	0-3 ft	10,600	NA (7)	9.64	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Chrysene	0-3 ft	4,590	NA (7)	4.17	Yes	No	Yes	Incl in tHPAH	No
Dibenz(a,h)anthracene	0-3 ft	238	NA (7)	0.216	No	No	Yes	Incl in tHPAH	No
Fluoranthene	0-3 ft	10,800	NA (7)	9.82	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Indeno(1,2,3-cd)pyrene	0-3 ft	1,160	NA (7)	1.05	Yes	No	Yes	Incl in tHPAH	No
Pyrene	0-3 ft	11,700	NA (7)	10.6	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	40,758	1,100	37.1	Yes	Yes	Yes	Yes	**Yes**
TPH (mg/kg)									
Diesel Range Organics	0-1 ft	229	NA	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	2.29	NA	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	671	NA	- -	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	266	NA	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	1,030	NA	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	577	NA	- -	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
For lead, the 95% UCL and maximum concentrations are from unseived samples.
CPEC = chemical of potential ecological concern
COI = chemical of interest

Table N-14
Identification of CPECs in Soil at Sandblast Area AOPC - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(6 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)

HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
Incl in tHPAH = COI is included in the Total HPAH Screening
Incl in tLPAH = COI is included in the Total LPAH Screening
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).

Hierarchy of Mammalian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.

(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j*.
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Lower of 95% UCL and maximum concentration for wildlife species (birds and mammals).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).
(6) The SLV for Total LPAHs was used to screen the individual LPAHs to determine which individuals are driving Total LPAH risk, if any.
(7) The SLV for Total HPAHs was used to screen the individual HPAHs to determine which individuals are driving Total HPAH risk, if any.

Table N-15
Identification of CPECs in Groundwater at Sandblast Area AOPC - Individual COIs for Aquatic Organisms
Bradford Island - Upland Operable Unit
(1 of 2)

Chemicals of Interest	Medium	Dissolved or Total (D or T)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	Chemical is a Concern for Aquatic Organisms (Tij>1)?	Is COI Bioaccum-ulative?	COI is Identified as a CPEC? (9) (Q = 1)
INORGANICS (mg/L)								
Arsenic	Groundwater	D	0.00303	0.15	0.0202	No	Yes	**Yes-Bio**
Calcium	Groundwater	D	44.3	116	0.382	No	No	No
Iron	Groundwater	D	0.0747	1.0	0.0747	No	No	No
Magnesium	Groundwater	D	14.0	82	0.171	No	No	No
Potassium	Groundwater	D	2.61	53	0.0492	No	No	No
Sodium	Groundwater	D	89.4	680	0.131	No	No	No
Vanadium	Groundwater	D	0.00133	0.020	0.0665	No	NA	No
BUTYLTINS (ug/L)								
Monobutyltin	Groundwater	T	0.0216	0.063	0.343	No	No	No
VOCs (ug/L)								
1,1,1-Trichloroethane (TCA)	Groundwater	T	1.90	11	0.173	No	No	No
1,1-Dichloroethane	Groundwater	T	5.00	47	0.106	No	No	No
1,1-Dichloroethene	Groundwater	T	2.10	25	0.0840	No	No	No
Carbon Disulfide	Groundwater	T	0.255	0.92	0.277	No	No	No
cis-1,2-Dichloroethene	Groundwater	T	658	590	1.12	Yes	No	**Yes**
Dichloromethane (Methylene Chloride)	Groundwater	T	0.175	2,200	0.0000795	No	No	No
Tetrachloroethene (PCE)	Groundwater	T	2.66	840	0.00317	No	No	No
Toluene	Groundwater	T	0.640	9.8	0.0653	No	No	No
trans-1,2-Dichloroethene	Groundwater	T	1.70	590	0.00288	No	No	No
Trichloroethene (TCE)	Groundwater	T	3.35	3,000	0.00112	No	No	No
Vinyl Chloride	Groundwater	T	1.10	1,300	0.000846	No	No	No
TPH (mg/L)								
Diesel Range Organics	Groundwater	T	0.0173	NA	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	Groundwater	T	0.0151	NA	- -	- -	- -	Yes - No SLV
PAHs (ug/L)								
2-Methylnaphthalene	Groundwater - DP	T	0.0833	72.16	0.00115	No	Yes	**Yes-Bio**
Acenaphthene	Groundwater - DP	T	0.0135	55.85	0.000242	No	Yes	**Yes-Bio**
Anthracene	Groundwater - DP	T	0.0126	13	0.000969	No	Yes	**Yes-Bio**
Benzo(a)pyrene	Groundwater - DP	T	0.00895	0.014	0.639	No	Yes	**Yes-Bio**
Dibenz(a,h)anthracene	Groundwater - DP	T	0.00671	0.2825	0.0238	No	Yes	**Yes-Bio**
Fluoranthene	Groundwater - DP	T	0.0311	6.16	0.00505	No	Yes	**Yes-Bio**
Fluorene	Groundwater - DP	T	0.0190	3.9	0.00487	No	Yes	**Yes-Bio**
Indeno(1,2,3-cd)pyrene	Groundwater - DP	T	0.00797	0.275	0.0290	No	Yes	**Yes-Bio**
Pyrene	Groundwater - DP	T	0.0261	10.11	0.00258	No	Yes	**Yes-Bio**

This table only includes COIs detected > 5% and above the reference area (metals only).
For lead, the 95% UCL and maximum concentrations are from unseived samples.

Table N-15
Identification of CPECs in Groundwater at Sandblast Area AOPC - Individual COIs for Aquatic Organisms
Bradford Island - Upland Operable Unit
(2 of 2)

Chemicals of Interest	Medium	Dissolved or Total (D or T)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	Chemical is a Concern for Aquatic Organisms (Tij>1)?	Is COI Bioaccum-ulative?	COI is Identified as a CPEC? (9) (Q = 1)

CPEC = chemical of potential ecological concern
COI = chemical of interest
NA = not available
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) In addition to seep water and surface water concentrations, concentrations in groundwater were compared to Selected Level II SLVs for surface water as a conservative measure (in the event that groundwater discharges to surface water).

Hierarchy of Aquatic Organisms SLV Selection (see Appendix J-5b)
(2) USEPA 2009. National Recommended Water Quality Criteria. Office of Water and Office of Science and Technology.
(3) Oregon Department of Environmental Quality (DEQ). Water Quality Criteria for freshwater organisms (Oregon Administrative rules, section 340-041, Table 33A).
(4) DEQ 1998. Updated 2001. Guidance for Ecological risk Assessment: Levels I,II,III,IV. Waste Management and Cleanup Division.
(5) Suter GW II, and CL Tsao. 1996. Toxicological Benchmarks for Screening of Potential Contaminants of Concern for Effects on Aquatic Biota on Oak Ridge Reservation: 1996 Revision. ORNL, Oak Ridge, TN. 104pp. ES/ER/TM-96/R2.
(6) USEPA 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. November. EPA-600-R-02-013.
(7) Canadian Council of Resource and Environment Ministers. 2007. Canadian Water Quality Guidelines for the Protection of Aquatic Life. December Accessed on 1/20/10 at http://ceqg-rcqe.ccme.ca/.
(8) Buchman, M.F., 2008. NOAA Screening Quick Reference Tables, NOAA OR&R Report 08-1, Seattle WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration, 34 pages.

Individual COIs in a Given Media
(9) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLV ij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Lower of Maximum detected concentration and 95% UCL (for aquatic receptors).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-16
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Plants
Bradford Island - Upland Operable Unit
(1 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)								
Antimony	0-1 ft	13.7	5	2.74	0.0113	No	No	No
Arsenic	0-1 ft	80.9	18	4.49	0.0186	No	No	No
Cadmium	0-1 ft	17.3	32	0.541	0.00224	No	No	No
Chromium	0-1 ft	2,650	28.1	94.3	0.390	Yes	Yes	**Yes**
Lead	0-1 ft	3,260	120	27.2	0.112	Yes	No	**Yes**
Nickel	0-1 ft	1,060	38	27.9	0.115	Yes	No	**Yes**
Selenium	0-1 ft	0.900	0.52	1.73	0.00716	No	No	No
Silver	0-1 ft	0.431	560	0.000770	0.00000318	No	No	No
Zinc	0-1 ft	1,160	160	7.25	0.0300	Yes	No	**Yes**
Antimony	0-3 ft	13.7	5	2.74	0.00858	No	No	No
Arsenic	0-3 ft	80.9	18	4.49	0.0141	No	No	No
Cadmium	0-3 ft	17.3	32	0.541	0.00169	No	No	No
Chromium	0-3 ft	2,650	28.1	94.3	0.295	Yes	Yes	**Yes**
Lead	0-3 ft	3,260	120	27.2	0.0851	Yes	No	**Yes**
Nickel	0-3 ft	1,060	38	27.9	0.0873	Yes	No	**Yes**
Selenium	0-3 ft	0.900	0.52	1.73	0.00542	No	No	No
Silver	0-3 ft	0.431	560	0.000770	0.00000241	No	No	No
Zinc	0-3 ft	1,160	160	7.25	0.0227	No	No	No
BUTYLTINS (ug/kg)								
Dibutyltin	0-1 ft	210	NA	- -	- -	- -	- -	Yes - No SLV
Monobutyltin	0-1 ft	108	NA	- -	- -	- -	- -	Yes - No SLV
Tributyltin	0-1 ft	1,860	NA	- -	- -	- -	- -	Yes - No SLV
Dibutyltin	0-3 ft	210	NA	- -	- -	- -	- -	Yes - No SLV
Monobutyltin	0-3 ft	108	NA	- -	- -	- -	- -	Yes - No SLV
Tributyltin	0-3 ft	1,860	NA	- -	- -	- -	- -	Yes - No SLV
PESTICIDES (ug/kg)								
4,4'-DDD	0-1 ft	0.990	NA	- -	- -	- -	- -	Yes - No SLV
4,4'-DDE	0-1 ft	2.44	NA	- -	- -	- -	- -	Yes - No SLV
4,4'-DDT	0-1 ft	140	NA	- -	- -	- -	- -	Yes - No SLV
Total DDTs	0-1 ft	144	NA	- -	- -	- -	- -	Yes - No SLV
BHC (delta)	0-1 ft	3.03	NA	- -	- -	- -	- -	Yes - No SLV
BHC (gamma) Lindane	0-1 ft	9.68	NA	- -	- -	- -	- -	Yes - No SLV
Chlordane (alpha)	0-1 ft	1.50	NA	- -	- -	- -	- -	Yes - No SLV
Chlordane (gamma)	0-1 ft	97.0	NA	- -	- -	- -	- -	Yes - No SLV
Dieldrin	0-1 ft	0.823	NA	- -	- -	- -	- -	Yes - No SLV
Endosulfan I	0-1 ft	6.45	NA	- -	- -	- -	- -	Yes - No SLV
Endosulfan II	0-1 ft	1.99	NA	- -	- -	- -	- -	Yes - No SLV

Table N-16
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Plants
Bradford Island - Upland Operable Unit
(2 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
Endosulfan Sulfate	0-1 ft	3.30	NA	- -	- -	- -	- -	Yes - No SLV
Endrin	0-1 ft	17.0	NA	- -	- -	- -	- -	Yes - No SLV
Endrin Aldehyde	0-1 ft	16.0	NA	- -	- -	- -	- -	Yes - No SLV
Endrin Ketone	0-1 ft	13.0	NA	- -	- -	- -	- -	Yes - No SLV
Heptachlor	0-1 ft	2.90	1,000	0.00290	0.0000120	No	No	No
Methoxychlor	0-1 ft	1.20	NA	- -	- -	- -	- -	Yes - No SLV
4,4'-DDD	0-3 ft	0.990	NA	- -	- -	- -	- -	Yes - No SLV
4,4'-DDE	0-3 ft	2.44	NA	- -	- -	- -	- -	Yes - No SLV
4,4'-DDT	0-3 ft	140	NA	- -	- -	- -	- -	Yes - No SLV
Total DDTs	0-3 ft	144	NA	- -	- -	- -	- -	Yes - No SLV
BHC (delta)	0-3 ft	3.03	NA	- -	- -	- -	- -	Yes - No SLV
BHC (gamma) Lindane	0-3 ft	9.68	NA	- -	- -	- -	- -	Yes - No SLV
Chlordane (alpha)	0-3 ft	1.50	NA	- -	- -	- -	- -	Yes - No SLV
Chlordane (gamma)	0-3 ft	97.0	NA	- -	- -	- -	- -	Yes - No SLV
Dieldrin	0-3 ft	0.823	NA	- -	- -	- -	- -	Yes - No SLV
Endosulfan I	0-3 ft	6.45	NA	- -	- -	- -	- -	Yes - No SLV
Endosulfan II	0-3 ft	1.99	NA	- -	- -	- -	- -	Yes - No SLV
Endosulfan Sulfate	0-3 ft	3.30	NA	- -	- -	- -	- -	Yes - No SLV
Endrin	0-3 ft	17.0	NA	- -	- -	- -	- -	Yes - No SLV
Endrin Aldehyde	0-3 ft	16.0	NA	- -	- -	- -	- -	Yes - No SLV
Endrin Ketone	0-3 ft	13.0	NA	- -	- -	- -	- -	Yes - No SLV
Heptachlor	0-3 ft	2.90	1,000	0.00290	0.00000908	No	No	No
Methoxychlor	0-3 ft	1.20	NA	- -	- -	- -	- -	Yes - No SLV
PCBs (ug/kg)								
Aroclor 1254	0-1 ft	1,700	40,000	0.0425	0.000176	No	No	No
Aroclor 1260	0-1 ft	690	40,000	0.0173	0.0000714	No	No	No
Aroclor 1254	0-3 ft	1,700	40,000	0.0425	0.000133	No	No	No
Aroclor 1260	0-3 ft	690	40,000	0.0173	0.0000540	No	No	No
VOCs (ug/kg)								
1,2,4-Trimethylbenzene	0-1 ft	0.580	NA	- -	- -	- -	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-1 ft	0.523	200,000	0.00000262	0.0000000108	No	No	No
1,3,5-Trimethylbenzene	0-1 ft	0.125	200,000	0.000000625	0.00000000259	No	No	No
2-Butanone (MEK)	0-1 ft	50.0	NA	- -	- -	- -	- -	Yes - No SLV
2-Hexanone	0-1 ft	8.80	NA	- -	- -	- -	- -	Yes - No SLV
4-Isopropyltoluene	0-1 ft	12.0	200,000	0.0000600	0.000000248	No	No	No
4-Methyl-2-pentanone (MIBK)	0-1 ft	1.20	NA	- -	- -	- -	- -	Yes - No SLV
Acetone	0-1 ft	540	NA	- -	- -	- -	- -	Yes - No SLV
Benzene	0-1 ft	1.20	NA	- -	- -	- -	- -	Yes - No SLV

Table N-16
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Plants
Bradford Island - Upland Operable Unit
(3 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
Bromomethane	0-1 ft	5.00	NA	- -	- -	- -	- -	Yes - No SLV
Carbon Disulfide	0-1 ft	6.90	NA	- -	- -	- -	- -	Yes - No SLV
Chloroform	0-1 ft	19.0	NA	- -	- -	- -	- -	Yes - No SLV
Chloromethane	0-1 ft	0.250	NA	- -	- -	- -	- -	Yes - No SLV
Dichlorodifluoromethane	0-1 ft	94.0	NA	- -	- -	- -	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-1 ft	460	NA	- -	- -	- -	- -	Yes - No SLV
Ethylbenzene	0-1 ft	0.320	NA	- -	- -	- -	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	0.440	NA	- -	- -	- -	- -	Yes - No SLV
Naphthalene	0-1 ft	1.50	10,000	0.000150	0.000000621	No	No	No
o-Xylene	0-1 ft	0.180	1,000	0.000180	0.000000745	No	No	No
Tetrachloroethene (PCE)	0-1 ft	3.10	10,000	0.000310	0.00000128	No	No	No
Toluene	0-1 ft	5.80	200,000	0.0000290	0.000000120	No	No	No
Trichloroethene (TCE)	0-1 ft	0.171	NA	- -	- -	- -	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-3 ft	14,300	200,000	0.0715	0.000224	No	No	No
1,3,5-Trimethylbenzene	0-3 ft	6,500	200,000	0.0325	0.000102	No	No	No
2-Butanone (MEK)	0-3 ft	50.0	NA	- -	- -	- -	- -	Yes - No SLV
2-Hexanone	0-3 ft	8.80	NA	- -	- -	- -	- -	Yes - No SLV
4-Isopropyltoluene	0-3 ft	161	200,000	0.000805	0.00000252	No	No	No
4-Methyl-2-pentanone (MIBK)	0-3 ft	1.20	NA	- -	- -	- -	- -	Yes - No SLV
Acetone	0-3 ft	540	NA	- -	- -	- -	- -	Yes - No SLV
Benzene	0-3 ft	1.20	NA	- -	- -	- -	- -	Yes - No SLV
Bromomethane	0-3 ft	5.00	NA	- -	- -	- -	- -	Yes - No SLV
Carbon Disulfide	0-3 ft	6.90	NA	- -	- -	- -	- -	Yes - No SLV
Chloroform	0-3 ft	19.0	NA	- -	- -	- -	- -	Yes - No SLV
Dichlorodifluoromethane	0-3 ft	94.0	NA	- -	- -	- -	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-3 ft	460	NA	- -	- -	- -	- -	Yes - No SLV
Ethylbenzene	0-3 ft	37.4	NA	- -	- -	- -	- -	Yes - No SLV
m,p-Xylenes	0-3 ft	7,400	NA	- -	- -	- -	- -	Yes - No SLV
Naphthalene	0-3 ft	19.5	10,000	0.00195	0.00000611	No	No	No
n-Propylbenzene	0-3 ft	122	NA	- -	- -	- -	- -	Yes - No SLV
o-Xylene	0-3 ft	3,200	1,000	3.20	0.0100	No	No	No
Tetrachloroethene (PCE)	0-3 ft	420,000	10,000	42.0	0.131	Yes	Yes	**Yes**
Toluene	0-3 ft	39,000	200,000	0.195	0.000611	No	No	No
Trichloroethene (TCE)	0-3 ft	6,080	NA	- -	- -	- -	- -	Yes - No SLV
SVOCs (ug/kg)								
Benzoic Acid	0-1 ft	980	200,000	0.00490	0.0000203	No	No	No
Bis(2-ethylhexyl) Phthalate	0-1 ft	260,000	NA	- -	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-1 ft	124	200,000	0.000620	0.00000257	No	No	No

Table N-16
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Plants
Bradford Island - Upland Operable Unit
(4 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
Carbazole	0-1 ft	530	NA	- -	- -	- -	- -	Yes - No SLV
Dibenzofuran	0-1 ft	220	NA	- -	- -	- -	- -	Yes - No SLV
Dimethyl Phthalate	0-1 ft	41.0	NA	- -	- -	- -	- -	Yes - No SLV
Di-n-butyl Phthalate	0-1 ft	280	200,000	0.00140	0.00000579	No	No	No
Di-n-octyl Phthalate	0-1 ft	127	200,000	0.000635	0.00000263	No	No	No
Pentachlorophenol	0-1 ft	32.0	5,000	0.00640	0.0000265	No	No	No
Phenol	0-1 ft	3.70	70,000	0.0000529	0.000000219	No	No	No
Benzoic Acid	0-3 ft	980	200,000	0.00490	0.0000153	No	No	No
Bis(2-ethylhexyl) Phthalate	0-3 ft	260,000	NA	- -	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-3 ft	124	200,000	0.000620	0.00000194	No	No	No
Carbazole	0-3 ft	530	NA	- -	- -	- -	- -	Yes - No SLV
Dibenzofuran	0-3 ft	485	NA	- -	- -	- -	- -	Yes - No SLV
Dimethyl Phthalate	0-3 ft	41.0	NA	- -	- -	- -	- -	Yes - No SLV
Di-n-butyl Phthalate	0-3 ft	280	200,000	0.00140	0.00000438	No	No	No
Di-n-octyl Phthalate	0-3 ft	127	200,000	0.000635	0.00000199	No	No	No
Pentachlorophenol	0-3 ft	32.0	5,000	0.00640	0.0000200	No	No	No
Phenol	0-3 ft	35.0	70,000	0.000500	0.00000157	No	No	No
PAHs (ug/kg)								
2-Methylnaphthalene	0-1 ft	150	NA (6)	0.0150	0.0000621	No	No	No
Acenaphthene	0-1 ft	470	20,000	0.0235	0.0000972	No	No	No
Acenaphthylene	0-1 ft	87.7	NA (6)	0.00877	0.0000363	No	No	No
Anthracene	0-1 ft	832	NA (6)	0.0832	0.000344	No	No	No
Fluorene	0-1 ft	462	NA (6)	0.0462	0.000191	No	No	No
Naphthalene	0-1 ft	227	10,000	0.0227	0.0000939	No	No	No
Phenanthrene	0-1 ft	4,000	NA (6)	0.400	0.00165	No	No	No
Benzo(a)anthracene	0-1 ft	6,440	1,200	5.37	0.0222	No	No	No
Benzo(a)pyrene	0-1 ft	6,470	1,200	5.39	0.0223	No	No	No
Benzo(b)fluoranthene	0-1 ft	4,100	1,200	3.42	0.0141	No	No	No
Benzo(g,h,i)perylene	0-1 ft	3,830	NA (7)	3.19	0.0132	No	No	No
Benzo(k)fluoranthene	0-1 ft	1,400	1,200	1.17	0.00483	No	No	No
Benzofluoranthenes, Total	0-1 ft	12,100	NA (7)	10.1	0.0417	Yes	No	**Yes**
Chrysene	0-1 ft	7,590	1,200	6.33	0.0262	Yes	No	**Yes**
Dibenz(a,h)anthracene	0-1 ft	1,430	1,200	1.19	0.00493	No	No	No
Fluoranthene	0-1 ft	20,700	NA (7)	17.3	0.0714	Yes	No	**Yes**
Indeno(1,2,3-cd)pyrene	0-1 ft	3,910	1,200	3.26	0.0135	No	No	No
Pyrene	0-1 ft	21,900	NA (7)	18.3	0.0755	Yes	No	**Yes**

Table N-16
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Plants
Bradford Island - Upland Operable Unit
(5 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
2-Methylnaphthalene	0-3 ft	150	NA (6)	0.0150	0.0000470	No	No	No
Acenaphthene	0-3 ft	3,200	20,000	0.160	0.000501	No	No	No
Acenaphthylene	0-3 ft	295	NA (6)	0.0295	0.0000924	No	No	No
Anthracene	0-3 ft	2,040	NA (6)	0.204	0.000639	No	No	No
Fluorene	0-3 ft	779	NA (6)	0.0779	0.000244	No	No	No
Naphthalene	0-3 ft	256	10,000	0.0256	0.0000802	No	No	No
Phenanthrene	0-3 ft	6,550	NA (6)	0.655	0.00205	No	No	No
Benzo(a)anthracene	0-3 ft	12,300	1,200	10.3	0.0321	Yes	No	**Yes**
Benzo(a)pyrene	0-3 ft	11,700	1,200	9.75	0.0305	Yes	No	**Yes**
Benzo(b)fluoranthene	0-3 ft	4,100	1,200	3.42	0.0107	No	No	No
Benzo(g,h,i)perylene	0-3 ft	3,830	NA (7)	3.19	0.00999	No	No	No
Benzo(k)fluoranthene	0-3 ft	1,400	1,200	1.17	0.00365	No	No	No
Benzofluoranthenes, Total	0-3 ft	16,300	NA (7)	13.6	0.0425	Yes	No	**Yes**
Chrysene	0-3 ft	12,000	1,200	10.0	0.0313	Yes	No	**Yes**
Dibenz(a,h)anthracene	0-3 ft	1,430	1,200	1.19	0.00373	No	No	No
Fluoranthene	0-3 ft	28,600	NA (7)	23.8	0.0746	Yes	No	**Yes**
Indeno(1,2,3-cd)pyrene	0-3 ft	4,170	1,200	3.48	0.0109	No	No	No
Pyrene	0-3 ft	32,000	NA (7)	26.7	0.0835	Yes	No	**Yes**
TPH (mg/kg)								
Diesel Range Organics	0-1 ft	1,090	NA	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	3.49	NA	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	2,300	NA	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	1,440	NA	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	3,960	NA	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	2,300	NA	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
For lead, the maximum concentration is from unseived samples.
CPEC = chemical of potential ecological concern
COI = chemical of interest
NA = not available
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

Hierarchy of Terrestrial Plant SLV Selection (see Appendix J-5a)

Table N-16
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Plants
Bradford Island - Upland Operable Unit
(6 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)

For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.

(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(3) Efroymson RA, ME Wil, GW Suter II, and AC Wooten. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. ORNL. ES/ER/TM-85/R3.
(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 43
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 242
0-3 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 43
Tj (0-3 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 319
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).
(6) The SLV for naphthalene was used to screen the individual and total LPAHs without SLVs.
(7) The SLV for the benzo(a)pyrene was used to screen the individual HPAHs without SLVs.

Table N-17
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(1 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)								
Antimony	0-1 ft	13.7	78	0.176	0.00150	No	No	No
Arsenic	0-1 ft	80.9	60	1.35	0.0115	No	No	No
Cadmium	0-1 ft	17.3	140	0.124	0.00106	No	No	No
Chromium	0-1 ft	2,650	28.1	94.3	0.806	Yes	Yes	**Yes**
Lead	0-1 ft	3,260	1,700	1.92	0.0164	No	No	No
Nickel	0-1 ft	1,060	280	3.79	0.0324	No	No	No
Selenium	0-1 ft	0.900	4.1	0.220	0.00188	No	No	No
Silver	0-1 ft	0.431	50	0.00862	0.0000737	No	No	No
Zinc	0-1 ft	1,160	120	9.67	0.0826	Yes	No	**Yes**
Antimony	0-3 ft	13.7	78	0.176	0.00148	No	No	No
Arsenic	0-3 ft	80.9	60	1.35	0.0113	No	No	No
Cadmium	0-3 ft	17.3	140	0.124	0.00104	No	No	No
Chromium	0-3 ft	2,650	28.1	94.3	0.792	Yes	Yes	**Yes**
Lead	0-3 ft	3,260	1,700	1.92	0.0161	No	No	No
Nickel	0-3 ft	1,060	280	3.79	0.0318	No	No	No
Selenium	0-3 ft	0.900	4.1	0.220	0.00184	No	No	No
Silver	0-3 ft	0.431	50	0.00862	0.0000724	No	No	No
Zinc	0-3 ft	1,160	120	9.67	0.0812	Yes	No	**Yes**
BUTYLTINS (ug/kg)								
Dibutyltin	0-1 ft	210	NA	- -	- -	- -	- -	Yes - No SLV
Monobutyltin	0-1 ft	108	NA	- -	- -	- -	- -	Yes - No SLV
Tributyltin	0-1 ft	1,860	NA	- -	- -	- -	- -	Yes - No SLV
Dibutyltin	0-3 ft	210	NA	- -	- -	- -	- -	Yes - No SLV
Monobutyltin	0-3 ft	108	NA	- -	- -	- -	- -	Yes - No SLV
Tributyltin	0-3 ft	1,860	NA	- -	- -	- -	- -	Yes - No SLV
PESTICIDES (ug/kg)								
4,4'-DDD	0-1 ft	0.990	NA	- -	- -	- -	- -	Yes - No SLV
4,4'-DDE	0-1 ft	2.44	NA	- -	- -	- -	- -	Yes - No SLV
4,4'-DDT	0-1 ft	140	NA	- -	- -	- -	- -	Yes - No SLV
Total DDTs	0-1 ft	144	NA	- -	- -	- -	- -	Yes - No SLV
BHC (delta)	0-1 ft	3.03	NA	- -	- -	- -	- -	Yes - No SLV
BHC (gamma) Lindane	0-1 ft	9.68	NA	- -	- -	- -	- -	Yes - No SLV
Chlordane (alpha)	0-1 ft	1.50	NA	- -	- -	- -	- -	Yes - No SLV
Chlordane (gamma)	0-1 ft	97.0	NA	- -	- -	- -	- -	Yes - No SLV
Dieldrin	0-1 ft	0.823	NA	- -	- -	- -	- -	Yes - No SLV
Endosulfan I	0-1 ft	6.45	NA	- -	- -	- -	- -	Yes - No SLV
Endosulfan II	0-1 ft	1.99	NA	- -	- -	- -	- -	Yes - No SLV

Table N-17
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(2 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
Endosulfan Sulfate	0-1 ft	3.30	NA	- -	- -	- -	- -	Yes - No SLV
Endrin	0-1 ft	17.0	NA	- -	- -	- -	- -	Yes - No SLV
Endrin Aldehyde	0-1 ft	16.0	NA	- -	- -	- -	- -	Yes - No SLV
Endrin Ketone	0-1 ft	13.0	NA	- -	- -	- -	- -	Yes - No SLV
Heptachlor	0-1 ft	2.90	NA	- -	- -	- -	- -	Yes - No SLV
Methoxychlor	0-1 ft	1.20	NA	- -	- -	- -	- -	Yes - No SLV
4,4'-DDD	0-3 ft	0.990	NA	- -	- -	- -	- -	Yes - No SLV
4,4'-DDE	0-3 ft	2.44	NA	- -	- -	- -	- -	Yes - No SLV
4,4'-DDT	0-3 ft	140	NA	- -	- -	- -	- -	Yes - No SLV
Total DDTs	0-3 ft	144	NA	- -	- -	- -	- -	Yes - No SLV
BHC (delta)	0-3 ft	3.03	NA	- -	- -	- -	- -	Yes - No SLV
BHC (gamma) Lindane	0-3 ft	9.68	NA	- -	- -	- -	- -	Yes - No SLV
Chlordane (alpha)	0-3 ft	1.50	NA	- -	- -	- -	- -	Yes - No SLV
Chlordane (gamma)	0-3 ft	97.0	NA	- -	- -	- -	- -	Yes - No SLV
Dieldrin	0-3 ft	0.823	NA	- -	- -	- -	- -	Yes - No SLV
Endosulfan I	0-3 ft	6.45	NA	- -	- -	- -	- -	Yes - No SLV
Endosulfan II	0-3 ft	1.99	NA	- -	- -	- -	- -	Yes - No SLV
Endosulfan Sulfate	0-3 ft	3.30	NA	- -	- -	- -	- -	Yes - No SLV
Endrin	0-3 ft	17.0	NA	- -	- -	- -	- -	Yes - No SLV
Endrin Aldehyde	0-3 ft	16.0	NA	- -	- -	- -	- -	Yes - No SLV
Endrin Ketone	0-3 ft	13.0	NA	- -	- -	- -	- -	Yes - No SLV
Heptachlor	0-3 ft	2.90	NA	- -	- -	- -	- -	Yes - No SLV
Methoxychlor	0-3 ft	1.20	NA	- -	- -	- -	- -	Yes - No SLV
PCBs (ug/kg)								
Aroclor 1254	0-1 ft	1,700	2,510	0.677	0.00579	No	No	No
Aroclor 1260	0-1 ft	690	2,510	0.275	0.00235	No	No	No
Aroclor 1254	0-3 ft	1,700	2,510	0.677	0.00569	No	No	No
Aroclor 1260	0-3 ft	690	2,510	0.275	0.00231	No	No	No
VOCs (ug/kg)								
1,2,4-Trimethylbenzene	0-1 ft	0.580	NA	- -	- -	- -	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-1 ft	0.523	NA	- -	- -	- -	- -	Yes - No SLV
1,3,5-Trimethylbenzene	0-1 ft	0.125	NA	- -	- -	- -	- -	Yes - No SLV
2-Butanone (MEK)	0-1 ft	50.0	NA	- -	- -	- -	- -	Yes - No SLV
2-Hexanone	0-1 ft	8.80	NA	- -	- -	- -	- -	Yes - No SLV
4-Isopropyltoluene	0-1 ft	12.0	NA	- -	- -	- -	- -	Yes - No SLV
4-Methyl-2-pentanone (MIBK)	0-1 ft	1.20	NA	- -	- -	- -	- -	Yes - No SLV
Acetone	0-1 ft	540	NA	- -	- -	- -	- -	Yes - No SLV
Benzene	0-1 ft	1.20	NA	- -	- -	- -	- -	Yes - No SLV

Table N-17
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(3 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
Bromomethane	0-1 ft	5.00	NA	- -	- -	- -	- -	Yes - No SLV
Carbon Disulfide	0-1 ft	6.90	NA	- -	- -	- -	- -	Yes - No SLV
Chloroform	0-1 ft	19.0	NA	- -	- -	- -	- -	Yes - No SLV
Chloromethane	0-1 ft	0.250	NA	- -	- -	- -	- -	Yes - No SLV
Dichlorodifluoromethane	0-1 ft	94.0	NA	- -	- -	- -	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-1 ft	460	NA	- -	- -	- -	- -	Yes - No SLV
Ethylbenzene	0-1 ft	0.320	2,260	0.000142	0.00000121	No	No	No
m,p-Xylenes	0-1 ft	0.440	NA	- -	- -	- -	- -	Yes - No SLV
Naphthalene	0-1 ft	1.50	NA	- -	- -	- -	- -	Yes - No SLV
o-Xylene	0-1 ft	0.180	NA	- -	- -	- -	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-1 ft	3.10	NA	- -	- -	- -	- -	Yes - No SLV
Toluene	0-1 ft	5.80	NA	- -	- -	- -	- -	Yes - No SLV
Trichloroethene (TCE)	0-1 ft	0.171	NA	- -	- -	- -	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-3 ft	14,300	NA	- -	- -	- -	- -	Yes - No SLV
1,3,5-Trimethylbenzene	0-3 ft	6,500	NA	- -	- -	- -	- -	Yes - No SLV
2-Butanone (MEK)	0-3 ft	50.0	NA	- -	- -	- -	- -	Yes - No SLV
2-Hexanone	0-3 ft	8.80	NA	- -	- -	- -	- -	Yes - No SLV
4-Isopropyltoluene	0-3 ft	161	NA	- -	- -	- -	- -	Yes - No SLV
4-Methyl-2-pentanone (MIBK)	0-3 ft	1.20	NA	- -	- -	- -	- -	Yes - No SLV
Acetone	0-3 ft	540	NA	- -	- -	- -	- -	Yes - No SLV
Benzene	0-3 ft	1.20	NA	- -	- -	- -	- -	Yes - No SLV
Bromomethane	0-3 ft	5.00	NA	- -	- -	- -	- -	Yes - No SLV
Carbon Disulfide	0-3 ft	6.90	NA	- -	- -	- -	- -	Yes - No SLV
Chloroform	0-3 ft	19.0	NA	- -	- -	- -	- -	Yes - No SLV
Dichlorodifluoromethane	0-3 ft	94.0	NA	- -	- -	- -	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-3 ft	460	NA	- -	- -	- -	- -	Yes - No SLV
Ethylbenzene	0-3 ft	37.4	2,260	0.0165	0.000139	No	No	No
m,p-Xylenes	0-3 ft	7,400	NA	- -	- -	- -	- -	Yes - No SLV
Naphthalene	0-3 ft	19.5	NA	- -	- -	- -	- -	Yes - No SLV
n-Propylbenzene	0-3 ft	122	NA	- -	- -	- -	- -	Yes - No SLV
o-Xylene	0-3 ft	3,200	NA	- -	- -	- -	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-3 ft	420,000	NA	- -	- -	- -	- -	Yes - No SLV
Toluene	0-3 ft	39,000	NA	- -	- -	- -	- -	Yes - No SLV
Trichloroethene (TCE)	0-3 ft	6,080	NA	- -	- -	- -	- -	Yes - No SLV
SVOCs (ug/kg)								
Benzoic Acid	0-1 ft	980	NA	- -	- -	- -	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-1 ft	260,000	NA	- -	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-1 ft	124	NA	- -	- -	- -	- -	Yes - No SLV

Table N-17
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(4 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
Carbazole	0-1 ft	530	2,260	0.235	0.00200	No	No	No
Dibenzofuran	0-1 ft	220	NA	- -	- -	- -	- -	Yes - No SLV
Dimethyl Phthalate	0-1 ft	41.0	200,000	0.000205	0.00000175	No	No	No
Di-n-butyl Phthalate	0-1 ft	280	NA	- -	- -	- -	- -	Yes - No SLV
Di-n-octyl Phthalate	0-1 ft	127	NA	- -	- -	- -	- -	Yes - No SLV
Pentachlorophenol	0-1 ft	32.0	31,000	0.00103	0.00000882	No	No	No
Phenol	0-1 ft	3.70	30,000	0.000123	0.00000105	No	No	No
Benzoic Acid	0-3 ft	980	NA	- -	- -	- -	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-3 ft	260,000	NA	- -	- -	- -	- -	Yes - No SLV
Butyl Benzyl Phthalate	0-3 ft	124	NA	- -	- -	- -	- -	Yes - No SLV
Carbazole	0-3 ft	530	2,260	0.235	0.00197	No	No	No
Dibenzofuran	0-3 ft	485	NA	- -	- -	- -	- -	Yes - No SLV
Dimethyl Phthalate	0-3 ft	41.0	200,000	0.000205	0.00000172	No	No	No
Di-n-butyl Phthalate	0-3 ft	280	NA	- -	- -	- -	- -	Yes - No SLV
Di-n-octyl Phthalate	0-3 ft	127	NA	- -	- -	- -	- -	Yes - No SLV
Pentachlorophenol	0-3 ft	32.0	31,000	0.00103	0.00000867	No	No	No
Phenol	0-3 ft	35.0	30,000	0.00117	0.00000980	No	No	No
PAHs (ug/kg)								
2-Methylnaphthalene	0-1 ft	150	NA	- -	- -	- -	- -	Incl in tLPAH
Acenaphthene	0-1 ft	470	NA	- -	- -	- -	- -	Incl in tLPAH
Acenaphthylene	0-1 ft	87.7	NA	- -	- -	- -	- -	Incl in tLPAH
Anthracene	0-1 ft	832	NA	- -	- -	- -	- -	Incl in tLPAH
Fluorene	0-1 ft	462	NA	- -	- -	- -	- -	Incl in tLPAH
Naphthalene	0-1 ft	227	NA	- -	- -	- -	- -	Incl in tLPAH
Phenanthrene	0-1 ft	4,000	NA	- -	- -	- -	- -	Incl in tLPAH
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	5,687	29,000	0.196	0.00168	No	No	No
Benzo(a)anthracene	0-1 ft	6,440	NA	- -	- -	- -	- -	Incl in tHPAH
Benzo(a)pyrene	0-1 ft	6,470	NA	- -	- -	- -	- -	Incl in tHPAH
Benzo(b)fluoranthene	0-1 ft	4,100	NA	- -	- -	- -	- -	Incl in tHPAH
Benzo(g,h,i)perylene	0-1 ft	3,830	NA	- -	- -	- -	- -	Incl in tHPAH
Benzo(k)fluoranthene	0-1 ft	1,400	NA	- -	- -	- -	- -	Incl in tHPAH
Benzofluoranthenes, Total	0-1 ft	12,100	NA	- -	- -	- -	- -	Incl in tHPAH
Chrysene	0-1 ft	7,590	NA	- -	- -	- -	- -	Incl in tHPAH
Dibenz(a,h)anthracene	0-1 ft	1,430	NA	- -	- -	- -	- -	Incl in tHPAH
Fluoranthene	0-1 ft	20,700	NA	- -	- -	- -	- -	Incl in tHPAH
Indeno(1,2,3-cd)pyrene	0-1 ft	3,910	NA	- -	- -	- -	- -	Incl in tHPAH
Pyrene	0-1 ft	21,900	NA	- -	- -	- -	- -	Incl in tHPAH
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	72,270	18,000	4.02	0.0343	No	No	No

Table N-17
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(5 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
2-Methylnaphthalene	0-3 ft	150	NA	- -	- -	- -	- -	Incl in tLPAH
Acenaphthene	0-3 ft	3,200	NA	- -	- -	- -	- -	Incl in tLPAH
Acenaphthylene	0-3 ft	295	NA	- -	- -	- -	- -	Incl in tLPAH
Anthracene	0-3 ft	2,040	NA	- -	- -	- -	- -	Incl in tLPAH
Fluorene	0-3 ft	779	NA	- -	- -	- -	- -	Incl in tLPAH
Naphthalene	0-3 ft	256	NA	- -	- -	- -	- -	Incl in tLPAH
Phenanthrene	0-3 ft	6,550	NA	- -	- -	- -	- -	Incl in tLPAH
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	13,120	29,000	0.452	0.00380	No	No	No
Benzo(a)anthracene	0-3 ft	12,300	NA	- -	- -	- -	- -	Incl in tHPAH
Benzo(a)pyrene	0-3 ft	11,700	NA	- -	- -	- -	- -	Incl in tHPAH
Benzo(b)fluoranthene	0-3 ft	4,100	NA	- -	- -	- -	- -	Incl in tHPAH
Benzo(g,h,i)perylene	0-3 ft	3,830	NA	- -	- -	- -	- -	Incl in tHPAH
Benzo(k)fluoranthene	0-3 ft	1,400	NA	- -	- -	- -	- -	Incl in tHPAH
Benzofluoranthenes, Total	0-3 ft	16,300	NA	- -	- -	- -	- -	Incl in tHPAH
Chrysene	0-3 ft	12,000	NA	- -	- -	- -	- -	Incl in tHPAH
Dibenz(a,h)anthracene	0-3 ft	1,430	NA	- -	- -	- -	- -	Incl in tHPAH
Fluoranthene	0-3 ft	28,600	NA	- -	- -	- -	- -	Incl in tHPAH
Indeno(1,2,3-cd)pyrene	0-3 ft	4,170	NA	- -	- -	- -	- -	Incl in tHPAH
Pyrene	0-3 ft	32,000	NA	- -	- -	- -	- -	Incl in tHPAH
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	105,200	18,000	5.84	0.0491	No	No	No
TPH (mg/kg)								
Diesel Range Organics	0-1 ft	1,090	NA	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	3.49	NA	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	2,300	NA	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	1,440	NA	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	3,960	NA	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	2,300	NA	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
For lead, the maximum concentration is from unseived samples.
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
Incl in tHPAH = COI is included in the Total HPAH Screening
Incl in tLPAH = COI is included in the Total LPAH Screening
MDL = method detection limit

Table N-17
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(6 of 6)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)

NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

Hierarchy of Terrestrial Invertebrate SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.

(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(3) RA Efroymson. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process, Nov 1997 Revision. ORNL ES/ER/TM-126/R2.
(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 18
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 117
0-3 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 18
Tj (0-3 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 119
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-18
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(1 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)										
Antimony	0-1 ft	2.94	0.176	16.7	0.177	Yes	Yes	No	- -	**Yes**
Arsenic	0-1 ft	15.1	43	0.351	0.00371	No	No	Yes	Yes	No
Cadmium	0-1 ft	3.20	0.77	4.16	0.0439	Yes	No	Yes	Yes	**Yes**
Chromium	0-1 ft	720	28.1	25.6	0.271	Yes	Yes	Yes	Yes	**Yes**
Lead	0-1 ft	465	25.5	18.2	0.193	Yes	Yes	Yes	Yes	**Yes**
Nickel	0-1 ft	353	210	1.68	0.0178	No	No	Yes	Yes	No
Selenium	0-1 ft	0.466	1.2	0.388	0.00411	No	No	Yes	Yes	No
Silver	0-1 ft	0.187	4.2	0.0445	0.000471	No	No	Yes	Yes	No
Zinc	0-1 ft	212	71.7	2.96	0.0313	No	No	Yes	Yes	No
Antimony	0-3 ft	2.42	0.176	13.8	0.166	Yes	Yes	No	- -	**Yes**
Arsenic	0-3 ft	9.71	43	0.226	0.00273	No	No	Yes	Yes	No
Cadmium	0-3 ft	2.63	0.77	3.42	0.0412	Yes	No	Yes	Yes	**Yes**
Chromium	0-3 ft	579	28.1	20.6	0.249	Yes	Yes	Yes	Yes	**Yes**
Lead	0-3 ft	529	25.5	20.7	0.250	Yes	Yes	Yes	Yes	**Yes**
Nickel	0-3 ft	251	210	1.20	0.0144	No	No	Yes	Yes	No
Selenium	0-3 ft	0.479	1.2	0.399	0.00482	No	No	Yes	Yes	No
Silver	0-3 ft	0.152	4.2	0.0362	0.000437	No	No	Yes	Yes	No
Zinc	0-3 ft	237	71.7	3.31	0.0399	Yes	No	Yes	Yes	**Yes**
BUTYLTINS (ug/kg)										
Dibutyltin	0-1 ft	34.6	28,000	0.00124	0.0000131	No	No	No	- -	No
Monobutyltin	0-1 ft	11.0	28,000	0.000393	0.00000415	No	No	No	- -	No
Tributyltin	0-1 ft	481	28,000	0.0172	0.000182	No	No	Yes	No	**Yes-Bio**
Dibutyltin	0-3 ft	26.6	28,000	0.000950	0.0000115	No	No	No	- -	No
Monobutyltin	0-3 ft	8.62	28,000	0.000308	0.00000372	No	No	No	- -	No
Tributyltin	0-3 ft	248	28,000	0.00886	0.000107	No	No	Yes	No	**Yes-Bio**
PESTICIDES (ug/kg)										
4,4'-DDD	0-1 ft	0.729	93	0.00784	0.0000829	No	No	Yes	Yes	No
4,4'-DDE	0-1 ft	0.632	93	0.00680	0.0000719	No	No	Yes	Yes	No
4,4'-DDT	0-1 ft	32.3	93	0.347	0.00367	No	No	Yes	Yes	No
Total DDTs	0-1 ft	96	93	1.03	0.0109	No	No	Yes	Yes	No
BHC (delta)	0-1 ft	1.54	8,000	0.000193	0.00000204	No	No	Yes	No	**Yes-Bio**
BHC (gamma) Lindane	0-1 ft	9.68	8,000	0.00121	0.0000128	No	No	Yes	No	**Yes-Bio**
Chlordane (alpha)	0-1 ft	0.815	9,000	0.0000906	0.000000958	No	No	Yes	No	**Yes-Bio**
Chlordane (gamma)	0-1 ft	30.3	9,000	0.00337	0.0000356	No	No	Yes	No	**Yes-Bio**
Dieldrin	0-1 ft	0.488	22	0.0222	0.000235	No	No	Yes	Yes	No
Endosulfan I	0-1 ft	2.69	42,000	0.0000640	0.000000677	No	No	Yes	No	**Yes-Bio**
Endosulfan II	0-1 ft	0.495	42,000	0.0000118	0.000000125	No	No	Yes	No	**Yes-Bio**
Endosulfan Sulfate	0-1 ft	0.953	42,000	0.0000227	0.000000240	No	No	Yes	No	**Yes-Bio**
Endrin	0-1 ft	5.04	22	0.229	0.00242	No	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-1 ft	3.87	22	0.176	0.00186	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-1 ft	3.09	22	0.140	0.00149	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-1 ft	0.464	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Methoxychlor	0-1 ft	1.05	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
4,4'-DDD	0-3 ft	0.721	93	0.00775	0.0000936	No	No	Yes	Yes	No

Table N-18
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(2 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
4,4'-DDE	0-3 ft	0.567	93	0.00610	0.0000736	No	No	Yes	Yes	No
4,4'-DDT	0-3 ft	79.4	93	0.854	0.0103	No	No	Yes	Yes	No
Total DDTs	0-3 ft	82	93	0.880	0.0106	No	No	Yes	Yes	No
BHC (delta)	0-3 ft	1.30	8,000	0.000163	0.00000196	No	No	Yes	No	**Yes-Bio**
BHC (gamma) Lindane	0-3 ft	1.06	8,000	0.000133	0.00000160	No	No	Yes	No	**Yes-Bio**
Chlordane (alpha)	0-3 ft	0.776	9,000	0.0000862	0.00000104	No	No	Yes	No	**Yes-Bio**
Chlordane (gamma)	0-3 ft	20.4	9,000	0.00227	0.0000274	No	No	Yes	No	**Yes-Bio**
Dieldrin	0-3 ft	0.483	22	0.0220	0.000265	No	No	Yes	Yes	No
Endosulfan I	0-3 ft	0.809	42,000	0.0000193	0.000000232	No	No	Yes	No	**Yes-Bio**
Endosulfan II	0-3 ft	0.447	42,000	0.0000106	0.000000128	No	No	Yes	No	**Yes-Bio**
Endosulfan Sulfate	0-3 ft	0.889	42,000	0.0000212	0.000000255	No	No	Yes	No	**Yes-Bio**
Endrin	0-3 ft	3.89	22	0.177	0.00213	No	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-3 ft	3.44	22	0.156	0.00189	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-3 ft	2.88	22	0.131	0.00158	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-3 ft	0.415	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Methoxychlor	0-3 ft	1.04	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
PCBs (ug/kg)										
Aroclor 1254	0-1 ft	292	655	0.446	0.00471	No	No	Yes	Yes	No
Aroclor 1260	0-1 ft	203	655	0.310	0.00328	No	No	Yes	Yes	No
Aroclor 1254	0-3 ft	136	655	0.208	0.00251	No	No	Yes	Yes	No
Aroclor 1260	0-3 ft	167	655	0.255	0.00308	No	No	Yes	Yes	No
VOCs (ug/kg)										
1,1,1-Trichloroethane (TCA)	0-1 ft	0.503	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-1 ft	0.230	NA	- -	- -	- -	- -	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-1 ft	0.0621	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
2-Butanone (MEK)	0-1 ft	16.5	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
2-Hexanone	0-1 ft	5.25	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
4-Isopropyltoluene	0-1 ft	1.33	NA	- -	- -	- -	- -	Yes	No	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-1 ft	0.574	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Acetone	0-1 ft	156	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Benzene	0-1 ft	0.524	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Bromomethane	0-1 ft	1.44	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Carbon Disulfide	0-1 ft	1.14	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Chloroform	0-1 ft	6.86	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Chloromethane	0-1 ft	0.234	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Dichlorodifluoromethane	0-1 ft	8.15	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-1 ft	140	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Ethylbenzene	0-1 ft	0.132	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	0.240	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Naphthalene	0-1 ft	0.610	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
o-Xylene	0-1 ft	0.172	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-1 ft	1.38	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Toluene	0-1 ft	1.11	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Trichloroethene (TCE)	0-1 ft	0.0766	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-3 ft	4,620	NA	- -	- -	- -	- -	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-3 ft	1,630	NA	- -	- -	- -	- -	No	- -	Yes - No SLV

Table N-18
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(3 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
2-Butanone (MEK)	0-3 ft	13.3	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
2-Hexanone	0-3 ft	5.12	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
4-Isopropyltoluene	0-3 ft	20.1	NA	- -	- -	- -	- -	Yes	No	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-3 ft	0.525	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Acetone	0-3 ft	122	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Benzene	0-3 ft	0.463	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Bromomethane	0-3 ft	1.11	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Carbon Disulfide	0-3 ft	1.12	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Chloroform	0-3 ft	5.70	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Dichlorodifluoromethane	0-3 ft	6.74	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-3 ft	56.0	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Ethylbenzene	0-3 ft	4.69	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-3 ft	1,820	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Naphthalene	0-3 ft	1.94	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
n-Propylbenzene	0-3 ft	35.5	NA	- -	- -	- -	- -	No	No SLV	**Yes-Bio**
o-Xylene	0-3 ft	200	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-3 ft	26,300	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Toluene	0-3 ft	9,360	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Trichloroethene (TCE)	0-3 ft	1,780	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
SVOCs (ug/kg)										
Benzoic Acid	0-1 ft	166	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-1 ft	98,000	4,500	21.8	0.230	Yes	Yes	Yes	No	**Yes**
Butyl Benzyl Phthalate	0-1 ft	17.1	450	0.0380	0.000402	No	No	Yes	No	**Yes-Bio**
Carbazole	0-1 ft	144	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-1 ft	42.4	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dimethyl Phthalate	0-1 ft	31.4	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-1 ft	80.4	450	0.179	0.00189	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-1 ft	25.1	450	0.0558	0.000590	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-1 ft	14.1	2,100	0.00671	0.0000710	No	No	Yes	Yes	No
Phenol	0-1 ft	2.28	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Benzoic Acid	0-3 ft	132	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-3 ft	77,100	4,500	17.1	0.207	Yes	Yes	Yes	No	**Yes**
Butyl Benzyl Phthalate	0-3 ft	15.2	450	0.0338	0.000408	No	No	Yes	No	**Yes-Bio**
Carbazole	0-3 ft	112	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-3 ft	122	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dimethyl Phthalate	0-3 ft	31.0	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-3 ft	54.3	450	0.121	0.00146	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-3 ft	22.5	450	0.0500	0.000603	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-3 ft	13.3	2,100	0.00633	0.0000764	No	No	Yes	Yes	No
Phenol	0-3 ft	35.0	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
PAHs (ug/kg)										
2-Methylnaphthalene	0-1 ft	27.4	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthene	0-1 ft	172	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthylene	0-1 ft	17.4	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Anthracene	0-1 ft	338	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluorene	0-1 ft	154	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**

Table N-18
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(4 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
Naphthalene	0-1 ft	108	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Phenanthrene	0-1 ft	1,260	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	1,849	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)anthracene	0-1 ft	1,750	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)pyrene	0-1 ft	1,760	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(b)fluoranthene	0-1 ft	1,950	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(g,h,i)perylene	0-1 ft	1,070	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(k)fluoranthene	0-1 ft	676	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzofluoranthenes, Total	0-1 ft	7,760	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Chrysene	0-1 ft	2,070	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenz(a,h)anthracene	0-1 ft	244	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluoranthene	0-1 ft	4,640	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Indeno(1,2,3-cd)pyrene	0-1 ft	1,130	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Pyrene	0-1 ft	4,780	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	18,577	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
2-Methylnaphthalene	0-3 ft	23.9	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthene	0-3 ft	652	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthylene	0-3 ft	29.6	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Anthracene	0-3 ft	772	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluorene	0-3 ft	227	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Naphthalene	0-3 ft	81.4	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Phenanthrene	0-3 ft	2,910	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	5,036	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)anthracene	0-3 ft	2,450	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)pyrene	0-3 ft	2,390	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(b)fluoranthene	0-3 ft	2,210	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(g,h,i)perylene	0-3 ft	1,050	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(k)fluoranthene	0-3 ft	764	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzofluoranthenes, Total	0-3 ft	10,600	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Chrysene	0-3 ft	4,590	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenz(a,h)anthracene	0-3 ft	238	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluoranthene	0-3 ft	10,800	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Indeno(1,2,3-cd)pyrene	0-3 ft	1,160	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Pyrene	0-3 ft	11,700	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	40,758	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
TPH (mg/kg)										
Diesel Range Organics	0-1 ft	229	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	2.29	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	671	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	266	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	1,030	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	577	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
For lead, the 95% UCL and maximum concentrations are from unseived samples.
CPEC = chemical of potential ecological concern

Table N-18
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(5 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)

COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.

Hierarchy of Avian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 31
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 94.6
0-3 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 31
Tj (0-3 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 82.9
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-19
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(1 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
INORGANICS (mg/kg)										
Antimony	0-1 ft	2.94	0.27	10.9	0.106	Yes	Yes	No	- -	**Yes**
Arsenic	0-1 ft	15.1	46	0.328	0.00321	No	No	Yes	Yes	No
Cadmium	0-1 ft	3.20	0.36	8.89	0.0868	Yes	No	Yes	Yes	No
Chromium	0-1 ft	720	34	21.2	0.207	Yes	Yes	Yes	Yes	**Yes**
Lead	0-1 ft	465	56	8.30	0.0811	Yes	No	Yes	Yes	No
Nickel	0-1 ft	353	130	2.72	0.0265	Yes	No	Yes	Yes	No
Selenium	0-1 ft	0.466	0.63	0.740	0.00722	No	No	Yes	Yes	No
Silver	0-1 ft	0.187	14	0.0134	0.000130	No	No	Yes	Yes	No
Zinc	0-1 ft	212	79	2.68	0.0262	Yes	No	Yes	Yes	No
Antimony	0-3 ft	2.42	0.27	8.96	0.0581	Yes	No	No	- -	No
Arsenic	0-3 ft	9.71	46	0.211	0.00137	No	No	Yes	Yes	No
Cadmium	0-3 ft	2.63	0.36	7.31	0.0474	Yes	No	Yes	Yes	No
Chromium	0-3 ft	579	34	17.0	0.110	Yes	Yes	Yes	Yes	**Yes**
Lead	0-3 ft	529	56	9.45	0.0613	Yes	No	Yes	Yes	No
Nickel	0-3 ft	251	130	1.93	0.0125	No	No	Yes	Yes	No
Selenium	0-3 ft	0.479	0.63	0.760	0.00493	No	No	Yes	Yes	No
Silver	0-3 ft	0.152	14	0.0109	0.0000704	No	No	Yes	Yes	No
Zinc	0-3 ft	237	79	3.00	0.0195	Yes	No	Yes	Yes	No
BUTYLTINS (ug/kg)										
Dibutyltin	0-1 ft	34.6	1,300,000	0.0000266	0.000000260	No	No	No	- -	No
Monobutyltin	0-1 ft	11.0	1,300,000	0.00000846	0.0000000826	No	No	No	- -	No
Tributyltin	0-1 ft	481	1,300,000	0.000370	0.00000361	No	No	Yes	No	**Yes-Bio**
Dibutyltin	0-3 ft	26.6	1,300,000	0.0000205	0.000000133	No	No	No	- -	No
Monobutyltin	0-3 ft	8.62	1,300,000	0.00000663	0.0000000430	No	No	No	- -	No
Tributyltin	0-3 ft	248	1,300,000	0.000191	0.00000124	No	No	Yes	No	**Yes-Bio**
PESTICIDES (ug/kg)										
4,4'-DDD	0-1 ft	0.729	21	0.0347	0.000339	No	No	Yes	Yes	No
4,4'-DDE	0-1 ft	0.632	21	0.0301	0.000294	No	No	Yes	Yes	No
4,4'-DDT	0-1 ft	32.3	21	1.54	0.0150	No	No	Yes	Yes	No
Total DDTs	0-1 ft	96	21	4.56	0.0445	Yes	No	Yes	Yes	No
BHC (delta)	0-1 ft	1.54	1,000,000	0.00000154	0.0000000150	No	No	Yes	No	**Yes-Bio**
BHC (gamma) Lindane	0-1 ft	9.68	1,000,000	0.00000968	0.0000000945	No	No	Yes	No	**Yes-Bio**
Chlordane (alpha)	0-1 ft	0.815	250,000	0.00000326	0.0000000318	No	No	Yes	No	**Yes-Bio**
Chlordane (gamma)	0-1 ft	30.3	250,000	0.000121	0.00000118	No	No	Yes	No	**Yes-Bio**
Dieldrin	0-1 ft	0.488	4.9	0.100	0.000973	No	No	Yes	Yes	No
Endosulfan I	0-1 ft	2.69	20,000	0.000135	0.00000131	No	No	Yes	No	**Yes-Bio**
Endosulfan II	0-1 ft	0.495	20,000	0.0000248	0.000000242	No	No	Yes	No	**Yes-Bio**
Endosulfan Sulfate	0-1 ft	0.953	20,000	0.0000477	0.000000465	No	No	Yes	No	**Yes-Bio**
Endrin	0-1 ft	5.04	4.9	1.03	0.0100	No	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-1 ft	3.87	4.9	0.790	0.00771	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-1 ft	3.09	4.9	0.631	0.00616	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-1 ft	0.464	15,000	0.0000309	0.000000302	No	No	Yes	No SLV	**Yes-Bio**
Methoxychlor	0-1 ft	1.05	500,000	0.00000210	0.0000000205	No	No	Yes	No SLV	**Yes-Bio**
4,4'-DDD	0-3 ft	0.721	21	0.0343	0.000223	No	No	Yes	Yes	No
4,4'-DDE	0-3 ft	0.567	21	0.0270	0.000175	No	No	Yes	Yes	No

Table N-19
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(2 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
4,4'-DDT	0-3 ft	79.4	21	3.78	0.0245	Yes	No	Yes	Yes	No
Total DDTs	0-3 ft	82	21	3.90	0.0253	Yes	No	Yes	Yes	No
BHC (delta)	0-3 ft	1.30	1,000,000	0.00000130	0.00000000843	No	No	Yes	No	**Yes-Bio**
BHC (gamma) Lindane	0-3 ft	1.06	1,000,000	0.00000106	0.00000000688	No	No	Yes	No	**Yes-Bio**
Chlordane (alpha)	0-3 ft	0.776	250,000	0.00000310	0.0000000201	No	No	Yes	No	**Yes-Bio**
Chlordane (gamma)	0-3 ft	20.4	250,000	0.0000816	0.000000529	No	No	Yes	No	**Yes-Bio**
Dieldrin	0-3 ft	0.483	4.9	0.0986	0.000640	No	No	Yes	Yes	No
Endosulfan I	0-3 ft	0.809	20,000	0.0000405	0.000000262	No	No	Yes	No	**Yes-Bio**
Endosulfan II	0-3 ft	0.447	20,000	0.0000224	0.000000145	No	No	Yes	No	**Yes-Bio**
Endosulfan Sulfate	0-3 ft	0.889	20,000	0.0000445	0.000000288	No	No	Yes	No	**Yes-Bio**
Endrin	0-3 ft	3.89	4.9	0.794	0.00515	No	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-3 ft	3.44	4.9	0.702	0.00455	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-3 ft	2.88	4.9	0.588	0.00381	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-3 ft	0.415	15,000	0.0000277	0.000000179	No	No	Yes	No SLV	**Yes-Bio**
Methoxychlor	0-3 ft	1.04	500,000	0.00000208	0.0000000135	No	No	Yes	No SLV	**Yes-Bio**
PCBs (ug/kg)										
Aroclor 1254	0-1 ft	292	371	0.787	0.00769	No	No	Yes	Yes	No
Aroclor 1260	0-1 ft	203	371	0.547	0.00534	No	No	Yes	Yes	No
Aroclor 1254	0-3 ft	136	371	0.367	0.00238	No	No	Yes	Yes	No
Aroclor 1260	0-3 ft	167	371	0.450	0.00292	No	No	Yes	Yes	No
VOCs (ug/kg)										
1,1,1-Trichloroethane (TCA)	0-1 ft	0.503	55,550,000	0.00000000905	0.0000000000884	No	No	No	- -	No
1,2,4-Trimethylbenzene	0-1 ft	0.230	1,440,000	0.000000160	0.00000000156	No	No	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-1 ft	0.0621	1,440,000	0.0000000431	0.000000000421	No	No	No	- -	No
2-Butanone (MEK)	0-1 ft	16.5	200,000,000	0.0000000825	0.000000000806	No	No	No	- -	No
2-Hexanone	0-1 ft	5.25	1,250,000	0.00000420	0.0000000410	No	No	No	- -	No
4-Isopropyltoluene	0-1 ft	1.33	NA	- -	- -	- -	- -	Yes	No	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-1 ft	0.574	1,250,000	0.000000459	0.00000000448	No	No	No	- -	No
Acetone	0-1 ft	156	1,250,000	0.000125	0.00000122	No	No	No	- -	No
Benzene	0-1 ft	0.524	3,300,000	0.000000159	0.00000000155	No	No	No	- -	No
Bromomethane	0-1 ft	1.44	730,000	0.00000197	0.0000000193	No	No	No	- -	No
Carbon Disulfide	0-1 ft	1.14	2,000,000	0.000000570	0.00000000557	No	No	No	- -	No
Chloroform	0-1 ft	6.86	1,875,000	0.00000366	0.0000000357	No	No	No	- -	No
Chloromethane	0-1 ft	0.234	730,000	0.000000321	0.00000000313	No	No	No	- -	No
Dichlorodifluoromethane	0-1 ft	8.15	730,000	0.0000112	0.000000109	No	No	No	- -	No
Dichloromethane (Methylene Chloride)	0-1 ft	140	730,000	0.000192	0.00000187	No	No	No	- -	No
Ethylbenzene	0-1 ft	0.132	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	0.240	120,000	0.00000200	0.0000000195	No	No	No	- -	No
Naphthalene	0-1 ft	0.610	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
o-Xylene	0-1 ft	0.172	120,000	0.00000143	0.0000000140	No	No	No	- -	No
Tetrachloroethene (PCE)	0-1 ft	1.38	80,000	0.0000173	0.000000168	No	No	No	- -	No
Toluene	0-1 ft	1.11	1,440,000	0.000000771	0.00000000753	No	No	No	- -	No
Trichloroethene (TCE)	0-1 ft	0.0766	40,000	0.00000192	0.0000000187	No	No	No	- -	No
1,2,4-Trimethylbenzene	0-3 ft	4,620	1,440,000	0.00321	0.0000208	No	No	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-3 ft	1,630	1,440,000	0.00113	0.00000734	No	No	No	- -	No
2-Butanone (MEK)	0-3 ft	13.3	200,000,000	0.0000000665	0.000000000431	No	No	No	- -	No

Table N-19
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(3 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
2-Hexanone	0-3 ft	5.12	1,250,000	0.00000410	0.0000000266	No	No	No	- -	No
4-Isopropyltoluene	0-3 ft	20.1	NA	- -	- -	- -	- -	Yes	No	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-3 ft	0.525	1,250,000	0.000000420	0.00000000272	No	No	No	- -	No
Acetone	0-3 ft	122	1,250,000	0.0000976	0.000000633	No	No	No	- -	No
Benzene	0-3 ft	0.463	3,300,000	0.000000140	0.000000000910	No	No	No	- -	No
Bromomethane	0-3 ft	1.11	730,000	0.00000152	0.00000000986	No	No	No	- -	No
Carbon Disulfide	0-3 ft	1.12	2,000,000	0.000000560	0.00000000363	No	No	No	- -	No
Chloroform	0-3 ft	5.70	1,875,000	0.00000304	0.0000000197	No	No	No	- -	No
Dichlorodifluoromethane	0-3 ft	6.74	730,000	0.00000923	0.0000000599	No	No	No	- -	No
Dichloromethane (Methylene Chloride)	0-3 ft	56.0	730,000	0.0000767	0.000000498	No	No	No	- -	No
Ethylbenzene	0-3 ft	4.69	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-3 ft	1,820	120,000	0.0152	0.0000984	No	No	No	- -	No
Naphthalene	0-3 ft	1.94	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
n-Propylbenzene	0-3 ft	35.5	NA	- -	- -	- -	- -	No	No SLV	**Yes-Bio**
o-Xylene	0-3 ft	200	120,000	0.00167	0.0000108	No	No	No	- -	No
Tetrachloroethene (PCE)	0-3 ft	26,300	80,000	0.329	0.00213	No	No	No	- -	No
Toluene	0-3 ft	9,360	1,440,000	0.00650	0.0000422	No	No	No	- -	No
Trichloroethene (TCE)	0-3 ft	1,780	40,000	0.0445	0.000289	No	No	No	- -	No
SVOCs (ug/kg)										
Benzoic Acid	0-1 ft	166	1,440,000	0.000115	0.00000113	No	No	No	- -	No
Bis(2-ethylhexyl) Phthalate	0-1 ft	98,000	1,020,000	0.0961	0.000938	No	No	Yes	No	**Yes-Bio**
Butyl Benzyl Phthalate	0-1 ft	17.1	30,000,000	0.000000570	0.00000000557	No	No	Yes	No	**Yes-Bio**
Carbazole	0-1 ft	144	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-1 ft	42.4	2	21.2	0.207	Yes	Yes	Yes	No	**Yes**
Dimethyl Phthalate	0-1 ft	31.4	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-1 ft	80.4	30,000,000	0.00000268	0.0000000262	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-1 ft	25.1	30,000,000	0.000000837	0.00000000817	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-1 ft	14.1	2,800	0.00504	0.0000492	No	No	Yes	Yes	No
Phenol	0-1 ft	2.28	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Benzoic Acid	0-3 ft	132	1,440,000	0.0000917	0.000000595	No	No	No	- -	No
Bis(2-ethylhexyl) Phthalate	0-3 ft	77,100	1,020,000	0.0756	0.000490	No	No	Yes	No	**Yes-Bio**
Butyl Benzyl Phthalate	0-3 ft	15.2	30,000,000	0.000000507	0.00000000329	No	No	Yes	No	**Yes-Bio**
Carbazole	0-3 ft	112	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-3 ft	122	2	61.0	0.396	Yes	Yes	Yes	No	**Yes**
Dimethyl Phthalate	0-3 ft	31.0	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-3 ft	54.3	30,000,000	0.00000181	0.0000000117	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-3 ft	22.5	30,000,000	0.00000075	0.00000000487	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-3 ft	13.3	2,800	0.00475	0.0000308	No	No	Yes	Yes	No
Phenol	0-3 ft	35.0	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
PAHs (ug/kg)										
2-Methylnaphthalene	0-1 ft	27.4	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Acenaphthene	0-1 ft	172	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Acenaphthylene	0-1 ft	17.4	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Anthracene	0-1 ft	338	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Fluorene	0-1 ft	154	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Naphthalene	0-1 ft	108	NA	- -	- -	- -	- -	No	- -	No
Phenanthrene	0-1 ft	1,260	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No

Table N-19
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(4 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	1,849	100,000	0.0185	0.000181	No	No	Yes	Yes	No
Benzo(a)anthracene	0-1 ft	1,750	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(a)pyrene	0-1 ft	1,760	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(b)fluoranthene	0-1 ft	1,950	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(g,h,i)perylene	0-1 ft	1,070	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(k)fluoranthene	0-1 ft	676	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzofluoranthenes, Total	0-1 ft	7,760	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Chrysene	0-1 ft	2,070	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Dibenz(a,h)anthracene	0-1 ft	244	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Fluoranthene	0-1 ft	4,640	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Indeno(1,2,3-cd)pyrene	0-1 ft	1,130	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Pyrene	0-1 ft	4,780	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	18,577	1,100	16.9	0.165	Yes	Yes	Yes	Yes	**Yes**
2-Methylnaphthalene	0-3 ft	23.9	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Acenaphthene	0-3 ft	652	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Acenaphthylene	0-3 ft	29.6	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Anthracene	0-3 ft	772	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Fluorene	0-3 ft	227	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Naphthalene	0-3 ft	81.4	NA	- -	- -	- -	- -	No	- -	No
Phenanthrene	0-3 ft	2,910	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	5,036	100,000	0.0504	0.000327	No	No	Yes	Yes	No
Benzo(a)anthracene	0-3 ft	2,450	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(a)pyrene	0-3 ft	2,390	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(b)fluoranthene	0-3 ft	2,210	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(g,h,i)perylene	0-3 ft	1,050	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(k)fluoranthene	0-3 ft	764	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzofluoranthenes, Total	0-3 ft	10,600	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Chrysene	0-3 ft	4,590	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Dibenz(a,h)anthracene	0-3 ft	238	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Fluoranthene	0-3 ft	10,800	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Indeno(1,2,3-cd)pyrene	0-3 ft	1,160	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Pyrene	0-3 ft	11,700	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	40,758	1,100	37.1	0.240	Yes	Yes	Yes	Yes	**Yes**
TPH (mg/kg)										
Diesel Range Organics	0-1 ft	229	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	2.29	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	671	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	266	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	1,030	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	577	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
For lead, the 95% UCL and maximum concentrations are from unseived samples.
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped

Table N-19
Identification of CPECs in Soil at Sandblast Area AOPC - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(5 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)

LPAH = low molecular weight polycyclic aromatic hydrocarbons
Incl in tHPAH = COI is included in the Total HPAH Screening
Incl in tLPAH = COI is included in the Total LPAH Screening
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).

Hierarchy of Mammalian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 56
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 102.4
0-3 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 54
Tj (0-3 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 154
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-20
Identification of CPECs in Groundwater at Sandblast Area AOPC - Multiple COIs for Aquatic Organisms
Bradford Island - Upland Operable Unit
(1 of 2)

Chemicals of Interest	Medium	Dissolved or Total (D or T)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	(Tij/Tj) (9)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Is COI Bioaccum-ulative?	COI is Identified as a CPEC? (9) (Q = 1)
INORGANICS (mg/L)									
Arsenic	Groundwater	D	0.00303	0.15	0.0202	0.00535	No	Yes	**Yes-Bio**
Calcium	Groundwater	D	44.3	116	0.382	0.101	Yes	No	**Yes**
Iron	Groundwater	D	0.0747	1.0	0.0747	0.0198	No	No	No
Magnesium	Groundwater	D	14.0	82	0.171	0.0452	Yes	No	**Yes**
Potassium	Groundwater	D	2.61	53	0.0492	0.0131	No	No	No
Sodium	Groundwater	D	89.4	680	0.131	0.0348	No	No	No
Vanadium	Groundwater	D	0.00133	0.020	0.0665	0.0176	No	NA	No
BUTYLTINS (ug/L)									
Monobutyltin	Groundwater	T	0.0216	0.063	0.343	0.0909	Yes	No	**Yes**
VOCs (ug/L)									
1,1,1-Trichloroethane (TCA)	Groundwater	T	1.90	11	0.173	0.0458	Yes	No	**Yes**
1,1-Dichloroethane	Groundwater	T	5.00	47	0.106	0.0282	No	No	No
1,1-Dichloroethene	Groundwater	T	2.10	25	0.0840	0.0223	No	No	No
Carbon Disulfide	Groundwater	T	0.255	0.92	0.277	0.0735	Yes	No	**Yes**
cis-1,2-Dichloroethene	Groundwater	T	658	590	1.12	0.296	Yes	No	**Yes**
Dichloromethane (Methylene Chloride)	Groundwater	T	0.175	2,200	0.0000795	0.0000211	No	No	No
Tetrachloroethene (PCE)	Groundwater	T	2.66	840	0.00317	0.000839	No	No	No
Toluene	Groundwater	T	0.640	9.8	0.0653	0.0173	No	No	No
trans-1,2-Dichloroethene	Groundwater	T	1.70	590	0.00288	0.000764	No	No	No
Trichloroethene (TCE)	Groundwater	T	3.35	3,000	0.00112	0.000296	No	No	No
Vinyl Chloride	Groundwater	T	1.10	1,300	0.000846	0.000224	No	No	No
TPH (mg/L)									
Diesel Range Organics	Groundwater	T	0.0173	NA	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	Groundwater	T	0.0151	NA	- -	- -	- -	- -	Yes - No SLV
PAHs (ug/L)									
2-Methylnaphthalene	Groundwater - DP	T	0.0833	72.16	0.00115	0.000306	No	Yes	**Yes-Bio**
Acenaphthene	Groundwater - DP	T	0.0135	55.85	0.000242	0.0000641	No	Yes	**Yes-Bio**
Anthracene	Groundwater - DP	T	0.0126	13	0.000969	0.000257	No	Yes	**Yes-Bio**
Benzo(a)pyrene	Groundwater - DP	T	0.00895	0.014	0.639	0.169	Yes	Yes	**Yes**
Dibenz(a,h)anthracene	Groundwater - DP	T	0.00671	0.2825	0.0238	0.00629	No	Yes	**Yes-Bio**
Fluoranthene	Groundwater - DP	T	0.0311	6.16	0.00505	0.00134	No	Yes	**Yes-Bio**
Fluorene	Groundwater - DP	T	0.0190	3.9	0.00487	0.00129	No	Yes	**Yes-Bio**
Indeno(1,2,3-cd)pyrene	Groundwater - DP	T	0.00797	0.275	0.0290	0.00768	No	Yes	**Yes-Bio**
Pyrene	Groundwater - DP	T	0.0261	10.11	0.00258	0.000684	No	Yes	**Yes-Bio**

This table only includes COIs detected > 5% and above the reference area (metals only).
For lead, the 95% UCL and maximum concentrations are from unseived samples.
CPEC = chemical of potential ecological concern

Table N-20
Identification of CPECs in Groundwater at Sandblast Area AOPC - Multiple COIs for Aquatic Organisms
Bradford Island - Upland Operable Unit
(2 of 2)

Chemicals of Interest	Medium	Dissolved or Total (D or T)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	(Tij/Tj) (9)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Is COI Bioaccum-ulative?	COI is Identified as a CPEC? (9) (Q = 1)

COI = chemical of interest
NA = not available
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) In addition to seep water and surface water concentrations, concentrations in groundwater were compared to Selected Level II SLVs for surface water as a conservative measure (in the event that groundwater discharges to surface water).

Hierarchy of Aquatic Organisms SLV Selection (see Appendix J-5b)
(2) USEPA 2009. National Recommended Water Quality Criteria. Office of Water and Office of Science and Technology.
(3) Oregon Department of Environmental Quality (DEQ). Water Quality Criteria for freshwater organisms (Oregon Administrative rules, section 340-041, Table 33A).
(4) DEQ 1998. Updated 2001. Guidance for Ecological risk Assessment: Levels I,II,III,IV. Waste Management and Cleanup Division.
(5) Suter GW II, and CL Tsao. 1996. Toxicological Benchmarks for Screening of Potential Contaminants of Concern for Effects on Aquatic Biota on Oak Ridge Reservation: 1996 Revision. ORNL, Oak Ridge, TN 104pp. ES/ER/TM-96/R2.
(6) USEPA 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. November. EPA-600-R-02-013.
(7) Canadian Council of Resource and Environment Ministers. 2007. Canadian Water Quality Guidelines for the Protection of Aquatic Life. December Accessed on 1/20/10 at http://ceqg-rcqe.ccme.ca/.
(8) Buchman, M.F., 2008. NOAA Screening Quick Reference Tables, NOAA OR&R Report 08-1, Seattle WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration, 34

Multiple COIs Simultaneously within a Given Medium
(9) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
Groundwater
Nij = total number of *i* contaminants in medium *j* = 28
Tj = sum of toxicity ratios for all contaminants in medium *j* = 3.77
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-21
Identification of CPECs in Soil at Pistol Range AOPC - Individual COIs for Plants
Bradford Island - Upland Operable Unit
(1 of 1)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	Concern for Threatened or Endangered Plants? (Tij>1)	Concern for Non-threatened or Endangered Plants? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)							
Lead	0-1 ft	1,110	120	9.25	Yes	Yes	**Yes**
Nickel	0-1 ft	32.0	38	0.842	No	No	No
Zinc	0-1 ft	199	160	1.24	Yes	No	**Yes**

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
SLV = screening level value
T&E = threatened and endangered

Hierarchy of Terrestrial Plant SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(3) Efroymson RA, ME Wil, GW Suter II, and AC Wooten. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. ORNL. ES/ER/TM-85/R3.
(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-22
Identification of CPECs in Soil at Pistol Range AOPC - Individual COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(1 of 1)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij>1)	Chemical is a Concern for Non-threatened or Endangered Invertebrates? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)							
Lead	0-1 ft	1,110	1700	0.653	No	No	No
Nickel	0-1 ft	32.0	280	0.114	No	No	No
Zinc	0-1 ft	199	120	1.66	Yes	No	**Yes**

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
SLV = screening level value
T&E = threatened and endangered

Hierarchy of Terrestrial Invertebrate SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(3) RA Efroymson. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process, Nov 1997 Revision. ORNL ES/ER/TM-126/R2.

(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-23
Identification of CPECs in Soil at Pistol Range AOPC - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(1 of 1)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)									
Lead	0-1 ft	365	25.5	14.3	Yes	Yes	Yes	Yes	**Yes**
Nickel	0-1 ft	25.9	210	0.123	No	No	Yes	Yes	No
Zinc	0-1 ft	148	71.7	2.06	Yes	No	Yes	Yes	**Yes**

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean

(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).

Hierarchy of Avian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Lower of 95% UCL and maximum concentration for wildlife species (birds and mammals).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-24
Identification of CPECs in Soil at Pistol Range AOPC - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(1 of 1)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
INORGANICS (mg/kg)									
Lead	0-1 ft	365	56	6.52	Yes	Yes	Yes	Yes	**Yes**
Nickel	0-1 ft	25.9	130	0.199	No	No	Yes	Yes	No
Zinc	0-1 ft	148	79	1.87	Yes	No	Yes	Yes	No

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean

(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).

Hierarchy of Mammalian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Lower of 95% UCL and maximum concentration for wildlife species (birds and mammals).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-25
Identification of CPECs in Groundwater at Pistol Range AOPC - Individual COIs for Aquatic Organisms
Bradford Island - Upland Operable Unit
(1 of 1)

Chemicals of Interest	Medium	Dissolved or Total (D or T)	Max Detected Concentration (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	Chemical is a Concern for Aquatic Organisms (Tij>1)?	Is COI Bioaccum-ulative?	COI is Identified as a CPEC? (9) (Q = 1)
INORGANICS (mg/L)								
Copper	Groundwater-DP	D	0.000800	0.0058	0.138	No	No	No
Nickel	Groundwater-DP	D	0.00390	0.034	0.116	No	No	No
Zinc	Groundwater-DP	D	0.00410	0.077	0.0535	No	Yes	**Yes-Bio**

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
SLV = screening level value
T&E = threatened and endangered
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV

(1) In addition to seep water and surface water concentrations, concentrations in groundwater were compared to Selected Level II SLVs for surface water as a conservative measure (in the event that groundwater discharges to surface water).

Hierarchy of Aquatic Organisms SLV Selection (see Appendix J-5b)
(2) USEPA 2009. National Recommended Water Quality Criteria. Office of Water and Office of Science and Technology.
(3) Oregon Department of Environmental Quality (DEQ). Water Quality Criteria for freshwater organisms (Oregon Administrative rules, section 340-041, Table 33A).
(4) DEQ 1998. Updated 2001. Guidance for Ecological risk Assessment: Levels I,II,III,IV. Waste Management and Cleanup Division.
(5) Suter GW II, and CL Tsao. 1996. Toxicological Benchmarks for Screening of Potential Contaminants of Concern for Effects on Aquatic Biota on Oak Ridge Reservation: 1996 Revision. ORNL, Oak Ridge, TN. 104pp. ES/ER/TM-96/R2.
(6) USEPA 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. November. EPA-600-R-02-013.
(7) Canadian Council of Resource and Environment Ministers. 2007. Canadian Water Quality Guidelines for the Protection of Aquatic Life. December Accessed on 1/20/10 at http://ceqg-rcqe.ccme.ca/.
(8) Buchman, M.F., 2008. NOAA Screening Quick Reference Tables, NOAA OR&R Report 08-1, Seattle WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration, 34 pages.

Individual COIs in a Given Media
(9) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLV ij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Maximum detected concentration (for aquatic receptors).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-26
Identification of CPECs in Lagoon Sediment at Pistol Range AOPC - Individual COIs for Benthic Invertebrates
Bradford Island - Upland Operable Unit
(1 of 1)

Chemical of Interest	Max Detected Conc in Sediment	Level II SLVs for Benthics Exposed to Sediment (1)	Toxicity Ratio for Benthics (Tij)	Chemical is a Concern for Benthic Community? (Tij>1)	COI is Identified as a CPEC? (2) (Q = 1)
INORGANICS (mg/kg)					
Copper	25.4	55.6	0.457	No	No
Lead	33.0	35	0.943	No	No
Nickel	15.4	21.2	0.726	No	No
Zinc	174	123	1.41	Yes	**Yes**

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
SLV = screening level value
T&E = threatened and endangered

(1) The greater of the site-specific reference 95% UPL concentration and the DEQ Level II SLV (see Appendix J-5c):
Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001

Individual COIs in a Given Media
(2) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-27
Identification of CPECs in Lagoon Sediment at Pistol Range AOPC - Individual COIs for Fish and Wildlife
Bradford Island - Upland Operable Unit
(1 of 1)

Chemicals of Interest	Max Detected Conc in Sediment	River OU Reference 95% UPL for Sediment	Toxicity Ratio for Fish, Birds, Mammals (Tij)	Chemical is a Concern for Fish and Aquatic-Dependent Birds and Mammals? (Tij>1)	Is COI Bioaccum-ulative?	COI is Identified as a CPEC? (1) (Q = 1)
INORGANICS (mg/kg)						
Copper	25.4	55.6	0.457	No	No	No
Lead	33.0	14.5	2.28	Yes	Yes	**Yes**
Nickel	15.4	21.2	0.726	No	No	No
Zinc	174	106	1.64	Yes	Yes	**Yes**

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean

Individual COIs in a Given Media
(1) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Lower of 95% UCL and maximum concentration for wildlife species (birds and mammals).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-28
Identification of CPECs in Soil at Pistol Range AOPC - Multiple COIs for Plants
Bradford Island - Upland Operable Unit
(1 of 1)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)								
Lead	0-1 ft	1,110	120	9.25	0.819	Yes	No	**Yes**
Nickel	0-1 ft	32.0	38	0.842	0.0745	No	No	No
Zinc	0-1 ft	199	160	1.24	0.110	No	No	No

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
SLV = screening level value
T&E = threatened and endangered

Hierarchy of Terrestrial Plant SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.

(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.

(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.

(3) Efroymson RA, ME Wil, GW Suter II, and AC Wooten. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. ORNL. ES/ER/TM-85/R3.

(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 3
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 11.3
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-29
Identification of CPECs in Soil at Pistol Range AOPC - Multiple COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(1 of 1)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)								
Lead	0-1 ft	1,110	1700	0.653	0.269	No	No	No
Nickel	0-1 ft	32.0	280	0.114	0.0470	No	No	No
Zinc	0-1 ft	199	120	1.66	0.682	Yes	No	**Yes**

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
SLV = screening level value
T&E = threatened and endangered

Hierarchy of Terrestrial Invertebrate SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(3) RA Efroymson. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process, Nov 1997 Revision. ORNL ES/ER/TM-126/R2.
(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 3
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 2.43
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-30
Identification of CPECs in Soil at Pistol Range AOPC - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(1 of 1)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)										
Lead	0-1 ft	365	25.5	14.3	0.867	Yes	No	Yes	Yes	**Yes**
Nickel	0-1 ft	25.9	210	0.123	0.00747	No	No	Yes	Yes	No
Zinc	0-1 ft	148	71.7	2.06	0.125	No	No	Yes	Yes	No

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.

Hierarchy of Avian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 3
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 16.5
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-31
Identification of CPECs in Soil at Pistol Range AOPC - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(1 of 1)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
INORGANICS (mg/kg)										
Lead	0-1 ft	365	56	6.52	0.759	Yes	No	Yes	Yes	No
Nickel	0-1 ft	25.9	130	0.199	0.0232	No	No	Yes	Yes	No
Zinc	0-1 ft	148	79	1.87	0.218	No	No	Yes	Yes	No

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean

(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).

Hierarchy of Mammalian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 3
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 8.59
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-32
Identification of CPECs in Groundwater at Pistol Range AOPC - Multiple COIs for Aquatic Organisms
Bradford Island - Upland Operable Unit
(1 of 1)

Chemicals of Interest	Medium	Dissolved or Total (D or T)	Max Detected Concentration (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	(Tij/Tj) (9)	Chemical is a Concern for Aquatic Organisms? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Is COI Bioaccum-ulative?	COI is Identified as a CPEC? (9) (Q = 1)
INORGANICS (mg/L)									
Copper	Groundwater-DP	D	0.0008	0.0058	0.138	0.450	No	No	No
Nickel	Groundwater-DP	D	0.0039	0.034	0.116	0.376	No	No	No
Zinc	Groundwater-DP	D	0.0041	0.077	0.0535	0.174	No	Yes	**Yes-Bio**

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
SLV = screening level value
T&E = threatened and endangered
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV

(1) In addition to seep water and surface water concentrations, concentrations in groundwater were compared to Selected Level II SLVs for surface water as a conservative measure (in the event that groundwater discharges to surface water).

Hierarchy of Aquatic Organisms SLV Selection (see Appendix J-5b)
(2) USEPA 2009. National Recommended Water Quality Criteria. Office of Water and Office of Science and Technology.
(3) Oregon Department of Environmental Quality (DEQ). Water Quality Criteria for freshwater organisms (Oregon Administrative rules, section 340-041, Table 33A).
(4) DEQ 1998. Updated 2001. Guidance for Ecological risk Assessment: Levels I,II,III,IV. Waste Management and Cleanup Division.
(5) Suter GW II, and CL Tsao. 1996. Toxicological Benchmarks for Screening of Potential Contaminants of Concern for Effects on Aquatic Biota on Oak Ridge Reservation: 1996 Revision. ORNL, Oak Ridge, TN. 104pp. ES/ER/TM-96/R2.
(6) USEPA 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. November. EPA-
(7) Canadian Council of Resource and Environment Ministers. 2007. Canadian Water Quality Guidelines for the Protection of Aquatic Life. December Accessed on 1/20/10 at http://ceqg-rcqe.ccme.ca/.
(8) Buchman, M.F., 2008. NOAA Screening Quick Reference Tables, NOAA OR&R Report 08-1, Seattle WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration, 34 pages.

Multiple COIs Simultaneously within a Given Medium
(9) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
Groundwater-DP
Nij = total number of *i* contaminants in medium *j* = 3
Tj = sum of toxicity ratios for all contaminants in medium *j* = 0.31
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-33
Identification of CPECs in Lagoon Sediment at Pistol Range AOPC - Multiple COIs for Benthic Invertebrates
Bradford Island - Upland Operable Unit
(1 of 1)

Chemicals of Interest	Max Detected Conc in Sediment	Level II SLVs for Benthics Exposed to Sediment (1)	Toxicity Ratio for Benthics (Tij)	(Tij/Tj) (2)	Chemical is a Concern for Benthic Community? (Tij/Tj >= [1/Nij] x Q when Q = 1)	COI is Identified as a CPEC? (2) (Q = 1)
INORGANICS (mg/kg)						
Copper	25	55.6	0.457	0.129	No	No
Lead	33	35.0	0.943	0.266	Yes	**Yes**
Nickel	15	21.2	0.726	0.205	No	No
Zinc	174	123	1.41	0.400	Yes	**Yes**

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
SLV = screening level value
T&E = threatened and endangered

(1) The greater of the site-specific reference 95% UPL concentration and the DEQ Level II SLV (see Appendix J-5c):
Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.

Multiple COIs Simultaneously within a Given Medium
(2) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
Nij = total number of *i* contaminants in medium *j* = 4
Tj = sum of toxicity ratios for all contaminants in medium *j* = 3.54
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-34
Identification of CPECs in Lagoon Sediment at Pistol Range AOPC - Multiple COIs for Fish and Wildlife
Bradford Island - Upland Operable Unit
(1 of 1)

Chemicals of Interest	Max Detected Conc in Sediment	River OU Reference 95% UPL for Sediment	Toxicity Ratio for Fish, Birds, Mammals (Tij)	(Tij/Tj) (2)	Chemical is a Concern for Fish and Aquatic-Dependent Birds and Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Is COI Bioaccum-ulative?	COI is Identified as a CPEC? (1) (Q = 1)
INORGANICS (mg/kg)							
Copper	25	55.6	0.457	0.0896	No	No	No
Lead	33	14.5	2.28	0.446	Yes	Yes	**Yes**
Nickel	15	21.2	0.726	0.142	No	No	No
Zinc	174	106	1.64	0.322	Yes	Yes	**Yes**

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean

Multiple COIs Simultaneously within a Given Medium
(1) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
Nij = total number of *i* contaminants in medium *j* = 4
Tj = sum of toxicity ratios for all contaminants in medium *j* = 5.10
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-35
Identification of CPECs in Soil at Bulb Slope AOPC - Individual COIs for Plants
Bradford Island - Upland Operable Unit
(1 of 1)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	Concern for Threatened or Endangered Plants? (Tij>1)	Concern for Non-threatened or Endangered Plants? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)							
Lead	0-1 ft	597	120	4.98	Yes	No	**Yes**
Mercury	0-1 ft	1.54	0.30	5.13	Yes	Yes	**Yes**
PCBs (ug/kg)							
Aroclor 1260	0-1 ft	251	40,000	0.00628	No	No	No
Total PCBs (Aroclors)	0-1 ft	251	40,000	0.00628	No	No	No
TPH (mg/kg)							
Diesel Range Organics	0-1 ft	170	NA	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	410	NA	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
NA = not available
NE = Not Evaluated. COI could not be evaluated due to a lack of toxicity data and was retained for uncertainty discussion (Section 5.4.2).
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

Hierarchy of Terrestrial Plant SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.

(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.

(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.

(3) Efroymson RA, ME Wil, GW Suter II, and AC Wooten. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. ORNL. ES/ER/TM-85/R3.

(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-36
Identification of CPECs in Soil at Bulb Slope AOPC - Individual COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(1 of 1)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij>1)	Chemical is a Concern for Non-threatened or Endangered Invertebrates? (Tij>5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)							
Lead	0-1 ft	597	1,700	0.351	No	No	No
Mercury	0-1 ft	1.54	0.1	15.4	Yes	Yes	**Yes**
PCBs (ug/kg)							
Aroclor 1260	0-1 ft	251	2,510	0.100	No	No	No
Total PCBs (Aroclors)	0-1 ft	251	2,510	0.100	No	No	No
TPH (mg/kg)							
Diesel Range Organics	0-1 ft	170	NA	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	410	NA	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
NA = not available
NE = Not Evaluated. COI could not be evaluated due to a lack of toxicity data and was retained for uncertainty discussion (Section 5.4.2).
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

Hierarchy of Terrestrial Invertebrate SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(3) RA Efroymson. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process, Nov 1997 Revision. ORNL ES/ER/TM-126/R2.

(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-37
Identification of CPECs in Soil at Bulb Slope AOPC - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(1 of 1)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)									
Lead	0-1 ft	307	25.5	12.0	Yes	Yes	Yes	Yes	**Yes**
Mercury	0-1 ft	0.720	0.066	10.9	Yes	Yes	Yes	Yes	**Yes**
PCBs (ug/kg)									
Aroclor 1260	0-1 ft	108	655	0.165	No	No	Yes	Yes	No
Total PCBs (Aroclors)	0-1 ft	104	655	0.158	No	No	Yes	Yes	No
TPH (mg/kg)									
Diesel Range Organics	0-1 ft	102	NA	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	232	NA	- -	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
NA = not available
NE = Not Evaluated. COI could not be evaluated due to a lack of toxicity data and was retained for uncertainty discussion (Section 5.4.2).
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).

Hierarchy of Avian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.

(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.

(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.

(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Lower of 95% UCL and maximum concentration for wildlife species (birds and mammals).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-38
Identification of CPECs in Soil at Bulb Slope AOPC - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(1 of 1)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
INORGANICS (mg/kg)									
Lead	0-1 ft	307	56	5.48	Yes	Yes	Yes	Yes	**Yes**
Mercury	0-1 ft	0.720	0.146	4.93	Yes	No	Yes	Yes	No
PCBs (ug/kg)									
Aroclor 1260	0-1 ft	108	371	0.291	No	No	Yes	Yes	No
Total PCBs (Aroclors)	0-1 ft	104	371	0.280	No	No	Yes	Yes	No
TPH (mg/kg)									
Diesel Range Organics	0-1 ft	102	NA	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	232	NA	- -	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
NA = not available
NE = Not Evaluated. COI could not be evaluated due to a lack of toxicity data and was retained for uncertainty discussion (Section 5.4.2).
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).

Hierarchy of Mammalian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Lower of 95% UCL and maximum concentration for wildlife species (birds and mammals).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-39
Identification of CPECs in Soil at Bulb Slope AOPC - Multiple COIs for Plants
Bradford Island - Upland Operable Unit
(1 of 2)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)								
Lead	0-1 ft	597	120	4.98	0.493	Yes	No	**Yes**
Mercury	0-1 ft	1.54	0.3	5.13	0.508	Yes	No	**Yes**
PCBs (ug/kg)								
Aroclor 1260	0-1 ft	251	40,000	0.00628	0.000621	No	No	No
TPH (mg/kg)								
Diesel Range Organics	0-1 ft	170	NA	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	410	NA	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
NA = not available
NE = Not Evaluated. COI could not be evaluated due to a lack of toxicity data and was retained for uncertainty discussion (Section 5.4.2).
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

Hierarchy of Terrestrial Plant SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(3) Efroymson RA, ME Wil, GW Suter II, and AC Wooten. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. November. ORNL. ES/ER/TM-85/R3.
(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 3
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 10.1
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-39
Identification of CPECs in Soil at Bulb Slope AOPC - Multiple COIs for Plants
Bradford Island - Upland Operable Unit
(2 of 2)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Plants Exposed to Soil (1,2,3,4)	Toxicity Ratio for Plants (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Plants? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)

For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-40
Identification of CPECs in Soil at Bulb Slope AOPC - Multiple COIs for Soil Invertebrates
Bradford Island - Upland Operable Unit
(1 of 1)

Chemical of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II SLVs for Invertebrates Exposed to Soil (1,2,3,4)	Toxicity Ratio for Invertebrates (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Invertebrates? (Tij/Tj >= [1/Nij] x Q when Q = 5)	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)								
Lead	0-1 ft	597	1,700	0.351	0.0221	No	No	No
Mercury	0-1 ft	1.54	0.1	15.4	0.969	Yes	No	**Yes**
PCBs (ug/kg)								
Aroclor 1260	0-1 ft	251	2,510	0.100	0.00629	No	No	No
TPH (mg/kg)								
Diesel Range Organics	0-1 ft	170	NA	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	410	NA	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
NA = not available
NE = Not Evaluated. COI could not be evaluated due to a lack of toxicity data and was retained for uncertainty discussion (Section 5.4.2).
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

Hierarchy of Terrestrial Invertebrate SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(1) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(2) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(3) RA Efroymson. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process, Nov 1997 Revision. ORNL ES/ER/TM-126/R2.
(4) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 3
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 15.9
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-41
Identification of CPECs in Soil at Bulb Slope AOPC - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(1 of 2)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?
INORGANICS (mg/kg)									
Lead	0-1 ft	307	25.5	12.0	0.521	Yes	No	Yes	Yes
Mercury	0-1 ft	0.720	0.066	10.9	0.472	Yes	No	Yes	Yes
PCBs (ug/kg)									
Aroclor 1260	0-1 ft	108	655	0.165	0.00713	No	No	Yes	Yes
TPH (mg/kg)									
Diesel Range Organics	0-1 ft	102	NA	- -	- -	- -	- -	- -	- -
Residual Range Organics	0-1 ft	232	NA	- -	- -	- -	- -	- -	- -

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
NA = not available
NE = Not Evaluated. COI could not be evaluated due to a lack of toxicity data and was retained for uncertainty discussion (Section 5.4.2).
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.

Hierarchy of Avian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 928
Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 3
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 23.1
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of I
of SLVs (Eco-SSLs).

Table N-41
Identification of CPECs in Soil at Bulb Slope AOPC - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(2 of 2)

COI is Identified as a CPEC? (5) (Q = 1)
Yes
Yes
No
Yes - No SLV
Yes - No SLV

5.7-72. Last

DEQ due to basis

Table N-42
Identification of CPECs in Soil at Bulb Slope AOPC - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(1 of 1)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
INORGANICS (mg/kg)										
Lead	0-1 ft	307	56	5.48	0.512	Yes	No	Yes	Yes	No
Mercury	0-1 ft	0.720	0.146	4.93	0.461	Yes	No	Yes	Yes	No
PCBs (ug/kg)										
Aroclor 1260	0-1 ft	108	371	0.291	0.0272	No	No	Yes	Yes	No
TPH (mg/kg)										
Diesel Range Organics	0-1 ft	102	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	232	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
NA = not available
NE = Not Evaluated. COI could not be evaluated due to a lack of toxicity data and was retained for uncertainty discussion (Section 5.4.2).
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).

Hierarchy of Mammalian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 3
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 10.7
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-43
Identification of CPECs in Soil at All Four AOPCs Combined - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(1 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)									
Antimony	0-1 ft	1.80	0.176	10.2	Yes	Yes	No	--	**Yes**
Arsenic	0-1 ft	9.20	43	0.214	No	No	Yes	Yes	No
Cadmium	0-1 ft	1.97	0.77	2.56	Yes	No	Yes	Yes	**Yes**
Chromium	0-1 ft	567	28.1	20.2	Yes	Yes	Yes	Yes	**Yes**
Lead	0-1 ft	398	25.5	15.6	Yes	Yes	Yes	Yes	**Yes**
Mercury	0-1 ft	0.378	0.066	5.73	Yes	Yes	Yes	Yes	**Yes**
Nickel	0-1 ft	227	210	1.08	Yes	No	Yes	Yes	**Yes**
Selenium	0-1 ft	0.412	1.2	0.343	No	No	Yes	Yes	No
Silver	0-1 ft	0.216	4.2	0.0514	No	No	Yes	Yes	No
Zinc	0-1 ft	188	71.7	2.62	Yes	No	Yes	Yes	**Yes**
Antimony	0-3 ft	1.64	0.176	9.32	Yes	Yes	No	--	**Yes**
Arsenic	0-3 ft	8.20	43	0.191	No	No	Yes	Yes	No
Cadmium	0-3 ft	1.67	0.77	2.17	Yes	No	Yes	Yes	**Yes**
Chromium	0-3 ft	510	28.1	18.1	Yes	Yes	Yes	Yes	**Yes**
Lead	0-3 ft	396	25.5	15.5	Yes	Yes	Yes	Yes	**Yes**
Mercury	0-3 ft	0.330	0.066	5.00	Yes	Yes	Yes	Yes	**Yes**
Nickel	0-3 ft	234	210	1.11	Yes	No	Yes	Yes	**Yes**
Selenium	0-3 ft	0.431	1.2	0.359	No	No	Yes	Yes	No
Silver	0-3 ft	0.207	4.2	0.0493	No	No	Yes	Yes	No
Zinc	0-3 ft	172	71.7	2.40	Yes	No	Yes	Yes	**Yes**
BUTYLTINS (ug/kg)									
Dibutyltin	0-1 ft	19.0	28,000	0.000679	No	No	No	--	No
Monobutyltin	0-1 ft	10.4	28,000	0.000371	No	No	No	--	No
Tributyltin	0-1 ft	422	28,000	0.0151	No	No	Yes	No	**Yes-Bio**
Dibutyltin	0-3 ft	14.7	28,000	0.000525	No	No	No	--	No
Monobutyltin	0-3 ft	8.72	28,000	0.000311	No	No	No	--	No
Tributyltin	0-3 ft	219	28,000	0.00782	No	No	Yes	No	**Yes-Bio**
PESTICIDES (ug/kg)									
4,4'-DDE	0-1 ft	1.33	93	0.0143	No	No	Yes	Yes	No
4,4'-DDT	0-1 ft	21.5	93	0.231	No	No	Yes	Yes	No
Total DDTs	0-1 ft	23.1	93	0.248	No	No	Yes	Yes	No
Chlordane (alpha)	0-1 ft	1.01	9,000	0.000112	No	No	Yes	No	**Yes-Bio**
Chlordane (gamma)	0-1 ft	18.8	9,000	0.00209	No	No	Yes	No	**Yes-Bio**
Chlordane (technical)	0-1 ft	1,560	9,000	0.173	No	No	Yes	No	**Yes-Bio**
Dieldrin	0-1 ft	0.608	22	0.0276	No	No	Yes	Yes	No
Endosulfan II	0-1 ft	0.844	42,000	0.0000201	No	No	Yes	No	**Yes-Bio**

Table N-43
Identification of CPECs in Soil at All Four AOPCs Combined - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(2 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
Endosulfan Sulfate	0-1 ft	1.08	42,000	0.0000257	No	No	Yes	No	**Yes-Bio**
Endrin	0-1 ft	4.21	22	0.191	No	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-1 ft	3.14	22	0.143	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-1 ft	2.61	22	0.119	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-1 ft	0.437	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
4,4'-DDE	0-3 ft	1.18	93	0.0127	No	No	Yes	Yes	No
4,4'-DDT	0-3 ft	19.3	93	0.208	No	No	Yes	Yes	No
Total DDTs	0-3 ft	21.6	93	0.232	No	No	Yes	Yes	No
Chlordane (alpha)	0-3 ft	0.952	9,000	0.000106	No	No	Yes	No	**Yes-Bio**
Chlordane (gamma)	0-3 ft	11.8	9,000	0.00131	No	No	Yes	No	**Yes-Bio**
Chlordane (technical)	0-3 ft	902	9,000	0.100	No	No	Yes	No	**Yes-Bio**
Endosulfan I	0-3 ft	0.547	42,000	0.0000130	No	No	Yes	No	**Yes-Bio**
Endosulfan II	0-3 ft	0.756	42,000	0.0000180	No	No	Yes	No	**Yes-Bio**
Endosulfan Sulfate	0-3 ft	1.01	42,000	0.0000240	No	No	Yes	No	**Yes-Bio**
Endrin	0-3 ft	3.21	22	0.146	No	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-3 ft	2.86	22	0.130	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-3 ft	2.50	22	0.114	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-3 ft	0.477	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
PCBs (ug/kg)									
Aroclor 1254	0-1 ft	99.4	655	0.152	No	No	Yes	Yes	No
Aroclor 1260	0-1 ft	140	655	0.214	No	No	Yes	Yes	No
Total PCBs (Aroclors)	0-1 ft	304	655	0.464	No	No	Yes	Yes	No
Aroclor 1254	0-3 ft	147	655	0.224	No	No	Yes	Yes	No
Aroclor 1260	0-3 ft	123	655	0.188	No	No	Yes	Yes	No
Total PCBs (Aroclors)	0-3 ft	325	655	0.496	No	No	Yes	Yes	No
HERBICIDES (ug/kg)									
2,4,5-T	0-1 ft	67.2	93	0.723	No	No	No	- -	No
Dichloroprop	0-1 ft	172	93	1.85	Yes	No	No	- -	**Yes**
MCPP	0-1 ft	10,300	93	111	Yes	Yes	No	- -	**Yes**
2,4,5-T	0-3 ft	66.9	93	0.719	No	No	No	- -	No
Dichloroprop	0-3 ft	172	93	1.85	Yes	No	No	- -	**Yes**
MCPP	0-3 ft	10,200	93	110	Yes	Yes	No	- -	**Yes**
VOCs (ug/kg)									
1,2,4-Trimethylbenzene	0-1 ft	2,940	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
1,3,5-Trimethylbenzene	0-1 ft	1,150	NA	- -	- -	- -	No	- -	Yes - No SLV
2-Butanone (MEK)	0-1 ft	13.2	NA	- -	- -	- -	No	- -	Yes - No SLV
2-Hexanone	0-1 ft	5.17	NA	- -	- -	- -	No	- -	Yes - No SLV

Table N-43
Identification of CPECs in Soil at All Four AOPCs Combined - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(3 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
4-Isopropyltoluene	0-1 ft	1.02	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-1 ft	0.566	NA	- -	- -	- -	No	- -	Yes - No SLV
Acetone	0-1 ft	129	NA	- -	- -	- -	No	- -	Yes - No SLV
Benzene	0-1 ft	0.470	NA	- -	- -	- -	No	- -	Yes - No SLV
Bromomethane	0-1 ft	1.29	NA	- -	- -	- -	No	- -	Yes - No SLV
Carbon Disulfide	0-1 ft	1.04	NA	- -	- -	- -	No	- -	Yes - No SLV
Chloroform	0-1 ft	5.06	NA	- -	- -	- -	No	- -	Yes - No SLV
Dichlorodifluoromethane	0-1 ft	5.98	NA	- -	- -	- -	No	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-1 ft	98.2	NA	- -	- -	- -	No	- -	Yes - No SLV
Ethylbenzene	0-1 ft	562	NA	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	2,040	NA	- -	- -	- -	No	- -	Yes - No SLV
Naphthalene	0-1 ft	1,750	NA	- -	- -	- -	No	- -	Yes - No SLV
o-Xylene	0-1 ft	0.180	NA	- -	- -	- -	No	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-1 ft	4.96	NA	- -	- -	- -	No	- -	Yes - No SLV
Toluene	0-1 ft	1.17	NA	- -	- -	- -	No	- -	Yes - No SLV
Trichloroethene (TCE)	0-1 ft	0.0765	NA	- -	- -	- -	No	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-3 ft	2,860	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
1,3,5-Trimethylbenzene	0-3 ft	417	NA	- -	- -	- -	No	- -	Yes - No SLV
2-Butanone (MEK)	0-3 ft	10.4	NA	- -	- -	- -	No	- -	Yes - No SLV
4-Isopropyltoluene	0-3 ft	14.7	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-3 ft	0.518	NA	- -	- -	- -	No	- -	Yes - No SLV
Acetone	0-3 ft	90.8	NA	- -	- -	- -	No	- -	Yes - No SLV
Benzene	0-3 ft	0.412	NA	- -	- -	- -	No	- -	Yes - No SLV
Bromomethane	0-3 ft	1.01	NA	- -	- -	- -	No	- -	Yes - No SLV
Carbon Disulfide	0-3 ft	1.00	NA	- -	- -	- -	No	- -	Yes - No SLV
Dichlorodifluoromethane	0-3 ft	5.04	NA	- -	- -	- -	No	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-3 ft	40.3	NA	- -	- -	- -	No	- -	Yes - No SLV
Ethylbenzene	0-3 ft	308	NA	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-3 ft	1,460	NA	- -	- -	- -	No	- -	Yes - No SLV
Naphthalene	0-3 ft	960	NA	- -	- -	- -	No	- -	Yes - No SLV
o-Xylene	0-3 ft	131	NA	- -	- -	- -	No	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-3 ft	44,400	NA	- -	- -	- -	No	- -	Yes - No SLV
Toluene	0-3 ft	4,060	NA	- -	- -	- -	No	- -	Yes - No SLV
Trichloroethene (TCE)	0-3 ft	833	NA	- -	- -	- -	No	- -	Yes - No SLV
SVOCs (ug/kg)									
Benzoic Acid	0-1 ft	133	NA	- -	- -	- -	No	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-1 ft	36,400	4,500	8.09	Yes	Yes	Yes	No	**Yes**

Table N-43
Identification of CPECs in Soil at All Four AOPCs Combined - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(4 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
Butyl Benzyl Phthalate	0-1 ft	17.2	450	0.0382	No	No	Yes	No	**Yes-Bio**
Carbazole	0-1 ft	272	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-1 ft	77.1	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Diethyl Phthalate	0-1 ft	16.0	NA	- -	- -	- -	No	- -	Yes - No SLV
Dimethyl Phthalate	0-1 ft	30.9	NA	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-1 ft	124	450	0.276	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-1 ft	21.0	450	0.0467	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-1 ft	28.6	2,100	0.0136	No	No	Yes	Yes	No
Benzoic Acid	0-3 ft	122	NA	- -	- -	- -	No	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-3 ft	31,300	4,500	6.96	Yes	Yes	Yes	No	**Yes**
Butyl Benzyl Phthalate	0-3 ft	15.4	450	0.0342	No	No	Yes	No	**Yes-Bio**
Carbazole	0-3 ft	312	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-3 ft	83.4	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Diethyl Phthalate	0-3 ft	15.6	NA	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-3 ft	105	450	0.233	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-3 ft	19.4	450	0.0431	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-3 ft	24.8	2,100	0.0118	No	No	Yes	Yes	No
Phenol	0-3 ft		NA	- -	- -	- -	No	- -	Yes - No SLV
PAHs (ug/kg)									
2-Methylnaphthalene	0-1 ft	180	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthene	0-1 ft	380	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthylene	0-1 ft	18.0	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Anthracene	0-1 ft	535	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluorene	0-1 ft	139	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Naphthalene	0-1 ft	185	NA	- -	- -	- -	No	- -	Yes - No SLV
Phenanthrene	0-1 ft	2,200	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	3,440	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)anthracene	0-1 ft	4,390	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)pyrene	0-1 ft	4,570	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(b)fluoranthene	0-1 ft	20,700	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(g,h,i)perylene	0-1 ft	2,440	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(k)fluoranthene	0-1 ft	19,800	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzofluoranthenes, Total	0-1 ft	10,700	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Chrysene	0-1 ft	4,510	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenz(a,h)anthracene	0-1 ft	1,120	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluoranthene	0-1 ft	8,020	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Indeno(1,2,3-cd)pyrene	0-1 ft	2,670	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**

Table N-43
Identification of CPECs in Soil at All Four AOPCs Combined - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(5 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
Pyrene	0-1 ft	7,090	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	47,078	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
2-Methylnaphthalene	0-3 ft	155	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthene	0-3 ft	564	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthylene	0-3 ft	26.2	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Anthracene	0-3 ft	1,250	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluorene	0-3 ft	191	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Naphthalene	0-3 ft	161	NA	- -	- -	- -	No	- -	Yes - No SLV
Phenanthrene	0-3 ft	3,870	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	5,089	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)anthracene	0-3 ft	5,260	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)pyrene	0-3 ft	7,150	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(b)fluoranthene	0-3 ft	9,750	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(g,h,i)perylene	0-3 ft	3,690	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(k)fluoranthene	0-3 ft	11,000	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzofluoranthenes, Total	0-3 ft	17,600	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Chrysene	0-3 ft	5,790	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenz(a,h)anthracene	0-3 ft	1,040	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluoranthene	0-3 ft	11,900	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Indeno(1,2,3-cd)pyrene	0-3 ft	3,480	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Pyrene	0-3 ft	10,400	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	53,046	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
TPH (mg/kg)									
Diesel Range Organics	0-1 ft	524	NA	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	164	NA	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	2,430	NA	- -	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	473	NA	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	782	NA	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	2,030	NA	- -	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit

Table N-43
Identification of CPECs in Soil at All Four AOPCs Combined - Individual COIs for Birds
Bradford Island - Upland Operable Unit
(6 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	Concern for Threatened or Endangered Birds? (Tij>1)	Concern for Non-threatened or Endangered Birds? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)

NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).

Hierarchy of Avian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Lower of 95% UCL and maximum concentration for wildlife species (birds and mammals).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-44
Identification of CPECs in Soil at All Four AOPCs Combined - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(1 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
INORGANICS (mg/kg)									
Antimony	0-1 ft	1.80	0.27	6.67	Yes	Yes	No	- -	**Yes**
Arsenic	0-1 ft	9.20	46	0.200	No	No	Yes	Yes	No
Cadmium	0-1 ft	1.97	0.36	5.47	Yes	Yes	Yes	Yes	**Yes**
Chromium	0-1 ft	567	34	16.7	Yes	Yes	Yes	Yes	**Yes**
Lead	0-1 ft	398	56	7.11	Yes	Yes	Yes	Yes	**Yes**
Mercury	0-1 ft	0.378	0.146	2.59	Yes	No	Yes	Yes	No
Nickel	0-1 ft	227	130	1.75	Yes	No	Yes	Yes	No
Selenium	0-1 ft	0.412	0.63	0.654	No	No	Yes	Yes	No
Silver	0-1 ft	0.216	14	0.0154	No	No	Yes	Yes	No
Zinc	0-1 ft	188	79	2.38	Yes	No	Yes	Yes	No
Antimony	0-3 ft	1.64	0.27	6.07	Yes	Yes	No	- -	**Yes**
Arsenic	0-3 ft	8.20	46	0.178	No	No	Yes	Yes	No
Cadmium	0-3 ft	1.67	0.36	4.64	Yes	No	Yes	Yes	No
Chromium	0-3 ft	510	34	15.0	Yes	Yes	Yes	Yes	**Yes**
Lead	0-3 ft	396	56	7.07	Yes	Yes	Yes	Yes	**Yes**
Mercury	0-3 ft	0.330	0.146	2.26	Yes	No	Yes	Yes	No
Nickel	0-3 ft	234	130	1.80	Yes	No	Yes	Yes	No
Selenium	0-3 ft	0.431	0.63	0.684	No	No	Yes	Yes	No
Silver	0-3 ft	0.207	14	0.0148	No	No	Yes	Yes	No
Zinc	0-3 ft	172	79	2.18	Yes	No	Yes	Yes	No
BUTYLTINS (ug/kg)									
Dibutyltin	0-1 ft	19.0	1,300,000	0.0000146	No	No	No	- -	No
Monobutyltin	0-1 ft	10.4	1,300,000	0.00000800	No	No	No	- -	No
Tributyltin	0-1 ft	422	1,300,000	0.000325	No	No	Yes	No	**Yes-Bio**
Dibutyltin	0-3 ft	14.7	1,300,000	0.0000113	No	No	No	- -	No
Monobutyltin	0-3 ft	8.72	1,300,000	0.00000671	No	No	No	- -	No
Tributyltin	0-3 ft	219	1,300,000	0.000168	No	No	Yes	No	**Yes-Bio**
PESTICIDES (ug/kg)									
4,4'-DDE	0-1 ft	1.33	21	0.0633	No	No	Yes	Yes	No
4,4'-DDT	0-1 ft	21.5	21	1.02	Yes	No	Yes	Yes	No
Total DDTs	0-1 ft	23.1	21	1.10	Yes	No	Yes	Yes	No
Chlordane (alpha)	0-1 ft	1.01	250,000	0.00000404	No	No	Yes	No	**Yes-Bio**
Chlordane (gamma)	0-1 ft	18.8	250,000	0.0000752	No	No	Yes	No	**Yes-Bio**
Chlordane (technical)	0-1 ft	1,560	250,000	0.00624	No	No	Yes	No	**Yes-Bio**
Dieldrin	0-1 ft	0.608	4.9	0.124	No	No	Yes	Yes	No
Endosulfan II	0-1 ft	0.844	20,000	0.0000422	No	No	Yes	No	**Yes-Bio**
Endosulfan Sulfate	0-1 ft	1.08	20,000	0.0000540	No	No	Yes	No	**Yes-Bio**

Table N-44
Identification of CPECs in Soil at All Four AOPCs Combined - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(2 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
Endrin	0-1 ft	4.21	4.9	0.859	No	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-1 ft	3.14	4.9	0.641	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-1 ft	2.61	4.9	0.533	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-1 ft	0.437	15,000	0.0000291	No	No	Yes	No	**Yes-Bio**
4,4'-DDE	0-3 ft	1.18	21	0.0562	No	No	Yes	Yes	No
4,4'-DDT	0-3 ft	19.3	21	0.919	No	No	Yes	Yes	No
Total DDTs	0-3 ft	21.6	21	1.03	Yes	No	Yes	Yes	No
Chlordane (alpha)	0-3 ft	0.952	250,000	0.00000381	No	No	Yes	No	**Yes-Bio**
Chlordane (gamma)	0-3 ft	11.8	250,000	0.0000472	No	No	Yes	No	**Yes-Bio**
Chlordane (technical)	0-3 ft	902	250,000	0.00361	No	No	Yes	No	**Yes-Bio**
Endosulfan I	0-3 ft	0.547	20,000	0.0000274	No	No	Yes	No	**Yes-Bio**
Endosulfan II	0-3 ft	0.756	20,000	0.0000378	No	No	Yes	No	**Yes-Bio**
Endosulfan Sulfate	0-3 ft	1.01	20,000	0.0000505	No	No	Yes	No	**Yes-Bio**
Endrin	0-3 ft	3.21	4.9	0.655	No	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-3 ft	2.86	4.9	0.584	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-3 ft	2.50	4.9	0.510	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-3 ft	0.477	15,000	0.0000318	No	No	Yes	No	**Yes-Bio**
PCBs (ug/kg)									
Aroclor 1254	0-1 ft	99.4	371	0.268	No	No	Yes	Yes	No
Aroclor 1260	0-1 ft	140	371	0.377	No	No	Yes	Yes	No
Total PCBs (Aroclors)	0-1 ft	304	371	0.819	No	No	Yes	Yes	No
Aroclor 1254	0-3 ft	147	371	0.396	No	No	Yes	Yes	No
Aroclor 1260	0-3 ft	123	371	0.332	No	No	Yes	Yes	No
Total PCBs (Aroclors)	0-3 ft	325	371	0.876	No	No	Yes	Yes	No
HERBICIDES (ug/kg)									
2,4,5-T	0-1 ft	67.2	21	3.20	Yes	No	No	- -	No
Dichloroprop	0-1 ft	172	21	8.19	Yes	Yes	No	- -	**Yes**
MCPP	0-1 ft	10,300	21	490	Yes	Yes	No	- -	**Yes**
2,4,5-T	0-3 ft	66.9	21	3.19	Yes	No	No	- -	No
Dichloroprop	0-3 ft	172	21	8.19	Yes	Yes	No	- -	**Yes**
MCPP	0-3 ft	10,200	21	486	Yes	Yes	No	- -	**Yes**
VOCs (ug/kg)									
1,2,4-Trimethylbenzene	0-1 ft	2,940	1,440,000	0.00204	No	No	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-1 ft	1,150	1,440,000	0.000799	No	No	No	- -	No
2-Butanone (MEK)	0-1 ft	13.2	200,000,000	0.0000000660	No	No	No	- -	No
2-Hexanone	0-1 ft	5.17	1,250,000	0.00000414	No	No	No	- -	No
4-Isopropyltoluene	0-1 ft	1.02	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-1 ft	0.566	1,250,000	0.000000453	No	No	No	- -	No

Table N-44
Identification of CPECs in Soil at All Four AOPCs Combined - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(3 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
Acetone	0-1 ft	129	1,250,000	0.000103	No	No	No	- -	No
Benzene	0-1 ft	0.470	3,300,000	0.000000142	No	No	No	- -	No
Bromomethane	0-1 ft	1.29	730,000	0.00000177	No	No	No	- -	No
Carbon Disulfide	0-1 ft	1.04	2,000,000	0.000000520	No	No	No	- -	No
Chloroform	0-1 ft	5.06	1,875,000	0.00000270	No	No	No	- -	No
Dichlorodifluoromethane	0-1 ft	5.98	730,000	0.00000819	No	No	No	- -	No
Dichloromethane (Methylene Chloride)	0-1 ft	98.2	730,000	0.000135	No	No	No	- -	No
Ethylbenzene	0-1 ft	562	NA	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	2,040	120,000	0.0170	No	No	No	- -	No
Naphthalene	0-1 ft	1,750	NA	- -	- -	- -	No	- -	Yes - No SLV
o-Xylene	0-1 ft	0.180	120,000	0.00000150	No	No	No	- -	No
Tetrachloroethene (PCE)	0-1 ft	4.96	80,000	0.0000620	No	No	No	- -	No
Toluene	0-1 ft	1.17	1,440,000	0.000000813	No	No	No	- -	No
Trichloroethene (TCE)	0-1 ft	0.0765	40,000	0.00000191	No	No	No	- -	No
1,2,4-Trimethylbenzene	0-3 ft	2,860	1,440,000	0.00199	No	No	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-3 ft	417	1,440,000	0.000290	No	No	No	- -	No
2-Butanone (MEK)	0-3 ft	10.4	200,000,000	0.0000000520	No	No	No	- -	No
4-Isopropyltoluene	0-3 ft	14.7	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-3 ft	0.518	1,250,000	0.000000414	No	No	No	- -	No
Acetone	0-3 ft	90.8	1,250,000	0.0000726	No	No	No	- -	No
Benzene	0-3 ft	0.412	3,300,000	0.000000125	No	No	No	- -	No
Bromomethane	0-3 ft	1.01	730,000	0.00000138	No	No	No	- -	No
Carbon Disulfide	0-3 ft	1.00	2,000,000	0.000000500	No	No	No	- -	No
Dichlorodifluoromethane	0-3 ft	5.04	730,000	0.00000690	No	No	No	- -	No
Dichloromethane (Methylene Chloride)	0-3 ft	40.3	730,000	0.0000552	No	No	No	- -	No
Ethylbenzene	0-3 ft	308	NA	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-3 ft	1,460	120,000	0.0122	No	No	No	- -	No
Naphthalene	0-3 ft	960	NA	- -	- -	- -	No	- -	Yes - No SLV
o-Xylene	0-3 ft	131	120,000	0.00109	No	No	No	- -	No
Tetrachloroethene (PCE)	0-3 ft	44,400	80,000	0.555	No	No	No	- -	No
Toluene	0-3 ft	4,060	1,440,000	0.00282	No	No	No	- -	No
Trichloroethene (TCE)	0-3 ft	833	40,000	0.0208	No	No	No	- -	No
SVOCs (ug/kg)									
Benzoic Acid	0-1 ft	133	1,440,000	0.0000924	No	No	No	--	No
Bis(2-ethylhexyl) Phthalate	0-1 ft	36,400	1,020,000	0.0357	No	No	Yes	No	**Yes-Bio**
Butyl Benzyl Phthalate	0-1 ft	17.2	30,000,000	0.000000573	No	No	Yes	No	**Yes-Bio**
Carbazole	0-1 ft	272	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-1 ft	77.1	2	38.6	Yes	Yes	Yes	No	**Yes**
Diethyl Phthalate	0-1 ft	16.0	250,000,000	0.0000000640	No	No	No	--	No

Table N-44
Identification of CPECs in Soil at All Four AOPCs Combined - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(4 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
Dimethyl Phthalate	0-1 ft	30.9	NA	- -	- -	- -	No	--	Yes - No SLV
Di-n-butyl Phthalate	0-1 ft	124	30,000,000	0.00000413	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-1 ft	21.0	30,000,000	0.000000700	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-1 ft	28.6	2,800	0.0102	No	No	Yes	Yes	No
Benzoic Acid	0-3 ft	122	1,440,000	0.0000847	No	No	No	--	No
Bis(2-ethylhexyl) Phthalate	0-3 ft	31,300	1,020,000	0.0307	No	No	Yes	No	**Yes-Bio**
Butyl Benzyl Phthalate	0-3 ft	15.4	30,000,000	0.000000513	No	No	Yes	No	**Yes-Bio**
Carbazole	0-3 ft	312	NA	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-3 ft	83.4	2	41.7	Yes	Yes	Yes	No	**Yes**
Diethyl Phthalate	0-3 ft	15.6	250,000,000	0.0000000624	No	No	No	--	No
Di-n-butyl Phthalate	0-3 ft	105	30,000,000	0.00000350	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-3 ft	19.4	30,000,000	0.000000647	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-3 ft	24.8	2,800	0.00886	No	No	Yes	Yes	No
Phenol	0-3 ft		NA	- -	- -	- -	No	- -	Yes - No SLV
PAHs (ug/kg)									
2-Methylnaphthalene	0-1 ft	180	NA (6)	0.00180	No	No	Yes	Incl in tLPAH	No
Acenaphthene	0-1 ft	380	NA (6)	0.00380	No	No	Yes	Incl in tLPAH	No
Acenaphthylene	0-1 ft	18.0	NA (6)	0.000180	No	No	Yes	Incl in tLPAH	No
Anthracene	0-1 ft	535	NA (6)	0.0054	No	No	Yes	Incl in tLPAH	No
Fluorene	0-1 ft	139	NA (6)	0.00139	No	No	Yes	Incl in tLPAH	No
Naphthalene	0-1 ft	185	NA (6)	0.00185	No	No	No	--	No
Phenanthrene	0-1 ft	2,200	NA (6)	0.0220	No	No	Yes	Incl in tLPAH	No
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	3,440	100,000	0.0344	No	No	Yes	Yes	No
Benzo(a)anthracene	0-1 ft	4,390	NA (7)	3.99	Yes	No	Yes	Incl in tHPAH	No
Benzo(a)pyrene	0-1 ft	4,570	NA (7)	4.15	Yes	No	Yes	Incl in tHPAH	No
Benzo(b)fluoranthene	0-1 ft	20,700	NA (7)	18.8	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Benzo(g,h,i)perylene	0-1 ft	2,440	NA (7)	2.22	Yes	No	Yes	Incl in tHPAH	No
Benzo(k)fluoranthene	0-1 ft	19,800	NA (7)	18.0	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Benzofluoranthenes, Total	0-1 ft	10,700	NA (7)	9.73	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Chrysene	0-1 ft	4,510	NA (7)	4.10	Yes	No	Yes	Incl in tHPAH	No
Dibenz(a,h)anthracene	0-1 ft	1,120	NA (7)	1.02	Yes	No	Yes	Incl in tHPAH	No
Fluoranthene	0-1 ft	8,020	NA (7)	7.29	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Indeno(1,2,3-cd)pyrene	0-1 ft	2,670	NA (7)	2.43	Yes	No	Yes	Incl in tHPAH	No
Pyrene	0-1 ft	7,090	NA (7)	6.45	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	47,078	1,100	42.8	Yes	Yes	Yes	Yes	**Yes**

Table N-44
Identification of CPECs in Soil at All Four AOPCs Combined - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(5 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
2-Methylnaphthalene	0-3 ft	155	NA (6)	0.00155	No	No	Yes	Incl in tLPAH	No
Acenaphthene	0-3 ft	564	NA (6)	0.00564	No	No	Yes	Incl in tLPAH	No
Acenaphthylene	0-3 ft	26.2	NA (6)	0.000262	No	No	Yes	Incl in tLPAH	No
Anthracene	0-3 ft	1,250	NA (6)	0.0125	No	No	Yes	Incl in tLPAH	No
Fluorene	0-3 ft	191	NA (6)	0.00191	No	No	Yes	Incl in tLPAH	No
Naphthalene	0-3 ft	161	NA (6)	0.00161	No	No	No	--	No
Phenanthrene	0-3 ft	3,870	NA (6)	0.0387	No	No	Yes	Incl in tLPAH	No
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	5,089	100,000	0.0509	No	No	Yes	Yes	No
Benzo(a)anthracene	0-3 ft	5,260	NA (7)	4.78	Yes	No	Yes	Incl in tHPAH	No
Benzo(a)pyrene	0-3 ft	7,150	NA (7)	6.50	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Benzo(b)fluoranthene	0-3 ft	9,750	NA (7)	8.86	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Benzo(g,h,i)perylene	0-3 ft	3,690	NA (7)	3.35	Yes	No	Yes	Incl in tHPAH	No
Benzo(k)fluoranthene	0-3 ft	11,000	NA (7)	10.0	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Benzofluoranthenes, Total	0-3 ft	17,600	NA (7)	16.0	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Chrysene	0-3 ft	5,790	NA (7)	5.26	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Dibenz(a,h)anthracene	0-3 ft	1,040	NA (7)	0.945	No	No	Yes	Incl in tHPAH	No
Fluoranthene	0-3 ft	11,900	NA (7)	10.8	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Indeno(1,2,3-cd)pyrene	0-3 ft	3,480	NA (7)	3.16	Yes	No	Yes	Incl in tHPAH	No
Pyrene	0-3 ft	10,400	NA (7)	9.45	Yes	Yes	Yes	Incl in tHPAH	**Yes**
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	53,046	1,100	48.2	Yes	Yes	Yes	Yes	**Yes**
TPH (mg/kg)									
Diesel Range Organics	0-1 ft	524	NA	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	164	NA	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	2,430	NA	- -	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	473	NA	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	782	NA	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	2,030	NA	- -	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
Incl in tHPAH = COI is included in the Total HPAH Screening
Incl in tLPAH = COI is included in the Total LPAH Screening

Table N-44
Identification of CPECs in Soil at All Four AOPCs Combined - Individual COIs for Mammals
Bradford Island - Upland Operable Unit
(6 of 6)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	Concern for Threatened or Endangered Mammals? (Tij>1)	Concern for Non-threatened or Endangered Mammals? (Tij>5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)

MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).

Hierarchy of Mammalian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Individual COIs in a Given Media
(5) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Lower of 95% UCL and maximum concentration for wildlife species (birds and mammals).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).
(6) The SLV for Total LPAHs was used to screen the individual LPAHs to determine which individuals are driving Total LPAH risk, if any.
(7) The SLV for Total HPAHs was used to screen the individual HPAHs to determine which individuals are driving Total HPAH risk, if any.

Table N-45
Identification of CPECs in Soil at All Four AOPCs Combined - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(1 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
INORGANICS (mg/kg)										
Antimony	0-1 ft	1.80	0.176	10.2	0.0563	Yes	No	No	--	**Yes**
Arsenic	0-1 ft	9.20	43	0.214	0.00118	No	No	Yes	Yes	No
Cadmium	0-1 ft	1.97	0.77	2.56	0.0141	No	No	Yes	Yes	No
Chromium	0-1 ft	567	28.1	20.2	0.111	Yes	No	Yes	Yes	**Yes**
Lead	0-1 ft	398	25.5	15.6	0.0859	Yes	No	Yes	Yes	**Yes**
Mercury	0-1 ft	0.378	0.066	5.73	0.0315	Yes	No	Yes	Yes	**Yes**
Nickel	0-1 ft	227	210	1.08	0.00595	No	No	Yes	Yes	No
Selenium	0-1 ft	0.412	1.2	0.343	0.00189	No	No	Yes	Yes	No
Silver	0-1 ft	0.216	4.2	0.0514	0.000283	No	No	Yes	Yes	No
Zinc	0-1 ft	188	71.7	2.62	0.0144	No	No	Yes	Yes	No
Antimony	0-3 ft	1.64	0.176	9.32	0.0533	Yes	No	No	--	**Yes**
Arsenic	0-3 ft	8.20	43	0.191	0.00109	No	No	Yes	Yes	No
Cadmium	0-3 ft	1.67	0.77	2.17	0.0124	No	No	Yes	Yes	No
Chromium	0-3 ft	510	28.1	18.1	0.104	Yes	No	Yes	Yes	**Yes**
Lead	0-3 ft	396	25.5	15.5	0.0888	Yes	No	Yes	Yes	**Yes**
Mercury	0-3 ft	0.330	0.066	5.00	0.0286	No	No	Yes	Yes	No
Nickel	0-3 ft	234	210	1.11	0.00637	No	No	Yes	Yes	No
Selenium	0-3 ft	0.431	1.2	0.359	0.00205	No	No	Yes	Yes	No
Silver	0-3 ft	0.207	4.2	0.0493	0.000282	No	No	Yes	Yes	No
Zinc	0-3 ft	172	71.7	2.40	0.0137	No	No	Yes	Yes	No
BUTYLTINS (ug/kg)										
Dibutyltin	0-1 ft	19.0	28,000	0.000679	0.00000373	No	No	No	--	No
Monobutyltin	0-1 ft	10.4	28,000	0.000371	0.00000204	No	No	No	--	No
Tributyltin	0-1 ft	422	28,000	0.0151	0.0000830	No	No	Yes	No	**Yes-Bio**
Dibutyltin	0-3 ft	14.7	28,000	0.000525	0.00000300	No	No	No	--	No
Monobutyltin	0-3 ft	8.72	28,000	0.000311	0.00000178	No	No	No	--	No
Tributyltin	0-3 ft	219	28,000	0.00782	0.0000447	No	No	Yes	No	**Yes-Bio**
PESTICIDES (ug/kg)										
4,4'-DDE	0-1 ft	1.33	93	0.0143	0.0000787	No	No	Yes	Yes	No
4,4'-DDT	0-1 ft	21.5	93	0.231	0.00127	No	No	Yes	Yes	No
Total DDTs	0-1 ft	23.1	93	0.248	0.00137	No	No	Yes	Yes	No
Chlordane (alpha)	0-1 ft	1.01	9,000	0.000112	0.000000618	No	No	Yes	No	**Yes-Bio**
Chlordane (gamma)	0-1 ft	18.8	9,000	0.00209	0.0000115	No	No	Yes	No	**Yes-Bio**
Chlordane (technical)	0-1 ft	1,560	9,000	0.173	0.000954	No	No	Yes	No	**Yes-Bio**
Dieldrin	0-1 ft	0.608	22	0.0276	0.000152	No	No	Yes	Yes	No
Endosulfan II	0-1 ft	0.844	42,000	0.0000201	0.000000111	No	No	Yes	No	**Yes-Bio**
Endosulfan Sulfate	0-1 ft	1.08	42,000	0.0000257	0.000000142	No	No	Yes	No	**Yes-Bio**
Endrin	0-1 ft	4.21	22	0.191	0.00105	No	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-1 ft	3.14	22	0.143	0.000786	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-1 ft	2.61	22	0.119	0.000653	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-1 ft	0.437	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
4,4'-DDE	0-3 ft	1.18	93	0.0127	0.0000725	No	No	Yes	Yes	No

Table N-45
Identification of CPECs in Soil at All Four AOPCs Combined - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(2 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
4,4'-DDT	0-3 ft	19.3	93	0.208	0.00119	No	No	Yes	Yes	No
Total DDTs	0-3 ft	21.6	93	0.232	0.00133	No	No	Yes	Yes	No
Chlordane (alpha)	0-3 ft	0.952	9,000	0.000106	0.000000605	No	No	Yes	No	**Yes-Bio**
Chlordane (gamma)	0-3 ft	11.8	9,000	0.00131	0.00000749	No	No	Yes	No	**Yes-Bio**
Chlordane (technical)	0-3 ft	902	9,000	0.100	0.000573	No	No	Yes	No	**Yes-Bio**
Endosulfan I	0-3 ft	0.547	42,000	0.0000130	0.0000000744	No	No	Yes	No	**Yes-Bio**
Endosulfan II	0-3 ft	0.756	42,000	0.0000180	0.000000103	No	No	Yes	No	**Yes-Bio**
Endosulfan Sulfate	0-3 ft	1.01	42,000	0.0000240	0.000000137	No	No	Yes	No	**Yes-Bio**
Endrin	0-3 ft	3.21	22	0.146	0.000834	No	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-3 ft	2.86	22	0.130	0.000743	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-3 ft	2.50	22	0.114	0.000650	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-3 ft	0.477	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
PCBs (ug/kg)										
Aroclor 1254	0-1 ft	99.4	655	0.152	0.000835	No	No	Yes	Yes	No
Aroclor 1260	0-1 ft	140	655	0.214	0.00118	No	No	Yes	Yes	No
Aroclor 1254	0-3 ft	147	655	0.224	0.00128	No	No	Yes	Yes	No
Aroclor 1260	0-3 ft	123	655	0.188	0.00107	No	No	Yes	Yes	No
HERBICIDES (ug/kg)										
2,4,5-T	0-1 ft	67.2	93	0.723	0.00398	No	No	No	- -	No
Dichloroprop	0-1 ft	172	93	1.85	0.0102	No	No	No	- -	No
MCPP	0-1 ft	10,300	93	111	0.610	Yes	Yes	No	- -	**Yes**
2,4,5-T	0-3 ft	66.9	93	0.719	0.00411	No	No	No	- -	No
Dichloroprop	0-3 ft	172	93	1.85	0.0106	No	No	No	- -	No
MCPP	0-3 ft	10,200	93	110	0.627	Yes	Yes	No	- -	**Yes**
VOCs (ug/kg)										
1,2,4-Trimethylbenzene	0-1 ft	2,940	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
1,3,5-Trimethylbenzene	0-1 ft	1,150	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
2-Butanone (MEK)	0-1 ft	13.2	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
2-Hexanone	0-1 ft	5.17	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
4-Isopropyltoluene	0-1 ft	1.02	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-1 ft	0.566	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Acetone	0-1 ft	129	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Benzene	0-1 ft	0.470	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Bromomethane	0-1 ft	1.29	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Carbon Disulfide	0-1 ft	1.04	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Chloroform	0-1 ft	5.06	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Dichlorodifluoromethane	0-1 ft	5.98	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-1 ft	98.2	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Ethylbenzene	0-1 ft	562	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	2,040	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Naphthalene	0-1 ft	1,750	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
o-Xylene	0-1 ft	0.180	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-1 ft	4.96	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Toluene	0-1 ft	1.17	NA	- -	- -	- -	- -	No	- -	Yes - No SLV

Table N-45
Identification of CPECs in Soil at All Four AOPCs Combined - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(3 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
Trichloroethene (TCE)	0-1 ft	0.0765	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
1,2,4-Trimethylbenzene	0-3 ft	2,860	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
1,3,5-Trimethylbenzene	0-3 ft	417	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
2-Butanone (MEK)	0-3 ft	10.4	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
4-Isopropyltoluene	0-3 ft	14.7	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-3 ft	0.518	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Acetone	0-3 ft	90.8	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Benzene	0-3 ft	0.412	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Bromomethane	0-3 ft	1.01	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Carbon Disulfide	0-3 ft	1.00	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Dichlorodifluoromethane	0-3 ft	5.04	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Dichloromethane (Methylene Chloride)	0-3 ft	40.3	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Ethylbenzene	0-3 ft	308	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-3 ft	1,460	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Naphthalene	0-3 ft	960	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
o-Xylene	0-3 ft	131	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Tetrachloroethene (PCE)	0-3 ft	44,400	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Toluene	0-3 ft	4,060	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Trichloroethene (TCE)	0-3 ft	833	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
SVOCs (ug/kg)										
Benzoic Acid	0-1 ft	133	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-1 ft	36,400	4,500	8.09	0.0445	Yes	No	Yes	No	**Yes**
Butyl Benzyl Phthalate	0-1 ft	17.2	450	0.0382	0.000210	No	No	Yes	No	**Yes-Bio**
Carbazole	0-1 ft	272	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-1 ft	77.1	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Diethyl Phthalate	0-1 ft	16.0	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Dimethyl Phthalate	0-1 ft	30.9	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-1 ft	124	450	0.276	0.00152	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-1 ft	21.0	450	0.0467	0.000257	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-1 ft	28.6	2,100	0.0136	0.0000750	No	No	Yes	Yes	No
Benzoic Acid	0-3 ft	122	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Bis(2-ethylhexyl) Phthalate	0-3 ft	31,300	4,500	6.96	0.0398	Yes	No	Yes	No	**Yes**
Butyl Benzyl Phthalate	0-3 ft	15.4	450	0.0342	0.000196	No	No	Yes	No	**Yes-Bio**
Carbazole	0-3 ft	312	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-3 ft	83.4	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Diethyl Phthalate	0-3 ft	15.6	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Di-n-butyl Phthalate	0-3 ft	105	450	0.233	0.00133	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-3 ft	19.4	450	0.0431	0.000246	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-3 ft	24.8	2,100	0.0118	0.0000675	No	No	Yes	Yes	No
Phenol	0-3 ft		NA	- -	- -	- -	- -	No	- -	Yes - No SLV
PAHs (ug/kg)										
2-Methylnaphthalene	0-1 ft	180	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthene	0-1 ft	380	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthylene	0-1 ft	18.0	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**

Table N-45
Identification of CPECs in Soil at All Four AOPCs Combined - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(4 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)
Anthracene	0-1 ft	535	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluorene	0-1 ft	139	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Naphthalene	0-1 ft	185	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Phenanthrene	0-1 ft	2,200	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	3,440	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)anthracene	0-1 ft	4,390	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)pyrene	0-1 ft	4,570	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(b)fluoranthene	0-1 ft	20,700	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(g,h,i)perylene	0-1 ft	2,440	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(k)fluoranthene	0-1 ft	19,800	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzofluoranthenes, Total	0-1 ft	10,700	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Chrysene	0-1 ft	4,510	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenz(a,h)anthracene	0-1 ft	1,120	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluoranthene	0-1 ft	8,020	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Indeno(1,2,3-cd)pyrene	0-1 ft	2,670	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Pyrene	0-1 ft	7,090	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	47,078	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
2-Methylnaphthalene	0-3 ft	155	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthene	0-3 ft	564	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Acenaphthylene	0-3 ft	26.2	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Anthracene	0-3 ft	1,250	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluorene	0-3 ft	191	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Naphthalene	0-3 ft	161	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
Phenanthrene	0-3 ft	3,870	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	5,089	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)anthracene	0-3 ft	5,260	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(a)pyrene	0-3 ft	7,150	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(b)fluoranthene	0-3 ft	9,750	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(g,h,i)perylene	0-3 ft	3,690	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzo(k)fluoranthene	0-3 ft	11,000	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Benzofluoranthenes, Total	0-3 ft	17,600	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Chrysene	0-3 ft	5,790	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenz(a,h)anthracene	0-3 ft	1,040	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Fluoranthene	0-3 ft	11,900	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Indeno(1,2,3-cd)pyrene	0-3 ft	3,480	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Pyrene	0-3 ft	10,400	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	53,046	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
TPH (mg/kg)										
Diesel Range Organics	0-1 ft	524	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	164	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	2,430	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	473	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	782	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	2,030	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV

Table N-45
Identification of CPECs in Soil at All Four AOPCs Combined - Multiple COIs for Birds
Bradford Island - Upland Operable Unit
(5 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Birds Exposed to Soil (2,3,4)	Toxicity Ratio for Birds (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Birds? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 1)

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.

Hierarchy of Avian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.

(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 33
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 182
0-3 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 33
Tj (0-3 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 175
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-46
Identification of CPECs in Soil at All Four AOPCs Combined - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(1 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
INORGANICS (mg/kg)										
Antimony	0-1 ft	1.80	0.27	6.67	0.0106	No	No	No	- -	No
Arsenic	0-1 ft	9.20	46	0.200	0.000317	No	No	Yes	Yes	No
Cadmium	0-1 ft	1.97	0.36	5.47	0.00868	No	No	Yes	Yes	No
Chromium	0-1 ft	567	34	16.7	0.0264	Yes	No	Yes	Yes	No
Lead	0-1 ft	398	56	7.11	0.0113	No	No	Yes	Yes	No
Mercury	0-1 ft	0.378	0.146	2.59	0.00410	No	No	Yes	Yes	No
Nickel	0-1 ft	227	130	1.75	0.00277	No	No	Yes	Yes	No
Selenium	0-1 ft	0.412	0.63	0.654	0.00104	No	No	Yes	Yes	No
Silver	0-1 ft	0.216	14	0.0154	0.0000245	No	No	Yes	Yes	No
Zinc	0-1 ft	188	79	2.38	0.00377	No	No	Yes	Yes	No
Antimony	0-3 ft	1.64	0.27	6.07	0.00962	No	No	No	- -	No
Arsenic	0-3 ft	8.20	46	0.178	0.000282	No	No	Yes	Yes	No
Cadmium	0-3 ft	1.67	0.36	4.64	0.00735	No	No	Yes	Yes	No
Chromium	0-3 ft	510	34	15.0	0.0238	Yes	No	Yes	Yes	No
Lead	0-3 ft	396	56	7.07	0.0112	No	No	Yes	Yes	No
Mercury	0-3 ft	0.330	0.146	2.26	0.00358	No	No	Yes	Yes	No
Nickel	0-3 ft	234	130	1.80	0.00285	No	No	Yes	Yes	No
Selenium	0-3 ft	0.431	0.63	0.684	0.00108	No	No	Yes	Yes	No
Silver	0-3 ft	0.207	14	0.0148	0.0000234	No	No	Yes	Yes	No
Zinc	0-3 ft	172	79	2.18	0.00345	No	No	Yes	Yes	No
BUTYLTINS (ug/kg)										
Dibutyltin	0-1 ft	19.0	1,300,000	0.0000146	0.0000000232	No	No	No	- -	No
Monobutyltin	0-1 ft	10.4	1,300,000	0.00000800	0.0000000127	No	No	No	- -	No
Tributyltin	0-1 ft	422	1,300,000	0.000325	0.000000515	No	No	Yes	No	**Yes-Bio**
Dibutyltin	0-3 ft	14.7	1,300,000	0.0000113	0.0000000179	No	No	No	- -	No
Monobutyltin	0-3 ft	8.72	1,300,000	0.00000671	0.0000000106	No	No	No	- -	No
Tributyltin	0-3 ft	219	1,300,000	0.000168	0.000000267	No	No	Yes	No	**Yes-Bio**
PESTICIDES (ug/kg)										
4,4'-DDE	0-1 ft	1.33	21	0.0633	0.000100	No	No	Yes	Yes	No
4,4'-DDT	0-1 ft	21.5	21	1.02	0.00162	No	No	Yes	Yes	No
Total DDTs	0-1 ft	23.1	21	1.10	0.00174	No	No	Yes	Yes	No
Chlordane (alpha)	0-1 ft	1.01	250,000	0.00000404	0.00000000641	No	No	Yes	No	**Yes-Bio**
Chlordane (gamma)	0-1 ft	18.8	250,000	0.0000752	0.000000119	No	No	Yes	No	**Yes-Bio**
Chlordane (technical)	0-1 ft	1,560	250,000	0.00624	0.00000989	No	No	Yes	No	**Yes-Bio**
Dieldrin	0-1 ft	0.608	4.9	0.124	0.000197	No	No	Yes	Yes	No
Endosulfan II	0-1 ft	0.844	20,000	0.0000422	0.0000000669	No	No	Yes	No	**Yes-Bio**
Endosulfan Sulfate	0-1 ft	1.08	20,000	0.0000540	0.0000000856	No	No	Yes	No	**Yes-Bio**
Endrin	0-1 ft	4.21	4.9	0.859	0.00136	No	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-1 ft	3.14	4.9	0.641	0.00102	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-1 ft	2.61	4.9	0.533	0.000845	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-1 ft	0.437	15,000	0.0000291	0.0000000462	No	No	Yes	No	**Yes-Bio**
4,4'-DDE	0-3 ft	1.18	21	0.0562	0.0000890	No	No	Yes	Yes	No
4,4'-DDT	0-3 ft	19.3	21	0.919	0.00146	No	No	Yes	Yes	No
Total DDTs	0-3 ft	21.6	21	1.03	0.00163	No	No	Yes	Yes	No
Chlordane (alpha)	0-3 ft	0.952	250,000	0.00000381	0.00000000603	No	No	Yes	No	**Yes-Bio**

Table N-46
Identification of CPECs in Soil at All Four AOPCs Combined - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(2 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
Chlordane (gamma)	0-3 ft	11.8	250,000	0.0000472	0.0000000748	No	No	Yes	No	**Yes-Bio**
Chlordane (technical)	0-3 ft	902	250,000	0.00361	0.00000572	No	No	Yes	No	**Yes-Bio**
Endosulfan I	0-3 ft	0.547	20,000	0.0000274	0.0000000433	No	No	Yes	No	**Yes-Bio**
Endosulfan II	0-3 ft	0.756	20,000	0.0000378	0.0000000599	No	No	Yes	No	**Yes-Bio**
Endosulfan Sulfate	0-3 ft	1.01	20,000	0.0000505	0.0000000800	No	No	Yes	No	**Yes-Bio**
Endrin	0-3 ft	3.21	4.9	0.655	0.00104	No	No	Yes	No	**Yes-Bio**
Endrin Aldehyde	0-3 ft	2.86	4.9	0.584	0.000925	No	No	Yes	No	**Yes-Bio**
Endrin Ketone	0-3 ft	2.50	4.9	0.510	0.000808	No	No	Yes	No	**Yes-Bio**
Heptachlor	0-3 ft	0.477	15,000	0.0000318	0.0000000504	No	No	Yes	No	**Yes-Bio**
PCBs (ug/kg)										
Aroclor 1254	0-1 ft	99.4	371	0.268	0.000425	No	No	Yes	Yes	No
Aroclor 1260	0-1 ft	140	371	0.377	0.000598	No	No	Yes	Yes	No
Aroclor 1254	0-3 ft	147	371	0.396	0.000628	No	No	Yes	Yes	No
Aroclor 1260	0-3 ft	123	371	0.332	0.000525	No	No	Yes	Yes	No
HERBICIDES (ug/kg)										
2,4,5-T	0-1 ft	67.2	21	3.20	0.00507	No	No	No	- -	No
Dichloroprop	0-1 ft	172	21	8.19	0.0130	No	No	No	- -	No
MCPP	0-1 ft	10,300	21	490	0.778	Yes	Yes	No	- -	**Yes**
2,4,5-T	0-3 ft	66.9	21	3.19	0.00505	No	No	No	- -	No
Dichloroprop	0-3 ft	172	21	8.19	0.0130	No	No	No	- -	No
MCPP	0-3 ft	10,200	21	486	0.770	Yes	Yes	No	- -	**Yes**
VOCs (ug/kg)										
1,2,4-Trimethylbenzene	0-1 ft	2,940	1,440,000	0.00204	0.00000324	No	No	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-1 ft	1,150	1,440,000	0.000799	0.00000127	No	No	No	- -	No
2-Butanone (MEK)	0-1 ft	13.2	200,000,000	0.0000000660	0.000000000105	No	No	No	- -	No
2-Hexanone	0-1 ft	5.17	1,250,000	0.00000414	0.00000000656	No	No	No	- -	No
4-Isopropyltoluene	0-1 ft	1.02	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-1 ft	0.566	1,250,000	0.000000453	0.000000000718	No	No	No	- -	No
Acetone	0-1 ft	129	1,250,000	0.000103	0.000000164	No	No	No	- -	No
Benzene	0-1 ft	0.470	3,300,000	0.000000142	0.000000000226	No	No	No	- -	No
Bromomethane	0-1 ft	1.29	730,000	0.00000177	0.00000000280	No	No	No	- -	No
Carbon Disulfide	0-1 ft	1.04	2,000,000	0.000000520	0.000000000824	No	No	No	- -	No
Chloroform	0-1 ft	5.06	1,875,000	0.00000270	0.00000000428	No	No	No	- -	No
Dichlorodifluoromethane	0-1 ft	5.98	730,000	0.00000819	0.0000000130	No	No	No	- -	No
Dichloromethane (Methylene Chloride)	0-1 ft	98.2	730,000	0.000135	0.000000213	No	No	No	- -	No
Ethylbenzene	0-1 ft	562	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-1 ft	2,040	120,000	0.0170	0.0000270	No	No	No	- -	No
Naphthalene	0-1 ft	1,750	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
o-Xylene	0-1 ft	0.180	120,000	0.00000150	0.00000000238	No	No	No	- -	No
Tetrachloroethene (PCE)	0-1 ft	4.96	80,000	0.0000620	0.0000000983	No	No	No	- -	No
Toluene	0-1 ft	1.17	1,440,000	0.000000813	0.00000000129	No	No	No	- -	No
Trichloroethene (TCE)	0-1 ft	0.0765	40,000	0.00000191	0.00000000303	No	No	No	- -	No
1,2,4-Trimethylbenzene	0-3 ft	2,860	1,440,000	0.00199	0.00000315	No	No	Yes	No	**Yes-Bio**
1,3,5-Trimethylbenzene	0-3 ft	417	1,440,000	0.000290	0.000000459	No	No	No	- -	No
2-Butanone (MEK)	0-3 ft	10.4	200,000,000	0.0000000520	0.0000000000824	No	No	No	- -	No
4-Isopropyltoluene	0-3 ft	14.7	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
4-Methyl-2-pentanone (MIBK)	0-3 ft	0.518	1,250,000	0.000000414	0.000000000657	No	No	No	- -	No

Table N-46
Identification of CPECs in Soil at All Four AOPCs Combined - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(3 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
Acetone	0-3 ft	90.8	1,250,000	0.0000726	0.000000115	No	No	No	- -	No
Benzene	0-3 ft	0.412	3,300,000	0.000000125	0.000000000198	No	No	No	- -	No
Bromomethane	0-3 ft	1.01	730,000	0.00000138	0.00000000219	No	No	No	- -	No
Carbon Disulfide	0-3 ft	1.00	2,000,000	0.000000500	0.000000000792	No	No	No	- -	No
Dichlorodifluoromethane	0-3 ft	5.04	730,000	0.00000690	0.0000000109	No	No	No	- -	No
Dichloromethane (Methylene Chloride)	0-3 ft	40.3	730,000	0.0000552	0.0000000875	No	No	No	- -	No
Ethylbenzene	0-3 ft	308	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
m,p-Xylenes	0-3 ft	1,460	120,000	0.0122	0.0000193	No	No	No	- -	No
Naphthalene	0-3 ft	960	NA	- -	- -	- -	- -	No	- -	Yes - No SLV
o-Xylene	0-3 ft	131	120,000	0.00109	0.00000173	No	No	No	- -	No
Tetrachloroethene (PCE)	0-3 ft	44,400	80,000	0.555	0.000879	No	No	No	- -	No
Toluene	0-3 ft	4,060	1,440,000	0.00282	0.00000447	No	No	No	- -	No
Trichloroethene (TCE)	0-3 ft	833	40,000	0.0208	0.0000330	No	No	No	- -	No
SVOCs (ug/kg)										
Benzoic Acid	0-1 ft	133	1,440,000	0.0000924	0.000000146	No	No	No	--	No
Bis(2-ethylhexyl) Phthalate	0-1 ft	36,400	1,020,000	0.0357	0.0000566	No	No	Yes	No	**Yes-Bio**
Butyl Benzyl Phthalate	0-1 ft	17.2	30,000,000	0.000000573	0.000000000909	No	No	Yes	No	**Yes-Bio**
Carbazole	0-1 ft	272	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-1 ft	77.1	2	38.6	0.0611	Yes	No	Yes	No	No
Diethyl Phthalate	0-1 ft	16.0	250,000,000	0.0000000640	0.000000000101	No	No	No	--	No
Dimethyl Phthalate	0-1 ft	30.9	NA	- -	- -	- -	- -	No	--	Yes - No SLV
Di-n-butyl Phthalate	0-1 ft	124	30,000,000	0.00000413	0.00000000655	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-1 ft	21.0	30,000,000	0.000000700	0.00000000111	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-1 ft	28.6	2,800	0.0102	0.0000162	No	No	Yes	Yes	No
Benzoic Acid	0-3 ft	122	1,440,000	0.0000847	0.000000134	No	No	No	--	No
Bis(2-ethylhexyl) Phthalate	0-3 ft	31,300	1,020,000	0.0307	0.0000486	No	No	Yes	No	**Yes-Bio**
Butyl Benzyl Phthalate	0-3 ft	15.4	30,000,000	0.000000513	0.000000000813	No	No	Yes	No	**Yes-Bio**
Carbazole	0-3 ft	312	NA	- -	- -	- -	- -	Yes	No SLV	**Yes-Bio**
Dibenzofuran	0-3 ft	83.4	2	41.7	0.0661	Yes	No	Yes	No	No
Diethyl Phthalate	0-3 ft	15.6	250,000,000	0.0000000624	0.0000000000989	No	No	No	--	No
Di-n-butyl Phthalate	0-3 ft	105	30,000,000	0.00000350	0.00000000555	No	No	Yes	No	**Yes-Bio**
Di-n-octyl Phthalate	0-3 ft	19.4	30,000,000	0.000000647	0.00000000102	No	No	Yes	No	**Yes-Bio**
Pentachlorophenol	0-3 ft	24.8	2,800	0.00886	0.0000140	No	No	Yes	Yes	No
Phenol	0-3 ft		NA	- -	- -	- -	- -	No	- -	Yes - No SLV
PAHs (ug/kg)										
2-Methylnaphthalene	0-1 ft	180	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Acenaphthene	0-1 ft	380	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Acenaphthylene	0-1 ft	18.0	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Anthracene	0-1 ft	535	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Fluorene	0-1 ft	139	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Naphthalene	0-1 ft	185	NA	- -	- -	- -	- -	No	--	No
Phenanthrene	0-1 ft	2,200	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	3,440	100,000	0.0344	0.0000545	No	No	Yes	Yes	No
Benzo(a)anthracene	0-1 ft	4,390	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(a)pyrene	0-1 ft	4,570	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(b)fluoranthene	0-1 ft	20,700	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(g,h,i)perylene	0-1 ft	2,440	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No

Table N-46
Identification of CPECs in Soil at All Four AOPCs Combined - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(4 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)
Benzo(k)fluoranthene	0-1 ft	19,800	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzofluoranthenes, Total	0-1 ft	10,700	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Chrysene	0-1 ft	4,510	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Dibenz(a,h)anthracene	0-1 ft	1,120	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Fluoranthene	0-1 ft	8,020	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Indeno(1,2,3-cd)pyrene	0-1 ft	2,670	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Pyrene	0-1 ft	7,090	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	47,078	1,100	42.8	0.0679	Yes	No	Yes	Yes	No
2-Methylnaphthalene	0-3 ft	155	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Acenaphthene	0-3 ft	564	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Acenaphthylene	0-3 ft	26.2	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Anthracene	0-3 ft	1,250	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Fluorene	0-3 ft	191	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Naphthalene	0-3 ft	161	NA	- -	- -	- -	- -	No	--	No
Phenanthrene	0-3 ft	3,870	NA	- -	- -	- -	- -	Yes	Incl in tLPAH	No
Total LPAHs (KM, capped; NDs at MDL)	0-3 ft	5,089	100,000	0.0509	0.0000806	No	No	Yes	Yes	No
Benzo(a)anthracene	0-3 ft	5,260	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(a)pyrene	0-3 ft	7,150	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(b)fluoranthene	0-3 ft	9,750	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(g,h,i)perylene	0-3 ft	3,690	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzo(k)fluoranthene	0-3 ft	11,000	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Benzofluoranthenes, Total	0-3 ft	17,600	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Chrysene	0-3 ft	5,790	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Dibenz(a,h)anthracene	0-3 ft	1,040	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Fluoranthene	0-3 ft	11,900	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Indeno(1,2,3-cd)pyrene	0-3 ft	3,480	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Pyrene	0-3 ft	10,400	NA	- -	- -	- -	- -	Yes	Incl in tHPAH	No
Total HPAHs (KM, capped; NDs at MDL)	0-3 ft	53,046	1,100	48.2	0.0764	Yes	No	Yes	Yes	No
TPH (mg/kg)										
Diesel Range Organics	0-1 ft	524	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-1 ft	164	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-1 ft	2,430	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Diesel Range Organics	0-3 ft	473	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Gasoline Range Organics	0-3 ft	782	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV
Residual Range Organics	0-3 ft	2,030	NA	- -	- -	- -	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
Incl in tHPAH = COI is included in the Total HPAH Screening
Incl in tLPAH = COI is included in the Total LPAH Screening
MDL = method detection limit
NA = not available
ND = non detect

Table N-46
Identification of CPECs in Soil at All Four AOPCs Combined - Multiple COIs for Mammals
Bradford Island - Upland Operable Unit
(5 of 5)

Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Level II SLVs for Mammals Exposed to Soil (2,3,4)	Toxicity Ratio for Mammals (Tij)	(Tij/Tj) (5)	Chemical is a Concern for Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 1)	Chemical is a Concern for Non-Threatened or Endangered Mammals? (Tij/Tj >= [1/Nij] x Q when Q = 5)	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a CPEC? (5) (Q = 5)

SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).

Hierarchy of Mammalian SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.
(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

Multiple COIs Simultaneously within a Given Medium
(5) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
0-1 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 56
Tj (0-1 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 631
0-3 ft bgs Soil Interval
Nij = total number of *i* contaminants in medium *j* = 54
Tj (0-3 ft bgs) = sum of toxicity ratios for all contaminants in medium *j* = 631
Assumptions: Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table N-47
Identification of CPECs in Forebay Sediment - Individual COIs for Benthic Invertebrates
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest	IUPAC #	Max Detected Conc	Level II SLVs for Benthics Exposed to Sediment (1)	Toxicity Ratio for Benthics (Tij)	Chemical is a Concern for Benthic Community? (Tij>1)	COI is Identified as a CPEC? (2) (Q =1)
PCB Aroclors (ug/kg)						
Aroclor 1254	-	27.0	7.00	3.86	Yes	**Yes**
Total PCBs As Aroclors (NDs at MDL)	-	28.7	34.0	0.844	No	No
PCB Congeners (ug/kg)						
3,3',4,4'-Tetrachlorobiphenyl	77	0.00709	34.0	0.000209	No	No
2,3,3',4,4'-Pentachlorobiphenyl	105	1.08	34.0	0.0318	No	No
2,3,4,4',5-Pentachlorobiphenyl	114	0.0603	34.0	0.00177	No	No
2,3',4,4',5-Pentachlorobiphenyl	118	2.65	34.0	0.0779	No	No
2,3',4,4',5'-Pentachlorobiphenyl	123	0.0363	34.0	0.00107	No	No
3,3',4,4',5-Pentachlorobiphenyl	126	0.000238	34.0	0.00000700	No	No
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.380	34.0	0.0112	No	No
2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.113	34.0	0.00332	No	No
2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.00901	34.0	0.000265	No	No
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	29.7	34.0	0.875	No	No
SVOCs (ug/kg)						
Bis(2-ethylhexyl) Phthalate	-	340	750	0.453	No	No
Carbazole	-	1.40	140	0.0100	No	No
p-cresol (4-Methylphenol)	-	21.0	48	0.438	No	No
PAHs (ug/kg)						
Anthracene	-	2.70	57	0.0474	No	No
Phenanthrene	-	7.40	42	0.176	No	No
Total LPAHs (KM, capped; NDs at MDL)	-	12.0	76	0.158	No	No
Benzo(a)anthracene	-	12.0	32	0.375	No	No
Benzo(a)pyrene	-	7.50	32	0.234	No	No
Benzo(b)fluoranthene	-	9.10	27	0.337	No	No
Benzo(g,h,i)perylene	-	6.20	300	0.0207	No	No
Benzo(k)fluoranthene	-	4.90	27	0.181	No	No
Chrysene	-	20.0	57	0.351	No	No
Fluoranthene	-	12.0	111	0.108	No	No
Indeno(1,2,3-cd)pyrene	-	5.70	17	0.335	No	No
Pyrene	-	17.0	53	0.321	No	No
Total HPAHs (KM, capped; NDs at MDL)	-	73.9	193	0.383	No	No

Table N-47
Identification of CPECs in Forebay Sediment - Individual COIs for Benthic Invertebrates
Bradford Island - River Operable Unit
(2 of 2)

Chemicals of Interest	IUPAC #	Max Detected Conc	Level II SLVs for Benthics Exposed to Sediment (1)	Toxicity Ratio for Benthics (Tij)	Chemical is a Concern for Benthic Community? (Tij>1)	COI is Identified as a CPEC? (2) (Q =1)
Total PAHs (KM, capped; NDs at MDL)	-	83.4	1610	0.0518	No	No
TPH (mg/kg)						
Diesel Range Organics	-	54	NA	- -	- -	Yes - No SLV
Residual Range Organics	-	180	NA	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

(1) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the DEQ Level II SLV (see Appendix J-5c):
Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.

Individual COIs in a Given Media
(2) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-48
Identification of CPECs in Forebay Sediment - Multiple COIs for Benthic Invertebrates
Bradford Island - River Operable Unit
(1 of 2)

Chemical of Interest	IUPAC #	Max Detected Conc	Level II SLVs for Benthics Exposed to Sediment (1)	Toxicity Ratio for Benthics (Tij)	(Tij/Tj) (2)	Chemical is a Concern for Benthic Community? (Tij/Tj >= [1/Nij] x Q when Q = 1)	COI is Identified as a CPEC? (2) (Q = 1)
PCB Aroclors (ug/kg)							
Aroclor 1254	-	27.0	7.00	3.86	0.475	Yes	**Yes**
PCB Congeners (ug/kg)							
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	29.7	34.0	0.875	0.108	Yes	**Yes**
SVOCs (ug/kg)							
Bis(2-ethylhexyl) Phthalate	-	340	750	0.453	0.0558	No	No
Carbazole	-	1.40	140	0.0100	0.00123	No	No
p-cresol (4-Methylphenol)	-	21.0	48	0.438	0.0539	No	No
PAHs (ug/kg)							
Anthracene	-	2.70	57	0.0474	0.00583	No	No
Phenanthrene	-	7.40	42	0.176	0.0217	No	No
Benzo(a)anthracene	-	12.0	32	0.375	0.0462	No	No
Benzo(a)pyrene	-	7.50	32	0.234	0.0289	No	No
Benzo(b)fluoranthene	-	9.10	27	0.337	0.0415	No	No
Benzo(g,h,i)perylene	-	6.20	300	0.0207	0.00255	No	No
Benzo(k)fluoranthene	-	4.90	27	0.181	0.0224	No	No
Chrysene	-	20.0	57	0.351	0.0432	No	No
Fluoranthene	-	12.0	111	0.108	0.0133	No	No
Indeno(1,2,3-cd)pyrene	-	5.70	17	0.335	0.0413	No	No
Pyrene	-	17.0	53	0.321	0.0395	No	No
TPH (mg/kg)							
Diesel Range Organics	-	54	NA	- -	- -	- -	Yes - No SLV
Residual Range Organics	-	180	NA	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest

Table N-48
Identification of CPECs in Forebay Sediment - Multiple COIs for Benthic Invertebrates
Bradford Island - River Operable Unit
(2 of 2)

Chemical of Interest	IUPAC #	Max Detected Conc	Level II SLVs for Benthics Exposed to Sediment (1)	Toxicity Ratio for Benthics (Tij)	(Tij/Tj) (2)	Chemical is a Concern for Benthic Community? (Tij/Tj >= [1/Nij] x Q when Q = 1)	COI is Identified as a CPEC? (2) (Q = 1)

KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

(1) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the DEQ Level II SLV (see Appendix J-5c):
Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.

Multiple COIs Simultaneously within a Given Medium
(2) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
Nij = total number of *i* contaminants in medium *j* = 16
Tj = sum of toxicity ratios for all contaminants in medium *j* = 8.12
* Conservatively including both Aroclor 1254 and Total PCBs as Congeners
Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-49
Identification of CPECs in Forebay Surface Water - Individual COIs for Aquatic Organisms
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest	IUPAC #	Phase	Max Detected Conc (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	Chemical is a Concern for Aquatic Organisms (Tij>1)?	COI is Identified as a CPEC? (9) (Q = 1)
INORGANICS (ug/L)							
Arsenic	-	D	0.940	150	0.00627	No	No
Barium	-	D	24.0	4.00	6.00	Yes	**Yes**
Beryllium	-	D	0.00400	5.30	0.000755	No	No
Cadmium	-	D	0.0100	0.17	0.0580	No	No
Copper	-	D	0.520	5.8	0.0898	No	No
Lead	-	D	0.0360	1.44	0.0251	No	No
Thallium	-	D	0.0310	40.0	0.000775	No	No
Zinc	-	D	7.50	77	0.0979	No	No
PCB Congeners (pg/L)							
3,3',4,4'-Tetrachlorobiphenyl	77	C+F	0.133	14,000	0.00000950	No	No
2,3,3',4,4'-Pentachlorobiphenyl	105	C+F	0.540	14,000	0.0000386	No	No
2,3',4,4',5-Pentachlorobiphenyl	118	C+F	1.57	14,000	0.000112	No	No
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	C+F	0.382	14,000	0.0000273	No	No
2,3',4,4',5,5'-Hexachlorobiphenyl	167	C+F	0.158	14,000	0.0000113	No	No
2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	C+F	0.0662	14,000	0.00000473	No	No
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	C+F	209	14,000	0.0149	No	No
PCBs As Mammals TEQ (KM, capped; NDs at MDL) (10)	-	C+F	0.000056	7,600	0.00000000736	No	No
PAHs (ng/L)							
Acenaphthene	-	C+F	1.28	55,850	0.00002290	No	No
Anthracene	-	C+F	0.121	13,000	0.00000932	No	No
Phenanthrene	-	C+F	1.61	6,300	0.000255	No	No
Benzo(a)anthracene	-	C+F	0.0600	27.0	0.00222	No	No
Benzo(b)fluoranthene	-	C+F	0.0917	677.4	0.000135	No	No
Chrysene	-	C+F	0.171	2,042	0.0000839	No	No
Fluoranthene	-	C+F	0.784	6,160	0.0001273	No	No
TPH (ug/L)							
Diesel Range Organics	-	D	46.0	NA	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
C+F = column and filter
CPEC = chemical of potential ecological concern
COI = chemical of interest
D = Dissolved
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit

Table N-49
Identification of CPECs in Forebay Surface Water - Individual COIs for Aquatic Organisms
Bradford Island - River Operable Unit
(2 of 2)

Chemicals of Interest	IUPAC #	Phase	Max Detected Conc (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	Chemical is a Concern for Aquatic Organisms (Tij>1)?	COI is Identified as a CPEC? (9) (Q = 1)

NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
TEQ = Toxicity Equivalence Quotient
UCL = upper confidence limit on the mean
- - = not applicable

(1) The maximum detected concentration was used because there are less than 8 surface water samples.

Hierarchy of Aquatic Organisms SLV Selection (see Appendix J-5b)
(2) USEPA 2009. National Recommended Water Quality Criteria. Office of Water and Office of Science and Technology.
(3) Oregon Department of Environmental Quality (DEQ). Water Quality Criteria for freshwater organisms (Oregon Administrative rules, section 340-041, Table 33A).
(4) DEQ 1998. Updated 2001. Guidance for Ecological risk Assessment: Levels I,II,III,IV. Waste Management and Cleanup Division.
(5) Suter GW II, and CL Tsao. 1996. Toxicological Benchmarks for Screening of Potential Contaminants of Concern for Effects on Aquatic Biota on Oak Ridge Reservation: 1996 Revision. ORNL, Oak Ridge, TN. 104pp. ES/ER/TM-96/R2.
(6) USEPA 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. November. EPA-600-R-02-013.
(7) Canadian Council of Resource and Environment Ministers. 2007. Canadian Water Quality Guidelines for the Protection of Aquatic Life. December Accessed on 1/20/10 at http://ceqg-rcqe.ccme.ca/.
(8) Buchman, M.F., 2008. NOAA Screening Quick Reference Tables, NOAA OR&R Report 08-1, Seattle WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration, 34 pages.

Individual COIs in a Given Media
(9) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLV ij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Lower of Maximum detected concentration and 95% UCL (for aquatic receptors).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
(10) The lowest surface water SLV for 2,3,7,8-TCDD is protective of mammals (DEQ's 2001 SLV for surface water, as cited in Appendix J, Table J-5). Therefore, the mammalian TEQ for dioxin-like PCBs in Forebay surface water is used appropriately for comparison to the lowest surface water SLV.

Table N-50
Identification of CPECs in Forebay Surface Water - Multiple COIs for Aquatic Organisms
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest	IUPAC #	Phase	Max Detected Conc (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	(Tij/Tj) (9)	Chemical is a Concern for Aquatic Organisms? (Tij/Tj >= [1/Nij] x Q when Q = 1)	COI is Identified as a CPEC? (9) (Q = 1)
INORGANICS (ug/L)								
Arsenic	-	D	0.940	150	0.00627	0.00100	No	No
Barium	-	D	24.0	4.00	6.00	0.953	Yes	**Yes**
Beryllium	-	D	0.00400	5.30	0.000755	0.000120	No	No
Cadmium	-	D	0.0100	0.17	0.0580	0.00921	No	No
Copper	-	D	0.520	5.8	0.0898	0.0143	No	No
Lead	-	D	0.0360	1.44	0.0251	0.00398	No	No
Thallium	-	D	0.0310	40.0	0.000775	0.000123	No	No
Zinc	-	D	7.50	77	0.0979	0.0155	No	No
PCB Congeners (pg/L)								
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	C+F	209	14,000	0.0149	0.00237	No	No
PCBs As Mammals TEQ (KM, capped; NDs at MDL) (10)	-	C+F	0.000056	7,600	0.00000000736	0.00000000117	No	No
PAHs (ng/L)								
Acenaphthene	-	C+F	1.28	55,850	0.0000229	0.00000364	No	No
Anthracene	-	C+F	0.121	13,000	0.00000932	0.00000148	No	No
Phenanthrene	-	C+F	1.61	6,300	0.000255	0.0000405	No	No
Benzo(a)anthracene	-	C+F	0.0600	27.0	0.00222	0.000353	No	No
Benzo(b)fluoranthene	-	C+F	0.0917	677.4	0.000135	0.0000215	No	No
Chrysene	-	C+F	0.171	2,042	0.0000839	0.0000133	No	No
Fluoranthene	-	C+F	0.784	6,160	0.000127	0.0000202	No	No
TPH (ug/L)								
Diesel Range Organics	-	D	46.0	NA	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
C+F = column and filter
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
TEQ = Toxicity Equivalence Quotient
UCL = upper confidence limit on the mean
- - = not applicable

Table N-50
Identification of CPECs in Forebay Surface Water - Multiple COIs for Aquatic Organisms
Bradford Island - River Operable Unit
(2 of 2)

Chemicals of Interest	IUPAC #	Phase	Max Detected Conc (1)	Level II SLVs for Aquatic Organisms Exposed to Surface Water (2,3,4,5,6,7,8)	Toxicity Ratio for Aquatic Organisms (Tij)	(Tij/Tj) (9)	Chemical is a Concern for Aquatic Organisms? (Tij/Tj >= [1/Nij] x Q when Q = 1)	COI is Identified as a CPEC? (9) (Q = 1)

(1) The maximum detected concentration was used because there are less than 8 surface water samples.

Hierarchy of Aquatic Organisms SLV Selection (see Appendix J-5b)

(2) USEPA 2009. National Recommended Water Quality Criteria. Office of Water and Office of Science and Technology.

(3) Oregon Department of Environmental Quality (DEQ). Water Quality Criteria for freshwater organisms (Oregon Administrative rules, section 340-041, Table 33A).

(4) DEQ 1998. Updated 2001. Guidance for Ecological risk Assessment: Levels I,II,III,IV. Waste Management and Cleanup Division.

(5) Suter GW II, and CL Tsao. 1996. Toxicological Benchmarks for Screening of Potential Contaminants of Concern for Effects on Aquatic Biota on Oak Ridge Reservation: 1996 Revision. ORNL, Oak Ridge, TN. 104pp. ES/ER/TM-96/R2.

(6) USEPA 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. November. EPA-600-R-02-013.

(7) Canadian Council of Resource and Environment Ministers. 2007. Canadian Water Quality Guidelines for the Protection of Aquatic Life. December Accessed on 1/20/10 at http://ceqg-rcqe.ccme.ca/.

(8) Buchman, M.F., 2008. NOAA Screening Quick Reference Tables, NOAA OR&R Report 08-1, Seattle WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration, 34 pages.

Multiple COIs Simultaneously within a Given Medium

(9) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.

Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific

Q = Receptor designator

Nij = total number of *i* contaminants in medium *j* = 17

Tj = sum of toxicity ratios for all contaminants in medium *j* = 6.30

Assumptions: Q = 1 for terrestrial T&E species and all aquatic species

Q = 5 for all common terrestrial species

(10) The lowest surface water SLV for 2,3,7,8-TCDD is protective of mammals (DEQ's 2001 SLV for surface water, as cited in Appendix J, Table J-5). Therefore, the mammalian TEQ for dioxin-like PCBs in Forebay surface water is used appropriately for comparison to the lowest surface water SLV.

Note: Both the fish PCB TEQ and total PCB congener toxicity ratios were included in the sum of all toxicity ratios, which may double-count affects from PCBs.

Table N-51
Identification of Bioaccumulative CPECs in Forebay Tissue - Fish and Shellfish
Bradford Island - River Operable Unit
(1 of 5)

Tissue	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	CTLs for Fish & Shellfish Exposed to Tissue (2)	Toxicity Ratio for Fish & Shellfish (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)							
Clam	Beryllium	-	0.00218	NA	- -	No	Yes - No SLV
Clam	Cadmium	-	0.382	0.15	2.55	Yes	**Yes**
Crayfish	Antimony	-	0.0420	NA	- -	No	Yes - No SLV
Crayfish	Arsenic	-	0.519	6.6	0.0786	Yes	No
Crayfish	Chromium	-	0.764	NA	- -	No	Yes - No SLV
Crayfish	Mercury	-	0.0237	0.088	0.269	Yes	No
Crayfish	Methyl Mercury	-	0.0329	0.088	0.374	Yes	No
Crayfish	Nickel	-	4.88	NA	- -	No	Yes - No SLV
Sculpin	Cadmium	-	0.0243	0.15	0.162	Yes	**Yes**
Sculpin	Lead	-	0.103	0.12	0.858	Yes	**Yes**
Sculpin	Mercury	-	0.187	0.088	2.13	Yes	**Yes**
Smallmouth Bass	Aluminum	-	7.11	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Barium	-	1.73	NA	- -	No	Yes - No SLV
Smallmouth Bass	Copper	-	0.764	NA	- -	No	Yes - No SLV
Smallmouth Bass	Mercury	-	0.317	0.088	3.60	Yes	**Yes**
Smallmouth Bass	Zinc	-	14.9	NA	- -	Yes	**Yes - Bio - No SLV**
PCB Aroclors (ug/kg)							
Clam	Aroclor 1254	-	37.0	430	0.0860	Yes	No
Clam	Total PCBs As Aroclors (NDs at MDL)	-	37.0	430	0.0860	Yes	No
Sculpin	Aroclor 1254	-	436	430	1.01	Yes	**Yes**
Sculpin	Total PCBs As Aroclors (NDs at MDL)	-	436	430	1.01	Yes	**Yes**
Smallmouth Bass	Aroclor 1242	-	260	430	0.605	Yes	**Yes**
Smallmouth Bass	Aroclor 1254	-	4,050	430	9.42	Yes	**Yes**
Smallmouth Bass	Total PCBs As Aroclors (NDs at MDL)	-	4,100	430	9.53	Yes	**Yes**
PCB Congeners (ug/kg)							
Clam	3,3',4,4'-Tetrachlorobiphenyl	77	0.0421	430	0.0000979	Yes	No
Clam	3,4,4',5-Tetrachlorobiphenyl	81	0.00209	430	0.00000486	Yes	No
Clam	2,3,3',4,4'-Pentachlorobiphenyl	105	2.41	430	0.00560	Yes	No
Clam	2,3,4,4',5-Pentachlorobiphenyl	114	0.171	430	0.000398	Yes	No
Clam	2,3',4,4',5-Pentachlorobiphenyl	118	24.3	430	0.0565	Yes	No
Clam	2,3',4,4',5'-Pentachlorobiphenyl	123	0.441	430	0.00103	Yes	No
Clam	3,3',4,4',5-Pentachlorobiphenyl	126	0.00565	430	0.0000131	Yes	No
Clam	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	1.35	430	0.00314	Yes	No

Table N-51
Identification of Bioaccumulative CPECs in Forebay Tissue - Fish and Shellfish
Bradford Island - River Operable Unit
(2 of 5)

Tissue	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	CTLs for Fish & Shellfish Exposed to Tissue (2)	Toxicity Ratio for Fish & Shellfish (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
Clam	2,3',4,4',5,5'-Hexachlorobiphenyl	167	1.51	430	0.00351	Yes	No
Clam	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.00344	430	0.00000800	Yes	No
Clam	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	128	430	0.298	Yes	**Yes**
Clam	PCBs As Fish TEQ (KM, capped; NDs at MDL)	-	0.000189	0.00640	0.0295	Yes	No
Crayfish	3,3',4,4'-Tetrachlorobiphenyl	77	0.00867	430	0.0000202	Yes	No
Crayfish	3,4,4',5-Tetrachlorobiphenyl	81	0.000452	430	0.00000105	Yes	No
Crayfish	2,3,3',4,4'-Pentachlorobiphenyl	105	0.0908	430	0.000211	Yes	No
Crayfish	2,3,4,4',5-Pentachlorobiphenyl	114	0.697	430	0.00162	Yes	No
Crayfish	2,3',4,4',5-Pentachlorobiphenyl	118	11.9	430	0.0277	Yes	No
Crayfish	2,3',4,4',5'-Pentachlorobiphenyl	123	0.412	430	0.000958	Yes	No
Crayfish	3,3',4,4',5-Pentachlorobiphenyl	126	0.00208	430	0.00000484	Yes	No
Crayfish	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	3.53	430	0.00821	Yes	No
Crayfish	2,3',4,4',5,5'-Hexachlorobiphenyl	167	1.49	430	0.00347	Yes	No
Crayfish	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.0821	430	0.000191	Yes	No
Crayfish	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	36.5	430	0.0848	Yes	No
Crayfish	PCBs As Fish TEQ (KM, capped; NDs at MDL)	-	0.000123	0.00640	0.0192	Yes	No
Sculpin	3,3',4,4'-Tetrachlorobiphenyl	77	0.1600	430	0.000372	Yes	No
Sculpin	3,4,4',5-Tetrachlorobiphenyl	81	0.00145	430	0.00000337	Yes	No
Sculpin	2,3,3',4,4'-Pentachlorobiphenyl	105	177	430	0.412	Yes	**Yes**
Sculpin	2,3,4,4',5-Pentachlorobiphenyl	114	13.3	430	0.0309	Yes	No
Sculpin	2,3',4,4',5-Pentachlorobiphenyl	118	500	430	1.16	Yes	**Yes**
Sculpin	2,3',4,4',5'-Pentachlorobiphenyl	123	7.77	430	0.0181	Yes	No
Sculpin	3,3',4,4',5-Pentachlorobiphenyl	126	0.0247	430	0.0000574	Yes	No
Sculpin	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	79.8	430	0.186	Yes	**Yes**
Sculpin	2,3',4,4',5,5'-Hexachlorobiphenyl	167	20.4	430	0.0474	Yes	No
Sculpin	3,3',4,4',5,5'-Hexachlorobiphenyl	169	0.00365	430	0.00000849	Yes	No
Sculpin	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	1.67	430	0.00388	Yes	No
Sculpin	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	3,180	430	7.40	Yes	**Yes**
Sculpin	PCBs As Fish TEQ (KM, capped; NDs at MDL)	-	0.00427	0.00640	0.668	Yes	**Yes**
Smallmouth Bass	3,3',4,4'-Tetrachlorobiphenyl	77	5.64	430	0.0131	Yes	No
Smallmouth Bass	3,4,4',5-Tetrachlorobiphenyl	81	0.691	430	0.00161	Yes	No
Smallmouth Bass	2,3,3',4,4'-Pentachlorobiphenyl	105	887	430	2.06	Yes	**Yes**
Smallmouth Bass	2,3,4,4',5-Pentachlorobiphenyl	114	65.6	430	0.153	Yes	**Yes**
Smallmouth Bass	2,3',4,4',5-Pentachlorobiphenyl	118	2,310	430	5.37	Yes	**Yes**

Table N-51
Identification of Bioaccumulative CPECs in Forebay Tissue - Fish and Shellfish
Bradford Island - River Operable Unit
(3 of 5)

Tissue	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	CTLs for Fish & Shellfish Exposed to Tissue (2)	Toxicity Ratio for Fish & Shellfish (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
Smallmouth Bass	2,3',4,4',5'-Pentachlorobiphenyl	123	38.7	430	0.0900	Yes	No
Smallmouth Bass	3,3',4,4',5-Pentachlorobiphenyl	126	1.92	430	0.00447	Yes	No
Smallmouth Bass	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	375	430	0.872	Yes	**Yes**
Smallmouth Bass	2,3',4,4',5,5'-Hexachlorobiphenyl	167	108	430	0.251	Yes	**Yes**
Smallmouth Bass	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	8.14	430	0.0189	Yes	No
Smallmouth Bass	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	19,314	430	44.9	Yes	**Yes**
Smallmouth Bass	PCBs As Fish TEQ (KM, capped; NDs at MDL)	-	0.0293	0.00640	4.58	Yes	**Yes**
SVOCs (ug/kg)							
Clam	Bis(2-ethylhexyl) Phthalate	-	717	1,760	0.407	Yes	**Yes**
Clam	Butyl Benzyl Phthalate	-	13.4	310	0.0432	Yes	No
Clam	Di-n-octyl Phthalate	-	38.0	63,000	0.000603	Yes	No
Clam	p-cresol (4-Methylphenol)	-	15.2	NA	- -	No	Yes - No SLV
Crayfish	Bis(2-ethylhexyl) Phthalate	-	77.4	1,760	0.0440	Yes	No
Smallmouth Bass	Bis(2-ethylhexyl) Phthalate	-	338	1,760	0.192	Yes	**Yes**
Smallmouth Bass	Butyl Benzyl Phthalate	-	239	310	0.771	Yes	**Yes**
Smallmouth Bass	Di-n-butyl Phthalate	-	150	3,120	0.0481	Yes	No
PAHs (ug/kg)							
Clam	Acenaphthene[4]	-	1.81	19,000	0.0000953	Yes	No
Clam	Anthracene[4]	-	1.05	19,000	0.0000553	Yes	No
Clam	Fluorene[4]	-	2.51	19,000	0.000132	Yes	No
Clam	Phenanthrene[4]	-	10.5	19,000	0.000553	Yes	No
Clam	Benzo(a)anthracene[5]	-	1.11	1,000	0.00111	Yes	No
Clam	Benzo(a)pyrene[5]	-	0.580	1,000	0.000580	Yes	No
Clam	Benzo(b)fluoranthene[5]	-	0.655	1,000	0.000655	Yes	No
Clam	Benzo(g,h,i)perylene[5]	-	0.232	1,000	0.000232	Yes	No
Clam	Benzo(k)fluoranthene[5]	-	0.187	1,000	0.000187	Yes	No
Clam	Chrysene[5]	-	3.14	1,000	0.00314	Yes	No
Clam	Fluoranthene	-	11.7	19,000	0.000616	Yes	No
Clam	Indeno(1,2,3-cd)pyrene[5]	-	0.476	1,000	0.000476	Yes	No
Clam	Pyrene	-	2.76	1,000	0.00276	Yes	No
Crayfish	Acenaphthene[4]	-	0.167	19,000	0.00000879	Yes	No
Crayfish	Anthracene[4]	-	0.134	19,000	0.00000705	Yes	No

Table N-51
Identification of Bioaccumulative CPECs in Forebay Tissue - Fish and Shellfish
Bradford Island - River Operable Unit
(4 of 5)

Tissue	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	CTLs for Fish & Shellfish Exposed to Tissue (2)	Toxicity Ratio for Fish & Shellfish (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
Crayfish	Fluorene[4]	-	0.169	19,000	0.00000889	Yes	No
Crayfish	Phenanthrene[4]	-	0.583	19,000	0.0000307	Yes	No
Crayfish	Benzo(a)anthracene[5]	-	0.274	1,000	0.000274	Yes	No
Crayfish	Benzo(a)pyrene[5]	-	0.170	1,000	0.000170	Yes	No
Crayfish	Benzo(b)fluoranthene[5]	-	0.140	1,000	0.000140	Yes	No
Crayfish	Benzo(g,h,i)perylene[5]	-	0.206	1,000	0.000206	Yes	No
Crayfish	Benzo(k)fluoranthene[5]	-	0.116	1,000	0.000116	Yes	No
Crayfish	Chrysene[5]	-	0.144	1,000	0.000144	Yes	No
Crayfish	Fluoranthene	-	0.426	19,000	0.0000224	Yes	No
Crayfish	Indeno(1,2,3-cd)pyrene[5]	-	0.166	1,000	0.000166	Yes	No
Crayfish	Pyrene	-	0.468	1,000	0.000468	Yes	No
Smallmouth Bass	Acenaphthene[4]	-	1.07	19,000	0.0000563	Yes	No
Smallmouth Bass	Anthracene[4]	-	11.8	19,000	0.000621	Yes	No
Smallmouth Bass	Fluorene[4]	-	2.52	19,000	0.000133	Yes	No
Smallmouth Bass	Phenanthrene[4]	-	2.88	19,000	0.000152	Yes	No
Smallmouth Bass	Benzo(a)anthracene[5]	-	3.69	1,000	0.00369	Yes	No
Smallmouth Bass	Benzo(a)pyrene[5]	-	3.25	1,000	0.00325	Yes	No
Smallmouth Bass	Benzo(b)fluoranthene[5]	-	4.23	1,000	0.00423	Yes	No
Smallmouth Bass	Benzo(g,h,i)perylene[5]	-	2.72	1,000	0.00272	Yes	No
Smallmouth Bass	Benzo(k)fluoranthene[5]	-	3.29	1,000	0.00329	Yes	No
Smallmouth Bass	Chrysene[5]	-	2.96	1,000	0.00296	Yes	No
Smallmouth Bass	Dibenz(a,h)anthracene[5]	-	3.44	1,000	0.00344	Yes	No
Smallmouth Bass	Fluoranthene	-	3.03	19,000	0.000159	Yes	No
Smallmouth Bass	Indeno(1,2,3-cd)pyrene[5]	-	3.89	1,000	0.00389	Yes	No
Smallmouth Bass	Pyrene	-	2.30	1,000	0.00230	Yes	No
Clam Sum R_{Bac}[6] = 3.09 : 3.31 : 3.04							
Crayfish Sum R_{Bac}[6] = - - : 0.852 : 0.787							
Sculpin Sum R_{Bac}[6] = 4.16 : 10.5 : 3.81							
Smallmouth Bass Sum R_{Bac}[6] = 14.2 : 49.6 : 9.22							

This table only includes COIs detected > 5% and above the reference area (metals only).

Table N-51
Identification of Bioaccumulative CPECs in Forebay Tissue - Fish and Shellfish
Bradford Island - River Operable Unit
(5 of 5)

Tissue	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	CTLs for Fish & Shellfish Exposed to Tissue (2)	Toxicity Ratio for Fish & Shellfish (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)

CPEC = chemical of potential ecological concern
COI = chemical of interest
CTL = critical tissue level (for fish)
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
TEQ = Toxicity Equivalence Quotient
UCL = upper confidence limit on the mean
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.
(2) DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31 (see Appendix J-5d).

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with R_{Bac} > 0.1 and Sum R_{Bac} > 1, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The SLV for Fluoranthene was used as a surrogate for the individual LPAHs without SLVs. Fluoranthene is considered an HPAH in the RI, HHRA, and ERA and used to calculate Total HPAH; however, fluoranthene is more accurately a PAH that borders the two with a molecular weight more similar to HPAHs and but a structure more similar to LPAHs. Therefore, use of fluoranthene as a surrogate for LPAHs is appropriate in the absence of any LPAH SLVs.
(5) The SLV for pyrene was used as a surrogate for the individual HPAHs without SLVs.
(6) The Sum R_{Bac} is the sum of the individual $R_{Bac.}$ Three ways of calculating Sum R_{Bac}: Total PCBs as Aroclors, individual metals, SVOCs, and PAHs : Total PCBs as Congeners, individual metals, SVOCs, and PAHs : PCBs as Fish TEQs, individual metals, SVOCs, and PAHs.

Table N-52
Identification of Bioaccumulative CPECs in Forebay Sediment - Fish
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	SLVs for Freshwater Fish Exposed to Sediment (2)	Toxicity Ratio for Fish (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)						
Aluminum	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
Barium	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Cadmium	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
Copper	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Lead	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
Mercury	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
Zinc	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
PCB Aroclors (ug/kg)						
Aroclor 1254	-	27.0	22.0	1.23	Yes	**Yes**
Total PCBs As Aroclors (NDs at MDL)	-	28.7	22.0	1.30	Yes	**Yes**
PCB Congeners (ug/kg)						
2,3,3',4,4'-Pentachlorobiphenyl	105	0.318	62.0	0.00513	Yes	No
2,3,4,4',5-Pentachlorobiphenyl	114	0.0238	65.0	0.000366	Yes	No
2,3',4,4',5-Pentachlorobiphenyl	118	0.783	79.0	0.00991	Yes	No
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.149	79.0	0.00189	Yes	No
2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.0449	79.0	0.000568	Yes	No
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	3.59	22.0	0.163	Yes	No
PCBs As Fish TEQ (KM, capped; NDs at MDL)	-	0.00000759	0.000560	0.0136	Yes	No
SVOCs (ug/kg)						
Bis(2-ethylhexyl) Phthalate	-	180	NA	- -	Yes	**Yes - Bio - No SLV**
Sum R_{Bac}^4 = 1.30 : 0.163 : 0.0136						

This table only includes the CPECs detected > 5% from the Tissue - Fish Table (Table N-51).
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
TEQ = Toxicity Equivalence Quotient
UCL = upper confidence limit on the mean

Table N-52
Identification of Bioaccumulative CPECs in Forebay Sediment - Fish
Bradford Island - River Operable Unit
(2 of 2)

Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	SLVs for Freshwater Fish Exposed to Sediment (2)	Toxicity Ratio for Fish (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)

Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.
(2) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the bioaccumulative freshwater fish SLVs from (see Appendix J-5c):

Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31.

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The Sum R_{Bac} is the R_{Bac} for Total PCBs as Aroclors, Total PCBs as congeners, and PCBs as TEQ (respectively), since there are no other COIs with toxicity ratios.

Table N-53
Identification of Bioaccumulative CPECs in Forebay Tissue - Birds (Individual)
Bradford Island - River Operable Unit
(1 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Individual Birds Exposed to Tissue (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)							
Crayfish	Antimony	-	0.0420	NA	- -	No	Yes - No SLV
Crayfish	Arsenic	-	0.519	13	0.0399	Yes	No
Crayfish	Chromium	-	0.764	NA	- -	No	Yes - No SLV
Crayfish	Mercury	-	0.0237	0.074	0.320	Yes	**Yes**
Crayfish	Methyl Mercury	-	0.0329	0.074	0.445	Yes	**Yes**
Crayfish	Nickel	-	4.88	NA	- -	No	Yes - No SLV
Sculpin	Cadmium	-	0.0243	8.4	0.00289	Yes	No
Sculpin	Lead	-	0.103	9.3	0.0111	Yes	No
Sculpin	Mercury	-	0.187	0.074	2.53	Yes	**Yes**
Smallmouth Bass	Aluminum	-	7.11	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Barium	-	1.73	NA	- -	No	Yes - No SLV
Smallmouth Bass	Copper	-	0.764	NA	- -	No	Yes - No SLV
Smallmouth Bass	Mercury	-	0.317	0.074	4.28	Yes	**Yes**
Smallmouth Bass	Zinc	-	14.9	NA	- -	Yes	**Yes - Bio - No SLV**
PCB Aroclors (ug/kg)							
Sculpin	Aroclor 1254	-	436	35	12.5	Yes	**Yes**
Sculpin	Total PCBs As Aroclors (NDs at MDL)	-	436	35	12.5	Yes	**Yes**
Smallmouth Bass	Aroclor 1242	-	260	35	7.43	Yes	**Yes**
Smallmouth Bass	Aroclor 1254	-	4,050	35	116	Yes	**Yes**
Smallmouth Bass	Total PCBs As Aroclors (NDs at MDL)	-	4,100	35	117	Yes	**Yes**
PCB Congeners (ug/kg)							
Crayfish	3,3',4,4'-Tetrachlorobiphenyl	77	0.00867	0.16	0.0542	Yes	No
Crayfish	3,4,4',5-Tetrachlorobiphenyl	81	0.000452	0.08	0.00565	Yes	No
Crayfish	2,3,3',4,4'-Pentachlorobiphenyl	105	0.0908	80	0.00114	Yes	No
Crayfish	2,3,4,4',5-Pentachlorobiphenyl	114	0.697	800	0.000871	Yes	No
Crayfish	2,3',4,4',5-Pentachlorobiphenyl	118	11.9	800	0.0149	Yes	No
Crayfish	2,3',4,4',5'-Pentachlorobiphenyl	123	0.412	800	0.000515	Yes	No
Crayfish	3,3',4,4',5-Pentachlorobiphenyl	126	0.00208	0.08	0.0260	Yes	No
Crayfish	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	3.53	80	0.0441	Yes	No
Crayfish	2,3',4,4',5,5'-Hexachlorobiphenyl	167	1.49	800	0.00186	Yes	No
Crayfish	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.0821	800	0.000103	Yes	No
Crayfish	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	36.5	35	1.04	Yes	**Yes**

Table N-53
Identification of Bioaccumulative CPECs in Forebay Tissue - Birds (Individual)
Bradford Island - River Operable Unit
(2 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Individual Birds Exposed to Tissue (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
Crayfish	PCBs As Avian TEQ (KM, capped; NDs at MDL)	-	0.000950	0.019	0.0500	Yes	No
Sculpin	3,3',4,4'-Tetrachlorobiphenyl	77	0.160	0.16	1.00	Yes	**Yes**
Sculpin	3,4,4',5-Tetrachlorobiphenyl	81	0.00145	0.08	0.0181	Yes	No
Sculpin	2,3,3',4,4'-Pentachlorobiphenyl	105	177	80	2.21	Yes	**Yes**
Sculpin	2,3,4,4',5-Pentachlorobiphenyl	114	13.3	800	0.0166	Yes	No
Sculpin	2,3',4,4',5-Pentachlorobiphenyl	118	500	800	0.625	Yes	**Yes**
Sculpin	2,3',4,4',5'-Pentachlorobiphenyl	123	7.77	800	0.00971	Yes	No
Sculpin	3,3',4,4',5-Pentachlorobiphenyl	126	0.0247	0.08	0.309	Yes	**Yes**
Sculpin	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	79.8	80	1.00	Yes	**Yes**
Sculpin	2,3',4,4',5,5'-Hexachlorobiphenyl	167	20.4	800	0.0255	Yes	No
Sculpin	3,3',4,4',5,5'-Hexachlorobiphenyl	169	0.00365	8	0.000456	Yes	No
Sculpin	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	1.67	800	0.00209	Yes	No
Sculpin	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	3,180	35	90.9	Yes	**Yes**
Sculpin	PCBs As Avian TEQ (KM, capped; NDs at MDL)	-	0.0302	0.019	1.59	Yes	**Yes**
Smallmouth Bass	3,3',4,4'-Tetrachlorobiphenyl	77	5.64	0.16	35.3	Yes	**Yes**
Smallmouth Bass	3,4,4',5-Tetrachlorobiphenyl	81	0.691	0.08	8.64	Yes	**Yes**
Smallmouth Bass	2,3,3',4,4'-Pentachlorobiphenyl	105	887	80	11.1	Yes	**Yes**
Smallmouth Bass	2,3,4,4',5-Pentachlorobiphenyl	114	65.6	800	0.0820	Yes	No
Smallmouth Bass	2,3',4,4',5-Pentachlorobiphenyl	118	2,310	800	2.89	Yes	**Yes**
Smallmouth Bass	2,3',4,4',5'-Pentachlorobiphenyl	123	38.7	800	0.0484	Yes	No
Smallmouth Bass	3,3',4,4',5-Pentachlorobiphenyl	126	1.92	0.08	24.0	Yes	**Yes**
Smallmouth Bass	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	375	80	4.69	Yes	**Yes**
Smallmouth Bass	2,3',4,4',5,5'-Hexachlorobiphenyl	167	108	800	0.135	Yes	**Yes**
Smallmouth Bass	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	8.14	800	0.0102	Yes	No
Smallmouth Bass	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	19,314	35	552	Yes	**Yes**
Smallmouth Bass	PCBs As Avian TEQ (KM, capped; NDs at MDL)	-	0.692	0.019	36.4	Yes	**Yes**
SVOCs (ug/kg)							
Crayfish	Bis(2-ethylhexyl) Phthalate	-	77.4	6,260	0.0124	Yes	No
Smallmouth Bass	Bis(2-ethylhexyl) Phthalate	-	338	6,260	0.0540	Yes	No
Smallmouth Bass	Butyl Benzyl Phthalate	-	239	6,260	0.0382	Yes	No
Smallmouth Bass	Di-n-butyl Phthalate	-	150	626	0.240	Yes	**Yes**
PAHs (ug/kg)							

Table N-53
Identification of Bioaccumulative CPECs in Forebay Tissue - Birds (Individual)
Bradford Island - River Operable Unit
(3 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Individual Birds Exposed to Tissue (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
Crayfish	Acenaphthene	-	0.160	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Anthracene	-	0.094	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Fluorene	-	0.165	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Phenanthrene	-	0.576	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(a)anthracene	-	0.273	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(a)pyrene	-	0.135	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(b)fluoranthene	-	0.140	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(g,h,i)perylene	-	0.165	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(k)fluoranthene	-	0.111	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Chrysene	-	0.144	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Fluoranthene	-	0.426	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Indeno(1,2,3-cd)pyrene	-	0.166	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Pyrene	-	0.468	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Acenaphthene	-	1.07	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Anthracene	-	11.8	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Fluorene	-	2.52	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Phenanthrene	-	2.88	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Benzo(a)anthracene	-	3.69	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Benzo(a)pyrene	-	3.25	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Benzo(b)fluoranthene	-	4.23	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Benzo(g,h,i)perylene	-	2.72	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Benzo(k)fluoranthene	-	3.29	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Chrysene	-	2.96	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Dibenz(a,h)anthracene	-	3.44	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Fluoranthene	-	3.03	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Indeno(1,2,3-cd)pyrene	-	3.89	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Pyrene	-	2.30	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish Sum R_{Bac}^4 = - - : 1.86 : 0.867							
Sculpin Sum R_{Bac}^4 = 15.0 : 93.4 : 4.13							
Smallmouth Bass Sum R_{Bac}^4 = 122 : 556 : 41.1							

This table only includes COIs detected > 5% and above the reference area (metals only).
ATL = acceptable tissue level
CPEC = chemical of potential ecological concern

Table N-53
Identification of Bioaccumulative CPECs in Forebay Tissue - Birds (Individual)
Bradford Island - River Operable Unit
(4 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Individual Birds Exposed to Tissue (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)

COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
ND = non detect
NA = not available
TEQ = Toxicity Equivalence Quotient
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.
(2) DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31 (see Appendix J-5d).

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The Sum R_{Bac} is the sum of the individual R_{Bac}. Three ways of calculating Sum R_{Bac}; Total PCBs as Aroclors, individual metals, SVOCs, and PAHs : Total PCBs as Congeners, individual metals, SVOCs, and PAHs : PCBs as Fish TEQs, individual metals, SVOCs, and PAHs.

Table N-54
Identification of Bioaccumulative CPECs in Forebay Tissue - Birds (Population)
Bradford Island - River Operable Unit
(1 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Bird Populations Exposed to Tissue (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)							
Crayfish	Antimony	-	0.0420	NA	- -	No	Yes - No SLV
Crayfish	Arsenic	-	0.519	64	0.00811	Yes	No
Crayfish	Chromium	-	0.764	NA	- -	No	Yes - No SLV
Crayfish	Mercury	-	0.0237	0.15	0.158	Yes	No
Crayfish	Methyl Mercury	-	0.0329	0.15	0.219	Yes	No
Crayfish	Nickel	-	4.88	NA	- -	No	Yes - No SLV
Sculpin	Cadmium	-	0.0243	42	0.000579	Yes	No
Sculpin	Lead	-	0.103	46	0.00224	Yes	No
Sculpin	Mercury	-	0.187	0.15	1.25	Yes	**Yes**
Smallmouth Bass	Aluminum	-	7.11	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Barium	-	1.73	NA	- -	No	Yes - No SLV
Smallmouth Bass	Copper	-	0.764	NA	- -	No	Yes - No SLV
Smallmouth Bass	Mercury	-	0.317	0.15	2.11	Yes	**Yes**
Smallmouth Bass	Zinc	-	14.9	NA	- -	Yes	**Yes - Bio - No SLV**
PCB Aroclors (ug/kg)							
Sculpin	Aroclor 1254	-	436	1,800	0.242	Yes	**Yes**
Sculpin	Total PCBs As Aroclors (NDs at MDL)	-	436	1,800	0.242	Yes	**Yes**
Smallmouth Bass	Aroclor 1242	-	260	1,800	0.144	Yes	**Yes**
Smallmouth Bass	Aroclor 1254	-	4,050	1,800	2.25	Yes	**Yes**
Smallmouth Bass	Total PCBs As Aroclors (NDs at MDL)	-	4,100	1,800	2.28	Yes	**Yes**
PCB Congeners (ug/kg)							
Crayfish	3,3',4,4'-Tetrachlorobiphenyl	77	0.00867	0.800	0.0108	Yes	No
Crayfish	3,4,4',5-Tetrachlorobiphenyl	81	0.000452	0.400	0.00113	Yes	No
Crayfish	2,3,3',4,4'-Pentachlorobiphenyl	105	0.0908	400	0.000227	Yes	No
Crayfish	2,3,4,4',5-Pentachlorobiphenyl	114	0.697	4,000	0.000174	Yes	No
Crayfish	2,3',4,4',5-Pentachlorobiphenyl	118	11.9	4,000	0.00298	Yes	No
Crayfish	2,3',4,4',5'-Pentachlorobiphenyl	123	0.412	4,000	0.000103	Yes	No
Crayfish	3,3',4,4',5-Pentachlorobiphenyl	126	0.00208	0.400	0.00520	Yes	No
Crayfish	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	3.53	400	0.00883	Yes	No
Crayfish	2,3',4,4',5,5'-Hexachlorobiphenyl	167	1.49	4,000	0.000373	Yes	No
Crayfish	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.0821	4,000	0.0000205	Yes	No
Crayfish	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	36.5	1,800	0.0203	Yes	No
Crayfish	PCBs As Avian TEQ (KM, capped; NDs at MDL)	-	0.000950	0.0400	0.0238	Yes	No

Table N-54
Identification of Bioaccumulative CPECs in Forebay Tissue - Birds (Population)
Bradford Island - River Operable Unit
(2 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Bird Populations Exposed to Tissue (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
Sculpin	3,3',4,4'-Tetrachlorobiphenyl	77	0.1600	0.800	0.200	Yes	**Yes**
Sculpin	3,4,4',5-Tetrachlorobiphenyl	81	0.00145	0.400	0.00363	Yes	No
Sculpin	2,3,3',4,4'-Pentachlorobiphenyl	105	177	400	0.443	Yes	**Yes**
Sculpin	2,3,4,4',5-Pentachlorobiphenyl	114	13.3	4,000	0.00333	Yes	No
Sculpin	2,3',4,4',5-Pentachlorobiphenyl	118	500	4,000	0.125	Yes	**Yes**
Sculpin	2,3',4,4',5'-Pentachlorobiphenyl	123	7.77	4,000	0.00194	Yes	No
Sculpin	3,3',4,4',5-Pentachlorobiphenyl	126	0.0247	0.400	0.0618	Yes	No
Sculpin	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	79.8	400	0.200	Yes	**Yes**
Sculpin	2,3',4,4',5,5'-Hexachlorobiphenyl	167	20.4	4,000	0.00510	Yes	No
Sculpin	3,3',4,4',5,5'-Hexachlorobiphenyl	169	0.00365	40.0	0.0000913	Yes	No
Sculpin	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	1.67	4,000	0.000418	Yes	No
Sculpin	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	3,180	1,800	1.77	Yes	**Yes**
Sculpin	PCBs As Avian TEQ (KM, capped; NDs at MDL)	-	0.0302	0.0400	0.754	Yes	**Yes**
Smallmouth Bass	3,3',4,4'-Tetrachlorobiphenyl	77	5.64	0.800	7.05	Yes	**Yes**
Smallmouth Bass	3,4,4',5-Tetrachlorobiphenyl	81	0.691	0.400	1.73	Yes	**Yes**
Smallmouth Bass	2,3,3',4,4'-Pentachlorobiphenyl	105	887	400	2.22	Yes	**Yes**
Smallmouth Bass	2,3,4,4',5-Pentachlorobiphenyl	114	65.6	4,000	0.0164	Yes	No
Smallmouth Bass	2,3',4,4',5-Pentachlorobiphenyl	118	2,310	4,000	0.578	Yes	**Yes**
Smallmouth Bass	2,3',4,4',5'-Pentachlorobiphenyl	123	38.7	4,000	0.00968	Yes	No
Smallmouth Bass	3,3',4,4',5-Pentachlorobiphenyl	126	1.92	0.400	4.80	Yes	**Yes**
Smallmouth Bass	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	375	400	0.938	Yes	**Yes**
Smallmouth Bass	2,3',4,4',5,5'-Hexachlorobiphenyl	167	108	4,000	0.0270	Yes	No
Smallmouth Bass	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	8.14	4,000	0.00204	Yes	No
Smallmouth Bass	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	19,314	1,800	10.7	Yes	**Yes**
Smallmouth Bass	PCBs As Avian TEQ (KM, capped; NDs at MDL)	-	0.692	0.0400	17.3	Yes	**Yes**
SVOCs (ug/kg)							
Crayfish	Bis(2-ethylhexyl) Phthalate	-	77.4	31,300	0.00247	Yes	No
Smallmouth Bass	Bis(2-ethylhexyl) Phthalate	-	338	31,300	0.0108	Yes	No
Smallmouth Bass	Butyl Benzyl Phthalate	-	239	31,300	0.00764	Yes	No
Smallmouth Bass	Di-n-butyl Phthalate	-	150	6,260	0.0240	Yes	No

Table N-54
Identification of Bioaccumulative CPECs in Forebay Tissue - Birds (Population)
Bradford Island - River Operable Unit
(3 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Bird Populations Exposed to Tissue (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
PAHs (ug/kg)							
Crayfish	Acenaphthene	-	0.160	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Anthracene	-	0.094	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Fluorene	-	0.165	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Phenanthrene	-	0.576	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(a)anthracene	-	0.273	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(a)pyrene	-	0.135	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(b)fluoranthene	-	0.140	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(g,h,i)perylene	-	0.165	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(k)fluoranthene	-	0.111	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Chrysene	-	0.144	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Fluoranthene	-	0.426	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Indeno(1,2,3-cd)pyrene	-	0.166	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Pyrene	-	0.468	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Acenaphthene	-	1.07	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Anthracene	-	11.8	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Fluorene	-	2.52	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Phenanthrene	-	2.88	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Benzo(a)anthracene	-	3.69	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Benzo(a)pyrene	-	3.25	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Benzo(b)fluoranthene	-	4.23	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Benzo(g,h,i)perylene	-	2.72	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Benzo(k)fluoranthene	-	3.29	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Chrysene	-	2.96	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Dibenz(a,h)anthracene	-	3.44	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Fluoranthene	-	3.03	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Indeno(1,2,3-cd)pyrene	-	3.89	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Pyrene	-	2.30	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish Sum R_{Bac}[4] = - - : 0.408 : 0.412							
Sculpin Sum R_{Bac}[4] = 1.49 : 3.02 : 2.00							
Smallmouth Bass Sum R_{Bac}[4] = 4.43 : 12.9 : 19.5							

This table only includes COIs detected > 5% and above the reference area (metals only).
ATL = acceptable tissue level
CPEC = chemical of potential ecological concern

Table N-54
Identification of Bioaccumulative CPECs in Forebay Tissue - Birds (Population)
Bradford Island - River Operable Unit
(4 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Bird Populations Exposed to Tissue (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)

COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
TEQ = Toxicity Equivalence Quotient
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.
(2) DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31 (see Appendix J-5d).

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The Sum R_{Bac} is the sum of the individual R_{Bac}. Three ways of calculating Sum R_{Bac}; Total PCBs as Aroclors, individual metals, SVOCs, and PAHs : Total PCBs as Congeners, individual metals, SVOCs, and PAHs : PCBs as Fish TEQs, individual metals, SVOCs, and PAHs

Table N-55
Identification of Bioaccumulative CPECs in Forebay Sediment - Birds (Individual)
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	SLVs for Individual Birds exposed to Sediment (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)						
Aluminum	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
Antimony	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Barium	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Chromium	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Copper	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Mercury	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
Nickel	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Zinc	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
PCB Aroclors (ug/kg)						
Aroclor 1254	-	27.0	1.80	15.0	Yes	**Yes**
Total PCBs As Aroclors (NDs at MDL)	-	28.7	1.80	15.9	Yes	**Yes**
PCB Congeners (ug/kg)						
3,3',4,4'-Tetrachlorobiphenyl	77	0.00223	0.00800	0.279	Yes	**Yes**
2,3,3',4,4'-Pentachlorobiphenyl	105	0.318	3.90	0.0815	Yes	No
2,3',4,4',5-Pentachlorobiphenyl	118	0.783	49.0	0.0160	Yes	No
3,3',4,4',5-Pentachlorobiphenyl	126	0.000188	0.00390	0.0482	Yes	No
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.149	4.9	0.0304	Yes	No
2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.0449	49	0.000916	Yes	No
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	3.59	1.80	1.99	Yes	**Yes**
PCBs As Avian TEQ (KM, capped; NDs at MDL)	-	0.000144	0.00170	0.0847	Yes	No
Sum R_{Bac}^4 = 15.9 : 1.99 : 0.0847						

This table only includes the CPECs detected > 5% from the Tissue - Bird Individual Table (Table N-53), except PAHs which lack avian SLVs.
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value

Table N-55
Identification of Bioaccumulative CPECs in Forebay Sediment - Birds (Individual)
Bradford Island - River Operable Unit
(2 of 2)

Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	SLVs for Individual Birds exposed to Sediment (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)

TEQ = Toxicity Equivalence Quotient
UCL = upper confidence limit on the mean
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.
(2) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the bioaccumulative bird (individual) SLVs from (see Appendix J-5c):

Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31.

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The Sum R_{Bac} is the R_{Bac} for Total PCBs as Aroclors, Total PCBs as congeners, and PCBs as TEQ (respectively), since there are no other COIs with toxicity ratios.

Table N-56
Identification of Bioaccumulative CPECs in Forebay Sediment - Birds (Population)
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	SLVs for Bird Populations Exposed to Sediment (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)						
Aluminum	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
Antimony		Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Barium	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Chromium		Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Copper	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Mercury	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
Nickel		Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Zinc	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
PCB Aroclors (ug/kg)						
Aroclor 1254	-	27.0	91.0	0.297	Yes	No
Total PCBs As Aroclors (NDs at MDL)	-	28.7	91.0	0.315	Yes	No
PCB Congeners (ug/kg)						
3,3',4,4'-Tetrachlorobiphenyl	77	0.00223	0.040	0.056	Yes	No
2,3,3',4,4'-Pentachlorobiphenyl	105	0.318	19.0	0.0167	Yes	No
2,3',4,4',5-Pentachlorobiphenyl	118	0.783	240	0.00326	Yes	No
3,3',4,4',5-Pentachlorobiphenyl	126	0.000188	0.019	0.00989	Yes	No
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.149	24.0	0.00621	Yes	No
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	3.59	91.0	0.0395	Yes	No
PCBs As Avian TEQ (KM, capped; NDs at MDL)	-	0.000144	0.00350	0.0411	Yes	No
Sum R_{Bac}[4] = 0.315 : 0.0395 : 0.0411						

This table only includes the CPECs detected > 5% from the Tissue - Bird Population Table (Table N-54), except PAHs which lack avian SLVs.
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
TEQ = Toxicity Equivalence Quotient
UCL = upper confidence limit on the mean

Table N-56
Identification of Bioaccumulative CPECs in Forebay Sediment - Birds (Population)
Bradford Island - River Operable Unit
(2 of 2)

Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	SLVs for Bird Populations Exposed to Sediment (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)

- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.
(2) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the bioaccumulative bird (population) SLVs from (see Appendix J-5d):

Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31.

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The Sum R_{Bac} is the R_{Bac} for Total PCBs as Aroclors, Total PCBs as congeners, and PCBs as TEQ (respectively), since there are no other COIs with toxicity ratios.

Table N-57
Identification of Bioaccumulative CPECs in Forebay Tissue - Mammals (Individual)
Bradford Island - River Operable Unit
(1 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Individual Mammals Exposed to Tissue (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)							
Crayfish	Antimony	-	0.0420	NA	- -	No	Yes - No SLV
Crayfish	Arsenic	-	0.519	7.6	0.0683	Yes	No
Crayfish	Chromium	-	0.764	NA	- -	No	Yes - No SLV
Crayfish	Mercury	-	0.0237	0.12	0.198	Yes	No
Crayfish	Methyl Mercury	-	0.0329	0.12	0.274	Yes	No
Crayfish	Nickel	-	4.88	NA	- -	No	Yes - No SLV
Sculpin	Cadmium	-	0.0243	5.6	0.00434	Yes	No
Sculpin	Lead	-	0.103	34	0.00303	Yes	No
Sculpin	Mercury	-	0.187	0.12	1.56	Yes	**Yes**
Smallmouth Bass	Aluminum	-	7.11	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Barium	-	1.73	NA	- -	No	Yes - No SLV
Smallmouth Bass	Copper	-	0.764	NA	- -	No	Yes - No SLV
Smallmouth Bass	Mercury	-	0.317	0.12	2.64	Yes	**Yes**
Smallmouth Bass	Zinc	-	14.9	NA	- -	Yes	**Yes - Bio - No SLV**
PCB Aroclors (ug/kg)							
Sculpin	Aroclor 1254	-	436	880	0.495	Yes	**Yes**
Sculpin	Total PCBs As Aroclors (NDs at MDL)	-	436	880	0.495	Yes	**Yes**
Smallmouth Bass	Aroclor 1242	-	260	880	0.295	Yes	**Yes**
Smallmouth Bass	Aroclor 1254	-	4,050	880	4.60	Yes	**Yes**
Smallmouth Bass	Total PCBs As Aroclors (NDs at MDL)	-	4,100	880	4.66	Yes	**Yes**
PCB Congeners (ug/kg)							
Crayfish	3,3',4,4'-Tetrachlorobiphenyl	77	0.00867	5.8	0.00149	Yes	No
Crayfish	3,4,4',5-Tetrachlorobiphenyl	81	0.000452	2.0	0.000226	Yes	No
Crayfish	2,3,3',4,4'-Pentachlorobiphenyl	105	0.0908	20	0.00454	Yes	No
Crayfish	2,3,4,4',5-Pentachlorobiphenyl	114	0.697	20	0.0349	Yes	No
Crayfish	2,3',4,4',5-Pentachlorobiphenyl	118	11.9	20	0.595	Yes	**Yes**
Crayfish	2,3',4,4',5'-Pentachlorobiphenyl	123	0.412	20	0.0206	Yes	No
Crayfish	3,3',4,4',5-Pentachlorobiphenyl	126	0.00208	0.0058	0.359	Yes	**Yes**
Crayfish	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	3.53	20	0.177	Yes	**Yes**
Crayfish	2,3',4,4',5,5'-Hexachlorobiphenyl	167	1.49	20	0.0745	Yes	No
Crayfish	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.0821	20	0.00411	Yes	No
Crayfish	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	36.5	880	0.0414	Yes	No
Crayfish	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	-	0.00117	0.000580	2.01	Yes	**Yes**
Sculpin	3,3',4,4'-Tetrachlorobiphenyl	77	0.160	5.8	0.0276	Yes	No

Table N-57
Identification of Bioaccumulative CPECs in Forebay Tissue - Mammals (Individual)
Bradford Island - River Operable Unit
(2 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Individual Mammals Exposed to Tissue (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
Sculpin	3,4,4',5-Tetrachlorobiphenyl	81	0.00145	2.0	0.000725	Yes	No
Sculpin	2,3,3',4,4'-Pentachlorobiphenyl	105	177	20	8.85	Yes	**Yes**
Sculpin	2,3,4,4',5-Pentachlorobiphenyl	114	13.3	20	0.665	Yes	**Yes**
Sculpin	2,3',4,4',5-Pentachlorobiphenyl	118	500	20	25.0	Yes	**Yes**
Sculpin	2,3',4,4',5'-Pentachlorobiphenyl	123	7.77	20	0.389	Yes	**Yes**
Sculpin	3,3',4,4',5-Pentachlorobiphenyl	126	0.0247	0.0058	4.26	Yes	**Yes**
Sculpin	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	79.8	20	3.99	Yes	**Yes**
Sculpin	2,3',4,4',5,5'-Hexachlorobiphenyl	167	20.4	20	1.02	Yes	**Yes**
Sculpin	3,3',4,4',5,5'-Hexachlorobiphenyl	169	0.00365	0.02	0.183	Yes	**Yes**
Sculpin	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	1.67	20	0.0835	Yes	No
Sculpin	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	3,180	880	3.61	Yes	**Yes**
Sculpin	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	-	0.0146	0.000580	25.2	Yes	**Yes**
Smallmouth Bass	3,3',4,4'-Tetrachlorobiphenyl	77	5.64	5.8	0.972	Yes	**Yes**
Smallmouth Bass	3,4,4',5-Tetrachlorobiphenyl	81	0.691	2.0	0.346	Yes	**Yes**
Smallmouth Bass	2,3,3',4,4'-Pentachlorobiphenyl	105	887	20	44.4	Yes	**Yes**
Smallmouth Bass	2,3,4,4',5-Pentachlorobiphenyl	114	65.6	20	3.28	Yes	**Yes**
Smallmouth Bass	2,3',4,4',5-Pentachlorobiphenyl	118	2,310	20	116	Yes	**Yes**
Smallmouth Bass	2,3',4,4',5'-Pentachlorobiphenyl	123	38.7	20	1.94	Yes	**Yes**
Smallmouth Bass	3,3',4,4',5-Pentachlorobiphenyl	126	1.92	0.0058	331	Yes	**Yes**
Smallmouth Bass	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	375	20	18.8	Yes	**Yes**
Smallmouth Bass	2,3',4,4',5,5'-Hexachlorobiphenyl	167	108	20	5.40	Yes	**Yes**
Smallmouth Bass	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	8.14	20	0.407	Yes	**Yes**
Smallmouth Bass	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	19,314	880	21.9	Yes	**Yes**
Smallmouth Bass	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	-	0.307	0.000580	530	Yes	**Yes**
SVOCs (ug/kg)							
Crayfish	Bis(2-ethylhexyl) Phthalate	-	77.4	55,500	0.00139	Yes	No
Smallmouth Bass	Bis(2-ethylhexyl) Phthalate	-	338	55,500	0.00609	Yes	No
Smallmouth Bass	Butyl Benzyl Phthalate	-	239	55,500	0.00431	Yes	No
Smallmouth Bass	Di-n-butyl Phthalate	-	150	1,670,000	0.0000898	Yes	No
PAHs (ug/kg)							
Crayfish	Acenaphthene[4]	-	0.160	190,000	0.000000842	Yes	No
Crayfish	Anthracene[4]	-	0.094	190,000	0.000000495	Yes	No
Crayfish	Fluorene[4]	-	0.165	190,000	0.000000868	Yes	No

Table N-57
Identification of Bioaccumulative CPECs in Forebay Tissue - Mammals (Individual)
Bradford Island - River Operable Unit
(3 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Individual Mammals Exposed to Tissue (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
Crayfish	Phenanthrene[4]	-	0.576	190,000	0.00000303	Yes	No
Crayfish	Benzo(a)anthracene[5]	-	0.273	9,500,000	0.0000000287	Yes	No
Crayfish	Benzo(a)pyrene[5]	-	0.135	9,500,000	0.0000000142	Yes	No
Crayfish	Benzo(b)fluoranthene[5]	-	0.140	9,500,000	0.0000000147	Yes	No
Crayfish	Benzo(g,h,i)perylene[5]	-	0.165	9,500,000	0.0000000174	Yes	No
Crayfish	Benzo(k)fluoranthene[5]	-	0.111	9,500,000	0.0000000117	Yes	No
Crayfish	Chrysene[5]	-	0.144	9,500,000	0.0000000152	Yes	No
Crayfish	Fluoranthene	-	0.426	190,000	0.00000224	Yes	No
Crayfish	Indeno(1,2,3-cd)pyrene[5]	-	0.166	9,500,000	0.0000000175	Yes	No
Crayfish	Pyrene	-	0.468	9,500,000	0.0000000493	Yes	No
Smallmouth Bass	Acenaphthene[4]	-	1.07	190,000	0.00000563	Yes	No
Smallmouth Bass	Anthracene[4]	-	11.8	190,000	0.0000621	Yes	No
Smallmouth Bass	Fluorene[4]	-	2.52	190,000	0.0000133	Yes	No
Smallmouth Bass	Phenanthrene[4]	-	2.88	190,000	0.0000152	Yes	No
Smallmouth Bass	Benzo(a)anthracene[5]	-	3.69	9,500,000	0.000000388	Yes	No
Smallmouth Bass	Benzo(a)pyrene[5]	-	3.25	9,500,000	0.000000342	Yes	No
Smallmouth Bass	Benzo(b)fluoranthene[5]	-	4.21	9,500,000	0.000000443	Yes	No
Smallmouth Bass	Benzo(g,h,i)perylene[5]	-	1.46	9,500,000	0.000000154	Yes	No
Smallmouth Bass	Benzo(k)fluoranthene[5]	-	3.29	9,500,000	0.000000346	Yes	No
Smallmouth Bass	Chrysene[5]	-	2.81	9,500,000	0.000000296	Yes	No
Smallmouth Bass	Dibenz(a,h)anthracene[5]	-	1.72	9,500,000	0.000000181	Yes	No
Smallmouth Bass	Fluoranthene	-	3.03	190,000	0.0000159	Yes	No
Smallmouth Bass	Indeno(1,2,3-cd)pyrene[5]	-	2.76	9,500,000	0.000000291	Yes	No
Smallmouth Bass	Pyrene	-	2.30	9,500,000	0.000000242	Yes	No
Crayfish Sum R_{Bac}[6] = 0.541 : 0.583 : 2.55							
Sculpin Sum R_{Bac}[6] = 2.06 : 5.18 : 26.7							
Smallmouth Bass Sum R_{Bac}[6] = 7.31 : 24.6 : 532							

This table only includes COIs detected > 5% and above the reference area (metals only).
ATL = acceptable tissue level
CPEC = chemical of potential ecological concern
COI = chemical of interest

Table N-57
Identification of Bioaccumulative CPECs in Forebay Tissue - Mammals (Individual)
Bradford Island - River Operable Unit
(4 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Individual Mammals Exposed to Tissue (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)

KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
TEQ = Toxicity Equivalence Quotient
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.
(2) DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31 (see Table J-5d).

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with R_{Bac} > 0.1 and Sum R_{Bac} > 1, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The SLV for Fluoranthene was used as a surrogate for the individual LPAHs without SLVs. Fluoranthene is considered an HPAH in the RI, HHRA, and ERA and used to calculate Total HPAH; however, fluoranthene is more accurately a PAH that borders the two with a molecular weight more similar to HPAHs and but a structure more similar to LPAHs. Therefore, use of fluoranthene as a surrogate for LPAHs is appropriate in the absence of any LPAH SLVs.
(5) The SLV for pyrene was used as a surrogate for the individual HPAHs without SLVs.
(6) The Sum R_{Bac} is the sum of the individual R_{Bac}. Three ways of calculating Sum R_{Bac}: Total PCBs as Aroclors, individual metals, SVOCs, and PAHs : Total PCBs as Congeners, individual metals, SVOCs, and PAHs : PCBs as Fish TEQs, individual metals, SVOCs, and PAHs.

Table N-58
Identification of Bioaccumulative CPECs in Forebay Tissue - Mammals (Population)
Bradford Island - River Operable Unit
(1 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Mammal Populations Exposed to Tissue (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)							
Crayfish	Antimony	-	0.0420	NA	- -	No	Yes - No SLV
Crayfish	Arsenic	-	0.519	38	0.0137	Yes	No
Crayfish	Chromium	-	0.764	NA	- -	No	Yes - No SLV
Crayfish	Mercury	-	0.0237	0.20	0.119	Yes	No
Crayfish	Methyl Mercury	-	0.0329	0.20	0.165	Yes	No
Crayfish	Nickel	-	4.88	NA	- -	No	Yes - No SLV
Sculpin	Cadmium	-	0.0243	28	0.000868	Yes	No
Sculpin	Lead	-	0.103	170	0.000606	Yes	No
Sculpin	Mercury	-	0.187	0.20	0.935	Yes	**Yes**
Smallmouth Bass	Aluminum	-	7.11	NA	- -	Yes	**Yes - Bio - No SLV**
Smallmouth Bass	Barium	-	1.73	NA	- -	No	Yes - No SLV
Smallmouth Bass	Copper	-	0.764	NA	- -	No	Yes - No SLV
Smallmouth Bass	Mercury	-	0.317	0.20	1.59	Yes	**Yes**
Smallmouth Bass	Zinc	-	14.9	NA	- -	Yes	**Yes - Bio - No SLV**
PCB Aroclors (ug/kg)							
Sculpin	Aroclor 1254	-	436	1,700	0.256	Yes	**Yes**
Sculpin	Total PCBs As Aroclors (NDs at MDL)	-	436	1,700	0.256	Yes	**Yes**
Smallmouth Bass	Aroclor 1242	-	260	1,700	0.153	Yes	**Yes**
Smallmouth Bass	Aroclor 1254	-	4,050	1,700	2.38	Yes	**Yes**
Smallmouth Bass	Total PCBs As Aroclors (NDs at MDL)	-	4,100	1,700	2.41	Yes	**Yes**
PCB Congeners (ug/kg)							
Crayfish	3,3',4,4'-Tetrachlorobiphenyl	77	0.00867	160	0.0000542	Yes	No
Crayfish	3,4,4',5-Tetrachlorobiphenyl	81	0.000452	54	0.00000837	Yes	No
Crayfish	2,3,3',4,4'-Pentachlorobiphenyl	105	0.0908	540	0.000168	Yes	No
Crayfish	2,3,4,4',5-Pentachlorobiphenyl	114	0.697	540	0.00129	Yes	No
Crayfish	2,3',4,4',5-Pentachlorobiphenyl	118	11.9	540	0.0220	Yes	No
Crayfish	2,3',4,4',5'-Pentachlorobiphenyl	123	0.412	540	0.000763	Yes	No
Crayfish	3,3',4,4',5-Pentachlorobiphenyl	126	0.00208	0.16	0.0130	Yes	No
Crayfish	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	3.53	540	0.00654	Yes	No
Crayfish	2,3',4,4',5,5'-Hexachlorobiphenyl	167	1.49	540	0.00276	Yes	No
Crayfish	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.0821	540	0.000152	Yes	No
Crayfish	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	36.5	1,700	0.0215	Yes	No
Crayfish	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	-	0.00117	0.0160	0.0729	Yes	No
Sculpin	3,3',4,4'-Tetrachlorobiphenyl	77	0.1600	160	0.00100	Yes	No
Sculpin	3,4,4',5-Tetrachlorobiphenyl	81	0.00145	54	0.0000269	Yes	No

Table N-58
Identification of Bioaccumulative CPECs in Forebay Tissue - Mammals (Population)
Bradford Island - River Operable Unit
(2 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Mammal Populations Exposed to Tissue (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
Sculpin	2,3,3',4,4'-Pentachlorobiphenyl	105	177	540	0.328	Yes	**Yes**
Sculpin	2,3,4,4',5-Pentachlorobiphenyl	114	13.3	540	0.0246	Yes	No
Sculpin	2,3',4,4',5-Pentachlorobiphenyl	118	500	540	0.926	Yes	**Yes**
Sculpin	2,3',4,4',5'-Pentachlorobiphenyl	123	7.77	540	0.0144	Yes	No
Sculpin	3,3',4,4',5-Pentachlorobiphenyl	126	0.0247	0.16	0.154	Yes	**Yes**
Sculpin	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	79.8	540	0.148	Yes	**Yes**
Sculpin	2,3',4,4',5,5'-Hexachlorobiphenyl	167	20.4	540	0.0378	Yes	No
Sculpin	3,3',4,4',5,5'-Hexachlorobiphenyl	169	0.00365	0.54	0.00676	Yes	No
Sculpin	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	1.67	540	0.00309	Yes	No
Sculpin	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	3,180	1,700	1.87	Yes	**Yes**
Sculpin	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	-	0.0146	0.0160	0.913	Yes	**Yes**
Smallmouth Bass	3,3',4,4'-Tetrachlorobiphenyl	77	5.64	160	0.0353	Yes	No
Smallmouth Bass	3,4,4',5-Tetrachlorobiphenyl	81	0.691	54	0.0128	Yes	No
Smallmouth Bass	2,3,3',4,4'-Pentachlorobiphenyl	105	887	540	1.64	Yes	**Yes**
Smallmouth Bass	2,3,4,4',5-Pentachlorobiphenyl	114	65.6	540	0.121	Yes	**Yes**
Smallmouth Bass	2,3',4,4',5-Pentachlorobiphenyl	118	2,310	540	4.28	Yes	**Yes**
Smallmouth Bass	2,3',4,4',5'-Pentachlorobiphenyl	123	38.7	540	0.0717	Yes	No
Smallmouth Bass	3,3',4,4',5-Pentachlorobiphenyl	126	1.92	0.16	12.0	Yes	**Yes**
Smallmouth Bass	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	375	540	0.694	Yes	**Yes**
Smallmouth Bass	2,3',4,4',5,5'-Hexachlorobiphenyl	167	108	540	0.200	Yes	**Yes**
Smallmouth Bass	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	8.14	540	0.0151	Yes	No
Smallmouth Bass	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	19,314	1,700	11.4	Yes	**Yes**
Smallmouth Bass	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	-	0.307	0.0160	19.2	Yes	**Yes**
SVOCs (ug/kg)							
Crayfish	Bis(2-ethylhexyl) Phthalate	-	77.4	555,000	0.000139	Yes	No
Smallmouth Bass	Bis(2-ethylhexyl) Phthalate	-	338	555,000	0.000609	Yes	No
Smallmouth Bass	Butyl Benzyl Phthalate	-	239	555,000	0.000431	Yes	No
Smallmouth Bass	Di-n-butyl Phthalate	-	150	5,570,000	0.0000269	Yes	No
PAHs (ug/kg)							
Crayfish	Acenaphthene[4]	-	0.160	950,000	0.000000168	Yes	No
Crayfish	Anthracene[4]	-	0.094	950,000	0.0000000989	Yes	No
Crayfish	Fluorene[4]	-	0.165	950,000	0.000000174	Yes	No
Crayfish	Phenanthrene[4]	-	0.576	950,000	0.000000606	Yes	No
Crayfish	Benzo(a)anthracene[5]	-	0.273	47,000,000	0.00000000581	Yes	No

Table N-58
Identification of Bioaccumulative CPECs in Forebay Tissue - Mammals (Population)
Bradford Island - River Operable Unit
(3 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Mammal Populations Exposed to Tissue (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
Crayfish	Benzo(a)pyrene[5]	-	0.135	47,000,000	0.00000000287	Yes	No
Crayfish	Benzo(b)fluoranthene[5]	-	0.140	47,000,000	0.00000000298	Yes	No
Crayfish	Benzo(g,h,i)perylene[5]	-	0.165	47,000,000	0.00000000351	Yes	No
Crayfish	Benzo(k)fluoranthene[5]	-	0.111	47,000,000	0.00000000236	Yes	No
Crayfish	Chrysene[5]	-	0.144	47,000,000	0.00000000306	Yes	No
Crayfish	Fluoranthene	-	0.426	950,000	0.000000448	Yes	No
Crayfish	Indeno(1,2,3-cd)pyrene[5]	-	0.166	47,000,000	0.00000000353	Yes	No
Crayfish	Pyrene	-	0.468	47,000,000	0.0000000100	Yes	No
Smallmouth Bass	Acenaphthene[4]	-	1.07	950,000	0.00000113	Yes	No
Smallmouth Bass	Anthracene[4]	-	11.8	950,000	0.0000124	Yes	No
Smallmouth Bass	Fluorene[4]	-	2.52	950,000	0.00000265	Yes	No
Smallmouth Bass	Phenanthrene[4]	-	2.88	950,000	0.00000303	Yes	No
Smallmouth Bass	Benzo(a)anthracene[5]	-	3.69	47,000,000	0.0000000785	Yes	No
Smallmouth Bass	Benzo(a)pyrene[5]	-	3.25	47,000,000	0.0000000691	Yes	No
Smallmouth Bass	Benzo(b)fluoranthene[5]	-	4.21	47,000,000	0.0000000896	Yes	No
Smallmouth Bass	Benzo(g,h,i)perylene[5]	-	1.46	47,000,000	0.0000000311	Yes	No
Smallmouth Bass	Benzo(k)fluoranthene[5]	-	3.29	47,000,000	0.0000000700	Yes	No
Smallmouth Bass	Chrysene[5]	-	2.81	47,000,000	0.0000000598	Yes	No
Smallmouth Bass	Dibenz(a,h)anthracene[5]	-	1.72	47,000,000	0.0000000366	Yes	No
Smallmouth Bass	Fluoranthene	-	3.03	950,000	0.00000319	Yes	No
Smallmouth Bass	Indeno(1,2,3-cd)pyrene[5]	-	2.76	47,000,000	0.0000000587	Yes	No
Smallmouth Bass	Pyrene	-	2.30	47,000,000	0.0000000489	Yes	No
Crayfish Sum R_{Bac}[6] = 0.297 : 0.318 : 0.370							
Sculpin Sum R_{Bac}[6] = 1.19 : 2.81 : 1.85							
Smallmouth Bass Sum R_{Bac}[6] = 4.00 : 12.9 : 20.8							

This table only includes COIs detected > 5% and above the reference area (metals only).
ATL = acceptable tissue level
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect

Table N-58
Identification of Bioaccumulative CPECs in Forebay Tissue - Mammals (Population)
Bradford Island - River Operable Unit
(4 of 4)

Medium	Chemicals of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	ATLs for Mammal Populations Exposed to Tissue (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)

TEQ = Toxicity Equivalence Quotient
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.
(2) DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31 (see Appendix J-5d).

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with R_{Bac} > 0.1 and Sum R_{Bac} > 1, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The SLV for Fluoranthene was used as a surrogate for the individual LPAHs without SLVs. Fluoranthene is considered an HPAH in the RI, HHRA, and ERA and used to calculate Total HPAH; however, fluoranthene is more accurately a PAH that borders the two with a molecular weight more similar to HPAHs and but a structure more similar to LPAHs. Therefore, use of fluoranthene as a surrogate for LPAHs is appropriate in the absence of any LPAH SLVs.
(5) The SLV for pyrene was used as a surrogate for the individual HPAHs without SLVs.
(6) The Sum R_{Bac} is the sum of the individual R_{Bac}. Three ways of calculating Sum R_{Bac}; Total PCBs as Aroclors, individual metals, SVOCs, and PAHs : Total PCBs as Congeners, individual metals, SVOCs, and PAHs : PCBs as Fish TEQs, individual metals, SVOCs, and PAHs.

Table N-59
Identification of Bioaccumulative CPECs in Forebay Sediment - Mammals (Individual)
Bradford Island - River Operable Unit
(1 of 2)

Chemical of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	SLVs for Individual Mammals Exposed to Sediment (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)						
Aluminum	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
Antimony	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Barium	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Chromium	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Copper	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Mercury	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
Nickel	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Zinc	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
PCB Aroclors (ug/kg)						
Aroclor 1254	-	27.0	44.0	0.614	Yes	No
Total PCBs As Aroclors (NDs at MDL)	-	28.7	44.0	0.652	Yes	No
PCB Congeners (ug/kg)						
2,3,3',4,4'-Pentachlorobiphenyl	105	0.318	0.940	0.338	Yes	**Yes**
2,3,4,4',5-Pentachlorobiphenyl	114	0.0238	0.980	0.0243	Yes	No
2,3',4,4',5-Pentachlorobiphenyl	118	0.783	1.20	0.653	Yes	**Yes**
3,3',4,4',5-Pentachlorobiphenyl	126	0.000188	0.000280	0.671	Yes	**Yes**
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.149	1.20	0.124	Yes	**Yes**
2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.0449	1.20	0.0374	Yes	No
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	3.59	44.0	0.0816	Yes	No
PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	-	0.0000895	0.0000520	1.72	Yes	**Yes**
Sum R_{Bac}^4 = 0.652 : 0.0816 : 1.72						

This table only includes the CPECs detected > 5% from the Tissue - Mammal Individual Table (Table N-57).
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
TEQ = Toxicity Equivalence Quotient

Table N-59
Identification of Bioaccumulative CPECs in Forebay Sediment - Mammals (Individual)
Bradford Island - River Operable Unit
(2 of 2)

Chemical of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	SLVs for Individual Mammals Exposed to Sediment (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)

UCL = upper confidence limit on the mean
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.
(2) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the bioaccumulative mammalian (individual) SLVs from (see Appendix J-5c):

Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31.

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The Sum R_{Bac} is the R_{Bac} for Total PCBs as Aroclors, Total PCBs as congeners, and PCBs as TEQ (respectively), since there are no other COIs with toxicity ratios.

Table N-60
Identification of Bioaccumulative CPECs in Forebay Sediment - Mammals (Population)
Bradford Island - River Operable Unit
(1 of 2)

Chemical of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	SLVs for Mammal Populations Exposed to Sediment (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)						
Aluminum	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
Antimony	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Barium	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Chromium	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Copper	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Mercury	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
Nickel	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			No	No
Zinc	-	Statistically ≤ to Reference Area (see Table L-4 in RI)			Yes	No
PCB Aroclors (ug/kg)						
Aroclor 1254	-	27.0	84.0	0.321	Yes	No
Total PCBs As Aroclors (NDs at MDL)	-	28.7	84.0	0.342	Yes	No
PCB Congeners (ug/kg)						
2,3,3',4,4'-Pentachlorobiphenyl	105	0.318	26.0	0.0122	Yes	No
2,3,4,4',5-Pentachlorobiphenyl	114	0.0238	27.0	0.000881	Yes	No
2,3',4,4',5-Pentachlorobiphenyl	118	0.783	33.0	0.0237	Yes	No
3,3',4,4',5-Pentachlorobiphenyl	126	0.000188	0.00780	0.0241	Yes	No
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.149	33.0	0.00452	Yes	No
2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.0449	33.0	0.00136	Yes	No
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	3.59	84.0	0.0427	Yes	No
PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	-	0.0000895	0.00140	0.0639	Yes	No
Sum R_{Bac}[4] = 0.342 : 0.0427 : 0.0639						

This table only includes the CPECs detected > 5% from the Tissue - Mammal Population Table (Table N-58).
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
TEQ = Toxicity Equivalence Quotient

Table N-60
Identification of Bioaccumulative CPECs in Forebay Sediment - Mammals (Population)
Bradford Island - River Operable Unit
(2 of 2)

Chemical of Interest	IUPAC #	Lower of Maximum and 95% UCL (1)	SLVs for Mammal Populations Exposed to Sediment (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)

UCL = upper confidence limit on the mean
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.
(2) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the bioaccumulative mammalian (population) SLVs from (see Appendix J-5c):

Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31.

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The Sum R_{Bac} is the R_{Bac} for Total PCBs as Aroclors, Total PCBs as congeners, and PCBs as TEQ (respectively), since there are no other COIs with toxicity ratios.

Table N-61
Identification of CPECs in Sediment at Mouth of Eagle Creek - Individual COIs for Benthic Invertebrates
Bradford Island - River Operable Unit
(1 of 1)

Chemicals of Interest (2)	Max Detected Conc	Level II SLVs for Benthics Exposed to Sediment (1)	Toxicity Ratio for Benthics (Tij)	Chemical is a Concern for Benthic Community? (Tij>1)	COI is Identified as a CPEC? (3) (Q = 1)
PCB Aroclors (ug/kg)					
Aroclor 1248	76.0	7.00	10.9	Yes	**Yes**
Total PCBs As Aroclors (NDs at MDL)	77.7	34.0	2.29	Yes	**Yes**
SVOCs (ug/kg)					
Carbazole	2.20	140	0.0157	No	No
PAHs (ug/kg)					
Anthracene	2.60	57	0.0456	No	No
Phenanthrene	6.50	42	0.155	No	No
Total LPAHs (KM, capped; NDs at MDL)	11.8	76	0.155	No	No
Benzo(a)anthracene	6.60	32	0.206	No	No
Benzo(a)pyrene	7.10	32	0.222	No	No
Benzo(b)fluoranthene	11.0	27	0.407	No	No
Benzo(g,h,i)perylene	5.00	300	0.0167	No	No
Benzo(k)fluoranthene	3.40	27	0.126	No	No
Chrysene	13.0	57	0.228	No	No
Fluoranthene	11.0	111	0.0991	No	No
Indeno(1,2,3-cd)pyrene	4.60	17	0.271	No	No
Pyrene	17.0	53	0.321	No	No
Total HPAHs (KM, capped; NDs at MDL)	80.9	193	0.419	No	No
Total PAHs (KM, capped; NDs at MDL)	90.8	1610	0.0564	No	No
TPH (mg/kg)					
Diesel Range Organics	13.0	NA	- -	- -	Yes - No SLV

This table does not include metals because they were detected below the reference area (Table L-7)
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

(1) DEQ Level II SLV from Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001 (see Appendix J-5c).
(2) Inorganics, with maximum detected concentrations less than the site-specific reference area concentrations (aluminum, antimony, arsenic, barium, beryllium, chromium, cobalt, copper, lead, mercury, nickel, vanadium, and zinc), were not considered CPECs and are not evaluated.

Individual COIs in a Given Media
(3) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-62
Identification of CPECs in Sediment at Mouth of Eagle Creek - Multiple COIs for Benthic Invertebrates
Bradford Island - River Operable Unit
(1 of 1)

Chemicals of Interest (2)	Max Detected Conc	Level II SLVs for Benthics Exposed to Sediment (1)	Toxicity Ratio for Benthics (Tij)	(Tij/Tj) (3)	Chemical is a Concern for Benthic Community? (Tij/Tj >= [1/Nij] x Q when Q = 1)	COI is Identified as a CPEC? (3) (Q = 1)
PCB Aroclors (ug/kg)						
Aroclor 1248	76.0	7.00	10.9	0.712	Yes	**Yes**
Total PCBs As Aroclors (NDs at MDL)	77.7	34.0	2.29	0.150	Yes	**Yes**
SVOCs (ug/kg)						
Carbazole	2.20	140	0.0157	0.00103	No	No
PAHs (ug/kg)						
Anthracene	2.60	57	0.0456	0.00299	No	No
Phenanthrene	6.50	42	0.155	0.0101	No	No
Benzo(a)anthracene	6.60	32	0.206	0.0135	No	No
Benzo(a)pyrene	7.10	32	0.222	0.0145	No	No
Benzo(b)fluoranthene	11.0	27	0.407	0.0267	No	No
Benzo(g,h,i)perylene	5.00	300	0.0167	0.00109	No	No
Benzo(k)fluoranthene	3.40	27	0.126	0.00825	No	No
Chrysene	13.0	57	0.228	0.0150	No	No
Fluoranthene	11.0	111	0.0991	0.00650	No	No
Indeno(1,2,3-cd)pyrene	4.60	17	0.271	0.0177	No	No
Pyrene	17.0	53	0.321	0.0210	No	No
TPH (mg/kg)						
Diesel Range Organics	13.0	NA	- -	- -	- -	Yes - No SLV

This table does not include metals because they were detected below the reference area (Table L-7)
CPEC = chemical of potential ecological concern
COI = chemical of interest
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

(1) DEQ Level II SLV from Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001 (see Appendix J-5c).

(2) Inorganics, with maximum detected concentrations less than the site-specific reference area concentrations (aluminum, antimony, arsenic, barium, beryllium, chromium, cobalt, copper, lead, mercury, nickel, vanadium, and zinc), were not considered CPECs and are not evaluated.

Multiple COIs Simultaneously within a Given Medium

(3) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
Nij = total number of *i* contaminants in medium *j* = 13
Tj = sum of toxicity ratios for all contaminants in medium *j* = 13.0
Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-63
Identification of Bioaccumulative CPECs in Sediment at Mouth of Eagle Creek - Fish
Bradford Island - River Operable Unit
(1 of 1)

Chemicals of Interest (2)	Max Detected Conc	SLVs for Freshwater Fish Exposed to Sediment (1)	Toxicity Ratio for Fish (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
PCB Aroclors (ug/kg)					
Aroclor 1248	76.0	22.0	3.45	Yes	**Yes**
Total PCBs As Aroclors (NDs at MDL)	77.7	22.0	3.53	Yes	**Yes**
SVOCs (ug/kg)					
Carbazole	2.20	NA	- -	Yes	**Yes - Bio - No SLV**
PAHs (ug/kg)					
Anthracene[4]	2.60	37,000	0.0000703	Yes	No
Phenanthrene[4]	6.50	37,000	0.000176	Yes	No
Benzo(a)anthracene[5]	6.60	1,900	0.00347	Yes	No
Benzo(a)pyrene[5]	7.10	1,900	0.00374	Yes	No
Benzo(b)fluoranthene[5]	11.0	1,900	0.00579	Yes	No
Benzo(g,h,i)perylene[5]	5.00	1,900	0.00263	Yes	No
Benzo(k)fluoranthene[5]	3.40	1,900	0.00179	Yes	No
Chrysene[5]	13.0	1,900	0.00684	Yes	No
Fluoranthene	11.0	37,000	0.000297	Yes	No
Indeno(1,2,3-cd)pyrene[5]	4.60	1,900	0.00242	Yes	No
Pyrene	17.0	1,900	0.00895	Yes	No
TPH (mg/kg)					
Diesel Range Organics	13.0	NA	- -	NA	Yes - No SLV
			Sum R_{Bac}[6] = 3.57		

This table does not include metals because they were detected below the reference area (Table L-7)
CPEC = chemical of potential ecological concern
COI = chemical of interest
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) Bioaccumulative freshwater fish SLVs from Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31 (see Appendix J-5c).
(2) Inorganics, with maximum detected concentrations less than the site-specific reference area concentrations (aluminum, antimony, arsenic, barium, beryllium, chromium, cobalt, copper, lead, mercury, nickel, vanadium, and zinc), were not considered CPECs and are not evaluated.

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The SLV for Fluoranthene was used as a surrogate for the individual LPAHs without SLVs. Fluoranthene is considered an HPAH in the RI, HHRA, and ERA and used to calculate Total HPAH; however, fluoranthene is more accurately a PAH that borders the two with a molecular weight more similar to HPAHs and but a structure more similar to LPAHs. Therefore, use of fluoranthene as a surrogate for LPAHs is appropriate in the absence of any LPAH SLVs.
(5) The SLV for pyrene was used as a surrogate for the individual HPAHs without SLVs
(6) The Sum R_{Bac} is the sum of the R_{Bac} for Total PCBs as Aroclors and the individual PAHs

Table N-64
Identification of Bioaccumulative CPECs in Sediment at Mouth of Eagle Creek - Birds (Individual)
Bradford Island - River Operable Unit
(1 of 1)

Chemicals of Interest (2)	Max Detected Conc	SLVs for Individual Birds Exposed to Sediment (1)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
PCB Aroclors (ug/kg)					
Aroclor 1248	76.0	1.80	42.2	Yes	**Yes**
Total PCBs As Aroclors (NDs at MDL)	77.7	1.80	43.2	Yes	**Yes**
SVOCs (ug/kg)					
Carbazole	2.20	NA	- -	Yes	**Yes - Bio - No SLV**
PAHs (ug/kg)					
Anthracene	2.60	NA	- -	Yes	**Yes - Bio - No SLV**
Phenanthrene	6.50	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(a)anthracene	6.60	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(a)pyrene	7.10	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(b)fluoranthene	11.0	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(g,h,i)perylene	5.00	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(k)fluoranthene	3.40	NA	- -	Yes	**Yes - Bio - No SLV**
Chrysene	13.0	NA	- -	Yes	**Yes - Bio - No SLV**
Fluoranthene	11.0	NA	- -	Yes	**Yes - Bio - No SLV**
Indeno(1,2,3-cd)pyrene	4.60	NA	- -	Yes	**Yes - Bio - No SLV**
Pyrene	17.0	NA	- -	Yes	**Yes - Bio - No SLV**
TPH (mg/kg)					
Diesel Range Organics	13.0	NA	- -	NA	Yes - No SLV
			Sum R_{Bac}[4] =	43.2	

This table does not include metals because they were detected below the reference area (Table L-7)
CPEC = chemical of potential ecological concern
COI = chemical of interest
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) Bioaccumulative bird (individual) SLVs from Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31 (see Appendix J-5c).

(2) Inorganics, with maximum detected concentrations less than the site-specific reference area concentrations (aluminum, antimony, arsenic, barium, beryllium, chromium, cobalt, copper, lead, mercury, nickel, vanadium, and zinc), were not considered CPECs and are not evaluated.

Bioaccumulative COIs in a Given Media

(3) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.

Where: Cij = concentration of contaminant *i* in medium *j*

SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .

R_{Bac} = bioaccumulation index for an individual COI

Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The Sum R_{Bac} is the sum of the R_{Bac} for Total PCBs as Aroclors

Table N-65
Identification of Bioaccumulative CPECs in Sediment at Mouth of Eagle Creek - Birds (Population)
Bradford Island - River Operable Unit
(1 of 1)

Chemicals of Interest (2)	Max Detected Conc	SLVs for Bird Populations Exposed to Sediment (1)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
PCB Aroclors (ug/kg)					
Aroclor 1248	76.0	91.0	0.835	Yes	No
Total PCBs As Aroclors (NDs at MDL)	77.7	91.0	0.854	Yes	No
SVOCs (ug/kg)					
Carbazole	2.20	NA	- -	Yes	**Yes - Bio - No SLV**
PAHs (ug/kg)					
Anthracene	2.60	NA	- -	Yes	**Yes - Bio - No SLV**
Phenanthrene	6.50	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(a)anthracene	6.60	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(a)pyrene	7.10	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(b)fluoranthene	11.0	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(g,h,i)perylene	5.00	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(k)fluoranthene	3.40	NA	- -	Yes	**Yes - Bio - No SLV**
Chrysene	13.0	NA	- -	Yes	**Yes - Bio - No SLV**
Fluoranthene	11.0	NA	- -	Yes	**Yes - Bio - No SLV**
Indeno(1,2,3-cd)pyrene	4.60	NA	- -	Yes	**Yes - Bio - No SLV**
Pyrene	17.0	NA	- -	Yes	**Yes - Bio - No SLV**
TPH (mg/kg)					
Diesel Range Organics	13.0	NA	- -	NA	Yes - No SLV
		Sum R_{Bac}[4] =	0.854		

This table does not include metals because they were detected below the reference area (Table L-7)
CPEC = chemical of potential ecological concern
COI = chemical of interest
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) Bioaccumulative bird (population) SLVs from Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31 (see Appendix J-5c).

(2) Inorganics, with maximum detected concentrations less than the site-specific reference concentrations (aluminum, antimony, arsenic, barium, beryllium, chromium, cobalt, copper, lead, mercury, nickel, vanadium, and zinc), were not considered CPECs and are not evaluated.

Individual COIs in a Given Media

(3) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.

Where: Cij = concentration of contaminant *i* in medium *j*

SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .

R_{Bac} = bioaccumulation index for an individual COI

Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The Sum R_{Bac} is the sum of the R_{Bac} for Total PCBs as Aroclors

Table N-66
Identification of Bioaccumulative CPECs in Sediment at Mouth of Eagle Creek - Mammals (Individual)
Bradford Island - River Operable Unit
(1 of 1)

Chemicals of Interest (2)	Max Detected Conc	SLVs for Individual Mammals Exposed to Sediment (1)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
PCB Aroclors (ug/kg)					
Aroclor 1248	76.0	44.0	1.73	Yes	**Yes**
Total PCBs As Aroclors (NDs at MDL)	77.7	44.0	1.77	Yes	**Yes**
SVOCs (ug/kg)					
Carbazole	2.20	NA	- -	Yes	**Yes - Bio - No SLV**
PAHs (ug/kg)					
Anthracene[4]	2.60	360,000	0.00000722	Yes	No
Phenanthrene[4]	6.50	360,000	0.0000181	Yes	No
Benzo(a)anthracene[5]	6.60	18,000,000	0.000000367	Yes	No
Benzo(a)pyrene[5]	7.10	18,000,000	0.000000394	Yes	No
Benzo(b)fluoranthene[5]	11.0	18,000,000	0.000000611	Yes	No
Benzo(g,h,i)perylene[5]	5.00	18,000,000	0.000000278	Yes	No
Benzo(k)fluoranthene[5]	3.40	18,000,000	0.000000189	Yes	No
Chrysene[5]	13.0	18,000,000	0.000000722	Yes	No
Fluoranthene	11.0	360,000	0.0000306	Yes	No
Indeno(1,2,3-cd)pyrene[5]	4.60	18,000,000	0.000000256	Yes	No
Pyrene	17.0	18,000,000	0.000000944	Yes	No
TPH (mg/kg)					
Diesel Range Organics	13.0	NA	- -	NA	Yes - No SLV
			Sum R_{Bac}[6] = 1.77		

This table does not include metals because they were detected below the reference area (Table L-7).
CPEC = chemical of potential ecological concern
COI = chemical of interest
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) Bioaccumulative mammal (individual) SLVs from Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31 (see Appendix J-5c).
(2) Inorganics, with maximum detected concentrations less than the site-specific reference area concentrations (aluminum, antimony, arsenic, barium, beryllium, chromium, cobalt, copper, lead, mercury, nickel, vanadium, and zinc), were not considered CPECs and are not evaluated.

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with R_{Bac} > 0.1 and Sum R_{Bac} > 1, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant*i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The SLV for Fluoranthene was used as a surrogate for the individual LPAHs without SLVs. Fluoranthene is considered an HPAH in the RI, HHRA, and ERA and used to calculate Total HPAH; however, fluoranthene is more accurately a PAH that borders the two with a molecular weight more similar to HPAHs and but a structure more similar to LPAHs. Therefore, use of fluoranthene as a surrogate for LPAHs is appropriate in the absence of any LPAH SLVs.
(5) The SLV for pyrene was used as a surrogate for the individual HPAHs without SLVs.
(6) The Sum R_{Bac} is the sum of the R_{Bac} for Total PCBs as Aroclors and the individual PAHs.

Table N-67
Identification of Bioaccumulative CPECs in Sediment at Mouth of Eagle Creek - Mammals (Population)
Bradford Island - River Operable Unit
(1 of 1)

Chemicals of Interest (2)	Max Detected Conc	SLVs for Mammal Populations Exposed to Sediment (1)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
PCB Aroclors (ug/kg)					
Aroclor 1248	76.0	84.0	0.905	Yes	No
Total PCBs As Aroclors (NDs at MDL)	77.7	84.0	0.925	Yes	No
SVOCs (ug/kg)					
Carbazole	2.20	NA	- -	Yes	**Yes - Bio - No SLV**
PAHs (ug/kg)					
Anthracene[4]	2.60	1,800,000	0.00000144	Yes	No
Phenanthrene[4]	6.50	1,800,000	0.00000361	Yes	No
Benzo(a)anthracene[5]	6.60	90,000,000	0.0000000733	Yes	No
Benzo(a)pyrene[5]	7.10	90,000,000	0.0000000789	Yes	No
Benzo(b)fluoranthene[5]	11.0	90,000,000	0.000000122	Yes	No
Benzo(g,h,i)perylene[5]	5.00	90,000,000	0.0000000556	Yes	No
Benzo(k)fluoranthene[5]	3.40	90,000,000	0.0000000378	Yes	No
Chrysene[5]	13.0	90,000,000	0.000000144	Yes	No
Fluoranthene	11.0	1,800,000	0.00000611	Yes	No
Indeno(1,2,3-cd)pyrene[5]	4.60	90,000,000	0.0000000511	Yes	No
Pyrene	17.0	90,000,000	0.000000189	Yes	No
TPH (mg/kg)					
Diesel Range Organics	13.0	NA	- -	NA	Yes - No SLV
			Sum R_{Bac}[6] = 0.925		

This table does not include metals because they were detected below the reference area (Table L-7).
CPEC = chemical of potential ecological concern
COI = chemical of interest
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) Bioaccumulative mammal (population) SLVs from Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31 (see Appendix J-5c).
(2) Inorganics, with maximum detected concentrations less than the site-specific reference area concentrations (aluminum, antimony, arsenic, barium, beryllium, chromium, cobalt, copper, lead, mercury, nickel, vanadium, and zinc), were not considered CPECs and are not evaluated.

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLV ij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The SLV for Fluoranthene was used as a surrogate for the individual LPAHs without SLVs. Fluoranthene is considered an HPAH in the RI, HHRA, and ERA and used to calculate Total HPAH; however, fluoranthene is more accurately a PAH that borders the two with a molecular weight more similar to HPAHs and but a structure more similar to LPAHs. Therefore, use of fluoranthene as a surrogate for LPAHs is appropriate in the absence of any LPAH SLVs.
(5) The SLV for pyrene was used as a surrogate for the individual HPAHs without SLVs.
(6) The Sum R_{Bac} is the sum of the R_{Bac} for Total PCBs as Aroclors and the individual PAHs.

Table N-68
Identification of CPECs in Sediment at Goose Island - Individual COIs for Benthic Invertebrates
Bradford Island - River Operable Unit
(1 of 3)

Chemicals of Interest	IUPAC #	Max Detected Conc	Level II SLVs for Benthics Exposed to Sediment (1)	Toxicity Ratio for Benthics (R_{Bac})	Chemical is a Concern for Benthic Community? (Tij>1)	COI is Identified as a CPEC? (3) (Q = 1)
INORGANICS (mg/kg) (2)						
Antimony	-	0.580	3.0	0.193	No	No
Cadmium	-	1.17	0.674	1.74	Yes	**Yes**
Thallium	-	0.435	0.354	1.23	Yes	**Yes**
Zinc	-	148	123	1.20	Yes	**Yes**
PCB Aroclors (ug/kg)						
Aroclor 1254	-	9.90	7.00	1.41	Yes	**Yes**
Total PCBs As Aroclors (NDs at MDL)	-	12.6	34.0	0.371	No	No
PCB Congeners (ug/kg)						
3,3',4,4'-Tetrachlorobiphenyl	77	0.00353	34.0	0.000104	No	No
3,4,4',5-Tetrachlorobiphenyl	81	0.000135	34.0	0.00000397	No	No
2,3,3',4,4'-Pentachlorobiphenyl	105	0.0277	34.0	0.000815	No	No
2,3,4,4',5-Pentachlorobiphenyl	114	0.00137	34.0	0.0000403	No	No
2,3',4,4',5-Pentachlorobiphenyl	118	0.0695	34.0	0.00204	No	No
2,3',4,4',5'-Pentachlorobiphenyl	123	0.000963	34.0	0.0000283	No	No
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.0104	34.0	0.000306	No	No
2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.00402	34.0	0.000118	No	No
2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.000869	34.0	0.0000256	No	No
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	1.34	34.0	0.0394	No	No
SVOCs (ug/kg)						
Bis(2-ethylhexyl) Phthalate	-	13.0	750	0.0173	No	No
Di-n-butyl Phthalate	-	10.0	111	0.0901	No	No
p-cresol (4-Methylphenol)	-	8.50	48	0.177	No	No
PAHs (ug/kg)						
Phenanthrene	-	4.60	42	0.110	No	No
Total LPAHs (KM, capped; NDs at MDL)	-	9.90	76	0.130	No	No
Benzo(a)anthracene	-	7.80	32	0.244	No	No
Benzo(a)pyrene	-	13.0	32	0.406	No	No
Benzo(b)fluoranthene	-	15.0	27	0.556	No	No
Benzo(g,h,i)perylene	-	9.90	300	0.0330	No	No
Benzo(k)fluoranthene	-	4.10	27	0.152	No	No

Table N-68
Identification of CPECs in Sediment at Goose Island - Individual COIs for Benthic Invertebrates
Bradford Island - River Operable Unit
(2 of 3)

Chemicals of Interest	IUPAC #	Max Detected Conc	Level II SLVs for Benthics Exposed to Sediment (1)	Toxicity Ratio for Benthics (R_{Bac})	Chemical is a Concern for Benthic Community? (Tij>1)	COI is Identified as a CPEC? (3) (Q = 1)
Chrysene	-	11.0	57	0.193	No	No
Fluoranthene	-	9.60	111	0.0865	No	No
Indeno(1,2,3-cd)pyrene	-	7.10	17	0.418	No	No
Pyrene	-	8.80	53	0.166	No	No
Total HPAHs (KM, capped; NDs at MDL)	-	89.1	193	0.462	No	No
Total PAHs (KM, capped; NDs at MDL)	-	96.1	1,610	0.0597	No	No
TPH (mg/kg)						
Diesel Range Organics	-	53.0	NA	- -	- -	Yes - No SLV
Residual Range Organics	-	480	NA	- -	- -	Yes - No SLV

This table only includes COIs detected above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

(1) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the DEQ Level II SLV (see Appendix J-5c):
Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(2) Inorganics with maximum detected concentrations less than the site-specific reference area concentrations (aluminum, arsenic, barium, beryllium, chromium, cobalt, copper, lead, mercury, nickel, and vanadium) were not considered CPECs and are not evaluated.

Individual COIs in a Given Media
(3) Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*.
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*.

Table N-68
Identification of CPECs in Sediment at Goose Island - Individual COIs for Benthic Invertebrates
Bradford Island - River Operable Unit
(3 of 3)

Chemicals of Interest	IUPAC #	Max Detected Conc	Level II SLVs for Benthics Exposed to Sediment (1)	Toxicity Ratio for Benthics (R_{Bac})	Chemical is a Concern for Benthic Community? (Tij>1)	COI is Identified as a CPEC? (3) (Q = 1)

Q = Receptor designator.

Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).

Q = 1 for terrestrial T&E species and all aquatic species

Q = 5 for all common terrestrial species

Table N-69
Identification of CPECs in Sediment at Goose Island - Multiple COIs for Benthic Invertebrates
Bradford Island - River Operable Unit
(1 of 2)

Chemical of Interest	IUPAC #	Max Detected Conc	Level II SLVs for Benthics Exposed to Sediment (1)	Toxicity Ratio for Benthics (Tij)	(Tij/Tj) (3)	Chemical is a Concern for Benthic Community? (Tij/Tj >= [1/Nij] x Q when Q = 1)	COI is Identified as a CPEC? (3) (Q = 1)
INORGANICS (mg/kg) (2)							
Antimony	-	0.580	3.0	0.193	0.0227	No	No
Cadmium	-	1.17	0.674	1.74	0.204	Yes	**Yes**
Thallium	-	0.435	0.354	1.23	0.144	Yes	**Yes**
Zinc	-	148	123	1.20	0.141	Yes	**Yes**
PCB Aroclors (ug/kg)							
Aroclor 1254	-	9.90	7.00	1.41	0.166	Yes	**Yes**
PCB Congeners (ug/kg)							
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	1.34	34.0	0.0394	0.00463	No	No
SVOCs (ug/kg)							
Bis(2-ethylhexyl) Phthalate	-	13.0	750	0.017	0.00203	No	No
Di-n-butyl Phthalate	-	10.0	140	0.0714	0.00838	No	No
p-cresol (4-Methylphenol)	-	8.50	48	0.177	0.0208	No	No
PAHs (ug/kg)							
Phenanthrene	-	7.40	42	0.176	0.0207	No	No
Benzo(a)anthracene	-	12.0	32	0.375	0.0440	No	No
Benzo(a)pyrene	-	7.50	32	0.234	0.0275	No	No
Benzo(b)fluoranthene	-	9.10	27	0.337	0.0396	No	No
Benzo(g,h,i)perylene	-	6.20	300	0.0207	0.00243	No	No
Benzo(k)fluoranthene	-	4.90	27	0.181	0.0213	No	No
Chrysene	-	20.0	57	0.351	0.0412	No	No
Fluoranthene	-	12.0	111	0.108	0.0127	No	No
Indeno(1,2,3-cd)pyrene	-	5.70	17	0.335	0.0394	No	No
Pyrene	-	17.0	53	0.321	0.0376	No	No
TPH (mg/kg)							
Diesel Range Organics	-	54	NA	- -	- -	- -	Yes - No SLV
Residual Range Organics	-	180	NA	- -	- -	- -	Yes - No SLV

This table only includes COIs detected above the reference area (metals only).

Table N-69
Identification of CPECs in Sediment at Goose Island - Multiple COIs for Benthic Invertebrates
Bradford Island - River Operable Unit
(2 of 2)

CPEC = chemical of potential ecological concern
COI = chemical of interest
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

(1) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the DEQ Level II SLV (see Appendix J-5c):
Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.
(2) Inorganics with maximum detected concentrations less than the site-specific reference area concentrations (aluminum, arsenic, barium, beryllium, chromium, cobalt, copper, lead, mercury, nickel, and vanadium) were not considered CPECs and are not evaluated.

Multiple COIs Simultaneously within a Given Medium
(3) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific.
Q = Receptor designator.
Nij = total number of *i* contaminants in medium *j* = 19.
Tj = sum of toxicity ratios for all contaminants in medium *j* = 8.52.
* Conservatively including both Aroclor 1254 and Total PCBs as Congeners.
Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table N-70
Identification of Bioaccumulative CPECs in Tissue at Goose Island - Fish and Shellfish
Bradford Island - River Operable Unit
(1 of 3)

Tissue	Chemicals of Interest	IUPAC #	Max Detected Conc	CTLs for Fish & Shellfish Exposed to Tissue (1)	Toxicity Ratio for Fish & Shellfish (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)							
Clam	Beryllium	-	0.00200	NA	- -	No	Yes - No SLV
Crayfish	Mercury	-	0.0359	0.088	0.408	Yes	No
PCB Congeners (ug/kg)							
Clam	3,3',4,4'-Tetrachlorobiphenyl	77	0.0337	430	0.0000784	Yes	No
Clam	2,3,3',4,4'-Pentachlorobiphenyl	105	0.352	430	0.000819	Yes	No
Clam	2,3,4,4',5-Pentachlorobiphenyl	114	0.0228	430	0.0000530	Yes	No
Clam	2,3',4,4',5-Pentachlorobiphenyl	118	1.59	430	0.00370	Yes	No
Clam	2,3',4,4',5'-Pentachlorobiphenyl	123	0.028	430	0.0000651	Yes	No
Clam	3,3',4,4',5-Pentachlorobiphenyl	126	0.00307	430	0.00000714	Yes	No
Clam	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.0969	430	0.000225	Yes	No
Clam	2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.0925	430	0.000215	Yes	No
Clam	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.00157	430	0.00000365	Yes	No
Clam	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	21.4	430	0.0499	Yes	No
Clam	PCBs As Fish TEQ (KM, capped; NDs at MDL)	-	0.0000298	0.00640	0.00466	Yes	No
Crayfish	3,3',4,4'-Tetrachlorobiphenyl	77	0.00226	430	0.00000526	Yes	No
Crayfish	2,3,3',4,4'-Pentachlorobiphenyl	105	0.00624	430	0.0000145	Yes	No
Crayfish	2,3,4,4',5-Pentachlorobiphenyl	114	0.00235	430	0.00000547	Yes	No
Crayfish	2,3',4,4',5-Pentachlorobiphenyl	118	0.0870	430	0.000202	Yes	No
Crayfish	2,3',4,4',5'-Pentachlorobiphenyl	123	0.00256	430	0.00000595	Yes	No
Crayfish	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.0133	430	0.0000309	Yes	No
Crayfish	2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.0112	430	0.0000260	Yes	No
Crayfish	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.000662	430	0.00000154	Yes	No
Crayfish	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	0.587	430	0.00136	Yes	No
Crayfish	PCBs As Fish TEQ (KM, capped; NDs at MDL)	-	0.000000960	0.00640	0.000150	Yes	No
Sculpin	3,3',4,4'-Tetrachlorobiphenyl	77	0.00799	430	0.0000186	Yes	No
Sculpin	2,3,3',4,4'-Pentachlorobiphenyl	105	0.362	430	0.000842	Yes	No
Sculpin	2,3,4,4',5-Pentachlorobiphenyl	114	0.022	430	0.0000512	Yes	No
Sculpin	2,3',4,4',5-Pentachlorobiphenyl	118	0.872	430	0.00203	Yes	No
Sculpin	2,3',4,4',5'-Pentachlorobiphenyl	123	0.0163	430	0.0000379	Yes	No
Sculpin	3,3',4,4',5-Pentachlorobiphenyl	126	0.00315	430	0.00000733	Yes	No
Sculpin	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.106	430	0.000247	Yes	No
Sculpin	2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.0348	430	0.0000809	Yes	No
Sculpin	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.00383	430	0.00000891	Yes	No

Table N-70
Identification of Bioaccumulative CPECs in Tissue at Goose Island - Fish and Shellfish
Bradford Island - River Operable Unit
(2 of 3)

Tissue	Chemicals of Interest	IUPAC #	Max Detected Conc	CTLs for Fish & Shellfish Exposed to Tissue (1)	Toxicity Ratio for Fish & Shellfish (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
Sculpin	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	8.14	430	0.0189	Yes	No
Sculpin	PCBs As Fish TEQ (KM, capped; NDs at MDL)	-	0.0000238	0.00640	0.00371	Yes	No
SVOCs (ug/kg)							
Clam	p-cresol (4-Methylphenol)	-	29.0	NA	- -	Yes	**Yes - Bio - No SLV**
PAHs (ug/kg)							
Clam	Acenaphthene[4]	-	0.680	19,000	0.0000358	Yes	No
Clam	Anthracene[4]	-	1.20	19,000	0.0000632	Yes	No
Clam	Fluorene[4]	-	1.80	19,000	0.0000947	Yes	No
Clam	Phenanthrene[4]	-	10.0	19,000	0.000526	Yes	No
Clam	Benzo(a)anthracene[5]	-	3.40	1,000	0.00340	Yes	No
Clam	Benzo(a)pyrene[5]	-	0.750	1,000	0.000750	Yes	No
Clam	Benzo(b)fluoranthene[5]	-	2.20	1,000	0.00220	Yes	No
Clam	Benzo(g,h,i)perylene[5]	-	0.740	1,000	0.000740	Yes	No
Clam	Benzo(k)fluoranthene[5]	-	1.30	1,000	0.00130	Yes	No
Clam	Chrysene[5]	-	2.50	1,000	0.00250	Yes	No
Clam	Dibenz(a,h)anthracene[5]	-	0.480	1,000	0.000480	Yes	No
Clam	Fluoranthene	-	18.0	19,000	0.000947	Yes	No
Clam	Indeno(1,2,3-cd)pyrene[5]	-	0.890	1,000	0.000890	Yes	No
Clam	Pyrene	-	5.40	1,000	0.00540	Yes	No
Crayfish	Anthracene[4]	-	0.430	19,000	0.0000226	Yes	No
Crayfish	Fluorene[4]	-	0.510	19,000	0.0000268	Yes	No
Crayfish	Phenanthrene[4]	-	0.820	19,000	0.0000432	Yes	No
Crayfish	Benzo(b)fluoranthene[5]	-	0.150	1,000	0.000150	Yes	No
Crayfish	Benzo(g,h,i)perylene[5]	-	0.110	1,000	0.000110	Yes	No
Crayfish	Benzo(k)fluoranthene[5]	-	0.110	1,000	0.000110	Yes	No
Crayfish	Indeno(1,2,3-cd)pyrene[5]	-	0.150	1,000	0.000150	Yes	No
					Clam Sum R_{Bac}[6] =	0.0692 :	0.0240
					Crayfish Sum R_{Bac}[6] =	0.410 :	0.409
					Sculpin Sum R_{Bac}[6] =	0.0189 :	0.00371

This table only includes COIs detected above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest

Table N-70
Identification of Bioaccumulative CPECs in Tissue at Goose Island - Fish and Shellfish
Bradford Island - River Operable Unit
(3 of 3)

Tissue	Chemicals of Interest	IUPAC #	Max Detected Conc	CTLs for Fish & Shellfish Exposed to Tissue (1)	Toxicity Ratio for Fish & Shellfish (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)

CTL = critical tissue level (for fish)
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31 (see Appendix J-5d).
(2) Inorganics with maximum detected concentrations less than the site-specific reference 95% UPL concentration were not considered CPECs and are not evaluated.

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with R_{Bac} > 0.1 and Sum R_{Bac} > 1, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*.
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI.
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs.

(4) The SLV for Fluoranthene was used as a surrogate for the individual LPAHs without SLVs. Fluoranthene is considered an HPAH in the RI, HHRA, and ERA and used to calculate Total HPAH; however, fluoranthene is more accurately a PAH that borders the two with a molecular weight more similar to HPAHs and but a structure more similar to LPAHs. Therefore, use of fluoranthene as a surrogate for LPAHs is appropriate in the absence of any LPAH SLVs.
(5) The SLV for pyrene was used as a surrogate for the individual HPAHs without SLVs.
(6) The Sum R_{Bac} is the sum of the individual R_{Bac}. Two ways of calculating Sum R_{Bac}; Total PCBs as Congeners, individual metals, SVOCs, and PAHs : PCBs as Fish TEQs, individual metals, SVOCs, and PAHs.

Table N-71
Identification of Bioaccumulative CPECs in Sediment at Goose Island - Fish
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest	IUPAC #	Max Detected Conc	SLVs for Freshwater Fish Exposed to Sediment (1)	Toxicity Ratio for Fish (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (2)
INORGANICS (mg/kg)						
Aluminum	-	Sed ≤ to Reference Area (see Table L-7)			Yes	No
Barium	-	Sed ≤ to Reference Area (see Table L-7)			No	No
Beryllium	-	Sed ≤ to Reference Area (see Table L-7)			No	No
Copper	-	Sed ≤ to Reference Area (see Table L-7)			No	No
Mercury	-	Sed ≤ to Reference Area (see Table L-7)			Yes	No
Zinc	-	148	106	1.40	Yes	**Yes**
PCB Aroclors (ug/kg)						
Aroclor 1254	-	9.90	22.0	0.450	Yes	**Yes**
Total PCBs As Aroclors (NDs at MDL)	-	12.6	22.0	0.573	Yes	**Yes**
PCB Congeners (ug/kg)						
2,3,3',4,4'-Pentachlorobiphenyl	105	0.0277	62.0	0.000447	Yes	No
2,3,4,4',5-Pentachlorobiphenyl	114	0.00137	65.0	0.0000211	Yes	No
2,3',4,4',5-Pentachlorobiphenyl	118	0.0695	79.0	0.000880	Yes	No
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.0104	79.0	0.000132	Yes	No
2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.00402	79.0	0.0000509	Yes	No
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	1.34	22.0	0.0609	Yes	No
PCBs As Fish TEQ (KM, capped; NDs at MDL)	-	0.00000104	0.000560	0.00186	Yes	No
SVOCs (ug/kg)						
Bis(2-ethylhexyl) Phthalate	-	13.0	NA	- -	Yes	**Yes - Bio - No SLV**
p-cresol (4-Methylphenol)	-	8.50	NA	- -	Yes	**Yes - Bio - No SLV**
Sum R_{Bac}^3 = 1.97 : 1.46 : 1.40						

This table only includes the CPECs from Goose Island Tissue - Fish and Shellfish (Table N-70) and Smallmouth Bass CPECs from Random Forebay Tissue - Fish and Shellfish (Table N-51
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

Table N-71
Identification of Bioaccumulative CPECs in Sediment at Goose Island - Fish
Bradford Island - River Operable Unit
(2 of 2)

(1) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the bioaccumulative freshwater fish SLVs from (see Appendix J-5c):
Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31.

Bioaccumulative COIs in a Given Media

(2) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where $R_{Bac} = Cij/SLVij$, must be identified as a CPEC.

Where: Cij = concentration of contaminant *i* in medium *j*.

SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .

R_{Bac} = bioaccumulation index for an individual COI.

Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs.

(3) The Sum R_{Bac} is the sum of the individual R_{Bac}. Three ways of calculating Sum R_{Bac}; Total PCBs as Aroclors, individual metals, and SVOCs : Total PCBs as Congeners, individual metals, and SVOCs : PCBs as Fish TEQs, individual metals, and SVOCs.

Table N-72
Identification of Bioaccumulative CPECs in Tissue at Goose Island - Birds (Individual)
Bradford Island - River Operable Unit
(1 of 2)

Medium	Chemicals of Interest	IUPAC #	Max Detected Conc	ATLs for Individual Birds Exposed to Tissue (1)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg) (2)							
Crayfish	Mercury	-	0.0359	0.074	0.485	Yes	No
PCB Congeners (ug/kg)							
Crayfish	3,3',4,4'-Tetrachlorobiphenyl	77	0.00226	0.16	0.0141	Yes	No
Crayfish	2,3,3',4,4'-Pentachlorobiphenyl	105	0.00624	80	0.0000780	Yes	No
Crayfish	2,3,4,4',5-Pentachlorobiphenyl	114	0.00235	800	0.00000294	Yes	No
Crayfish	2,3',4,4',5-Pentachlorobiphenyl	118	0.0870	800	0.000109	Yes	No
Crayfish	2,3',4,4',5'-Pentachlorobiphenyl	123	0.00256	800	0.00000320	Yes	No
Crayfish	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.0133	80	0.000166	Yes	No
Crayfish	2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.0112	800	0.0000140	Yes	No
Crayfish	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.000662	800	0.000000828	Yes	No
Crayfish	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	0.587	35	0.0168	Yes	No
Crayfish	PCBs As Avian TEQ (KM, capped; NDs at MDL)	-	0.000117	0.019	0.00614	Yes	No
Sculpin	3,3',4,4'-Tetrachlorobiphenyl	77	0.00799	0.16	0.0499	Yes	No
Sculpin	2,3,3',4,4'-Pentachlorobiphenyl	105	0.362	80	0.00453	Yes	No
Sculpin	2,3,4,4',5-Pentachlorobiphenyl	114	0.022	800	0.0000275	Yes	No
Sculpin	2,3',4,4',5-Pentachlorobiphenyl	118	0.872	800	0.00109	Yes	No
Sculpin	2,3',4,4',5'-Pentachlorobiphenyl	123	0.0163	800	0.0000204	Yes	No
Sculpin	3,3',4,4',5-Pentachlorobiphenyl	126	0.00315	0.08	0.0394	Yes	No
Sculpin	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.106	80	0.00133	Yes	No
Sculpin	2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.0348	800	0.0000435	Yes	No
Sculpin	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.00383	800	0.00000479	Yes	No
Sculpin	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	8.14	35	0.233	Yes	No
Sculpin	PCBs As Avian TEQ (KM, capped; NDs at MDL)	-	0.000780	0.019	0.0410	Yes	No
PAHs (ug/kg)							
Crayfish	Anthracene	-	0.430	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Fluorene	-	0.510	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Phenanthrene	-	0.820	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(b)fluoranthene	-	0.150	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(g,h,i)perylene	-	0.110	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(k)fluoranthene	-	0.110	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Indeno(1,2,3-cd)pyrene	-	0.150	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish Sum R_{Bac}[4] = 0.502 : 0.491							
Sculpin Sum R_{Bac}[4] = 0.233 : 0.0410							

Table N-72
Identification of Bioaccumulative CPECs in Tissue at Goose Island - Birds (Individual)
Bradford Island - River Operable Unit
(2 of 2)

This table only includes COIs detected above the reference area (metals only).
ATL = acceptable tissue level
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
- - = not applicable

(1) DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31 (see Appendix J-5d).
(2) Inorganics with maximum detected concentrations less than the site-specific reference 95% UPL concentration were not considered CPECs and are not evaluated.

Bioaccumulative COIs in a Given Media

(3) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.

Where: Cij = concentration of contaminant *i* in medium *j*.
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI.
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs.

(4) The Sum R_{Bac} is the sum of the individual R_{Bac}. Two ways of calculating Sum R_{Bac}; Total PCBs as Congeners, individual metals, and PAHs : PCBs as Avian TEQs, individual metals, and

Table N-73
Identification of Bioaccumulative CPECs in Tissue at Goose Island - Birds (Population)
Bradford Island - River Operable Unit
(1 of 2)

Medium	Chemicals of Interest	IUPAC #	Max Detected Conc	ATLs for Bird Populations Exposed to Tissue (1)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg) (2)							
Crayfish	Mercury	-	0.0359	0.15	0.239	Yes	No
PCB Congeners (ug/kg)							
Crayfish	3,3',4,4'-Tetrachlorobiphenyl	77	0.00226	0.80	0.00283	Yes	No
Crayfish	2,3,3',4,4'-Pentachlorobiphenyl	105	0.00624	400	0.0000156	Yes	No
Crayfish	2,3,4,4',5-Pentachlorobiphenyl	114	0.00235	4,000	0.000000588	Yes	No
Crayfish	2,3',4,4',5-Pentachlorobiphenyl	118	0.0870	4,000	0.0000218	Yes	No
Crayfish	2,3',4,4',5'-Pentachlorobiphenyl	123	0.00256	4,000	0.000000640	Yes	No
Crayfish	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.0133	400	0.0000333	Yes	No
Crayfish	2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.0112	4,000	0.00000280	Yes	No
Crayfish	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.000662	4,000	0.000000166	Yes	No
Crayfish	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	0.587	1,800	0.000326	Yes	No
Crayfish	PCBs As Avian TEQ (KM, capped; NDs at MDL)	-	0.000117	0.0400	0.00292	Yes	No
Sculpin	3,3',4,4'-Tetrachlorobiphenyl	77	0.00799	0.80	0.00999	Yes	No
Sculpin	2,3,3',4,4'-Pentachlorobiphenyl	105	0.362	400	0.000905	Yes	No
Sculpin	2,3,4,4',5-Pentachlorobiphenyl	114	0.022	4,000	0.00000550	Yes	No
Sculpin	2,3',4,4',5-Pentachlorobiphenyl	118	0.872	4,000	0.000218	Yes	No
Sculpin	2,3',4,4',5'-Pentachlorobiphenyl	123	0.0163	4,000	0.00000408	Yes	No
Sculpin	3,3',4,4',5-Pentachlorobiphenyl	126	0.00315	0.40	0.00788	Yes	No
Sculpin	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.106	400	0.000265	Yes	No
Sculpin	2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.0348	4,000	0.00000870	Yes	No
Sculpin	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.00383	4,000	0.000000958	Yes	No
Sculpin	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	8.14	1,800	0.00452	Yes	No
Sculpin	PCBs As Avian TEQ (KM, capped; NDs at MDL)	-	0.000780	0.0400	0.0195	Yes	No
PAHs (ug/kg)							
Crayfish	Anthracene	-	0.430	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Fluorene	-	0.510	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Phenanthrene	-	0.820	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(b)fluoranthene	-	0.150	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(g,h,i)perylene	-	0.110	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Benzo(k)fluoranthene	-	0.110	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish	Indeno(1,2,3-cd)pyrene	-	0.150	NA	- -	Yes	**Yes - Bio - No SLV**
Crayfish Sum R_{Bac} [4] = 0.240 : 0.242							
Sculpin Sum R_{Bac} [4] = 0.00452 : 0.0195							

Table N-73
Identification of Bioaccumulative CPECs in Tissue at Goose Island - Birds (Population)
Bradford Island - River Operable Unit
(2 of 2)

This table only includes COIs detected above the reference area (metals only).
ATL = acceptable tissue level
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
- - = not applicable

(1) DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31 (see Appendix J-5d).
(2) Inorganics with maximum detected concentrations less than the site-specific reference 95% UPL concentration were not considered CPECs and are not evaluated.

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*.
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI.
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs.

(4) The Sum R_{Bac} is the sum of the individual R_{Bac}. Two ways of calculating Sum R_{Bac}; Total PCBs as Congeners, individual metals, and PAHs : PCBs as Avian TEQs, individual metals, and PAHs.

Table N-74
Identification of Bioaccumulative CPECs in Sediment at Goose Island - Birds (Individual)
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest	IUPAC #	Max Detected Conc	SLVs for Individual Birds Exposed to Sediment (1)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (2)
INORGANICS (mg/kg)						
Aluminum	-	Sed ≤ to Reference Area (see Table L-7)			Yes	No
Barium	-	Sed ≤ to Reference Area (see Table L-7)			No	No
Copper	-	Sed ≤ to Reference Area (see Table L-7)			No	No
Mercury	-	Sed ≤ to Reference Area (see Table L-7)			Yes	No
Zinc	-	148	106	1.40	Yes	**Yes**
PCB Aroclors (ug/kg)						
Aroclor 1254	-	9.90	1.80	5.50	Yes	**Yes**
Total PCBs As Aroclors (NDs at MDL)	-	12.6	1.80	7.00	Yes	**Yes**
PCB Congeners (ug/kg)						
3,3',4,4'-Tetrachlorobiphenyl	77	0.00353	0.00800	0.441	Yes	**Yes**
3,4,4',5-Tetrachlorobiphenyl	81	0.000135	0.00400	0.0338	Yes	No
2,3,3',4,4'-Pentachlorobiphenyl	105	0.0277	3.90	0.00710	Yes	No
2,3',4,4',5-Pentachlorobiphenyl	118	0.0695	49.0	0.00142	Yes	No
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.0104	4.9	0.00212	Yes	No
2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.00402	49.0	0.0000820	Yes	No
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	1.34	1.80	0.745	Yes	**Yes**
PCBs As Avian TEQ (KM, capped; NDs at MDL)	-	0.000183	0.00170	0.107	Yes	**Yes**
SVOCs (ug/kg)						
Di-n-butyl Phthalate	-	10.0	NA	- -	Yes	**Yes - Bio - No SLV**
PAHs (ug/kg)						
Phenanthrene	-	4.60	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(a)anthracene	-	7.80	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(a)pyrene	-	13.0	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(b)fluoranthene	-	15.0	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(g,h,i)perylene	-	9.90	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(k)fluoranthene	-	4.10	NA	- -	Yes	**Yes - Bio - No SLV**
Chrysene	-	11.0	NA	- -	Yes	**Yes - Bio - No SLV**
Fluoranthene	-	9.60	NA	- -	Yes	**Yes - Bio - No SLV**
Indeno(1,2,3-cd)pyrene	-	7.10	NA	- -	Yes	**Yes - Bio - No SLV**
Pyrene	-	8.80	NA	- -	Yes	**Yes - Bio - No SLV**
Sum R_{Bac}[3] = 8.40 : 2.14 : 1.50						

Table N-74
Identification of Bioaccumulative CPECs in Sediment at Goose Island - Birds (Individual)
Bradford Island - River Operable Unit
(2 of 2)

This table only includes the CPECs from the Goose Island Tissue - Bird (Individual) (Table N-72) and Smallmouth Bass CPECs from Forebay Tissue - Bird (Individual) (Table N-53).
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the bioaccumulative bird (individual) SLVs from (see Appendix J-5c):
Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31.

Bioaccumulative COIs in a Given Media
(2) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j*.
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(3) The Sum R_{Bac} is the sum of the individual R_{Bac}. Three ways of calculating Sum R_{Bac}; Total PCBs as Aroclors, individual metals, SVOCs, and PAHs : Total PCBs as Congeners, individual metals, SVOCs, and PAHs : PCBs as Avian TEQs, individual metals, SVOCs, and PAHs.

Table N-75
Identification of Bioaccumulative CPECs in Sediment at Goose Island - Birds (Population)
Bradford Island - River Operable Unit
(1 of 2)

Chemicals of Interest	IUPAC #	Max Detected Conc	SLVs for Bird Populations Exposed to Sediment (1)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (2)
INORGANICS (mg/kg)						
Aluminum	-	Sed ≤ to Reference Area (see Table L-7)			Yes	No
Barium	-	Sed ≤ to Reference Area (see Table L-7)			No	No
Copper	-	Sed ≤ to Reference Area (see Table L-7)			No	No
Mercury	-	Sed ≤ to Reference Area (see Table L-7)			Yes	No
Zinc	-	148	106	1.40	Yes	**Yes**
PCB Aroclors (ug/kg)						
Aroclor 1254	-	9.90	91.0	0.109	Yes	**Yes**
Total PCBs As Aroclors (NDs at MDL)	-	12.6	91.0	0.138	Yes	**Yes**
PCB Congeners (ug/kg)						
3,3',4,4'-Tetrachlorobiphenyl	77	0.00353	0.040	0.0883	Yes	No
3,4,4',5-Tetrachlorobiphenyl	81	0.000135	0.020	0.00675	Yes	No
2,3,3',4,4'-Pentachlorobiphenyl	105	0.0277	19.0	0.00146	Yes	No
2,3',4,4',5-Pentachlorobiphenyl	118	0.0695	240	0.000290	Yes	No
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.0104	24.0	0.000433	Yes	No
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	1.34	91.0	0.0147	Yes	No
PCBs As Avian TEQ (KM, capped; NDs at MDL)	-	0.000183	0.00350	0.0522	Yes	No
SVOCs (ug/kg)						
Di-n-butyl Phthalate	-	10.0	NA	- -	Yes	**Yes - Bio - No SLV**
PAHs (ug/kg)						
Phenanthrene	-	4.60	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(a)anthracene	-	7.80	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(a)pyrene	-	13.0	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(b)fluoranthene	-	15.0	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(g,h,i)perylene	-	9.90	NA	- -	Yes	**Yes - Bio - No SLV**
Benzo(k)fluoranthene	-	4.10	NA	- -	Yes	**Yes - Bio - No SLV**
Chrysene	-	11.0	NA	- -	Yes	**Yes - Bio - No SLV**
Fluoranthene	-	9.60	NA	- -	Yes	**Yes - Bio - No SLV**
Indeno(1,2,3-cd)pyrene	-	7.10	NA	- -	Yes	**Yes - Bio - No SLV**
Pyrene	-	8.80	NA	- -	Yes	**Yes - Bio - No SLV**
Sum R_{Bac}[3] = 1.53 : 1.41 : 1.45						

This table only includes the CPECs from the Goose Island Tissue - Bird (Population) (Table N-73) and Smallmouth Bass CPECs from Forebay Tissue - Bird (Population) (Table N-54).

Table N-75
Identification of Bioaccumulative CPECs in Sediment at Goose Island - Birds (Population)
Bradford Island - River Operable Unit
(2 of 2)

CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

(1) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the bioaccumulative bird (population) SLVs from (see Appendix J-5c):
Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31.

Bioaccumulative COIs in a Given Media

(2) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*.
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI.
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs.

(3) The Sum R_{Bac} is the sum of the individual R_{Bac}. Three ways of calculating Sum R_{Bac}; Total PCBs as Aroclors, individual metals, and PAHs : Total PCBs as Congeners, individual metals, and PAHs : PCBs as Avian TEQs, individual metals, and PAHs.

Table N-76
Identification of Bioaccumulative CPECs in Tissue at Goose Island - Mammals (Individual)
Bradford Island - River Operable Unit
(1 of 2)

Medium	Chemicals of Interest	IUPAC #	Max Detected Conc	ATLs for Individual Mammals Exposed to Tissue (1)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg) (2)							
Crayfish	Mercury	-	0.0359	0.12	0.299	Yes	No
PCB Congeners (ug/kg)							
Crayfish	3,3',4,4'-Tetrachlorobiphenyl	77	0.00226	5.8	0.000390	Yes	No
Crayfish	2,3,3',4,4'-Pentachlorobiphenyl	105	0.00624	20	0.000312	Yes	No
Crayfish	2,3,4,4',5-Pentachlorobiphenyl	114	0.00235	20	0.000118	Yes	No
Crayfish	2,3',4,4',5-Pentachlorobiphenyl	118	0.0870	20	0.00435	Yes	No
Crayfish	2,3',4,4',5'-Pentachlorobiphenyl	123	0.00256	20	0.000128	Yes	No
Crayfish	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.0133	20	0.000665	Yes	No
Crayfish	2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.0112	20	0.000560	Yes	No
Crayfish	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.000662	20	0.0000331	Yes	No
Crayfish	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	0.587	880	0.000667	Yes	No
Crayfish	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	-	0.00000482	0.000580	0.00831	Yes	No
Sculpin	3,3',4,4'-Tetrachlorobiphenyl	77	0.00799	5.8	0.00138	Yes	No
Sculpin	2,3,3',4,4'-Pentachlorobiphenyl	105	0.362	20	0.0181	Yes	No
Sculpin	2,3,4,4',5-Pentachlorobiphenyl	114	0.022	20	0.00110	Yes	No
Sculpin	2,3',4,4',5-Pentachlorobiphenyl	118	0.872	20	0.0436	Yes	No
Sculpin	2,3',4,4',5'-Pentachlorobiphenyl	123	0.0163	20	0.000815	Yes	No
Sculpin	3,3',4,4',5-Pentachlorobiphenyl	126	0.00315	0.0058	0.543	Yes	No
Sculpin	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.106	20	0.00530	Yes	No
Sculpin	2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.0348	20	0.00174	Yes	No
Sculpin	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.00383	20	0.000192	Yes	No
Sculpin	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	8.14	880	0.00925	Yes	No
Sculpin	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	-	0.000363	0.000580	0.626	Yes	No
PAHs (ug/kg)							
Crayfish	Anthracene[4]	-	0.430	190,000	0.00000226	Yes	No
Crayfish	Fluorene[4]	-	0.510	190,000	0.00000268	Yes	No
Crayfish	Phenanthrene[4]	-	0.820	190,000	0.00000432	Yes	No
Crayfish	Benzo(b)fluoranthene[5]	-	0.150	9,500,000	0.0000000158	Yes	No
Crayfish	Benzo(g,h,i)perylene[5]	-	0.110	9,500,000	0.0000000116	Yes	No
Crayfish	Benzo(k)fluoranthene[5]	-	0.110	9,500,000	0.0000000116	Yes	No
Crayfish	Indeno(1,2,3-cd)pyrene[5]	-	0.150	9,500,000	0.0000000158	Yes	No
				Crayfish Sum R_{Bac}[6] =	0.309 : 0.307		
				Sculpin Sum R_{Bac}[6] =	0.00925 : 0.626		

Table N-76
Identification of Bioaccumulative CPECs in Tissue at Goose Island - Mammals (Individual)
Bradford Island - River Operable Unit
(2 of 2)

This table only includes COIs detected above the reference area (metals only).
ATL = acceptable tissue level
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
- - = not applicable

(1) DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31 (see Appendix J-5d).
(2) Inorganics with maximum detected concentrations less than the site-specific reference 95% UPL concentration were not considered CPECs and are not evaluated.

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*.
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI.
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs.

(4) The SLV for Fluoranthene was used as a surrogate for the individual LPAHs without SLVs. Fluoranthene is considered an HPAH in the RI, HHRA, and ERA and used to calculate Total HPAH; however, fluoranthene is more accurately a PAH that borders the two with a molecular weight more similar to HPAHs and but a structure more similar to LPAHs. Therefore, use of fluoranthene as a surrogate for LPAHs is appropriate in the absence of any LPAH SLVs.
(5) The SLV for pyrene was used as a surrogate for the individual HPAHs without SLVs.
(6) The Sum R_{Bac} is the sum of the individual R_{Bac}. Two ways of calculating Sum R_{Bac}; Total PCBs as Congeners, individual metals, and PAHs : PCBs as Mammal TEQs, individual metals, and

Table N-77
Identification of Bioaccumulative CPECs in Tissue at Goose Island - Mammals (Population)
Bradford Island - River Operable Unit
(1 of 2)

Medium	Chemicals of Interest	IUPAC #	Max Detected Conc	ATLs for Bird Populations Exposed to Tissue (1)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg) (2)							
Crayfish	Mercury	-	0.0359	0.20	0.180	Yes	No
PCB Congeners (ug/kg)							
Crayfish	3,3',4,4'-Tetrachlorobiphenyl	77	0.00226	160	0.0000141	Yes	No
Crayfish	2,3,3',4,4'-Pentachlorobiphenyl	105	0.00624	540	0.0000116	Yes	No
Crayfish	2,3,4,4',5-Pentachlorobiphenyl	114	0.00235	540	0.00000435	Yes	No
Crayfish	2,3',4,4',5-Pentachlorobiphenyl	118	0.0870	540	0.000161	Yes	No
Crayfish	2,3',4,4',5'-Pentachlorobiphenyl	123	0.00256	540	0.00000474	Yes	No
Crayfish	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.0133	540	0.0000246	Yes	No
Crayfish	2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.0112	540	0.0000207	Yes	No
Crayfish	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.000662	540	0.00000123	Yes	No
Crayfish	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	0.587	1,700	0.000345	Yes	No
Crayfish	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	-	0.00000482	0.0160	0.000301	Yes	No
Sculpin	3,3',4,4'-Tetrachlorobiphenyl	77	0.00799	160	0.0000499	Yes	No
Sculpin	2,3,3',4,4'-Pentachlorobiphenyl	105	0.362	540	0.000670	Yes	No
Sculpin	2,3,4,4',5-Pentachlorobiphenyl	114	0.022	540	0.0000407	Yes	No
Sculpin	2,3',4,4',5-Pentachlorobiphenyl	118	0.872	540	0.00161	Yes	No
Sculpin	2,3',4,4',5'-Pentachlorobiphenyl	123	0.0163	540	0.0000302	Yes	No
Sculpin	3,3',4,4',5-Pentachlorobiphenyl	126	0.00315	0.16	0.0197	Yes	No
Sculpin	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.106	540	0.000196	Yes	No
Sculpin	2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.0348	540	0.0000644	Yes	No
Sculpin	2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.00383	540	0.00000709	Yes	No
Sculpin	Total PCBs As Congeners (KM, capped; NDs at MDL)	-	8.14	1,700	0.00479	Yes	No
Sculpin	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	-	0.000363	0.0160	0.0227	Yes	No
PAHs (ug/kg)							
Crayfish	Anthracene[4]	-	0.430	950,000	0.000000453	Yes	No
Crayfish	Fluorene[4]	-	0.510	950,000	0.000000537	Yes	No
Crayfish	Phenanthrene[4]	-	0.820	950,000	0.000000863	Yes	No
Crayfish	Benzo(b)fluoranthene[5]	-	0.150	47,000,000	0.00000000319	Yes	No
Crayfish	Benzo(g,h,i)perylene[5]	-	0.110	47,000,000	0.00000000234	Yes	No
Crayfish	Benzo(k)fluoranthene[5]	-	0.110	47,000,000	0.00000000234	Yes	No
Crayfish	Indeno(1,2,3-cd)pyrene[5]	-	0.150	47,000,000	0.00000000319	Yes	No
				Crayfish Sum R_{Bac}[6] =	0.180	0.180	
				Sculpin Sum R_{Bac}[6] =	0.00479	0.0227	

Table N-77
Identification of Bioaccumulative CPECs in Tissue at Goose Island - Mammals (Population)
Bradford Island - River Operable Unit
(2 of 2)

This table only includes COIs detected above the reference area (metals only).
ATL = acceptable tissue level
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
- - = not applicable

(1) DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31 (see Appendix J-5d).
(2) Inorganics with maximum detected concentrations less than the site-specific reference 95% UPL concentration were not considered CPECs and are not evaluated.

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*.
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI.
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs.

(4) The SLV for Fluoranthene was used as a surrogate for the individual LPAHs without SLVs. Fluoranthene is considered an HPAH in the RI, HHRA, and ERA and used to calculate Total HPAH; however, fluoranthene is more accurately a PAH that borders the two with a molecular weight more similar to HPAHs and but a structure more similar to LPAHs. Therefore, use of fluoranthene as a surrogate for LPAHs is appropriate in the absence of any LPAH SLVs.
(5) The SLV for pyrene was used as a surrogate for the individual HPAHs without SLVs.
(6) The Sum R_{Bac} is the sum of the individual R_{Bac}. Two ways of calculating Sum R_{Bac}; Total PCBs as Congeners, individual metals, and PAHs : PCBs as Mammal TEQs, individual metals, and PAHs.

Table N-78
Identification of Bioaccumulative CPECs in Sediment at Goose Island - Mammals (Individual)
Bradford Island - River Operable Unit
(1 of 2)

Chemical of Interest	IUPAC #	Max Detected Conc	SLVs for Individual Mammals Exposed to Sediment (1)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (2)
INORGANICS (mg/kg)						
Aluminum	-	Sed ≤ to Reference Area (see Table L-7)			Yes	No
Barium	-	Sed ≤ to Reference Area (see Table L-7)			No	No
Copper	-	Sed ≤ to Reference Area (see Table L-7)			No	No
Mercury	-	Sed ≤ to Reference Area (see Table L-7)			Yes	No
Zinc	-	148	106	1.40	Yes	**Yes**
PCB Aroclors (ug/kg)						
Aroclor 1254	-	9.90	44.0	0.225	Yes	**Yes**
Total PCBs As Aroclors (NDs at MDL)	-	12.6	44.0	0.286	Yes	**Yes**
PCB Congeners (ug/kg)						
3,3',4,4'-Tetrachlorobiphenyl	77	0.00353	0.300	0.0118	Yes	No
3,4,4',5-Tetrachlorobiphenyl	81	0.000135	0.0980	0.00138	Yes	No
2,3,3',4,4'-Pentachlorobiphenyl	105	0.0277	0.940	0.0295	Yes	No
2,3,4,4',5-Pentachlorobiphenyl	114	0.00137	0.980	0.00140	Yes	No
2,3',4,4',5-Pentachlorobiphenyl	118	0.0695	1.20	0.0579	Yes	No
2,3',4,4',5'-Pentachlorobiphenyl	123	0.000963	1.20	0.000803	Yes	No
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.0104	1.20	0.00867	Yes	No
2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.00402	1.20	0.00335	Yes	No
2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	0.000869	6.60	0.000132	Yes	No
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	1.34	44.0	0.0305	Yes	No
PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	-	0.00000467	0.0000520	0.0898	Yes	No
Sum R_{Bac}^3 = 1.68 : 1.43 : 1.49						

This table only includes the CPECs from the Goose Island Tissue - Mammal (Individual) (Table N-76) and Smallmouth Bass CPECs from Forebay Tissue - Mammal (Individual) (Table N-57).
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
UCL = upper confidence limit on the mean

Table N-78
Identification of Bioaccumulative CPECs in Sediment at Goose Island - Mammals (Individual)
Bradford Island - River Operable Unit
(2 of 2)

- - = not applicable

(1) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the bioaccumulative mammalian (individual) SLVs from (see Appendix J-5c):
Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31.

Bioaccumulative COIs in a Given Media

(2) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.

Where: Cij = concentration of contaminant *i* in medium *j*.

SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .

R_{Bac} = bioaccumulation index for an individual COI.

Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs.

(3) The Sum R_{Bac} is the sum of the individual R_{Bac}. Three ways of calculating Sum R_{Bac}; Total PCBs as Aroclors and individual metals : Total PCBs as Congeners and individual metals : PCBs as Mammal TEQs and individual metals.

Table N-79
Identification of Bioaccumulative CPECs in Sediment at Goose Island - Mammals (Population)
Bradford Island - River Operable Unit
(1 of 2)

Chemical of Interest	IUPAC #	Max Detected Conc	SLVs for Mammal Populations Exposed to Sediment (1)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	COI is Identified as a Bioaccumulative CPEC? (2)
INORGANICS (mg/kg)						
Aluminum	-	Sed ≤ to Reference Area (see Table L-7)			Yes	No
Barium	-	Sed ≤ to Reference Area (see Table L-7)			No	No
Copper	-	Sed ≤ to Reference Area (see Table L-7)			No	No
Mercury	-	Sed ≤ to Reference Area (see Table L-7)			Yes	No
Zinc	-	148	106	1.40	Yes	**Yes**
PCB Aroclors (ug/kg)						
Aroclor 1254	-	9.90	84.0	0.118	Yes	**Yes**
Total PCBs As Aroclors (NDs at MDL)	-	12.6	84.0	0.150	Yes	**Yes**
PCB Congeners (ug/kg)						
2,3,3',4,4'-Pentachlorobiphenyl	105	0.0277	26.0	0.00107	Yes	No
2,3,4,4',5-Pentachlorobiphenyl	114	0.00137	27.0	0.0000507	Yes	No
2,3',4,4',5-Pentachlorobiphenyl	118	0.0695	33.0	0.00211	Yes	No
2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	156 + 157	0.0104	33.0	0.000315	Yes	No
2,3',4,4',5,5'-Hexachlorobiphenyl	167	0.00402	33.0	0.000122	Yes	No
Total PCBs As Congeners (KM, capped; NDs at MDL)	-	1.34	84,000	0.0000160	Yes	No
PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	-	0.00000467	0.00140	0.00333	Yes	No
Sum R_{Bac}^3 = 1.55 : 1.40 : 1.40						

This table only includes the CPECs from the Goose Island Tissue - Mammal (Population) (Table N-77) and Smallmouth Bass CPECs from Forebay Tissue - Mammal (Population) (Table N-58).
CPEC = chemical of potential ecological concern
COI = chemical of interest
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
UCL = upper confidence limit on the mean
- - = not applicable

(1) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the bioaccumulative mammalian (population) SLVs from (see Appendix J-5c):
Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. January 31.

Table N-79
Identification of Bioaccumulative CPECs in Sediment at Goose Island - Mammals (Population)
Bradford Island - River Operable Unit
(2 of 2)

Bioaccumulative COIs in a Given Media

(2) Any individual COI in any given media with $R_{Bac} > 0.1$ and Sum $R_{Bac} > 1$, where R_{Bac} = Cij/SLVij, must be identified as a CPEC.

Where: Cij = concentration of contaminant *i* in medium *j*

SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .

R_{Bac} = bioaccumulation index for an individual COI

Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(3) The Sum R_{Bac} is the sum of the individual R_{Bac}. Three ways of calculating Sum R_{Bac}; Total PCBs as Aroclors and individual metals : Total PCBs as Congeners and individual metals : PCBs as Mammal TEQs and individual metals.

Table N-80
Summary of Forebay CPECs for Benthic Community, Fish and Shellfish
Bradford Island - River Operable Unit
(1 of 1)

Group	Benthic Community [a]	Clams	Crayfish	Sculpin	Smallmouth Bass
Metals	none	Cadmium	No CPECs	Cadmium, Lead, and Mercury	Mercury
PCBs	Aroclors 1254 and 1248 [b] and Total PCBs as Aroclors [b]	Total PCBs as Congeners		Aroclor 1254* and Total PCBs as Aroclors*	Aroclors 1242 and 1254*; and Total PCBs as Aroclors*
				PCBs 105, 118, 156+157,Total PCBs as Congeners, and fish PCB TEQ	PCBs 105, 114, 118, 156+157, 167, Total PCBs as Congeners, and fish PCB TEQ
SVOCs	none	Bis(2-ethylhexyl) Phthalate		not enough tissue for analysis	Bis(2-ethylhexyl) Phthalate* and Butyl Benzyl Phthalate

* Also identified as CPECs in Forebay sediment.
[a] CPECs identified for benthic community based on evaluation of direct toxicity from exposure to sediment. CPECs for clams, crayfish, sculpin, and smallmouth bass based on evaluation of exposure through dietary pathway (i.e., evaluation of species-specific tissue data).
[b] Eagle Creek sediment only.

Table N-81
Summary of Forebay CPECs for Birds
Bradford Island - River Operable Unit
(1 of 1)

Group	Individual-Level CPEC for Birds			Population-Level CPEC for Birds		
	Crayfish	**Sculpin**	**Smallmouth Bass**	**Crayfish**	**Sculpin**	**Smallmouth Bass**
Metals	Mercury	Mercury	Mercury	No CPECs	Mercury	Mercury
PCBs	Total PCBs as Congeners*	Aroclors 1254* and Total PCBs as Aroclors*	Aroclors 1242 and 1254*, and Total PCBs as Aroclors*		Aroclors 1254 and Total PCBs as Aroclors	Aroclors 1242 and 1254, and Total PCBs as Aroclors
		PCBs 77*, 105, 118, 126, 156+157, Total PCBs as Congeners*, and avain PCB TEQ	PCBs 77*, 81, 105, 118, 126, 156+157, 167, Total PCBs as Congeners*, and avain PCB TEQ		PCBs 77, 105, 118, 156+157, Total PCBs as Congeners, and avain PCB TEQ	PCBs 77, 81, 105, 118, 126, 156+157, Total PCBs as Congeners, and avain PCB TEQ
SVOCs	not enough tissue for analysis	not enough tissue for analysis	Di-n-butyl phthalate		not enough tissue for analysis	none

* Also identified as CPECs in Forebay sediment

Table N-82
Summary of Forebay CPECs for Mammals
Bradford Island - River Operable Unit
(1 of 1)

Group	Individual-Level CPEC for Mammals			Population-Level CPEC for Mammals		
	Crayfish	Sculpin	Smallmouth Bass	Crayfish	Sculpin	Smallmouth Bass
Metals	PCBs 118, 126, 156+157, mammalian PCB TEQ	Mercury	Mercury	No CPECs	Mercury	Mercury
PCBs		Aroclor 1254 and Total PCBs as Aroclors	Aroclors 1242 and 1254; and Total PCBs as Aroclors		Aroclor 1254 and Total PCBs as Aroclors	Aroclors 1242 and 1254; and Total PCBs as Aroclors
		PCBs 105*, 114, 118*, 123, 126*, 156+157*, 167, 169, Total PCBs as Congeners, and mammalian PCB TEQ*	PCBs 77, 81, 105*, 114, 118*, 123, 126*, 156+157*, 167, 189, Total PCBs as Congeners, and mammalian PCB TEQ*		PCBs 105, 118, 126, 156+157, Total PCBs as Congeners, and mammalian PCB TEQ	PCBs 105, 114, 118, 126, 156+157, 167, Total PCBs as Congeners, and mammalian PCB TEQ

* Also identified as CPECs in Forebay sediment

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Uncertainties are inherent in any risk-based approach to evaluation and decision-making for potentially contaminated sites. The uncertainties may be general and systemic as well as specific to the site. The objective of the uncertainty assessment is to identify the sources of uncertainty in the risk assessment (RA) process, understand their potential to contribute to either underestimation or overestimation of risk for the selected receptors and pathways and describe how the uncertainty is addressed. By describing the nature and magnitude of the uncertainties, the findings and conclusions of the RA can be better understood and used as a tool for decision-making.

Both the human health risk assessment (HHRA) and ecological risk assessment (ERA) use essentially the same process for chemicals of potential concern (COPCs) identification, or chemicals of potential ecological concern (CPECs), and screening level risk evaluation. The process includes 4 elements: compilation of useable analytical data, identification of receptors and exposure pathways, selection and application of media-specific screening level values (SLVs), and identification of COPCs and CPECs from the broader list of chemicals of interest (COIs) that were analyzed. Therefore, some uncertainties are common to both the HHRA and the ERA. These uncertainties are described first followed by more extensive discussion of uncertainties that apply specifically to either the HHRA or ERA.

O.1 Uncertainties Common to the HHRA and ERA

The sources of uncertainty that are common to the HHRA and ERA include issues related to data quality, estimation of exposure point concentrations (EPCs), and the selection and application of SLVs to identify COPCs. For simplicity, the term COPCs is used in reference to both the HHRA and ERA in this section. The uncertainties common to the HHRA and ERA that are not specific to the Upland or River Operable Units (OUs) are in Section O.1.1, and those that are OU-specific are described in Sections O.1.2 and O.1.3.

O.1.1 Upland and River OUs

O.1.1.1 Data Adequacy and Data Quality

Section 7.0 of the main remedial investigation (RI) text provides a thorough evaluation of the adequacy and quality of the data used in the Upland and River OU RAs. Specifically, the following elements were assessed for each data set included in the RAs:

- Sample size
- J-flagged Data
- Variable method detection limits (MDLs) and method reporting limits (MRLs)
- MDLs of undetected data (U-flagged) greater than SLVs
- MRLs of undetected (U-flagged) and estimated (J-flagged) data greater than SLVs
- Analytes without SLVs

The findings of the data adequacy and quality evaluations are described in detail in Section 7.0. In summary, the majority of sample sizes for each analyte measured in media of the Upland and River OUs are considered to be sufficient for their intended uses since they meet the minimum required sample size for statistical evaluation. Analytes for which the sample sizes were limited include, but are not limited to, those that were targeted (i.e., Goose Island and Eagle Creek), focused (i.e., groundwater, seep water, and surface water), or limited based on the ability to collect (i.e., sculpin and sucker) and were included for non-statistical use.

Eight samples is the minimum necessary to calculate a 95% upper confidence limit on the mean (UCL) as the exposure point concentration (EPC), and 14 samples is the minimum desired for the population-to-population statistical comparison to identify COIs that are above Reference concentrations. Limited sample sizes were noted for some analytes in samples intended for these statistical analyses. For human and ecological receptors for which the UCL is an appropriate EPC, the maximum detected concentration was used to represent the EPC for analytes with less than 8 samples and represents the best effort to avoid underestimation of risk. Analytes for which at least 14 samples are not available were not included in the statistical comparison, and a qualitative comparison to Reference concentrations was performed.

The use of J-flagged data and analytical MDLs and MRLs with respect to SLVs are associated with some potential for underprediction of risk but have been mitigated to the extent possible by the RA methodology by including J-flagged data as detected values in the data comparisons. The treatment of analytes without SLVs may also have the potential to underpredict risk, but these analytes and media are evaluated qualitatively in the RAs. Sections O.2 and O.3 provide a

more detailed discussion of the MDLs in exceedance of the SLVs specific to the HHRA and ERA, as well as COPCs that lack SLVs protective of either human or ecological receptors. Overall, data quality issues have been addressed in a manner that tends to overestimate the occurrence and concentrations of COIs in the screening-level HHRA and ERA.

O.1.1.2 COPC Selection Process

The extensive COPC selection process includes consideration of detection frequency (for Upland media and analytes with more than 20 samples), comparison with Reference levels for inorganics, and a concentration-risk screen. The use of the 5% detection frequency criterion may underestimate risk by omitting some COIs that are present at low frequency but may potentially contribute to human and ecological risk if exposures to those COIs were to occur. Several of the COIs omitted on the basis of detection frequency (a number of volatile organic compounds [VOCs] and semivolatile organic compound [SVOCs]) are generally of low toxicity and do not bioaccumulate. Bioaccumulation of COIs in soil is only a concern for ecological receptors in the Upland OU, and bioaccumulation of COIs in groundwater that could discharge to surface water of the River is a concern for both human and ecological receptors. Overall, the selection process tends to retain more COPCs than are actually expected to contribute significantly to human health or ecological risks.

O.1.1.3 Exposure Point Concentrations

As with all site characterizations for RA, there is uncertainty that the maximum and minimum detected concentrations for COPCs may potentially not be the actual highest and lowest concentrations in each medium. Since the actual high and low concentrations may not have been detected, the calculation of the EPC (e.g., maximum detected concentrations and 95% UCLs) may overestimate or underestimate the risk at the site to human and ecological receptors, but is assumed to represent an upper-bound estimate of the mean.

O.1.1.4 Selection and Use of SLVs

The human or ecological screening value represents a constituent concentration in a given medium (e.g., soil) that is considered to be protective of humans or the ecological community, provided that the ecological screening value is not exceeded. However, some of the SLVs used in the Human Health Problem Formulation and Level II ERA screening may be based on the protection of a single, most-sensitive receptor or species in a specific medium, which may not be an exposure pathway or species likely to be present on Bradford Island (e.g., potable use of shallow perched groundwater in a residential setting).

In addition, SLVs protective of ecological receptors were not available to evaluate species-specific toxicity for all of the COIs evaluated in the HHRA and ERA. When appropriate, surrogate SLVs were selected from chemically-similar COIs to assess risk for the COIs without chemical-specific SLVs. However, the exposed organisms may respond differently to exposures to different toxicants, and responses from exposures to COIs with surrogate SLVs may be different from the response for the COIs for which toxicity data were reported. The direction and magnitude of this uncertainty are not measurable, although the choice of conservative SLVs is likely to skew the evaluation toward more protective conclusions.

O.1.2 Upland OU

O.1.2.1 Exposure to Undiluted Groundwater

The assumption that aquatic organisms, fish, aquatic-based wildlife, and humans utilizing the River could be exposed to undiluted groundwater concentrations likely overestimated risk. However, risk to these receptors is more accurately assessed through the evaluation of the seep water and adjacent shoreline surface water (i.e., Landfill area of potential concern [AOPC]), thereby minimizing the uncertainty surrounding risk to aquatic receptors from groundwater. Also the assumption of potable use of unfiltered groundwater in a hypothetical on-site residential setting is an unlikely exposure scenario but is built in to the unavoidable use of residential water use SLVs for evaluation of the potable use pathway for occupational receptors.

O.1.2.2 Overland Transport Pathway from Upland to River

The majority of the Landfill AOPC is flat and well vegetated, with no evidence of runoff or erosion. While there is no visual evidence of current sloughing along the northern perimeter of the Landfill AOPC, if mass wasting were to occur (i.e., catastrophic event) on the steep slopes, the soils may reach the river. During a site visit in 2009, an area northeast of the Sandblast Building was observed to have been recently disturbed and was identified as erodible, whereby contaminated surface soil is transported to the river via stormwater drainage and surface water runoff. However, this area has become revegetated (see the photo in Appendix C) and the soils are no longer considered erodible. The majority of the Bulb Slope AOPC exhibits no evidence of surface runoff or overland flow to the River. However, wave erosion at the base of the slope has resulted in mass wasting (small slope failures) of material into the river and appears to be a potential mechanism for transport of debris and/or contaminated soil into the river.

For these reasons, the evaluation to address the potential transport of soil from the Landfill, Sandblast Area, and Bulb Slope AOPCs to the River through a comparison of COI concentrations detected in soil samples collected in-place from these three AOPCs to sediment SLVs protective of aquatic organisms, aquatic-dependent wildlife, and humans utilizing the River likely overestimates risk for exposure to these receptor groups. Risk to these receptors is more accurately assessed through the evaluation of the sediment and tissue data collected from River OU, thereby minimizing the uncertainty surrounding risk to aquatic receptors from Upland soil transport. The findings of the receptor-specific evaluation of the overland transport pathway are provided in Sections O.2 and O.3.

O.1.3 River OU

O.1.3.1 Large Scale Sucker Data

The large scale sucker is a higher trophic level fish that represents a different feeding guild than either the sculpin or smallmouth bass, and may conceivably be exposed to COIs from different prey items than the smallmouth bass. The sucker is considered to be an edible sport fish of low attraction to anglers. One composite sample of large scale sucker was collected and analyzed prior to the interim sediment and equipment removal. The sample size was limited due to the inability to collect sufficient tissue from the Forebay. Due to the limited sample size and time of collection, the large-scale sucker data are not considered representative of current Forebay conditions. However, the data are evaluated qualitatively here to address two concerns expressed

by Oregon Department of Environmental Quality (DEQ): whether there are any CPECs unique to large-scale sucker that were not found in other fish species sampled, and whether concentrations of any COIs are higher in large-scale sucker than in other tissue matrices.

Table O.1-1 shows a comparison of the COI concentrations in large scale sucker tissue to smallmouth bass tissue, and to tissue SLVs protective of human and ecological receptors. Total polychlorinated biphenyls (PCBs) as well as individual dioxin-like congeners were substantially higher (by 1 to 3 orders of magnitude) in the bass than the sucker. The only exception detected in the sucker that was not reported in bass was PCB congener 169. PCB 169 was detected in sucker tissue at a concentration of 0.011 µg/kg, which is higher than the human health tissue SLVs of 0.00025 micrograms per kilogram (µg/kg) and 0.0021 µg/kg for subsistence and recreational fishers, respectively, and lower than the lowest ecological tissue SLV of 0.02 µg/kg. All other chemicals detected in sucker were also reported in bass, the majority of which were higher in the bass. No other COIs in large scale sucker tissue exceeded the tissue SLVs.

Based on this analysis, it is concluded that the addition of large-scale sucker data to the RAs (in addition to smallmouth bass) is not likely to add either precision or accuracy to the risk estimates, and excluding it did not result in underestimation of risk.

O.1.3.2 Use of Tissue Data

A major source of uncertainty for the River OU is whether the tissue and sediment data utilized in the RAs represent current conditions in the Forebay. The risk characterization is based upon post-sediment removal clam tissue, crayfish tissue, and sculpin tissue, as well as smallmouth bass tissue data that were collected prior to the 2007 sediment removal. The crayfish tissue was collected after the sediment removal but may represent exposure periods that date back to pre-removal conditions. These factors may overestimate the number of COPCs and the magnitudes of their exceedances above SLVs for smallmouth bass and crayfish. Crayfish, smallmouth bass and other receptors that may have been exposed to both pre-removal and post-removal conditions are likely to show a trend of declining tissue concentrations over time. However, crayfish and smallmouth bass populations that are hatched after the removal will be exposed only to post-removal conditions and will furnish a more accurate estimate of bioaccumulation potential under current conditions.

O.1.3.3 Pre-Removal Sediment

Five sediment samples (termed pre-removal sediment samples) were collected from within the footprint of the sediment removal area before the removal action (Table 6-7). These samples are not representative of current conditions in the Forebay. Therefore, it is inappropriate to use these data as part of the COPC selection process. However, the data were reviewed on a qualitative basis herein.

In Table O.1-2, the data from the five pre-removal samples are screened against the lowest SLV (applicable to ecological or human health). The only COIs that exceed these most-conservative SLVs are Aroclor 1254, Total PCBs as Aroclors, and mercury. Mercury, Aroclor 1254 and Total PCBs are already identified as COPCs for the River OU. Although mercury levels in Forebay sediment are comparable to Reference Area concentrations, mercury was retained as a bioaccumulative COPC for sediments based on its selection as a COPC for fish tissues.

If the pre-removal sediment data were included for evaluation of PCBs, the benthic invertebrate EPC (the maximum detected concentration) for Aroclor 1254 would change from 29.0 to 130 µg/kg and the EPC for Total PCBs as Aroclors would change from 29.7 to 131 µg/kg. This would have resulted in toxicity ratios (Tij) above 1 for both Aroclor 1254 and total PCBs as Aroclors. However, Aroclor 1254 is already identified as a CPEC for benthic invertebrates exposed to multiple COIs, so there is no change in the overall outcome (identification of PCBs as CPECs) of the current ERA.

Although the pre-removal data are not representative of current conditions, and should not be used quantitatively in the RAs, the United States Army Corps of Engineers (USACE) agreed to calculate the area-weighted average 95% UCL for the Forebay, both with and without the pre-removal data (URS Corporation [URS] 2010d). The 95% UCL for Total PCBs as Congeners, characterizing the Forebay using the 19 random sediment samples is 3.63 µg/kg. The area of nearshore Forebay sediments represented by the five pre-removal samples is 5% of the total area. Only PCB Aroclor data is available for these samples, but if the Total PCBs as Aroclors data from the pre-removal data is used to characterize 5% of the Forebay, the area-weighted average 95% UCL for Forebay sediments is 9.05 µg/kg.

The area-weighted 95% UCL for Total PCBs as Aroclors in pre-removal sediment (9.05 µg/kg), is roughly 3 times lower than post-remediation Total PCBs as Aroclors maximum concentration (28.7 µg/kg) . Therefore, it is unlikely that risk has been underestimated in the evaluation for PCBs as Aroclors performed in the HHRA or ERA. .

O.1.3.4 Bioaccumulative Metals Without SLVs

Several metals (aluminum, thallium, vanadium, and zinc) were detected in tissue that are bioaccumulative (bioconcentration factor [BCF] > 300) or potentially bioaccumulative (no BCF available) but do not have DEQ Acceptable Tissue Levels (ATLs) protective of humans and wildlife that consume fish and shellfish, or Critical Tissue Levels (CTLs) protective of piscivorous fish. Ecological ATLs and CTLs were not developed for these metals for the following reasons:

- Concentrations of thallium and vanadium in Forebay sediment and tissue were not elevated above the Reference Area concentrations.
- Concentrations of aluminum and zinc were not elevated relative to Reference Area concentrations for sediment, clams, crayfish, or sculpin.
- Although aluminum and zinc concentrations in Forebay bass tissue were found to be statistically higher than the Reference Area bass tissue concentrations in the population-to-population evaluation, the Forebay smallmouth bass tissue had 95% UCL concentrations (Table N-55) lower than the Reference Area:
    - Aluminum – Small mouth bass 95% UCL for the Forebay was 7.11 milligrams per kilogram (mg/kg) compared to the Reference Area 95% UCL of 10.1 mg/kg.
    - Zinc – Small mouth bass 95% UCL for the Forebay was 14.9 mg/kg compared to the Reference Area 95% UCL of 15.5 mg/kg.

Based on this analysis, the uncertainty regarding these metals is manageable and is unlikely to substantively underestimate risk.

In addition to the comparison with Reference Area concentrations, human health-protective ATLs were calculated for aluminum, antimony, barium, chromium, copper, nickel, and zinc since they were detected in either crayfish or smallmouth bass tissue in the Forebay, as described in Section 11.3.4.1. The human health-based values were developed by multiplying the water quality criterion that is protective of consumption of organisms (and water, if organism only-based criteria are not available) by the BCF for each of these metals. In all cases, the measured tissue concentrations were well below the ATLs. All the ATLs developed in this manner are not specific to the subsistence or recreational fisher, they are a useful tool in demonstrating that these poorly bioaccumulative chemicals were reported at low concentrations in the tissues and that elimination of these COIs is not a concern for human receptors.

O.1.3.5 Ubiquitous Presence of PCBs

The most abundant PCB congener in the majority of the River OU samples was PCB 11. This PCB congener constituted from approximately 7 to 27% of the total PCB congener burden, and contributes a larger percentage to samples with lower total PCB concentrations. This is consistent with the results of other regional studies have noted that airborne PCBs in the Willamette airshed have contributed to the ubiquitous occurrence of PCBs in sediments and that PCB 11 is one of the indicator PCB congeners for evidence of airborne deposition (Hope 2007, 2008). PCB 11 has also been found in water and air in urban environments (Hu et al. 2008, Du et al. 2009, Rodenburg et al. 2010), the great lakes watershed (Basu et al. 2009), and even the polar regions (Choi et al. 2008). Part of the reason it is so ubiquitous may be that it is not derived by Aroclor mixtures, but is instead found in unregulated paints and pigments (Fraser 2010, Hu and Hornbuckle 2010, Rodenburg et al. 2010).

PCB 118, another ubiquitous PCB congener in the Willamette airshed, was also observed in all river media (surface water, sediment, clam, crayfish, sculpin, and smallmouth bass). Therefore, risk from PCBs in the River OU likely includes both site-related sources, and non-site related sources, including those from upstream as well as from the ubiquitous presence of PCBs in the Willamette airshed

O.2 HHRA Uncertainty Assessment

O.2.1 Upland OU

The sources of uncertainty in the problem formulation for the HHRA are described in this section. The major potential sources of uncertainty in the problem formulation process are associated with the level of confidence in the adequacy of the analytical data used for site characterization, the identified receptors and exposure pathways, selection and use of SLVs and the level of confidence in the COPC selection and screening risk characterization.

O.2.1.1 Data Sensitivity Analysis for HHRA

In Section 7.4, the analytical data used for the HHRA were evaluated with regard to the sensitivity of the data for RA use. The goal was to understand whether COIs reported as not detected could be reliably assumed to not be present in the individual sample or medium at levels of concern to human health. Evaluating this issue necessarily requires an understanding of how close the analyte's MDLs are to the SLV for that analyte. This evaluation was performed for analytes reported as non-detect at least once in any medium.

The following datasets were considered in the Upland OU data quality evaluation:

- Landfill AOPC: soil, groundwater, and co-located (adjacent) seep water and surface water
- Sandblast Area AOPC: soil, soil gas, and groundwater.
- Pistol Range AOPC: soil and groundwater (All COIs analyzed for in lagoon sediments were detected in all samples, so no MDL comparison was required)
- Bulb Slope AOPC: soil

Tables K-1 through K-4 in Appendix K present the results of this analysis for the Landfill, Sandblast Area, Pistol Range, and Bulb Slope AOPCs, respectively. At all the AOPCs, one metal (thallium), one SVOC (N-nitrosodimethylamine), and three VOCs (1,2,3-trichlorobenzene, 1,2,-dibromo-3-chloropropane, trichloroethene [TCE]) had a few observations where the MDL exceeded the SLVs for soil. For all of these analytes, except the SVOC, the number of samples with MDLs exceeding the SLV formed only a subset of the total number of samples. Therefore, it did not affect the evaluation of the analytes as to whether they should be identified as COPCs. In groundwater, MDLs for antimony, arsenic and thallium sometimes exceeded their SLVs. Arsenic is retained as a COPC for landfill groundwater while thallium and antimony are of less human health concern and were not associated with high exceedances. The magnitude of MDL exceedance above the SLV is generally less than a factor of ten for the analytes. MDLs for pesticides, Aroclors, and many SVOCs and VOCs routinely exceeded the SLVs for groundwater, seep water and shoreline surface water. These are analytes that are poorly soluble in water and generally are best evaluated based on their occurrence in the solid phase, such as soils, sediments or tissue. These limits to analytical technology are well understood and are inherent in the RA process. The SLVs for some chemicals such as pesticides are sometimes based on literature-based estimates of toxicity and threshold values and do not necessarily take the feasibility of analytical detection limits into consideration. This only means that the limitations and uncertainties associated with concentrations detected or not detected at the low end of the concentration gradient should be understood.

O.2.1.2 Statistical Background Comparison Screening

As discussed in Section 8.1 of the main text, the goal established in the remedial investigation/ feasibility study (RI/FS) management plan (MP) (URS 2007a) for statistical power associated with the background comparison was achieved (i.e., to detect "one-standard-deviation-away"). However, for some Upland soils, this one-standard-deviation is high due to the high data variability, which could not be controlled because of the inherent heterogeneity of the Upland soils. As an artifact of this high data variability, minimum detectable differences (MDDs) greater than 100% of the reference mean were calculated for several metals in soil of the Landfill, Sandblast Area, and the four combined AOPCs (Table L-1), and include the following:

Landfill AOPC

- 0 to 3 feet below ground surface (ft bgs) – chromium, copper, magnesium, nickel, and silver
- 0 to 10 ft bgs – arsenic, chromium, copper, magnesium

Sandblast Area AOPC

- 0 to 3 ft bgs and 0 to 10 ft bgs – antimony, copper, magnesium, and mercury

All Four AOPCs Combined

- 0 to 3 ft bgs and 0 to 10 ft bgs – antimony, copper, magnesium, mercury, and silver

Although the null hypothesis was not rejected, the statistical power to detect substantial differences between the site and Reference Area datasets for metals with MDDs greater than 100% of the reference mean might be limited.

Magnesium is an essential nutrient in soil, it was eliminated from the risk-based evaluation and no further investigation is recommended. Examination of the box-and-whisker plots in Appendix L indicated that silver (0-3 ft bgs, Landfill AOPC), antimony (0-3 and 0-10 ft bgs, Sandblast AOPC), and antimony, mercury, and silver (0-3 and 0-10 ft bgs, All Four AOPCs Combined) should be considered as having higher concentrations than the Reference Area concentrations even though the population-to-population comparison indicated that they were the same or equal to Reference Area concentrations; therefore, these analytes were compared included in the HHRA screening evaluation and compared to SLVs (Section 11.2.4). However, they were not retained as COPCs as a result of the screening.

Since the results of the statistical background comparisons (population-to-population and box-and-whisker plot) indicated that concentrations of the remaining metals were present below or equal to that of the Reference Area levels, these metals were not carried to the COPC SLV screening step in Section 11 (HHRA). However, the high MDDs (greater than 100% of the reference mean) present an uncertainty with this finding.

To address the uncertainty with the results of the statistical background comparison, the remaining metals were subjected to a risk-based screening evaluation, herein. The purpose of this evaluation is to explore whether or not these metals should be included as COPCs, and ultimately advanced to the next level of RA or directly to the FS. A weight-of-evidence approach similar to the one implemented in Section 11 (HHRA) was used to evaluate these metals.

The following sequential steps summarize the risk screening process used to evaluate these metals with MDDs greater than 100% of the reference mean:

- SLVs protective of human health receptors were compared to the appropriate EPCs , which are the lower of the 95% UCLs and maximum detected concentrations for each analyte.
- Magnitude of SLV exceedances, detection frequency, confidence in the SLV, comparison of AOPC versus Reference Area concentration ranges, and other lines of evidence were evaluated.
- Spatial distribution of the concentrations relative to the site-specific background upper prediction limits (UPLs) and SLVs was assessed by referencing existing figures presented in the main RI report.

The human health SLVs presented in Appendix J were compared to the EPCs calculated for soil from 0 to 3 ft bgs (adult outdoor worker), and soil from 0 to 10 ft bgs soils (construction workers and excavation workers) (Table O.2-1). SLVs for construction workers and excavation workers varied due to exposure duration differences, but the more conservative SLV was initially used in the screening for this analysis.

Based on this weight-of-evidence approach, those COPCs that truly warrant additional investigation or risk management were identified and discussed below.

Landfill AOPC

Of the three metals (chromium, copper, nickel) in 0 to 3 ft bgs soils with high MDDs, only the EPC for chromium exceeded the SLV. Of the three metals (arsenic, chromium, copper) in 0 to 10 ft bgs soils with high MDDs, none of the EPCs exceeded the SLV.

Chromium. The MDD generated for chromium in soil during the statistical background comparison is 1559% for 0 to 3 ft bgs (Table L-1).

The 95% UCL of 594 mg/kg was used as the chromium EPC, which exceeds the SLV of 190 mg/kg (based on the DEQ soil ingestion for occupational Risk Based Concentrations [RBC]).

Concentrations of chromium in Landfill AOPC soils from 0 to 3 ft bgs range from 14.7 mg/kg to 1,950 mg/kg (Table I-1). Concentrations of chromium in Upland Reference Area soils range from 15.5 mg/kg to 27.3 mg/kg (Table I-6). Highest levels of chromium occur in the Gully Test Pit and just downgradient of this area (Figure 11-5): BIL07 (0.5 ft bgs), BIL18 (2 ft bgs), and BIL-22 (3 ft bgs). BIL05 (0 to 0.5 ft bgs), located just east of Lead Hot Spot Test Pit #1, also has elevated chromium (237 mg/kg). Chromium concentrations in the remaining samples from 0 to 3 ft bgs are below the SLV, and many are equivalent to or below the Reference Area UPL.

In the absence of site-specific chromium speciation data, it was conservatively assumed that all the detected chromium was the more toxic hexavalent chromium rather than the more common and much less toxic trivalent chromium. Chromium is recommended for further evaluation.

Summary. Of the metals with high MDDs demonstrated for Landfill AOPC soils, only chromium in soil from 0 to 3 ft bgs is recommended for further evaluation in the form of either a baseline HHRA or remediation of the locations above the UPL.

Sandblast Area AOPC

Of the two metals (copper, mercury) in the 0 to 3 ft bgs and 0 to 10 ft bgs soils with high MDDs; there were no exceedances of their SLVs. Therefore, further evaluation is not warranted.

All Four AOPCs Combined

Of the single metal (copper) in the 0 to 3 ft bgs and 0 to 10 ft bgs soils with a high MDD. There was no exceedance of the SLV, therefore, further evaluation is not warranted.

O.2.1.3 COPC Selection and Screening Risk Characterization

Detection Frequency

The extensive COPC selection process includes consideration of detection frequency, comparison with reference soils and a concentration-risk screen. The use of the 5% detection frequency criterion may omit some COIs that are present in the Landfill and Sandblast AOPCs that were at low frequency but may potentially contribute to human health risk if exposures to those COIs were to occur. An evaluation of these COIs, which were detected in soil, groundwater, or both, was performed to understand the implications of not including these COIs in the quantitative screening assessment. In Tables O.2-2 and O.2-3, concentrations of these COIs were compared to SLVs protective of the relevant receptor groups:

- soil: outdoor worker, construction worker, and excavation worker
- groundwater: potable water user and bioaccumulation

In addition, whether or not these COIs were detected in both soil and groundwater from the same AOPC is also considered. Only bioaccumulative COIs (as defined in Table J-7) were compared to SLVs. Although the criteria used to identify bioaccumulative COIs for the River OU indicate selenium is not bioaccumulative in aquatic environments, selenium was included in the screening tables because it is included as a bioaccumulative COI in DEQ's sediment bioaccumulation guidance (2007).

Landfill AOPC

As shown in Tables O.2-2, Aroclor 1248 in 0-10 ft bgs soil interval and 4,4'-DDE, total DDTs, dieldrin, and carbon tetrachloride in groundwater at the Landfill AOPC were eliminated on the basis of detection frequency and were detected above the SLV.

The maximum detected soil concentration for Aroclor 1248 (968 µg/kg) exceeded the construction and excavation worker SLV (740 µg/kg). Based on earlier discussions with DEQ and as outlined in the RI/FS MP, 95% UCL values are used to represent site concentrations of COIs when there were at least two detections and a sample size of eight. The 95% UCL is based on United States Environmental Protection Agency (USEPA) recommendations and is consistent with the USACE's desire to maintain compatibility with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) process. It is slightly different from DEQ's recommendation to use the 90% UCL. Since use of the 95% UCL will not lead to underestimation of risk when compared to the 90% UCL, the technical advisory group (TAG) agreed that representation of the 95% UCL is acceptable. The 95% UCL was not calculated in Appendix I because the detection frequency was below 5%; however, because there were two detections (in a sample size of 43), a 95% UCL could be calculated. Using the latest ProUCL

4.1.01, a 95% UCL of 211 µg/kg was calculated by using the Chebyshev KM method. The 95% UCL for Aroclor 1248 does not exceed the construction and excavation worker SLV. Therefore, elimination of Aroclor 1248 from the SLV screening for 0-10 ft bgs soil interval based on detection frequency is not expected to present a significant uncertainty in the HHRA.

The groundwater concentration of total DDTs is attributed to the one detection (out of 22 samples) for 4,4'-DDE, as the other DDT isomers were not detected in any of the 22 groundwater samples (Table I-1) collected at the Landfill AOPC. The 4,4'-DDE detected concentration of 0.00246 µg/L that exceeded the bioaccumulation SLV (0.00022 µg/L) was detected at a single well (MW-03, see Figure 11-7) and down gradient wells closer to the river were all non-detect for 4,4'-DDE. Furthermore, no DDT isomers were detected in the seep sample collected from the Landfill. The non-detect groundwater MDLs, which range from 0.00195 to 0.1 µg/L, all exceed the bioaccumulation SLV, indicating that the theoretically based SLV is lower than analytical methods can achieve. In addition, as discussed in Section 11.2.4.1.5 (of the main text), the potential for discharge of COPCs in Landfill AOPC groundwater into the river surface at levels of concern appears to be low. Based on the low, single detection of 4,4'-DDE in groundwater of the Landfill and lack of detected DDT isomers in seep water, elimination of this COI from the SLV screening for groundwater based on detection frequency is not expected to present a significant uncertainty in the HHRA.

Dieldrin was detected (0.00982 µg/L) in one of 22 groundwater samples collected at the Landfill AOPC, which exceeded the bioaccumulation SLV (0.000052 µg/L). Dieldrin was detected in MW-03 on May 1, 2002. MW-03 is located on the eastern edge of the Landfill debris (Figure 11-7) and the down gradient wells closer to the river were all non-detect for dieldrin. The non-detect MDLs, which range from 0.000294 to 0.100 µg/L, all exceed the bioaccumulation SLV, indicating that the theoretically based SLV is lower than analytical methods can achieve. As stated previously in section O.2.1.1, SLVs for some chemicals such as pesticides are sometimes based on literature-based estimates of toxicity and threshold values and do not necessarily take the feasibility of analytical detection limits into consideration. In addition, as discussed in Section 11.2.4.1.5 (of the main text), the potential for discharge of COPCs in Landfill AOPC groundwater into the river surface at levels of concern appears to be low. Elimination of dieldrin based on detection frequency is not expected to present a significant uncertainty in the HHRA.

Carbon tetrachloride was detected (1.4 µg/L) in one of 22 groundwater samples collected at the Landfill AOPC, which exceeded both the potable water user and bioaccumulation SLVs (0.19 and 0.23 micrograms per liter (µg/L), respectively). Carbon tetrachloride was detected in MW-04 on January 1, 2000. MW-04 is located in the Lead Hot-Spot Test Pit #2 (Figure 11-7). Wells down gradient and closer to the river were all non-detect for carbon tetrachloride. The non-detect MDLs, which range from 0.500 to 1 µg/L, which all exceed the potable water user and bioaccumulation SLVs, indicating that the theoretically based SLVs are lower than analytical methods can achieve. In addition, as discussed in Section 11.2.4.1.5 (of the main text), the potential for discharge of COPCs in Landfill AOPC groundwater into the river surface at levels of concern appears to be low. The single detection of carbon tetrachloride in only one medium of the Landfill AOPC likely demonstrates that elimination of carbon tetrachloride based on detection frequency is not expected to present a significant uncertainty in the HHRA.

Sandblast Area AOPC

As shown in Tables O.2-3, benzo(b)fluoranthene in groundwater at the Sandblast AOPC was eliminated on the basis of detection frequency and was detected above the SLV.

Benzo(b)fluoranthene was detected (0.0180 µg/L) in one of 20 direct push groundwater samples collected at the Sandblast AOPC, which exceeded the bioaccumulation SLV (0.0038 µg/L). Benzo(b)fluoranthene was detected in MW-12, which is located at an intermediate location between the upgradient and downgradient edges (Figure 11-13). This exceedance, however, was relatively low (corresponding to an excess lifetime cancer risk [ELCR] of 4.7E-06). The direct push groundwater data is considered to be of low quality for RA use due to matrix interferences (i.e. influence of particulate-related concentrations in unfiltered samples). For these reasons, elimination of benzo(b)fluoranthene based on detection frequency is not expected to present a significant uncertainty in the HHRA.

In summary, none of the COIs eliminated as soil and groundwater COPCs in the Landfill and Sandblast AOPCs on the basis of frequency of detection represent a significant uncertainty in the HHRA.

Three-Step Concentration-Risk Screen

The use of the single chemical, multi-chemical and multi-media COPC selection process is a comprehensive approach that greatly minimizes the potential for omission of qualified COPCs or underestimation of risks and hazards at a screening level. Many of the selected COPCs are unlikely to contribute significant risk or hazard if they were to be further evaluated in a baseline human health risk assessment (BHHRA). The summation of concentration over screening level value (C/SLV) ratios, where C is the concentration of the COI, for non-carcinogens provides an approximate estimate of the non-cancer hazard index (HI). This may be an underestimate since the non-cancer effects of carcinogenic COPCs are not included in this summation. However, this does not affect the COPC selection process since the cancer SLVs are typically lower than the non-cancer-based SLV for most carcinogens.

Degradation Products of PCE and TCE

Per DEQ guidance, degradation products of tetrachloroethylene (PCE) and trichloroethene (TCE) (cis,1,2-dichloroethene, trans-1,2-dichloroethene, 1,1-dichloroethene and vinyl chloride) were identified as COPCs (even if they were not detected) in all media where PCE or TCE was identified as a COPC. The retention of the degradation products as COPCs adds to the number of COPCs without necessarily demonstrating that they actually occur in these media.

Total Benzofluoranthenes

There is also uncertainty related to the use of historical and recently collected data for benzofluoranthenes at the Upland AOPC soils for the Landfill and Sandblast Area AOPCs. This sub-group of carcinogenic polycyclic aromatic hydrocarbon (cPAHs) is reported as total benzofluoranthenes in the historical data but is more precisely reported as the individual compounds in recent data: benzo(b)fluoranthene, benzo(j)fluoranthene and benzo(k)fluoranthene. The level of confidence in the quality of the summed analyte in the historical data, collected in 2001 and 2002, is unknown, but results in higher C/SLV ratios for total benzofluoranthenes than when the individual constituents are added (Tables M-1, M-2, and M-3). For the Landfill AOPC soils, in particular, the total benzofluoranthenes are a significant contributor to the cumulative C/SLV ratio and screening risks for cPAHs. There is greater

confidence in the sensitivity and representativeness of the recent data for polycyclic aromatic hydrocarbon (PAH) analysis. Therefore, the estimated C/SLV ratios and screening level risk estimate for the total benzofluoranthenes, cumulative cPAHs and cumulative carcinogenic risks for the Landfill and Sandblast AOPCs soils are likely to be substantial overestimates. The COI and COPC selection tables present the results separately for the older total benzofluoranthenes data and the recent individual benzofluoranthene to illustrate and clearly define the results of the screening.

Chromium

Total chromium in Upland soils was evaluated on the assumption that it is comprised entirely of the more toxic hexavalent form. This is a conservative assumption that is unlikely to be true and will overestimate risks related to chromium.

Direct-Push Groundwater Data for Sandblast AOPC

Groundwater samples from soil borings at the Sandblast AOPC were analyzed for the full analytical suite, while monitoring well groundwater samplers were only analyzed for a subset of COIs. The direct push groundwater data is considered to be of low quality for RA due to matrix interferences (i.e. influence of particulate-related concentrations in unfiltered samples). Only monitoring well data were included in the RAs, for which both filtered and unfiltered data are available. However, the direct push groundwater PAH data was used in the screening to address the sampling data gap for PAHs in monitoring well data for this AOPC. In the HHRA tables, benzo(a)pyrene (Tables M-17, M-18, and M-19), dibenzo(a,h)anthracene (Tables M-18 and M-19), and indeno(1,2,3-cd)pyrene (Table M-19) were screened using direct push data and were retained as COPCs. These were generally low exceedances (ELCR less than 3.1E-06) or retained due to multi-media selection process. Using direct push groundwater data would likely result in an overestimate the risk of the exposure to PAHs in groundwater due to the presence of suspended particulates.

Residential SLVs for Potable Water

The use of residential SLVs to identify COPCs for the potable water use pathway, even though no residential use will occur on the island, and the use of National Recommended Water Quality Criteria (NRWQC; USEPA 2009) (for consumption of water and organisms) to screen COPCs for the groundwater discharge to surface water pathway are both conservative since it is based on undiluted groundwater data. Both of these screening methods are likely to overestimate the number of COPCs that may actually qualify for these pathways.

HI and ELCR Estimates

As described in Section 11, the cumulative C/SLV ratios for a single medium were presented separately for the noncarcinogenic and carcinogenic COPCs. They were then further presented and discussed as screening-level estimates of the non-cancer hazard HI and the carcinogenic ELCR (after multiplying by 1E-06). These estimates are presented for initial comparison and to enable a screening-level discussion of whether an AOPC may be estimated to fall within USEPA's and DEQ's risk management range (1E-06 to 1E-04 ELCR, HI less than 1.0) or warranting remedial response (ELCR greater than 1E-04) or below the acceptable risk level (1E-06 ELCR). . .

Several chemical-specific attributes in interpreting these ratios are described in Section 11. They include issues such as not estimating ELCR values for C/SLV ratios for arsenic since the SLV is based on a Reference Area soil value and not a risk-based concentration; caution in interpreting C/SLV ratios for COIs in groundwater for which the SLV is based on an maximum contaminant level (MCL) since MCLs are not necessarily risk-based (e.g., lead and thallium) and ascribing bioaccumulation potential to COIs based solely on octanol-water partition coefficient (log K_{ow})greater than 3.5 or BCF greater than 300. The net effect of many of these assumptions is to increase the number of COIs that are initially identified as COPCs.

Infant Milk Ingestion Pathway

There is uncertainty regarding the pathway of infant exposure to bioaccumulative COIs through the human milk ingestion pathway. Although this is recognized as a viable pathway, there is no established federal guidance on quantitative evaluation methodology for this pathway. However, DEQ's recent guidance has suggested a method for evaluation of this pathway for PCBs. The suggested methodology in DEQ's guidance would generate a non-carcinogenic PCB hazard quotient (HQ) for this pathway for infants that would be approximately 25 times the HQ of the mother for the types of occupational and groundwater ingestion pathways considered for the Upland (Appendix D, DEQ 2010b). The subchronic PCB ELCR for the infant would be approximately similar to, or potentially lower than, the ELCR for the mother because of the shorter exposure duration of the infant. If DEQ's draft methodology were to be applied to the problem formulation, there would be no difference to the results of the COPC selection for carcinogens since PCBs are already considered for their carcinogenic potential.

For the Upland OU, PCBs in soil were evaluated by comparison to the USEPA cancer-based regional screening levels (RSL) (0.740 mg/kg for industrial soil, USEPA 2010). The non-cancer RSL for PCBs in industrial soil is 11 mg/kg, primarily based on Aroclor 1254 (Supporting Tables, USEPA 2010). Dividing the non-cancer RSL by a factor of 25 provides a soil SLV for the milk ingestion pathway of 0.44 mg/kg or 440 µg/kg. The UCL is lower than 440 µg/kg for all the Aroclors and Total PCBs as Aroclors that were reported in Landfill and Sandblast Area AOPCs soils for the Outdoor Occupational Worker, Construction Worker and Excavation Worker (Tables M-1, M-2, M-3, M-13, M-14 and M-15). Therefore, applying this SLV would not result in the addition of PCBs as COPCs at the Landfill or Sandblast Area AOPCs. The non-cancer C/SLV ratio would increase (e.g., C/SLV for Total PCBs for the Outdoor Occupational Worker at the Landfill AOPC from 0.554 [Table M-1] to 0.932 when the SLV of 410 µg/kg is used). The cumulative non-cancer HI would increase from 0.293 to 1.22 which would still be considered an acceptable HI that is only marginally higher than 1.0. Similarly, the increase in the HI for the Occupational Outdoor Worker at the Sandblast Area AOPC would be from 0.0866 to 1.04 when the C/SLV for Total Aroclors is applied to the UCL value of 0.419 mg/kg (Table M-13). In summary, consideration of the milk ingestion pathway does not add PCBs as COPCs to the Upland OUs nor does it increase the non-cancer HI to unacceptable levels.

O.2.1.4 Site Characterization Data

Use of the data from the two test pit mercury lamp area samples at the Landfill AOPC adds some uncertainty. The data were used in this HHRA to assess risk to human receptors exposed to shallow and deeper soil intervals (0-3 and 0-10 ft bgs) since there is no way to assign a depth at which the results for these samples occur.

Extensive discussion of the adequacy of the data with regard to representativeness, intended uses, and associated uncertainties is presented in Section 7 (in conjunction with Appendix K).

O.2.1.5 Receptors and Exposure Pathways

As shown in the Conceptual Exposure Models (CEMs) (Figures 11-1 to 11-4), numerous types of employees are present at Bradford Island and may engage in soil intrusive activities. There is a high degree of confidence in excluding residential land uses from the receptors due to the long history of industrial use at the Island and its continuing use for the foreseeable future. Therefore, there is little uncertainty or potential for underestimation of risk regarding the lack of consideration of residential receptors. .

Among the occupational uses at the site, construction workers engaged in activities that would fall within DEQ's exposure assumptions are unlikely (250 days for one year) and risks may be overestimated (DEQ 2010b). However, existing excavation workers may be engaged in activities that exceed DEQ's assumptions for excavation workers (9 days for one year) since they may actually perform such activities for multiple years. This may underestimate risks to excavation workers. For this reason, use of the construction worker SLVs is considered more appropriate for evaluation of soil-intrusive occupational exposures.

RAs following USEPA methodology often include a trespasser as a receptor even if public access is restricted at a site. A trespasser is not included here since the evaluation of the more highly exposed Occupational Outdoor Worker will encompass lesser exposures for other receptors, including trespassers.

All groundwater-related pathways are accompanied by a high level of uncertainty as to whether the pathways may actually occur. There is currently no use of on-site groundwater for potable use and no such use is planned for the foreseeable future. Similarly, although groundwater discharge to the river does occur, the use of untreated river water for potable water use is also unlikely and is not known to occur. Consideration of these pathways is part of the intentional conservatism of the problem formulation, complies with evaluation of the designated beneficial uses of groundwater and surface water and would overestimate risks for these pathways.

O.2.1.6 Erodible/Mass Wasting Soil

As discussed in Section O.1.2.2, an evaluation of the overland transport pathway to the River OU was conducted for the Landfill, Sandblast Area, and Bulb Slope AOPCs. Under current and likely future conditions, the only viable exposure route for human receptors for the mass wasting pathway is through bioaccumulation and subsequent consumption of smallmouth bass and crayfish. Direct exposure to eroded soils in the River OU is unlikely for humans. Selection of COPCs for the mass wasting pathway was based on multiple lines of evaluation including a comparison to reference sediments and a comparison to sediment bioaccumulation SLVs.

In the first step of this evaluation, the data from surface soils (0 to 1 ft bgs) that were collected from areas that may potentially be subject to erosion or mass wasting (as identified in Sections 3.5 and 10.1 of the main text) were compared to the inorganic concentrations in the site-specific Reference Area sediment (Table L-8). Those inorganic COIs that were detected less than the Reference Area were not retained as COPCs and were not evaluated further. The organic COIs and remaining inorganic COIs identified as potentially bioaccumulative were then compared to

sediment SLVs protective of human health and the results are presented in Tables O.2-4 to O.2-6. The following describes the erodible/mass wasting evaluation at each of the three AOPCs.

Landfill AOPC (0-1 ft bgs)

Bioaccumulative COIs in surface soils that exceed sediment SLVs included cadmium, lead, manganese, thallium, zinc, 4,4'-DDT, total DDTs, dieldrin, PCBs (Aroclor 1254, Aroclor 1260, and total PCBs as Aroclors), bis(2-ethyl hexyl)phthalate (B2EHP), carbazole, dibenzofuran, and di-n-butyl phthalate (Table O.2-4) were retained as COPCs. All of these COPCs, except for 4,4'-DDT, total DDTs, and dieldrin, were already evaluated for the River OU using Forebay data. PCBs and B2EHP were identified as COPCs for the River OU (Table M-46). In the absence of SLVs for cadmium, lead, manganese, thallium, and zinc, reference UPLs were used as surrogates. For these chemicals, C/SLV does not indicate that an acceptable risk level was exceeded, only that the site concentration is greater than the Reference UPL. Carbazole, dibenzofuran, and di-n-butyl phthalate were retained as COPCs due to lack of SLVs. Three pesticides, 4-4'-DDT, total DDTs, and dieldrin were retained because they exceeded the sediment SLVs. DDT and total DDTs were detected in 7 of 10 erodible soil samples and dieldrin in one of 10 samples. The magnitude of exceedance above the sediment SLV was more than two orders of magnitude, primarily because the SLVs are low. Due to the finite mass of erodible soils and the fact that erosion potential at this AOPC is low (Section 10), it is unlikely that these three COIs would actually have much potential to be released to the River OU.

However, due to the exceedances of human health SLVs and/or their potential to bioaccumulate, as well as the potential for these areas to be sources of contamination (e.g., erosion or mass wasting), further evaluation of this area is recommended for the Upland OU, which may include a BHHRA.

Sandblast Area AOPC (0-1 ft bgs)

The bioaccumulative COIs in surface soils that exceeded sediment SLVs included cadmium, lead, manganese, zinc, tributyltin, chlorinated pesticides, PCBs (Aroclor 1260 and total PCBs as Aroclors), 1,2,4-trimethylbenzene, 4-isopropyltoluene, B2EHP, and carbazole were retained as COPCs (Table O.2-5). All of these COPCs, except for tributyltin, chlorinated pesticides, and two VOCs, were already evaluated for the River OU using Forebay data. PCBs and B2EHP were identified as COPCs for the River OU (Table M-46). In the absence of SLVs for cadmium, lead, manganese, and zinc, reference UPLs were used as surrogates. For these chemicals, C/SLV does not indicate that an acceptable risk level was exceeded, only that the site concentration is greater than the Reference UPL. A few bioaccumulative pesticide compounds and tributyltin were also retained since they were detected in the erodible soils at concentrations exceeding the bioaccumulation SLVs, but had not been analyzed in the River OU media. Since the potential for mass wasting to actually occur is low, as described in Section 10, the chlorinated pesticides and tributyltin are unlikely to be released in significant quantities to the River OU. Two VOCs (1,2,4-trimethylbenzene and 4-isopropyltoluene) did not have SLVs but are eliminated from bioaccumulation concerns since VOCs are typically not persistent in the aquatic environment after release. Carbazole was retained as COPCs due to lack of an SLV.

However, due to the exceedances of human health SLVs and/or their potential to bioaccumulate, as well as the potential for these areas to be sources of contamination (e.g., erosion or mass

wasting), further evaluation of this area is recommended for the Upland OU, which may include a BHHRA.

Bulb Slope AOPC (0-1 ft bgs)

As shown in Table O.2-6, lead, mercury and PCBs (Aroclor 1260 and Total PCBs as Aroclors) exceeded the sediment SLVs and were retained as COPCs for the bioaccumulation pathway (if mass wasting soils from the Bulb Slope AOPC were to enter the Forebay). PCBs and mercury are already included as COPCs for the River OU. In the absence of SLVs for lead and mercury, reference UPLs were used as surrogates. For these chemicals, C/SLV does not indicate that an acceptable risk level was exceeded, only that the site concentration is greater than the Reference UPL. Although mercury in Forebay sediments is not elevated in comparison to the Reference Area sediments, it has been retained as a COPC because of its selection as a COPC for fish tissues. Because the Bulb Slope area is well vegetated, erosional activities are unlikely to occur (Section 10).

O.2.1.7 Selection and Use of SLVs

SLVs were identified for the majority of the COIs by following the hierarchical process of SLV selection (Appendix J). To the extent possible, surrogate chemicals were used to identify SLVs for COIs lacking their own SLVs. Only a few COIs remained without SLVs, and are identified in Table 7-4.

Human health-protective SLVs were available for all COIs that were detected in soil and groundwater in the Upland OU media (Table 7-4). Among COIs that were never detected, a small number of VOCs and SVOCs did not have SLVs, primarily some alkylbenzenes, chloroethers, and chlorotoluenes. Due to the lack of toxicity information for these chemicals, no further evaluation of the uncertainty related to them can be done. However, the fact that they were never detected lessens the potential for underestimation of risk.

DEQ SLVs for the evaluation of the construction workers and excavation workers were available only for a limited number of COIs and were supplemented with industrial soil RSLs that assume a much higher duration of exposure with a slightly lower level of soil ingestion. The effect of using the RSLs is likely to overestimate the number of COPCs and overestimate the screening-level risks and hazards for these receptors.

O.2.1.7.1 Updates to SLVs

As part of the uncertainty assessment, there have been updates to the agreed upon sources of SLVs. These include updates to DEQ RBCs (2011) (affecting direct contact pathways for soil and groundwater), DEQ RBCs for petroleum hydrocarbons (2011), DEQ's Water Quality Criteria (WQC; 2011) (affecting groundwater and surface water SLVs for fish ingestion pathway), and USEPA RSLs (2012) (affecting direct contact pathways for soil and groundwater). Since USEPA RSLs are likely to update again prior to a Level III baseline for the Upland OU, a comparison of SLVs was not conducted at this time. If these updates contain more stringent SLVs, those analytes will be considered for further evaluation as to whether they should be included in the BHHRA for the Upland OU or in a separate document. They will also be considered during future monitoring activities for the River OU, if additional surface water data are collected.

O.2.2 River OU

The uncertainties associated with tissue and sediment data as well as with the confidence in available screening criteria or COIs without SLVs are discussed in further detail in this section.

O.2.2.1 Sensitivity Analysis for HHRA

The following data sets were considered for the data quality evaluation:

- Random Forebay Data: surface water, sediment, crayfish, smallmouth bass, and largescale sucker
- Targeted Forebay Data:
    - Eagle Creek: sediment
    - Goose Island: sediment and crayfish

Tables K-9 through K-12 provide an analysis of MDLs in relation to SLVs for the River OU media. Analytes with MDLs that exceeded the SLVs included Aroclors in sediment, crayfish, smallmouth bass and large-scale sucker. Antimony and vanadium had MDLs exceeding SLVs in surface water. PCB Congeners 126 and 169 generally had MDLs exceeding the SLVs in all media. The SLVs for PCB Aroclors and congeners are drawn from DEQ's bioaccumulation-based SLVs (DEQ 2007) and are extremely low since they are based on literature-derived toxicity values and exposure assumptions, without regard to whether the SLVs are analytically achievable. The use of congener data to evaluate PCBs in the River OU greatly reduces dependence on the Aroclor data, thus the uncertainties related to the Aroclor MDLs do not affect the HHRA. PCB congeners 126 and 169 were reported in many samples, thus increasing the level of confidence in the sensitivity of the data. Therefore, no further assessment of uncertainty regarding these analytes is needed.

O.2.2.2 Statistical Background Comparison Screening

As discussed in Section 8.1 of the main text, the goal established in the RI/FS MP (URS 2007a) for statistical power associated with the background comparison was achieved (i.e., to detect "one-standard-deviation-away"). However, for some Forebay media, this one-standard-deviation is high due to the high data variability, which could not be controlled because of the inherent heterogeneity. As an artifact of this high data variability, MDDs greater than 100% of the reference mean were calculated for several metals in Forebay tissue (Table L-4) and included the following:

Forebay Tissues

- Crayfish – lead
- Smallmouth Bass – chromium

Although the null hypothesis was not rejected, the statistical power to detect substantial differences between the site and Reference Area datasets for metals with MDDs greater than 100% of the reference mean might be limited. Since the results of the statistical background comparison indicated that concentrations of these metals were present below or equal to that of the Reference Area levels, these metals were not carried to the COPC SLV screening step in

Section 11 (HHRA). However, the high MDDs (greater than 100% of the reference mean) present an uncertainty with this finding.

To address the uncertainty with the results of the statistical background comparison, these metals were subjected to a risk-based screening evaluation, herein. The purpose of this evaluation is to explore whether or not these metals should be included as COPCs, and ultimately advanced to the next level of RA or directly to the FS. A weight-of-evidence approach similar to the one implemented in Section 11 (HHRA) was used to evaluate these metals.

The following sequential steps summarize the risk screening process used to evaluate metals with MDDs greater than 100% of the reference mean:

- SLVs protective of human health receptors were compared to the appropriate EPCs, which are the lower of the 95% UCLs and maximum detected concentrations) for each analyte.
- Magnitude of SLV exceedances, detection frequency, confidence in the SLV, comparison of AOPC vs. Reference Area concentration ranges, and other lines of evidence were evaluated.
- Spatial distribution of the concentrations relative to the site-specific background UPLs and SLVs was assessed by referencing existing figures presented in the main RI report.

The human health SLVs presented in Appendix J were compared to the EPCs calculated for Forebay tissues (subsistence and recreational fisher) (Tables O.2-7). SLVs for subsistence and recreational fisher varied due to rates of consumption differences, the more conservative SLV was initially used in the screening of this analysis.

Based on this weight-of-evidence approach, those COPCs that truly warrant additional investigation or risk management were identified and discussed below.

Forebay Tissues

Crayfish. Lead was the only metal with a high MDD with a generated statistical background comparison of 108% (Table L-4), which is just slightly over 100%. The 95% UCL of 0.925 mg/kg was used as the lead EPC, which exceeds the SLV of 0.5 mg/kg (based on the DEQ non-carcinogen for subsistence ATLs). Nine of seventeen crayfish tissue samples, located throughout the Forebay, were above the lead SLV. However, crayfish lead concentrations within the Forebay range from 0.0980 mg/kg to 2.66 mg/kg (Table L-4) and were similar to lead concentrations in Reference Area crayfish tissue, which ranged from 0.0560 mg/kg to 1.55 mg/kg (Table L-4). There are uncertainties involved as to whether this pathway is complete. Shellfish consumption appears to be relatively minor or minimal, relative to finfish consumption. Crayfish have a large home range and may be exposed to COPCs from sources other than the Forebay. Crayfish may live to 5 or 6 years and often may live as long as 10 years (URS 2007a). Therefore, although the Forebay crayfish random samples were collected after the sediment removal action, they are very likely to have had exposure to pre-removal concentrations of Forebay COPCs for several years prior to their sample collection. Therefore, lead is not recommended for further evaluation.

Smallmouth Bass. Only one metal, chromium, had a MDD greater than 100% of the reference mean. There was no exceedance of the SLV, therefore, further evaluation is not warranted.

Summary. None of the metals with high MDDs demonstrated for Forebay tissues are recommended for further evaluation in the form of either a baseline HHRA or remediation of the locations above the UPL.

O.2.2.3 COPC Identification and Screening Risk Estimates

Similar to the discussion presented in Section O.2.1.5, a major uncertainty for PCBs in the River OU is that evaluation of the human milk ingestion pathway has not been performed and the non-cancer hazards to infants have not been estimated in this problem formulation. Evaluation of this pathway is unlikely to increase estimates of ELCR but is likely to increase non-cancer HQs by up to a factor of 25, according to DEQ (2010b). The non-cancer values corresponding to DEQ's tissue and sediment SLVs for PCBs are not available. Therefore, a non-cancer SLV could not be readily estimated in the manner that was done for the Upland OU soils. However, PCBs have already been included as COPCs for all the River OU media even without consideration of the milk ingestion pathway.

As noted earlier, all estimates of C/SLV ratios, HI and ELCR based on crayfish tissue and, more importantly, the smallmouth bass tissue, must be interpreted with caution and should not be assumed to represent current exposure conditions in the Forebay. Use of these data likely overestimates the potential risks.

Although they are generally considered to be readily metabolized in fish tissues, a number of PAHs were reported in the tissue of smallmouth bass. ATLs for the subsistence and recreational fish consumer were developed for the PAHs (Table J-4f) and the lower of the UCL and maximum were compared to the ATLs. The magnitude of exceedance was relatively small and was generally less than a factor of 4. The only exceptions were benzo(a)pyrene and dibenzo(a,h)anthracene which had higher ratios. Whether these cPAHs are likely to pose a threat to human health is uncertain. PAH levels in fish are usually low because this group rapidly metabolizes PAHs (Lawrence and Weber 1984); furthermore, higher molecular weight PAHs, which include the largest class of chemical carcinogens, do not seem to accumulate in fish (West et al. 1984). In general, free (unmetabolized) PAHs are detected at lower concentrations in muscle than in liver, gonads, stomach, or gall bladder (bile), although liver concentrations are probably more associated with short-term exposure and muscle concentrations are probably more associated with long-term bioaccumulation (Hellou 1996). Whether the PAHs in the smallmouth bass are present in the edible portions of the fish such as muscle, or in the portions that are discarded during cooking (e.g., viscera) is unknown since the smallmouth bass data for the Forebay are based on whole-body analyses.

Since PAHs in the Forebay sediments were not elevated in relation to Reference Area sediments, the source of PAHs to elevated concentrations in Forebay smallmouth bass is unknown. It may be related to pre-removal concentrations of PAHs in sediments and feeding range habits of the bass among other factors.

B2EHP

B2EHP was reported in several media including groundwater in the Upland AOPCs, and in sediment and smallmouth bass tissue in the River OU. It was not retained as a COPC based on an understanding of its properties, its spatial distribution and its potential to contribute to human health risk by the fish consumption pathway.

In the aquatic environment, lipophilic organic compounds (Log K_{ow} > 5; DEQ 1998) such as phthalates would be expected to bioaccumulate in aquatic organisms. However, B2EHP is not as readily absorbed into fish as are other phthalates. For example, gill uptake efficiencies in English sole (Parophrys vetulus) from single-pass exposures to phthalates ranged from 42% for butylbenzyl phthalate (Log K_{ow} =5.8), 12% for di-n-octyl phthalate (Log K_{ow} =9.2), 11% for diethylphthalate (Log K_{ow} =3.2), and 3% for B2EHP (Log K_{ow} =8.7) (Boese 1984). If absorbed into fish, there is little bioaccumulation of B2EHP or its first metabolic degradation product (monoethylhexyl phthalate [MEHP]) due to an efficient biotransformation mechanisms (Barron et al. 1989). Relative to other components of a model aquatic ecosystem (snails, clams, Daphnia, and aquatic plants), B2EHP was rapidly metabolized in a guppy species (*Lebistes reticulatus*) (Metcalf et al. 1973). Similarly, B2EHP and MEHP were reduced to near-background concentrations within one week after a four-week dietary exposure of Atlantic salmon (*Salmo salar*) (Norman et al. 2007). Perhaps due to its relatively rapid metabolism, there are no readily available data on the specific distribution of B2EHP among tissues within a fish. However, butylbenzyl phthalate bioconcentrated in viscera of bluegill sunfish (*Lepomis macrochirus*) approximately 5-fold greater than in fillet, following a 3-day exposure period (Carr et al. 1997). In general, these collective data indicate that B2EHP is not highly bioaccumulative in fish, and within fish, tends to occur to a lesser extent in muscle (fillet) than in the viscera.

Arsenic

Arsenic in fish and crayfish tissue was initially evaluated on the basis of SLVs that assume all the arsenic is present as the more toxic inorganic arsenic. In reality, the majority of arsenic in shellfish and finfish tissue is likely to be organic arsenic, which exerts minimal toxicity. This initial assumption is likely to overestimate risks related to arsenic by the shellfish and finfish consumption pathway.

O.2.2.4 Site Characterization Data

Extensive discussion of the quality and sensitivity of the data used to characterize the River OU media has been provided in Sections 7, 8, 9 (in conjunction with Appendix K).

O.2.2.5 Receptors and Exposure Pathways

A common uncertainty for subsistence and recreational fishers is that although site-specific consumption of shellfish tissue from the Forebay is theoretically possible, the actual occurrence of shellfishing and rates of consumption have been difficult to establish with certainty.

Another uncertainty is that actual use of the Forebay area for subsistence fishing use appears to be unlikely. As noted in the RI/FS MP (URS, 2007a), the Forebay area is of low habitat quality and is not considered to be as attractive for fishing as other portions of the Columbia River. Although tribal fishers may use the area to some degree, it is unlikely that sole usage of the Forebay for subsistence fishing actually occurs.

Although it is theoretically possible, the likelihood of potable use of unfiltered, untreated river water by receptors in the Forebay area or immediately downstream is also unlikely.

O.2.2.6 Selection and Use of SLVs

SLVs were identified for the majority of the COIs by following the hierarchical process of SLV selection (Appendix J). To the extent possible, surrogate chemicals were used to identify SLVs for COIs lacking their own SLVs. Only a few COIs remained without SLVs, and are identified in Table 7-6.

Bioaccumulative COIs without human health SLVs in the River OU consist primarily of several phthalate compounds, carbazole and p-cresol, as well as a few metals (Table J-7). The potential for bioaccumulation was evaluated by first identifying COPCs in the tissue data and using the results to guide the identification of COPCs for sediments. The phthalates were evaluated by reference to B2EHP. Although B2EHP is classified as a carcinogen, it has a relatively high soil SLV of 150 mg/kg for direct contact pathways unlike many other more potent carcinogens (Table J-4a). ATLs were developed for B2EHP in tissue for the subsistence and recreational fishers. Its occurrence is widespread and it was reported in both the Forebay and Reference media. Therefore it was evaluated in the context of whether it exceeded the ATLs and whether Forebay sediment concentrations exceeded Reference Area sediment concentrations. This multiple lines of evidence approach was useful in minimizing the level of uncertainty associated with these COIs. However, all COIs without SLVs or ATLs or surrogates were retained as COPCs.

COIs for which the appropriate speciation data were not available were screened using the more conservative of available SLVs, e.g., chromium was evaluated by using SLVs based on the more toxic hexavalent chromium rather than trivalent chromium. In addition, fluoranthene and pyrene bioaccumulation SLVs were used as surrogates for the other PAHs detected in tissue. This uncertainty is minimized by that fact that the detected concentrations of all PAHs in fish tissue are generally very low. Arsenic in crayfish and fish tissue is also likely to occur as the less toxic organic form of arsenic than the more toxic inorganic form. By applying the arsenic SLV that is based on inorganic arsenic, the potential risk associated with arsenic in tissue is likely overestimated.

The subsistence fisher and recreational fisher SLVs for sediment and tissue are based on estimated rates of finfish and shellfish consumption that are likely higher than actual consumption for these fishers in the Forebay. Therefore, the screening level risk estimates for these receptors are likely to be overestimated.

O.2.2.6.1 Updates to SLVs

As part of the uncertainty assessment, there have been updates to the agreed upon sources of SLVs, DEQ WQC (2011) (affecting surface water SLVs for fish ingestion pathway). If this update contains more stringent SLVs, they will be considered for further evaluation as to whether they should be included in subsequent River OU evaluations (e.g., future monitoring activities) if additional surface water data are collected.

O.3 ERA Uncertainty Assessment

This section describes the uncertainties specific to the ERAs conducted for the Upland and River OUs.

O.3.1 Upland OU

O.3.1.1 Data Sensitivity Analysis for ERA

To evaluate the quality of the data for specific use in the Level II ERA, the MDLs for the non-detect results from the Upland OU were compared with the lowest of the ecologically protective screening levels available for each receptor group (Appendix J). The MDL evaluation was only performed for analytes with a detection frequency of less than 100%; those with at least one non-detect sample. The data for analytes that have actual measurable detections above MDLs at every location are less uncertain than those that were not quantifiable in some samples. For individual chemicals that are consistently non-detect or estimated, there is uncertainty that is discussed further in Section 7.0, of the main RI, and below. There is relatively less uncertainty for chemicals for which there are some detected results above the MDL.

The following datasets were considered in the Upland OU data quality evaluation:

- Landfill AOPC: soil, groundwater, and co-located (adjacent) seep water and surface water
- Sandblast Area AOPC: soil and groundwater.
- Pistol Range AOPC: soil and groundwater (All COIs analyzed for in lagoon sediments were detected in all samples, so no MDL comparison was required)
- Bulb Slope: soil

Tables K-5 through K-8 in Appendix K present the results of this analysis for the Landfill, Sandblast Area, Pistol Range, and Bulb Slope AOPCs, respectively. Various MDLs for soils, groundwater, seep water and potentially mass wasting soils exceeded the lowest ecological SLVs at the Landfill AOPC (Table K-5). At the Sandblast Area AOPC, two metals, two SVOCs, various pesticides, and seven VOCs had MDLs greater than the lowest ecological SLVs (Table K-6). Of these, only three VOCs in soils that had 100% nondetects had MDLs greater than the lowest ecological SLV (Table K-6). For groundwater at the Sandblast Area AOPC, two VOCs, two SVOCs, and one pesticide had MDLs greater than the lowest ecological SLVs (Table K-6). Several SVOCs, pesticides and PCBs in the potentially erodible soils at the Sandblast Area AOPC also had MDLs greater than the lowest ecological SLV (Table K-6). At the Pistol Range AOPC, only antimony had MDLs greater than the lowest screening level (Table K-7). All MDLs at the Bulb Slope AOPC were below the screening levels (Table K-8).

In general, the majority of the MDLs are equal to or lower than the SLVs, but a few analytes (some PAHs, pesticides, herbicides, PCB-Aroclors) exceed their corresponding SLVs for certain media. Exceedance of the lowest ecological SLV does not mean that the MDL exceeds the screening level for all receptors. It is unlikely that additional analysis will be needed for the analytes and media with elevated MDLs, as shown in the data usability tables presented in Appendix K, for the following reasons:

- Elevated MDLs demonstrated for a specific analyte in one medium, but not in any other media may not be an issue due to the chemical properties of that particular analyte. For example, elevated MDLs for PCB-Aroclors in groundwater with 0% non-detects may reflect a combination of factors: the limits of analytical technology for detecting PCBs in water samples, the generally low solubility of PCBs in water and the use of extremely low, theoretically estimated risk screening values for comparison.
- Analytes for which the MDLs are exceeded in all samples (e.g., high molecular weight PAHs [HPAHs]) likely reflect the current analytical technology limitations.
- The lowest ecological SLVs were used, which may be replaced with more relevant screening levels in the RI Report and RAs.
- Many of the analytes were detected at a frequency greater than 5% (and were greater than background levels for metals) and will already be included as COIs in the ERA.

The use of flagged data increases the level of uncertainty associated with the EPC; however, none of the data were R flagged. In general, the historical and more recent data utilized in this ERA represents the best available analytical data and, as detailed in Section 7.0 of the main RI, the quality of the data was sufficient to provide for a defensible ERA.

O.3.1.2 Statistical Background Comparison Screening

As discussed in Section 8.1 of the main text, the goal established in the RI/FS MP (URS 2007a) for statistical power associated with the background comparison was achieved (i.e., to detect "one-standard-deviation-away"). However, for some Upland soils, this one-standard-deviation is high due to the high data variability, which could not be controlled because of the inherent heterogeneity of the Upland soils. As an artifact of this high data variability, MDDs greater than 100% of the reference mean were calculated for several metals in soil of the Landfill, Sandblast Area, and the four combined AOPCs (Table L-1). Although the null hypothesis was not rejected, the statistical power to detect substantial differences between the site and Reference Area datasets for metals with MDDs greater than 100% of the reference mean might be limited.

For metals with data sets containing a large numbers of non-detects, the statistical methodology used in the background comparison may present limitations. Therefore, comparisons also included an examination of the data distributions using box-and-whisker plots. These plots are included in Appendix L. Examination of these plots allowed for the identification of data sets in which the analyte concentrations in the site data were clearly higher than the reference area concentrations, even when the population-to-population comparisons were inconclusive. These metals were ultimately included in the SLV comparison presented in Section 12 (ERA). The final list of metal COIs considered to have concentrations higher than the Reference Area are provided in Table 8-1 of the main report.

The results of the statistical background comparison indicated that concentrations of several metals with high MDDs (greater than 100% of the reference mean) were present below or equal to that of the Reference Area levels. These metals were not carried to the SLV comparison step (not presented in Table 8-1). Since the high MDDs present an uncertainty with this approach, these metals were evaluated further below.

Metals with MDDs greater than 100% of the reference mean that were not included in the SLV comparison in Section 12 (ERA) include the following:

Landfill

- 0 to 1 ft bgs – arsenic, chromium, copper, and nickel
- 0 to 3 ft bgs – chromium, copper, magnesium, and nickel

Sandblast Area

- 0 to 1 ft bgs and 0 to 3 ft bgs – copper, magnesium, and mercury

Four Combined AOPCs

- 0 to 1 ft bgs and 0 to 3 ft bgs – copper and magnesium

Magnesium is an essential nutrient; therefore, it was eliminated from further evaluation and no further investigation is recommended. To address the uncertainty with the results of the statistical background comparison, the remaining metals were subjected to a risk-based screening evaluation. The purpose of this evaluation is to explore whether or not these metals should be included as CPECs, and ultimately advanced to the next level of RA or directly to the FS. A weight-of-evidence approach similar to the one implemented in Section 12 (ERA) was used to evaluate these metals.

The following sequential steps summarize the risk screening process used to evaluate metals with MDDs greater than 100% of the reference mean that were not included in the SLV comparison:

- SLVs protective of ecological receptors were compared to the appropriate EPCs (i.e., 95% UCLs for mobile receptors and maximum concentrations for stationary receptors) for each analyte.
- Magnitude of SLV exceedances, detection frequency, confidence in the SLV, comparison of AOPC vs. Reference Area concentration ranges, and other lines of evidence were evaluated.
- Spatial distribution of the concentrations relative to the site-specific background UPLs and SLVs was assessed by referencing existing figures presented in the main RI report.

The ecological SLVs presented in Appendix J were compared to the EPCs calculated for 0 to 1 ft bgs and 0 to 3 ft bgs soils (Table O.3-1). Based on this weight-of-evidence approach, those CPECs that truly warrant additional investigation or risk management were identified and discussed below. A unitless receptor designator that dictates the level of protection appropriate for a certain site: Q of 1 is applicable to all receptors with the exception of mammals, for which a Q of 5 was used.

Landfill AOPC

. . EPCs for the four metals in 0 to 1 ft bgs soils and three metals in 0 to 3 ft bgs soils with high MDDs exceed at least one receptor-specific SLV:

- 0 to 1 ft bgs – arsenic, chromium, copper, and nickel
- 0 to 3 ft bgs – chromium, copper, and nickel.

Arsenic. The MDD generated for arsenic in soil during the statistical background comparison is 148% for 0 to 1 ft bgs, while the MDD for 0 to 3 ft bgs is below 100% (i.e., no uncertainty needs to be addressed) (Table L-1).

As shown in Table O.3-1, toxicity ratios (EPC/SLV) for all receptors with the exception of plants are below 1.0. The toxicity ratio for plants is very low at 1.7. Concentrations of arsenic in Landfill soils from 0 to 1 ft bgs range from 1.5 mg/kg to 30.1 mg/kg, and concentrations in Upland Reference Area soils range from 1.09 mg/kg to 5.18 mg/kg (Table L-1). The location with the maximum detected concentration of 30.1 mg/kg is BIL05, just east of the Lead Hot Spot Test Pit #1. This is the only sample with a concentration greater than the plant SLV. No other samples exceed SLVs for any receptors.

Based on the relatively low MDD, low arsenic concentrations, and general lack of SLV exceedances in 0 to 1 ft soils (and 1 to 3 ft soils), arsenic is not recommended for further evaluation at the Landfill AOPC.

Chromium. The MDDs generated for chromium in soil during the statistical background comparison are 598% for 0 to 1 ft bgs and 1559% for 0 to 3 ft bgs (Table L-1).

As shown in Table O.3-1, toxicity ratios for plants and soil invertebrates range from 29 (0 to 1 ft bgs) to 69 (0 to 3 ft bgs), with the highest concentrations of chromium occurring between 1 to 3 ft bgs. The toxicity ratios for birds range from 8.6 (0 to 1 ft bgs) to 21 (0 to 3 ft bgs). With the exception of the SLV for mammals, all risk-based SLVs for chromium are below the site-specific background UPL of 28.1 mg/kg. Therefore, the UPL was used as the default soil SLV for these receptors. The soil SLV for mammals of 34 mg/kg is similar to the site-specific UPL, and when adjusted for a receptor designator (i.e., Q) of 5.0 (i.e., an SLV of 170 mg/kg), the toxicity ratios for mammals range from 1.4 (0 to 1 ft bgs) to 3.5 (0 to 3 ft bgs).

Concentrations of chromium in Landfill AOPC soils from 0 to 1 ft bgs range from 14.7 mg/kg to 801 mg/kg, and soils from 0 to 3 ft bgs range from 14.7 mg/kg to 1950 mg/kg (Table L-1). Concentrations of chromium in Upland Reference Area soils range from 15.5 mg/kg to 27.3 mg/kg (Table L-1). Highest levels of chromium occur in the Gully Test Pit and just downgradient of this area (Figure 12-6): BIL07 (0 to 1 ft bgs maximum), BIL08, BIL17, BIL18 (1 to 3 ft bgs maximum), and BIL-22. . BIL05, located just east of Lead Hot Spot Test Pit #1, also has elevated chromium (237 mg/kg), as well as BIL11 (50 mg/kg) to a lesser extent. Chromium concentrations in the remaining samples from 0 to 3 ft bgs are equivalent to or below the Reference Area UPL.

Elevated toxicity ratios were calculated for plants, soil invertebrates, and birds, which also reflect the high chromium levels in certain areas of the Landfill AOPC compared to Reference Area concentrations. Therefore, chromium is recommended for further evaluation.

Copper. The MDDs generated for copper in soil during the statistical background comparison are 195% for 0 to 1 foot bgs and 228% for 0 to 3 ft bgs (Table L-1).

As shown in Table O.3-1, respective toxicity ratios for plants and soil invertebrates are 7.1 and 6.2, respectively, for both depth intervals because the maximum concentration of copper, i.e., the EPC, occurs at the surface between 0 and 1 foot bgs. The toxicity ratios for birds range from 3.0 (0 to 1 foot bgs) to 3.4 (0 to 3 ft bgs) and are below 5.0 for mammals (the point of departure, or Q designator, for this receptor group). Toxicity ratios for birds and mammals are based on the

Reference Area UPL, as their risk-based SLVs are below the site-specific background UPL of 56.7 mg/kg. Therefore, the UPL was used as the default soil SLV for these receptors.

Concentrations of copper in Landfill AOPC soils for both depth intervals range from 23.5 mg/kg to 494 mg/kg (Table L-1). Concentrations of copper in Upland Reference Area soils range from 22.8 mg/kg to 58.2 mg/kg (Table L-1). The maximum concentration of copper occurs at BIL05, just east of Lead Hot Spot Test Pit #1, and the next highest concentration of 378 mg/kg was detected between 1 and 3 ft bgs at BIL22 in the Gully Test Pit (Figure 12-6). Elevated copper was also detected at BIL11 to the west of Lead Hot Spot Test Pit #1; BIL06 within Lead Hot Spot Test Pit #2; and BIL03 near the southern boundary of the Landfill AOPC. Copper concentrations in the remaining samples from 0 to 3 ft bgs are similar to or below the Reference Area UPL.

Elevated toxicity ratios were calculated for plants, soil invertebrates, and birds, which also reflect the high copper levels in specific areas of the Landfill AOPC compared to Reference Area concentrations. Therefore, copper is recommended for further evaluation.

Nickel. The MDDs generated for nickel in soil during the statistical background comparison are 492% for 0 to 1 foot bgs and 1458% for 0 to 3 ft bgs (Table L-1).

As shown in Table O.3-1, toxicity ratios for plants and soil invertebrates range from 2.0 (0 to 1 ft bgs) to 42 (0 to 3 ft bgs), with the highest concentrations of nickel occurring between 1 to 3 ft bgs. The toxicity ratios for birds range from 0.83 (0 to 1 ft bgs) to 2.2 (0 to 3 ft bgs) and are below 5.0 for mammals (the point of departure, or Q designator, for this receptor group).

Concentrations of nickel in Landfill AOPC soils from 0 to 1 ft bgs range from 13.4 mg/kg to 570 mg/kg, and Landfill AOPC soils from 0 to 3 ft bgs range from 13.4 mg/kg to 1610 mg/kg (Table L-1). Concentrations of nickel in Upland Reference Area soils range from 11.5 mg/kg to 26.1 mg/kg (Table L-1). Highest levels of nickel in Landfill AOPC soils appear to be co-located with highest concentrations of chromium and occur in the Gully Test Pit and just downgradient of this area (Figure 12-6): BIL07 (0 to 1 ft bgs maximum), BIL08, BIL17, BIL18 (1 to 3 ft bgs maximum), and BIL-22. . BIL05, located just east of Lead Hot Spot Test Pit #1, also has elevated nickel (170 mg/kg), as well as BIL11 (42.4 mg/kg) and BIL01 (40 mg/kg) to a lesser extent. Nickel concentrations in the remaining samples from 0 to 3 ft bgs are equivalent to or below the Reference Area UPL.

Elevated toxicity ratios were calculated for plants, soil invertebrates, and birds to a lesser degree at depth only, which also reflect the high nickel levels in certain areas of the Landfill AOPC compared to Reference Area concentrations. Therefore, nickel is recommended for further evaluation.

Summary. Of the metals with high MDDs demonstrated for Landfill soils, the following are recommended for further evaluation in the form of either a Level III Baseline Ecological Risk Assessment (BERA) (for all Upland receptors) or remediation of the locations above the UPL:

- Chromium
- Copper
- Nickel

In a Level III BERA, these metals should be evaluated for both soil depth intervals for Landfill soils. . . . . .

Sandblast Area AOPC

. EPCs for the two metals in 0 to 1 ft bgs soils and 0 to 3 ft bgs soils with high MDDs exceed at least one SLV: copper and mercury.

Copper. The MDDs generated for copper in soil during the statistical background comparison are 148% for 0 to 1 ft bgs and 134% for 0 to 3 ft bgs (Table L-1).

As shown in Table O.3-1, respective toxicity ratios for plants and soil invertebrates are 4.6 and 4.0, respectively (same for both depth intervals). The highest concentrations of copper occur at the surface. The toxicity ratios for birds range from 1.6 (0 to 3 ft bgs) to 1.8 (0 to 1 ft bgs), and are below 5.0 for mammals (Q designator for this receptor group). Risk-based SLVs for birds and mammals are below the site-specific background UPL for copper of 56.7 mg/kg. Therefore, the UPL was used as the default soil SLV for these receptors.

Concentrations of copper in Sandblast Area AOPC soils for both depth intervals range from 13.2 mg/kg to 319 mg/kg (Table L-1). Concentrations of copper in Upland Reference Area soils range from 22.8 mg/kg to 58.2 mg/kg (Table L-1). Highest levels of copper (greater than 100 mg/kg) occur near the HMSA (SBB18, maximum detection), in the eastern portion of the Equipment Laydown Area (LD-01, LD-02, LD-03, LD-05, LD-10, and LD-11), west side of the Equipment Laydown Area (TRA-04), near the former HMSA (DSA11), and near the southern boundary of the Spent Sandblast Grit Disposal Area (SBB12). Several other exceedances of the Upland Reference Area UPL are scattered throughout the Sandblast Area AOPC.

Given that no special status plant or soil invertebrate species are present in the Upland OU (protection is afforded at the community level), the 95% UCL concentration of copper at the Sandblast Area was considered. When the UCL for the 0 to 1 ft interval is used as the EPC instead of the maximum concentration of copper, the toxicity ratios decrease to 1.47 for plants and 1.29 for soil invertebrates.

The approach for the Level II Screening Assessment focused on protection of birds at the individual level to account for the bald eagle, and possible transient juvenile spotted owls, but these special-status species are not likely to forage at the 3.1-acre Sandblast Area AOPC. Owls have not been documented to occur on the island, and bald eagles have been seen roosting in the Upland OU, but these piscivorous birds would be much more likely to forage in the adjacent River OU. Therefore, the minor toxicity ratio exceedances of 1.8 and 1.6 are not considered significant and no exceedances are noted at a Q designator of 5.0, which is more applicable to the birds of the Upland OU. Piscivorous birds were evaluated in the Level II Screening Assessment for the River OU (Section 12.5 of the main text).

Based on the relatively low MDDs, low toxicity ratios based on the 95% UCL, lack of special status species in the Upland OU, and the fact that copper is an essential nutrient for plants and animals (USEPA 2005-2008), copper is not recommended for further evaluation at the Sandblast Area AOPC.

Mercury. The MDDs generated for mercury in soil during the statistical background comparison are 229% for 0 to 1 ft bgs and 209% for 0 to 3 ft bgs (Table L-1).

As shown in Table O.3-1, respective toxicity ratios for plants and soil invertebrates are 2.4 and 7.2, respectively (same for both depth intervals). The highest concentrations of mercury occur at the surface. The toxicity ratios for birds range from 1.7 (0 to 3 ft bgs) to 1.5 (0 to 1 ft bgs) and are below 5.0 for mammals (Q designator for this receptor group). The risk-based SLV for birds is below the site-specific background UPL for mercury of 0.066 mg/kg. Therefore, the UPL was used as the default soil SLV for birds.

Concentrations of mercury in Sandblast Area AOPC soils for both depth intervals range from 0.0114 mg/kg to 0.723 mg/kg (Table L-1, Appendix L). Concentrations of mercury in Upland Reference Area soils range from 0.034 mg/kg to 0.068 mg/kg (Table L-1). Highest levels of mercury occur in the eastern portion of the Equipment Laydown Area (LD-01, LD-02, LD-05, which has the maximum detection, and LD-10) and near the former HMSA (DSA09 and DSA10), and several other exceedances of the Upland Reference Area UPL are scattered throughout the Sandblast Area AOPC.

Elevated toxicity ratios were calculated for plants, soil invertebrates, and birds, which also reflect the high mercury levels in certain areas of the Sandblast Area AOPC compared to Reference Area concentrations. Therefore, mercury is recommended for further evaluation.

Summary. Of the two metals with high MDDs demonstrated for Sandblast Area soils, only mercury is recommended for further evaluation in the form of either a Level III BERA (for all Upland receptors) or remediation of the locations above the UPL. In a Level III BERA, mercury should be evaluated for both soil depth intervals.

All Four AOPCs Combined

As shown in Table O.3-1, copper is the only metal with a high MDD demonstrated for soil from the four combined AOPCs that was not included in the Section 12 (ERA) SLV evaluation. For all four AOPCs combined, toxicity ratios were calculated for the wide ranging receptors that might be exposed to soils from all four AOPCs. The toxicity ratios for all four AOPCs combined were greater than 1 for birds in both soil intervals. However, the toxicity ratio for birds is very low at 1.7. The all four COPCs combined evaluation did not identify any additional CPECs not already identified in the individual AOPC evaluations (see above).

Summary. In summary, although copper was identified as a CPEC for all four AOPCs combined, the toxicity ratio was very low (1.7) and copper was already retained as a CPEC recommended for further evaluation at the Landfill AOPC. Copper is recommended for further evaluation in the form of either a Level III BERA (for birds and mammals that could forage over all four AOPCs) or remediation of the locations above the UPL. In a Level III BERA, this CPEC should be evaluated for both soil depth intervals.

O.3.1.3 CPEC Selection Process

As part of the Level II Screening process (DEQ 2001), several COIs were eliminated as CPECs in soil and groundwater on the basis of detection frequency for the Landfill and Sandblast Area. An evaluation of these COIs, which were detected in soil, groundwater, or both, was performed to understand the implications of not including these COIs in the quantitative screening assessment. In Tables O.3-2 and O.3-3, concentrations of these COIs were compared to SLVs protective of the relevant receptor groups:

- soil: plants, soil invertebrates, and terrestrial birds and mammals

- groundwater: aquatic organisms and aquatic-dependent birds and mammals

In addition, whether or not these COIs were detected in both soil and groundwater from the same AOPC is also considered. Only bioaccumulative COIs (as defined in Table J-7) were compared to SLVs protective of birds and mammals, with the exception of selenium. Although the criteria used to identify bioaccumulative COIs for the River OU indicate selenium is not bioaccumulative in aquatic environments, selenium was included in the screening tables because it is included as a bioaccumulative COI in DEQ's sediment bioaccumulation guidance (2007).

Landfill AOPC

As shown in Table O.3-2 for Landfill AOPC soils, only ethylbenzene was detected at a concentration in exceedance of the SLV protective of soil invertebrates (0-3 ft bgs interval). However, this exceedance is low (resulting in a toxicity ratio of 1.19, Table N-2). Ethylbenzene was detected in one of 20 soil samples (0 to 3 ft bgs) collected from the Landfill AOPC (Table I-1), and the detection was in a surface sample (0 to 1 ft bgs). Because less than 20 samples are available for the 0 to 1 ft depth interval, ethylbenzene was already included in the screening for this depth interval in Section 12.0. The concentration in soil of 2700 µg/kg was detected at BIL04TPG in the Gully Test Pit (Figure 12-7).

Ethylbenzene was detected in one of 22 groundwater samples of the Landfill AOPC as well. The concentration in groundwater of 1 µg/L was detected from MW-05, which is east of the Gully Test Pit (Figure 12-10). This concentration is below the SLV protective of aquatic organisms, and ethylbenzene was not detected in the seep sample collected from the Landfill AOPC.

Based on the low, single detection of ethylbenzene in soil and groundwater at the Landfill AOPC, elimination of this COI from the SLV screening for shallow soils (0 to 3 ft bgs) and groundwater based on detection frequency is not expected to present a significant uncertainty in the ERA, especially since the single detection in soil was already included in the 0-1 ft bgs soil interval evaluation in Section 12.

4,4'-DDE and Total DDTs in groundwater at the Landfill AOPC were eliminated on the basis of detection frequency and were detected above the SLV (Table O.3-2). The concentration of Total DDTs is attributed to the one detection (out of 22 samples) for 4,4'-DDE, as the other DDT isomers were not detected in the 22 groundwater samples from the Landfill. No DDTs were detected in the seep water (Table I-1).

The groundwater 4,4'-DDE concentration of 0.00246 µg/L was detected at a single well (MW-03; Figure 12-10) and down gradient wells closer to the river were all non-detect for 4,4'-DDE. The non-detect MDLs, which range from 0.00195 to 0.1 µg/L, all exceed the surface water benchmark of 0.001 µg/L, indicating that the theoretically based SLV is lower than analytical methods can achieve. In addition, as discussed in Section O.1.2, the assumption that aquatic organisms are exposed to undiluted groundwater concentrations is highly conservative.

4,4'-DDE was detected in one of 23 soil samples (0 to 3 ft bgs) collected from the Landfill AOPC, and this sample is a surface sample (0 to 1 ft bgs). The detected concentration (17 µg/kg) was in surface soil (0 to 1 ft bgs) at BIL04SSI in the Lead Hot-Spot Test Pit #1 (Figure 12-7). Due to the higher detection frequency for 4,4'-DDT in Landfill AOPC soils, 4,4'-DDE was already included in the screening for both depth intervals in Section 12.0 (4,4'-DDE is included in the calculation of Total DDTs). As noted above, 4,4'-DDT (and 4,4'-DDD) was not detected

in groundwater of the Landfill AOPC. Furthermore, no DDT isomers were detected in the seep sample collected from the Landfill.

Based on the low, single detection of 4,4'-DDE in groundwater of the Landfill AOPC and lack of DDT isomers in seep water, elimination of this COI from the SLV screening for groundwater based on detection frequency is not expected to present a significant uncertainty in the ERA.

The remaining COIs that were eliminated on the basis of detection frequency and were detected above the SLV for the Landfill AOPC are two SVOCs (2-methylphenol and p-cresol) and one VOC (carbon disulfide) (Table O.3-2). 2-Methylphenol and p-cresol were detected in one of 23 groundwater samples collected from the Landfill AOPC, and carbon disulfide was detected in one of 22 groundwater samples.

The single detections of the two SVOCs occurred at MW-05, and the single detection of carbon disulfide occurred at MW-09 (Figure 12-10). 2-Methylphenol and p-cresol were not detected in wells closer to the River and were not detected in the seep sample (Table I-1). 2-Methylphenol was not detected in soil at the Landfill AOPC, and p-cresol was only detected in one of 29 soil samples collected from 0 to 3 ft bgs (BIL17, Gully Test Pit; see Figure 12-7). The single detection of p-cresol is below the corresponding soil SLV (Table O.3-2). Neither of these SVOCs is considered to be potentially bioaccumulative (Table O.3-2).

Carbon disulfide was not detected in the seep sample or in any soil samples collected from the Landfill AOPC (Table I-1). In addition, this VOC is not expected to persist once discharged to surface water and is not considered to be potentially bioaccumulative (Table O.3-2).

Based on the single detections of 2-methylphenol, p-cresol, and carbon disulfide in groundwater at the Landfill AOPC, lack of detections in seep water, and the fact that none of these COIs are potentially bioaccumulative, elimination of these COIs from the SLV screening for groundwater based on detection frequency is not expected to present a significant uncertainty in the ERA.

Several pesticides in soil and anthracene in groundwater of the Landfill are potentially bioaccumulative but lack dietary-based SLVs. For these COIs, the uncertainty associated with the low detection frequency was not as easily quantified. Most of the pesticides were detected once in soil, however, none were detected in groundwater (Table I-1). The single detection of these COIs in only one medium of the Landfill AOPC likely demonstrates that elimination of these COIs based on detection frequency is not expected to present a significant uncertainty in the ERA.

Sandblast Area AOPC

None of the COIs eliminated on the basis of detection frequency in soil and groundwater at the Sandblast Area AOPC exceed the corresponding SLVs (Table O.3-3). However, a few butyltins, pesticides, and VOCs in soil and two PAHs in groundwater of the Sandblast Area AOPC are potentially bioaccumulative but lack dietary-based SLVs. In addition, seven COIs in soil lack SLVs protective of plants and soil invertebrates that are exposed through direct contact. For these COIs, the uncertainty associated with the low detection frequency was not as easily quantified. All of these potentially bioaccumulative COIs in soil (with the exception of isopropylbenzene in the direct push groundwater data set) (Table I-2), however, were never detected in groundwater, and the two potentially bioaccumulative COIs (PAHs) in groundwater were detected below the direct toxicity-based SLVs. For these reasons, elimination of these COIs based on detection frequency is not expected to present a significant uncertainty in the ERA.

O.3.1.4 Calculation of Total LPAHs and Total HPAHs

USEPA (2005-2008) included fluoranthene in the development of the Total low molecular weight PAH (LPAH) Ecological Soil Screening Levels (EcoSSL). However, fluoranthene is more often considered a HPAH (Agency for Toxic Substances and Disease Registry [ATSDR] 1995; Washington State Department of Ecology [Ecology] 2008; USEPA 1998; Canadian Council of Ministers of the Environment [CCME] 2008) and was evaluated as an HPAH in the ERA and used to calculate Total HPAH. Exposure to LPAHs and HPAHs due to inclusion of fluoranthene in the totaling of HPAHs does not underestimate risk and may actually overestimate risk because the EcoSSLs for HPAHs are lower than those for LPAHs and grouping fluoranthene as a HPAH is actually more conservative (e.g., HPAH totals are higher and screened against a lower SLV).

O.3.1.5 Erodible/Mass Wasting Soil

As discussed in Section O.1.2, an evaluation of the overland transport pathway to the River OU was conducted for the Landfill, Sandblast Area, and Bulb Slope AOPCs. In the first step of this evaluation, the data from surface soils (0 to 1 ft bgs) that were collected from areas that may potentially be subject to erosion or mass wasting (as identified in Sections 3.5 and 10.1 of the RI Report) were compared to the inorganic concentrations in the site-specific Reference Area sediment (Table L-8). Those COIs that were detected less than the Reference Area were not retained as CPECs and were not evaluated further.

The organic COIs and remaining inorganic COIs were then compared to sediment SLVs protective of the four receptor groups relevant to the River OU, and the results are summarized below. For fish and wildlife, only the COIs identified as potentially bioaccumulative were evaluated through a comparison of soil concentrations to DEQ's bioaccumulation SLVs:

- Benthic Invertebrates - (Tables O.3-4 and O.3-5). Soil CPECs for benthic invertebrates that could be exposed if mass wasting of debris and soil from the Landfill or Bulb Slope AOPCs were to occur or through soil erosion at the Sandblast Area AOPC include arsenic, cadmium, chromium, cobalt, copper, lead, mercury, nickel, selenium, thallium, zinc, 4,4'-DDT, Total DDTs, Aroclor 1254, Aroclor 1260, Total Aroclors, carbazole, bis(2-ethylhexyl) phthalate, di-n-butyl phthalate, and most PAHs.
- Fish - (Tables O.3-6). Soil CPECs for fish that could be exposed through their diet if mass wasting of debris and soil from the Landfill or Bulb Slope AOPCs were to occur or through soil erosion at the Sandblast Area AOPC include arsenic, cadmium, lead, mercury, selenium, thallium, zinc, tributyltin, 4,4'-DDE, 4,4'-DDT, Total DDTs, dieldrin, Aroclor 1254, Aroclor 1260, Total Aroclors, and most HPAHs.
- Birds – Individuals and Populations - (Tables O.3-7 and O.3-8). Soil CPECs for piscivorous birds that could be exposed through their diet if mass wasting of debris and soil from the Landfill or Bulb Slope AOPCs were to occur or through soil erosion at the Sandblast Area AOPC include arsenic, cadmium, lead, mercury, selenium, thallium, zinc, 4,4'-DDE, 4,4'-DDT, Total DDTs, dieldrin, Aroclor 1254, Aroclor 1260, Total Aroclors.
- Mammals – Individuals and Populations - (Tables O.3-9 and O.3-10). Soil CPECs for piscivorous mammals that could be exposed through their diet if mass wasting of debris and soil from the Landfill or Bulb Slope AOPCs were to occur or through soil erosion at

the Sandblast Area AOPC include arsenic, cadmium, lead, mercury, selenium, thallium, zinc, 4,4'-DDT, Total DDTs, dieldrin, Aroclor 1254, Aroclor 1260, Total Aroclors.

As shown in Tables O.3-4 and O.3-5, several COIs in soil were identified as CPECs for the benthic community exposed through direct contact because they lacked SLVs: selenium, butyltins, a few pesticides, most VOCs, two SVOCs, 2-methylnaphthalene, and total petroleum hydrocarbons (TPH). As shown in Tables O.3-6 through O.3-10, several COIs in soil were identified as CPECs for upper trophic level fish and shellfish and aquatic-dependent birds and mammals solely due to their bioaccumulation potential; they either lacked SLVs or their SLVs were not dietary-based (i.e., do not account for bioaccumulation). These primarily include manganese, TPH, and a few VOCs, SVOCs, and pesticides, as well as PAHs for birds. In addition, TPH was identified as a CPEC due to the lack of reliable SLVs protective of fish and shellfish and aquatic-dependent birds and mammals that could be exposed through direct contact. Naphthalene is the other CPEC identified for birds based on direct contact due to the lack of reliable SLVs for PAHs and birds.

The CPECs in soil identified through the evaluation of the overland transport pathway were evaluated for their potential to bioaccumulate in the ERA for the River OU (Section 12.5 of the main RI), with the exception of pesticides, and the protection of fish and aquatic-dependent wildlife is discussed in that section of the ERA. The lack of data for the Forebay for pesticides constitutes an additional source of uncertainty that was discussed previously.

Due to the elevated toxicity ratios for the CPECs listed above and/or their potential to bioaccumulate, as well as the potential for these areas to be sources of contamination (e.g., erosion or mass wasting), further evaluation of these CPECs within their respective AOPCs (i.e., Landfill, Sandblast Area, and Bulb Slope) is recommended for the Upland OU.

The magnitude of the potential for mass wasting/erosion and the mass of CPECs from the mass wasting/erodible soils that may actually enter the River OU are both highly uncertain. Therefore, the toxicity ratios associated with CPECs in the erodible soils do not provide a reliable evaluation (even at a screening level) of the potential risks and hazards associated with this pathway. The primary purpose of this exercise was to identify CPECs that may warrant further evaluation and discussion of the magnitude of the ratios is not appropriate.

O.3.1.6 Selection and Use of SLVs

The general uncertainties associated with the selection of SLVs were described in Section O.1, and this section specifically addresses those uncertainties related to SLVs used in the Level II ERA.

The applicability of the selected SLVs to the habitats and receptors present or likely to be present in the Upland (and River) OUs presents an uncertainty in the ERA because the inherent assumption in these SLVs is that a site is comprised of high-quality habitats, which is not always the case given current and future land use conditions. For example, most of the AOPCs in the Upland OU generally provide good habitat for animals that occur in the Lower Columbia River watershed, i.e., Landfill, which is managed as wildlife habitat (primarily for Canada geese) and the Pistol Range. Applying the generic SLVs for plants and animals at the more highly disturbed Sandblast Area (i.e., less desirable areas for ecological receptor use) poses more uncertainty in the ERA than applying them at the areas with higher quality, more attractive and diverse habitat.

In the absence of avian toxicity data for dichloroprop and MCPP (herbicides), the SLV for 4,4-DDT (a pesticide) was used as a surrogate. Use of DDT as a surrogate for these herbicides is expected to be very conservative due to the high bioaccumulation potential associated with DDTs, which is the basis of the SLV, compared to that of the two herbicides, which are not expected to bioaccumulate (log K_{ow} < 3.5) and likely overestimated risk.

In the absence of reliable PAH toxicity data for birds, the potential hazards to birds exposed to PAHs are addressed qualitatively in this section. Because PAHs can accumulate in tissues, the potential for PAH exposure by birds (of the Upland or River OUs) is of potential concern. However, the chemical behavior of PAHs may impact the bioavailability of PAHs and overall exposure. In general, both LPAHs and HPAHs are expected to significantly adsorb to soil due to their strong affinity for organically enriched substrates (i.e., organic carbon) and other ligands (e.g., sulfides) (Eisler 1987). In addition, significant bioaccumulation of PAHs by vertebrate species has not been reported in the literature (Hartung 1995) most likely due to the rapid metabolism of PAHs. As noted in the EcoSSL document for PAHs (USEPA 2005-2008), the recommended bioaccumulation factor (BAF) for PAHs is zero for estimating PAH concentrations in mammalian prey tissue because of the rapid metabolism of these compounds after ingestion by birds and mammals. Therefore, ingestion of PAHs in prey items for the birds evaluated in the ERA, especially predatory birds of the Upland OU, is likely to be minimal and the lack of PAH toxicity reference values (TRVs) for birds would not significantly impact the findings of the Level II ERA.

Potential impacts from generic classes of petroleum hydrocarbons (as TPH purgeable and extractable), are difficult to quantify because of uncertainty due to the analytical problems frequently encountered when characterizing the petroleum mixture and because of the change in composition of the petroleum hydrocarbons with exposure to the environment (i.e., weathering). As such, the focus of this ERA was on evaluating the chemical-specific hazards from the most toxic components (i.e., VOC, SVOCs, PAHs) of TPH.

O.3.1.7 Bioaccumulative COIs without Dietary-based SLVs

Table O.3-11 lists the bioaccumulative COIs detected at the Landfill and Sandblast Area AOPCs that had SLVs and were evaluated for ecological risk in this Level II ERA do not have dietary-based SLVs. The lack of dietary-based SLVs for bioaccumulative COIs may result in the underestimation of risk to wildlife from exposure to the following COIs since the non-dietary-based SLVs do not account for bioaccumulation. However, these COIs were retained as CPECs for the Landfill and Sandblast Area AOPCs and warrant further consideration for birds and mammals. As discussed above, ingestion of PAHs in prey items for the birds evaluated in the ERA, especially predatory birds of the Upland OU, is likely to be minimal and the lack of PAH TRVs for birds would not significantly impact the findings of the Level II ERA.

O.3.1.8 Bioavailability, Absorption, and Metabolism of CPECs

The bioavailability and absorption of all of the CPECs was assumed to be 100% in the Level II ERA, while the metabolism of COIs was assumed to be 0%. There were no adjustment factors to account for CPECs binding onto soil/sediment particles, or being present in a form that is not biologically available or active, or for the ability of vertebrates to metabolize certain CPECs (e.g., PAHs). Assumption of 100% bioavailability/absorption of CPECs, as well as the assumption that there is no metabolism of COIs, likely results in the overestimation of risk.

O.3.1.9 Area and Seasonal Use Factors

This Level II ERA conservatively assumed that all of the ecological receptors were present at each AOPC all day and year-round. However, some receptors (e.g., migratory birds and fish or mammals/birds with home ranges larger than the AOPCs) may be only present at each AOPC during a portion of the day and/or year. Accounting for the area use and seasonal migration habits of receptors would influence the degree of risk associated with exposure of this receptor.

O.3.2 River OU

Many of the uncertainties discussed above for the Upland OU also apply to the River OU, such as those that originate from assumptions regarding the selection and use of SLVs, the absence of bird SLVs for PAHs, lack of a quantitative evaluation for petroleum hydrocarbons, bioavailability and metabolism of CPECs, and area use factors.

O.3.2.1 Data Sensitivity Analysis for ERA

To evaluate the quality of the data for specific use in the Level II ERA, the MDLs for the non-detect results from the River OU were compared with the lowest of the ecologically protective screening levels available for each receptor group (Appendix J). As described in Section O.3.1 for the Upland OU, the MDL evaluation was only performed for analytes with a detection frequency of less than 100%.

The following data sets were considered for the data quality evaluation:

- Random Forebay Data: surface water, sediment, clams, crayfish, sculpin, smallmouth bass, and largescale sucker
- Targeted Forebay Data:
    - Eagle Creek: sediment
    - Goose Island: sediment, clam, crayfish, and sculpin

Tables K-14 and K-15 in Appendix K presents the results of this analysis for the pre-removal, Random Forebay Data, Targeted Eagle Creek Data, and Targeted Goose Island Data, respectively.

For the Random Forebay Data, aluminum in surface water, one SVOC in sediment, and several PCB Aroclors and congeners in sediment, clam, sculpin, and smallmouth bass had MDLs greater than the lowest ecological SLVs (Tables K-13 and K-14). For the Goose Island data, two metals, two SVOCs, various pesticides and 7 VOCs had MDLs the PCB Aroclors and 1 PCB congener had MDLs greater than the lowest ecological SLVs (Table B-2c). All MDLs for Random Forebay crayfish and sucker, Eagle Creek sediment, Goose Island clam, crayfish, and sculpin, and pre-removal clam were below the lowest ecological SLVs (Tables K-13 through K-15).

In general, the majority of the MDLs are equal to or lower than the SLVs, but some analytes (PCB-Aroclors and a few individual PCB congeners) exceed their corresponding SLVs for certain media. Exceedance of the lowest ecological SLV does not mean that the MDL exceeds the screening level for all receptors.

It is unlikely that additional analysis will be needed for the analytes and media with elevated MDLs, as shown in the data usability tables presented in Appendix K, for the following reasons:

Sediment

The lowest Aroclor ecological SLV for total PCBs (Aroclor 1254) was applied as a surrogate value to all Aroclors except for Aroclor 1248 (for which a chemical-specific level was available). This approach is conservative given the lower toxicity potential associated with the other Aroclors compared to Aroclor 1254 SLV is designed to be protective of the additive toxicity of all individual Aroclors. Many of the Aroclors have MDL exceedances for sediment sample; however, they are minor exceedances based on the lowest ecological SLV. This data quality issue is further minimized when screening levels for total PCBs are considered. As previously discussed, the PCB congener data collected is expected to provide more representative concentrations in sediments than the Aroclor data.

Of the PCB congener MDLs, only PCB 126 in the Random Forebay and Goose Island sediment had MDLs that exceeded the lowest ecological SLV. For this reason, the potential for risk to ecological receptors may be underestimated for PCB 126 as an individual dioxin-like congener in sediment. PCB 126 was, however, was detected in most tissue samples. Given that the MDLs for all other PCB congeners were less than the lowest ecological SLVs, the exceedance of the MDL for PCB 126 above the lowest ecological SLV is not expected to present a substantive issue for data quality in terms of estimated risk from PCBs as the sum of all 209 congeners.

Tissue

The ecological screening levels for total PCBs were applied as a surrogate value to all Aroclors. All of the Aroclors in the smallmouth bass data and several of the Aroclors in the clam and sculpin data have MDLs that exceed the lowest ecological SLV; however, the exceedances in clam and sculpin are minor. As is the case for sediment, the PCB congener data collected is expected to provide more representative concentrations in sediments than the Aroclor data.

None of the MDLs for PCB congeners were exceeded in the crayfish, clam, or sucker data. Only PCBs 126 and 169 in the Random Forebay smallmouth bass and PCBs 81, 126, 169 in the Random Forebay sculpin data had a few MDLs that exceeded the lowest ecological SLV. Given the following, these exceedances are not expected to present a substantive issue for data quality:

- Smallmouth bass – The lowest ecological SLV is exceeded in only one sample for PCB 126 and only three samples for PCB 169. While PCB 126 was detected in the remaining samples, PCB 169 was never detected, of which, 16 samples had MDLs well below the ecological SLV.
- Sculpin – The lowest ecological SLV is exceeded by only one MDL for PCB 81, one MDL for PCB 126, and three MDLs for PCB 169. While PCB 126 was detected in the remaining samples, PCBs 81 and 169 were not detected in 16 of 17 samples, of which, the majority of MDLs were less than the lowest ecological SLV. The potential for ecological risk from exposure to these two congeners may be underestimated.

In summary, the MDLs are considered acceptable for the majority of the constituents, with some exceptions due to the limits of analytical technology or the use of unrealistically low screening benchmarks. The data for analytes that have actual measurable detections above MDLs at every location are less uncertain than those that were not quantifiable in some samples. For individual chemicals that are consistently non-detect, there is uncertainty that risk for these COIs may be

underestimated. There is relatively less uncertainty for chemicals for which there are some detected results above the MDL.

O.3.2.2 Statistical Background Comparison Screening

As discussed in Section 8.1 of the main text, the goal established in the RI/FS MP (URS 2007a) for statistical power associated with the background comparison was achieved (i.e., to detect "one-standard-deviation-away"). However, for some randomly-collected Forebay tissues, this one-standard-deviation is high due to the high data variability, which could not be controlled because of the inherent heterogeneity of the Upland soils. As discussed in detail for the Upland OU (Section O.3.1.2), this high data variability resulted in MDDs greater than 100% of the reference mean. Since the results of the statistical background comparison indicated that concentrations of lead in crayfish and chromium in smallmouth bass were present below or equal to that of the Reference Area levels, these metals were not carried to the SLV comparison step. However, the high MDDs (greater than 100% of the reference mean) present an uncertainty with this finding.

To address the uncertainty with the results of the statistical background comparison, these metals were subjected to a risk-based screening evaluation. The purpose of this evaluation is to explore whether or not these metals should be included as CPECs, and ultimately advanced to the next level of RA or directly to the FS. A weight-of-evidence approach similar to the one implemented in Section 12 (ERA) was used to evaluate these metals (see Section O.3.1.2 for further detail regarding the general approach).

Lead in Crayfish

The ecological SLVs for tissue protective of upper trophic level fish and shellfish and aquatic-dependent birds and mammals presented in Appendix J were compared to the EPCs calculated for lead in crayfish (Table O.3-12). The MDD generated for lead in crayfish during the statistical background comparison is 108% (Table L-4). Concentrations of lead in Forebay crayfish range from 0.098 mg/kg to 2.66 mg/kg, and in crayfish from the Reference Area they range from 0.056 mg/kg to 1.55 mg/kg (Table L-4).

As shown in Table O.3-12, R_{BACs} (i.e., tissue EPC divided by bioaccumulation SLV) for lead are below one for all receptors. This finding is consistent with the results for all COIs in crayfish tissue evaluated in the Level II Screening presented in Section 12.5.4 of the main report (also see Tables N-51, N-53, and N-58). R_{BACs} for crayfish were the lowest of all the tissue types collected from the Forebay, and the sum R_{BACs} (estimate simultaneous exposure to multiple COIs) were also low. The sum R_{BACs} for crayfish were below one for predatory fish and shellfish that could consume crayfish (Table N-51) and for populations of aquatic-dependent mammals (Table N-58), such that if lead were included as a COI in the sum R_{BACs}, these values would remain low or below one. The sum R_{BACs} for individual aquatic-dependent birds that could consume crayfish is only slightly greater than 1.0 at 1.86 (Table N-53). Given the low sum R_{BACs} for crayfish and low R_{BACs} for lead in crayfish, adverse effects to receptors from the Forebay from exposure to lead in crayfish are not expected to occur.

Based on the low MDD, low R_{BACs} and sum R_{BACs}, and similarity between Forebay and Reference Area tissue concentrations, lead in Forebay crayfish is not recommended for further evaluation.

Chromium in Smallmouth Bass

Ecological SLVs for tissue protective of upper trophic level fish and shellfish and aquatic-dependent birds and mammals are not available for chromium (Table O.3-12). Therefore, R_{BACs} for chromium in smallmouth bass could not be calculated.

The MDD generated for chromium in bass during the statistical background comparison is 201% (Table L-4). Concentrations of chromium in Forebay bass range from 0.19 mg/kg to 0.86 mg/kg, and in bass from the Reference Area they range from 0.04 mg/kg to 7.15 mg/kg (Table L-4). The mean concentration of lead for the Forebay is 0.235 mg/kg, which is lower than yet similar to, the mean for the Reference Area (0.458 mg/kg) (Table O.3-12).

Sediment and other species in the Forebay were also analyzed for chromium: clams and crayfish. Concentrations of chromium in Forebay sediment and clams are less than concentrations from the Reference Area. Although chromium levels in crayfish were demonstrated to be elevated above Reference Area concentrations based on the statistical background comparison, the concentration ranges between the two areas are extremely similar: 0.2 to 1.2 for the Forebay and 0.12 to 1.23 for the Reference Area (Table L-4).

Based on the similarity between Forebay and Reference Area bass tissue concentrations, and all tissue types for that matter, chromium in Forebay bass is not recommended for further evaluation.

O.3.2.3 Selection and Use of SLVs

For the PAHs detected in tissue and sediment that do not have ATLs/CTLs), surrogate SLVs were selected. The ATL and CTL for pyrene were selected for individual HPAHs without SLVs and the ATL and CTL for fluoranthene were selected for individual LPAHs without SLVs. The ATL for pyrene protective of mammals is lower than the ATL for fluoranthene, so selection of pyrene ATL is conservative and does not underestimate risk for mammals. The CTL for pyrene protective of fish is higher than the CTL for fluoranthene. However, HPAHs would not be retained as CPECs for fish even if the CTL for fluoranthene was utilized instead. Therefore, risk to fish from HPAHs is not underestimated. Although fluoranthene is considered an HPAH in the RI, HHRA, and ERA and used to calculate Total HPAH, fluoranthene is more accurately a PAH that borders the two with a molecular weight more similar to HPAHs and but a structure more similar to LPAHs. Therefore, use of fluoranthene as a surrogate for LPAHs is appropriate in the absence of any LPAH ATLs/CTLs.

O.3.2.4 Updates to SLVs for Water

As part of the uncertainty assessment, updates to the agreed upon sources of SLVs were reviewed (Table O.3-13). The only medium for which updates were noted is surface water. DEQ's WQC protective of aquatic organisms (Oregon Administrative Rules, Section 340-041, new Table 20) (DEQ 2011) now appears to be more current than USEPA's NRWQC (2009) and DEQ's previous WQC tables. As shown in Table O.3-13, which only presents COIs that have updated water SLVs, seven of these 22 COIs have more stringent DEQ water SLVs. These updates will be considered upon further evaluation of Upland source control (i.e., groundwater discharging to surface water of the River), which may be included in the Level III baseline for the Upland OU or in a separate document. They will also be considered during future monitoring activities for the River OU if additional surface water data are collected. Furthermore, any

updates to other SLV sources (e.g., soil SLVs) will be considered during the Level III baseline for the Upland OU.

O.3.2.5 Absence of Direct Toxicity Evaluation for Birds and Mammals

Wildlife receptors do not "live in" sediment and are therefore do not spend much time in direct contact with sediments or surface water. Additionally, they are likely protected from direct toxicity exposure by their fur and feathers. In the absence of direct toxicity evaluation for birds and mammals, the direct toxicity evaluation for sediments and surface water using benthic invertebrates and aquatic organisms SLVs indirectly covers this pathway for wildlife. This minimizes the potential for risk to be underestimated from direct toxicity to ecological receptors.

O.4 Summary and Conclusions

The intentional conservatism of the COPC and CPEC selection process, as described in Sections 11 and 12 of the main report, resulted in the retention of COPCs/CPECs for many reasons including exceedances of SLVs in a single medium, multi-media exposure, and lack of SLVs. During this process, the uncertainties inherent in the COPC selection and RA process can result in over- or under-estimates of risk. Among the many sources of uncertainty described in this evaluation, only a few factors contributed to the addition of a small number of additional COPCs/CPECs. These factors included a few metals with high MDDs and some COPCs/CEPCs associated with mass-wasting and erodible soil pathways. The effect of the remaining sources of uncertainty generally tended towards overestimation of risk or, in a few cases, could lead to either overestimation or underestimation of risk.

In general, the data adequacy and quality for the Upland AOPCs is sufficient to provide for a defensible HHRA and ERA. Further evaluation is recommended for the COPCs/CPECs in the potentially erodible/mass wasting areas of the Upland OU due to their high toxicity ratios and potential for future contamination of the River. The attempt to optimize the probability of detecting the maximum concentrations at each AOPC with judgmental sampling and the use of undiluted groundwater results in the likelihood that the EPCs are overestimated.

The majority of SLVs utilized in the RAs are developed to be conservatively protective of human and ecological receptors. Bioaccumulative COIs that lacked dietary based SLVs in the Upland OU were retained as COPCs/CPECs for further evaluation for humans and wildlife. Bioaccumulation of COIs in soil is only a concern for ecological receptors in the Upland OU, and bioaccumulation of COIs in groundwater that could discharge to surface water of the River is a concern for both human and ecological receptors. The assumptions of 100% bioavailability/absorption of all COIs, the assumption of zero metabolism of COIs, and no adjustment for area/seasonal use are all conservative assumptions utilized in this screening assessment.

Selected metal COIs in the Upland OU that were originally eliminated as COPCs/CPECs based on the findings of the statistical background comparison presented in Section 8.0 of the main text were retained for further evaluation after a more rigorous assessment of these metals due to elevated MDDs. However, none of the COIs eliminated based on frequency of detection were found to present a significant uncertainty in the HHRA or ERA.

Considering the number of uncertainties and number of conservative assumptions applied throughout the RA process, the HHRA and ERA adequately assesses risk to human and ecological receptors and indicates the COPCs/CPECs, receptors, and media that warrant further evaluation, remediation, or monitoring.

O.5 References

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Table O.1-1
Comparison of Largescale Sucker and Smallmouth Bass Data
Bradford Island - River Operable Unit
(1 of 2)

			Smallmouth Bass (SB)			Largescale Sucker (LS)		Selected SLV					Lower of Max or 95UCL Exceed SLV?									
										Birds	Mammals	Freshwater	Subsistence		Recreational		Bird ATL		Mammal ATL		Freshwater ATL	
c	Chemical Name	UNITS	Min Detected	Max Detected	95% UCL	Min Detected	Max Detected	Subsistence	Recreational	Individual	Individual	CTL	SB	LS	SB	LS	SB	LS	SB	LS	SB	LS
77	3,3',4,4'-Tetrachlorobiphenyl	pg/g	21.7	8,950	5,640	110	110	76	620	160	5,800	430,000	**Yes**	**Yes**	**Yes**	No	**Yes**	No	No	No	No	No
81	3,4,4',5-Tetrachlorobiphenyl	pg/g	1.21	1,190	691	9.02	9.02	25	210	80	2,000	430,000	**Yes**	No	**Yes**	No	**Yes**	No	No	No	No	No
105	2,3,3',4,4'-Pentachlorobiphenyl	pg/g	717	1,300,000	887,000	4,350	4,350	250	2,100	80,000	20,000	430,000	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No	**Yes**	No
114	2,3,4,4',5-Pentachlorobiphenyl	pg/g	59.4	89,800	65,600	289	289	250	2,100	800,000	20,000	430,000	**Yes**	**Yes**	**Yes**	No	No	No	**Yes**	No	No	No
118	2,3',4,4',5-Pentachlorobiphenyl	pg/g	2,420	3,270,000	2,310,000	10,300	10,300	250	2,100	800,000	20,000	430,000	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No	**Yes**	No
123	2,3',4,4',5'-Pentachlorobiphenyl	pg/g	32.3	55,300	38,700	179	179	250	2,100	800,000	20,000	430,000	**Yes**	No	**Yes**	No	No	No	**Yes**	No	No	No
126	3,3',4,4',5-Pentachlorobiphenyl	pg/g	5.05	3,030	1,920	19.1	19.1	0.076	0.62	80	5.8	430,000	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	No	No
156 + 157	2,3,3',4,4',5-Hexachlorobiphenyl + 2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	541	486,000	375,000	1,770	1,770	250	2,100	80,000	20,000	430,000	**Yes**	**Yes**	**Yes**	No	**Yes**	No	**Yes**	No	No	No
167	2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	161	140,000	108,000	565	565	250	2,100	800,000	20,000	430,000	**Yes**	**Yes**	**Yes**	No	No	No	**Yes**	No	No	No
169	3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	ND	ND	N/A	11.1	11.1	0.25	2.1	8,000	20	430,000	ND	**Yes**	ND	**Yes**	ND	No	ND	No	ND	No
189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	21.6	10,100	8,140	78.0	78.0	250	2,100	800,000	20,000	430,000	**Yes**	No	**Yes**	No	No	No	No	No	No	No
NA	Total PCBs As Congeners (KM, capped; NDs at MDL)	ug/kg	32.1	26,505	19,314	201	201	0.570	4.70	35	880	0.00043	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**
NA	PCBs As Avian TEQ (KM, capped; NDs at MDL)	ug/kg	0.00200	1.09	0.692	0.00908	0.00908	NA	NA	0.019	NA	NA	NA	NA	NA	NA	**Yes**	No	NA	NA	NA	NA
NA	PCBs As Fish TEQ (KM, capped; NDs at MDL)	ug/kg	0.0000549	0.0434	0.0293	0.000199	0.000199	NA	NA	NA	NA	0.00640	NA	NA	NA	NA	NA	NA	NA	NA	**Yes**	No
NA	PCBs As Mammalian TEQ (KM, capped; NDs at MDL)	ug/kg	0.000675	0.468	0.307	0.00278	0.00278	0.00000760	0.0000620	NA	0.00058	NA	**Yes**	**Yes**	**Yes**	**Yes**	NA	NA	**Yes**	**Yes**	NA	NA
NA	Aroclor 1016	ug/kg	ND	ND	N/A	ND	ND	0.57	4.7	35	880	430	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NA	Aroclor 1221	ug/kg	ND	ND	N/A	ND	ND	0.57	4.7	35	880	430	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NA	Aroclor 1232	ug/kg	ND	ND	N/A	ND	ND	0.57	4.7	35	880	430	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NA	Aroclor 1242	ug/kg	260	260	N/A	ND	ND	0.57	4.7	35	880	430	**Yes**	ND	**Yes**	ND	**Yes**	ND	No	ND	No	ND
NA	Aroclor 1248	ug/kg	ND	ND	N/A	ND	ND	0.57	4.7	35	880	430	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NA	Aroclor 1254	ug/kg	51.0	18,000	4,050	160	160	0.57	4.7	35	880	430	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No
NA	Aroclor 1260	ug/kg	ND	ND	N/A	ND	ND	0.57	4.7	35	880	430	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NA	Aroclor 1262	ug/kg	ND	ND	N/A	N/A	N/A	0.57	4.7	35	880	430	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NA	Aroclor 1268	ug/kg	ND	ND	N/A	ND	ND	0.57	4.7	35	880	430	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NA	Sum 209	pg/g	32,157	26,504,430	19,316,062	200,913	200,913	570	4,700	35,000	880,000	430,000	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No
NA	Lipids, Total	%	1.40	6.60	N/A	10.4	10.4	N/A	N/A	N/A	N/A	N/A	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV
NA	Solids, Total	%	24.8	30.5	N/A	32.4	32.4	N/A	N/A	N/A	N/A	N/A	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV
NA	Acenaphthene	ug/kg	0.160	1.60	1.07	ND	ND	15,000	120,000	NE	190,000	19,000	No	ND	No	ND	No SLV	No SLV	No	ND	No	ND
NA	Anthracene	ug/kg	0.0780	17.0	11.8	4.50	4.50	15,000	120,000	NE	190,000	19,000	No	No	No	No	No SLV	No SLV	No	No	No	No
NA	Benz(a)anthracene	ug/kg	1.00	17.0	3.69	ND	ND	1.57	12.8	NE	9,500,000	1,000	**Yes**	ND	No	ND	No SLV	No SLV	No	ND	No	ND
NA	Benzo(a)pyrene	ug/kg	0.720	7.40	3.25	6.30	6.30	0.157	1.28	NE	9,500,000	1,000	**Yes**	**Yes**	**Yes**	**Yes**	No SLV	No SLV	No	No	No	No
NA	Benzo(b)fluoranthene	ug/kg	0.110	4.40	4.21	ND	ND	1.57	12.8	NE	9,500,000	1,000	**Yes**	ND	No	ND	No SLV	No SLV	No	ND	No	ND
NA	Benzo(g,h,i)perylene	ug/kg	0.420	3.30	1.46	2.00	2.00	15.7	128	NE	9,500,000	1,000	No	No	No	No	No SLV	No SLV	No	No	No	No
NA	Benzo(k)fluoranthene	ug/kg	0.110	7.70	3.29	11.0	11.0	15.7	128	NE	9,500,000	1,000	No	No	No	No	No SLV	No SLV	No	No	No	No
NA	Bis(2-ethylhexyl) Phthalate	ug/kg	89.0	1,600	338	ND	ND	81.9	667	6,260	55,474	1,764	**Yes**	ND	No	ND	No	ND	No	ND	No	ND
NA	Butyl Benzyl Phthalate	ug/kg	33.0	440	239	ND	ND	604	4,912	6,260	55,474	310	No	ND	No	ND	No	ND	No	ND	No	ND
NA	Carbazole	ug/kg	ND	ND	N/A	ND	ND	NE	NE	NE	NE	NE	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV
NA	Chrysene	ug/kg	0.500	10.0	2.81	ND	ND	157	1,279	NE	9,500,000	1,000	No	ND	No	ND	No SLV	No SLV	No	ND	No	ND
NA	Dibenz(a,h)anthracene	ug/kg	0.410	4.10	1.72	3.70	3.70	0.157	1.28	NE	9,500,000	1,000	**Yes**	**Yes**	**Yes**	**Yes**	No SLV	No SLV	No	No	No	No
NA	Di-n-butyl Phthalate	ug/kg	150	150	N/A	ND	ND	49,157	400,000	626	1,671,533	3,115	No	ND	No	ND	No	ND	No	ND	No	ND
NA	Di-n-octyl Phthalate	ug/kg	ND	ND	N/A	ND	ND	49,157	400,000	626	1,671,533	63,012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NA	Fluoranthene	ug/kg	0.490	6.50	3.03	5.90	5.90	20,000	160,000	NE	190,000	19,000	No	No	No	No	No SLV	No SLV	No	No	No	No
NA	Fluorene	ug/kg	0.300	4.70	2.52	ND	ND	15,000	120,000	NE	190,000	19,000	No	ND	No	ND	No SLV	No SLV	No	ND	No	ND
NA	Indeno(1,2,3-cd)pyrene	ug/kg	0.700	6.10	2.76	6.50	6.50	1.57	12.8	NE	9,500,000	1,000	**Yes**	**Yes**	No	No	No SLV	No SLV	No	No	No	No
NA	p-cresol (4-Methylphenol)	ug/kg	ND	ND	N/A	ND	ND	NE	NE	NE	NE	NE	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV
NA	Phenanthrene	ug/kg	0.540	5.70	2.88	3.80	3.80	15,000	120,000	NE	190,000	19,000	No	No	No	No	No SLV	No SLV	No	No	No	No
NA	Pyrene	ug/kg	0.110	7.20	2.30	7.40	7.40	15,000	120,000	NE	9,500,000	1,000	No	No	No	No	No SLV	No SLV	No	No	No	No
NA	Aluminum	mg/kg	1.06	15.5	7.11	19.7	19.7	NE	NE	NE	NE	NE	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV
NA	Antimony	mg/kg	ND	ND	N/A	ND	ND	NE	NE	NE	NE	NE	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV
NA	Arsenic	mg/kg	0.170	0.700	0.472	0.350	0.350	0.00076	0.0062	13	7.6	6.6	**Yes**	**Yes**	**Yes**	**Yes**	No	No	No	No	No	No
NA	Barium	mg/kg	0.720	2.64	1.73	1.92	1.92	NE	NE	NE	NE	NE	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV
NA	Beryllium	mg/kg	0.000500	0.000700	0.000545	ND	ND	NE	NE	NE	NE	NE	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV
NA	Cadmium	mg/kg	0.00400	0.0280	0.0126	0.0420	0.0420	0.49	4	8.4	5.6	0.15	No	No	No	No	No	No	No	No	No	No
NA	Chromium	mg/kg	0.190	0.860	0.302	0.480	0.480	NE	NE	NE	NE	NE	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV
NA	Cobalt	mg/kg	0.0441	0.0758	0.0579	0.0775	0.0775	NE	NE	NE	NE	NE	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV
NA	Copper	mg/kg	0.364	1.42	0.764	0.728	0.728	NE	NE	NE	NE	NE	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV

Table O.1-1
Comparison of Largescale Sucker and Smallmouth Bass Data
Bradford Island - River Operable Unit
(2 of 2)

			Smallmouth Bass (SB)			Largescale Sucker (LS)		Selected SLV					Lower of Max or 95UCL Exceed SLV?									
													Subsistence		Recreational		Bird ATL		Mammal ATL		Freshwater ATL	
c	Chemical Name	UNITS	Min Detected	Max Detected	95% UCL	Min Detected	Max Detected	Subsistence	Recreational	Birds Individual	Mammals Individual	Freshwater CTL	SB	LS	SB	LS	SB	LS	SB	LS	SB	LS
NA	Lead	mg/kg	0.00400	0.0360	0.0142	0.0440	0.0440	0.5	0.5	9.3	34	0.12	No	No	No	No	No	No	No	No	No	No
NA	Mercury	mg/kg	0.0710	0.512	0.317	0.139	0.139	0.049	0.4	0.074	0.12	0.088	**Yes**	**Yes**	No	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
NA	Nickel	mg/kg	0.213	0.399	0.319	0.343	0.343	NE	NE	NE	NE	NE	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV
NA	Thallium	mg/kg	0.00790	0.0215	0.0162	0.00560	0.00560	NE	NE	NE	NE	NE	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV
NA	Vanadium	mg/kg	0.0300	0.130	0.0698	0.170	0.170	NE	NE	NE	NE	NE	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV
NA	Zinc	mg/kg	11.4	18.0	14.9	17.5	17.5	NE	NE	NE	NE	NE	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV	No SLV

= Maximum concentration is higher in Largescale Sucker
= Maximum concentration is higher in Largescale Sucker
max = maximum
min = minimum
mg/kg = milligram per kilogram
N/A = not applicable
ND = not detected
NE = no SLV established
pg/g = picogram per gram
UCL = 95% upper confidence limit
ug/kg = microgram per kilogram

Notes
Smallmouth Bass sample size for forebay = 19 individual fish
Largescale Sucker sample size for forebay = 1 composite of three individual fish

Table O.1-2
Screening Summary for Forebay - Pre-Sediment Removal Data
Bradford Island - River Operable Unit
(1 of 3)

Medium	Analyte Group	Basis	Analyte	Unit	Detection Rate > 5%?[1]	Max Detected Value	Lower of HH & Eco SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Sediment	Metals	D	Aluminum	mg/kg	--	14,000	38,000	No	0	No
Sediment	Metals	D	Antimony	mg/kg	--	0.170	3.00	No	0	No
Sediment	Metals	D	Arsenic	mg/kg	--	5.68	6.00	No	0	No
Sediment	Metals	D	Barium	mg/kg	--	149	315	No	0	No
Sediment	Metals	D	Beryllium	mg/kg	--	0.358	0.847	No	0	No
Sediment	Metals	D	Cadmium	mg/kg	--	0.608	0.674	No	0	No
Sediment	Metals	D	Chromium	mg/kg	--	22.0	37.0	No	0	No
Sediment	Metals	D	Cobalt	mg/kg	--	10.4	15.2	No	0	No
Sediment	Metals	D	Copper	mg/kg	--	38.9	55.6	No	0	No
Sediment	Metals	D	Lead	mg/kg	--	18.4	35.0	No	0	No
Sediment	Metals	D	Mercury	mg/kg	--	0.366	0.214	**Yes**	3	**Yes**
Sediment	Metals	D	Nickel	mg/kg	--	15.9	21.2	No	0	No
Sediment	Metals	D	Thallium	mg/kg	--	0.171	0.354	No	0	No
Sediment	Metals	D	Vanadium	mg/kg	--	58.6	70.6	No	0	No
Sediment	Metals	D	Zinc	mg/kg	--	108	123	No	0	No
Sediment	NWTPH-Dx	D	Diesel Range Organics	mg/kg	--	35.0	NV	***Yes***	--	***Yes***
Sediment	NWTPH-Dx	D	Residual Range Organics	mg/kg	--	120	NV	***Yes***	--	***Yes***
Sediment	PCB Aroclors	D	Aroclor 1254	ug/kg	--	130	0.048	**Yes**	4	**Yes**
Sediment	PCB Aroclors	D	Total PCBs As Aroclors	ug/kg	--	131	0.048	**Yes**	4	**Yes**
Sediment	SVOCs	D	Anthracene	ug/kg	--	4.30	57.0	No	0	No
Sediment	SVOCs	D	Benzo(a)anthracene	ug/kg	--	5.70	32.0	No	0	No
Sediment	SVOCs	D	Benzo(a)pyrene	ug/kg	--	32.0	32.0	No	0	No
Sediment	SVOCs	D	Benzo(b)fluoranthene	ug/kg	--	11.0	27.0	No	0	No
Sediment	SVOCs	D	Benzo(g,h,i)perylene	ug/kg	--	5.40	300	No	0	No
Sediment	SVOCs	D	Benzo(k)fluoranthene	ug/kg	--	3.40	27.0	No	0	No
Sediment	SVOCs	D	Bis(2-ethylhexyl) Phthalate	ug/kg	--	180	750	No	0	No
Sediment	SVOCs	D	Butyl Benzyl Phthalate	ug/kg	--	10.0	110	No	0	No
Sediment	SVOCs	D	Carbazole	ug/kg	--	2.60	140	No	0	No
Sediment	SVOCs	D	Chrysene	ug/kg	--	7.90	57.0	No	0	No
Sediment	SVOCs	D	Dibenz(a,h)anthracene	ug/kg	--	3.10	33.0	No	0	No
Sediment	SVOCs	D	Di-n-butyl Phthalate	ug/kg	--	24.0	110	No	0	No
Sediment	SVOCs	D	Fluoranthene	ug/kg	--	13.0	111	No	0	No
Sediment	SVOCs	D	Indeno(1,2,3-cd)pyrene	ug/kg	--	13.0	17.0	No	0	No
Sediment	SVOCs	D	p-cresol (4-Methylphenol)	ug/kg	--	4,100	48.0	**Yes**	1	**Yes**
Sediment	SVOCs	D	Phenanthrene	ug/kg	--	9.10	42.0	No	0	No
Sediment	SVOCs	D	Pyrene	ug/kg	--	13.0	53.0	No	0	No

Table O.1-2
Screening Summary for Forebay - Pre-Sediment Removal Data
Bradford Island - River Operable Unit
(2 of 3)

Medium	Analyte Group	Basis	Analyte	Unit	Detection Rate > 5%?[1]	Max Detected Value	Lower of HH & Eco SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?
Sediment	SVOCs	D	Total LPAH	ug/kg	--	13.4	76.0	No	0	No
Sediment	SVOCs	D	Total HPAH	ug/kg	--	98.3	193	No	0	No
Tissue - Clam	Metals	W	Aluminum	mg/kg	--	196	NV	***Yes***	--	***Yes***
Tissue - Clam	Metals	W	Arsenic	mg/kg	--	3.13	6.6	No	0	No
Tissue - Clam	Metals	W	Barium	mg/kg	--	2.68	NV	***Yes***	--	***Yes***
Tissue - Clam	Metals	W	Beryllium	mg/kg	--	0.00565	NV	***Yes***	--	***Yes***
Tissue - Clam	Metals	W	Cadmium	mg/kg	--	0.454	0.15	**Yes**	4	**Yes**
Tissue - Clam	Metals	W	Chromium	mg/kg	--	1.20	NV	***Yes***	--	***Yes***
Tissue - Clam	Metals	W	Cobalt	mg/kg	--	0.172	NV	***Yes***	--	***Yes***
Tissue - Clam	Metals	W	Copper	mg/kg	--	13.5	NV	***Yes***	--	***Yes***
Tissue - Clam	Metals	W	Lead	mg/kg	--	0.184	0.12	**Yes**	2	**Yes**
Tissue - Clam	Metals	W	Mercury	mg/kg	--	0.0132	0.074	No	0	No
Tissue - Clam	Metals	W	Nickel	mg/kg	--	0.394	NV	***Yes***	--	***Yes***
Tissue - Clam	Metals	W	Thallium	mg/kg	--	0.0193	NV	***Yes***	--	***Yes***
Tissue - Clam	Metals	W	Vanadium	mg/kg	--	0.540	NV	***Yes***	--	***Yes***
Tissue - Clam	Metals	W	Zinc	mg/kg	--	28.2	NV	***Yes***	--	***Yes***
Tissue - Clam	PCB Aroclors	W	Aroclor 1254	ug/kg	--	355	35	**Yes**	4	**Yes**
Tissue - Clam	PCB Aroclors	W	Total PCBs As Aroclors	ug/kg	--	355	35	**Yes**	4	**Yes**
Tissue - Clam	SVOCs	W	Acenaphthene	ug/kg	--	0.250	19,000	No	0	No
Tissue - Clam	SVOCs	W	Anthracene	ug/kg	--	1.10	19,000	No	0	No
Tissue - Clam	SVOCs	W	Benzo(a)anthracene	ug/kg	--	1.02	1,000	No	0	No
Tissue - Clam	SVOCs	W	Chrysene	ug/kg	--	2.55	1,000	No	0	No
Tissue - Clam	SVOCs	W	Di-n-butyl Phthalate	ug/kg	--	71.0	626	No	0	No
Tissue - Clam	SVOCs	W	Fluoranthene	ug/kg	--	12.5	19,000	No	0	No
Tissue - Clam	SVOCs	W	Fluorene	ug/kg	--	1.30	19,000	No	0	No
Tissue - Clam	SVOCs	W	Phenanthrene	ug/kg	--	7.00	19,000	No	0	No
Tissue - Clam	SVOCs	W	Pyrene	ug/kg	--	2.80	1,000	No	0	No
Tissue - Clam	SVOCs	W	Total LPAH	ug/kg	--	9.64	NV	***Yes***	--	***Yes***
Tissue - Clam	SVOCs	W	Total HPAH	ug/kg	--	19.1	NV	***Yes***	--	***Yes***

Notes
(1) Only evaluated for analytes with a sample size of 20 or more.
All concentrations are totals.

'--' = Not evaluated
% = percent

Table O.1-2
Screening Summary for Forebay - Pre-Sediment Removal Data
Bradford Island - River Operable Unit
(3 of 3)

Medium	Analyte Group	Basis	Analyte	Unit	Detection Rate > 5%?[1]	Max Detected Value	Lower of HH & Eco SLV	Maximum Detected Value > SLV?	No. of Detections > SLV	Retain as Preliminary COPC?

D = Dry weight
ft = feet
Max = maximum
mg/kg = milligrams per kilogram
Min = minimum
No. = number
NWTPH-Dx = northwest total petroleum hydrocarbon-diesel-extended
NWTPH-Gx =northwest total petroleum hydrocarbon-gasoline-extended
PCB = polychlorinated biphenyl
SLV = screening level value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
W = Wet Weight

Table O.2-1
Human Health Risk-Based Screening for Metals with High MDDs - Bradford Island - Upland Operable Units

Area of Potential Concern	Chemicals of Interest	note	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Site-Specific Reference UPL	Selected Screening Level Values (SLV) in mg/kg (Table J-4a)			Site concentration (C)/SLV (2)					Should COI be considered further as a COPC?	Basis
						Outdoor Worker (0-3 ft)	Construction Worker (0-10 ft)	Excavation Worker (0-10 ft)	$\frac{C_{soil}}{SLV_{soil}}$	$\frac{C_{gw}}{SLV_{gw}}$ (Potable Water User or Direct Contact Tables M-5, M-4, M-18, M-17, M-32, M-31)	$\frac{C_{gw}}{SLV_{gw}}$ (Bioaccumulation Tables M-7, M-19, M-33)	Multimedia (direct contact) $sum(C/SLV_{soil}+C/SLV_{gw})$	Multimedia (bioaccumulation) $sum(C/SLV_{soil}+C/SLV_{gw})$		
Landfill	Chromium	c	0-3 ft	594	28.1	190 (3)	NA	NA	3.13	0.000145	-	3.13	3.13	Yes	C/SLV > 1 (Outdoor Worker)
Landfill	Copper	n	0-3 ft	191	56.7	41,000	NA	NA	0.00466	0.0303	0.0349	0.0349	0.0396	No	C/SLV <1
Landfill	Nickel	c	0-3 ft	472	26.5	20,000	NA	NA	0.0236	0.160	0.192	0.184	0.215	No	C/SLV <1
Landfill	Arsenic	c	0-10 ft	8.11	5.40	NA	13	370	0.624	0.00179	578	0.626	NE	No	C/SLV <1
Landfill	Chromium	c	0-10 ft	656	28.1	NA	920 (3)	26,000 (3)	0.713	-	-	0.713	0.713	No	C/SLV <1
Landfill	Copper	n	0-10 ft	152	56.7	NA	12,000	41,000	0.0127	0.00000908	0.0349	0.0127	0.0476	No	C/SLV <1
Sandblast Area	Copper	n	0-3 ft	91.8	56.7	41,000	NA	NA	0.00224	-	-	0.00224	0.00224	No	C/SLV <1
Sandblast Area	Mercury	n	0-3 ft	0.0976	0.0660	310	NA	NA	0.000315	-	-	0.000315	0.000315	No	C/SLV <1
Sandblast Area	Copper	n	0-10 ft	70.3	56.7	NA	12,000	41,000	0.00586	-	-	0.00586	0.00586	No	C/SLV <1
Sandblast Area	Mercury	n	0-10 ft	0.0988	0.0660	NA	93	2,600	0.00106	-	-	0.00106	0.00106	No	C/SLV <1
Four Combined AOPCs	Copper	n	0-3 ft	93.6	56.7	41,000	NA	NA	0.00228	0.0292	0.0337	0.0315	0.0360	No	C/SLV <1
Four Combined AOPCs	Copper	n	0-10 ft	91.5	56.7	NA	12,000	41,000	0.00763	0.00000876	0.0337	0.00763	0.0413	No	C/SLV <1

= Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
MDD = minimum detectable differences
mg/kg = milligram per kilogram
NA = not applicable
NE = Multi-media was not evaluated since the chemical is already identified as a COPC
UCL = upper confidence limit on the mean
UPL = upper prediction limit

Notes
Outdoor Worker hierarchical SLV selection for soil: 1. Minimum of DEQ Soil RBCs (Ingest Occupational and Volatilize Outdoor Occupational), 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4
Construction Worker hierarchical SLV selection for soil: 1. DEQ Soil RBCs (Direct Contact Construction,. 2. USEPA Soil Industrial RSL, and 3. Surrogate used as noted in Appendix J-4a
Excavation Worker hierarchical SLV selection for soil: 1. DEQ Soil RBCs (Direct Contact Excavation), 2. USEPA Soil Industrial RSL, 3. Outdoor Worker SLV, and 4. Surrogate used as noted in Appendix J-4a
Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 20
United States Environmental Protection Agency 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May

Footnotes
(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples)
(2) The minimum of the soil SLVs was selected
(3) Due to the lack of speciation data, the chromium in soil were compared to the more conservative hexavalent chromium SLVs

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
COPC selection process for human health follows the following criteria
[C/SLV] > 1.0 for an individual chemical in a given mediun
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given mediu
[Sum C/SLV] >1.0 for a single chemical in multiple medi
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a)

Table O.2-2
Evaluation of COIs Detected in ≤ 5% of Samples at the Landfill AOPC
Bradford Island - Upland Operable Unit
(1 of 1)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	No. of Samples	Detection Rate	Min Detected Value	Max Detected Value	COI Detected in Both Soil and GW?	Outdoor Worker SLV (Table J-4a)	Construction Worker SLV (Table J-4a)	Excavation Worker SLV (Table J-4a)	Potable Water User SLV (Table J-4b)	Bioaccumulation SLV (Table J-4c)	Detected Greater than SLV(s)?	COI Identified as Bioacc-umulative? (LogKow > 3.5)	SLV(s) Accounts for Bioaccumulation?	Potential COPC?
Soil	Pesticides	Total	4,4'-DDE	0-3 ft	ug/kg	23	4%	17.0	17.0	**Yes, <5% both media**	7,700	-	-	-	-	No	-	--	No
Soil	Pesticides	Total	BHC (alpha)	0-3 ft	ug/kg	23	4%	2.02	2.02	No	340	-	-	-	-	No	-	--	No
Soil	Pesticides	Total	BHC (beta)	0-3 ft	ug/kg	23	4%	2.60	2.60	No	960	-	-	-	-	No	-	--	No
Soil	Pesticides	Total	Chlordane (alpha)	0-3 ft	ug/kg	20	5%	4.00	4.00	No	7,200	-	-	-	-	No	-	--	No
Soil	Pesticides	Total	Dieldrin	0-3 ft	ug/kg	23	4%	2.10	2.10	**Yes, <5% both media**	130	-	-	-	-	No	-	--	No
Soil	Pesticides	Total	Endosulfan II	0-3 ft	ug/kg	23	4%	8.84	8.84	No	4,600,000	-	-	-	-	No	-	--	No
Soil	Pesticides	Total	Endosulfan Sulfate	0-3 ft	ug/kg	23	4%	5.97	5.97	No	4,600,000	-	-	-	-	No	-	--	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-3 ft	ug/kg	23	4%	14.4	14.4	No	240	-	-	-	-	No	-	--	No
Soil	SVOCs	Total	Benzyl Alcohol	0-3 ft	ug/kg	29	3%	14.0	14.0	No	62,000,000	-	-	-	-	No	-	--	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-3 ft	ug/kg	29	3%	64.0	64.0	**Yes, <5% both media**	3,100,000	-	-	-	-	No	-	--	No
Soil	VOCs	Total	Ethylbenzene	0-3 ft	ug/kg	20	5%	2,700	2,700	**Yes, <5% both media**	140,000	-	-	-	-	No	-	--	No
Soil	VOCs	Total	m,p-Xylenes	0-3 ft	ug/kg	20	5%	9,800	9,800	No	2,700,000	-	-	-	-	No	-	--	No
Soil	Pesticides	Total	4,4'-DDE	0-10 ft	ug/kg	30	3%	17.0	17.0	**Yes, <5% both media**	-	58,000	1,600,000	-	-	No	-	--	No
Soil	Pesticides	Total	BHC (alpha)	0-10 ft	ug/kg	30	3%	2.02	2.02	No	-	2,600	74,000	-	-	No	-	--	No
Soil	Pesticides	Total	BHC (beta)	0-10 ft	ug/kg	30	3%	2.60	2.60	No	-	960	960	-	-	No	-	--	No
Soil	Pesticides	Total	Chlordane (alpha)	0-10 ft	ug/kg	20	5%	4.00	4.00	No	-	55,000	1,500,000	-	-	No	-	--	No
Soil	Pesticides	Total	Dieldrin	0-10 ft	ug/kg	30	3%	2.10	2.10	**Yes, <5% both media**	-	1,000	29,000	-	-	No	-	--	No
Soil	Pesticides	Total	Endosulfan II	0-10 ft	ug/kg	30	3%	8.84	8.84	No	-	1,400,000	40,000,000	-	-	No	-	--	No
Soil	Pesticides	Total	Endosulfan Sulfate	0-10 ft	ug/kg	30	3%	5.97	5.97	No	-	1,400,000	40,000,000	-	-	No	-	--	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-10 ft	ug/kg	30	3%	14.4	14.4	No	-	1,800	51,000	-	-	No	-	--	No
Soil	PCB Aroclors	Total	Aroclor 1248	0-10 ft	ug/kg	43	5%	61.5	968	No	-	740	740	-	-	Yes	-	--	Yes
Soil	SVOCs	Total	Benzyl Alcohol	0-10 ft	ug/kg	36	3%	14.0	14.0	No	-	62,000,000	62,000,000	-	-	No	-	--	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-10 ft	ug/kg	36	3%	64.0	64.0	**Yes, <5% both media**	-	3,100,000	3,100,000	-	-	No	-	--	No
Soil	VOCs	Total	4-Isopropyltoluene	0-10 ft	ug/kg	27	4%	0.457	0.457	No	-	24,000,000	24,000,000	-	-	No	-	--	No
Soil	VOCs	Total	Dichlorodifluoromethane	0-10 ft	ug/kg	27	4%	0.221	0.221	No	-	780,000	780,000	-	-	No	-	--	No
Soil	VOCs	Total	Dichloromethane (Methylene Chlo	0-10 ft	ug/kg	27	4%	12.0	12.0	No	-	2,700,000	75,000,000	-	-	No	-	--	No
Soil	VOCs	Total	Trichlorofluoromethane	0-10 ft	ug/kg	27	4%	0.325	0.325	No	-	63,000,000	3,400,000	-	-	No	-	--	No
Groundwater	Herbicides	Total	Dichloroprop	N/A	ug/L	21	5%	1.10	1.10	**Yes, <5% gw only**	-	-	-	290	-	No	No	No	No
Groundwater	Pesticides	Total	4,4'-DDE	N/A	ug/L	22	5%	0.00246	0.00246	**Yes, <5% both media**	-	-	-	0.17	0.00022	Yes	Yes	Yes	Yes
Groundwater	Pesticides	Total	Total DDTs	N/A	ug/L	22	5%	0.00246	0.00246	**Yes, <5% gw only**	-	-	-	0.17	0.00022	Yes	Yes	Yes	Yes
Groundwater	Pesticides	Total	Dieldrin	N/A	ug/L	22	5%	0.000982	0.000982	**Yes, <5% both media**	-	-	-	0.0035	0.000052	Yes	Yes	Yes	Yes
Groundwater	SVOCs	Total	Phenol	N/A	ug/L	54	2%	0.382	0.382	No	-	-	-	11,000	10,000	No	No	Yes	No
Groundwater	SVOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	54	4%	0.0258	0.0601	No	-	-	-	0.42	63	No	No	Yes	No
Groundwater	SVOCs	Total	2-Methylphenol	N/A	ug/L	23	4%	76.0	76.0	No	-	-	-	1,800	10,000	No	No	Yes	No
Groundwater	SVOCs	Total	Anthracene	N/A	ug/L	23	4%	0.0589	0.0589	**Yes, <5% gw only**	-	-	-	11,000	8,300	No	Yes	Yes	No
Groundwater	SVOCs	Total	Benzoic Acid	N/A	ug/L	23	4%	11.0	11.0	**Yes, <5% gw only**	-	-	-	150,000	-	No	No	No	No
Groundwater	SVOCs	Total	Dimethyl Phthalate	N/A	ug/L	23	4%	0.235	0.235	No	-	-	-	29000	270,000	No	No	Yes	No
Groundwater	SVOCs	Total	p-cresol (4-Methylphenol)	N/A	ug/L	23	4%	29.0	29.0	**Yes, <5% both media**	-	-	-	180	-	No	No	No	No
Groundwater	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	ug/L	22	5%	3.04	3.04	No	-	-	-	2,000	-	No	No	No	No
Groundwater	VOCs	Total	Carbon Disulfide	N/A	ug/L	22	5%	3.95	3.95	No	-	-	-	1,000	-	No	No	No	No
Groundwater	VOCs	Total	Carbon Tetrachloride	N/A	ug/L	22	5%	1.40	1.40	No	-	-	-	0.19	0.23	Yes	No	Yes	Yes
Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	ug/L	22	5%	0.791	0.791	No	-	-	-	360	-	No	No	No	No
Groundwater	VOCs	Total	Ethylbenzene	N/A	ug/L	22	5%	1.00	1.00	**Yes, <5% both media** (1)	-	-	-	1.4	530	No	No	Yes	No

= Retained as a COPC
- = Not applicable/evaluated
BHC = hexachlorocyclohexane
ft = feet
Max = maximum
Min = minimum
No. = number
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
VOC = volatile organic carbon
Yes-Bio = Identified as potential COPC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV

Footnote
(1) Ethylbenzene was detected at a frequency greater than 5% in soils from 0 to 10 feet bgs, but less than 5% in soils from 0 to 3 feet bgs and groundwater.

Table O.2-3
Evaluation of COIs Detected in ≤ 5% of Samples at the Sandblast AOPC
Bradford Island - Upland Operable Unit
(1 of 2)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	No. of Samples	Detection Rate	Min Detected Value	Max Detected Value	COI Detected in Both Soil and GW?	Outdoor Worker SLV (Table J-4a)	Construction Worker SLV (Table J-4a)	Excavation Worker SLV (Table J-4a)	Potable Water User SLV (Table J-4b)	Bioaccumulation SLV (Table J-4c)	Detected Greater than SLV(s)?	COI Identified as Bioacc-umulative? (LogKow > 3.5)	SLV(s) Accounts for Bioaccumulation ?	Potential COPC?
Soil	Butyltins	Total	Tetrabutyltin	0-3 ft	ug/kg	44	2%	3.99	3.99	No	180,000	-	-	-	-	No	--	--	No
Soil	Pesticides	Total	Aldrin	0-3 ft	ug/kg	37	3%	4.40	4.40	No	130	-	-	-	-	No	--	--	No
Soil	Pesticides	Total	BHC (beta)	0-3 ft	ug/kg	37	3%	0.952	0.952	No	960	-	-	-	-	No	--	--	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-3 ft	ug/kg	37	3%	0.634	0.634	No	240	-	-	-	-	No	--	--	No
Soil	SVOCs	Total	Benzyl Alcohol	0-3 ft	ug/kg	39	3%	7.81	7.81	**Yes, <5% soil only** (1)	62,000,000	-	-	-	-	No	--	--	No
Soil	SVOCs	Total	Diethyl Phthalate	0-3 ft	ug/kg	39	3%	8.80	8.80	No	490,000,000	-	-	-	-	No	--	--	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-3 ft	ug/kg	39	3%	27.0	27.0	No	440,000	-	-	-	-	No	--	--	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-3 ft	ug/kg	39	3%	2.46	2.46	No	3,100,000	-	-	-	-	No	--	--	No
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-3 ft	ug/kg	0.490	0.580	0.490	0.580	**Yes, <5% soil only**	38,000,000	-	-	-	-	No	--	--	No
Soil	VOCs	Total	1,1-Dichloroethane	0-3 ft	ug/kg	0.290	0.290	0.290	0.290	**Yes, <5% soil only**	240,000	-	-	-	-	No	--	--	No
Soil	VOCs	Total	1,4-Dichlorobenzene	0-3 ft	ug/kg	0.140	0.160	0.140	0.160	No	36,000	-	-	-	-	No	--	--	No
Soil	VOCs	Total	Chloromethane	0-3 ft	ug/kg	0.230	0.250	0.230	0.250	No	25,000,000	-	-	-	-	No	--	--	No
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-3 ft	ug/kg	12.0	120	12	120	**Yes, <5% soil only**	10,000,000	-	-	-	-	No	--	--	No
Soil	VOCs	Total	Isopropylbenzene	0-3 ft	ug/kg	47.3	47.3	47.3	47.3	No	53,000,000	-	-	-	-	No	--	--	No
Soil	VOCs	Total	n-Butylbenzene	0-3 ft	ug/kg	0.0920	0.0920	0.0920	0.0920	No	36,000 (2)	-	-	-	-	No	--	--	No
Soil	VOCs	Total	sec-Butylbenzene	0-3 ft	ug/kg	0.435	90.2	0.435	90.2	No	36,000 (2)	-	-	-	-	No	--	--	No
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-3 ft	ug/kg	2.28	2.28	2.28	2.28	**Yes, <5% soil only**	9,200,000	-	-	-	-	No	--	--	No
Soil	Butyltins	Total	Tetrabutyltin	0-10 ft	ug/kg	44	2%	3.99	3.99	No	-	180,000	180,000	-	-	No	--	--	No
Soil	Pesticides	Total	Aldrin	0-10 ft	ug/kg	37	3%	4.40	4.40	No	-	980	27,000	-	-	No	--	--	No
Soil	Pesticides	Total	BHC (beta)	0-10 ft	ug/kg	37	3%	0.952	0.952	No	-	96,000	960	-	-	No	--	--	No
Soil	Pesticides	Total	Heptachlor Epoxide	0-10 ft	ug/kg	37	3%	0.634	0.634	No	-	1,800	51,000	-	-	No	--	--	No
Soil	SVOCs	Total	Benzyl Alcohol	0-10 ft	ug/kg	42	2%	7.81	7.81	**Yes, <5% soil only** (1)	-	62,000,000	62,000,000	-	-	No	--	--	No
Soil	SVOCs	Total	Diethyl Phthalate	0-10 ft	ug/kg	42	2%	8.80	8.80	No	-	490,000,000	490,000,000	-	-	No	--	--	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-10 ft	ug/kg	42	2%	27.0	27.0	No	-	350,000	95,000,000	-	-	No	--	--	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-10 ft	ug/kg	42	2%	2.46	2.46	No	-	3,100,000	3,100,000	-	-	No	--	--	No
Soil	SVOCs	Total	Pentachlorophenol	0-10 ft	ug/kg	42	5%	11.0	32.0	No	-	100,000	2,900,000	-	-	No	--	--	No
Soil	VOCs	Total	1,1-Dichloroethane	0-10 ft	ug/kg	49	2%	0.290	0.290	**Yes, <5% soil only**	-	2,900,000	81,000,000	-	-	No	--	--	No
Soil	VOCs	Total	1,4-Dichlorobenzene	0-10 ft	ug/kg	49	4%	0.140	0.160	No	-	1,200,000	34,000,000	-	-	No	--	--	No
Soil	VOCs	Total	Chloromethane	0-10 ft	ug/kg	49	4%	0.230	0.250	No	-	25,000,000	500,000	-	-	No	--	--	No
Soil	VOCs	Total	Isopropylbenzene	0-10 ft	ug/kg	49	2%	47.3	47.3	No	-	24,000,000	11,000,000	-	-	No	--	--	No
Soil	VOCs	Total	n-Butylbenzene	0-10 ft	ug/kg	49	2%	0.092	0.092	No	-	1,200,000 (2)	34,000,000 (2)	-	-	No	--	--	No
Soil	VOCs	Total	sec-Butylbenzene	0-10 ft	ug/kg	49	4%	0.435	90.2	No	-	1,200,000 (2)	34,000,000 (2)	-	-	No	--	--	No
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-10 ft	ug/kg	49	2%	2.28	2.28	**Yes, <5% soil only**	-	4,500,000	690,000	-	-	No	--	--	No
Groundwater	SVOCs	Total	Benzo(b)fluoranthene	N/A	ug/L	20	5%	0.0180	0.0180	**Yes, <5% gw only**	-	-	-	0.029	0.0038	Yes	Yes	Yes	Yes
Groundwater	SVOCs	Total	Phenanthrene	N/A	ug/L	20	5%	0.0840	0.0840	**Yes, <5% gw only**	-	-	-	11,000	8,300	No	Yes	Yes	No
Groundwater	VOCs	Total	Chloroform	N/A	ug/L	20	5%	0.180	0.180	**Yes, <5% gw only**	-	-	-	0.19	5.7	No	No	Yes	No

= Retained as a COPC
- = Not applicable/evaluated
BHC = hexachlorocyclohexane
ft = feet
Max = maximum
Min = minimum
No. = number
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
VOC = volatile organic carbon

Table O.2-3
Evaluation of COIs Detected in ≤ 5% of Samples at the Sandblast AOPC
Bradford Island - Upland Operable Unit
(2 of 2)

Yes-Bio = Identified as potential COPC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV

Footnotes
(1) Benzyl Alcohol was only anlayzed for in direct push groundwater.
(2) 1,4- Dichlorobenzene was used as a surrogate because there was no chemical specific SLV.

Table O.2-4
Identification of COPCs in Mass Wasting Soil at Landfill AOPC
Bradford Island -Upland Operable Unit
(1 of 2)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4e)	Site concentration(C) / SLV $\frac{C_{soil}}{SLV_{sed}}$	Retain as a COPC, Y/N?	Rationale (1)
INORGANICS (mg/kg)							
Arsenic	c	100%	4.95	5.86 (2)	0.845	N	carc C/SLV <1
Cadmium	c	100%	1.04	0.674 (2)	1.54	Y	carc C/SLV >1
Lead	n	100%	324	14.5 (2)	22.3	Y	C/SLV >1
Manganese	n	100%	447	-	-	Y	No SLV
Mercury	n	100%	0.214	0.214 (2)	1.00	N	C/SLV <1
Selenium	n	20%	0.490	2 (3)	0.245	N	C/SLV <1
Thallium	n	10%	0.378	0.354 (2)	1.07	Y	C/SLV >1
Zinc	n	100%	184	106 (2)	1.74	Y	C/SLV >1
PESTICIDES (ug/kg)							
4,4'-DDT	c	70%	18.0	0.04	450	Y	carc C/SLV >1
Total DDTs	c	70%	19.2	0.04	479	Y	carc C/SLV >1
Dieldrin	c	10%	2.10	0.001	2,100	Y	carc C/SLV >1
PCBs (ug/kg)							
Aroclor 1254	c	70%	28.0	0.048	583	Y	carc C/SLV >1
Aroclor 1260	c	90%	55.4	0.048	1,154	Y	carc C/SLV >1
Total PCBs (Aroclors)	c	90%	88.2	0.048	1,838	Y	carc C/SLV >1
SVOCs (ug/kg)							
Bis(2-ethylhexyl) Phthalate	c	90%	229	-	-	Y	No SLV
Carbazole	c	80%	81.5	-	-	Y	No SLV
Dibenzofuran	n	20%	32.9	-	-	Y	No SLV
Di-n-butyl Phthalate	n	40%	563	-	-	Y	No SLV
PAHs (ug/kg)							
2-Methylnaphthalene	n	10%	11.0	62,000 (4)	0.000177	N	C/SLV <1
Acenaphthene	n	79%	592	62,000	0.00955	N	C/SLV <1
Acenaphthylene	n	29%	18.5	62,000	0.000298	N	C/SLV <1
Anthracene	n	93%	722	62,000	0.0116	N	C/SLV <1
Benzo(a)anthracene	c	93%	3,790	47,000	0.0806	N	carc C/SLV <1
Benzo(a)pyrene	c	93%	4,890	47,000	0.104	N	carc C/SLV <1
Benzo(b)fluoranthene	c	93%	5,800	47,000	0.123	N	carc C/SLV <1
Benzo(g,h,i)perylene	c	93%	2,400	47,000	0.0511	N	carc C/SLV <1
Benzo(k)fluoranthene	c	93%	2,070	47,000	0.0440	N	carc C/SLV <1
Chrysene	c	93%	4,530	47,000	0.0964	N	carc C/SLV <1
Dibenz(a,h)anthracene	c	93%	725	47,000	0.0154	N	carc C/SLV <1

Table O.2-4
Identification of COPCs in Mass Wasting Soil at Landfill AOPC
Bradford Island -Upland Operable Unit
(2 of 2)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4e)	Site concentration(C) / SLV $\frac{C_{soil}}{SLV_{sed}}$	Retain as a COPC, Y/N?	Rationale (1)
Fluoranthene	n	93%	8,520	62,000	0.137	N	C/SLV <1
Fluorene	n	71%	273	62,000	0.00440	N	C/SLV <1
Indeno(1,2,3-cd)pyrene	c	93%	3,230	47,000	0.0687	N	carc C/SLV <1
Phenanthrene	n	93%	2,820	62,000	0.0455	N	C/SLV <1
Pyrene	n	93%	7,050	47,000	0.150	N	C/SLV <1

= Retained as a COPC
- = no data
AOPC = area of potential concern
COIs = chemicals of interest
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
HH = human health
mg/kg = milligrams per kilogram
n = non-carcinogen
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
SLV = screening level value
SVOCs = semivolatile organic chemicals
ug/kg = micrograms per kilogram
UCL = 95% upper confidence limit
UPL = 95% Upper Prediction Limit

Notes
Only detected chemicals with a detection frequency greater than 5%, inorganics greater than reference, and are considered bioaccumulative (Appendix J-7) are shown in this table. Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately.
The Landfill AOPC potentially erodible soil subset is comprised of the following samples: BIL01USE through BIL09USE, BIL13SSI, and L-01 through L-04.
Hierarchy was developed to determine Screening Levels Values for erodible soil against Sediment SLVs; 1. Minimum DEQ HH Bioaccumulative SLVs and 2. Surrogates used as noted in Appendix J-4e.
Oregon Department of Environmental Quality (DEQ) 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.

Footnotes
(1) COIs were retained as COPCs if they met detection frequency (>5%), exceeded Reference UPL, exceeded HH SLV, and identified as bioaccumulative. See Section O.2.1.
(2) Reference Sediment 95% Upper Prediction Limit (UPL) was used as the Selected HH SLV; see Appendix I-20a, Sediment.
(3) In the absence of a Reference Sediment 95% UPL for the HH SLV, the freshwater inorganic background suggested by DEQ was used (DEQ 2007)
(4) Fluoranthene was used as a surrogate because there was no chemical specific SLV and fluoranthene had the lowest SLV of the low Molecular Weight PAHs.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated seperately.
Sum carcinogenic C/SLV = summation of C/SLV of all carcinogens. Total aroclors, rather than individual aroclors, was used in the summation.
Ratios for SLVs based on Reference Upper Prediction Limits (UPLs) are not included in sum totals.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if inorganic site concentration exceeds reference and under the following condition:
[C/SLV] > 1.0 for an individual chemical in a given medium

Table O.2-5
Identification of COPCs in Erodible Soil (0-1 ft bgs) at Sandblast Area AOPC
Bradford Island -Upland Operable Unit
(1 of 3)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4e)	Site concentration(C) / SLV $\frac{C_{soil}}{SLV_{sed}}$	Retain as a COPC, Y/N?	Rationale (1)
INORGANICS (mg/kg)							
Cadmium	c	100%	1.06	0.674 (2)	1.57	Y	carc C/SLV >1
Lead - sieved <250um	n	100%	90.8	14.5 (2)	6.26	Y	C/SLV >1
Lead - sieved <2mm	n	100%	52.7	14.5 (2)	3.63	Y	C/SLV >1
Lead - unsieved	n	100%	319	14.5 (2)	22.0	Y	C/SLV >1
Manganese	n	100%	479	-	-	Y	No SLV
Selenium	n	100%	0.650	2 (3)	0.325	N	C/SLV <1
Zinc	n	100%	203	106 (2)	1.92	Y	C/SLV >1
BUTYLTINS (ug/L)							
Tributyltin	n	100%	12.8	10	1.28	Y	C/SLV >1
PESTICIDES (ug/kg)							
4,4'-DDE	c	100%	0.440	0.04	11.0	Y	carc C/SLV >1
4,4'-DDT	c	100%	10.0	0.04	250	Y	carc C/SLV >1
Total DDTs	c	100%	10.4	0.04	260	Y	carc C/SLV >1
BHC (delta)	n	50%	0.0780	2.3	0.0339	N	C/SLV <1
Endosulfan II	n	50%	0.240	0.001	240	Y	C/SLV >1
Endosulfan Sulfate	n	50%	0.770	0.001	770	Y	C/SLV >1
Heptachlor	c	100%	0.380	0.001	380	Y	carc C/SLV >1
PCBs (ug/kg)							
Aroclor 1260	c	100%	67.0	0.048	1,396	Y	carc C/SLV >1
Total PCBs (Aroclors)	c	100%	69.1	0.048	1,440	Y	carc C/SLV >1
VOCs (ug/kg)							
1,2,4-Trimethylbenzene	n	75%	0.243	-	-	Y	No SLV
4-Isopropyltoluene	n	38%	1.46	-	-	Y	No SLV
SVOCs (ug/kg)							
Bis(2-ethylhexyl) Phthalate	c	100%	260,000	-	-	Y	No SLV
Carbazole	c	100%	91.0	-	-	Y	No SLV
PAHs (ug/kg)							
Acenaphthene	n	100%	68.0	62,000	0.00110	N	C/SLV <1
Anthracene	n	100%	150	62,000	0.00242	N	C/SLV <1
Benzo(a)anthracene	c	100%	1,200	47,000	0.0255	N	carc C/SLV <1
Benzo(a)pyrene	c	100%	1000	47,000	0.0213	N	carc C/SLV <1
Benzo(b)fluoranthene	c	100%	1,600	47,000	0.0340	N	carc C/SLV <1
Benzo(g,h,i)perylene	c	100%	590	47,000	0.0126	N	carc C/SLV <1

Table O.2-5
Identification of COPCs in Erodible Soil (0-1 ft bgs) at Sandblast Area AOPC
Bradford Island -Upland Operable Unit
(2 of 3)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4e)	Site concentration(C) / SLV $\frac{C_{soil}}{SLV_{sed}}$	Retain as a COPC, Y/N?	Rationale (1)
Benzo(k)fluoranthene	c	100%	570	47,000	0.0121	N	carc C/SLV <1
Chrysene	c	100%	1,500	47,000	0.0319	N	carc C/SLV <1
Dibenz(a,h)anthracene	c	100%	220	47,000	0.00468	N	carc C/SLV <1
Fluoranthene	n	100%	2,100	62,000	0.0339	N	C/SLV <1
Indeno(1,2,3-cd)pyrene	c	100%	690	47,000	0.0147	N	carc C/SLV <1
Phenanthrene	n	100%	940	62,000	0.0152	N	C/SLV <1
Pyrene	n	100%	1,900	47,000	0.0404	N	C/SLV <1
TPH (mg/kg)							
Diesel Range Organics	n	100%	69.0	-	-	N	Evaluated as PAHs
Gasoline Range Organics	n	50%	2.56	-	-	N	Evaluated as VOCs
Residual Range Organics	n	100%	1000	-	-	N	Evaluated as PAHs

= Retained as a COPC
- = no data
AOPC = area of potential concern
COIs = chemicals of interest
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
HH = human health
mg/kg = milligrams per kilogram
n = non-carcinogen
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
SLV = screening level value
SVOCs = semivolatile organic chemicals
TPH = total petroleum hydrocarbon
ug/kg = micrograms per kilogram
UCL = 95% upper confidence limit
UPL = 95% Upper Prediction Limit
VOCs = volatile organic chemicals

Notes
Only detected chemicals with a detection frequency greater than 5%, inorganics greater than reference, and are considered bioaccumulative (Appendix J-7) are shown in this table. Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately.
The Sandblast Area AOPC potentially erodible soil subset is comprised of the following samples: SB-EUA, SB-EUB, SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, SB-
Hierarchy was developed to determine Screening Levels Values for erodible soil against Sediment SLVs; 1. Minimum DEQ HH Bioaccumulative SLVs and 2. Surrogates used as noted in Appendix J-4e.
Oregon Department of Environmental Quality (DEQ) 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.

Footnotes
(1) COIs were retained as COPCs if they met detection frequency (>5%), exceeded Reference UPL, exceeded HH SLV, and identified as bioaccumulative. See Section O.2.1.
(2) Reference Sediment 95% Upper Prediction Limit (UPL) was used as the Selected HH SLV; see Appendix I-20a, Sediment.

Table O.2-5
Identification of COPCs in Erodible Soil (0-1 ft bgs) at Sandblast Area AOPC
Bradford Island -Upland Operable Unit
(3 of 3)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4e)	Site concentration(C) / SLV $\frac{C_{soil}}{SLV_{sed}}$	Retain as a COPC, Y/N?	Rationale (1)

(3) In the absence of a Reference Sediment 95% UPL for the HH SLV, the freshwater inorganic background suggested by DEQ was used (DEQ 2007)

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated seperately.
Sum carcinogenic C/SLV = summation of C/SLV of all carcinogens. Total aroclors, rather than individual aroclors, was used in the summation.
Ratios for SLVs based on Reference Upper Prediction Limits (UPLs) are not included in sum totals.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if inorganic site concentration exceeds reference and under the following condition:
[C/SLV] > 1.0 for an individual chemical in a given medium

Table O.2-6
Identification of COPCs in Soil at Bulb Slope AOPC
Bradford Island -Upland Operable Unit
(1 of 2)

Chemicals of Interest	note	Detection Rate	Lower of the Maximum and 95% UCL	Selected HH SLV (Table J-4e)	Site concentration(C) / SLV $\frac{C_{soil}}{SLV_{sed}}$	Retain as a COPC, Y/N?	Rationale (1)
INORGANICS (mg/kg)							
Lead	n	100%	307	14.5 (2)	21.2	Y	C/SLV >1
Mercury	n	100%	0.720	0.214 (2)	3.36	Y	C/SLV >1
PCBs (ug/kg)							
Aroclor 1260	c	67%	108	0.048	2,250	Y	C/SLV >1
Total PCBs (Aroclors)	c	67%	104	0.048	2,163	Y	C/SLV >1
TPH (mg/kg)							
Diesel Range Organics	n	100%	102	-	-	N	Evaluated as PAHs
Residual Range Organics	n	100%	232	-	-	N	Evaluated as VOCs

= Retained as a COPC
- = no data
AOPC = area of potential concern
COIs = chemicals of interest
C = concentration
c = carcinogen
COPC = chemical of potential concern
DEQ = Oregon Department of Environmental Quality
HH = human health
mg/kg = milligrams per kilogram
n = non-carcinogen
PCBs = polychlorinated biphenyls
SLV = screening level value
TPH = total petroleum hydrocarbon
ug/kg = micrograms per kilogram
UCL = 95% upper confidence limit
UPL = 95% Upper Prediction Limit

Notes
Only detected chemicals with a detection frequency greater than 5%, inorganics greater than reference, and are considered bioaccumulative (Appendix J-7) are shown in this table. Essential nutrients (calcium, magnesium, sodium, and potassium) are not included even if detected. Reporting limits for non-detected chemicals are evaluated separately.
The entire Bulb Slope AOPC is potentially
Hierarchy was developed to determine Screening Levels Values for erodible soil against Sediment SLVs; 1. Minimum DEQ HH Bioaccumulative SLVs and 2. Surrogates used as noted in Appendix J
Oregon Department of Environmental Quality (DEQ) 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.

Footnotes
(1) COIs were retained as COPCs if they met detection frequency (>5%), exceeded Reference UPL, exceeded HH SLV, and identified as bioaccumulative. See Section O.2.1.
(2) Reference Sediment 95% Upper Prediction Limit (UPL) was used as the Selected HH SLV; see Appendix I-20a, Sediment.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
Sum non-carcinogenic C/SLV (HI) = summation of C/SLV of all non-carcinogens. Lead not included in summation because evaluated separately.

Table O.2-6
Identification of COPCs in Soil at Bulb Slope AOPC
Bradford Island -Upland Operable Unit
(2 of 2)

Sum carcinogenic C/SLV = summation of C/SLV of all carcinogens. Total aroclors, rather than individual aroclors, was used in the summation.
Ratios for SLVs based on Reference Upper Prediction Limits (UPLs) are not included in sum totals.
COPC selection process for human health follows the following criteria. Chemicals are included as COPCs if inorganic site concentration exceeds reference and under the following condition:
[C/SLV] > 1.0 for an individual chemical in a given medium

Table O.2-7
Human Health Risk-Based Screening for Metals with High MDDs - Bradford Island - River Operable Unit
(1 of 1)

Medium	Chemicals of Interest	note	Lower of Maximum and 95% UCL (1)	Site-Specific Reference UPL	Selected Screening Level Values (SLV) in mg/kg (Table J-4f)		Site concentration (C)/SLV (2)			Should COI be considered further as a COPC?	Rationale
					Subsistence Fisher	Recreational Fisher	$\frac{C_{tissue}}{SLV_{tissue}}$	$\frac{C_{sw}}{SLV_{sw}}$ (Potable Water User Table M-39)	Multimedia (direct contact) $sum(C/SLV_{tissue}+C/SLV_{sw})$		
Crayfish	Lead	n	0.925	1.14	0.5	0.5	1.85	0.0117	1.86	Yes	C/SLV >1
Smallmouth Bass	Chromium	c	0.302	7.15	20 (3)	20 (3)	0.0151	-	0.0151	No	carc C/SLV <1

= Retained as a COPC
- = not evaluated since chemical was not detected in this medium at detection frequency >5%
MDD = minimum detectable differences
mg/kg = milligram per kilogram wet weight
UCL = upper confidence limit on the mean
UPL = upper prediction limit

Notes
Potable Water User hierarchy was developed to determine Screening Levels Values for surface water; 1. Minimum of DEQ Groundwater RBCs (Ingest Residential, Ingest Occupational, Volatilize Outdoor, Vapor Intrusion, Excavation), 2. USEPA tapwater RSLs, 3. DEQ MCLs, 4. Surrogates used as noted in Appendix J-4b.
Subsitence Fisher hierarchy was developed to determine Screening Levels Values for Tissue; 1. Minimum of DEQ HH Bioaccumulative ATLs (human subsistence/tribal) (Appendix J-4f).
Recreational Fisher hierarchy was developed to determine Screening Levels Values for Tissue; 1. Minimum of DEQ HH Bioaccumulative ATLs (human general/recreational) (Appendix J-4f).

Oregon Department of Environmental Quality (DEQ) 2003. Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites. Land Quality Division, Environmental Cleanup and Tanks Program. September. Updated 2009
DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. January 31.
DEQ 2010a. Human Health Risk Assessment Guidance. Draft May 12.
DEQ 2010b. Maximum Contaminant Level. Accessed online in January 2010 at: http://www.oregon.gov/DHS/ph/dwp/docs/pwsrules/61-0030.pdf
USEPA 2010. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update. May.

Footnotes
(1) The lower of the maximum detected concentration and the calculated 95% UCL (for COIs with at least 8 samples).
(2) The minimum of the SLVs was selected.
(3) SLVs were calculated ATLs using DEQ Methodology (DEQ 2007); see Section 11.3.4.1.1 and Appendix J-2.

COPC Selection
C/SLV = Site concentration divided by risk-based concentration where risk-based concentration equaled human health SLV
COPC selection process for human health follows the following criteria:
[C/SLV] > 1.0 for an individual chemical in a given medium
[Sum non-carcinogenic C/SLV] >1.0 and individual non-carcinogen [C/SLV] >0.1 for multiple chemicals in a given medium
[Sum C/SLV] >1.0 for a single chemical in multiple media
For carcinogens only, eliminated as COPC if individual [C/SLV] < 1.0 (DEQ, 2010a).

Table O.3-1
Ecological Risk-Based Screening for Metals with High MDDs
Bradford Island - Upland Operable Unit
(1 of 1)

Area of Potential Concern	Chemicals of Interest	Depth Category (Soil)	Soil EPCs (Cij) (mg/kg)		Site-Specific Reference UPL	Level II Screening Level Values for Soils (2,3,4,5,6) (mg/kg)				Toxicity Ratios (Tij) (7)				Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	Should COI be considered further as a CPEC? (7)	Basis
			Max Detected Conc in Soil	Lower of Maximum and 95% UCL (1)		Plants	Soil Invertebrates	Birds	Mammals	Plants	Soil Invertebrates	Birds	Mammals				
Landfill	Arsenic	0-1 ft	30.1	11.1	5.40	18	60	43	46	**1.7**	0.50	0.26	0.24	Yes	Yes	**Yes**	plants
Landfill	Chromium	0-1 ft	801	242	28.1	28.1	28.1	28.1	34	**29**	**29**	**8.6**	**7.1**	Yes	Yes	**Yes**	all
Landfill	Copper	0-1 ft	494	170	56.7	70	80	56.7	56.7	**7.1**	**6.2**	**3.0**	3.0	Yes	Yes	**Yes**	plants, inverts, birds
Landfill	Nickel	0-1 ft	570	175	26.5	38	280	210	130	**15**	**2.0**	0.83	1.35	Yes	Yes	**Yes**	plants and inverts
Landfill	Chromium	0-3 ft	1,950	594	28.1	28.1	28.1	28.1	34	**69**	**69**	**21**	**17**	Yes	Yes	**Yes**	all
Landfill	Copper	0-3 ft	494	191	56.7	70	80	56.7	56.7	**7.1**	**6.2**	**3.4**	3.4	Yes	Yes	**Yes**	plants, inverts, birds
Landfill	Nickel	0-3 ft	1,610	472	26.5	38	280	210	130	**42**	**5.8**	**2.2**	3.6	Yes	Yes	**Yes**	plants, inverts, birds
Sandblast Area	Copper	0-1 ft	319	103	56.7	70	80	56.7	56.7	**4.6**	**4.0**	**1.8**	1.8	Yes	Yes	**Yes**	plants, inverts, birds
Sandblast Area	Mercury	0-1 ft	0.723	0.113	0.0660	0.3	0.1	0.066	0.146	**2.4**	**7.2**	**1.7**	0.8	Yes	Yes	**Yes**	plants, inverts, birds
Sandblast Area	Copper	0-3 ft	319	91.8	56.7	70	80	56.7	56.7	**4.6**	**4.0**	**1.6**	1.6	Yes	Yes	**Yes**	plants, inverts, birds
Sandblast Area	Mercury	0-3 ft	0.723	0.0976	0.0660	0.3	0.1	0.066	0.146	**2.4**	**7.2**	**1.5**	0.67	Yes	Yes	**Yes**	plants, inverts, birds
All Four AOPCs Combined	Copper	0-1 ft	494	95.0	56.7	NE	NE	56.7	56.7	NE	NE	**1.7**	1.7	Yes	Yes	**Yes**	birds
All Four AOPCs Combined	Copper	0-3 ft	494	93.6	56.7	NE	NE	56.7	56.7	NE	NE	**1.7**	1.7	Yes	Yes	**Yes**	birds

AOPC = area of potential concern
CPEC = chemical of potential ecological concern
COI = chemical of interest
Eco-SSL = ecological soil screening level
EPC = exposure point concentration
ft = feet
MDD = minimum detectable difference
mg/kg = milligrams per kilogram
NE = Not evaluated (only wide-ranging receptors are evaluated for all four AOPCs combined)
SLV = screening level value
T&E = threatened and endangered
UCL = upper confidence limit on the mean
UPL = upper prediction limit
- - = not applicable

(1) The lower of the maximum detected concentration and the calculated 95% UCL.

Hierarchy of SLV Selection (see Appendix J-5a)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.

(2) United States Environmental Protection Agency (USEPA), 2005 -2007. Ecological Soil Screening Levels. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-72. Last Update July 2007.

(3) Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001

(4) Efroymson RA, GW Suter II, BE Sample, DS Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints. August. ORNL. ES/ER/TM-162/R2.

(5) USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Peer review Draft. EPA530-D-99-001A. August.

(6) RA Efroymson. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process, Nov 1997 Revision. ORNL ES/ER/TM-126/R2.

Bioaccumulative COIs in a Given Media
Any individual COI in any given media with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Maximum concentration for plants and invertebrates; Lower of 95% UCL and maximum concentration for wildlife species (birds and mammals).
(7) Receptor designator (Q) as defined in DEQ guidance (1998):
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species
For this project, Q = 1 for terrestrial plants, soil invertebrates, and birds; Q = 5 for mammals. Although no T&E plant or soil invertebrates species are potentially present, Q = 1 applied for these receptor groups at request of DEQ due to basis of SLVs (Eco-SSLs).

Table O.3-2
Evaluation of COIs Detected in ≤ 5% of Samples at the Landfill AOPC
Bradford Island - Upland Operable Unit
(1 of 1)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	No. of Samples	Detection Rate	Min Detected Value	Max Detected Value	COI Detected in Both Soil and GW?	Plant SLV	Soil Invertebrate SLV	Avian SLV	Mammal SLV	Aquatic SLV	Detected Greater than SLV(s)?	COI Identified as Bioacc-umulative? (LogKow > 3.5)	SLV(s) Accounts for Bioaccumulation?	Potential CPEC?
Soil	Pesticides	Total	4,4'-DDE	0-1 ft	ug/kg	21	5%	17.0	17.0	**Yes, <5% both media**	NV	NV	93	21	--	No	Yes	Yes	No
Soil	Pesticides	Total	BHC (beta)	0-1 ft	ug/kg	21	5%	2.60	2.60	No	NV	NV	8,000	1,000,000	--	No	Yes	No	**Yes-Bio**
Soil	Pesticides	Total	Chlordane (alpha)	0-1 ft	ug/kg	20	5%	4.00	4.00	No	NV	NV	9,000	250,000	--	No	Yes	No	**Yes-Bio**
Soil	Pesticides	Total	Dieldrin	0-1 ft	ug/kg	21	5%	2.10	2.10	**Yes, <5% both media**	NV	NV	22	4.9	--	No	Yes	Yes	No
Soil	Pesticides	Total	Endosulfan II	0-1 ft	ug/kg	21	5%	8.84	8.84	No	NV	NV	42,000	20,000	--	No	Yes	No	**Yes-Bio**
Soil	Pesticides	Total	Endosulfan Sulfate	0-1 ft	ug/kg	21	5%	5.97	5.97	No	NV	NV	42,000	20,000	--	No	Yes	No	**Yes-Bio**
Soil	Pesticides	Total	Heptachlor	0-1 ft	ug/kg	21	5%	2.83	2.83	No	1,000	NV	NV	15,000	--	No	Yes	No	**Yes-Bio**
Soil	Pesticides	Total	Heptachlor Epoxide	0-1 ft	ug/kg	21	5%	14.4	14.4	No	1,000	NV	NV	15,000	--	No	Yes	No	**Yes-Bio**
Soil	Pesticides	Total	4,4'-DDE	0-3 ft	ug/kg	23	4%	17.0	17.0	**Yes, <5% both media**	NV	NV	93	21	--	No	Yes	Yes	No
Soil	Pesticides	Total	BHC (alpha)	0-3 ft	ug/kg	23	4%	2.02	2.02	No	NV	NV	8,000	1,000,000	--	No	Yes	No	**Yes-Bio**
Soil	Pesticides	Total	BHC (beta)	0-3 ft	ug/kg	23	4%	2.60	2.60	No	NV	NV	8,000	1,000,000	--	No	Yes	No	**Yes-Bio**
Soil	Pesticides	Total	Chlordane (alpha)	0-3 ft	ug/kg	20	5%	4.00	4.00	No	NV	NV	9,000	250,000	--	No	Yes	No	**Yes-Bio**
Soil	Pesticides	Total	Dieldrin	0-3 ft	ug/kg	23	4%	2.10	2.10	**Yes, <5% both media**	NV	NV	22	4.9	--	No	Yes	Yes	No
Soil	Pesticides	Total	Endosulfan II	0-3 ft	ug/kg	23	4%	8.84	8.84	No	NV	NV	42,000	20,000	--	No	Yes	No	**Yes-Bio**
Soil	Pesticides	Total	Endosulfan Sulfate	0-3 ft	ug/kg	23	4%	5.97	5.97	No	NV	NV	42,000	20,000	--	No	Yes	No	**Yes-Bio**
Soil	Pesticides	Total	Heptachlor Epoxide	0-3 ft	ug/kg	23	4%	14.4	14.4	No	1,000	NV	NV	15,000	--	No	Yes	No	**Yes-Bio**
Soil	SVOCs	Total	Benzyl Alcohol	0-1 ft	ug/kg	27	4%	14.0	14.0	No	NV	2,260	--	--	--	No	No	--	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	ug/kg	27	4%	64.0	64.0	**Yes, <5% both media**	50,000	NV	--	--	--	No	No	--	No
Soil	SVOCs	Total	Benzyl Alcohol	0-3 ft	ug/kg	29	3%	14.0	14.0	No	NV	2,260	--	--	--	No	No	--	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-3 ft	ug/kg	29	3%	64.0	64.0	**Yes, <5% both media**	50,000	NV	--	--	--	No	No	--	No
Soil	VOCs	Total	Ethylbenzene	0-3 ft	ug/kg	20	5%	2,700	2,700	**Yes, <5% both media**	NV	2,260	--	--	--	Yes	No	--	**Yes**
Soil	VOCs	Total	m,p-Xylenes	0-3 ft	ug/kg	20	5%	9,800	9,800	No	NV	NV	--	--	--	--	No	--	Yes - No SLV
Groundwater	Herbicides	Total	Dichloroprop	N/A	ug/L	21	5%	1.10	1.10	**Yes, <5% gw only**	--	--	--	--	4.00	No	No	--	No
Groundwater	Pesticides	Total	4,4'-DDE	N/A	ug/L	22	5%	0.00246	0.00246	**Yes, <5% both media**	--	--	20	6,000	0.001	Yes	Yes	Yes	**Yes**
Groundwater	Pesticides	Total	Total DDTs	N/A	ug/L	22	5%	0.00246	0.00246	**Yes, <5% gw only**	--	--	20	6,000	0.001	Yes	Yes	Yes	**Yes**
Groundwater	Pesticides	Total	Dieldrin	N/A	ug/L	22	5%	0.000982	0.000982	**Yes, <5% both media**	--	--	600	150	0.056	No	Yes	No	**Yes-Bio**
Groundwater	SVOCs	Total	Phenol	N/A	ug/L	54	2%	0.382	0.382	No	--	--	--	--	110	No	No	--	No
Groundwater	SVOCs	Total	1,4-Dichlorobenzene	N/A	ug/L	54	4%	0.0258	0.0601	No	--	--	--	--	15	No	No	--	No
Groundwater	SVOCs	Total	2-Methylphenol	N/A	ug/L	23	4%	76.0	76.0	No	--	--	--	--	13	Yes	No	--	**Yes**
Groundwater	SVOCs	Total	Anthracene	N/A	ug/L	23	4%	0.0589	0.0589	**Yes, <5% gw only**	--	--	--	--	13	No	Yes	No	**Yes-Bio**
Groundwater	SVOCs	Total	Benzoic Acid	N/A	ug/L	23	4%	11.0	11.0	**Yes, <5% gw only**	--	--	--	--	42	No	No	--	No
Groundwater	SVOCs	Total	Dimethyl Phthalate	N/A	ug/L	23	4%	0.235	0.235	No	--	--	--	--	3	No	No	--	No
Groundwater	SVOCs	Total	p-cresol (4-Methylphenol)	N/A	ug/L	23	4%	29.0	29.0	**Yes, <5% both media**	--	--	--	--	13	Yes	No	--	**Yes**
Groundwater	VOCs	Total	4-Methyl-2-pentanone (MIBK)	N/A	ug/L	22	5%	3.04	3.04	No	--	--	--	--	170	No	No	--	No
Groundwater	VOCs	Total	Carbon Disulfide	N/A	ug/L	22	5%	3.95	3.95	No	--	--	--	--	0.92	Yes	No	--	**Yes**
Groundwater	VOCs	Total	Carbon Tetrachloride	N/A	ug/L	22	5%	1.40	1.40	No	--	--	--	--	74	No	No	--	No
Groundwater	VOCs	Total	cis-1,2-Dichloroethene	N/A	ug/L	22	5%	0.791	0.791	No	--	--	--	--	590	No	No	--	No
Groundwater	VOCs	Total	Ethylbenzene	N/A	ug/L	22	5%	1.00	1.00	**Yes, <5% both media** [a]	--	--	--	--	7.3	No	No	--	No

-- = Not applicable/evaluated
BHC = hexachlorocyclohexane
ft = feet
Max = maximum
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
Min = minimum
No. = number
NV = No value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
VOC = volatile organic carbon
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
[a] Ethylbenzene was detected at a frequency greater than 5% in soils from 0 to 1 foot bgs, but less than 5% in soils from 0 to 3 feet bgs and groundwater.

Table O.3-3
Evaluation of COIs Detected in ≤ 5% of Samples at the Sandblast AOPC
Bradford Island - Upland Operable Unit
(1 of 1)

Medium	Analyte Group	Total / Dissolved	Analyte	Depth Category (Soil)	Unit	No. of Samples	Detection Rate	Min Detected Value	Max Detected Value	COI Detected in Both Soil and GW?	Plant SLV	Soil Invertebrate SLV	Avian SLV	Mammal SLV	Aquatic SLV	Detected Greater than SLV(s)?	COI Identified as Bioacc-umulative? (LogKow > 3.5)	SLV(s) Accounts for Bioaccumulation?	Potential CPEC?
Soil	Butyltins	Total	Tetrabutyltin	0-1 ft	ug/kg	34	3%	3.99	3.99	No	NV	NV	28,000	1,300,000	--	No	Yes	No	**Yes-Bio**
Soil	Butyltins	Total	Tetrabutyltin	0-3 ft	ug/kg	44	2%	3.99	3.99	No	NV	NV	28,000	1,300,000	--	No	Yes	No	**Yes-Bio**
Soil	Pesticides	Total	Aldrin	0-1 ft	ug/kg	31	3%	4.40	4.40	No	NV	NV	22	4.9	--	No	Yes	Yes	No
Soil	Pesticides	Total	BHC (beta)	0-1 ft	ug/kg	31	3%	0.952	0.952	No	NV	NV	8,000	1,000,000	--	No	Yes	No	**Yes-Bio**
Soil	Pesticides	Total	Aldrin	0-3 ft	ug/kg	37	3%	4.40	4.40	No	NV	NV	22	4.9	--	No	Yes	Yes	No
Soil	Pesticides	Total	BHC (beta)	0-3 ft	ug/kg	37	3%	0.952	0.952	No	NV	NV	8,000	1,000,000	--	No	Yes	No	**Yes-Bio**
Soil	Pesticides	Total	Heptachlor Epoxide	0-3 ft	ug/kg	37	3%	0.634	0.634	No	1,000	NV	NV	15,000	--	No	Yes	No	**Yes-Bio**
Soil	SVOCs	Total	Benzyl Alcohol	0-1 ft	ug/kg	31	3%	7.81	7.81	No	NV	2,260	--	--	--	No	No	--	No
Soil	SVOCs	Total	Diethyl Phthalate	0-1 ft	ug/kg	31	3%	8.80	8.80	No	100,000	NV	--	--	--	No	No	--	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-1 ft	ug/kg	31	3%	27.0	27.0	No	NV	20,000	--	--	--	No	No	--	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-1 ft	ug/kg	31	3%	2.46	2.46	No	50,000	NV	--	--	--	No	No	--	No
Soil	SVOCs	Total	Benzyl Alcohol	0-3 ft	ug/kg	39	3%	7.81	7.81	No	NV	2,260	--	--	--	No	No	--	No
Soil	SVOCs	Total	Diethyl Phthalate	0-3 ft	ug/kg	39	3%	8.80	8.80	No	100,000	NV	--	--	--	No	No	--	No
Soil	SVOCs	Total	N-Nitrosodiphenylamine	0-3 ft	ug/kg	39	3%	27.0	27.0	No	NV	20,000	--	--	--	No	No	--	No
Soil	SVOCs	Total	p-cresol (4-Methylphenol)	0-3 ft	ug/kg	39	3%	2.46	2.46	No	50,000	NV	--	--	--	No	No	--	No
Soil	VOCs	Total	1,1-Dichloroethane	0-1 ft	ug/kg	37	3%	0.290	0.290	**Yes, <5% soil only**	NV	NV	--	--	--	--	No	--	Yes - No SLV
Soil	VOCs	Total	1,4-Dichlorobenzene	0-1 ft	ug/kg	37	3%	0.160	0.160	No	NV	20,000	--	--	--	No	No	--	No
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-1 ft	ug/kg	37	3%	12.0	12.0	**Yes, <5% soil only**	NV	NV	--	--	--	--	No	--	Yes - No SLV
Soil	VOCs	Total	n-Butylbenzene	0-1 ft	ug/kg	37	3%	0.0920	0.0920	No	NV	2,260	--	--	--	No	Yes	No Bird/Mammal SLV	**Yes-Bio**
Soil	VOCs	Total	n-Propylbenzene	0-1 ft	ug/kg	37	3%	0.150	0.150	No	NV	2,260	--	--	--	No	Yes	No Bird/Mammal SLV	**Yes-Bio**
Soil	VOCs	Total	1,1,1-Trichloroethane (TCA)	0-3 ft	ug/kg	46	4%	0.490	0.580	**Yes, <5% soil only** [a]	NV	NV	--	--	--	--	No	--	Yes - No SLV
Soil	VOCs	Total	1,1-Dichloroethane	0-3 ft	ug/kg	46	2%	0.290	0.290	**Yes, <5% soil only**	NV	NV	--	--	--	--	No	--	Yes - No SLV
Soil	VOCs	Total	1,4-Dichlorobenzene	0-3 ft	ug/kg	46	4%	0.140	0.160	No	NV	20,000	--	--	--	No	No	--	No
Soil	VOCs	Total	Chloromethane	0-3 ft	ug/kg	46	4%	0.230	0.250	No	NV	NV	--	--	--	--	No	--	Yes - No SLV
Soil	VOCs	Total	cis-1,2-Dichloroethene	0-3 ft	ug/kg	46	4%	12.0	120	**Yes, <5% soil only**	NV	NV	--	--	--	--	No	--	Yes - No SLV
Soil	VOCs	Total	Isopropylbenzene	0-3 ft	ug/kg	46	2%	47.3	47.3	No	NV	2,260	--	--	--	No	Yes	No Bird/Mammal SLV	**Yes-Bio**
Soil	VOCs	Total	n-Butylbenzene	0-3 ft	ug/kg	46	2%	0.0920	0.0920	No	NV	2,260	--	--	--	No	Yes	No Bird/Mammal SLV	**Yes-Bio**
Soil	VOCs	Total	sec-Butylbenzene	0-3 ft	ug/kg	46	4%	0.435	90.2	No	NV	2,260	--	--	--	No	Yes	No Bird/Mammal SLV	**Yes-Bio**
Soil	VOCs	Total	trans-1,2-Dichloroethene	0-3 ft	ug/kg	46	2%	2.28	2.28	**Yes, <5% soil only** [b]	NV	NV	--	--	--	--	No	--	Yes - No SLV
Groundwater	SVOCs	Total	Benzo(b)fluoranthene	N/A	ug/L	20	5%	0.0180	0.0180	**Yes, <5% gw only**	--	--	--	--	0.6774	No	Yes	No	**Yes-Bio**
Groundwater	SVOCs	Total	Phenanthrene	N/A	ug/L	20	5%	0.0840	0.0840	**Yes, <5% gw only**	--	--	--	--	6.30	No	Yes	No	**Yes-Bio**
Groundwater	VOCs	Total	Chloroform	N/A	ug/L	20	5%	0.180	0.180	**Yes, <5% gw only**	--	--	--	--	1,240	No	No	--	No

-- = Not applicable/evaluated
BHC = hexachlorocyclohexane
ft = feet
Max = maximum
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
Min = minimum
No. = number
NV = No value
SVOC = semi-volatile organic carbon
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
VOC = volatile organic carbon
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
[a] 1,1,1-Trichloroethane (TCA) was detected at a frequency greater than 5% in soils from 0 to 1 foot bgs and groundwater, but less than 5% in soils from 0 to 3 feet bgs.
[b] trans-1,2-Dichloroethene was detected at a frequency greater than 5% in groundwater, but less than 5% in soils from 0 to 3 feet bgs (not detected at all in soils from 0 to 1 foot bgs).

Table O.3-4
Identification of CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Benthic Invertebrates
Bradford Island - Upland Operable Unit
(1 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II Sediment SLVs for Benthics Exposed to Erodible Soil (1)	Toxicity Ratio for Benthics (Tij)	Chemical is a Concern for Benthic Community? (Tij>1)	COI is Identified as a CPEC? (2) (Q = 1)
INORGANICS (mg/kg)							
Landfill	Arsenic	0-1 ft	6.20	6.0	1.03	Yes	**Yes**
Landfill	Cadmium	0-1 ft	1.70	0.674	2.52	Yes	**Yes**
Landfill	Chromium	0-1 ft	801	37.0	21.6	Yes	**Yes**
Landfill	Cobalt	0-1 ft	22.7	15.2	1.49	Yes	**Yes**
Landfill	Copper	0-1 ft	60.5	55.6	1.09	Yes	**Yes**
Landfill	Lead	0-1 ft	680	35.0	19.4	Yes	**Yes**
Landfill	Manganese	0-1 ft	614	1,100	0.558	No	No
Landfill	Mercury	0-1 ft	0.320	0.214	1.50	Yes	**Yes**
Landfill	Nickel	0-1 ft	570	21.2	26.9	Yes	**Yes**
Landfill	Selenium	0-1 ft	0.848	NA	- -	- -	Yes - No SLV
Landfill	Silver	0-1 ft	0.500	4.50	0.111	No	No
Landfill	Thallium	0-1 ft	0.378	0.354	1.07	Yes	**Yes**
Landfill	Zinc	0-1 ft	221	123	1.80	Yes	**Yes**
Sandblast Area	Cadmium	0-1 ft	1.06	0.674	1.57	Yes	**Yes**
Sandblast Area	Chromium	0-1 ft	162	37	4.38	Yes	**Yes**
Sandblast Area	Copper	0-1 ft	71.6	55.6	1.29	Yes	**Yes**
Sandblast Area	Lead	0-1 ft	319	35	9.11	Yes	**Yes**
Sandblast Area	Manganese	0-1 ft	479	1,100	0.435	No	No
Sandblast Area	Nickel	0-1 ft	74.9	21.2	3.53	Yes	**Yes**
Sandblast Area	Selenium	0-1 ft	0.650	0.500	1.30	Yes	**Yes**
Sandblast Area	Silver	0-1 ft	0.175	4.50	0.0389	No	No
Sandblast Area	Zinc	0-1 ft	203	123	1.65	Yes	**Yes**
Bulb Slope	Lead	0-1 ft	597	35	17.1	Yes	**Yes**
Bulb Slope	Mercury	0-1 ft	1.54	0.214	7.20	Yes	**Yes**
BUTYLTINS (ug/kg)							
Sandblast Area	Dibutyltin	0-1 ft	9.10	NA	- -	- -	Yes - No SLV
Sandblast Area	Monobutyltin	0-1 ft	8.25	NA	- -	- -	Yes - No SLV
Sandblast Area	Tributyltin	0-1 ft	12.8	NA	- -	- -	Yes - No SLV
PESTICIDES (ug/kg)							
Landfill	4,4'-DDT	0-1 ft	28.0	4.00	7.00	Yes	**Yes**
Landfill	Total DDTs	0-1 ft	29.9	7.00	4.27	Yes	**Yes**
Landfill	Dieldrin	0-1 ft	2.10	3.00	0.700	No	No
Sandblast Area	4,4'-DDE	0-1 ft	0.440	4.00	0.110	No	No
Sandblast Area	4,4'-DDT	0-1 ft	10.0	4.00	2.50	Yes	**Yes**
Sandblast Area	Total DDTs	0-1 ft	10.4	7.00	1.49	Yes	**Yes**
Sandblast Area	BHC (delta)	0-1 ft	0.0780	0.900	0.0867	No	No

Table O.3-4
Identification of CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Benthic Invertebrates
Bradford Island - Upland Operable Unit
(2 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II Sediment SLVs for Benthics Exposed to Erodible Soil (1)	Toxicity Ratio for Benthics (Tij)	Chemical is a Concern for Benthic Community? (Tij>1)	COI is Identified as a CPEC? (2) (Q = 1)
Sandblast Area	Endosulfan II	0-1 ft	0.240	NA	- -	- -	Yes - No SLV
Sandblast Area	Endosulfan Sulfate	0-1 ft	0.770	NA	- -	- -	Yes - No SLV
Sandblast Area	Heptachlor	0-1 ft	0.380	10	0.0380	No	No
PCBs (ug/kg)							
Landfill	Aroclor 1254	0-1 ft	49.0	7.00	7.00	Yes	**Yes**
Landfill	Aroclor 1260	0-1 ft	92.0	7.00	13.1	Yes	**Yes**
Landfill	Total PCBs (Aroclors)	0-1 ft	127	34.0	3.74	Yes	**Yes**
Sandblast Area	Aroclor 1260	0-1 ft	67.0	7.00	9.57	Yes	**Yes**
Sandblast Area	Total PCBs (Aroclors)	0-1 ft	69.1	34.0	2.03	Yes	**Yes**
Bulb Slope	Aroclor 1260	0-1 ft	251	7.00	35.9	Yes	**Yes**
Bulb Slope	Total PCBs (Aroclors)	0-1 ft	251	34.0	7.38	Yes	**Yes**
VOCs (ug/kg)							
Landfill	Dichloromethane (Methylene Chloride)	0-1 ft	1,000	NA	- -	- -	Yes - No SLV
Landfill	Tetrachloroethene (PCE)	0-1 ft	9.70	NA	- -	- -	Yes - No SLV
Landfill	Toluene	0-1 ft	1.46	NA	- -	- -	Yes - No SLV
Sandblast Area	1,2,4-Trimethylbenzene	0-1 ft	0.280	NA	- -	- -	Yes - No SLV
Sandblast Area	2-Butanone (MEK)	0-1 ft	50.0	NA	- -	- -	Yes - No SLV
Sandblast Area	2-Hexanone	0-1 ft	8.80	NA	- -	- -	Yes - No SLV
Sandblast Area	4-Isopropyltoluene	0-1 ft	2.50	NA	- -	- -	Yes - No SLV
Sandblast Area	4-Methyl-2-pentanone (MIBK)	0-1 ft	1.20	NA	- -	- -	Yes - No SLV
Sandblast Area	Acetone	0-1 ft	540	NA	- -	- -	Yes - No SLV
Sandblast Area	Benzene	0-1 ft	1.00	NA	- -	- -	Yes - No SLV
Sandblast Area	Bromomethane	0-1 ft	5.00	NA	- -	- -	Yes - No SLV
Sandblast Area	Carbon Disulfide	0-1 ft	1.00	NA	- -	- -	Yes - No SLV
Sandblast Area	Chloroform	0-1 ft	19.0	NA	- -	- -	Yes - No SLV
Sandblast Area	Chloromethane	0-1 ft	0.250	NA	- -	- -	Yes - No SLV
Sandblast Area	cis-1,2-Dichloroethene	0-1 ft	12.0	NA	- -	- -	Yes - No SLV
Sandblast Area	Dichlorodifluoromethane	0-1 ft	94.0	NA	- -	- -	Yes - No SLV
Sandblast Area	Dichloromethane (Methylene Chloride)	0-1 ft	460	NA	- -	- -	Yes - No SLV
Sandblast Area	Ethylbenzene	0-1 ft	0.200	NA	- -	- -	Yes - No SLV
Sandblast Area	m,p-Xylenes	0-1 ft	0.360	NA	- -	- -	Yes - No SLV
Sandblast Area	Naphthalene	0-1 ft	0.540	176	0.00307	No	No
Sandblast Area	Toluene	0-1 ft	1.30	NA	- -	- -	Yes - No SLV
SVOCs (ug/kg)							
Landfill	Benzoic Acid	0-1 ft	300	NA	- -	- -	Yes - No SLV
Landfill	Benzyl Alcohol	0-1 ft	14.0	NA	- -	- -	Yes - No SLV
Landfill	Bis(2-ethylhexyl) Phthalate	0-1 ft	420	750	0.560	No	No

Table O.3-4
Identification of CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Benthic Invertebrates
Bradford Island - Upland Operable Unit
(3 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II Sediment SLVs for Benthics Exposed to Erodible Soil (1)	Toxicity Ratio for Benthics (Tij)	Chemical is a Concern for Benthic Community? (Tij>1)	COI is Identified as a CPEC? (2) (Q = 1)
Landfill	Carbazole	0-1 ft	210	140	1.50	Yes	**Yes**
Landfill	Dibenzofuran	0-1 ft	36.0	5,100	0.00706	No	No
Landfill	Di-n-butyl Phthalate	0-1 ft	1,800	110	16.4	Yes	**Yes**
Sandblast Area	Bis(2-ethylhexyl) Phthalate	0-1 ft	260,000	750	347	Yes	**Yes**
Sandblast Area	Carbazole	0-1 ft	91.0	140	0.650	No	No
PAHs (ug/kg)							
Landfill	2-Methylnaphthalene	0-1 ft	11.0	NA	- -	- -	Yes - No SLV
Landfill	Acenaphthene	0-1 ft	1160	290	4.00	Yes	**Yes**
Landfill	Acenaphthylene	0-1 ft	19.0	160	0.119	No	No
Landfill	Anthracene	0-1 ft	1070	57	18.8	Yes	**Yes**
Landfill	Fluorene	0-1 ft	510	77	6.62	Yes	**Yes**
Landfill	Naphthalene	0-1 ft	79.0	176	0.449	No	No
Landfill	Phenanthrene	0-1 ft	4,200	42	100	Yes	**Yes**
Landfill	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	7,043	76	92.7	Yes	**Yes**
Landfill	Benzo(a)anthracene	0-1 ft	4,500	32	141	Yes	**Yes**
Landfill	Benzo(a)pyrene	0-1 ft	6,200	32	194	Yes	**Yes**
Landfill	Benzo(b)fluoranthene	0-1 ft	8,200	27	304	Yes	**Yes**
Landfill	Benzo(g,h,i)perylene	0-1 ft	3,300	300	11.0	Yes	**Yes**
Landfill	Benzo(k)fluoranthene	0-1 ft	2,500	27	92.6	Yes	**Yes**
Landfill	Chrysene	0-1 ft	5,900	57	104	Yes	**Yes**
Landfill	Dibenz(a,h)anthracene	0-1 ft	1,000	33	30.3	Yes	**Yes**
Landfill	Fluoranthene	0-1 ft	14,000	111	126	Yes	**Yes**
Landfill	Indeno(1,2,3-cd)pyrene	0-1 ft	4,600	17	271	Yes	**Yes**
Landfill	Pyrene	0-1 ft	9,100	53	172	Yes	**Yes**
Landfill	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	55,030	193	285	Yes	**Yes**
Sandblast Area	Acenaphthene	0-1 ft	68.0	290	0.234	No	No
Sandblast Area	Anthracene	0-1 ft	150	57	2.63	Yes	**Yes**
Sandblast Area	Phenanthrene	0-1 ft	940	42	22.4	Yes	**Yes**
Sandblast Area	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	1,356	76	17.8	Yes	**Yes**
Sandblast Area	Benzo(a)anthracene	0-1 ft	1,200	32	37.5	Yes	**Yes**
Sandblast Area	Benzo(a)pyrene	0-1 ft	1,000	32	31.3	Yes	**Yes**
Sandblast Area	Benzo(b)fluoranthene	0-1 ft	1,600	27	59.3	Yes	**Yes**
Sandblast Area	Benzo(g,h,i)perylene	0-1 ft	590	300	1.97	Yes	**Yes**
Sandblast Area	Benzo(k)fluoranthene	0-1 ft	570	27	21.1	Yes	**Yes**
Sandblast Area	Chrysene	0-1 ft	1,500	57	26.3	Yes	**Yes**
Sandblast Area	Dibenz(a,h)anthracene	0-1 ft	220	33	6.67	Yes	**Yes**
Sandblast Area	Fluoranthene	0-1 ft	2,100	111	18.9	Yes	**Yes**
Sandblast Area	Indeno(1,2,3-cd)pyrene	0-1 ft	690	17	40.6	Yes	**Yes**

Table O.3-4
Identification of CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Benthic Invertebrates
Bradford Island - Upland Operable Unit
(4 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II Sediment SLVs for Benthics Exposed to Erodible Soil (1)	Toxicity Ratio for Benthics (Tij)	Chemical is a Concern for Benthic Community? (Tij>1)	COI is Identified as a CPEC? (2) (Q = 1)
Sandblast Area	Pyrene	0-1 ft	1,900	53	35.8	Yes	**Yes**
Sandblast Area	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	11,370	193	58.9	Yes	**Yes**
TPH (mg/kg)							
Sandblast Area	Diesel Range Organics	0-1 ft	69.0	NA	- -	- -	Yes - No SLV
Sandblast Area	Gasoline Range Organics	0-1 ft	3.20	NA	- -	- -	Yes - No SLV
Sandblast Area	Residual Range Organics	0-1 ft	1,000	NA	- -	- -	Yes - No SLV
Bulb Slope	Diesel Range Organics	0-1 ft	170	NA	- -	- -	Yes - No SLV
Bulb Slope	Residual Range Organics	0-1 ft	410	NA	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

The Landfill AOPC potentially erodible soil subset is comprised of the following samples: BIL01USE through BIL09USE, BIL13SSI, and L-01 through L-04.

The Sandblast Area AOPC potentially erodible soil subset is comprised of the following samples: SB-EUA, SB-EUB, SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, SB-EUB-15, and SB-04.

The entire Bulb Slope AOPC is potentially erodible.
(1) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the DEQ Level II SLV (see Appendix J-5c):

Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.

Individual COIs in a Given Medium
(2) Any individual COI in any given medium with Tij > Q, where Tij = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
Tij = Risk ratios for contaminant *i* in medium *j*
Q = Receptor designator
Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table O.3-5
Identification of CPECs in Mass Wasting and Erodible Soil at Upland OU - Multiple COIs for Benthic Invertebrates
Bradford Island - Upland Operable Unit
(1 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II Sediment SLVs for Benthics Exposed to Erodible Soil (1)	Toxicity Ratio for Benthics (Tij)	(Tij/Tj) (2)	Chemical is a Concern for Benthic Community? (Tij/Tj >= [1/Nij] x Q when Q = 1)	COI is Identified as a CPEC? (2) (Q = 1)
INORGANICS (mg/kg)								
Landfill	Arsenic	0-1 ft	6.20	6.0	1.03	0.000609	No	No
Landfill	Cadmium	0-1 ft	1.70	0.674	2.52	0.00149	No	No
Landfill	Chromium	0-1 ft	801	37.0	21.6	0.0128	No	No
Landfill	Cobalt	0-1 ft	22.7	15.2	1.49	0.000880	No	No
Landfill	Copper	0-1 ft	60.5	55.6	1.09	0.000641	No	No
Landfill	Lead	0-1 ft	680	35.0	19.4	0.0115	No	No
Landfill	Manganese	0-1 ft	614	1,100	0.558	0.000329	No	No
Landfill	Mercury	0-1 ft	0.320	0.214	1.50	0.000881	No	No
Landfill	Nickel	0-1 ft	570	21.2	26.9	0.0158	No	No
Landfill	Selenium	0-1 ft	0.848	NA	- -	- -	- -	Yes - No SLV
Landfill	Silver	0-1 ft	0.500	4.50	0.111	0.0000655	No	No
Landfill	Thallium	0-1 ft	0.378	0.354	1.07	0.000629	No	No
Landfill	Zinc	0-1 ft	221	123	1.80	0.00106	No	No
Sandblast Area	Cadmium	0-1 ft	1.06	0.674	1.57	0.00230	No	No
Sandblast Area	Chromium	0-1 ft	162	37	4.38	0.00639	No	No
Sandblast Area	Copper	0-1 ft	71.6	55.6	1.29	0.00188	No	No
Sandblast Area	Lead	0-1 ft	319	35	9.11	0.0133	No	No
Sandblast Area	Manganese	0-1 ft	479	1,100	0.435	0.000636	No	No
Sandblast Area	Nickel	0-1 ft	74.9	21.2	3.53	0.00516	No	No
Sandblast Area	Selenium	0-1 ft	0.650	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Silver	0-1 ft	0.175	4.50	0.0389	0.0000568	No	No
Sandblast Area	Zinc	0-1 ft	203	123	1.65	0.00241	No	No
Bulb Slope	Lead	0-1 ft	597	35	17.1	0.284	No	No
Bulb Slope	Mercury	0-1 ft	1.54	0.214	7.20	0.120	No	No
BUTYLTINS (ug/kg)								
Sandblast Area	Dibutyltin	0-1 ft	9.10	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Monobutyltin	0-1 ft	8.25	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Tributyltin	0-1 ft	12.8	NA	- -	- -	- -	Yes - No SLV
PESTICIDES (ug/kg)								
Landfill	4,4'-DDT	0-1 ft	28.0	4.00	7.00	0.00413	No	No
Landfill	Total DDTs	0-1 ft	29.9	7.00	4.27	0.00252	No	No
Landfill	Dieldrin	0-1 ft	2.10	3.00	0.700	0.000413	No	No
Sandblast Area	4,4'-DDE	0-1 ft	0.440	4.00	0.110	0.000161	No	No
Sandblast Area	4,4'-DDT	0-1 ft	10.0	4.00	2.50	0.00365	No	No
Sandblast Area	Total DDTs	0-1 ft	10.4	7.00	1.49	0.00217	No	No

Table O.3-5
Identification of CPECs in Mass Wasting and Erodible Soil at Upland OU - Multiple COIs for Benthic Invertebrates
Bradford Island - Upland Operable Unit
(2 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II Sediment SLVs for Benthics Exposed to Erodible Soil (1)	Toxicity Ratio for Benthics (Tij)	(Tij/Tj) (2)	Chemical is a Concern for Benthic Community? (Tij/Tj >= [1/Nij] x Q when Q = 1)	COI is Identified as a CPEC? (2) (Q = 1)
Sandblast Area	BHC (delta)	0-1 ft	0.0780	0.900	0.0867	0.000126	No	No
Sandblast Area	Endosulfan II	0-1 ft	0.240	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Endosulfan Sulfate	0-1 ft	0.770	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Heptachlor	0-1 ft	0.380	10	0.0380	0.0000555	No	No
PCBs (ug/kg)								
Landfill	Aroclor 1254	0-1 ft	49.0	7.00	7.00	0.00413	No	No
Landfill	Aroclor 1260	0-1 ft	92.0	7.00	13.1	0.00775	No	No
Sandblast Area	Aroclor 1260	0-1 ft	67.0	7.00	9.57	0.0140	No	No
Bulb Slope	Aroclor 1260	0-1 ft	251	7.00	35.9	0.597	Yes	**Yes**
VOCs (ug/kg)								
Landfill	Dichloromethane (Methylene Chloride)	0-1 ft	1,000	NA	- -	- -	- -	Yes - No SLV
Landfill	Tetrachloroethene (PCE)	0-1 ft	9.70	NA	- -	- -	- -	Yes - No SLV
Landfill	Toluene	0-1 ft	1.46	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	1,2,4-Trimethylbenzene	0-1 ft	0.280	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	2-Butanone (MEK)	0-1 ft	50.0	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	2-Hexanone	0-1 ft	8.80	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	4-Isopropyltoluene	0-1 ft	2.50	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	4-Methyl-2-pentanone (MIBK)	0-1 ft	1.20	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Acetone	0-1 ft	540	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Benzene	0-1 ft	1.00	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Bromomethane	0-1 ft	5.00	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Carbon Disulfide	0-1 ft	1.00	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Chloroform	0-1 ft	19.0	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Chloromethane	0-1 ft	0.250	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	cis-1,2-Dichloroethene	0-1 ft	12.0	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Dichlorodifluoromethane	0-1 ft	94.0	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Dichloromethane (Methylene Chloride)	0-1 ft	460	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Ethylbenzene	0-1 ft	0.200	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	m,p-Xylenes	0-1 ft	0.360	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Naphthalene	0-1 ft	0.540	176	0.00307	0.00000448	No	No
Sandblast Area	Toluene	0-1 ft	1.30	NA	- -	- -	- -	Yes - No SLV
SVOCs (ug/kg)								
Landfill	Benzoic Acid	0-1 ft	300	NA	- -	- -	- -	Yes - No SLV
Landfill	Benzyl Alcohol	0-1 ft	14.0	NA	- -	- -	- -	Yes - No SLV
Landfill	Bis(2-ethylhexyl) Phthalate	0-1 ft	420	750	0.560	0.000330	No	No
Landfill	Carbazole	0-1 ft	210	140	1.50	0.000884	No	No

Table O.3-5
Identification of CPECs in Mass Wasting and Erodible Soil at Upland OU - Multiple COIs for Benthic Invertebrates
Bradford Island - Upland Operable Unit
(3 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II Sediment SLVs for Benthics Exposed to Erodible Soil (1)	Toxicity Ratio for Benthics (Tij)	(Tij/Tj) (2)	Chemical is a Concern for Benthic Community? (Tij/Tj >= [1/Nij] x Q when Q = 1)	COI is Identified as a CPEC? (2) (Q = 1)
Landfill	Dibenzofuran	0-1 ft	36.0	5,100	0.00706	0.00000416	No	No
Landfill	Di-n-butyl Phthalate	0-1 ft	1,800	110	16.4	0.00965	No	No
Sandblast Area	Bis(2-ethylhexyl) Phthalate	0-1 ft	260,000	750	347	0.506	Yes	**Yes**
Sandblast Area	Carbazole	0-1 ft	91.0	140	0.650	0.000949	No	No
PAHs (ug/kg)								
Landfill	2-Methylnaphthalene	0-1 ft	11.0	NA	- -	- -	- -	Yes - No SLV
Landfill	Acenaphthene	0-1 ft	1160	290	4.00	0.00236	No	No
Landfill	Acenaphthylene	0-1 ft	19.0	160	0.119	0.0000700	No	No
Landfill	Anthracene	0-1 ft	1070	57	18.8	0.0111	No	No
Landfill	Fluorene	0-1 ft	510	77	6.62	0.00390	No	No
Landfill	Naphthalene	0-1 ft	79.0	176	0.449	0.000265	No	No
Landfill	Phenanthrene	0-1 ft	4,200	42	100	0.0589	Yes	**Yes**
Landfill	Benzo(a)anthracene	0-1 ft	4,500	32	141	0.0829	Yes	**Yes**
Landfill	Benzo(a)pyrene	0-1 ft	6,200	32	194	0.114	Yes	**Yes**
Landfill	Benzo(b)fluoranthene	0-1 ft	8,200	27	304	0.179	Yes	**Yes**
Landfill	Benzo(g,h,i)perylene	0-1 ft	3,300	300	11.0	0.00648	No	No
Landfill	Benzo(k)fluoranthene	0-1 ft	2,500	27	92.6	0.0546	Yes	**Yes**
Landfill	Chrysene	0-1 ft	5,900	57	104	0.0610	Yes	**Yes**
Landfill	Dibenz(a,h)anthracene	0-1 ft	1,000	33	30.3	0.0179	No	No
Landfill	Fluoranthene	0-1 ft	14,000	111	126	0.0743	Yes	**Yes**
Landfill	Indeno(1,2,3-cd)pyrene	0-1 ft	4,600	17	271	0.159	Yes	**Yes**
Landfill	Pyrene	0-1 ft	9,100	53	172	0.101	Yes	**Yes**
Sandblast Area	Acenaphthene	0-1 ft	68.0	290	0.234	0.000342	No	No
Sandblast Area	Anthracene	0-1 ft	150	57	2.63	0.00384	No	No
Sandblast Area	Phenanthrene	0-1 ft	940	42	22.4	0.0327	No	No
Sandblast Area	Benzo(a)anthracene	0-1 ft	1,200	32	37.5	0.0547	Yes	**Yes**
Sandblast Area	Benzo(a)pyrene	0-1 ft	1,000	32	31.3	0.0456	Yes	**Yes**
Sandblast Area	Benzo(b)fluoranthene	0-1 ft	1,600	27	59.3	0.0865	Yes	**Yes**
Sandblast Area	Benzo(g,h,i)perylene	0-1 ft	590	300	1.97	0.00287	No	No
Sandblast Area	Benzo(k)fluoranthene	0-1 ft	570	27	21.1	0.0308	No	No
Sandblast Area	Chrysene	0-1 ft	1,500	57	26.3	0.0384	Yes	**Yes**
Sandblast Area	Dibenz(a,h)anthracene	0-1 ft	220	33	6.67	0.00973	No	No
Sandblast Area	Fluoranthene	0-1 ft	2,100	111	18.9	0.0276	No	No
Sandblast Area	Indeno(1,2,3-cd)pyrene	0-1 ft	690	17	40.6	0.0592	Yes	**Yes**
Sandblast Area	Pyrene	0-1 ft	1,900	53	35.8	0.0523	Yes	**Yes**
TPH (mg/kg)								

Table O.3-5
Identification of CPECs in Mass Wasting and Erodible Soil at Upland OU - Multiple COIs for Benthic Invertebrates
Bradford Island - Upland Operable Unit
(4 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Max Detected Conc in Soil	Level II Sediment SLVs for Benthics Exposed to Erodible Soil (1)	Toxicity Ratio for Benthics (Tij)	(Tij/Tj) (2)	Chemical is a Concern for Benthic Community? (Tij/Tj >= [1/Nij] x Q when Q = 1)	COI is Identified as a CPEC? (2) (Q = 1)
Sandblast Area	Diesel Range Organics	0-1 ft	69.0	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Gasoline Range Organics	0-1 ft	3.20	NA	- -	- -	- -	Yes - No SLV
Sandblast Area	Residual Range Organics	0-1 ft	1,000	NA	- -	- -	- -	Yes - No SLV
Bulb Slope	Diesel Range Organics	0-1 ft	170	NA	- -	- -	- -	Yes - No SLV
Bulb Slope	Residual Range Organics	0-1 ft	410	NA	- -	- -	- -	Yes - No SLV

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
NA = not available
SLV = screening level value
T&E = threatened and endangered
- - = not applicable

The Landfill AOPC potentially erodible soil subset is comprised of the following samples: BIL01USE through BIL09USE, BIL13SSI, and L-01 through L-04.

The Sandblast Area AOPC potentially erodible soil subset is comprised of the following samples: SB-EUA, SB-EUB, SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, SB-EUB-15, and SB-04.
The entire Bulb Slope AOPC is potentially erodible.

(1) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the DEQ Level II SLV (see Appendix J-5c):

Oregon Department of Environmental Quality (DEQ), 1998. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Waste Management and Cleanup Division. Final. April. Updated December 2001.

Multiple COIs Simultaneously within a Given Medium
(2) COIs with Tij/Tj values >= 1/Nij*Q must be retained as a CPEC, provided Tj>Q.
Where: Tij = toxicity ratio for contaminant *i* in medium *j* = chemical specific
Q = Receptor designator
Landfill AOPC Mass Wasting Soil Subset
Nij = total number of *i* contaminants in medium *j* = 36
Tj (LF) = sum of toxicity ratios for all contaminants in medium *j* = 1697
Sandblast AOPC Erodible Soil Subset
Nij = total number of *i* contaminants in medium *j* = 29
Tj (SB) = sum of toxicity ratios for all contaminants in medium *j* = 686
Bulb Slope Mass Wasting Soil Subset
Nij = total number of *i* contaminants in medium *j* = 3
Tj (BS) = sum of toxicity ratios for all contaminants in medium *j* = 60.1

Tj is the sum of the individual toxicity ratio (Tij) for individual metals, pesticides (except Total DDTs was used instead of the individual DDT isomers), individual PCBs as Aroclors, VOCs, SVOCs, and individual PAHs.
Assumptions: Cij = Maximum detected concentration for immobile species (plants and invertebrates).
Q = 1 for terrestrial T&E species and all aquatic species
Q = 5 for all common terrestrial species

Table O.3-6
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Fish Shellfish
Bradford Island - Upland Operable Unit
(1 of 5)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Freshwater Fish Exposed to Erodible Soil (2)	Toxicity Ratio for Fish & Shellfish (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)								
Landfill	Arsenic	0-1 ft	4.95	5.86	0.845	Yes	Yes	**Yes**
Landfill	Cadmium	0-1 ft	1.04	0.674	1.54	Yes	Yes	**Yes**
Landfill	Lead	0-1 ft	324	14.5	22.3	Yes	Yes	**Yes**
Landfill	Manganese	0-1 ft	447	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Mercury	0-1 ft	0.214	0.214	1.00	Yes	Yes	**Yes**
Landfill	Selenium	0-1 ft	0.490	2.00	0.245	No	- -	**Yes**
Landfill	Thallium	0-1 ft	0.378	0.354	1.07	Yes	No	**Yes**
Landfill	Zinc	0-1 ft	184	106	1.74	Yes	No	**Yes**
Sandblast Area	Cadmium	0-1 ft	1.06	0.674	1.57	Yes	Yes	**Yes**
Sandblast Area	Lead	0-1 ft	319	14.5	22.0	Yes	Yes	**Yes**
Sandblast Area	Manganese	0-1 ft	479	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Selenium	0-1 ft	0.650	2.00	0.325	NA	- -	**Yes**
Sandblast Area	Zinc	0-1 ft	203	106	1.92	Yes	No	**Yes**
Bulb Slope	Lead	0-1 ft	307	14.5	21.2	Yes	Yes	**Yes**
Bulb Slope	Mercury	0-1 ft	0.720	0.214	3.36	Yes	Yes	**Yes**
BUTYLTINS (ug/kg)								
Sandblast Area	Tributyltin	0-1 ft	12.8	2.3	5.57	Yes	Yes	**Yes**
PESTICIDES (ug/kg)								
Landfill	4,4'-DDT	0-1 ft	18.0	0.390	46.2	Yes	Yes	**Yes**
Landfill	Total DDTs	0-1 ft	19.2	0.390	49.1	Yes	Yes	**Yes**
Landfill	Dieldrin	0-1 ft	2.10	2.20	0.955	Yes	Yes	**Yes**
Sandblast Area	4,4'-DDE	0-1 ft	0.440	0.390	1.13	Yes	Yes	**Yes**
Sandblast Area	4,4'-DDT	0-1 ft	10.0	0.390	25.6	Yes	Yes	**Yes**
Sandblast Area	Total DDTs	0-1 ft	10.4	0.390	26.7	Yes	Yes	**Yes**
Sandblast Area	BHC (delta)	0-1 ft	0.0780	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Endosulfan II	0-1 ft	0.240	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Endosulfan Sulfate	0-1 ft	0.770	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Heptachlor	0-1 ft	0.380	NA	- -	Yes	No SLV	**Yes-Bio**
PCBs (ug/kg)								
Landfill	Aroclor 1254	0-1 ft	28.0	22.0	1.27	Yes	Yes	**Yes**
Landfill	Aroclor 1260	0-1 ft	55.4	22.0	2.52	Yes	Yes	**Yes**
Landfill	Total PCBs (Aroclors)	0-1 ft	88.2	22.0	4.01	Yes	Yes	**Yes**
Sandblast Area	Aroclor 1260	0-1 ft	67.0	22.0	3.05	Yes	Yes	**Yes**
Sandblast Area	Total PCBs (Aroclors)	0-1 ft	69.1	22.0	3.14	Yes	Yes	**Yes**
Bulb Slope	Aroclor 1260	0-1 ft	106	22.0	4.82	Yes	Yes	**Yes**

Table O.3-6
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Fish Shellfish
Bradford Island - Upland Operable Unit
(2 of 5)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Freshwater Fish Exposed to Erodible Soil (2)	Toxicity Ratio for Fish & Shellfish (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)
Bulb Slope	Total PCBs (Aroclors)	0-1 ft	104	22.0	4.72	Yes	Yes	**Yes**
VOCs (ug/kg)								
Sandblast Area	1,2,4-Trimethylbenzene	0-1 ft	0.243	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	4-Isopropyltoluene	0-1 ft	1.46	NA	- -	Yes	No SLV	**Yes-Bio**
SVOCs (ug/kg)								
Landfill	Bis(2-ethylhexyl) Phthalate	0-1 ft	229	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Carbazole	0-1 ft	81.5	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Dibenzofuran	0-1 ft	32.9	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Di-n-butyl Phthalate	0-1 ft	563	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Bis(2-ethylhexyl) Phthalate	0-1 ft	260,000	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Carbazole	0-1 ft	91.0	NA	- -	Yes	No SLV	**Yes-Bio**
PAHs (ug/kg)								
Landfill	2-Methylnaphthalene[4]	0-1 ft	11.0	37,000	0.000297	Yes	Yes	No
Landfill	Acenaphthene[4]	0-1 ft	592	37,000	0.0160	Yes	Yes	No
Landfill	Acenaphthylene[4]	0-1 ft	18.5	37,000	0.000500	Yes	Yes	No
Landfill	Anthracene[4]	0-1 ft	722	37,000	0.0195	Yes	Yes	No
Landfill	Fluorene[4]	0-1 ft	273	37,000	0.00738	Yes	Yes	No
Landfill	Naphthalene[4]	0-1 ft	30.6	37,000	0.000827	No	--	No
Landfill	Phenanthrene[4]	0-1 ft	2,820	37,000	0.0762	Yes	Yes	No
Landfill	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	4,431	NA	- -	Yes	No SLV	No
Landfill	Benzo(a)anthracene[5]	0-1 ft	3,790	1,900	1.99	Yes	Yes	**Yes**
Landfill	Benzo(a)pyrene[5]	0-1 ft	4,890	1,900	2.57	Yes	Yes	**Yes**
Landfill	Benzo(b)fluoranthene[5]	0-1 ft	5,800	1,900	3.05	Yes	Yes	**Yes**
Landfill	Benzo(g,h,i)perylene[5]	0-1 ft	2,400	1,900	1.26	Yes	Yes	**Yes**
Landfill	Benzo(k)fluoranthene[5]	0-1 ft	2,070	1,900	1.09	Yes	Yes	**Yes**
Landfill	Chrysene[5]	0-1 ft	4,530	1,900	2.38	Yes	Yes	**Yes**
Landfill	Dibenz(a,h)anthracene[5]	0-1 ft	725	1,900	0.382	Yes	Yes	**Yes**
Landfill	Fluoranthene	0-1 ft	8,520	37,000	0.230	Yes	Yes	**Yes**
Landfill	Indeno(1,2,3-cd)pyrene[5]	0-1 ft	3,230	1,900	1.70	Yes	Yes	**Yes**
Landfill	Pyrene	0-1 ft	7,050	1,900	3.71	Yes	Yes	**Yes**
Landfill	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	42,516	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Acenaphthene[4]	0-1 ft	68.0	37,000	0.00184	Yes	Yes	No
Sandblast Area	Anthracene[4]	0-1 ft	150	37,000	0.00405	Yes	Yes	No

Table O.3-6
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Fish Shellfish
Bradford Island - Upland Operable Unit
(3 of 5)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Freshwater Fish Exposed to Erodible Soil (2)	Toxicity Ratio for Fish & Shellfish (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)
Sandblast Area	Phenanthrene[4]	0-1 ft	940	37,000	0.0254	Yes	Yes	No
Sandblast Area	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	1,356	NA	- -	Yes	No SLV	No
Sandblast Area	Benzo(a)anthracene[5]	0-1 ft	1,200	1,900	0.632	Yes	Yes	**Yes**
Sandblast Area	Benzo(a)pyrene[5]	0-1 ft	1,000	1,900	0.526	Yes	Yes	**Yes**
Sandblast Area	Benzo(b)fluoranthene[5]	0-1 ft	1,600	1,900	0.842	Yes	Yes	**Yes**
Sandblast Area	Benzo(g,h,i)perylene[5]	0-1 ft	590	1,900	0.311	Yes	Yes	**Yes**
Sandblast Area	Benzo(k)fluoranthene[5]	0-1 ft	570	1,900	0.300	Yes	Yes	**Yes**
Sandblast Area	Chrysene[5]	0-1 ft	1,500	1,900	0.789	Yes	Yes	**Yes**
Sandblast Area	Dibenz(a,h)anthracene[5]	0-1 ft	220	1,900	0.116	Yes	Yes	**Yes**
Sandblast Area	Fluoranthene	0-1 ft	2,100	37,000	0.0568	Yes	Yes	No
Sandblast Area	Indeno(1,2,3-cd)pyrene[5]	0-1 ft	690	1,900	0.363	Yes	Yes	**Yes**
Sandblast Area	Pyrene	0-1 ft	1,900	1,900	1.00	Yes	Yes	**Yes**
Sandblast Area	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	11,370	NA	- -	Yes	No SLV	**Yes-Bio**
TPH (mg/kg)								
Sandblast Area	Diesel Range Organics	0-1 ft	69.0	NA	- -	NA	- -	Yes - No SLV
Sandblast Area	Gasoline Range Organics	0-1 ft	2.56	NA	- -	NA	- -	Yes - No SLV
Sandblast Area	Residual Range Organics	0-1 ft	1,000	NA	- -	NA	- -	Yes - No SLV
Bulb Slope	Diesel Range Organics	0-1 ft	102	NA	- -	NA	- -	Yes - No SLV
Bulb Slope	Residual Range Organics	0-1 ft	232	NA	- -	NA	- -	Yes - No SLV
					Landfill Sum R_{Bac}[6] =	101		
					Sandblast Area Sum R_{Bac}[6] =	66.2		
					Bulb Slope Sum R_{Bac}[6] =	29.3		

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

Table O.3-6
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Fish Shellfish
Bradford Island - Upland Operable Unit
(4 of 5)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Freshwater Fish Exposed to Erodible Soil (2)	Toxicity Ratio for Fish & Shellfish (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)

The Landfill AOPC potentially erodible soil subset is comprised of the following samples: BIL01USE through BIL09USE, BIL13SSI, and L-01 through L-04.

Table O.3-6
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Fish Shellfish
Bradford Island - Upland Operable Unit
(5 of 5)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Freshwater Fish Exposed to Erodible Soil (2)	Toxicity Ratio for Fish & Shellfish (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)

The Sandblast Area AOPC potentially erodible soil subset is comprised of the following samples: SB-EUA, SB-EUB, SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, SB-EUB-15, and SB-04.
The entire Bulb Slope AOPC is potentially erodible.
(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.
(2) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the bioaccumulative freshwater fish SLVs from (see Appendix J-5d):
In the absence of a site-specific reference UPL for selenium, the freshwater inorganic background concentration suggested by DEQ was used (DEQ 2007).
Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. April 3.

Bioaccumulative COIs in a Given Medium
(3) Any individual COI in any given medium with RBac > 0.1 and Sum RBac > 1, where RBac = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The SLV for Fluoranthene was used as a surrogate for the individual LPAHs without SLVs. Fluoranthene is considered an HPAH in the RI, HHRA, and ERA and used to calculate Total HPAH; however, fluoranthene is more accurately a PAH that borders the two with a molecular weight more similar to HPAHs and but a structure more similar to LPAHs. Therefore, use of fluoranthene as a surrogate for LPAHs is appropriate in the absence of any LPAH SLVs.
(5) The SLV for pyrene was used as a surrogate for the individual HPAHs without SLVs.
(6) The Sum R_{Bac} is the sum of the R_{Bac} for Total PCBs as Aroclors and the individual metals, butyltins, PAHs, and pesticides (except Total DDTs was used instead of the individual DDT isomers).

Table O.3-7
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Birds (Individual)
Bradford Island - Upland Operable Unit
(1 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Individual Birds Exposed to Erodible Soil (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)								
Landfill	Arsenic	0-1 ft	4.95	5.86	0.845	Yes	Yes	**Yes**
Landfill	Cadmium	0-1 ft	1.04	0.674	1.54	Yes	Yes	**Yes**
Landfill	Lead	0-1 ft	324	14.5	22.3	Yes	Yes	**Yes**
Landfill	Manganese	0-1 ft	447	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Mercury	0-1 ft	0.214	0.214	1.00	Yes	Yes	**Yes**
Landfill	Selenium	0-1 ft	0.490	2.00	0.245	NA	- -	**Yes**
Landfill	Thallium	0-1 ft	0.378	0.354	1.07	Yes	No	**Yes**
Landfill	Zinc	0-1 ft	184	106	1.74	Yes	No	**Yes**
Sandblast Area	Cadmium	0-1 ft	1.06	0.674	1.57	Yes	Yes	**Yes**
Sandblast Area	Lead	0-1 ft	319	14.5	22.0	Yes	Yes	**Yes**
Sandblast Area	Manganese	0-1 ft	479	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Selenium	0-1 ft	0.650	2.00	0.325	NA	- -	**Yes**
Sandblast Area	Zinc	0-1 ft	203	106	1.92	Yes	No	**Yes**
Bulb Slope	Lead	0-1 ft	307	14.5	21.2	Yes	Yes	**Yes**
Bulb Slope	Mercury	0-1 ft	0.720	0.214	3.36	Yes	Yes	**Yes**
BUTYLTINS (ug/kg)								
Sandblast Area	Tributyltin	0-1 ft	12.8	1,600	0.00800	Yes	Yes	No
PESTICIDES (ug/kg)								
Landfill	4,4'-DDT	0-1 ft	18.0	0.095	189	Yes	Yes	**Yes**
Landfill	Total DDTs	0-1 ft	19.2	0.095	202	Yes	Yes	**Yes**
Landfill	Dieldrin	0-1 ft	2.10	0.370	5.68	Yes	Yes	**Yes**
Sandblast Area	4,4'-DDE	0-1 ft	0.440	0.095	4.63	Yes	Yes	**Yes**
Sandblast Area	4,4'-DDT	0-1 ft	10.0	0.095	105	Yes	Yes	**Yes**
Sandblast Area	Total DDTs	0-1 ft	10.4	0.095	109	Yes	Yes	**Yes**
Sandblast Area	BHC (delta)	0-1 ft	0.0780	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Endosulfan II	0-1 ft	0.240	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Endosulfan Sulfate	0-1 ft	0.770	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Heptachlor	0-1 ft	0.380	NA	- -	Yes	No SLV	**Yes-Bio**
PCBs (ug/kg)								
Landfill	Aroclor 1254	0-1 ft	28.0	1.80	15.6	Yes	Yes	**Yes**
Landfill	Aroclor 1260	0-1 ft	55.4	1.80	30.8	Yes	Yes	**Yes**
Landfill	Total PCBs (Aroclors)	0-1 ft	88.2	1.80	49.0	Yes	Yes	**Yes**
Sandblast Area	Aroclor 1260	0-1 ft	67.0	1.80	37.2	Yes	Yes	**Yes**
Sandblast Area	Total PCBs (Aroclors)	0-1 ft	69.1	1.80	38.4	Yes	Yes	**Yes**
Bulb Slope	Aroclor 1260	0-1 ft	106	1.80	58.9	Yes	Yes	**Yes**

Table O.3-7
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Birds (Individual)
Bradford Island - Upland Operable Unit
(2 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Individual Birds Exposed to Erodible Soil (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)
Bulb Slope	Total PCBs (Aroclors)	0-1 ft	104	1.80	57.7	Yes	Yes	**Yes**
VOCs (ug/kg)								
Sandblast Area	1,2,4-Trimethylbenzene	0-1 ft	0.243	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	4-Isopropyltoluene	0-1 ft	1.46	NA	- -	Yes	No SLV	**Yes-Bio**
SVOCs (ug/kg)								
Landfill	Bis(2-ethylhexyl) Phthalate	0-1 ft	229	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Carbazole	0-1 ft	81.5	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Dibenzofuran	0-1 ft	32.9	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Di-n-butyl Phthalate	0-1 ft	563	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Bis(2-ethylhexyl) Phthalate	0-1 ft	260,000	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Carbazole	0-1 ft	91.0	NA	- -	Yes	No SLV	**Yes-Bio**
PAHs (ug/kg)								
Landfill	2-Methylnaphthalene	0-1 ft	11.0	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Acenaphthene	0-1 ft	592	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Acenaphthylene	0-1 ft	18.5	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Anthracene	0-1 ft	722	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Fluorene	0-1 ft	273	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Naphthalene	0-1 ft	30.6	NA	- -	No	--	Yes - No SLV
Landfill	Phenanthrene	0-1 ft	2,820	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	4,431	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Benzo(a)anthracene	0-1 ft	3,790	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Benzo(a)pyrene	0-1 ft	4,890	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Benzo(b)fluoranthene	0-1 ft	5,800	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Benzo(g,h,i)perylene	0-1 ft	2,400	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Benzo(k)fluoranthene	0-1 ft	2,070	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Chrysene	0-1 ft	4,530	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Dibenz(a,h)anthracene	0-1 ft	725	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Fluoranthene	0-1 ft	8,520	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Indeno(1,2,3-cd)pyrene	0-1 ft	3,230	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Pyrene	0-1 ft	7,050	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	42,516	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Acenaphthene	0-1 ft	68.0	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Anthracene	0-1 ft	150	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Phenanthrene	0-1 ft	940	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	1,356	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Benzo(a)anthracene	0-1 ft	1,200	NA	- -	Yes	No SLV	**Yes-Bio**

Table O.3-7
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Birds (Individual)
Bradford Island - Upland Operable Unit
(3 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Individual Birds Exposed to Erodible Soil (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)
Sandblast Area	Benzo(a)pyrene	0-1 ft	1,000	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Benzo(b)fluoranthene	0-1 ft	1,600	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Benzo(g,h,i)perylene	0-1 ft	590	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Benzo(k)fluoranthene	0-1 ft	570	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Chrysene	0-1 ft	1,500	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Dibenz(a,h)anthracene	0-1 ft	220	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Fluoranthene	0-1 ft	2,100	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Indeno(1,2,3-cd)pyrene	0-1 ft	690	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Pyrene	0-1 ft	1,900	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	11,370	NA	- -	Yes	No SLV	**Yes-Bio**
TPH (mg/kg)								
Sandblast Area	Diesel Range Organics	0-1 ft	69.0	NA	- -	NA	- -	Yes - No SLV
Sandblast Area	Gasoline Range Organics	0-1 ft	2.56	NA	- -	NA	- -	Yes - No SLV
Sandblast Area	Residual Range Organics	0-1 ft	1,000	NA	- -	NA	- -	Yes - No SLV
Bulb Slope	Diesel Range Organics	0-1 ft	102	NA	- -	NA	- -	Yes - No SLV
Bulb Slope	Residual Range Organics	0-1 ft	232	NA	- -	NA	- -	Yes - No SLV
					Landfill Sum R_{Bac}^4 =	285		
					Sandblast Area Sum R_{Bac}^4 =	174		
					Bulb Slope Sum R_{Bac}^4 =	82.2		

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

The Landfill AOPC potentially erodible soil subset is comprised of the following samples: BIL01USE through BIL09USE, BIL13SSI, and L-01 through L-04.

The Sandblast Area AOPC potentially erodible soil subset is comprised of the following samples: SB-EUA, SB-EUB, SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, SB-EUB-15, and SB-04.
The entire Bulb Slope AOPC is potentially erodible.
(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.

Table O.3-7
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Birds (Individual)
Bradford Island - Upland Operable Unit
(4 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Individual Birds Exposed to Erodible Soil (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)

(2) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the bioaccumulative bird (individual) SLVs from (see Appendix J-5c):

In the absence of a site-specific reference UPL for selenium, the freshwater inorganic background concentration suggested by DEQ was used (DEQ 2007).

Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. April 3.

Bioaccumulative COIs in a Given Medium

(3) Any individual COI in any given medium with RBac > 0.1 and Sum RBac > 1, where RBac = Cij/SLVij, must be identified as a CPEC.

Where: Cij = concentration of contaminant *i* in medium *j*

SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .

R_{Bac} = bioaccumulation index for an individual COI

Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The Sum R_{Bac} is the sum of the R_{Bac} for Total PCBs as Aroclors and the individual metals, butyltins, and pesticides (except Total DDTs was used instead of the individual DDT isomers).

Table O.3-8
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Birds (Population)
Bradford Island - Upland Operable Unit
(1 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Bird Populations Exposed to Erodible Soil (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)								
Landfill	Arsenic	0-1 ft	4.95	5.86	0.845	Yes	Yes	**Yes**
Landfill	Cadmium	0-1 ft	1.04	0.674	1.54	Yes	Yes	**Yes**
Landfill	Lead	0-1 ft	324	14.5	22.3	Yes	Yes	**Yes**
Landfill	Manganese	0-1 ft	447	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Mercury	0-1 ft	0.214	0.214	1.00	Yes	Yes	**Yes**
Landfill	Selenium	0-1 ft	0.490	2.00	0.245	NA	- -	**Yes**
Landfill	Thallium	0-1 ft	0.378	0.354	1.07	Yes	No	**Yes**
Landfill	Zinc	0-1 ft	184	106	1.74	Yes	No	**Yes**
Sandblast Area	Cadmium	0-1 ft	1.06	0.674	1.57	Yes	Yes	**Yes**
Sandblast Area	Lead	0-1 ft	319	14.5	22.0	Yes	Yes	**Yes**
Sandblast Area	Manganese	0-1 ft	479	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Selenium	0-1 ft	0.650	2.00	0.325	NA	- -	**Yes**
Sandblast Area	Zinc	0-1 ft	203	106	1.92	Yes	No	**Yes**
Bulb Slope	Lead	0-1 ft	307	14.5	21.2	Yes	Yes	**Yes**
Bulb Slope	Mercury	0-1 ft	0.720	0.214	3.36	Yes	Yes	**Yes**
BUTYLTINS (ug/kg)								
Sandblast Area	Tributyltin	0-1 ft	12.8	4,100	0.00312	Yes	Yes	No
PESTICIDES (ug/kg)								
Landfill	4,4'-DDT	0-1 ft	18.0	0.340	52.9	Yes	Yes	**Yes**
Landfill	Total DDTs	0-1 ft	19.2	0.340	56.3	Yes	Yes	**Yes**
Landfill	Dieldrin	0-1 ft	2.10	0.370	5.68	Yes	Yes	**Yes**
Sandblast Area	4,4'-DDE	0-1 ft	0.440	0.340	1.29	Yes	Yes	**Yes**
Sandblast Area	4,4'-DDT	0-1 ft	10.0	0.340	29.4	Yes	Yes	**Yes**
Sandblast Area	Total DDTs	0-1 ft	10.4	0.340	30.6	Yes	Yes	**Yes**
Sandblast Area	BHC (delta)	0-1 ft	0.0780	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Endosulfan II	0-1 ft	0.240	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Endosulfan Sulfate	0-1 ft	0.770	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Heptachlor	0-1 ft	0.380	NA	- -	Yes	No SLV	**Yes-Bio**
PCBs (ug/kg)								
Landfill	Aroclor 1254	0-1 ft	28.0	91.0	0.308	Yes	Yes	**Yes**
Landfill	Aroclor 1260	0-1 ft	55.4	91.0	0.609	Yes	Yes	**Yes**
Landfill	Total PCBs (Aroclors)	0-1 ft	88.2	91.0	0.970	Yes	Yes	**Yes**
Sandblast Area	Aroclor 1260	0-1 ft	67.0	91.0	0.736	Yes	Yes	**Yes**
Sandblast Area	Total PCBs (Aroclors)	0-1 ft	69.1	91.0	0.759	Yes	Yes	**Yes**
Bulb Slope	Aroclor 1260	0-1 ft	106	91.0	1.16	Yes	Yes	**Yes**

Table O.3-8
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Birds (Population)
Bradford Island - Upland Operable Unit
(2 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Bird Populations Exposed to Erodible Soil (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)
Bulb Slope	Total PCBs (Aroclors)	0-1 ft	104	91.0	1.14	Yes	Yes	**Yes**
VOCs (ug/kg)								
Sandblast Area	1,2,4-Trimethylbenzene	0-1 ft	0.243	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	4-Isopropyltoluene	0-1 ft	1.46	NA	- -	Yes	No SLV	**Yes-Bio**
SVOCs (ug/kg)								
Landfill	Bis(2-ethylhexyl) Phthalate	0-1 ft	229	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Carbazole	0-1 ft	81.5	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Dibenzofuran	0-1 ft	32.9	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Di-n-butyl Phthalate	0-1 ft	563	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Bis(2-ethylhexyl) Phthalate	0-1 ft	260,000	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Carbazole	0-1 ft	91.0	NA	- -	Yes	No SLV	**Yes-Bio**
PAHs (ug/kg)								
Landfill	2-Methylnaphthalene	0-1 ft	11.0	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Acenaphthene	0-1 ft	592	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Acenaphthylene	0-1 ft	18.5	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Anthracene	0-1 ft	722	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Fluorene	0-1 ft	273	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Naphthalene	0-1 ft	30.6	NA	- -	No	--	Yes - No SLV
Landfill	Phenanthrene	0-1 ft	2,820	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	4,431	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Benzo(a)anthracene	0-1 ft	3,790	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Benzo(a)pyrene	0-1 ft	4,890	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Benzo(b)fluoranthene	0-1 ft	5,800	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Benzo(g,h,i)perylene	0-1 ft	2,400	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Benzo(k)fluoranthene	0-1 ft	2,070	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Chrysene	0-1 ft	4,530	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Dibenz(a,h)anthracene	0-1 ft	725	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Fluoranthene	0-1 ft	8,520	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Indeno(1,2,3-cd)pyrene	0-1 ft	3,230	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Pyrene	0-1 ft	7,050	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	42,516	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Acenaphthene	0-1 ft	68.0	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Anthracene	0-1 ft	150	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Phenanthrene	0-1 ft	940	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	1,356	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Benzo(a)anthracene	0-1 ft	1,200	NA	- -	Yes	No SLV	**Yes-Bio**

Table O.3-8
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Birds (Population)
Bradford Island - Upland Operable Unit
(3 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Bird Populations Exposed to Erodible Soil (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)
Sandblast Area	Benzo(a)pyrene	0-1 ft	1,000	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Benzo(b)fluoranthene	0-1 ft	1,600	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Benzo(g,h,i)perylene	0-1 ft	590	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Benzo(k)fluoranthene	0-1 ft	570	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Chrysene	0-1 ft	1,500	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Dibenz(a,h)anthracene	0-1 ft	220	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Fluoranthene	0-1 ft	2,100	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Indeno(1,2,3-cd)pyrene	0-1 ft	690	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Pyrene	0-1 ft	1,900	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	11,370	NA	- -	Yes	No SLV	**Yes-Bio**
TPH (mg/kg)								
Sandblast Area	Diesel Range Organics	0-1 ft	69.0	NA	- -	NA	- -	Yes - No SLV
Sandblast Area	Gasoline Range Organics	0-1 ft	2.56	NA	- -	NA	- -	Yes - No SLV
Sandblast Area	Residual Range Organics	0-1 ft	1,000	NA	- -	NA	- -	Yes - No SLV
Bulb Slope	Diesel Range Organics	0-1 ft	102	NA	- -	NA	- -	Yes - No SLV
Bulb Slope	Residual Range Organics	0-1 ft	232	NA	- -	NA	- -	Yes - No SLV
					Landfill Sum R_{Bac}^4 =	91.7		
					Sandblast Area Sum R_{Bac}^4 =	57.2		
					Bulb Slope Sum R_{Bac}^4 =	25.7		

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

The Landfill AOPC potentially erodible soil subset is comprised of the following samples: BIL01USE through BIL09USE, BIL13SSI, and L-01 through L-04.

The Sandblast Area AOPC potentially erodible soil subset is comprised of the following samples: SB-EUA, SB-EUB, SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, SB-EUB-15, and SB-04.
The entire Bulb Slope AOPC is potentially erodible.
(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.

Table O.3-8
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Birds (Population)
Bradford Island - Upland Operable Unit
(4 of 4)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Bird Populations Exposed to Erodible Soil (2)	Toxicity Ratio for Birds (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)

(2) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the bioaccumulative bird (population) SLVs from (see Appendix J-5c):

In the absence of a site-specific reference UPL for selenium, the freshwater inorganic background concentration suggested by DEQ was used (DEQ 2007).

Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. April 3.

Bioaccumulative COIs in a Given Medium

(3) Any individual COI in any given medium with RBac > 0.1 and Sum RBac > 1, where RBac = Cij/SLVij, must be identified as a CPEC.

Where: Cij = concentration of contaminant *i* in medium *j*

SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .

R_{Bac} = bioaccumulation index for an individual COI

Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The Sum R_{Bac} is the sum of the R_{Bac} for Total PCBs as Aroclors and the individual metals, butyltins, and pesticides (except Total DDTs was used instead of the individual DDT isomers).

Table O.3-9
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Mammals (Individual)
Bradford Island - Upland Operable Unit
(1 of 5)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Individual Mammals Exposed to Erodible Soil (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)								
Landfill	Arsenic	0-1 ft	4.95	5.86	0.845	Yes	Yes	**Yes**
Landfill	Cadmium	0-1 ft	1.04	0.674	1.54	Yes	Yes	**Yes**
Landfill	Lead	0-1 ft	324	14.5	22.3	Yes	Yes	**Yes**
Landfill	Manganese	0-1 ft	447	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Mercury	0-1 ft	0.214	0.214	1.00	Yes	Yes	**Yes**
Landfill	Selenium	0-1 ft	0.490	2.00	0.245	NA	- -	**Yes**
Landfill	Thallium	0-1 ft	0.378	0.354	1.07	Yes	No	**Yes**
Landfill	Zinc	0-1 ft	184	106	1.74	Yes	No	**Yes**
Sandblast Area	Cadmium	0-1 ft	1.06	0.674	1.57	Yes	Yes	**Yes**
Sandblast Area	Lead	0-1 ft	319	14.5	22.0	Yes	Yes	**Yes**
Sandblast Area	Manganese	0-1 ft	479	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Selenium	0-1 ft	0.650	2.00	0.325	NA	- -	**Yes**
Sandblast Area	Zinc	0-1 ft	203	106	1.92	Yes	No	**Yes**
Bulb Slope	Lead	0-1 ft	307	14.5	21.2	Yes	Yes	**Yes**
Bulb Slope	Mercury	0-1 ft	0.720	0.214	3.36	Yes	Yes	**Yes**
BUTYLTINS (ug/kg)								
Sandblast Area	Tributyltin	0-1 ft	12.8	730	0.0175	Yes	Yes	No
PESTICIDES (ug/kg)								
Landfill	4,4'-DDT	0-1 ft	18.0	4.90	3.67	Yes	Yes	**Yes**
Landfill	Total DDTs	0-1 ft	19.2	4.90	3.91	Yes	Yes	**Yes**
Landfill	Dieldrin	0-1 ft	2.10	1.20	1.75	Yes	Yes	**Yes**
Sandblast Area	4,4'-DDE	0-1 ft	0.440	4.90	0.0898	Yes	Yes	No
Sandblast Area	4,4'-DDT	0-1 ft	10.0	4.90	2.04	Yes	Yes	**Yes**
Sandblast Area	Total DDTs	0-1 ft	10.4	4.90	2.12	Yes	Yes	**Yes**
Sandblast Area	BHC (delta)	0-1 ft	0.0780	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Endosulfan II	0-1 ft	0.240	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Endosulfan Sulfate	0-1 ft	0.770	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Heptachlor	0-1 ft	0.380	NA	- -	Yes	No SLV	**Yes-Bio**
PCBs (ug/kg)								
Landfill	Aroclor 1254	0-1 ft	28.0	44.0	0.636	Yes	Yes	**Yes**
Landfill	Aroclor 1260	0-1 ft	55.4	44.0	1.26	Yes	Yes	**Yes**
Landfill	Total PCBs (Aroclors)	0-1 ft	88.2	44.0	2.01	Yes	Yes	**Yes**
Sandblast Area	Aroclor 1260	0-1 ft	67.0	44.0	1.52	Yes	Yes	**Yes**
Sandblast Area	Total PCBs (Aroclors)	0-1 ft	69.1	44.0	1.57	Yes	Yes	**Yes**
Bulb Slope	Aroclor 1260	0-1 ft	106	44.0	2.41	Yes	Yes	**Yes**

Table O.3-9
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Mammals (Individual)
Bradford Island - Upland Operable Unit
(2 of 5)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Individual Mammals Exposed to Erodible Soil (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)
Bulb Slope	Total PCBs (Aroclors)	0-1 ft	104	44.0	2.36	Yes	Yes	**Yes**
VOCs (ug/kg)								
Sandblast Area	1,2,4-Trimethylbenzene	0-1 ft	0.243	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	4-Isopropyltoluene	0-1 ft	1.46	NA	- -	Yes	No SLV	**Yes-Bio**
SVOCs (ug/kg)								
Landfill	Bis(2-ethylhexyl) Phthalate	0-1 ft	229	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Carbazole	0-1 ft	81.5	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Dibenzofuran	0-1 ft	32.9	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Di-n-butyl Phthalate	0-1 ft	563	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Bis(2-ethylhexyl) Phthalate	0-1 ft	260,000	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Carbazole	0-1 ft	91.0	NA	- -	Yes	No SLV	**Yes-Bio**
PAHs (ug/kg)								
Landfill	2-Methylnaphthalene[4]	0-1 ft	11.0	360,000	0.0000306	Yes	Yes	No
Landfill	Acenaphthene[4]	0-1 ft	592	360,000	0.00164	Yes	Yes	No
Landfill	Acenaphthylene[4]	0-1 ft	18.5	360,000	0.0000514	Yes	Yes	No
Landfill	Anthracene[4]	0-1 ft	722	360,000	0.00201	Yes	Yes	No
Landfill	Fluorene[4]	0-1 ft	273	360,000	0.000758	Yes	Yes	No
Landfill	Naphthalene[4]	0-1 ft	30.6	360,000	0.0000850	No	--	No
Landfill	Phenanthrene[4]	0-1 ft	2,820	360,000	0.00783	Yes	Yes	No
Landfill	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	4,431	NA	- -	Yes	No SLV	No
Landfill	Benzo(a)anthracene[5]	0-1 ft	3,790	18,000,000	0.000211	Yes	Yes	No
Landfill	Benzo(a)pyrene[5]	0-1 ft	4,890	18,000,000	0.000272	Yes	Yes	No
Landfill	Benzo(b)fluoranthene[5]	0-1 ft	5,800	18,000,000	0.000322	Yes	Yes	No
Landfill	Benzo(g,h,i)perylene[5]	0-1 ft	2,400	18,000,000	0.000133	Yes	Yes	No
Landfill	Benzo(k)fluoranthene[5]	0-1 ft	2,070	18,000,000	0.000115	Yes	Yes	No
Landfill	Chrysene[5]	0-1 ft	4,530	18,000,000	0.000252	Yes	Yes	No
Landfill	Dibenz(a,h)anthracene[5]	0-1 ft	725	18,000,000	0.0000403	Yes	Yes	No
Landfill	Fluoranthene	0-1 ft	8,520	360,000	0.0237	Yes	Yes	No
Landfill	Indeno(1,2,3-cd)pyrene[5]	0-1 ft	3,230	18,000,000	0.000179	Yes	Yes	No
Landfill	Pyrene	0-1 ft	7,050	18,000,000	0.000392	Yes	Yes	No
Landfill	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	42,516	NA	- -	Yes	No SLV	No
Sandblast Area	Acenaphthene[4]	0-1 ft	68.0	360,000	0.000189	Yes	Yes	No
Sandblast Area	Anthracene[4]	0-1 ft	150	360,000	0.000417	Yes	Yes	No

Table O.3-9
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Mammals (Individual)
Bradford Island - Upland Operable Unit
(3 of 5)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Individual Mammals Exposed to Erodible Soil (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)
Sandblast Area	Phenanthrene[4]	0-1 ft	940	360,000	0.00261	Yes	Yes	No
Sandblast Area	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	1,356	NA	- -	Yes	No SLV	No
Sandblast Area	Benzo(a)anthracene[5]	0-1 ft	1,200	18,000,000	0.0000667	Yes	Yes	No
Sandblast Area	Benzo(a)pyrene[5]	0-1 ft	1,000	18,000,000	0.0000556	Yes	Yes	No
Sandblast Area	Benzo(b)fluoranthene[5]	0-1 ft	1,600	18,000,000	0.0000889	Yes	Yes	No
Sandblast Area	Benzo(g,h,i)perylene[5]	0-1 ft	590	18,000,000	0.0000328	Yes	Yes	No
Sandblast Area	Benzo(k)fluoranthene[5]	0-1 ft	570	18,000,000	0.0000317	Yes	Yes	No
Sandblast Area	Chrysene[5]	0-1 ft	1,500	18,000,000	0.0000833	Yes	Yes	No
Sandblast Area	Dibenz(a,h)anthracene[5]	0-1 ft	220	18,000,000	0.0000122	Yes	Yes	No
Sandblast Area	Fluoranthene	0-1 ft	2,100	360,000	0.00583	Yes	Yes	No
Sandblast Area	Indeno(1,2,3-cd)pyrene[5]	0-1 ft	690	18,000,000	0.0000383	Yes	Yes	No
Sandblast Area	Pyrene	0-1 ft	1,900	18,000,000	0.000106	Yes	Yes	No
Sandblast Area	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	11,370	NA	- -	Yes	No SLV	No
TPH (mg/kg)								
Sandblast Area	Diesel Range Organics	0-1 ft	69.0	NA	- -	NA	- -	Yes - No SLV
Sandblast Area	Gasoline Range Organics	0-1 ft	2.56	NA	- -	NA	- -	Yes - No SLV
Sandblast Area	Residual Range Organics	0-1 ft	1,000	NA	- -	NA	- -	Yes - No SLV
Bulb Slope	Diesel Range Organics	0-1 ft	102	NA	- -	NA	- -	Yes - No SLV
Bulb Slope	Residual Range Organics	0-1 ft	232	NA	- -	NA	- -	Yes - No SLV
					Landfill Sum R_{Bac}[6] =	36.5		
					Sandblast Area Sum R_{Bac}[6] =	29.5		
					Bulb Slope Sum R_{Bac}[6] =	26.9		

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

Table O.3-9
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Mammals (Individual)
Bradford Island - Upland Operable Unit
(4 of 5)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Individual Mammals Exposed to Erodible Soil (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)

The Landfill AOPC potentially erodible soil subset is comprised of the following samples: BIL01USE through BIL09USE, BIL13SSI, and L-01 through L-04.

Table O.3-9
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Individual COIs for Mammals (Individual)
Bradford Island - Upland Operable Unit
(5 of 5)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Individual Mammals Exposed to Erodible Soil (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)

The Sandblast Area AOPC potentially erodible soil subset is comprised of the following samples: SB-EUA, SB-EUB, SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, SB-EUB-15, and SB-04. The entire Bulb Slope AOPC is potentially erodible.

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.

(2) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the bioaccumulative mammalian (individual) SLVs from (see Appendix J-5c):

In the absence of a site-specific reference UPL for selenium, the freshwater inorganic background concentration suggested by DEQ was used (DEQ 2007).

Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. April 3.

Bioaccumulative COIs in a Given Medium
(3) Any individual COI in any given medium with RBac > 0.1 and Sum RBac > 1, where RBac = Cij/SLVij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .
R_{Bac} = bioaccumulation index for an individual COI
Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The SLV for Fluoranthene was used as a surrogate for the individual LPAHs without SLVs. Fluoranthene is considered an HPAH in the RI, HHRA, and ERA and used to calculate Total HPAH; however, fluoranthene is more accurately a PAH that borders the two with a molecular weight more similar to HPAHs and but a structure more similar to LPAHs. Therefore, use of fluoranthene as a surrogate for LPAHs is appropriate in the absence of any LPAH SLVs.
(5) The SLV for pyrene was used as a surrogate for the individual HPAHs without SLVs.
(6) The Sum R_{Bac} is the sum of the R_{Bac} for Total PCBs as Aroclors and the individual metals, butyltins, and pesticides (except Total DDTs was used instead of the individual DDT isomers).

Table O.3-10
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Mammals (Population)
Bradford Island - Upland Operable Unit
(1 of 5)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Mammal Populations Exposed to Erodible Soil (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)
INORGANICS (mg/kg)								
Landfill	Arsenic	0-1 ft	4.95	5.86	0.845	Yes	Yes	**Yes**
Landfill	Cadmium	0-1 ft	1.04	0.674	1.54	Yes	Yes	**Yes**
Landfill	Lead	0-1 ft	324	14.5	22.3	Yes	Yes	**Yes**
Landfill	Manganese	0-1 ft	447	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Mercury	0-1 ft	0.214	0.214	1.00	Yes	Yes	**Yes**
Landfill	Selenium	0-1 ft	0.490	2.00	0.245	NA	- -	**Yes**
Landfill	Thallium	0-1 ft	0.378	0.354	1.07	Yes	No	**Yes**
Landfill	Zinc	0-1 ft	184	106	1.74	Yes	No	**Yes**
Sandblast Area	Cadmium	0-1 ft	1.06	0.674	1.57	Yes	Yes	**Yes**
Sandblast Area	Lead	0-1 ft	319	14.5	22.0	Yes	Yes	**Yes**
Sandblast Area	Manganese	0-1 ft	479	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Selenium	0-1 ft	0.650	2.00	0.325	NA	- -	**Yes**
Sandblast Area	Zinc	0-1 ft	203	106	1.92	Yes	No	**Yes**
Bulb Slope	Lead	0-1 ft	307	14.5	21.2	Yes	Yes	**Yes**
Bulb Slope	Mercury	0-1 ft	0.720	0.214	3.36	Yes	Yes	**Yes**
BUTYLTINS (ug/kg)								
Sandblast Area	Tributyltin	0-1 ft	12.8	1,100	0.0116	Yes	Yes	No
PESTICIDES (ug/kg)								
Landfill	4,4'-DDT	0-1 ft	18.0	24.0	0.750	Yes	Yes	**Yes**
Landfill	Total DDTs	0-1 ft	19.2	24.0	0.798	Yes	Yes	**Yes**
Landfill	Dieldrin	0-1 ft	2.10	6.10	0.344	Yes	Yes	**Yes**
Sandblast Area	4,4'-DDE	0-1 ft	0.440	24.0	0.0183	Yes	Yes	No
Sandblast Area	4,4'-DDT	0-1 ft	10.0	24.0	0.417	Yes	Yes	**Yes**
Sandblast Area	Total DDTs	0-1 ft	10.4	24.0	0.433	Yes	Yes	**Yes**
Sandblast Area	BHC (delta)	0-1 ft	0.0780	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Endosulfan II	0-1 ft	0.240	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Endosulfan Sulfate	0-1 ft	0.770	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Heptachlor	0-1 ft	0.380	NA	- -	Yes	No SLV	**Yes-Bio**
PCBs (ug/kg)								
Landfill	Aroclor 1254	0-1 ft	28.0	84.0	0.333	Yes	Yes	**Yes**
Landfill	Aroclor 1260	0-1 ft	55.4	84.0	0.660	Yes	Yes	**Yes**
Landfill	Total PCBs (Aroclors)	0-1 ft	88.2	84.0	1.05	Yes	Yes	**Yes**
Sandblast Area	Aroclor 1260	0-1 ft	67.0	84.0	0.798	Yes	Yes	**Yes**
Sandblast Area	Total PCBs (Aroclors)	0-1 ft	69.1	84.0	0.823	Yes	Yes	**Yes**
Bulb Slope	Aroclor 1260	0-1 ft	106	84.0	1.26	Yes	Yes	**Yes**

Table O.3-10
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Mammals (Population)
Bradford Island - Upland Operable Unit
(2 of 5)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Mammal Populations Exposed to Erodible Soil (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)
Bulb Slope	Total PCBs (Aroclors)	0-1 ft	104	84.0	1.24	Yes	Yes	**Yes**
VOCs (ug/kg)								
Sandblast Area	1,2,4-Trimethylbenzene	0-1 ft	0.243	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	4-Isopropyltoluene	0-1 ft	1.46	NA	- -	Yes	No SLV	**Yes-Bio**
SVOCs (ug/kg)								
Landfill	Bis(2-ethylhexyl) Phthalate	0-1 ft	229	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Carbazole	0-1 ft	81.5	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Dibenzofuran	0-1 ft	32.9	NA	- -	Yes	No SLV	**Yes-Bio**
Landfill	Di-n-butyl Phthalate	0-1 ft	563	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Bis(2-ethylhexyl) Phthalate	0-1 ft	260,000	NA	- -	Yes	No SLV	**Yes-Bio**
Sandblast Area	Carbazole	0-1 ft	91.0	NA	- -	Yes	No SLV	**Yes-Bio**
PAHs (ug/kg)								
Landfill	2-Methylnaphthalene[4]	0-1 ft	11.0	1,800,000	0.00000611	Yes	Yes	No
Landfill	Acenaphthene[4]	0-1 ft	592	1,800,000	0.000329	Yes	Yes	No
Landfill	Acenaphthylene[4]	0-1 ft	18.5	1,800,000	0.0000103	Yes	Yes	No
Landfill	Anthracene[4]	0-1 ft	722	1,800,000	0.000401	Yes	Yes	No
Landfill	Fluorene[4]	0-1 ft	273	1,800,000	0.000152	Yes	Yes	No
Landfill	Naphthalene[4]	0-1 ft	30.6	1,800,000	0.0000170	No	--	No
Landfill	Phenanthrene[4]	0-1 ft	2,820	1,800,000	0.00157	Yes	Yes	No
Landfill	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	4,431	NA	- -	Yes	No SLV	No
Landfill	Benzo(a)anthracene[5]	0-1 ft	3,790	90,000,000	0.0000421	Yes	Yes	No
Landfill	Benzo(a)pyrene[5]	0-1 ft	4,890	90,000,000	0.0000543	Yes	Yes	No
Landfill	Benzo(b)fluoranthene[5]	0-1 ft	5,800	90,000,000	0.0000644	Yes	Yes	No
Landfill	Benzo(g,h,i)perylene[5]	0-1 ft	2,400	90,000,000	0.0000267	Yes	Yes	No
Landfill	Benzo(k)fluoranthene[5]	0-1 ft	2,070	90,000,000	0.0000230	Yes	Yes	No
Landfill	Chrysene[5]	0-1 ft	4,530	90,000,000	0.0000503	Yes	Yes	No
Landfill	Dibenz(a,h)anthracene[5]	0-1 ft	725	90,000,000	0.00000806	Yes	Yes	No
Landfill	Fluoranthene	0-1 ft	8,520	1,800,000	0.00473	Yes	Yes	No
Landfill	Indeno(1,2,3-cd)pyrene[5]	0-1 ft	3,230	90,000,000	0.0000359	Yes	Yes	No
Landfill	Pyrene	0-1 ft	7,050	90,000,000	0.0000783	Yes	Yes	No
Landfill	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	42,516	NA	- -	Yes	No SLV	No
Sandblast Area	Acenaphthene[4]	0-1 ft	68.0	1,800,000	0.0000378	Yes	Yes	No
Sandblast Area	Anthracene[4]	0-1 ft	150	1,800,000	0.0000833	Yes	Yes	No

Table O.3-10
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Mammals (Population)
Bradford Island - Upland Operable Unit
(3 of 5)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Mammal Populations Exposed to Erodible Soil (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)
Sandblast Area	Phenanthrene[4]	0-1 ft	940	1,800,000	0.000522	Yes	Yes	No
Sandblast Area	Total LPAHs (KM, capped; NDs at MDL)	0-1 ft	1,356	NA	- -	Yes	No SLV	No
Sandblast Area	Benzo(a)anthracene[5]	0-1 ft	1,200	90,000,000	0.0000133	Yes	Yes	No
Sandblast Area	Benzo(a)pyrene[5]	0-1 ft	1,000	90,000,000	0.0000111	Yes	Yes	No
Sandblast Area	Benzo(b)fluoranthene[5]	0-1 ft	1,600	90,000,000	0.0000178	Yes	Yes	No
Sandblast Area	Benzo(g,h,i)perylene[5]	0-1 ft	590	90,000,000	0.00000656	Yes	Yes	No
Sandblast Area	Benzo(k)fluoranthene[5]	0-1 ft	570	90,000,000	0.00000633	Yes	Yes	No
Sandblast Area	Chrysene[5]	0-1 ft	1,500	90,000,000	0.0000167	Yes	Yes	No
Sandblast Area	Dibenz(a,h)anthracene[5]	0-1 ft	220	90,000,000	0.00000244	Yes	Yes	No
Sandblast Area	Fluoranthene	0-1 ft	2,100	1,800,000	0.00117	Yes	Yes	No
Sandblast Area	Indeno(1,2,3-cd)pyrene[5]	0-1 ft	690	90,000,000	0.00000767	Yes	Yes	No
Sandblast Area	Pyrene	0-1 ft	1,900	90,000,000	0.0000211	Yes	Yes	No
Sandblast Area	Total HPAHs (KM, capped; NDs at MDL)	0-1 ft	11,370	NA	- -	Yes	No SLV	No
TPH (mg/kg)								
Sandblast Area	Diesel Range Organics	0-1 ft	69.0	NA	- -	NA	- -	Yes - No SLV
Sandblast Area	Gasoline Range Organics	0-1 ft	2.56	NA	- -	NA	- -	Yes - No SLV
Sandblast Area	Residual Range Organics	0-1 ft	1,000	NA	- -	NA	- -	Yes - No SLV
Bulb Slope	Diesel Range Organics	0-1 ft	102	NA	- -	NA	- -	Yes - No SLV
Bulb Slope	Residual Range Organics	0-1 ft	232	NA	- -	NA	- -	Yes - No SLV
					Landfill Sum R_{Bac}[6] =	31.0		
					Sandblast Area Sum R_{Bac}[6] =	27.1		
					Bulb Slope Sum R_{Bac}[6] =	25.8		

This table only includes COIs detected > 5% and above the reference area (metals only).
CPEC = chemical of potential ecological concern
COI = chemical of interest
HPAH = high molecular weight polycyclic aromatic hydrocarbons
KM, capped = Kaplan–Meier-based with Efron's bias correction, capped
LPAH = low molecular weight polycyclic aromatic hydrocarbons
MDL = method detection limit
NA = not available
ND = non detect
SLV = screening level value
UCL = upper confidence limit on the mean
Yes-Bio = Identified as potential CPEC because COI is bioaccumulative but SLV is does not account for bioaccumulation or there is no SLV
- - = not applicable

Table O.3-10
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Mammals (Population)
Bradford Island - Upland Operable Unit
(4 of 5)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Mammal Populations Exposed to Erodible Soil (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)

The Landfill AOPC potentially erodible soil subset is comprised of the following samples: BIL01USE through BIL09USE, BIL13SSI, and L-01 through L-04.

Table O.3-10
Identification of Bioaccumulative CPECs in Mass Wasting and Erodible Soil at Upland OU - Mammals (Population)
Bradford Island - Upland Operable Unit
(5 of 5)

AOPC	Chemicals of Interest	Depth Category (Soil)	Lower of Maximum and 95% UCL (1)	Sediment SLVs for Mammal Populations Exposed to Erodible Soil (2)	Toxicity Ratio for Mammals (R_{Bac})	Is COI Bioaccum-ulative?	SLV Accounts for Bioaccum-ulation?	COI is Identified as a Bioaccumulative CPEC? (3)

The Sandblast Area AOPC potentially erodible soil subset is comprised of the following samples: SB-EUA, SB-EUB, SB-EUA-02, SB-EUA-04, SB-EUA-06, SB-EUA-08, SB-EUB-02, SB-EUB-03, SB-EUB-12, SB-EUB-15, and SB-04. The entire Bulb Slope AOPC is potentially erodible.

(1) The lower of the maximum detected concentration and the calculated 95% UCL for COIs with at least 8 samples was used.

(2) The greater of the site-specific reference 95% UPL concentration (inorganics only) and the bioaccumulative mammalian (population) SLVs from (see Appendix J-5c):

In the absence of a site-specific reference UPL for selenium, the freshwater inorganic background concentration suggested by DEQ was used (DEQ 2007).

Oregon Department of Environmental Quality (DEQ), 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Land Quality Division. Final. April 3

Bioaccumulative COIs in a Given Medium

(3) Any individual COI in any given medium with RBac > 0.1 and Sum RBac > 1, where RBac = Cij/SLVij, must be identified as a CPEC.

Where: Cij = concentration of contaminant *i* in medium *j*

SLVij = Level II Screening Level Value from DEQ for contaminant *i* in medium *j* .

R_{Bac} = bioaccumulation index for an individual COI

Sum R_{Bac} = Cumulative Bioaccumulation Index for all COIs

(4) The SLV for Fluoranthene was used as a surrogate for the individual LPAHs without SLVs. Fluoranthene is considered an HPAH in the RI, HHRA, and ERA and used to calculate Total HPAH; however, fluoranthene is more accurately a PAH that borders the two with a molecular weight more similar to HPAHs and but a structure more similar to LPAHs. Therefore, use of fluoranthene as a surrogate for LPAHs is appropriate in the absence of any LPAH SLVs.

(5) The SLV for pyrene was used as a surrogate for the individual HPAHs without SLVs.

(6) The Sum R_{Bac} is the sum of the R_{Bac} for Total PCBs as Aroclors and the individual metals, butyltins, and pesticides (except Total DDTs was used instead of the individual DDT isomers).

Table O.3-11
Summary of Upland OU Bioaccumulative COIs that Lacked Dietary-based SLVs
Bradford Island - Upland Operable Unit
(1 of 1)

Butyltins	Pesticides	VOCs	SVOCs
Tributyltin	BHC (delta)	1,2,4-Trimethylbenzene	Bis(2-ethylhexyl) Phthalate
	BHC (gamma)	4-Isopropyltoluene	Butyl Benzyl Phthalate
	Chlordane (alpha)	Isopropylbenzene	Carbazole
	Chlordane (gamma)	n-Propylbenzene	Dibenzofuran
	Chlordane (technical)		Di-n-butyl Phthalate
	Endosulfan I		Di-n-octyl Phthalate
	Endosulfan II		PAHs (Birds Only)
	Endosulfan sulfate		
	Endrin		
	Endrin aldehyde		
	Endrin ketone		
	Heptachlor		
	Methoxychlor		

Table O.3-12
Ecological Risk-Based Screening for Metals with High MDDs
Bradford Island - River Operable Unit
(1 of 1)

Area of Potential Concern	Chemicals of Interest	Medium	Max Detected Conc in Tissue (mg/kg wet)	Tissue EPC - Lower of Maximum and 95% UCL (1) (mg/kg wet)	Site-Specific Reference UPL	DEQ Bioaccumulation CTLs and ATLs (2) (mg/kg wet)			Toxicity Ratios (R_{Bac}) (3)			Is COI Bioaccumulative? (BCF>300 or Log Kow >3.5)	Should COI be considered further as a CPEC? (3)
						Fish	Birds	Mammals	Fish	Birds	Mammals		
Forebay	Lead	Crayfish	2.66	0.925	1.14	1.2	9.3	34	0.8	0.10	0.027	Yes	No
Forebay	Chromium	Smallmouth Bass	0.860	0.302	7.15	not available	not available	not available	--	--	--	No	Yes - No SLV

ATL = acceptable tissue level protective of birds or mammals
CPEC = chemical of potential ecological concern
COI = chemical of interest
CTL = critical tissue level protective of fish
DEQ = Oregon Department of Environmental Quality
EPC = exposure point concentration
MDD = minimum detectable difference
mg/kg wet = milligrams per kilogram wet weight
T&E = threatened and endangered
UCL = upper confidence limit on the mean
UPL = upper prediction limit

(1) The lower of the maximum detected concentration and the calculated 95% UCL.

Hierarchy of SLV Selection (see Appendix J-5d)
For metals only, the higher of the Reference Area 95% UPL and the hierarchical SLV was selected.
(2) DEQ 2007. Guidance for Evaluation of Bioaccumulative Chemicals of Concern in Sediment. Final. April 3. For birds and mammals, ATLs protective of individuals are shown.

Bioaccumulative COIs in a Given Media
(3) Any individual COI in any given medium with $R_{Bac} > 1$, where R_{Bac} = Cij/ATLij or CTLij, must be identified as a CPEC.
Where: Cij = concentration of contaminant *i* in medium *j*
SLVij = DEQ Bioaccumulation CTL or ATL
R_{Bac} = bioaccumulation index for an individual COI

Table O.3-13 - COIs with Recently Updated SLVs that have Decreased
Bradford Island, Upland and River Operable Units
(1 of 1)

Chemical of Interest [a]	Current Ecological Water SLV from Table J-5b (ug/L)		DEQ Freshwater Table 20 WQC [f] (ug/L)	Is DEQ's Updated WQC < Current SLV?
DDT isomers	0.001	b	0.001	No
BHC (gamma) Lindane	0.08	c	0.08	No
Chlordanes	0.0043	e	0.0043	No
Cyanide (Hydrogen Cyanide)	5.2	b	5.2	No
Chromium	74 (49)	d	210	No
Dieldrin	0.056	b	0.0019	**Yes**
Endosulfans	0.056	b	0.056	No
Endrin	0.036	b	0.0023	**Yes**
Heptachlor	0.0038	b	0.0038	No
Methoxychlor	0.03	c	0.03	No
Pentachlorophenol	15	b	13	**Yes**
Toxaphene	0.002	b	0.0002	**Yes**
Chloride	230,000	c	230,000	No
Cadmium	0.25 (0.17)	d	1.1	No
Copper	9 (5.8)	d	12	No
Iron	1,000	c	1,000	No
Lead	2.5 (1.44)	d	3.2	No
Mercury	0.77	b	0.012	**Yes**
Nickel	52 (34)	d	160	**Yes**
Selenium	5	b	35	No
Silver	0.12	e	0.12	No
Zinc	120 (77)	d	110	**Yes**

DEQ = Oregon Department of Environmental Quality
NRWQC = National Recommended Water Quality Criteria
SLV = Screening Level Value
ug/L = microgram per liter
USEPA = US Environmental Protection Agency
WQC = Water Quality Criteria

[a] Only COIs that were actually detected in groundwater or seeps from the Upland OU or surface water from the River OU are included in this table.
[b] USEPA 2009. National Recommended Water Quality Criteria. Office of Water and Office of Science and Technology.
[c] Oregon Department of Environmental Quality (ODEQ). Water Quality Criteria for freshwater organisms (Oregon Administrative rules, section 340-041, Table 33A).
[d] NRWQC (USEPA, 2009) shown and value in parenthesis is the criterion adjusted for hardness. As per EPA guidance, certain NRWQC were adjusted for hardness based on a site-specific hardness value of 60 mg/L.
[e] DEQ 1998. Updated 2001. Guidance for Ecological risk Assessment: Levels I,II,III,IV. Waste Management and Cleanup Division.
[f] DEQ. Aquatic Life Water Quality Criteria for freshwater organisms (Oregon Administrative rules, section 340-041, new Table 20).

APPENDIX P

RESPONSES TO DEQ COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT

Comment Number	Comments by Jennifer Peterson, Paul Seidel and Bob Schwarz, DEQ Cleanup Program April 22, 2011	US Army Corps of Engineers Response/Action Taken
General Comments		
1.	**Slope stability near the landfill.** As DEQ has mentioned previously, we are concerned about the findings in a May 2001 draft document by URS entitled, Draft *Geotechnical Design report, North Slope Regrade and Stabilization, Bradford Island Landfill.* Of particular interest are the following: - **Page 1-1, paragraph 1:** URS states that the purpose of the report is "to evaluate the stability of the slope north of the landfill and prepare a geotechnical design for regrading and stabilizing the slope." [This statement indicates that at the time, the need to regrade this slope was considered a foregone conclusion.] - **Page 4-2:** Table 1 on this page shows that even if the slope were reduced to 2:1 (horizontal to vertical), the factor of safety would be only 1.4, less than the recommended 1.5. This analysis did not consider seismic effects. Both Table 1 and Table 3 (which considers seismic effects) suggest that the slope should be reduced to 2.5:1. [As noted on in section 5.2.1.3 of the draft RI report, slopes on this part of the island are greater than 1:1.] The draft RI report discusses this issue in sections 5.2.1.3, 9.1.1 and 13.1. The draft RI report states qualitatively that "mass wasting" is possible but that the risk is low. This issue is also discussed in the following two URS documents: - January 19, 2007 draft memorandum: *Upland Source Evaluation – Bradford Island Landfill, Bulb Slope and Site 7,* - August 9, 2007, memorandum: *Upland Source Evaluation - Bradford Island Landfill.* Again, the discussions in these documents are qualitative. We are concerned that the project record includes a 2001 report containing a quantitative geotechnical analysis indicating that the slope is unstable and discussing measures to be taken to make it stable. And then the issue appears to be dropped. If the 2001 study is incorrect, a quantitative rebuttal needs to be (cont'd)	Comment noted. The May 2001 Draft *Geotechnical Design report, North Slope Regrade and Stabilization, Bradford Island Landfill* was not completed as a Final Report in 2001. The Portland District instead decided to investigate the potential for contamination to reside in the Landfill area where the geotechnical work was conducted. Based on the findings of the Draft Final *Upland and River Operable Units Remedial Investigation Report, Bradford Island Cascade Locks, Oregon*, "The majority of the ground surface at the Landfill AOPC is relatively flat, well vegetated, and shows minimal evidence of surface runoff, soil erosion, or sediment deposition, indicating that the ground surface is stable and there is minimal potential for off-site migration of contaminated soil or buried debris. The north and east sides of the Landfill AOPC include steep slopes leading down to the Columbia River. Although the potential for mass wasting appears low, soil on these slopes has the potential to migrate to the Columbia River via mass wasting." The recommendation for the Landfill AOPC presented in Section 13.7 of the draft final Remedial Investigation report (RI) was: "Based on the screening level risk assessments at the Landfill AOPC, implementation of one of two options is recommended: 1. Perform a feasibility study (FS) to identify targeted soil removal or other remedial actions which will decrease residual concentrations to acceptable risk levels or 2. Perform a site-specific BHHRA and a Level III BERA to determine if risks to human and ecological receptors are unacceptable. " For the Upland AOPCs the Portland District is planning to perform option 2 above and perform a site-specific BHHRA and a Level III BERA to determine if risks to human and ecological receptors are unacceptable. Further evaluation of the mass wasting and erosion pathways from Upland soils to the River will be performed in the BHHRA and Level III BERA because chemicals of potential concern (COPCs) were identified for these exposure pathways in the screening-level human and ecological risk assessments that were presented in (cont'd)

1. (cont'd)	(cont'd) presented showing why it is incorrect. The draft RI suggests that, if a massive slope failure were to occur and a large portion of the landfill were to end up in the Columbia River, contaminant levels in the waste are not high enough to cause significant environmental harm. We believe that contaminant concentrations are beside the point. If there is reason to think a significant portion of a landfill could end up in the river, measures must be taken to prevent the slope failure from happening.	(cont'd) Appendix O of the RI. Based on the future findings of the BHHRA and Level III BERA, the Portland District plans to revisit the North slope regrade and stabilization issue as part of the Upland FS for the Bradford Island Landfill.
2.	**Use and interpretation of qualified data.** DEQ continues to disagree with the interpretation of EMPC qualifiers. It is our understanding that the following reasoning was followed: If all laboratory QA criteria were met indicating the presence of an analyte, but the ion-abundance ratio was greater than method-defined ion ratios, the analyte was qualified as an EMPC, and then subsequently identified as a non-detection. DEQ's opinion is that the EMPC value can be corrected to account for the elevated ion abundance ratio. Depending on the amount of the deviation, the concentration may be valid and should be used in further calculations. Certainly, analytical results with ion abundance ratios less than 25 percent should be used as a full detected value. By evaluating the actual deviation of the ion ratio and the corrected EMPC value, results can be validated and used on a case by case basis. In many cases, the use of the EMPC as non-detected concentration significantly and inappropriately elevates the detection limits of the analytical results. In the future, all congener data should be provided to the DEQ laboratory for independent validation, and the instrument estimated detection limit (EDL) and analyte-specific reporting limit (MRL) should be provided. Validation of analytical data should be conducted by an independent third party. Moreover, additional cleanup procedures should be considered that have the potential to reduce the occurrence of EMPCs. Information presented in Appendix H suggests that the impact of this decision on calculation of total PCBs appears to be limited. However, the decision to treat EMPCs as non-detects adds ambiguity to the interpretation of Forebay-to-Reference Area hypothesis tests, exposure point concentration (EPC) calculations in the risk assessment and, toxicity equivalent (TEQ) estimates. Further, it may complicate an assessment (cont'd)	Comment noted. The treatment of the EMPC qualified data in the RI is consistent with the agreed upon approach, as outlined in the RI/FS MP, 22 April 2010 Memorandum (see pages 16-18), and 30 September 2010 Memorandum.

2. (cont'd)	(cont'd) of congener profiles, should this be needed in the future. Therefore, we believe decision rules for treatment of method reporting limits and estimated detection limits should be agreed on in advance of future monitoring. In addition to EMPC qualifiers, only the RDL, defined here as the "reported detection limit," was reported for high resolution data. Please confirm that the RDL is equivalent to the estimated detection limit (EDL). It appears that method reporting limit (MRL) was not reported for the high resolution data set. The MRL and EDL data provide the information necessary to "J"-flag data. Since this is not reported, it is unclear how "J" flags were assigned in the dataset. In summary, the database should be updated consistent with the above comments on treatment of EMPC qualifiers and inclusion of the MRL. **Follow-up DEQ Response:** Concerning the February 10, 2010 and the September 30, 2010 memos, the September 30 memo addressed the approach to calculation of total PCB and PAHs. DEQ agrees with the approach outlined in that memo to calculate totals, which was used in the RI report. The February 10 memo discusses the point of disagreement, which is with respect to interpretation of EMPC qualifiers as non-detections. DEQ appreciates the detailed discussion and presentation on this issue provided in the February 10 memo as well as the fact that there is limited guidance on how to handle EMPC qualified results. DEQ believes that peaks that would otherwise be qualified as EMPC may be resolvable from instrument noise and used on a case by case basis. As discussed during a meeting on June 15, 2011, DEQ prepared a proposal for management of PCB congener data to be used in future monitoring. This proposal was intended as basis for discussion between USACE and DEQ analytical laboratory staff, regarding analysis and management of future PCB congener data for the project. The proposal was transmitted in a memo from Jennifer Peterson, Paul Seidel and Bob Schwarz, to Mark Dasso and Mike Gross on July 12, 2011.	Comment accepted. DEQ's proposed approach for treatment of EMPC data will be adopted for all future monitoring activities in the River, while the approach currently used will be maintained to finalize the RI/RAs.
3.	**Forebay sediment risk assessment.** The 19 randomly collected sediment samples are intended to characterize the forebay as a single unit. However, relatively few of these samples happened to be in the vicinity of the source (cont'd)	Comment noted. The Portland District is planning to conduct future sampling in the 2007 sediment removal areas as part of the River OU FS. As stated, the additional investigation work will be conducted in the (cont'd)

3. (cont'd)	(cont'd) area (i.e., P4, P5, and P6). To the extent that residual contaminants remain in these source areas they are not adequately represented by the existing random sediment samples. The omission of source area sediment samples around Bradford Island confounds important evaluations in the RI report related to COPC selection, risk assessment and source evaluation Therefore, we believe it is appropriate for sediment to remain a relevant medium for future monitoring. There is some additional uncertainty in the risk assessment with respect to the contributions from the source area sediment to tissue body burdens. Although contaminants are distributed throughout the forebay, the most significant concentrations remain near Bradford Island, as indicated by the random samples closest to Bradford Island and source samples presented in Appendix G. Future sediment sampling will need to include more substantial sampling around Bradford Island. This should include the area dredged in 2007, so that we can evaluate whether contaminant levels have rebounded. **Clarification of DEQ Response:** DEQ's concern as expressed in the comment, relates to the adequacy of the 19 random forebay samples in capturing potential source areas. In particular, DEQs concern is focused on the older detections of PCBs outside the removal areas and along the northern shore of Bradford Island that range up to 500 ug/kg (e.g. S1-39 and S1-41; S2-72-75 and TR series). Additional COIs such as Aroclor 1260, phthalates, butyltins and metals were detected in the areas below source areas (sandblast AOPC, bulb slope, etc.) USACE proposed in an email dated July 28th, 2011, new sediment sampling locations to address this concern with the following objectives: 1) Confirm that the 19 random samples accurately represent the in-water OU. If deemed yes, then these samples would remain as the baseline condition for future monitoring. 2) As a secondary objective, detection of localized areas of contamination in the removal areas. Six new locations are proposed to address the Corps' two objectives. However, these sample locations are within previous removal areas. DEQ proposes an additional objective for sample selection: to characterize source area sediment (cont'd)	(cont'd) former sediment removal areas. The investigation will look into whether sediment has been redeposited in the former sediment removal areas and whether clams have repopulated the area. If sediment has been redeposited and accumulated in the removal areas and/or clams have repopulated the area, then both sediment and clam samples will be collected. The samples will be analyzed for PCBs, metals, PAHs, pesticides, butyltins and SVOCs. The intent of the sediment sampling will be to confirm that the 19 randomly collected sediment samples are representative of the Forebay as a single operable unit. Additionally, the Portland District is planning to collect another round of bass samples from the Forebay and Reference Areas. The intent of this sampling is to assess current bass contamination levels and set a baseline for potential bass monitoring as part of the River OU FS Alternatives. Comment noted. As part of the pre-feasibility study work, the Corps has collected additional River OU sediment and clam samples at seven locations along the north-shore of Bradford Island. The samples were collected in the areas suggested by DEQ in the October 13, 2011 email from Bob Schwarz. The intent of the samples is to verify data used in the RI characterization of the areas in and around the removal areas to verify COIs and COPCs identified in the RI/RA. The sediment and clam sampling was completed in October 2011. Sediment samples were successfully collected at all seven proposed sample locations. While clams were located and collected at all seven proposed sample locations, only six of the locations yielded enough clam tissue for the planned analysis. It is the Corps' understanding that DEQ's comments pertaining to the sampling effort in the River OU have been adequately addressed. For this reason, historical data collected outside of the removal areas will not be used in the RI and RAs. Further, as discussed in Section 5.4 in the RI Report, there are numerous data quality concerns associated with use of the historical data in terms of their ability to represent current spatial (cont'd)

3. (cont'd)	(cont'd) around Bradford Island outside the removal areas for the source control evaluation and to validate the COIs and COPCs identified in the remedial investigation and risk assessment. Additional samples should be added to address DEQ's stated objective above, and should be placed to ensure that they can be considered replacement for the older pre-RI data and address DEQ concern about runoff from different areas of concern (e.g. the Sandblast area and bulb slope AOPCs) and remaining PCB contamination outside removal areas. For example, sandblast area source samples should be placed closer to shore and more proximal to previous sampling near SBDS-19, S1-32 and S1-43. Similar samples should be placed just offshore of former pile #3 (S1-39, S1-41). Recharacterization of areas with elevated PCB sediment concentrations contamination between removal area 2 and 3 is also needed. [Proposed sample P115 may address this concern for former pile #3, but without a map that includes historical sediment samples it is difficult to verify this]. For source control, if any one composite sample indicated the potential for a localized area of elevated concentrations, then that potential source would be the subject of addition actions. If data indicate that one location is elevated relative to RI data, it should be re-screened to ensure no COPCs or CPECs have been missed in the risk assessment. If sampling cannot be completed to meet these objectives in the fall of 2011, a screening of historical Bradford Island source area sediment data for all contaminants of interest outside the removal action areas should be completed as a part of RI and risk assessment revisions. Maps should be provided that show the historical sampling locations along with more recent fore bay sampling efforts. Currently, it is difficult to determine how current sampling plans line up with historical samples.	(cont'd) distributions. These concerns include the fact that collection of data occurred over many years and multiple sampling events, and there is variation in sampling methods, analytical methods, suite of included analytes, and reporting limits. These data were collected from the dynamic forebay environment and more than one interim removal actions has also occurred since the collection data. Therefore, inclusion of the historical data is expected to introduce additional uncertainty into the RI evaluation.
4.	**Goose Island.** The sampling around Goose Island provides limited information about contaminant levels in sediment and small home range species such as clam, sculpin and crayfish. Data on these receptors was hampered by problems collecting tissue on these species. The lines of evidence available, however, do show elevated levels of contaminants around Goose Island in sediment, surface water, and tissue. Contaminants of interest in the Goose Island area appear similar to those found around Bradford Island, (cont'd)	Comment noted.

4. (cont'd)	(cont'd) and include cadmium, mercury, phthalates, PCBs, and PAHs. The magnitude of these exceedances and contribution to fish tissue are unclear at this time given uncertainty in bass habitat use. Until more post-removal data is collected to refine exposure estimates, Goose Island should remain an area of concern.	
5.	**Censoring level.** Because a J-flagged detection contains useful information, as described in Section 7.2.1, it is our preference to censor data at the method detection limit (MDL), not the method reporting limit (MRL), for EPC calculations. While this could be interpreted as less precise, it is standard risk assessment practice, and should be done consistently in any future risk calculations.	Clarification provided. In general, calculation of the 95% upper confidence limit on the mean (UCL) was relatively insensitive to the choice of censoring level. Based on the data review presented in Section 7.2, the more statistically-robust UCL calculation using the MDL as the censoring level, plus using the J-flagged data as-is, was indeed employed in the EPC calculations for the risk assessments, as suggested by the commenter.
6.	**Data sets not used in the RI.** Data collected in earlier phases of investigation and not used in the RI are presented in Appendix G. Additional explanation of these data sets is needed to ensure important data are not omitted. Alternatively, these data should be reviewed as part of a weight of evidence evaluation to ensure no additional contaminants of potential concern (COPCs) or contaminants of potential ecological concern (CPECs) would have been included, if these data were considered. For example, data should not be removed when evaluating areas of concern (e.g. landfill, sandblast area, River OU) except when they are superseded by newer data that represent the same locations or analytes list. As specific examples for the Sandblast Area and River OU, the older data sets include analyses for butyltins in soil, sediment, pore water and catch basin samples that were not included in more recent forebay sediment samples. These appear to be associated with a source in the sandblast area, and would not have been addressed as an element of the risk assessment. Even where similar lists of COPCs were identified, such as the Landfill Area, omitted datasets provide additional information on the heterogeneity and magnitude of contamination not captured by the most recent data collection.	Comment noted. The data utilization strategy was presented in detail in the agreed upon RI/FS MP (URS, 2007). As discussed in Section 5.0 of the RI, except where data quality does not meet the standards outlined in the RI/FS MP (URS 2007a) and where comparable data were superseded by newer data at the same location, analytical results from investigations in the Upland OU from 1999 to 2009 are included in the RI data set and were evaluated in the Upland OU risk assessments. The relatively static physical environment of the Upland OU means that environmental data collected over the past decade can be considered representative of current conditions. Historical Upland OU data not utilized in the RI <u>due to poor data quality</u> are provided in Appendix G. In contrast to the Upland OU, the physical environment of the River OU is much more dynamic and the primary (in-water) contamination sources (the electrical equipment, debris, and the majority of the contaminated sediment) have been removed from the river. Additionally, the sampling methods used to collect the historical data from the River OU are not comparable to the recent sampling which was conducted in accordance with the procedures outlined in the River OU QAPP (URS 2007b), Revised Sculpin Analysis Strategy Technical Memorandum (URS 2009b), and In Water QAPP Addendum (URS 2009c). Therefore, only analytical results from investigations in the River OU after 2007, with the exception of smallmouth bass and sucker collected in 2006, are included (cont'd)

6. (cont'd)		(cont'd) in the RI data set and used in the River OU risk assessments to evaluate current conditions. As discussed above, based on the future findings of the BHHRA and Level III BERA the Portland District plans to revisit the North slope regrade and stabilization issue as part of the Upland OU FS for the Bradford Island Landfill AOPC (see the response to General Comment 1) and is planning to conduct future sampling in the 2007 sediment removal areas as part of the River OU FS (see the response to General Comment 3). The initial FS samples in the sediment removal areas will be analyzed for PCBs, metals, PAHs, organochlorine pesticides, butyltins and SVOCs. Also see the response to General Comment 9 (Source Control), below.
	Clarification of DEQ Response: DEQ does not object to replacing older data with newer data to represent current conditions, and using consistent sampling and analytical methods and detection and reporting limits that are lower and using recent data that were collected to meet specific RI objectives. To complete resolution of the comment, DEQ requests more specific information on the particular reasons why each data set not used in the RI was excluded. This information should be presented in Appendix G. We suggest a table by date, sampling event and environmental medium that presents the reason for exclusion of each data set, and references the newer data that replaces it. For the in-water data, in cases where some analytes and media may not be replaced by newer data, a reference to the inclusion of the same analytes in the planned sediment sampling and tissue monitoring would also be appropriate. Some of the data sets that represent catch basins or sediments near the sandblast and landfill AOPCs should be considered in assessing source control from these AOPCs.	Comment noted. One main objective of the RI/FS MP (URS 2007) was to review the all of the existing data collected from the River (both qualitative and quantitative) during previous investigations and remedial activities in order to develop a clear understanding of the COIs, their present locations, and their potential future fate and transport. Much of this information was presented in Section 5.0 of the RI/FS MP. The list of COIs developed for each medium in the River was used to identify data gaps and facilitate the sampling efforts described in the RI/FS MP and River QAPP (URS 2007). As described in Section 8.0 of the RI/FS MP, all existing information was used to identify data gaps that would allow for the achievement of 3 main goals: nature and extent delineation, completion of the HHRA, and completion of the ERA. The Corps feels that the sampling efforts performed in support of RI and RAs were adequate to achieve the 3 main goals and does not believe additional efforts are warranted to re-justify the sampling design and approach. With the exception of the additional sampling activities described in the response to General Comment 3, which will supplement the proposed pre-FS sampling effort, no further attempt will be made to re-characterize the site or justify the exclusion of historical data. (cont'd)

6. (cont'd)		(cont'd) As stated previously, including the historical data (or any data collected independently of the random sampling design) would introduce bias into the Ras since the purpose of the random sampling strategy was to generate a dataset that represents the Forebay as a whole. Each random sample was spatially-distributed equally across the entire unit. However, all chemicals will be analyzed for in pre-FS sediment and clam samples that will be collected from the north side of the island and bass tissue collected from the Forebay and Reference Area (PCBs [Aroclors and congeners], metals, PAHs, pesticides, butyltins, and SVOCs). If the results of these analyses indicate a potential source of contamination that was overlooked based on evaluation of the random Forebay datasets included in the RI/RA, the list of sediment and tissue COPCs and CPECs may be modified to reflect the new information. URS. 2007. Remedial Investigation/Feasibility Study (RI/FS) Management Plan (MP), Bradford Island, Bonneville Lock and Dam Project, Cascade Locks, Oregon. September. URS. 2007. Quality Assurance Project Plan (QAPP), River Operable Unit Remedial Investigation, Bradford Island, Bonneville Lock and Dam Project, Cascade Locks, Oregon. September.
7.	**Reference area.** The reference area does have some elevated metals, PAH, and 4-methylphenol concentrations, indicating some degree of impacts from these constituents. In particular the bass samples are substantially elevated over the forebay in lead and nickel.	Comment noted.
8.	**Statistical comparison between site and reference area.** There are several instances where the statistical comparison between site and reference exhibits a high minimum detectable difference (MDD). In these cases the hypothesis test had very low power to detect a difference. However, examination of the data further clearly shows a difference in the range and magnitude of contamination. In these cases, contaminants of interest (COIs) should be carried forward to the risk assessment for screening. A few examples are provided below, but corrections should be made to all exposure areas and media (soil, sediment, surface water, groundwater, seep water, and tissue samples). Some examples include: (cont'd)	Comment noted. The goal of the statistical comparison was to compare the central tendency (mean or median) of two populations, as opposed to comparing the tail-end or the maximum observed values. This is analogous to the use of 95% UCL (an estimate of average concentration) to reflect the EPC (i.e., average exposure). Hence, even though a few elevated concentrations were observed for the site, as noted by the reviewer, the *average* concentrations did not appear to be significantly different between the two populations. Given the large number of statistical comparisons, it was conceivable that some MDDs were not as desirable; though currently a minimum level of MDD was not established (cont'd)

8. (cont'd)	(cont'd) Landfill, surface (0-1ft): Arsenic, chromium, copper, nickel and silver were detected at maximum concentrations of 30, 801, 494, 570 and 570 parts per million (ppm), respectively. MDDs were 148 percent, 598 percent, 195 percent, 492 percent and 370 percent. The report concluded there was no statistical difference, and these COIs were not carried forward into the risk assessment. The 0-3 ft interval had similar results with higher-magnitude detections and larger MDDs. Sandblast, Surface (0-1ft): The issue described above for the landfill samples is also true here, for copper, mercury, nickel and antimony. **Follow-up DEQ Response:** DEQ notes that this issue was considered in the February 10, 2010 memorandum responding to DEQ comments on the data sufficiency report as well as in this comment response. We note that minimum detectable differences were acceptable in many cases, and we acknowledge that the purpose of the hypothesis testing was to evaluate whether central tendency concentrations were different, and that the assessment generally accomplished this objective, although there are some instances where minimum detectable differences (MDDs) are relatively elevated (i.e., more than 100 percent). We also agree that in these cases, a large number of samples would be required to reduce the MDDs, which we are not requesting. Notwithstanding the foregoing, DEQs primary concern with these tests is the adequacy of statistical power to detect a difference when variability is higher. In particular, the response to our comments on the data sufficiency report notes that the probability of making both Type I and Type II errors is controlled, and therefore it does not matter how the null hypothesis is defined. To clarify the DEQ concern, we note the following from USEPA ProUCL guidance: "if the variance estimate used in the planning state was too low, the statistical test is unlikely to reject the null hypothesis due to the lack of sufficient power". "If large uncertainties exist concerning the variability of the contaminant concentration in potentially impacted areas, the Background Test Form 1 (null is that concentrations in potentially impacted site areas do not exceed (or are less than)) may lead to inconclusive results". For the (cont'd)	(cont'd) by published guidances. For some constituents, it was plausible that the inherent natural variation was high, and an unrealistically large number of samples would then be required to reduce the MDD. In any case, for these constituents with higher MDDs, a review of the respective box-and-whisker plots presented in Appendix L did not suggest strong evidence that the site's *central tendency* was significantly higher than the reference area's. As for the current statistical comparison, it should be noted that a conservative alpha level (false positive rate) of 0.05 was already in use for each "individual" comparison, which provided a balancing act to reduce the false negative error. Comment noted. The errors rates selected were based on the previously submitted RI/FS MP (URS 2007), and the ProUCL guidance was not published at that time. Nevertheless, given the large number of comparisons that were performed, the current alpha level (0.05) was conservative for each "individual" comparison, as the site-wide alpha level (or exposure area alpha level) would be much higher (more conservative), based on the Bonferroni correction. In terms of the power of the statistical comparison, the goal established in the RI/FS MP (i.e., to detect one-standard-deviation-away) was achieved. However, for Upland soils only, this one-standard-deviation happened to be large due to the high data variability, which could not be controlled because of the inherent heterogeneity of the Upland soil environment. (It should be noted that the data variability for sediment and tissue samples from the River are low and the MDDs are generally well within acceptable range.) Currently, there is no established state or EPA guidance on what level (ceiling) of MDD one must achieve. For analytes with a high MDD (such as greater than 100% of the reference mean), which affects the comparison for metals in the Upland OU (Landfill, Sandblast, and 4 AOPCs only – see Table L-1), we agree that further desk-level evaluation should be done. The metals (with high MDDs) include: antimony, arsenic, chromium, copper, magnesium, mercury, nickel, and silver; which represents 41 out of 378 combinations (cont'd)

8. (cont'd)

(cont'd)

Background Test Form 1, the error rates selected by EPA as the minimum recommended performance measures are "the confidence level should be at least 80 percent (alpha = 0.20) and the power should be at least 90 percent".

We suspect that this issue has been considered. To address the DEQ concern regarding potentially inadequate power, DEQ proposes that the statistical power be included in the Figure L-1, Appendix L so it can be seen directly along with the MDD and a more detailed explanation of how the probability of making both Type I and Type II errors is simultaneously controlled to avoid the potential of inappropriately making a Type II error. If there are cases with low power, then these COI can be re-screened, and the comment will be resolved.

One specific case where we suspect the hypothesis test may be leading to an inappropriate conclusion is mercury, which shows some elevated samples in the sandblast area, has high MDD, was selected as a preliminary COPC, but was not in the "site-related" list due to similarity in central tendency site and reference sediment concentrations (See DEQ's response on the response to General Comment 10).

(cont'd)

of metals and exposure depths. These metals were compared to the following depth-specific criteria:

- 0 to 1 foot bgs – ecological SLVs
- 0 to 3 feet bgs – lower of human health and ecological SLVs
- 0 to 10 feet bgs – human health SLVs

The higher of these depth-specific SLVs and the Upland background UPL was used as the final SLV for the comparison.

Of the eight metals, magnesium is an essential nutrient, and all detected results of silver are below the lowest, depth-specific screening criteria; hence, these two metals do not warrant any further investigation. The remaining six metals affect the following Upland exposure areas:

Site AOPC	**Depth Group**	**Antimony**	**Arsenic**	**Chromium**	**Copper**	**Mercury**	**Nickel**
Landfill	0-1 ft		X	X	X		X
	0-3 ft			X	X		X
	0-10 ft		X	X			
Sandblast	0-1 ft	X			X	X	
	0-3 ft	X			X	X	
	0-10 ft						
4 AOPCs	0-1 ft	X			X	X	
	0-3 ft	X			X	X	
	0-10 ft						

None of the metals with high MDDs associated with 0 to 10 foot bgs soils from the Sandblast Area and 4 combined AOPCs exceed human health SLVs. Arsenic and chromium both exceed human health SLVs for the Landfill, but were already demonstrated to be above background based on the statistical comparison and were already included in the HHRA (thus, not shown with an X for the Sandblast Area and 4 AOPCs).

Given that the data variability is "uncontrolled" and high data variability leads to uncertainty, we suggest that the aforementioned 21 combinations of metals and exposure depths be evaluated in the risk assessment uncertainty section (Appendix O). This focused analysis allows us to explore whether these compounds should be included as COPCs and thereby be advanced to the next level of risk assessment. This focused (cont'd)

8. (cont'd)		(cont'd) evaluation will assure that these uncertainties have been explicitly considered, be less disruptive to the current main report, and should help to ease the review effort by ODEQ for the next submittal. Per the telephone conference on Nov 14, 2011 between ODEQ, USACE, and URS, the following three items will be provided to ODEQ subsequent to this response-to-comment letter for further consideration: • text that will be inserted into the main report in either Section 8 or 9 that briefly describes the additional evaluation that has been conducted to address the uncertainty associated with the 8 metals with high MDDs; reference to Appendix O will be made in this section • a draft outline/approach for the revised uncertainty section that addresses these COPCs (e.g., screening against SLVs) • evaluation of one of the metals as an example of the lines of evidence that will be used to make decisions regarding these COPCs
9.	**Source control.** Certain decision criteria have confounded the interpretation of the RI data in terms of the conceptual site model and comprehensive evaluation of Bradford Island sources. A more rigorous evaluation of source control should be presented in the report. Of note are the sandblast area, bulb slope and the landfill. The data clearly show that migration from these areas has occurred (e.g., sandblast COIs were found in river sediment and porewater), and it is important to show and confirm that these pathways have been controlled. Some of the tissue (sculpin, clam, crayfish) appear to be impacted by antimony, arsenic, barium, copper, chromium, mercury, methyl mercury, cadmium, lead, nickel, zinc, phthalates and PAHs, relative to the reference area. These were also the same constituents that were elevated in the landfill and bulb slope areas of potential concern (AOPCs). Further, the following points indicate a need for a specific consideration of source control: • Section 8.3.4 describes a comparison of soils in the landfill, bulb slope and sandblast area AOPCs to reference area soils. One conclusion is that concentrations of hazardous substances in these AOPC soils do exceed those in the reference area. In particular, the evaluation shows that metals including mercury and lead as well as PAHs are elevated in these soils. We also note that copper was (cont'd)	This response is organized into the three main topics discussed in the comment. **Data Gaps and Insufficiencies to Assess Upland Soil Migration to the River.** Comment accepted. The overland runoff pathway for the Landfill, Sandblast Area, and Bulb Slope will be subjected to a more site-specific evaluation in the BHHRA and Level III BERA that will be performed for the Upland OU. Aquatic-related target receptors from the Forebay will be assessed in the baseline risk assessments for the Upland OU in order to identify the list of COPCs/CPECs that should comprise the focus of source control measures evaluated in the FS. The HHRA recommended no further evaluation for the Bulb Slope (one of the three AOPCs included in the runoff pathway evaluation), and therefore only this potential soil-to-river transport and exposure pathway will be included in the BHHRA for the Bulb Slope. The findings of the Upland BHHRA and Level III BERA for this runoff pathway will be carried into the Upland OU FS, where these findings will be considered in parallel with the initial FS data that will be collected from the former removal area (and bass from the Forebay). (cont'd)

9. (cont'd)	(cont'd) detected at 13,100 ppm in sediment off the bulb slope area, as documented in Appendix G. As described in Section 9.1.1, the inorganics in upland soil were compared to reference area sediment from the River operable unit (OU) as a means of screening for potential impacts to the River OU. These soils exceeded reference area sediments for some contaminants, including lead and mercury. While not used for COPC selection, Table L-8 also shows PAHs are elevated in upland AOPC soils relative to reference area sediment. • The data set from groundwater seeps is limited. However, the results suggest that seep water is likely elevated relative to reference area groundwater with respect to metals including lead and mercury and petroleum hydrocarbons. Section 9.3.2 presents the interpretation that groundwater exceeding screening level values (SLVs) may be discharging to surface water. • As described in Section 9.3.1.1, discharge to catch basins is believed to be a historic and potentially current mechanism of transport from the sandblast AOPC to the River OU. Elevated levels of metals, including lead and cadmium, Aroclor 1260, phthalates and butyl tins are associated with the sandblast area AOPC. Post-removal sediment and tissue samples collected near this source (P04) continue to show elevation of these contaminants in sediment, clam and crayfish tissue. Nickel was detected in sandblast area catch basin solids at up to 374 ppm and in river sediment at one outfall at up to 630 ppm (SBDS-19). Chromium was detected at up to 620 ppm and nickel at up to 520 ppm in sediment (S1-43) off the sandblast area. • Post removal sediment butyl tin and organochlorine pesticide data were not collected and represents a data gap. Pre-removal sediment (P-44) showed detections of Aroclor 1260 up to 380 parts per billion (ppb) in sediment in this area and catch basin soils and filter sock material up to 173 and 144 ppb respectively. • Lead, mercury and PCBs (Aroclor 1260) are elevated in the bulb slope AOPC. • Metals including lead and mercury, and PAHs were detected in (cont'd)	(cont'd) Upland source control will be considered during the Upland OU FS. As described above in the response to General Comment 6, the initial FS samples in the sediment removal areas and bass tissue samples from the entire Forebay will be analyzed for PCBs, metals, SVOCs (including PAHs), organochlorine pesticides, and butyltins. Collection of new data for these chemical classes will address the concerns regarding specific analytes expressed throughout this comment. **Upland Groundwater Transport to River (Groundwater and Seep and Co-locate Surface Water Data).** Clarification provided. Concentrations of most COIs at the Landfill exhibit a decreasing trend from groundwater monitoring wells located distally from the river, to groundwater wells closer to the river, to the seeps, and thence to the river surface water. This trend occurrence and the COIs in exceedance of the SLVs for humans and aquatic organisms is discussed in further detail in Sections 11.2.4.1.5 and 12.3.4.1.1. Based on the findings of the HHRA and ERA, no further evaluation of COIs in groundwater from the Landfill is necessary to address the discharge to surface water pathway. Section 9.3.2 describes groundwater quality at the Sandblast Area and conditions regarding groundwater discharge to surface water of the River. Sections 11.2.4.2.5 and 12.3.4.1.2 provide more detailed descriptions of this groundwater to surface water transport pathway as it relates to human health and ecological risk. Based on the findings of the HHRA and ERA, no further evaluation of COIs in groundwater from the Sandblast Area is necessary to address the discharge to surface water pathway, with the exception of PAHs. As described in the response to Specific Comment 12 (below), concentrations of PAHs in direct push groundwater samples from the Sandblast Area will be added to the groundwater screening tables (HHRA Tables M-17, M-18, and M-19 and ERA Tables N-15 and N-20) to address the sampling data gap for PAHs in monitoring well data for this AOPC. **Implied Correlation Between Upland Sources/COIs and PCBs in River.** Comment noted. The Upland OU was not identified as the source of PCB contamination in the River OU. The primary site-related source of the River OU PCB contamination is from equipment disposal along the northern shoreline. A statistical correlation between PCBs and (cont'd)

9. (cont'd)	(cont'd) erodible soil around the landfill, suggesting the landfill as a potential source to the River OU. • A number of the preliminary COPCs and CPECs were statistically higher in forebay tissue samples relative to the reference area. As described in Section 9.6.2.2, cadmium and various PAHs in forebay clams were significantly higher than in reference area clams. In crayfish, various metals and PAHs were significantly higher than in the reference area crayfish. In sculpin, cadmium, lead and mercury were statistically higher. For bass, various metals and PAHs were higher in the forebay relative to the reference area. • Total PCBs (the Kaplan-Meier based sum) appears to have some correlation to cadmium, lead and mercury in the forebay sediment, which may suggest a common source. Based on the various lines of evidence presented above, it appears that there is a plausible source and mechanism of transport of metals, butyl tins, phthalates, PCBs and PAHs from several of the upland AOPCs to the River OU and these same constituents may be elevated in some biotic tissues. Moreover, it appears that some of these constituents are correlated to total PCBs, indicating a potential common source. Based on these concerns we believe it is appropriate to carry those substances identified as preliminary COPCs and CPECs forward for some additional consideration in the RI/FS process and to address them as part of a more comprehensive source control evaluation. **Follow-up DEQ Response:** • **Data gaps and insufficiencies to assess upland soil migration to the river.** DEQ's comment will be resolved by the additional sampling proposed (July 28, 2011 email from Mark Dasso) to collect new samples along the northern side of Bradford Island, including the potential source areas outside the former removal area. We understand this sampling will be a component of the source control evaluation consider as part of the Upland OU FS. The sandblast area is an example of an area that needs assessment for source to control to ensure migration to River OU is not occurring. (cont'd)	(cont'd) metals may not obligatorily indicate causation. Comment noted.

9. (cont'd)	(cont'd) • **Upland groundwater transport to river (groundwater and seep).** DEQ Groundwater and seep data were screened for risk to the river, but screening was conducted using a 95 percent UCL. For source control, each seep and well should be screened separately. • **Implied correlation between upland sources/COIs and PCBs in river.** DEQ agrees that correlation does not necessarily imply causation. However, because Aroclor 1260 was detected in the landfill, bulb slope and sandblast area soils, and a stormwater and a potentially complete erosion pathway exists, we do consider the correlation to suggest potentially complete migration pathways from the upland OU.	(cont'd) Comment noted. The maximum detected concentrations in groundwater, seep water, and co-located surface water were compared to the lowest of the human health and ecological SLVs for purposes of nature and extent delineation (Section 9.0). In addition, COPCs with concentrations in these Upland water media that exceeded the lowest SLVs were plotted on figures that illustrate the point by point comparison to SLVs (i.e., each well and seep/co-located surface location), and the text in this section discusses point by point exceedances for all COPCs. Furthermore, in the HHRA and ERA sections (Section 11 and 12), maximum detected concentrations or 95% UCLs (groundwater from the Landfill and Sandblast Area only) in the Upland water media were compared to the respective SLVs and selected COPCs were plotted on figures that illustrate point by point exceedances for all wells (sample locations). Wells closest to the point of discharge, and seep/co-located water samples available for the Landfill only, comprise the main focus of the detailed evaluation of the Upland groundwater transport pathway. The process used to evaluate Upland water media followed in the report concurs with DEQ guidance for conducting ERAs (2001), and an adjustment to this process is not warranted for purposes of this document. However, additional evaluation specifically for source control purposes may be considered in FS or in a separate document. Comment noted. All COI classes, including PCBs (each Aroclor and 209 congeners) metals, PAHs, pesticides, butyltins, and SVOCs, will be analyzed in the River OU to evaluate potential contribution from Upland sources.
10.	**Preliminary versus site-related COPCs/CPECs.** Section 11.2.3.5 discusses the approach used to identify site-related COPCs. Strictly speaking, this is not a determination of which COPCs are associated with site releases. The approach described is a filter to identify those constituents that are more likely to pose significant risk potential, based on relative risk. We do not think that this filter is an adequate basis for dropping the preliminary COPCs from further consideration. Although it is common to focus risk management on one (cont'd)	Clarification provided. The use of the terminology "Preliminary COPCs" and "site-related COPCs" may contribute to confusion and will be revised to say COIs and COPCs respectively. The term "site-related" will be deleted from the text and tables. Additional clarifying text will be added to 11.2.3.5 to reflect the fact that the process that was followed consisted of a weight-of-evidence approach that evaluated site-specific patterns of chemical distribution and exceedance *in addition* to the (cont'd)

10. (cont'd)	(cont'd) or a few substances, other COPCs posing less risk potential are also addressed. For example, where it can be shown that COPCs are spatially co-located, risk management actions aimed at substances posing the highest risk potential can also be demonstrated to address other contaminants. Alternatively, additional risk evaluation may demonstrate risk below acceptable levels for less significant COPCs. We believe additional consideration of preliminary COPCs is warranted, in particular for metals, PAHs and phthalates.	(cont'd) relative-risk filter. The resulting conclusions were used to identify which chemicals should be considered COPCs warranting further evaluation or consideration for each AOPC on the basis of human health concerns. The site-specific discussions are presented in each of the AOPC discussions are presented in each of the AOPC discussions (e.g., the rationale for elimination of lead and VOCs as COPCs in landfill soils is discussed in Section 11.2.4.1). All of the COPCs identified in the HHRA (specific metals, PAHs, and phthalates) are proposed for additional evaluation in a baseline HHRA for the Upland AOPC (Landfill and Sandblast AOPCs). Part of this evaluation will include a more detailed assessment of the COPCs identified through the evaluation of mass wasting and erodible soils performed for the Landfill, Sandblast Area and Bulb Slope AOPCs (see Tables O.2-1 through O.2-3, as well as Sections O.2.1.4). The sediment data, which will be collected in the removal footprint area and immediate vicinity (i.e., where historic and, potentially, recent Upland soils have been transported), and the bass data, which will be collected from the entire Forebay as part of the initial FS sampling effort, will be evaluated in the Upland OU FS in conjunction with the list of chemicals identified as Upland COPCs/CPECs for the overland runoff pathway (see the response to General Comment 9). These sediment data will be used to identify which chemicals, if any, may have been or may currently be transported from Upland erodible/mass wasting soil to the Forebay and will be used to assess the extent to which any bioaccumulative COPCs may have impacted the aquatic food web. Similarly, these initial FS sediment and bass samples will provide a more current data set for the River OU FS.
	Follow-up DEQ Response: The proposed resolution of changing the terminology from "preliminary COPCs and site related COPCs" to "COIs and COPCs" is not appropriate. DEQ Human Health Risk Assessment Guidance (ODEQ 2010) states "chemicals detected at the site which have not been screened should be designated as "Chemicals of Interest" (COIs), while those that have been screened-in should be designated as "Chemicals of Potential Concern" (COPCs). (cont'd)	Comment accepted. The weight-of-evidence approach to selection of COPCs is a scientifically sound method that utilizes the HHRA guidance (DEQ 2010) and also uses the Problem Formulation to identify priority chemicals and to make defensible decisions regarding further risk assessment needs. The WOE approach may be used to screen out chemicals as well as to screen in chemicals that may otherwise be excluded (e.g., commenter's discussion of arsenic and cadmium above) (cont'd)

10. (cont'd)	(cont'd) According to EPA and DEQ Guidance, chemicals that exceed risk based levels are COPCs regardless of additional analysis on "site specific patterns of chemical distribution". This type of analysis may be used in the feasibility study, but the contaminants should be retained in the risk assessment. Some discussion may be included with the uncertainty section of the risk assessment to prioritize and identify the primary risk drivers. Specifically, uncertainties in the SLVs or toxicity information can also be discussed in the uncertainty section. The following discussion provides some examples of COPCs that were not designated as site-specific, but for which DEQ believes the overall evidence suggests that they need to be carried forward in the risk assessment. • **Mercury.** Mercury has an association with the bulb slope and landfill, detection in groundwater seeps, occurrence in bass over risk-based levels and relatively greater variability than reference variability in sediment. Therefore, regardless of comparison of the central tendency in sediment, mercury should be retained as a significant COPC warranting focus at these upland AOPCs and the in-water OU. • **Arsenic.** Arsenic was screened out in crayfish based on low risk potential, given that that portion of the arsenic exists in the organic form. Because arsenic is associated with the sandblast area, and the crayfish samples nearest to the north shore of Bradford Island were the most elevated, arsenic should be a focus of source control from upland AOPCs and retained as a COPC. • **Cadmium.** Clams and sculpin from the forebay show higher levels of cadmium relative to the reference area. Visual inspection of surface water data suggests it may be higher in forebay surface water, and cadmium is elevated in the landfill and sandblast AOPCs. The reference area bass appear to represent two separate populations with respect to several metals, including cadmium. Therefore, the bass result is somewhat ambiguous. We recommend retaining cadmium for source control and monitoring. (cont'd)	(cont'd) and allows a more holistic view of the data. The weight of evidence text will remain in the RI Report since it is defensible and sound and is consistent with the approach described in the RI Management Plan. As noted in the responses to General Comments 3 and 6, however, the sampling plan for the pre-FS data collection effort has been revised based on discussions with DEQ to allow for better characterization of sediment and clams outside of the in-water removal areas and areas most likely to be influenced by Upland sources. All chemicals, including arsenic, mercury and cadmium, will be analyzed for in pre-FS sediment and tissue samples. If the results of these analyses indicate a potential source of contamination that was overlooked based on evaluation of the random Forebay datasets included in the RI/RA, the list of sediment and tissue COPCs may be modified to reflect the new information. Additionally, a more thorough evaluation of the potential for mass wasting of Upland soils will be conducted during the FS to support conclusions made regarding the likelihood and magnitude of the overland runoff pathway. Text describing the purpose of the pre-FS sample collection and use of the data (i.e., to confirm list of COPCs) and the additional investigation of the mass wasting scenario will be added in the revised RI/RA.

10. (cont'd)	(cont'd) **Additional Follow-up DEQ Response:** **CPEC selection.** In response to CPEC designations in the ERA, **Table 1 (attached)** presents a list of CPECs identified in the risk assessment. These CPECs are further evaluated in Section 12 to determine if they should be retained for either a Baseline Level III Risk Assessment or remediation. These CPECs are all COIs that exceeded ecological risk based levels. Many of these chemicals screen in for several different receptor groups in one AOPC, which is a strong line of evidence that these chemicals are present at effect levels for many species and the community as a whole. For example, in the landfill mercury screens in for plants, soil invertebrates, birds and mammals, but is only retained for mammals as a CPEC for further assessment. Many chemicals also screen in across different AOPCs. For example, antimony screens in for the landfill and the sandblast area, but is not retained as a CPEC in either case. However, it shows up as a CPEC in the exposure area of four AOPCs combined addition weight that the individual AOPCs are impacted. All CPECs should be identified as such carried forward to the FS unless a baseline ecological risk assessment (to identify COCs) is completed for these chemicals.	Comment accepted. The purpose of the weight of evidence approach used to identify CPECs in the ERA is scientifically sound and serves to focus the forthcoming Upland Level III BERA on the CPECs, receptors, and exposure pathways that warrant a more site-specific evaluation. It is not necessary, and not common practice, to carry all chemicals into a BERA simply based on an exceedance of a SLV. However, to address one of the main concerns expressed in this comment and allow for a more comprehensive (less piece-meal) Upland BERA, any CPEC recommended for further evaluation for a particular AOPC and specific receptor group will be retained for all receptor groups in the BERA. See the response to the first part of General Comment 10, which addresses specific concerns raised by DEQ about the influence of Upland sources on River media. Based on evaluation of the pre-FS data that will be collected, the list of sediment and tissue CPECs may be modified to reflect the new information.
11.	**TEQ screening.** A TEQ screening for dioxin-like PCB congeners is not included in the risk assessment. Please include this screening in a revision for both human health and ecological assessment. TEQ values should be compared to the 2,3,7,8-TCDD values presented in DEQ's Guidance for the Evaluation of Bioaccumulative Chemicals of Concern.	Comment accepted. The screening already performed in the risk assessment for the individual dioxin-like PCB congeners will be augmented through evaluation of the total TEQ expressed as the summation of these 12 congeners for both human health and ecological receptors.
12.	**COCs.** In addition to other contaminants of concern (COCs), all PCB congeners, total PCBs and dioxin-like PCBs as TEQ should be considered contaminants of concern for the site.	Clarification provided. Total PCBs expressed as the sum of 209 congeners and dioxin-like PCBs, which will also be expressed as a total PCBs TEQ (see the response to General Comment 11), are considered COCs in the Forebay. All 209 congeners will be analyzed for in the initial FS samples collected from the Forebay and Reference Area. The comparison of individual PCB congener concentrations in the Forebay and Reference Area was performed to determine which congeners measured in River OU media have concentrations that are elevated relative to the reference area, and, thus, potentially attributable to Bradford Island, and which have concentrations that are indistinguishable from more widespread conditions, which are likely due to other sources not related to the site. This information may be useful for the next phase of the project (i.e., FS), but the intention was not to immediately screen out certain congeners from further investigation.

Specific Comments		
1.	**Section 6.2.2.** The second sentence in the first paragraph is incomplete.	Comment accepted. The text "starting on" will be deleted at the end of the second sentence.
2.	**Section 6.2.3.2, surface water.** Why were historical water samples collected outside of the removal area (e.g. Goose Island, upstream) not included in the RI?	Clarification provided. See the response to General Comment 6, above.
3.	**Table 6-6a, bass and largescale sucker results.** Organochlorine pesticides and butyltins were not analyzed in tissue. Future monitoring should include these COIs; they have been detected in sediment during previous rounds of sampling (e.g., near the sandblast area). Upland sources include the sandblast area (soil and catch basins) and the landfill (up to 9,500 ppb DDT was found in test pit TP1-01).	Comment accepted. As discussed in the response to General Comment 3, the Portland District is planning to conduct future sampling in the 2007 sediment removal areas as part of the River OU FS. The initial FS samples in the sediment removal areas will be analyzed for PCBs, metals, PAHs, organochlorine pesticides, butyltins and SVOCs. Also see the response to General Comment 9 (Source Control).
4.	**Section 7.2.1, Upland OU.** Please clarify what is meant by "more conservative" at the top of page 7-7, and why censoring at the MRL is more conservative. DEQ prefers that non-detects be censored at the MDL. While results below the MRL are less precise, they contain information about the presence of the contaminant, and should not be considered non-detect.	Clarification provided. The intent of the statement "censoring using the MRL is a more conservative approach" was to describe that the UCL results were generally higher when the MRL was used as the censoring limit. We agreed with DEQ that censoring using the MDL was the preferred statistical method for the risk assessments since it preserved the rank order of the data, plus the information from the J-flagged data were properly maintained. The preferred MDL-censoring method was indeed used in the subsequent EPC calculations for risk assessments.
5.	**Section 8, comparisons between the forebay area and reference area.** DEQ prefers that hypothesis tests take the alternate form, with the null hypothesis stating that the site concentrations are greater than (1-sided) or different from (2–sided) the reference area. We acknowledge that power tests are performed under a normal approximation. Many, perhaps most, of the data sets are not normal. Moreover, in many cases, the minimum detectable differences were too high to detect meaningful differences that exist. Therefore, we believe the best approach for any future comparisons, if needed is to use the alternate hypothesis form.	Comment noted. The current hypothesis testing set-up controlled both the probability of incorrectly concluding that a clean site was contaminated and the probability of incorrectly concluding that a contaminated site was clean. When both of these probabilities were controlled, it did not matter how one defined the null hypothesis. The conclusion of whether the mean Forebay concentrations were higher than the mean Reference Area concentrations would be the same even if the null hypothesis and the alternative hypothesis were to be switched. The same level of detectable differences would also be achieved in either set-up. In the future, if new data are collected and a new statistical comparison is warranted, the reverse hypothesis testing set-up suggested in the comment will be considered. (cont'd)

5. (cont'd)	**Follow-up DEQ Response:** See response on General Comment 8.	(cont'd) The minimum detectable differences for inorganic constituents in the River OU (which were some of the key comparison results, as their conclusions were being used in the COI selection process) were very good – and most minimum detectable differences were within the 20% to 30% range. Comment noted.
6.	**Section 8.1.** It is unclear why a median MDL or MRL was used for censoring, as opposed to a sample- and analyte-specific value, or why a detected concentration would be re-set to a higher value. Intuitively, it seems that would introduce an artificial bias into the comparisons.	Clarification provided. It was key to have a single censoring limit for population-to-population comparison purposes. For a vast majority of the statistical evaluations, there was only a single MDL or MRL, and hence, it was not an issue here. Where there were multiple MDLs or MRLs, the range of the limits was narrow and the median limit was close to the highest limit. Based on these considerations, we believed that the use of a single censoring limit (i.e., a single "common-bottom-line") was an acceptable simplification. Given the narrow range of the censoring limits, the main conclusions of the statistical evaluations would be unaffected even if other methods were considered.
7.	**Section 8.3.1, sediment.** URS did not identify a significant difference in sediment for total PCBs in the forebay random samples relative to the reference area. In this case, DEQ recommends trying a nonparametric permutation test, which shows much stronger evidence for the mean forebay concentration being higher than the reference area, a result more consistent with the other media. Nevertheless, Figure L-2F clearly shows much greater variability in the forebay samples, consistent with the source of PCBs being localized to specific samples within the forebay. Based on all available lines of evidence, sediment remains a medium of concern. **Follow-up DEQ Response:** Response acceptable. As a point of clarification, DEQ provided the comment with the intent to clarify that we don't think the sediment data indicates an absence of impacts for total PCBs. We concur with the selection of PCBs as the primary COPC and CPEC.	Comment noted. Since the statistical comparison results for PCBs were not used in the COI selection process and PCBs were carried forward into the risk assessment, the additional level of analysis using nonparametric tests is not considered to be necessary. Comment noted.
8.	**Page 8-9, Section 8.3.3, downstream sediments.** This section acknowledges that the number of downstream samples (six) is too small for statistical comparison. The section should explain why only six samples were collected downstream of the dam relative to the forebay and reference areas, where 18 and 19 were collected.	Clarification provided. The following text from the RI/FS MP will be added to this section in the RI: "The objective of the downstream sampling was to determine whether or not contaminated sediments from the Forebay may have migrated and accumulated in the Downstream area and whether further sampling might (cont'd)

8. (cont'd)		(cont'd) be needed to assess the potential contamination. Unlike the Forebay and Reference areas, a non-statistical sampling approach was implemented Downstream, whereby areas of the river most conducive to sedimentation were targeted for sampling (depositional areas identified by lower river velocities) in an attempt to collect from locations most likely to be impacted by Forebay sediment transport. During the post-removal in-water sampling that occurred in March 2008, sediment was collected from six Downstream locations. These samples were collected from 1,200 feet below the dam to approximately 26,500 feet (5.0 miles) downstream of the dam. All Downstream sediment samples were analyzed for the same chemicals that were analyzed in the Forebay and Reference areas: semi-volatile organic compounds (SVOCs) (including polycyclic aromatic hydrocarbons [PAHs]), metals, polychlorinated biphenyls (PCBs) as Aroclors, total petroleum hydrocarbons (TPH), and sediment quality parameters (i.e., total organic compounds [TOC] and grain size). See Section 9.6.1, which provides an evaluation of the Downstream sediment."
9.	**Section 9.1.** The upper prediction limit or maximum concentration from the reference area is used to screen erodible soil. This evaluation should be included as part of a source control evaluation, which will be necessary for the landfill and sandblast areas. In that evaluation, contaminant concentrations in erodible soils and catch basin sediment should be evaluated against screening levels presented in Appendix D in the Stormwater Evaluation Guidance found at this website: http://www.deq.state.or.us/lq/cu/stmwtrguidance.htm. In the event that exceedances of these screening levels are found, a review of best management practices will be needed to evaluate how to reduce contaminant releases to the river.	Comment Noted. The mass wasting/erodible soil pathway will be further evaluated in the Upland BHHRA and BERA (see the response to General Comment 9), and source control measures will be considered during the Upland OU FS.
10.	**Section 9.3.2.** Some constituents in groundwater (metals, VOCs) appear to be discharging to the river. Please clarify where these may be exceeding ambient water quality criteria (AWQC). We note that AWQC exceedances are significant issues under Oregon Administrative Rule.	Clarification provided. The direction of groundwater flow beneath the Sandblast Area is to the north and northwest (Section 3.1.3 and Appendix D). Groundwater data from the Sandblast Area was evaluated in further detail in Sections 11.2.4.2.5 and 12.3.4.1.2 (see Tables M-18, M-19, N-15, and N-20). While in Section 9.3.2, the lowest of the selected human health- and ecologically-based SLVs are compared to water data from the Sandblast Area AOPC, the relevant human health and ecological SLVs (cont'd)

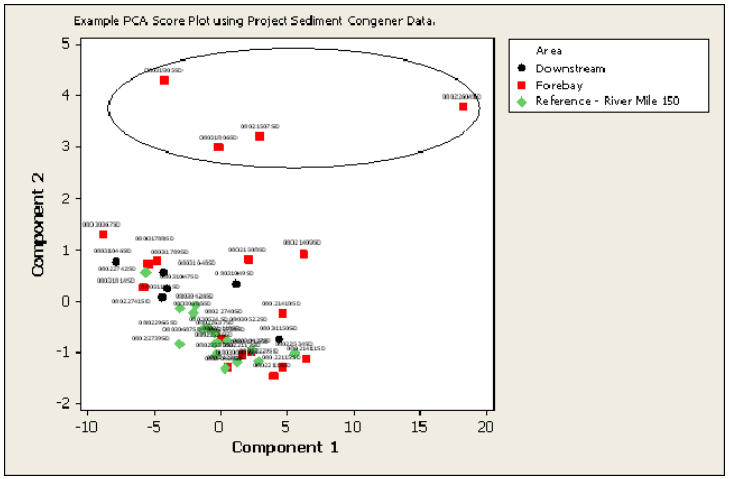
10. (cont'd)		(cont'd) are used separately in the HHRA (Section 11) and ERA (Section 12). In these risk assessment sections, the COIs in exceedances of the SLVs for humans and aquatic organisms are more thoroughly evaluated and discussed. The following excerpt is from the HHRA, Section 11.2.4.2.5: "Only arsenic was retained as a COPC for the bioaccumulation pathway, even though it was only marginally higher than upgradient arsenic concentrations (Table M-20). The bioaccumulation potential for the remaining chemicals was considered to be negligible since they were not supported by evidence of bioaccumulation in the River OU (Section 11.3.4). However, the potential for bioaccumulation is best evaluated by review of the River OU data. Since arsenic was not selected as a site-related COPC for any of the River OU media (Section 11.3.4), it was not retained as a site-related COPC for this discharge and bioaccumulation pathway at the Sandblast AOPC (Table 11-2)." Additionally, in Section 11.3.4.1.3 of the HHRA, surface water data is evaluated for the potable use pathway and no COPCs were identified. The following excerpt is from the ERA, Section 12.3.4.1.2: "The toxicity ratio for cis-1,2-dichloroethene is only slightly greater than 1.0 (at 1.12, Table N-15), and since this is the only CPEC with a detection above the benchmark, no further investigation is recommended to assess the potential for adverse effects to aquatic organisms or wildlife that could be exposed to surface water that has been impacted by COIs in groundwater of the Sandblast Area AOPC. Arsenic is the only bioaccumulative COI that was retained as a CPEC due to the lack of SLVs that address the dietary pathway." Based on the findings of the HHRA and ERA, no further evaluation of COIs in groundwater from the Sandblast Area is necessary. However, as described in the response to Specific Comment 12 (below), concentrations of PAHs in direct push groundwater samples from the Sandblast Area will be added to the groundwater screening tables (cont'd)

10. (cont'd)		(cont'd) (HHRA Tables M-17, M-18, and M-19 and ERA Tables N-15 and N-20) to address the sampling data gap for PAHs in monitoring well data for this AOPC. In addition, future sediment samples collected in the former removal areas and bass samples collected from the entire Forebay as part of the initial FS sampling effort (please see response to General Comment 6 above) will be analyzed for all metals and PAHs.
	Follow-up DEQ Response: Arsenic in groundwater should not be dropped for the groundwater discharge pathway at the Sandblast AOPC based on the determination that arsenic was not selected as a site-related CPEC for the River OU data. Contaminants in water discharging above ecological and risk-based levels on a point basis and a Q=1 should be retained as CPECs. This applies to the sandblast area and landfill AOPCs. (See General Comment 9 on upland groundwater transport).	Comment noted. Arsenic in groundwater from the Sandblast Area did not exceed the surface water SLV protective of aquatic organism exposed through direct contact based on the UCL and Q=1 (toxicity quotient of 0.0202; Table N-15) or the maximum detected concentration and Q=1 (toxicity quotient of 0.06). Arsenic is potentially bioaccumulative in aquatic tissues, but was only identified as a COI in crayfish collected from the Forebay (not a COI in clams, sculpin, or smallmouth bass). The maximum detected concentration in crayfish is lower than DEQ's bioaccumulation SLVs protective of fish/shellfish, birds, and mammals. Therefore, arsenic is not a CPEC in groundwater from the Sandblast Area based on the evaluation of direct toxicity and bioaccumulation.
11.	**Page 12-42, Section 12.5.4, fish and shellfish.** The comparison of cadmium, lead and mercury in forebay to reference sediment is somewhat confounded by the fact that cadmium, lead and nickel are elevated in the some of the reference area bass. The tissue levels should be used to determine whether these substances are CPECs. We believe that considering the overall evidence in tissue, reference tissue samples and upland sources, cadmium, lead, and mercury should be retained as CPECs in sediment.	Comment noted. Concentrations of cadmium in Forebay and Reference Area sediment and bass tissue are below DEQs suggested default background concentration for cadmium in sediment (Table B-1 of DEQ 2007) and the ATLs protective of humans and wildlife. Concentrations of lead in sediment and bass tissue from the Forebay and Reference Area exceed the default background concentrations and ATLs in some samples. None of the bass samples collected from the Forebay exceed ATLs for lead, and none of the bass samples collected from the Reference exceed wildlife-based ATLs for lead. Sediment and bass tissue concentrations of mercury from the Forebay and Reference Area also exceed the default background concentrations and ATLs in some samples. However, concentrations of mercury in sediment of the Forebay versus the Reference area, and in tissue of the Forebay versus the Reference Area, are very similar. See the response to Specific Comment 32 (below). (cont'd)

11. (cont'd)		(cont'd) In the absence of ATLs for nickel, the evidence to support a conclusion that nickel is elevated in tissue is unclear (it is possible that "mercury" was the intended COPC for this statement). Based on this information, it is unclear whether or not a source of cadmium, lead, and/or mercury originates from Bradford Island. Therefore, future samples collected in the former removal areas as part of the initial FS sampling effort (please see response to General Comments 3 and 6) will be analyzed for all metals. If a contaminant source does exist upstream, these contaminants could potentially migrate downstream and impact Forebay media. As per CERCLA guidance, it is legitimate to account for ongoing upstream sources that could contribute to a site, as it is impossible to maintain remedial goals that are below upstream concentrations.
	Follow-up DEQ Response: This comment is directed to a larger problem identified in Specific Comment 15 that the selected reference location does not meet the definition of background per DEQ guidance. This is shown by the elevations of COI in sediment and tissue (e.g. metals) in the selected reference location of Cascade Locks and the location of the sampling near known industrial activities. Please specify that the selected background location is in fact anthropogenic (EPA, 2002) because there are "natural and human-made substances present in environment as a result of human activities". The selected upstream area is not a background location as outlined in DEQ rule as "the concentration of hazardous substance, if any, existing in the environment in the location of the facility before the occurrence of any past or present release or releases." Therefore, following CERCLA Guidance, all COIs including metals above risk levels should be retained as COPCs for further evaluation. CERCLA Guidance, states that chemicals above risk levels that also may be above reference locations are not removed from the risk assessment, but rather the full risk of these chemicals are determined in the risk assessment. EPA 2002 states "when concentrations of naturally occurring elements at a site exceed risk-based screening levels, that information should (cont'd)	Comment noted. A new upstream reference location or the previous reference location mentioned in the comment will not be incorporated into the revised RI for the reasons previously described in the original response to this comment. Additionally, the Reference area represents ambient conditions upstream of the Bradford Island Forebay. This allows for the comparison of potential contaminate contributions from upstream sources, so that the Forebay contaminate contributions can be assessed more accurately.

11. (cont'd)	(cont'd) be discussed qualitatively in the risk characterization" and "the COPCs retained in the quantitative risk assessment should include those hazardous substances, pollutants, and contaminants with concentrations that exceed risk based screening levels." However, background metals can be evaluated using the previous selected background location at RM 147 (RF-91 through RF-110), since these samples are away from known sources and meet the definition of DEQ background.	
12.	**Section 9.3.2, Page 9-18.** This section states that groundwater monitoring was limited to three PAHs. Is this a typo? With respect to TPH and PAHs in groundwater, the text is unclear. Is TPH currently or reasonably likely to reach seeps and impact the Columbia River?	Clarification provided. Text will be added to this section clarifying that groundwater samples from soil borings at the Sandblast Area were analyzed for the full analytical suite, while the monitoring well groundwater samples were only analyzed for a subset of those COIs. All TPH analytes (DRO, GRO, and RRO) were measured in monitoring well samples collected from the Sandblast Area, and DRO and GRO were detected. As stated in Section 9.3.2, lack of PAH groundwater data from monitoring wells in the Sandblast Area introduces a data gap for this AOPC. Three PAHs (benzo[b]flouranthene, benzo[k]flouranthene, and phenanthrene) were analyzed for in groundwater samples collected from monitoring wells, and benzo[b]flouranthene and phenanthrene were detected in 1 of 20 samples (5% detection frequency). All PAHs were analyzed for in direct push groundwater samples, and several detections were reported in these samples. The direct push groundwater data are considered to be of low quality for risk assessment due to matrix interferences (i.e., influence of particulate-related concentrations in unfiltered samples) and were not utilized in the HHRA and ERA. Only the monitoring well data were included in the risk assessments, for which both filtered and unfiltered data are available. However, the direct push groundwater PAH data will be evaluated for the Sandblast Area in the revised screening level tables (HHRA Tables M-17, M-18, and M-19 and ERA Tables N-15 and N-20) to address the sampling data gap for PAHs in monitoring well data for this AOPC. This approach will result in an overestimate of exposure to PAHs in approach will result in an overestimate of exposure to PAHs in groundwater potentially discharging to the River OU (assumed to be more bioavailable for uptake) due to the presence of suspended particulates in the direct push samples. The uncertainties introduced in the risk (cont'd)

12. (cont'd)	(cont'd) **Follow-up DEQ Response:** DEQ agrees with the approach to use the direct push groundwater PAH data in order to address the sampling data gap for the monitoring wells. However, please clarify the decision rules for evaluation of the data, if there are exceedances of applicable criteria.	(cont'd) assessments by using direct push groundwater will be discussed in the revised text. Comment accepted. If the direct push groundwater data from the Sandblast Area exceed SLVs, and the resulting toxicity quotients (based on Q=1) are greater than 1.5, then additional samples will be collected from monitoring wells to provide a more meaningful evaluation of these PAHs. Given the influence of the suspended solids in these direct push samples on the PAH concentrations detected, which leads to an overestimate of exposure, if toxicity quotients are between 1 and 1.5, it may be determined that additional sampling is not necessary. The direct-push data for the sub-set of PAHs will also be compared to human health SLVs. If exceedances are noted, additional considerations such as whether these are carcinogenic PAHs, whether suspended solids and other parameters which may affect PAH concentrations are present and so on, will be considered and a recommendation will be developed as to whether additional sampling is warranted.
13.	**Section 9.0 figures.** The forebay PCB congener profile distribution charts are difficult to interpret. The main conclusion from these appears to be that the majority of the total PCB concentrations in each matrix are attributable to a subset of PCBs. As an alternative presentation, we recommend that within each media, principle component analysis (PCA) score plots be produced for all the randomly collected samples, and that you color code forebay versus reference area samples. These would show the relative similarities (and differences) of each of the sampling locations. For these score plots, a subset of individual samples that are relatively different (i.e., "end members") can be selected and homologue profiles plotted for this subset of samples. In this way, the homologue profiles of samples that are known to be relatively different can be compared and the forebay samples can be compared to reference samples. This may also provide insight in a visual manner into which congeners have accumulated into tissue and could therefore merit consideration in any future monitoring program. An example PCA score plot for sediment is included below showing distinctiveness of samples nearest to Bradford Island. Homologue profiles for selected samples in sediment and fish tissue might also be compared using 3-D bar charts, where the third (cont'd)	Comment noted. The multivariate PCA analysis may provide additional insight into the PCB congener profiles; however, the associated results/plots may be difficult to interpret, and at times, may require subjective judgment. At present, the PCB congener profile distribution charts were considered to be part of an exploratory data analysis (EDA) effort. Given that information regarding the source of PCB was available through other aspects of site investigation, additional PCB profiling analysis based on multivariate statistical analysis was not deemed to be necessary to complete the current remedial investigation.

13. (cont'd)	(cont'd) dimension is the analytical matrix, (i.e., sediment vs. tissue).  **Follow-up DEQ Response:** Response acceptable. DEQ agrees with the response, and understands the absence of a need to source profile in the remedial investigation. The comment was intended as a suggested method to create a focused subset of figures that might be more informative to illustrate relative similarities and differences between samples. We also note that source profiling may potentially become a more relevant issue in the future as declining PCB concentrations approach some level at which the project may be considered "complete". The source profile or congener-specific ratios could have utility as an additional line of evidence in addition to central tendency comparisons because of the possibility that there may be a component of central tendency sourced from the site release, and these methods may allow a more refined understanding of PCB congeners in the River OU.	Comment noted.
14.	**Page 9-4, groundwater, seeps, and /or surface water.** Frequency of detection should not be applied to water, because aquatic life standards apply on a point basis.	Comment noted. Since DEQ guidance (DEQ 2001 and DEQ 2010b) allows for the removal of COIs detected at a frequency of less than 5% from further consideration, the RI only dropped COIs in a given medium if there were 20 or more samples. See Tables I-1, I-2, and I-5 in Appendix I. Twenty or more water samples are available for COIs in Landfill groundwater (Table I-1) and a subset of COIs in Sandblast Area groundwater (Table I-2) and, therefore, only these datasets were subjected to the 5% detection frequency screening. As discussed in the (cont'd)

14. (cont'd)	(cont'd) **Follow-up DEQ Response:** As indicated, DEQ guidance discussion is pulled from EPA guidance (see also Specific Comment 25), and the intention of the Department is to use frequency detection screening in identifying potential errors associated with the sampling, not chemicals known to be associated with the site. As EPA 1989 states in the evaluation of frequency of detection that "chemicals expected to be present should not be eliminated. The risk assessor should consider whether the chemical is expected to be present based on historical data or any other relevant information (e.g. known degradation products of chemicals present at the site, modeling results)". The text goes on to say "a chemical that is infrequently detected in soil (a potential groundwater contamination source) probably should not be eliminated as a site contaminant if the same chemical is frequently detected in ground water. In addition, infrequently detected chemicals with concentrations that greatly exceed reference concentrations should not be eliminated". Spatial application should be broad, so as not to confound data distribution and CSM analysis. Any removal based on frequency of detection must provide an analysis as to why the detection is believed to be in error, and information of detections in other media (soil, groundwater, seeps, surface water, tissue, etc.).	(cont'd) response to Specific Comment 23, bioaccumulative COIs detected in less than 5% of groundwater samples collected from the Landfill and Sandblast Area were compared to dietary-based SLVs protective of aquatic biota when available (Appendix O, Tables O.3-1 and O.3-2) as a precautionary measure. Comment accepted. The 5% detection frequency screening only applied to soil and groundwater of the Landfill and Sandblast Area (and soil of the combined AOPCs), as these are the only two AOPCs with 20 or more samples. Furthermore, to address concerns regarding spatial application, the combined dataset for all four AOPCs was evaluated for wide-ranging receptors. In addition to the bioaccumulative COIs in soil and groundwater of the Landfill and Sandblast Area that were eliminated based on the 5% detection frequency screening but were evaluated for ecological risk in Appendix O as a precautionary measure, all COIs in these media (regardless of their potential to bioaccumulate) will be included in Appendix O. An explanation as to why their removal does not influence the findings of the ERA will be provided, and any connections between COIs in soil that may influence concentrations of these same COIs in groundwater will be discussed.
15.	**Page 9-4, forebay random sediment samples.** Because the source area around Bradford Island is not densely sampled, and there may be COIs that are relatively spatially localized, we believe that COIs should not be eliminated solely using the frequency of detection rule for River OU samples (sediment, tissue). For example, Aroclor 1260 and phthalates were removed on this basis even though they were detected in other datasets not included in the RI, but presented in Appendix G. These two COIs can be found in the outfalls that drain the sandblast area and are relevant for source control to the River OU. Thus, the Appendix G data should be considered in COI selection to identify those contaminants that may not be sufficiently widespread to be detected in the random samples, but do have an upland source and spatially localized impacts in sediment.	Clarification provided. The first sentence of the first bullet (regarding detection frequency) will be deleted and replaced with the following text: "1. *Frequency* – Although DEQ guidance (DEQ 2001 and DEQ 2010b) allows for the removal of COIs detected at a frequency of less than 5% from further consideration, none of the River OU media samples had greater than 20 samples. Therefore, none of the COIs detected in the River OU media were removed from evaluation due to detection frequency." Source control will be evaluated in the Upland BHHRA and BERA, and considered during the Upland OU FS. Please note, as discussed in response to General Comment 6, historical River OU data were not used in the RI, with the exception of the bass and sucker data.

15. (cont'd)	(cont'd) **Follow-up DEQ Response:** See response to General Comments 3 and 6.	(cont'd) Comment noted.
16.	**Use of frequency of detection rule.** Frequency of detection should not be applied to tissue analysis. Crayfish, clam, sculpin, and bass samples represent localized exposure areas that should be carried forward if the contaminant concentrations exceed SLVs regardless of frequency of detection.	Clarification provided. See the response to Specific Comment 15. Although DEQ guidance (DEQ 2001 and DEQ 2010b) allows for the removal of COIs detected at a frequency of less than 5% from further consideration, none of the River OU media samples had greater than 20 samples. Therefore, none of the COIs detected in the River OU media were removed from the evaluation due to detection frequency.
17.	**Page 9-26 and 11-25, mercury.** Please clarify why mercury is not selected as "site-related", as there is a source of mercury in the sandblast area Upland AOPC, concentrations in forebay tissues were elevated over reference, and exceeded human health based screening values. **Follow-up DEQ Response:** Please see response to General Comment 10 with respect to mercury. DEQ agrees with the proposed approach for additional mercury sampling.	Comment noted. See the response to Specific Comment 11. Concentrations of mercury in Forebay sediments were demonstrated to be below Reference Area sediment concentrations based on the population to population statistical comparison. Concentrations of mercury in other Forebay media, such as bass, are also similar to Reference Area concentrations (Forebay range = 0.071 to 0.512 mg/kg and Reference range = 0.0548 to 0.333 mg/kg). As per CERCLA guidance, it is legitimate to consider upstream sources that could contribute to a site, as it is impossible to maintain remedial goals that are below upstream concentrations. It is unclear whether or not a source of mercury, and other metals, originates from the Upland portion of the site, including at the Sandblast AOPC. Therefore, future samples collected in the former removal areas as part of the River OU initial FS sampling effort will be analyzed for all metals. Comment noted.
18.	**Page 9-29, Section 9.6.4.** This section describes a correlation analysis of three parameters: PCBs, total organic carbon and percent fines in sediment. We suspect a more useful correlation may be PCBs, TPH and PAHs. **Clarification of DEQ Response:** This comment was directed at correlations in sediment, not upland source control. Upland source control will not address further analysis that may be needed to assess in-water sediment.	Comment noted. See the response to General Comment 9 regarding Upland source control. Comment noted. The suggestion to correlate PCBs, TPH, and PAHs in sediment of the Forebay will be considered in the FS.

19.	**Section 9.3.3, hazardous materials storage area.** The report emphasizes VOC levels in soil gas in samples SB-10 and SB-12. These are north of the hazardous materials storage area (HMSA). Note that the highest PCE concentration in soil (420,000 ug/kg, per Table 5-4b) was found at soil boring SBB18, which is south of the HMSA. With this in mind, the soil VOC data should be considered in addition to the soil gas results when considering future remedial action decisions for this area. Table 5-4c also indicates that PAH concentrations in soil are particularly high in portions of the sandblast area.	Comment noted. Additional discussion of the Sandblast Area is provided in Section 11.2.4.2, in which further evaluation of these COPCs in the baseline HHRA is recommended.
20.	**Page 11-38.** The text states "five specimens of large-scale sucker, collected by USACE in 2006, were archived. They were collected from two locations, the south shore of Cascade Island and the south shore of Bradford Island. These samples will be analyzed for the range of bioaccumulative and other site-related COIs requested by DEQ." Are there additional largescale sucker that have not been analyzed? **Follow-up DEQ Response:** The response indicates "the specimens were composited in order to generate enough tissue mass for analytical testing". Please clarify; DEQ does not recall that tissue mass requirements were a concern for largescale sucker.	Clarification provided. There are no additional largescale sucker samples that have not yet been analyzed. The text above will be modified to indicate the following: "As discussed in Section 6.2.1, in June and August 2006, the USACE used one sucker composite sample from the Forebay (URS 2008c). The sucker sample is the composite of the five specimens from two locations that were collected by USACE in 2006. The specimens were composited in order to generate enough tissue mass for analytical testing. The analytical results of the composite sample are included in Table 6-6 and were considered qualitatively in the risk assessments." Clarification provided. As stated in the response, the five individual sucker specimens were composited so that all of analyses that were conducted on the other species could be performed on the sucker.
21.	**Page 12-5.** The soil exposure media for birds should also be evaluated using surface soil (e.g. 0-1 foot). An exposure soil horizon of 0-3 ft. would not normally occur for birds, and the use of a the deeper horizon may dilute out risk at the surface. For example, only evaluating truly surface soil would be an important evaluation in the sandblast area.	Clarification provided. As shown in Tables N-3, N-8, N-13, N-18, N-43, and N-45 of Appendix N, both soil depth intervals (0 to 1 and 0 to 3 feet bgs) were evaluated for all terrestrial receptors. The text in Section 12.2.2 (Page 12-5) will be clarified as follows (see text in italics): "Rooting depths for plants and burrowing depths for invertebrates and mammals were assumed to occur within the upper 3 feet of soil, and it will be assumed that all terrestrial receptors are exposed to soils from this depth interval. This is a conservative assumption for birds, which typically do not burrow and forage on the ground surface, and mammals that burrow are more likely to consume organisms that are exposed to soils below the surface. *For plants, soil invertebrates, birds, and mammals,* the Landfill and Sandblast Area AOPCs were evaluated for both the surface (0-1 foot bgs) and shallow (0 to 3 feet bgs) intervals."

22.	**Page 12-8, Section 12.3.2.2, assessment endpoints.** A higher trophic level mammal, such as fox or mink, should be included in the evaluation. Is there evidence that predatory mammals would not be feeding on the terrestrial mammals (shrew, etc) on the island? **Follow-up DEQ Response:** An upper trophic level terrestrial mammal should be used to represent this guild for the risk assessment. For the upland risk assessment, a scenario could be added (separate of the in water exposure area) that evaluates a mink exposed to the upland areas of Bradford Island. Alternatively, a separate receptor such as a fox could be added to represent this pathway. In water exposure to the mink does not address the upland pathway. Quantitative changes are required to the screening tables for the upland AOPCs.	Comment accepted. Protection of higher trophic-level mammals (such as mink) that may forage in the Upland OU will be added to the assessment endpoints described in this section. Since the SLVs for mammalian receptors as a generic receptor class were already used in the screening-level ERA, no changes to the quantitative evaluation are necessary. Clarification is needed on the last statement in this comment. Soil SLVs protective of mammals (as a generic receptor group) were already applied in the ERA for the Upland AOPCs; therefore, it is unclear what quantitative changes are required to the Upland screening tables. In regards to adding a large terrestrial mammal to the assessment endpoints for the Upland OU, this request will be incorporated in the revised ERA. As the Upland OU has been recommended for a Level III BERA, identification of a specific large mammal is needed for purposes of the BERA. According to Section 3.5 of the Level I Scoping Assessment that was performed for the Landfill (URS 2002), which included a thorough biological characterization of the Landfill and all habitats on the island, "large mammalian predators do not occur on the island." The only mammals on the island that are mentioned in the Scoping Assessment are small mammals (rodents) and feral cats: "Although the island harbors small mammals, feral cats, Canadian geese, and other bird species, the minimal amount of available habitat (~12 acres) makes it unsuitable for supporting viable populations of wildlife species with larger home ranges." For this reason, large mammals were not included in the assessment endpoints described in the approved RI MP (URS 2007). However, because mink are present in the area and could feasibly access the island and forage there, exposure by this species through consumption of rodents will be included in the Level III BERA. The following information was identified regarding the mink's diet: • Crayfish most important mink food in Columbia River study area, followed by fish, birds, and mammals; of 7 taxa of mammals eaten by mink, bushy-tailed woodrats, microtines (rodents that eat primarily grasses and forbs, and pocket mice consumed most frequently (Henny, Grove, and Hedstrom, 1996) (cont'd)

22. (cont'd)		(cont'd) • Prey of mink in Lower Columbia River include small mammals (e.g., muskrat), fish (including crayfish), and birds; diet varies by season and is localized (Lower Columbia River Bi-State Program, 1996) • Assumption of 15% crayfish and 85% fish used for Portland Harbor; many studies cited that demonstrate range of prey consumed by mink, including muskrats, fish, frogs, crayfish, small mammals, and birds found near water; region-specific studies on dietary proportions not available (Lower Willamette Group, 2007) • Assumption of 90% fish and 10% terrestrial food chain used for derivation of mammalian wildlife values for bioaccumulative chemicals; proportion of mink's diet strictly from terrestrial sources can vary from almost none to one third of diet (EPA 1995); • River in Michigan (year round diet) – 85% fish, 7% crustaceans and amphibians, 6% birds and mammals, 1% vegetation, and 1% unidentified (EPA 1993) Based on the information gathered regarding carnivorous (large mammal) predators in the Upland OU, the mink is the selected receptor based on likelihood of presence and sensitivity to environmental contaminants. To be conservative, a dietary composition of 15% small mammals from the Upland OU will be assumed as a first step, even though a lower proportion may actually be more realistic for site conditions (i.e., permanent water source; riverine habitat). In addition, contribution from crayfish and fish from the river will be considered to provide a more comprehensive evaluation of the chronic exposure dose to this species. EPA. 1995. Great Lakes Water Quality Initiative Criteria Documents for the Protection of Wildlife: DDT, Mercury, 2,3,7,8-TCDD, PCBs. Office of Water. EPA-820-B-95-008. March. EPA. 1993. Wildlife Exposure Factors Handbook, Vol. 1 of 2. Office of Health & Environmental Assessment. EPA/600/R-93/187a. December. (cont'd)

22. (cont'd)		(cont'd) Henry, C.J., R.A. Grove, and O.R. Hedstrom. 1996. Final Report, A Field Evaluation of Mink and River Otter on the Lower Columbia River and the Influence of Environmental Contaminants. February. Lower Columbia River Bi-State Program. 1996b. Final Report, Contaminant Ecology of Fish and Wildlife of the Lower Columbia River: Summary and Integration. April. Lower Willamette Group. 2007. Portland Harbor RI/FS Comprehensive Round 2 Report, Appendix G. February. URS 2002. Draft Level I Ecological Scoping Assessment and Human Health Problem Formulation, Bradford Island Landfill. Bonneville Dam, Cascade Locks, Oregon. April. URS. 2007. Remedial Investigation/Feasibility Study (RI/FS) Management Plan (MP), Bradford Island, Bonneville Lock and Dam Project, Cascade Locks, Oregon. September.
23.	**Page 12-11, Section 12.3.3.3, Identification of CPECs.** Comparison between background and the site should be done for inorganics only. Frequency of detection should not be used to screen out COIs associated with known sources at Bradford Island. While DEQ is in the process of phasing out the frequency-of-detection screen, the objective (as cited in the report) is to really identify COIs that are infrequently detected (less than 5 percent of samples), that may be artifacts in the data due to sampling, analytical, or other errors and need not be selected as COPCs (DEQ 2000, 2010). In addition, the mixture of sources, analytical results and the heterogeneity of the source material relative to the sampling confound this evaluation. COIs found in localized areas still need to be evaluated for small home range receptors or those exposed on a point basis (e.g. plants, invertebrates). In addition, in Tables 9-1 to 9-6 where soils and groundwater were evaluated for frequency of detection, the data summary statistics are omitted for those where detection frequency was less than 5 percent. Therefore, an evaluation on the magnitude and occurrence of these chemicals could not be made. Number of samples and concentration statistics should be presented for these COIs. Identification of CPECs in the Tables appears to be based on a screening that considers a mixture of human health and ecological SLVs. It is difficult to review the adequacy of the SLVs with these tables. A master table showing a (cont'd)	Clarification provided. As described in the second paragraph of Section 12.3.3.3, "The objective of the statistical analysis was to assess whether the mean <u>inorganic</u> COI concentrations in soil within each AOPC, as well as the mean soil COI concentrations for all four AOPCs combined, were significantly higher than the mean Reference Area concentrations." Use of the 5% detection frequency rule concurs with DEQ guidance (2001, 2010b). This step of the screening process was also described in the agreed upon RI/FS MP (URS 2007) and follows precedent that has been set in ERAs for other sites lead by DEQ, including the Level II Screening Assessment that was previously performed for the Landfill AOPC (comment letter from Matt McClincy, previous DEQ PM, to Mark Dasso, USACE PM dated November 4, 2004). Only a few media in specific AOPCs (e.g., soil and groundwater of Landfill and Sandblast Area) were subject to this step, due to the absence of 20 samples for most media per AOPC. This approach was not applicable for any of the River OU media. As a precautionary measure, bioaccumulative COIs detected in less than 5% of soil (0 to 1 foot bgs and 0 to 3 feet bgs) and groundwater samples collected from the Landfill and Sandblast Area, but detected at least (cont'd)

23. (cont'd)	(cont'd) comprehensive list of human health and ecological screening values for water, soil and sediment should be presented along with the selected SLV.	(cont'd) once, were compared to dietary-based SLVs when available (Appendix O, Tables O.3-1 and O.3-2). As shown in these tables, the only COI omitted on the basis of detection frequency and detected above the SLV is 4,4'-DDE in groundwater at the Landfill AOPC (Table O.3-1). However, 4,4'-DDE was only detected at a single well (MW-03; Figure 5-1) at a concentration of 0.00246 µg/L, and down gradient wells closer to the River were all non-detect for 4,4'-DDE. The non-detect MDLs for 4,4'-DDE, which range from 0.00195 to 0.1 µg/L, all exceed the surface water benchmark of 0.001 µg/L, indicating that the theoretically based SLV is lower than analytical methods can achieve. In addition, as discussed in Section O.1.2, the assumption that aquatic organisms are exposed to undiluted groundwater concentrations is highly conservative. No sensitive plants or invertebrates are known to exist at the Site and, therefore, no further assessment of the COPC selection process based on the 5% rule is necessary. The data summary and statistics tables for all analytes are presented in Appendix I. The tables in Appendix J provide all of the human health- and ecologically-based SLVs for all media evaluated in the RI. The selected SLVs are presented in these tables, as well as all sources of SLVs considered. In Section 9.0 (Nature and Extent), the lower of the final selected human health- and ecologically-based SLVs were used in the third step of the screening process, while in Sections 11 (HHRA) and 12 (ERA) only the human health- or ecologically-based SLVs were used, as appropriate, for the final selection of COPCs and CPECs, respectively.
	Follow-up DEQ Response: The appropriate exposure point concentration for plants and invertebrates is point by point and therefore frequency of detection over a larger area does not apply. Alternative information can be provided if a particular detected analyte is believed to be in error (e.g. see response to Specific Comment 14. DEQ requests that all COIs removed due to frequency of detection or Q=5 should be added to tables of data summary statistics as this provides important information on detections across different media.	Comment accepted. See the responses to Specific Comment 14, and Specific Comments 24 and 25. The tables presented in Appendix I provide summary statistics for all AOPCs, including detection frequency.

24.	**Page 12-12, Section 12.3.3.3.1 and 12.3.3.3.2.** A multiplier of 5 should not be used for water media. (Refer to the note at the beginning of section II of DEQ's *Guidance for Ecological Risk Assessment: Levels I, II, III, IV*: "In Task 9(c), page II-8 of the Level II Ecological Risk Assessment Guidance, please note that the Q = 5 guidance applies only to soil, and does not apply to water and sediment. Until other screening level values become available, water and sediment screening should be done using the SLVs provided in Tables 1 and 2.") This reason for the multiplier in DEQ guidance is to estimate a lowest observed effect concentration (LOAEL) based on a no observed effect concentration (NOAEL). NOAELs are used to screen threatened and endangered species, whereas LOAELs are used to screen for population level effects. Water SLVs are typically based on AWQC values, which are community-based toxicity values. For plants and invertebrates, the toxicity values are more commonly based on Maximum Acceptable Toxicant Concentrations (MATC) and therefore the 5 x factor does not apply. (cont'd)	Comment regarding first part accepted (about aquatic organisms and benthic invertebrates exposed to water/sediment), and comment noted regarding second part (about terrestrial plants and invertebrates exposed to soil). For aquatic and benthic organisms, Q=1 will be used to identify CPECs, and Q=5 will be maintained to identify CPECs for terrestrial plants and invertebrates**.** Toxicity ratios based on both Q=1 and Q=5 were provided in the screening tables created for soil, water, and sediment for plants and soil invertebrates, aquatic organisms, and benthic invertebrates, respectively. To accommodate DEQ guidance, the columns presenting toxicity ratios based on Q=5 will be deleted from the water and sediment tables for aquatic organisms and benthic invertebrates. Identification of CPECs for aquatic organisms is already based on Q=1 and, therefore, the findings for water will not change (e.g., Table N-5). Additional CPECs may be identified for benthic invertebrates, as Q=5 was used to identify CPECs for this receptor group. Based on the absence of threatened and endangered, or otherwise protected, species in the Upland OU, use of a Q=5 to identify CPECs for plants and soil invertebrates complies with DEQ guidance (2001) and the agreed upon RI/FS MP (URS 2007). This approach also follows precedent that has been set in ERAs for other sites led by DEQ, including the Level II Screening Assessment that was previously performed for the Landfill AOPC (comment letter from Matt McClincy, previous DEQ PM, to Mark Dasso, USACE PM dated November 4, 2004). Additionally, plant and soil invertebrate SLVs are based on different toxicity endpoints depending on the SLV source, and mainly include the EcoSSLs derived from a geometric mean of the effective concentration that affects 20% of the test population (EC_{20}), effective concentration that affects 10% of the test population (EC_{10}), or MATCs (EPA 2005), or DEQ's SLVs derived from an EC_{20} (DEQ 2001; Efroymson et al. 1997). Plant and soil invertebrate SLVs from these sources are intended for screening purposes and are intentionally conservative. No additional evaluation for plants or soil invertebrates is warranted for this site. (cont'd)

24. (cont'd)	(cont'd) **Follow-up DEQ Response:** A Q=5 should not be used for plant and invertebrate SLVs based on MATCs (Maximum Acceptable Toxicant Concentrations). A Q of 5 can be used for SLVs derived with a no observed adverse effect level (NOAEL) where threatened and endangered species are not present.	(cont'd) Comment accepted. The SLVs potentially based on MATCs (i.e., the geometric mean of the NOAEL and LOAEL) are EPA's EcoSSLs for the following COIs: arsenic, cadmium, cobalt, copper, lead, manganese, nickel, pentachlorophenol, selenium, silver, zinc, Total LPAHs, and Total HPAHs. Although DEQ's 2001 guidance explicitly states that a Q=5 may be used for species that are not threatened or endangered, and does not exclude plants and soil invertebrates, a Q=1 will be used for these receptor groups. However, the concept of using LOAEL-based benchmarks for non-threatened and endangered plants and soil invertebrates will be incorporated in the weight of evidence for assessing risk to these receptor groups.

25.	**Page 12-13, Section 12.3.4.1.1, landfill AOPC – Individual and multiple CPEC Table N-1** and Table O.3-10**:**
	• Plants: For plants, all COIs should be screened on a sample by sample basis, consistent with the appropriate exposure point concentration.
	  o Plant values should not be multiplied by 5 since they are based on maximum acceptable toxicant concentrations.
	• Soil Biota:
	  o TPH: Use 100 mg/kg for gasoline range and 200 mg/kg for diesel range TPH screening levels (Washington DOE, MTCA Table 749-3).
	  o Eco SSL (soil screening level) values for Total LPAHs and Total HPAHs should have been used for evaluating each individual PAH and the total values. The values are 29 mg/kg total LPAHs and 18 mg/kg total HPAHs. This will change the results of the risk screening for individuals.
	• Birds:
	  o SLVs: If a national Eco SSL is available, this value should be used instead of DEQ Level II SLVs. This was discussed in the planning process. This will change the SLVs for lead and zinc.
	(cont'd)
		Plants: Comment noted. Maximum COI concentrations were used to assess risk to plants per ERA guidance (DEQ, 2001). This approach also follows precedent that has been set in ERAs for other sites lead by DEQ, including the Level II Screening Assessment that was previously performed for the Landfill AOPC (comment letter from Matt McClincy, previous DEQ PM, to Mark Dasso, USACE PM dated November 4, 2004). Neither DEQ nor EPA guidance requires the screening level risk assessment to be conducted on a sample by sample basis.
		  o Comment noted. See the response to Specific Comment 24.
		• Soil Biota:
		  o Comment noted. This is not one of the SLV sources identified in the 22 April 2010 Memorandum (see page 3). Individual components of TPH that represent the most toxic chemicals contained in petroleum mixtures (i.e., PAHs, metals, VOCs) were screened to assess risk to soil biota for the reasons described in Section O.3.1.5.
		  o Comment noted. The screening of soil biota included the screening of individual PAHs to the LPAH and HPAH SLVs; however, none of the individual SLVs exceeded the total SLVs. See Tables N-2 and N-12.
		(cont'd)

25. (cont'd)	(cont'd) o DDT and metabolites (DDE and DDD and total DDX): There is an EPA Eco SSL available of 0.093 mg/kg, which should have been used. This was discussed during planning. This will change the results of the screening. o Eco SSL values for Total LPAHs and Total HPAHs should have been used for each individual PAH and the total values. The values are 29 mg/kg total LPAHs and 18 mg/kg total HPAHs. This will change the results of the risk screening for individuals. o TPH: Use 5,000 mg/kg for gasoline range and 6,000 mg/kg for diesel range, except that the concentration shall not exceed residual saturation at the soil surface (WA DOE, MTCA Table 749-3). • Mammals: o Butyltins: A Region 5 Ecological Screening Level is available for total butyltins for a shrew: 7,620 ug/kg. o DDT and metabolites (DDE and DDD and total DDX): There is an EPA Eco SSL available of 0.021 mg/kg, which should have been used. This was discussed during planning. o TPH: Use screening levels of 5,000 mg/kg for gasoline range and 6,000 mg/kg for diesel range, except that the concentration shall not exceed residual saturation at the soil surface (WA DOE, MTCA Table 749-3). o PCBs: DEQ's Level II SLVs do not address bioaccumulation. Therefore, they can only be used to address direct toxicity. The data must also be screened based on a bioaccumulation value. EPA Region 5 ecological screening levels include a SLV of 0.332 ug/kg for the shrew. ORNL PRGs should also be considered. The PRG for the shrew is 0.371 mg/kg. (cont'd)	(cont'd) • Birds: o Clarification provided. EPA Eco SSLs were the preferred source of SLVs for terrestrial receptors; however, for lead and zinc (among other metals) the reference area UPL was selected as detailed in Appendix J of the RI (higher of SLV and reference UPL for inorganics). See Table J-5 in Appendix J. o Clarification provided. EPA Eco SSLs were the preferred source of SLVs for terrestrial receptors. The EPA Eco SSL for DDT and metabolites was used in the avian screening. See Table J-5 in Appendix J. Also see Tables N-3 and N-13. o Clarification provided. There are no EPA Eco SSLs for PAHs available for birds. The SLVs listed in this comment are for soil invertebrates. Based on discussions with Jennifer Peterson, as documented in an email from Usha Vedagiri to Paul Seidel and Jennifer Peterson (December 10, 2009), PAHs were dropped from quantitative risk estimation for all bird receptors due to the lack of reliable TRVs. o Comment noted. This is not one of the SLV sources identified in the 22 April 2010 Memorandum (see pages 3 and 5). Also see Table J-5 in Appendix J. Individual components of TPH (the most toxic chemicals contained in petroleum mixtures) for which reasonably reliable SLVs are available (i.e., metals, SVOCs) were screened to assess risk to birds for the reasons described in Section O.3.1.5. • Mammals: o Comment noted. This is not one of the SLV sources identified in the 22 April 2010 Memorandum (see pages 3 and 5). Also see Table J-5 in Appendix J. (cont'd)

25. (cont'd)	(cont'd) o Since EPA Region 5 provides additional SLVs for soil, these should be used in evaluating the data: ▪ Bis (2-ethylhexyl phthalate) is 0.95 mg/kg. ▪ Di-n-butyl phthalate 0.150 mg/kg di-n-octyl phthalate 709 mg/kg ▪ Diethyl phthalate 24.8 mg/kg ▪ Butylbenzyl phthalate 0.239 mg/kg	(cont'd) As stated in Section 12.3.5 of the RI and in Section O.3.1.6 of Appendix O, those COIs without dietary based SLVs (listed in Table O.3-10) were retained as CPECs for the Landfill and Sandblast Area AOPCs and warrant further consideration for birds and mammals in the Level III BERA for the Upland OU. EPA Region 5 TRVs, as well as other sources of TRVs, and their uncertainties will be considered in the BERA. o Clarification provided. EPA Eco SSLs were the preferred source of SLVs for terrestrial receptors. The EPA Eco SSL for DDT and metabolites was used in the avian screening. See Table J-5 in Appendix J. Also see Tables N-4 and N-9. o Comment noted. This is not one of the SLV sources identified in the 22 April 2010 Memorandum (see pages 3 and 5). Also see Table J-5 in Appendix J. Individual components of TPH (the most toxic chemicals contained in petroleum mixtures, i.e., PAHs, metals, VOCs) were screened to assess risk to mammals for the reasons described in Section O.3.1.5. o Clarification provided. EPA Region 5 SLVs are not one of the SLV sources identified in the 22 April 2010 Memorandum (see pages 3 and 5). ORNL PRGs, which do account for dietary exposure, were used in the ERA, and the PRG for PCBs of 0.371 mg/kg was the selected SLV for evaluating risk to mammals. See Table J-5 in Appendix J. Also see Tables N-4 and N-9. o Comment noted. EPA Region 5 SLVs are not one of the SLV sources identified in the 22 April 2010 Memorandum (see pages 3 and 5). See Table J-5 in Appendix J. As stated in Section 12.3.5 of the RI and in Section O.3.1.6 of Appendix O, those COIs without dietary based SLVs (listed in Table O.3-10) were (cont'd)

25. (cont'd)	(cont'd)	(cont'd) retained as CPECs for the Landfill and Sandblast Area AOPCs and warrant further consideration for birds and mammals in the Level III BERA for the Upland OU. EPA Region 5 TRVs, as well as other sources of TRVs, and their uncertainties will be considered in the BERA.
	Follow-up DEQ Response:	
	• **Appropriate exposure point concentration.** For "plants, aquatic, and soil invertebrates that are immobile or nearly immobile, the maximum detected concentration (MDC) in soil or sediment is the appropriate value for comparison" to the screening level value (DEQ, Guidance for Ecological Risk Assessment: LEVELS I, II, III, IV, 2001). Therefore, screening must be completed on a sample-by-sample basis. The screening should identify which samples and how many samples exceed screening levels.	Comment noted. The MDC was used as the EPC for immobile or nearly immobile receptors, as per the guidance. The guidance does not state that a sample by sample comparison is necessary for all COIs, especially if the MDC does not exceed the SLV. Figures were created illustrating SLV exceedances for immobile receptors for many CPECs; primarily those CPECs with elevated concentrations at more than one sample location (e.g., Figures 12-6, 12-7, 12-11, 12-12, 12-16, and 12-17).
	• **Additional SLVs.** It was not possible to identify the complete list of COIs and SLVs in upfront discussions without submission of a work plan screening level table for DEQ review. Based on the risk assessment, these additional SLVs are presented here and allow for COIs to be evaluated in a risk based context. Unless there is a technical problem with the cited SLV sources, these should be used in the risk assessment. Uncertainties can be discussed in the uncertainty section.	Comment accepted. The additional SLVs will be used in the absence of a value that was already included in the hierarchy of sources approved by DEQ prior to completion of the RI/RA, with the exception of the WA DOE SLVs for TPH. In other words, the SLVs recommended by DEQ will be used for COIs that were retained as CPECs based solely on the fact that a SLV was not available. Due to the low confidence in SLVs for TPH for purposes of blanket application to sites with petroleum hydrocarbons, the chemical indicator approach whereby the most toxic components of TPH mixtures (e.g., VOCs and PAHs) are used to assess risk will be maintained. If the potential for risk is demonstrated for the indicator chemicals, then an evaluation of TPH results along with results for these indicator chemicals will be performed in the FS to confirm co-location.
	• **DDT and metabolites for birds and mammals.** The original comment indicated that the SLV should be compared to a Total DDX value (total of all DDD, DDE and DDT isomers) and not just comparisons of individual isomers to the SLV. Please revise.	Comment accepted. All detected DDT isomers in soil of the Landfill and Sandblast Area will be summed to generate a value for Total DDTs, which will be compared to the receptor-specific EcoSSLs.
	• **PCBs.** Agree with response.	Comment noted.

26.	**Table N-5, Identification of CPECs in Groundwater, Seep Water and Surface Water.** Please use the following hierarchy of SLVs for water: • 1.) National Ambient Water Quality Criteria (NAWQC), hardness adjusted to 25 mg/L calcium carbonate for hardness dependent COIs • 2.) Tier II Chronic Values from Suter and Tsao, 1996 (ORNL) 3.) EPA, 2003. Final Chronic Values (FCV) for PAHs. The outdated DEQ values for acenaphthene and naphthalene should not be used. • 4.) EPA, 2006b, EPA Region III BTAG, Freshwater Screening Criteria References: Suter and Tsao, 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision EPA, 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. Table 3-4 • EPA, 2006, Region III BTAG, Freshwater Screening Criteria, http://www.epa.gov/reg3hwmd/risk/eco/btag/sbv/fw/R3_BTAG_FW_Benchmarks_07-06.pdf **Follow-up DEQ Response:** • National Ambient Water Quality Criteria must be hardness adjusted. Please revise. (cont'd)	Comment noted. This is not the agreed upon hierarchy for water SLVs, as presented in the 22 April 2010 Memorandum (see pages 3 and 6). However, the agreed upon hierarchy, which is provided in Section J.2.3 of Appendix J, is similar to the hierarchy described in this comment and the latest NAWQC (EPA 2009) were the preferred source of SLVs for water. Comment accepted. The AWQC for cadmium, chromium, copper, lead, nickel, and zinc will be adjusted for a site-specific mean hardness value of 60 mg/L (as calcium carbonate). This mean hardness value is based on 11 surface water samples collected in April 2003: 8 from the Forebay (pre-sediment removal), 1 from the vicinity of Goose Island, and 2 from the former reference location (RM 147). Hardness data for these 11 samples range from 56 to 64. The selected hardness value of 60 mg/L is supported by a 2008 USFWS study that reported a mean hardness value for the Columbia River of 64 mg/L. (cont'd)

26. (cont'd)	(cont'd) • DEQ's outdated values for acenaphthene and naphthalene should be replaced with risk based values. These are currently not listed in DEQ's table 33A. ORNL Tier II values should be used for these chemicals instead. • National Ambient Water Quality Criteria for isomers of DDT apply in addition to individual isomers or congeners. Therefore, the sum of DDT, DDE and DDD should be screened against 0.001 ug/L.	(cont'd) USFWS. 2008. Columbia River Basin Asian Carps Risk Evaluation. February. Comment accepted. There is no Tier II chronic value for acenaphthene, only for naphthalene (Suter and Tsao, 1996). However, the more up-to-date freshwater chronic values presented in EPA 2003 will be used as SLVs to be protective of aquatic biota: acenaphthene (55.85 ug/L) and naphthalene (193.5 ug/L). Comment accepted. All detected DDT isomers in groundwater of the Landfill and Sandblast Area will be summed to generate values for Total DDTs, which will be compared to the chronic AWQC.
27.	**Page 12-5, Section 12.3.4.1.2, sandblast area AOPC (Tables N-11 through N-15).** Please refer to the comments for the landfill area on SLVs.	Comment noted. See the responses to the SLV-related comments for the Landfill AOPC above.
28.	**Page 12-42, Section 12.5.4, Benthic Invertebrates.** The removal of the sediment datasets except the random 18 samples reduces the areas that can be evaluated for benthic invertebrates. Sediment pore-water concentrations and river sediment at outfalls are relevant for butyltins but not included in the screening. For example see Table G-2e (dibutyltin and monobutyltin detected in porewater at 0.0820 ug/L and 0.570 ug/L, respectively) and Table G-7 as well as samples SBDS-18, SBDS-19, SBDS-24. At S1-43, dibutyltin was found at 4.60 ug/kg and tributyltin at 13 ug/kg. **Follow-up DEQ Response:** Please see response to Specific Comment 3 and 6. Areas outside the former removal action areas must be considered.	Comment noted. As discussed in the response to General Comment 6, initial FS samples collected in the former removal areas as part of the River OU FS will be analyzed for butyltins to better characterize this area of the Forebay. These data will be especially useful for understanding exposure conditions for the benthic community adjacent to the island. Comment noted. See the responses to General Comments 3 and 6.
29.	**Page 12-42, Section 12.5.4, Table N-50, Aquatic Organisms.** Please see comments above for groundwater / seep water for the hierarchy for water SLVs.	Comment noted. See the response to the SLV comments for groundwater/seep water, above (Specific Comment 26).
30.	**Page 12-42, Section 12.5.4, Table N-51, Fish and Shellfish:** (cont'd)	• Comment accepted. Please see the responses to General Comments 11 and 12, above (TEQs will be included in the risk (cont'd)

30. (cont'd)	(cont'd) • Dioxin-like PCB congeners in tissue need to be screened on a total TEQ basis against the 2,3,7,8-TCDD value in DEQ guidance for aquatic biota of 0.00646 ug/kg or 6.46 ng/kg. TEQ needs to be calculated for each sample. If the total TEQ screens in, then all dioxin-like congeners need to be carried forward. In Table N-51 an SLV of 430 mg/kg is used for all dioxin-like congeners and total PCBs, which inappropriately screens out PCBs. All dioxin-like congeners should be screened; Table N-51 only has a reduced list. • PAHs: DEQ's PAH screening list was developed based on PAHs that are detected regionally. However, PAHs detected on a site-specific basis in tissue are considered bioaccumulative. • The largescale sucker data are presented in Table 6-6a but are not included in the screening tables or conclusions. Even though there is only one composite sample of these fish, these data are appropriate for a screening level risk assessment and should be added to the screening tables for fish and piscivorous birds and mammals. • Sculpin analysis was limited to four metals (arsenic, cadmium, lead and mercury) and PCBs. These were not analyzed for PAHs or phthalates. We acknowledge that this was due to limited availability of sculpin. However, this represents a significant data gap. During future monitoring, an effort should be made to collect and analyze sculpin for all COIs (metals, PAHs, TPH, phthalates and PCBs).	(cont'd) assessment and will be screened against the TEQ SLV). Similar methodology used to calculate the sum 209 Congeners total will be used to calculate the TEQs based on all 12-dioxin like congeners. To clarify, the SLV of 430 µg/kg (i.e., DEQ's CTL for total PCBs as Aroclors) was used to screen total PCBs and the dioxin-like PCB congeners in the absence of CTLs for each individual dioxin-like PCB congener. In the revised Tables N-51 (Forebay fish/shellfish screening) and N-71 (Goose Island fish/shellfish screening), the SLV of 0.00646 µg/kg for the total TEQ based on 2,3,7,8-TCDD will be compared to the total PCB TEQ concentration. The individual dioxin-like PCBs concentrations will not be screened against the SLV for total PCBs of 0.43 µg/kg, but the concentrations of the individual dioxin-like PCBs will remain in the table for informational purposes. • Clarification provided. As shown in Tables J-6 and J-7, all PAHs were identified as bioaccumulative, except naphthalene, based on DEQ and EPA guidance and following the agreed upon approach for identifying bioaccumulative COIs in the 22 April 2010 Memorandum (see page 8). • Comment noted. As agreed upon and outlined in the 22 April 2010 Memorandum, the single sucker composite was evaluated qualitatively in the screening level RAs (see pages 12 and 13). In Table O.1-1 of Appendix O, the sucker data were compared to the smallmouth bass data collected from the Forebay to verify that COI concentrations in bass are higher than in suckers. Of the 58 COIs measured in both bass and sucker tissue (metals, PCBs as congeners and Aroclors, and SVOCs, including PAHs), nine were detected at a higher concentration in sucker tissue based on a comparison of the maximum detected concentration in bass versus the concentration in the sucker sample (PCB 169, (cont'd)

30. (cont'd)	(cont'd) **Follow-up DEQ Response: Largescale sucker.** The largescale sucker should be included as a receptor of concern, just as bass and sculpin, and screened in the risk assessment. Since this species is a separate receptor of concern, it should be included in the main document and not considered only in the uncertainly section. Largescale sucker tissue concentrations should be compared to both DEQ critical tissue levels (CTLs) and acceptable tissue levels (ATLs).	(cont'd) benzo[k]fluoranthene, indeno[1,2,3-cd]pyrene, pyrene, aluminum, cadmium, cobalt, lead, and vanadium). With the exception of PCB 169, which was not detected in bass tissue or in any other media sampled in the Forebay or the upstream Reference Area, the concentrations of the remaining eight COIs in sucker tissue are remarkably similar to the maximum concentrations in bass tissue. A screening evaluation of the sucker data will be added to the uncertainty section in the revised RI (Appendix O). On this basis, it is assumed that evaluation of bass, which are expected to exhibit higher site fidelity, is assumed to be protective of humans and wildlife that consume fish. • Comment noted. Appropriate future monitoring, if any, will be determined as part of the River OU FS. Comment noted. Large-scale sucker tissue concentrations will be compared to both CTLs and ATLs, and this evaluation will remain in Appendix O. The large-scale sucker was not one of the fish species identified for inclusion in the RAs in the RI/FS MP, but was analyzed at the specific request of DEQ after the RI/FS MP was approved. It was agreed that this species would be analyzed to verify the assumption that the smallmouth bass is the most appropriate and conservative species for purposes of the RA, and this agreement was upheld by including an evaluation of the sucker data in the uncertainty section.
31.	**Page 12-43, 12-44, Piscivorous Birds, Tables N-52-N-56.** Total dioxin TEQ for birds, mammals and fish needs to be compared to the 2,3,7,8-TCDD screening level for each species group in DEQ guidance (this comment applies to all tables) including sediment and acceptable tissue levels (ATLs). ALL dioxin-like PCB congeners need to be carried forward where TEQ exceeds the SLV. ALL 12 dioxin-like congeners (not a reduced list of 7) need to be included and a total TEQ for birds, mammals and fish calculated. If total TEQ screens in, then all dioxin-like congeners need to be carried through the screening. Analytes detected in tissue should not be screened out based on a comparison between site and reference <u>sediment</u>. Instead, tissue-to-tissue comparisons (cont'd)	Comment noted. Please see the response to General Comments 11 and 12, above (TEQs will be included in the risk assessment). Please see the responses to General Comments 3 and 6 and Specific Comment 11, which indicate that initial FS samples collected in the former removal areas as part of the River OU FS will be analyzed for all metals. None of the bass samples collected from the Forebay exceed ATLs for lead, and the evidence to support a conclusion that nickel is elevated in tissue is unclear considering the absence of ATLs for nickel. It is unclear whether or not a source of nickel or lead originates from the site, and future sampling efforts are planned to investigate this issue. (cont'd)

31. (cont'd)	(cont'd) should be made between an appropriate background area and site. However, tissue comparisons are confounded for this site given that the selected reference area is elevated in metals (e.g., smallmouth bass nickel concentrations were detected up to 1,480 ppb, and lead was found up to 1,810 ppb). • TEQ from all dioxin-like PCB congeners needs to be calculated and screened against the 2,3,7,8-TCDD screening level sediment SLVs and tissue ATLs. • Table N-53 and N-54: The only tissue compared to bird ATLs are smallmouth bass. Bird exposure to other tissue such as sculpin, crayfish and largescale sucker should have been evaluated. Birds other than osprey and eagle will feed on crayfish and provide different spatial resolution than the bass. Largescale sucker data, while more limited, provides additional information on other guilds of fish that have also have a different habitat use than the bass. **Follow-up DEQ Response: Identification of tissue COPCs.** As mentioned in previous comments, uncertainties related to the use of only forebay-wide sediment data in the risk assessment results in uncertainty in evaluations between sediment and tissue. Smallmouth bass primarily use the habitat around the island, but contaminants detected in tissue were not evaluated using co-located sediment data from the source areas. Therefore, COPCs in tissue cannot be eliminated based only on the fact that they are not also determined to be a forebay-wide sediment COPC.	(cont'd) • Comment accepted. Please see the responses to General Comments 11 and 12, above (TEQs will be included in the risk assessment). • Comment accepted, in part. Although the approach used to evaluate aquatic-dependent birds concurs with the methodology for the ERA described in Appendix C of the RI/FS MP (URS 2007), sculpin and crayfish will be added to the screening tables for birds. Physical conditions in the river may hinder access to these food sources in many areas of the Forebay, including the northshore of Bradford Island, but wading birds (e.g., heron) could forage in areas along the Forebay shoreline where water is shallower and moves slower. Please see the response to Specific Comment 30 regarding evaluation of the largescale sucker sample. Comment noted. Regardless of the phased screening approach used to identify COPCs and CPECs in tissue, all chemicals will be analyzed for in sediment and clams collected from the north side of the island and bass tissue collected from the Forebay and Reference Area (PCBs [Aroclors and congeners], metals, PAHs, pesticides, butyltins, and SVOCs). If the results of these analyses indicate a potential source of contamination for tissue that was overlooked based on evaluation of the random Forebay datasets included in the RI/RA, the list of tissue COPCs and CPECs may be modified to reflect the new information. All chemicals detected in tissue based on the results of the forthcoming pre-FS sampling effort that are greater than DEQ's ATLs and CTLs will be considered for continued monitoring in the FS.
32.	**Page 12-44, Piscivorous Mammals, Tables N-57 through N-58:** • Phthalate screening levels are not available in DEQ's bioaccumulation guidance. What is the reference for these SLVs? • TEQ from all dioxin-like PCB congeners needs to be calculated and screened against the 2,3,7,8-TCDD screening level sediment SLVs and tissue ATLs. (cont'd)	• Clarification provided. Please refer to Section J.2.4 of Appendix J, which describes the ATLs that were calculated for phthalates detected in crayfish and smallmouth bass. These ATLs were estimated by applying DEQ's methodology for ATL development (2007) and using mammalian TRVs from the Oak Ridge National Laboratory (Sample et al 1996) to calculate ATLs for piscivorous mammals (see Tables J-3). Mink and (cont'd)

32. (cont'd)	(cont'd) • Mercury was significantly higher in site bass tissue when compared to the reference area. Therefore, mercury should be retained as a COPC in future sampling. • PAHs detected in fish and shellfish tissue should be evaluated with appropriate toxicity information. The use of pyrene as a surrogate for HPAHs is not representative of the toxicity of the HPAH group. EPA Eco SSL TRVs should be used to develop an acceptable tissue levels applied to tissue concentrations for protection of mammals. For example, the Eco SSL TRV is 65.6 mg dw/kg bw/d [milligrams as dry weight per kilograms of body weight per day] for LPAHs and 0.615 mg dw/kg bw/d for HPAHs.	(cont'd) great blue heron were used as endpoint species to be consistent with the ATLs used from DEQ's guidance (2007); exposure factors for the mink and heron from DEQ's guidance were used. • Comment accepted. Please see the responses to General Comments 11 and 12 (TEQs will be included in the risk assessment). • Comment noted. See the response to Specific Comment 11. Concentrations of mercury in Forebay and Reference Area sediment (Forebay range = 0.008 to 0.373 mg/kg and Reference range = 0.041 to 0.225 mg/kg; Table L-4) and bass (Forebay range = 0.071 to 0.512 mg/kg and Reference range = 0.0548 to 0.333 mg/kg) are very similar, and sediment concentrations of mercury in the Forebay were demonstrated to be below Reference Area sediment levels. To better understand the concentrations of mercury in the former removal area, initial FS samples collected as part of the River OU FS will be analyzed for mercury (see the responses to General Comments 3 and 6). The smallmouth bass samples that will be collected from the Forebay and Reference Area as part of this effort will also be analyzed for mercury. As per CERCLA guidance, it is legitimate to consider upstream sources that could contribute to a site, as it is impossible to maintain remedial goals that are below upstream concentrations. • Comment noted. This is not the agreed upon SLV screening approach based on discussions with Jennifer Peterson, as documented in an email from Usha Vedagiri to Paul Seidel and Jennifer Peterson (December 10, 2009). Since the detected concentrations of PAHs in fish and shellfish are so low, it is unlikely that utilizing a different surrogate mammalian TRV would result in different conclusions in the ERA. The current toxicity ratios, or R_{Bacs}, for mammals based on consumption of crayfish, sculpin, and bass from the Forebay containing PAHs and protection at the individual level range from $1.2x10^{-8}$ to (cont'd)

32. (cont'd)		(cont'd) 0.00006. The R_{Bacs} for mammals calculated from Goose Island crayfish and sculpin tissue concentrations range from $1.2x10^{-8}$ to $4.3x10^{-6}$. In addition, the EcoSSL TRVs were compiled by EPA from a database of TRVs in which aquatic-related studies on mammals (e.g., mink) were specifically omitted from the final list of TRVs used to ultimately derive the TRV that was incorporated into the EcoSSLs. EPA specifically states that the "wildlife TRVs are derived for use in assessments conducted for a terrestrial rather than aquatic environment" (EPA 2005). For this reason, using the EcoSSL TRVs for mammals exposed to HPAHs and LPAHs is not expected to reduce the level of uncertainty in the assessment of risk to mammals from consumption of aquatic fish/shellfish tissue. The Portland District believes the agreed upon methodology for assessment of fish/shellfish was followed and feels that the use of aquatic- based ATLs as surrogates (i.e., pyrene and fluoranthene), which are also derived from TRVs based on rodent studies, introduces a similar level of uncertainty into the ERA.
	Follow-up DEQ Response:	
	• **Mercury.** Please see the response to General Comment 10. Based on all available evidence mercury should be retained as COPC and CPEC.	Comment noted. See the response to Specific Comment 31. Mercury will also be analyzed for during the pre-FS sampling effort and will be considered for continued monitoring in the FS if detected concentrations in tissue are greater than DEQ's ATLs and CTLs.
	• **PAH TRVs.** If mammalian EPA Eco SSL TRVs for high molecular weight polycyclic aromatic hydrocarbons (HPAHs) and low molecular weight polycyclic aromatic hydrocarbons (LPAHs) are not used to evaluate acceptable tissue levels in aquatic biota, use either a PAH chemical specific toxicity reference value (e.g. benzo(a) pyrene) or an appropriate surrogate more for each detected PAH. The EPA Eco SSLs TRVs for LPAH and LPAH are 65.6 mg/kg bw/day and 0.615 mg/kg bw/day dry weight.	Comment noted. The agreed upon methodology for assessment of PAH exposure by mammals consuming fish/shellfish was followed: use of aquatic- based ATLs as surrogates (i.e., pyrene and fluoranthene). The current toxicity ratios (R_{Bacs}) for mammals based on consumption of crayfish, sculpin, and bass from the Forebay containing PAHs and protection at the individual level range from 1.17E-08 to 6.21E-05. The R_{Bacs} for mammals calculated from Goose Island crayfish and sculpin tissue concentrations range from 1.16E-08 to 4.32E-06. Since the detected concentrations of PAHs in fish and shellfish are so low, utilizing a different surrogate mammalian TRV would not result in different conclusions in the ERA. DEQ's mammalian TRV for (cont'd)

32. (cont'd)		(cont'd) fluoranthene (surrogate for LPAHs) is 26 mg/kg-bw/day for protection at the individual level, which is lower than the suggested EcoSSL TRV for LPAHs of 65.6 mg/kg-bw/day. DEQ's mammalian TRV for fluoranthene is 130 mg/kg-bw/day for protection at the population level, which is approximately 2 times higher than the EcoSSL TRV for LPAHs. Using the EcoSSL TRV for LPAHs would result in lower R_{Bacs} for individual LPAHs based on protection of individual mammals. Given that the highest R_{Bac} of all individual LPAHs for mammals based on protection at the population level is 1.24E-05, using the EcoSSL TRV for LPAHs would result in a maximum R_{Bac} of all individual LPAHs of 2.48E-05 (assuming similar bioaccumulation factors), i.e., 1.24E-05 x 2. Therefore, the findings of the evaluation for mammals consuming tissue containing LPAHs from the Forebay and Goose Island would not change if the EcoSSL TRV for LPAHs is used. DEQ's mammalian TRVs for pyrene are 1,300 mg/kg-bw/day for protection at the individual level and 6,500 for protection at the population level. These DEQ TRVs are approximately 2,100 and 10,600 times higher than the EcoSSL TRV for HPAHs of 0.615 mg/kg-bw/day. Given that the highest R_{Bac} of all individual HPAHs for mammals based on protection at the individual level is 4.43E-07, using the EcoSSL TRV for HPAHs would result in a maximum R_{Bac} of all individual HPAHs of 9.31E-04 (assuming similar bioaccumulation factors), i.e., 4.43E-07 x 1,300. Given that the highest R_{Bac} of all individual HPAHs for mammals based on protection at the population level is 8.96E-08, using the EcoSSL TRV for HPAHs would result in a maximum R_{Bac} of all individual HPAHs of 9.49E-04, i.e., 8.96E-08 x 10,600. Therefore, the findings of the evaluation for mammals consuming tissue containing HPAHs from the Forebay and Goose Island would also not change if the EcoSSL TRV for HPAHs is used.
33.	**Page 12-46, Goose Island Slough.** For fish and piscivorous birds and mammals, the division between the random forebay samples and the Goose Island area is not appropriate These should be treated as one exposure unit for more mobile receptors (e.g. bass, sucker, birds and mammals), and Goose Island media should be included in 90 percent EPCs.	Comment noted. Including the Goose Island data would introduce bias into the ERA since the random samples were designed to represent the Forebay as a whole and each random sample was spatially-distributed equally across the entire unit. In addition, the targeted samples near Goose Island had lower COI concentrations, and if they had been included, the resulting EPCs would have likely been lower than the random Forebay EPCs presented and used in the RI and risk assessments.

33. (cont'd)	**Follow-up DEQ Response:** Please provide a list of COIs for which the inclusion of the Goose Island data would change either the outcome of the risk screening or the comparison to reference. Ideally, this would be completed with the Bradford Island sediment data as well.	Comment noted. As described previously, the targeted samples near Goose Island had lower COI concentrations and fewer COIs than in the random Forebay dataset. If the Goose Island samples were combined with the random Forebay samples, the resulting EPCs would have likely been lower than the random Forebay EPCs presented and used in the RI and risk assessments. There may be a decrease in the number of COPCs/CPECs (based on detection frequency considerations since the combined sample size will exceed 20) and a decrease in the estimated risks (since forebay EPCs may be "diluted" by the lower Goose Island concentrations), if data for Goose Island media were combined with the random Forebay dataset. The same outcome would likely result by combining the targeted Eagle Creek samples with the random Forebay samples, for the same reasons described for Goose Island. No COIs were ignored in the HHRA and ERA evaluation of Goose Island and Eagle Creek sediment and tissue. All detected chemicals from these areas were included in the COPC/CPEC identification process as described below. The HHRA and ERA completed risk screenings for Goose Island sediment and tissue and Eagle Creek sediment that was similar in process to the screening conducted for the random Forebay media. In the RAs, COI concentrations in Eagle Creek and Goose Island media were compared to SLVs, following DEQ's COPC identification methodology. The results are shown in Tables M-41 through M-44 for the HHRA and in Tables N-61 through N-79 for the ERA. There would be no change in the outcomes of the risk screening or COPC selection by inclusion of these data, since these data <u>were</u> already included and considered in the RAs. The RAs did not perform a new comparison of Goose Island and Eagle Creek media to Reference media, but incorporated the results of the earlier comparison, as discussed in Section 8.3.2 (Table L-7).
34.	**Page 12-49, Section 12.5.4.3, Risk Interpretation:** • **Risk screening ratios for benthic and aquatic receptors**. A toxicity ratio >5 for benthic invertebrates in order to be identified as a CPEC should not be used. All COIs with a hazard quotient >1 should be retained as CPECs in the risk assessment. (Refer to the note at the beginning of section II of DEQ's Guidance for Ecological Risk (cont'd)	• Comment noted. See the response to Specific Comment 24, which indicates a Q=1 will be used to identify CPECs for benthic invertebrates and was the target hazard value already used for aquatic organisms. The agreed upon hierarchy for water SLVs and sources of sediment SLVs, as presented in the 22 April 2010 Memorandum (previously referenced in the responses to Specific Comments 25 and 26), were used in the ERA. (cont'd)

34. (cont'd)	(cont'd) Assessment: Levels I, II, III, IV: "In Task 9(c), page II-8 of the Level II Ecological Risk Assessment Guidance, please note that the Q = 5 guidance applies only to soil, and does not apply to water and sediment. Until other screening level values become available, water and sediment screening should be done using the SLVs provided in Tables 1 and 2.") • **Phased risk screening for tissue.** The text states (first bullet on this page) that, "*If a CPEC in tissue is also present in sediment at concentrations in exceedance of the bioaccumulation SLV (i.e., it is also a CPEC in sediment), then further risk assessment may be helpful to evaluate the actual potential for adverse effects to occur from exposure to site-related CPEC concentrations.*" Tissue CPECs should be considered site related regardless of results of the sediment evaluation. Tissue CPECs should not be screened out based on a comparison between site and reference <u>sediment</u>. • The second bullet on this page says that, *If a CPEC in tissue is either undetected, present below Reference Area concentrations (inorganics only), or present below sediment SLVs, further risk assessment may not be helpful because tissue concentrations likely do not correlate with current sediment concentrations at the site. If this is the case, the tissue levels could reflect exposure to other sources in the river or could reflect historical body burdens.* The Reference Area bass are elevated for cadmium, lead and nickel, and do not therefore do not meet the conditions of a Background location. Tissue levels are considered site related regardless of the sediment comparisons.	(cont'd) • Comment noted. See the response to Specific Comment 11 and the response to the following bullet. The objective of this first bullet referenced in the comment is not to differentiate between tissue CPECs that are site-related and those that are not site-related, but to recommend a way to interpret the findings of both the tissue and sediment evaluations for the River. The point of this statement is that further risk assessment on a CPEC identified for tissue that is also detected in sediment above the Reference concentration and SLV may be helpful because the results of the screening-level risk assessment indicate that some relationship may exist between site sediment and tissue concentrations. Likewise, further risk assessment on a CPEC identified for tissue that is not detected in sediment, or is detected below the Reference concentration and/or SLV may not provide much insight because the results of the screening-level risk assessment indicate that no apparent relationship exists between site sediment and tissue concentrations (as referenced in the second bullet discussed in the following comment). • First point in comment accepted, and second point regarding Reference Area is noted. Please see the response to Specific Comments 11, which address these specific metals in Reference Area bass. Based on the available information, it is unclear whether or not a source of these metals originates from Bradford Island. Therefore, initial FS samples that will be collected in the former removal areas as part of the River OU FS will be analyzed for all metals (see the responses to General Comments 3 and 6). Clarification on DEQ's definition of a "background" location for a riverine environment is needed. Although it is more feasible to identify relatively pristine background locations for Upland sites, as was accomplished for this project, under conditions of constant change and influence from upstream sources, the Portland District feels the Reference Area selected for the River OU does meet the criteria applicable to this (cont'd)

34. (cont'd)		(cont'd) environment. If a contaminant source does exist upstream, these contaminants could potentially migrate downstream and impact Forebay media. As per CERCLA guidance, it is legitimate to account for ongoing upstream sources that could contribute to a site, as it is impossible to maintain remedial goals that are below upstream concentrations. The response to the comment above ("Phased risk screening for tissue") addresses the purpose of the statements made in the second bullet referenced in this comment.
	Follow-up DEQ Response: • **Phased screening for tissue.** The decision rules for tissue in relation to sediment would be relevant if the sediment and tissue under evaluation were co-located. For the RI and risk assessment presentation, this is not the case (see General Comments 3 and 6). Therefore, tissue CPECs should not be screened out based on comparison to sediment (SLVs or comparison to reference).	Comment noted. See the response to Specific Comment 31.
	• **Background location.** DEQ's definition of background level (DEQ Rule, 340-122-0115) "means the concentration of hazardous substance, if any, existing in the environment in the location of the facility before the occurrence of any past or present release or releases." DEQ Guidance (1994) goes on to say "background samples are taken to determine the level of a particular compound that naturally occurs in the area of a site. Background samples should not be collected from areas where other anthropogenic sources may have contributed the same consistently as those encountered at the site in question". The reference Area selected by the Corps does not represent naturally occurring background concentrations and does not meet the criteria outlined above. Contaminants may exist upstream at other contaminated sites, but this evaluation should be included as a part of the feasibility study to determine if upstream contaminants are moving and would impact the Bradford Island site.	Comment noted. According to EPA's *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites*, EPA's definition of background is "background refers to substances or locations that are not influenced by the release from the site, and are usually described as naturally occurring or anthropogenic" (EPA, September 2002) Please see response to Comment 33.

35.	**Page 12-44 through 12-46, mouth of Eagle Creek and Goose Island slough.** Screening these areas separately from Bradford is defensible only for benthic invertebrates and small home range aquatic biota such as crayfish and sculpin. For other receptors the areas should be combined into one relevant exposure unit. **Follow-up DEQ Response:** Please identify any COPCs/CPECs that would have been identified if the combined dataset including Goose Island and Eagle Creek been evaluated for humans and wildlife.	Comment noted. Please see the response to Specific Comments 33, which describes the purpose and reasoning for maintaining separate datasets for the random and targeted samples. Combining the data from Eagle Creek and Goose Island slough would not likely change the findings of the RAs due to the generally lower concentrations of COIs measured in these targeted areas relative to the greater Forebay (random samples). It is likely that fewer COPCs/CPECs would have been identified if the combined datasets had been evaluated for humans and wildlife. Comment accepted. Protection of higher trophic-level mammals (such as mink) that may forage in the Upland OU will be added to the assessment endpoints described in this section. Since the SLVs for mammalian receptors as a generic receptor class were already used in the screening-level ERA, no changes to the quantitative evaluation are necessary.
36.	**Page 12-52, Tissue.** All COPCs (e.g. mercury, lead, cadmium, PAHs, P2EHP, PCBs in bass) that exceed risk screening levels or for which there are no SLVs should be retained for future monitoring and assessment. These should not be dropped as sediment COPCs. **Follow-up DEQ Response:** COIs that exceed risk levels or do not have SLVs are COPCs and should not be dropped as COPCs in the risk assessment. Please see response to comments 3 and 6. This will ensure that monitoring, even though repeatedly termed an FS task, will provide more refined risk estimates and address data gaps for in the risk assessment for source area COPCs.	Comment noted. Please see the responses to General Comments 3 and 6, which describe the initial River OU FS sampling effort that will be conducted and will include analysis of these chemicals in sediments at the former removal area and in bass collected from the Forebay and Reference Areas. Comment noted. See the response to Specific Comment 31.
37.	**Page 12-57 through 12-62, Goose Island and mouth of Eagle Creek.** The screening and conclusions should be re-done to include all COIs, and not be limited to "only additional CPECs that have not already been identified as a part of the random forebay event". (cont'd)	Clarification provided. All COIs detected in Eagle Creek and Goose Island media were included in the risk-based screening for these targeted exposure areas, and the same methodology used to screen the random Forebay data was used for these two targeted datasets. The random Forebay data were included in the discussions for Eagle Creek and Goose Island to provide context for the CPECs identified in these two targeted locations relative to the broader and more robust tissue and sediment random Forebay datasets. Clarification on this comment would be helpful to identify the statement in quotes, which could not be found in Section 12. No changes are needed to address this comment. (cont'd)

37. (cont'd)	(cont'd) **Follow-up DEQ Response:** The text the comment is referring to is on Page 12-45, which states "because tissue data have been collected from the greater Forebay (the random samples), the purpose of the bioaccumulation evaluation for eagle Creek sediment was to identify any additional CPECs that have not already been identified through the random Forebay sampling event. Any bioaccumulative CPEC identified in Eagle Creek sediments (i.e. maximum sediment concentration above the bioaccumulation SLV) were compared to the tissue data to determine their actual presence in measured tissue data from the forebay." For this area, Aroclor 1248 is detected in sediment above screening levels but appears to have been dropped given Aroclor 1248 was not detected in bass tissue. PCBs should be carried forward as a COPC for this area.	(cont'd) Comment accepted. Given the influence of weathering and metabolic processes on the ability to identify PCBs measured as Aroclors in tissue, Aroclor 1248 will not be dropped as a COPC or CPEC in Eagle Creek sediments. However, Aroclor 1248 was not detected in pre-removal Forebay sediment samples (Table I-7) or random Forebay and Goose Island sediment and tissue samples (Tables I-8 and I-9), indicating that the source of Aroclor 1248 detected in Eagle Creek sediments is not likely associated with former activities at Bradford Island. If the findings of the pre-FS sampling also indicate the absence of Aroclor 1248, this information will be considered in the FS.
38.	**Reference to bis(2-ethylhexyl)phthalate.** The text of the report, and the list of acronyms, refers to bis(2-ethylhexyl)phthalate as B2EHP, but some of the figures refer to it as BEHP. Please revise the abbreviation in the figures to be consistent with that in the text.	Comment accepted. The text will be corrected to be consistent.
39.	**Section 13.5.** The source of metals, including mercury as well as PAHs that were determined to be elevated in forebay tissue compared to reference area tissue has not been determined. However, several of these elevated concentrations appear correlated to PCB in sediment and there is a plausible connection to the sandblast area or landfill. Therefore, DEQ recommends retaining antimony, arsenic, cadmium, copper, chromium, lead, nickel, mercury, zinc, phthalates and PAHs for additional evaluation and monitoring.	Comment noted. Please see the response to General Comment 9, which acknowledges the benefit of collecting additional data from the removal area to further assess runoff, erosion, and mass wasting from the Upland OU to the River. These additional data will be further evaluated in the Upland OU FS in conjunction with the findings of the overland runoff pathway evaluation that will be performed in the Upland OU baseline risk assessments. The chemicals listed in the comment will be analyzed for in sediment and bass tissue, and the need for additional monitoring of these chemicals will be explored in the River OU FS (also see the responses to General Comments 3 and 6 that describe the initial FS sampling effort). Although a plausible source and transport mechanism for COIs may exist at three of the Upland AOPCs (most notably the Sandblast Area), the Portland District does not agree that there is enough data conclude that the source of PCBs in the River is the same as the source of other Upland non-PCB chemicals. The primary Bradford Island source of the River OU PCB contamination is from equipment disposal along the northern shoreline (see the response to General Comment 9). The mass wasting/erodible soil pathway will be further evaluated in the Upland (cont'd)

39. (cont'd)	(cont'd) **Follow-up DEQ Response:** COIs elevated in tissue from the forebay may be related to source areas around Bradford Island as indicated. For example, in addition to PCBs, metals and phthalates are elevated in source area sediment. As outlined in General Comment 3, additional sampling of these areas will help will help evaluate these additional chemicals, and assist in the interpretation of tissue data. For metals, several localized species such as clams and crayfish are elevated in the forebay relative to the reference location (e.g. antimony/crayfish; arsenic/crayfish; clams and crayfish/cadmium; crayfish/chromium; crayfish/lead; crayfish/nickel; crayfish/mercury.	(cont'd) BHHRA and BERA, and source control measures will be considered during the Upland OU FS. Comment noted. See the response to Specific Comment 31.
40.	**Appendix O, Uncertainty Analysis.** The uncertainty in the use of the random forebay samples instead of samples around Bradford Island is addressed by re-evaluation of data collected from within the footprint of the sediment removal area before the removal action. This analysis was limited to only 5 samples within the removal area. Instead, this analysis should be completed using the larger dataset collected around Bradford Island, some of which were not removed as a part of the early action, and may represent current conditions in those locations. This evaluation will change the results of the COPC identification process. **Follow-up DEQ Response:** Please see the response to General Comments 3 and 6. The uncertainty analysis should be revised to evaluate results using the existing larger dataset of historical sediment data, some of which is present outside the removal action areas.	Comment noted. Please see the response to Specific Comment 33, which discusses the purpose and reasoning for maintaining separate datasets for the random and targeted samples. Also see the responses to General Comments 3 and 6, which describe the initial River OU FS sampling effort that will be conducted in the removal area and greater Forebay. Comment noted. See the responses to General Comments 3 and 6.
41.	**Appendix O, Tables O.2-1, O.2-2, O.2-3, Erodible Soil Evaluation for the Landfill, Sandblast Grit, and Bulb Slope AOPCs.** As one example, it appears that Aroclor 1260 was not screened in these tables where detected, but is instead termed "not a tissue COPC" based on the in-water evaluation. Aroclor 1260 is detected in sediment collected around Bradford Island, and was detected in tissue. PAHs detected in the landfill AOPC is another example. The random forebay sediment samples are not appropriate in determining the COPC list for erodible soil. All COIs from the source areas should be screened and the tables updated.	Comment noted. Tables O.2-1 to O.2-3 will be revised to show a more accurate statement describing the rationale for the selection of COPCs for the mass wasting pathway. Bioaccumulative COPCs that were retained on the basis of exceedance of SLVs or lack of SLVs will be clearly noted. The term "not a tissue COPC" will be removed from the tables since it was never used as a basis for identification of COPCs. In addition, to avoid confusion, Aroclor-1260 will be indicated as a retained COPC and will be footnoted to show that all Aroclor mixture components are also included in "Total PCBs" which are retained as COPCs for the mass-wasting pathway for all three Upland AOPCs. The text in Section O.2.1.4 of Appendix O will also be expanded to (cont'd)

41. (cont'd)		(cont'd) incorporate the discussion provided below. Under current and likely future conditions, the only viable exposure route for human receptors for the mass wasting pathway is through bioaccumulation and subsequent consumption of smallmouth bass and crayfish. Direct exposure to eroded soils in the River OU is unlikely for humans. Selection of COPCs for the mass wasting pathway was based on multiple lines of evaluation including a comparison to Reference sediments and a comparison to sediment bioaccumulation SLVs. Whether or not a chemical was selected as a tissue COPC was not the sole reason for identifying COPCs for the mass wasting pathway but was included in the tables primarily to provide context and a deeper understanding of the issues based on sediment and tissue data collected to date. As noted in the RI/FS MP (URS 2007), tissue data for consumable species is a legitimate and necessary means of confirming whether uptake of chemicals released to the Forebay is actually occurring or could occur. Although Aroclor 1260 is shown as not a selected COPC in Table O.2-1, the table shows that Total PCBs (using congener data) are retained as COPCs for the mass wasting pathway for all the three Upland AOPCs (also described in Section O.2.1.4). Aroclor 1260 was detected in soils of the three Upland AOPCs, but was not detected in any Forebay (random or targeted) or Reference Area media collected in support of the RI and risk assessments (see the tables in Appendices I and L). Similarly, Table O.2-1 also shows that carcinogenic PAHs were retained as COPCs for the mass wasting pathway. Some bioaccumulative chemicals in erodible soils could not be evaluated due to a lack of bioaccumulation-based SLVs and were retained as COPCs (e.g. 2-methylnaphthalene in Table O.2-1) with a few exceptions. The only bioaccumulative organic chemicals without SLVs that were eliminated as COPCs are carbazole and di-n-butylphthalate for the Landfill erodible soils and carbazole in the Sandblast Area erodible soils. Carbazole and di-n-butyl phthalate were eliminated based on their extremely low toxicity to humans (e.g., the US EPA residential screening level [RSL] of di-n-butyl phthalate is 6100 mg/kg); there is no RSL for (cont'd)

41. (cont'd)		(cont'd) carbazole but its oral LD_{50} for rats is greater than 5,000 mg/kg (HSDB database). Therefore, the lack of bioaccumulation-based SLVs for these chemicals was not viewed as sufficient reason for retaining them as COPCs. Bioaccumulative metals without SLVs (and that also exceeded reference sediment concentrations) include cadmium, lead, mercury, thallium and zinc in Landfill AOPC erodible soils, cadmium, lead and zinc in Sandblast Area erodible soils, and lead in Bulb Slope erodible soils. The tables and text will be revised to identify these COPCs. Also see the responses to General Comments 3, 6, and 9, which describes the additional data that will be collected from the removal area to further assess potential runoff, mass wasting, and erosion from the Upland OU to the river. These data will be evaluated in the Upland OU FS in conjunction with the findings of the overland runoff pathway evaluation that will be performed in the Upland OU baseline risk assessments.
	Clarification of DEQ Response: Aroclor 1260 was detected in Stage 1 source area drain outfall samples, several sediment samples, and in one high-volume water sample. Some of these data were not included as part of the RI data set. DEQ wishes to confirm that analytes detected in upland samples and in non-RI data are addressed as part of source control evaluation and that there are not COPC/CPECs that are overlooked on this basis. Relevant sediment data should be used to assess the migration of these chemicals into the River OU.	Comment noted. See the responses to General Comments 3, 6, and 9.
42.	**Appendix O, Table O.3-10.** DEQ guidance includes screening level values for many of these COIs. At the minimum, DEQ values should have been used, but since these values do not include a full evaluation of bioaccumulation, USEPA Region 5 values should be used for these chemicals (e.g. pesticides, SVOCs, tributyltin).	Comment noted. EPA Region 5 values were not one of the SLV sources identified in the 22 April 2010 Memorandum (see pages 3 and 5). As stated in Section 12.3.5 of the RI and in Section O.3.1.6 of Appendix O, those COIs without dietary based SLVs (listed in Table O.3-10) were retained as CPECs for the Landfill and Sandblast Area AOPCs and warrant further consideration for birds and mammals in the Level III BERA for the Upland OU. EPA Region 5 TRVs, as well as other sources of TRVs, and their uncertainties will be considered in the BERA.
	Follow-up DEQ Response: DEQ would prefer that relevant screening levels be used in the ERA to evaluate COIs instead of listing them as CPECs without SLVs (See Specific Comment 25 and responses for discussion of SLVs). This (cont'd)	Comment accepted. See the response to Specific Comment 25. As discussed in Section 12.3.5, "... the bioaccumulative CPECs at the Landfill and Sandblast Area AOPCs for which dietary-based SLVs are (cont'd)

42. (cont'd)	(cont'd) limits the focus of a Level III evaluation to those chemicals that are known to exceed risk based levels. In the case of bioaccumulation, COIs cannot be screened out unless an bioaccumulative SLV is used in the analysis.	(cont'd) not available (Tables N-3, N-4, N-13, and N-14) also warrant further consideration for birds and mammals." The list of bioaccumulative CPECs for which appropriate SLVs are unavailable will be retained for the Level III BERA. Dietary-based SLVs were available for all bioaccumulative CPECs identified for the Bulb Slope and Pistol Range.
43.	**Appendix O, Tables O.3-3 and O.3-4, Mass Wasting Evaluation, Benthic Invertebrates.** A multiplier of 5 ("Q"=5) should not be used for benthic invertebrates as specified by DEQ guidance. This will designate several additional chemicals as CPECs. As an additional line of evidence, sediment samples off these sources should be screened (Appendix G).	Comment noted. Please refer to the response to Specific Comment 24, which indicates a Q=1 will be used to identify CPECs for benthic invertebrates. Sediment samples from the former removal areas will be collected as part of the initial River OU FS sampling effort. These new sediment data will be evaluated in the Upland OU FS in conjunction with the findings of the overland runoff pathway evaluation that will be performed in the Upland OU Level III BERA, which will include a more site-specific evaluation for the benthic community.

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