

Lower Duwamish Waterway RM 4.2 to 5.8 West (Restoration Areas)

Summary of Existing Information and Identification of Data Gaps

Prepared for



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Acronyms and Abbreviations

2LAET	Second Lowest Apparent Effects Threshold
AET	Apparent Effects Threshold
AST	aboveground storage tank
BEHP	bis(2-ethylhexyl)phthalate
bgs	below ground surface
BMP	best management practice
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (also known as SuperFund)
CMP	corrugated metal pipe
CNE	Certificate of No Exposure
COC	chemical of concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CSCSL	Confirmed and Suspected Contaminated Sites List
CSL	Cleanup Screening Level
CSO	combined sewer overflow
D&SG	Defense & Space Group
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
DNR	Department of Natural Resources
DW	dry weight
EAA	Early Action Area
EB/DRP	Elliott Bay/Duwamish Restoration Program
ECHO	Enforcement and Compliance History Online
Ecology	Washington State Department of Ecology
EOF	emergency overflow
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study
GIS	Geographic Information Systems
HPAH	high molecular weight polycyclic aromatic hydrocarbon
HVAC	heating, ventilation, and air-conditioning
ID	identification number
ISGP	Industrial Stormwater General Permit
ISIS	Integrated Site Information System
LAET	Lowest Apparent Effects Threshold
LDW	Lower Duwamish Waterway
LDWG	Lower Duwamish Waterway Group
LPAH	low molecular weight polycyclic aromatic hydrocarbon
LUST	leaking underground storage tank
METRO	Municipality of Metropolitan Seattle
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mgy	million gallons per year
MOU	Memorandum of Understanding
MTBE	methyl tertiary butyl ether
MTCA	Model Toxics Control Act

Acronyms and Abbreviations (Continued)

NA	not applicable
NAICS	North American Industry Classification System
NFA	No Further Action
ng/kg	nanograms per kilogram
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NWRO	Northwest Regional Office
OC	organic carbon
PAH	polycyclic aromatic hydrocarbon
PBDE	polybrominated diethyl ethers
PBT	persistent bioaccumulative toxin
PCB	polychlorinated biphenyl
PSCAA	Puget Sound Clean Air Agency
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RM	River Mile
SAIC	Science Applications International Corporation
SCAP	Source Control Action Plan
SCL	Seattle City Light
SCWG	Source Control Work Group
SD	storm drain
SHA	site hazard assessment
SIC	Standard Industrial Classification
SKCDPH	Seattle-King County Department of Public Health
SMS	Sediment Management Standards
SPU	Seattle Public Utilities
sq ft	square foot
SQS	Sediment Quality Standard
SVOC	semivolatile organic compound
TBT	tributyltin
TEQ	toxic equivalency
TOC	total organic carbon
TPH	total petroleum hydrocarbons
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USPS	United States Postal Service
UST	underground storage tank
VCP	Voluntary Cleanup Program
VOC	volatile organic compound
WAC	Washington Administrative Code
WQS	water quality standards
WSDOT	Washington State Department of Transportation
WWTP	wastewater treatment plant

1.0 Introduction

1.1 Background and Purpose

This *Summary of Existing Information and Identification of Data Gaps Report* (Data Gaps Report) pertains to River Mile (RM) 4.2 to 5.8 West¹ (Restoration Areas), one of 24 source control areas identified as part of the overall cleanup process for the Lower Duwamish Waterway (LDW) Superfund Site (Figure 1). It summarizes readily available information regarding properties in the Restoration Areas source control area. The purpose of the Data Gaps Report is as follows:

- Identify chemicals of potential concern in sediments near the Restoration Areas source control area.
- Evaluate potential contaminant migration pathways to LDW sediments.
- Identify and describe potential adjacent or upland sources of contaminants that could be transported to sediments.
- Identify critical data gaps that should be addressed in order to assess the potential for recontamination of sediments and the need for source control.
- Determine what, if any, effective source control is already in place.

The LDW consists of 5.5 miles of the Duwamish Waterway as measured from the southern tip of Harbor Island to just south of the Norfolk Combined Sewer Overflow (CSO). The LDW flows into Elliott Bay in Seattle, Washington. The LDW was added to the U.S. Environmental Protection Agency (USEPA or EPA) National Priorities List in September 2001 due to the presence of chemical contaminants in sediment. The key parties involved in the LDW site are EPA, the Washington State Department of Ecology (Ecology), and the Lower Duwamish Waterway Group (LDWG), which is composed of the City of Seattle, King County, the Port of Seattle, and The Boeing Company (Boeing). In December 2000, EPA and Ecology signed an agreement with the LDWG to conduct a Remedial Investigation/Feasibility Study (RI/FS) for the LDW site. The Remedial Investigation (RI) was completed in July 2010 (Windward 2010b). The Feasibility Study (FS) was completed in October 2012 (AECOM 2012).

EPA is leading the effort to determine the most effective cleanup strategies for the LDW through the RI/FS process. Ecology is leading the effort to investigate adjacent and upland sources of contamination and to develop plans to reduce contaminant migration to waterway sediments.² The LDWG collected data during the Phase I Remedial Investigation (Windward 2003) that were used to identify candidate locations for early cleanup action. Seven candidate early action areas (EAAs or Tier 1 sites) were identified. Ecology's *Lower Duwamish Waterway Source Control Status Report, 2003 to June 2007* (Ecology 2007) and *Lower Duwamish Waterway Source Control Status Report, July 2007 to March 2008* (Ecology 2008) identified another 16 areas

¹ River miles as defined in this report are measured from the southern tip of Harbor Island.

² EPA and Ecology signed an interagency Memorandum of Understanding (MOU) in April 2002 and updated the MOU in April 2004. The MOU divides responsibilities for the site. EPA is the lead agency for the sediment RI/FS, while Ecology is the lead agency for source control issues (EPA and Ecology 2002, 2004).

where source control actions may be necessary. The Restoration Areas source control area was identified as one of these areas. One additional source control area was added by Ecology in 2010, for a total of 24 source control areas. The seven candidate EAAs and 17 additional source control areas are shown on Figure 1. Subsequently, Ecology and EPA redefined the boundaries of the source control areas, generally defined by stormwater drainage areas. Figure 2 shows the stormwater drainage basins near the Restoration Areas source control area. CSO basins, which overlap with stormwater drainage basins in many areas along the LDW, were not considered for defining source control area boundaries. However, sources within the CSO basins are evaluated as part of source control. Figure 3 shows the King County CSO basins associated with the LDW.

Ecology is the lead agency for source control for the LDW site. Source control is the process of finding and eliminating or reducing releases of contaminants to LDW sediments, to the extent practicable. The goal of source control is to prevent sediments from being recontaminated after cleanup has been undertaken.

The LDW Source Control Strategy (Ecology 2004) describes the process for identifying source control issues and implementing effective controls for the LDW. The plan is to identify and manage potential sources of sediment recontamination in coordination with sediment cleanups. Source control will be achieved by using existing administrative and legal authorities to perform inspections and require necessary source control actions.

The strategy is based primarily on the principles of source control for sediment sites described in EPA's *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* (USEPA 2002), and the Washington State Sediment Management Standards (SMS) (Washington Administrative Code [WAC] 173-340-370[7] and WAC 173-204-400). The Source Control Strategy involves developing and implementing a series of detailed, area-specific Source Control Action Plans (SCAPs).

Before developing a SCAP, Ecology prepares a Data Gaps Report for the source control area. Findings from the Data Gaps Report are reviewed by LDW stakeholders and are incorporated into the SCAP. This process helps to ensure that the action items identified in the SCAP will be effective, implementable, and enforceable. As part of the source control efforts for the Restoration Areas source control area, Ecology requested Science Applications International Corporation (SAIC) to prepare this Data Gaps Report.

1.2 Report Organization

Section 2.0 of this report provides background information on the Restoration Areas source control area, including location, physical characteristics, chemicals of concern (COCs), and pathways by which contaminants may reach sediments. Sections 3.0 through 5.0 describe potential sources of contaminants and data gaps that must be addressed in order to develop and implement a SCAP for the source control area. Section 6.0 provides a summary of data gaps, and Section 7.0 lists the documents cited in this report.

Information presented in this report was obtained from the following sources:

- Ecology Northwest Regional Office (NWRO) Central Records;

- Washington State Archives;
- Ecology Facility/Site Database;
- Ecology Integrated Site Information System (ISIS) Database;
- Washington State Confirmed and Suspected Contaminated Sites List (CSCSL);
- Ecology Underground Storage Tank (UST) and Leaking Underground Storage Tank (LUST) lists;
- EPA Enforcement and Compliance History Online (ECHO);
- EPA Envirofacts Warehouse;
- King County Geographic Information Systems (GIS) Center Parcel Viewer, Property Tax Records, and iMap;
- GIS shape files produced by Seattle Public Utilities (SPU), King County, the City of Burien, the City of SeaTac, the City of Tukwila, and the Valley View Sewer District; and
- Historical aerial photographs.

Information collected from the Facility/Site Database, ISIS, ECHO, EPA Envirofacts Warehouse, and King County property tax records was current as of January 2013. Recent updates to these databases may not be reflected in this report.

1.3 Scope of Report

This report documents readily available information relevant to potential sources of contaminants to sediments associated with the Restoration Areas source control area, including outfalls, adjacent properties, and upland properties within the Hamm Creek storm drain (SD) basin.

Air pollution is a potential source of sediment contamination with origins outside of the Restoration Areas source control area. Toxic chemicals are emitted into the air from tailpipes, smokestacks, and industrial and commercial processes. Toxics loading studies conducted in Puget Sound suggest that runoff from the land surface and atmospheric deposition directly to marine waters has resulted in considerable loading of contaminants to Puget Sound. Although limited discussion of atmospheric deposition is provided in Section 2.0, the scope of this report does not include an assessment of data gaps pertaining to the effects of air pollution on the sediments associated with the source control area.

Ecology is developing an inventory of point sources registered with the Puget Sound Clean Air Agency (PSCAA), and preparing a report that summarizes existing information and understanding about the contribution of atmospheric deposition of COCs to LDW sediments. This work started in summer 2012 and is scheduled to be completed in September 2013.

Information presented in this report is limited to the Restoration Areas source control area, direct discharges to the sediments adjacent to the source control area, and potential adjacent and upland contaminant sources. This report focuses on sources that have the potential to recontaminate sediments associated with the source control area in the event that sediment remediation is

required. Source control with regard to any contaminated sediments left in place will be important to address as part of the remedial action selection process for sediments adjacent to the Restoration Areas source control area.

Chemical data have been compared to relevant regulatory criteria and guidelines, as appropriate. The level of assessment conducted for the data reviewed in this report is determined by the source control objectives. The scope of this Data Gaps Report does not include data validation or analysis that exceeds what is required to reasonably achieve source control.

2.0 Restoration Areas Source Control Area

The Restoration Areas source control area, also referred to as the RM 4.2-5.8 West source control area³, is located along the western side of the LDW between RM 4.2 and 5.8, as measured from the southern end of Harbor Island (Figure 1). Turning Basin 3 is located between RM 4.5 and 4.7 West. Properties and facilities located directly adjacent to the LDW at RM 4.2-5.8 West are shown in Figures 4 through 6. From north to south, these properties/facilities are:

- Hamm Creek Restoration Area
- Seattle City Light (SCL) Power Substation
- Kenco Marine Restoration Area
- Turning Basin 3 Restoration Area
- Fremont Property
- Boeing Parking Lot Property
- Thales Avionics⁴
- United States Postal Service (USPS) Distribution Center
- North Wind's Weir Restoration Area

Publically accessible beach areas are present along these properties, with the exception of the SCL Power Substation. The mud shoreline of the LDW is exposed along the entire bank within the Restoration Areas source control area, except for an approximate 0.1-mile length of riprap offshore of the SCL substation. The mudflats in this area have been identified as clam habitat (Windward 2010b).

The LDW is east of these properties. Located to the west of these properties are West Marginal Way SW and commercial and residential properties (Figures 5 through 11). Upland properties that have been assigned Ecology Facility/Site identification numbers (IDs) are listed below:

- Moimoi Property
- Rainier Golf & Country Club
- Glen Acres Home Association
- McCall Oil
- 7-Eleven Food Store
- Puget Sound Plumbing & Heating
- Connect Motorsports (former Chevron 306536)

³ The boundary of the Restoration Areas Source Control Area was extended from RM 4.2-4.8 West to RM 4.2-5.8 West in April 2013. The decision to extend the boundary to RM 5.8 West was made so that all properties on the peninsula between RM 4.7 and 5.8 West are included in the source control area (Cargill 2013). Stormwater from these facilities discharges to the LDW.

⁴ All properties on the peninsula between RM 4.7 and 5.8 West are considered to be properties adjacent to the LDW due to the shared history of the properties.

- Chavez Auto Repair
- Jones Property
- The Aussie Repair & Machine Shop Properties, which include:
 - Mike's Aussie Machine Shop
 - Goldco
 - Aussie Machine
 - Joe's Aussie Repair
- Glendale Heating & Air Conditioning
- Pacific Underwriters
- Former Highline School District Warehouse
- Big Picture High School

These properties are listed in Table 1.⁵ The parcels associated with these adjacent and upland facilities are identified on Figure 12.

2.1 Site Description

General background information on the LDW is provided in the Phase I RI Report (Windward 2003), which describes the history of dredging/filling and industrialization of the Duwamish River and its environs, as well as the physiography, physical characteristics, hydrogeology, and hydrology of the area.

The upland areas adjacent to the LDW within the Restoration Areas source control area was developed as agricultural and residential land for many decades. Industrial land uses in the area began in the late 1930s/early 1940s, with the construction of the Seattle City Light substation. Current and historical commercial and industrial operations in the vicinity of the Restoration Areas source control area include the SCL substation, historical barge and vessel mooring by Kenco Marine, truck and container parking and storage, and aerospace electronics manufacturing.

In the late 1800s and early 1900s, extensive topographic modifications were made to the Duwamish River to create a straightened channel; many of the current side slips are remnants of old river meanders. Prior to development, Turning Basin 3 was a tidal swamp and river channel (Tanner 1991). The Hamm Creek Restoration Area was used as a dredged material stockpiling area by the U.S. Army Corps of Engineers (USACE). Major dumps of dredged materials occurred in 1954, 1960, 1968 and 1971 (USACE 1998). Dredged sediment from the Duwamish Yacht Club marina was dumped in the east-central portion of the Hamm Creek Restoration Area in 1985 (Weston 1990).

Groundwater in the Duwamish Valley alluvium is typically encountered within about 3 meters (10 feet) of the ground surface and under unconfined conditions (Windward 2003). The general direction of groundwater flow is toward the LDW, although the direction may vary locally depending on the nature of the subsurface material, and temporally, based on proximity to the

⁵ Table 1 lists all names and Ecology/Facility Site ID numbers associated with each property/facility.

LDW and the influence of tidal action. High tides can cause temporary groundwater flow reversals, generally within 100 to 150 meters (300 to 500 feet) of the LDW (Booth and Herman 1998). Groundwater flow in the vicinity of the source control area is generally to the east, toward the LDW.

Bottom sediment composition is variable throughout the LDW, ranging from sands to mud. Typically, the sediment consists of slightly sandy silt with varying amounts of organic detritus. Coarser sediments are present in nearshore areas adjacent to storm drain discharges (Weston 1999); finer grained sediments are typically located in remnant mudflats and along channel side slopes. Sediments near the Restoration Areas source control area consist primarily of greater than 80 percent fines between RM 4.2 and 4.3 West and 20 to 60 percent fines between RM 4.3 and 4.8 West. Mudflats are present between RM 4.2 and 4.4 West and between RM 4.5 and 4.8 West. Total organic carbon (TOC) in this area ranges from 0.3 to 4.01 percent (Appendix A).

In an effort to more thoroughly understand and evaluate historical facility operations and development in the Restoration Areas source control area, SAIC reviewed historical aerial photographs from 1936 to 2004. These photographs represent conditions during roughly each decade. The photographs for the years 1936, 1946, 1956, 1960, 1969, 1980, 1990, and 2004 are provided in Appendix B. The properties are identified by the names used in the Data Gaps Report.

2.1.1 Hamm Creek, South Fork

Hamm Creek is composed of four tributaries known as the South, Middle, Lost and North Forks. Only the South Fork of Hamm Creek is located within the Restoration Areas source control area. The remaining forks are located within the Sea King Industrial Park source control area.

The South Fork originates from groundwater seeps and springs in the hills to the west of the LDW. The flow regime of the creek has been altered by human activities including industrial development and urbanization, channelization and piping, dredging, and removal of wetlands riparian vegetation, and large woody debris. King County estimated that approximately 3,590 feet of the 7,475-foot long South Fork have been modified by human activity. Rainier Golf and Country Club diverts water from the South Fork to supply an ornamental concrete-lined pond on the golf course (King County 2000b). In the 1980s, fish and wildlife habitats in and near Hamm Creek South Fork were improved by citizen volunteers through trash removal, introduction of insect larvae and crayfish, and planting of trees and aquatic and riparian vegetation (USACE 1998).

In the 1950s, Hamm Creek South Fork was rerouted from its original discharge location near RM 4.2 West to an open ditch and culvert that ran parallel to West Marginal Place S. The culvert was plumbed to the S 96th Street SD system, which discharges to the LDW at Outfall 2100 (A). In 2000, King County and USACE completed a 2,000-foot natural channel that redirected Hamm Creek South Fork to its current discharge location (the Hamm Creek outlet), which is immediately south of Delta Marine (King County 2000a).

Water quality in Hamm Creek is typical of urbanized streams during storm events. Metals (zinc, copper and lead) and total petroleum hydrocarbon concentrations increase in the creek during

storms. In 1997 a release of chlorinated water to the South Fork resulted in a fish kill (King County 2000b). Surface runoff from residential areas has contributed to sediment erosion, sedimentation and contamination in the creek. Pesticides, insecticides and fungicides may be present in runoff from the golf course operations. Approximately 3 acres of SR-99 drains to Hamm Creek South Fork (USACE 1998).

2.2 Chemicals of Concern in Sediment

COCs in sediment associated with the Restoration Areas source control area were identified based on sediment sampling conducted between 1997 and 2011.

2.2.1 Sediment Investigations

Sediment samples have been collected adjacent to the Restoration Areas source control area as part of the investigations listed below. Sampling locations are listed in Table 2 and are shown in Figures 13a through 13c. Data and information regarding the investigations performed before 2005 were compiled by Windward for the LDW RI (Windward 2003, 2010b). Concentrations of COCs in surface and subsurface sediment samples detected above screening levels are presented in Table 3 and Appendix A, Table A-2a, respectively.

- **King County CSO Water Quality Assessment (1997) (King County 1999)**
Four surface sediment samples were collected from a single sampling station (WQAHAMM) near the source control area from May to June 1997. All samples were analyzed for metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), phthalates, and other semivolatile organic compounds (SVOCs).
- **Duwamish Waterway Sediment Characterization Study (NOAA 1998)**
Twenty-three surface sediment samples were collected near the source control area during September, October, and November 1997. All 23 samples were analyzed for PCBs and polychlorinated terphenyls.
- **EPA Site Inspection, Lower Duwamish River (1998) (Weston 1999)**
In August 1998, 12 surface sediment samples were collected near the source control area. All 12 samples were analyzed for metals, PCBs, PAHs, phthalates, and other SVOCs. Samples DR264, DR266, DR270 and DR273 were analyzed for organometals. Sample DR264 was also analyzed for dioxins/furans. Sample DR266 was also analyzed for pesticides and volatile organic compounds (VOCs).
- **LDW Phase 2 Remedial Investigation, Benthic, Round 1, 2, and 3 Sediment Sampling (Windward 2005a, 2005b, 2010b)**
Sixteen surface sediment samples were collected adjacent to the source control area during four rounds of sampling for the Phase 2 RI from 2004 to 2006. All samples were analyzed for metals and trace elements, SVOCs, PAHs, phthalates, and PCBs. In addition sample LDW-SS131 was analyzed for dioxins/furans; samples B10b, LDW-SS131, and LDW-SS133 were analyzed for organometals; and samples B10b, LDW-SS134, LDW-SS131, LDW-SS133, LDW-SS140, and LDW-SS150 were analyzed for pesticides.

- **LDW Phase 2 RI Subsurface Sediment Sampling (Windward 2007)**

Five samples were collected from two coring locations near the source control area during 2006. All samples were analyzed for PCBs, PAHs and other SVOCs, and metals. Samples from location LDW-SC54 were also analyzed for pesticides.

- **Duwamish River RM 4.9 to 7.4 Sediment Sampling and Analysis (E&E 2009)**

Thirteen surface sediment samples and seven bank sediment samples were collected near the source control area in April and May 2008. Seventeen of these samples were analyzed for PCBs, PAHs, arsenic, and dioxins/furans. Thirteen samples were analyzed for other SVOCs and metals. Two samples were analyzed only for TOC and grain size. No analytical tests were performed for one sample, OS-11.

- **LDW RI Dioxin Sampling (Windward 2010a)**

In January 2010, one beach composite sample (LDW-SS544-comp) and one surface sediment sample (LDW-SS547) were collected near the source control area. The samples were analyzed for dioxins/furans, arsenic, PAHs, and PCBs.

- **Surface Sediment Sampling at Outfalls in the Lower Duwamish Waterway (SAIC 2011)**

In March and April 2011, 11 surface sediment samples were collected near the source control area. All samples were analyzed for metals, PCBs, PAHs, phthalates, and other SVOCs, and pesticides. Four samples were analyzed for dioxins/furans.

Sediment sampling results are listed in Appendices A-1 and A-2 for surface and subsurface sediments, respectively.

2.2.2 Identification of Chemicals of Concern

A COC is defined in this report as a chemical that is present in sediments associated with the Restoration Areas source control area at concentrations above regulatory criteria, and is therefore of particular interest with respect to source control. These COCs are the initial focus of the evaluation of potential contaminant sources.

The Washington SMS (Chapter 173-204 WAC) establish marine Sediment Quality Standard (SQS) and Cleanup Screening Level (CSL) values for some chemicals that may be present in sediments. The SQS values correspond to a sediment quality level that will result in no adverse effects on biological resources and no significant human health risk. CSLs represent minor adverse effects levels and are used as an upper regulatory threshold for making decisions about source control and cleanup. The SQS and CSL values are based on the Lowest Apparent Effects Threshold (LAET) and Second Lowest Apparent Effects Threshold (2LAET). Apparent Effects Threshold (AET) values are the concentrations of specific chemicals in sediment above which a significant adverse biological effect is observed (Ecology 1996). The AET values form the basis for both the Puget Sound Dredged Disposal Analysis program guidelines and the criteria contained in the SMS rule.

A chemical was identified as a COC for the Restoration Areas source control area if it was detected in surface or subsurface sediment at concentrations above the SQS in at least one

sample. A comparison of sample results to the SQS and CSL values is provided in Appendix A. For non-polar organics, the dry weight (DW) concentrations were organic carbon (OC) normalized to allow comparison to the SQS/CSL, except when TOC in the sample is less than 0.5 percent or greater than 4 percent. When TOC is outside this range, OC normalization is not considered to be appropriate (Michelsen and Bragdon-Cook 1993, as cited in Windward 2010b), and the dry weight concentrations for non-polar organics are instead compared to the LAET and 2LAET values, which are functionally equivalent to the SQS and CSL. Chemicals detected in sediment for which no SQS/CSL or LAET/2LAET values are available may be identified as COCs on a case-by-case basis.

Chemicals that were detected at concentrations above their respective SQS/CSL values are listed in Table 3 for surface sediment samples. In subsurface samples, only one chemical exceedance was observed; total PCBs were detected at 19.8 mg/kg OC in the 0-2 ft sample from location LDW-SC56, which exceeded the SQS (12 mg/kg OC) by a factor of 1.6. The CSL (65 mg/kg OC) was not exceeded (Appendix A, Table A-2a).

Chemicals with concentrations above the SQS in surface or subsurface sediment samples are listed below. In general, chemicals were present in sediment samples at concentrations only slightly above the SQS values; the greatest exceedances were observed for 1,2,4-trichlorobenzene, 1,2-dichlorobenzene and benzyl alcohol, cadmium, silver, and hexachlorobenzene in surface samples collected near Outfalls 2098 and 2099 (Figures 13b and 13c).

Chemicals Detected at Concentrations Above the SQS/CSL	Surface Sediment		Subsurface Sediment	
	> SQS	> CSL	> SQS	> CSL
Metals				
Arsenic	●	●		
Cadmium	●	●		
Silver	●	●		
PAHs				
Acenaphthene	●			
Benzo(g,h,i)perylene	●			
Dibenzo(a,h)anthracene	●	●		
Fluorene	●			
Indeno(1,2,3-cd)pyrene	●	●		
Phenanthrene	●			
Pyrene	●	●		
Total HPAH	●	●		
Phthalates				
Butyl benzyl phthalate	●			
Other SVOCs				
2,4-Dimethylphenol	●	●		
2-Methylphenol	●	●		
4-Methylphenol	●	●		
Benzoic acid	●	●		
Benzyl alcohol	●	●		
Dibenzofuran	●		●	

Chemicals Detected at Concentrations Above the SQS/CSL	Surface Sediment		Subsurface Sediment	
	> SQS	> CSL	> SQS	> CSL
Hexachlorobenzene	●	●		
Hexachlorobutadiene	●	●		
N-Nitrosodiphenylamine	●	●		
Pentachlorophenol	●			
PCBs				
PCBs (total)	●		●	

Exceedance factors, which are a measure of the degree to which maximum detected concentrations exceed the SQS/CSL values, are listed in Table 3 and Appendix A, Table A-2a.

HPAH = high molecular weight PAH

Results for these chemicals are discussed in more detail below.

Metals

Arsenic, cadmium, and silver concentrations exceeded the SQS and CSL in one surface sediment sample, LDW-SS2098-D, which was located downstream of Outfall 2098 (Figure 13b). The arsenic concentration also exceeded the LDW Natural Background concentration for arsenic of 7 milligrams per kilogram (mg/kg) (AECOM 2012).

Arsenic was detected in all 62 surface sediment samples that were analyzed for metals and all four subsurface sediment samples (Appendix A, Tables A-1b and A-2b). Arsenic concentrations exceeded the LDW Natural Background concentration for arsenic in 33 surface sediment samples and in two subsurface sediment samples, both collected from coring location LDW-SC54 (Figure 13b).

PAHs

PAH concentrations exceeding the SQS were detected two surface samples. Acenaphthene, benzo(g,h,i)perylene, dibenzo(a,h)anthracene and fluorene were detected above the SQS in sample LDW-SS2098-D. The dibenzo(a,h)anthracene concentration in this sample also exceeded the CSL. Dibenzo(a,h)anthracene was also detected above the SQS in sample LDW-SS-2009-U. PAHs were not detected above the SQS/CSL in the subsurface sediment samples (Figure 13b).

Carcinogenic PAHs (cPAHs) were detected in 43 of the 62 surface samples and 3 of the 4 subsurface samples analyzed for PAHs (Appendix A, Tables A-1b and A-2b). The LDW Natural Background cPAH toxic equivalency (TEQ) of 0.009 mg TEQ/kg (AECOM 2012) was exceeded in 36 surface sediment and three subsurface sediment samples.

Phthalates

Butyl benzyl phthalate concentrations exceeded the SQS in surface samples collected near Outfalls 2098 and 2099 (Figure 13b). Phthalate concentrations in the subsurface samples did not exceed the SQS or CSL.

Phenols

Concentrations of 2,4-dimethylphenol, 2-methylphenol, and 4-methylphenol exceeded the SQS and CSL in surface samples collected downstream from Outfall 2098 and upstream of Outfall 2099 (Figure 13b). Pentachlorophenol concentrations also exceeded the SQS in these samples. Phenols were not detected in the subsurface samples.

Other SVOCs

Concentrations of other SVOCs exceeded the SQS and CSL in eight surface sediment samples. Benzyl alcohol exceeded the SQS and CSL in samples collected near Outfalls 2098, 2099, 2200, and 2201. In the surface samples collected downstream from Outfall 2098 and upstream of Outfall 2099, concentrations of 1,2,4-trichlorobenzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene, benzoic acid, hexachlorobenzene, hexachlorobutadiene, and n-nitrosodiphenylamine exceeded the SQS and CSL; concentrations of dibenzofuran exceeded the SQS only (Figure 13b). Concentrations of benzoic acid exceeded the SQS and CSL in bank sediment samples DRB-113 and DRB-114, which were collected between RM 5.4 and 5.5 (Figure 13c). Concentrations of other SVOCs in the subsurface samples did not exceed the SQS or CSL.

PCBs

Total PCB concentrations exceeded the SQS in two surface sediment samples (LDW-SS148 and WIT258) and in one subsurface sample (LDW-SC56 0-2 ft). The greatest PCB concentration was observed in the subsurface sample, which was collected near the Turning Basin 3 Restoration Area (Figure 13b).

PCBs were detected in 66 of the 85 surface samples and 3 of the 4 subsurface samples analyzed for PCBs (Appendix A, Tables A-1b and A-2b). Concentrations in 63 surface samples and all three subsurface sediment samples exceeded the LDW Natural Background concentration of 0.002 mg/kg (AECOM 2012).

Other COCs

Organotin compounds are persistent bioaccumulative toxins (PBTs) and are generally considered COCs for LDW sediments. Tributyltin (TBT) is used as the indicator chemical for organotin compounds. The mean concentration of TBT in the LDW is 90 mg/kg DW (AECOM 2012). Organotin compounds were detected at six sampling locations near the Restoration Areas source control area in between 1998 and 2006, with concentrations of TBT up to 0.053 mg/kg DW at location LDW-SS131 (Appendix A, Table A-1a). Since the maximum TBT concentration in sediments near the Restoration Areas source control area is three orders of magnitude below the mean TBT concentration in LDW sediment, organotin compounds are not considered COCs for the sediments adjacent to the Restoration Areas source control area.

Although no sediment quality standards have been promulgated, dioxins and furans are considered to be potential COCs at the Restoration Areas source control area. These compounds were detected in 20 surface sediment samples. Mammalian dioxin/furan TEQs ranged from 0.0841 to 15.4 nanograms TEQ per kilogram (ng TEQ/kg) DW (Appendix A, Table A-1a). The

highest concentrations of dioxins/furans were detected at location LDW-SS131, collected downstream of the Hamm Creek outfall to the LDW. In addition, the dioxin/furan TEQ exceeded the LDW Natural Background TEQ for dioxins/furans (2 ng TEQ/kg) in four samples, DRB-114, LDW-SS131, LDW-SS544, and LDW-SS547 (Appendix A, Table A-1b). Sample DRB-114 was a bank sediment sample collected near RM 5.4 West. Sample LDW-SS544 was a beach composite sample collected near the Hamm Creek outfall to the LDW and sample LDW-SS547 was collected near the Turning Basin 3 Restoration Area, respectively.

Pesticides are considered potential COCs at the Restoration Areas source control area. Concentrations of pesticides including dichlorodiphenyldichloroethane (DDD), dichlorodiphenyltrichloroethane (DDT), and dichlorodiphenyldichloroethylene (DDE) were detected in surface sediment sampling locations. Greatest concentrations of pesticides were detected at surface sample locations LDW-SS2098-D and LDW-2099-U (Figure 13b).

2.2.3 Summary of Chemicals of Concern in Sediments

As described above, COCs were identified based on the results of sediment sampling conducted between 1997 and 2011. Chemicals that exceeded the SQS in at least one surface or subsurface sediment sample offshore of the Restoration Areas source control area are considered COCs. In addition, dioxins/furans and pesticides were identified as potential COCs, as described above.

In summary, the following chemicals are considered to be COCs in sediment associated with the Restoration Areas source control area:

- Metals: arsenic, cadmium, and silver;
- PAHs: cPAHs, acenaphthene, benzo(g,h,i)perylene, dibenzo(a,h)anthracene, and fluorene;
- Butyl benzyl phthalate;
- Phenols: 2,4-dimethylphenol, 2-methylphenol, 4-methylphenol and pentachlorophenol;
- Other SVOCs: 1,2,4-trichlorobenzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene, benzoic acid, benzyl alcohol, dibenzofuran, hexachlorobenzene, hexachlorobutadiene, and n-nitrosodiphenylamine;
- PCBs;
- Pesticides; and
- Dioxins/furans.

2.3 Potential Pathways to Sediment

Potential sources of sediment recontamination associated with the Restoration Areas source control area include storm drains and discharges from adjacent properties. Transport pathways that could contribute to the recontamination of sediments near the Restoration Areas source control area following remedial activities include direct discharges via outfalls, surface runoff (sheet flow) from adjacent properties, bank erosion, groundwater discharges, air deposition, and

spills directly to the LDW. These pathways are described below and are discussed in more specific detail in Sections 3.0 through 5.0.

2.3.1 Direct Discharges via Outfalls

Direct discharges may occur from public or private storm drain systems, CSOs, and emergency overflows (EOFs). In the Restoration Areas source control area, there are nine outfalls to the LDW, including six public storm drains, two ditches, and Hamm Creek (Section 3.0).

Upland areas within the LDW are served by a combination of separated storm/sanitary systems and combined sewer systems. Storm drains convey stormwater runoff collected from pervious surfaces (yards, parks) and impervious surfaces (streets, parking lots, driveways, and rooftops) in the drainage basin. In the LDW, there are both public and private storm drain systems. Most of the waterfront properties are served by privately owned systems that discharge directly to the waterway. The other upland areas are served by a combination of privately and publicly owned systems. Typically, private onsite storm drain systems discharge to the public storm drain in the street, which conveys runoff from private property and public rights-of-way to the LDW.

The sanitary sewer system collects municipal and industrial wastewater from throughout the LDW area and conveys it to King County's West Point wastewater treatment plant (WWTP), where it is treated before being discharged to Puget Sound. The smaller trunk sewer lines, which collect wastewater from individual properties, are owned and operated by the individual municipalities (e.g., Cities of Burien, SeaTac, and Tukwila) and local sewer districts (e.g., Valley View Sewer District). The large interceptor system that collects wastewater from the trunk lines is owned and operated by King County. A King County interceptor extends along the west side of West Marginal Way SW.

Some areas of the LDW are served by combined sewer systems, which carry both stormwater and municipal/industrial wastewater in a single pipe. These systems were generally constructed before about 1970 because it was less expensive to install a single pipe rather than separate storm and sanitary systems. Under normal rainfall conditions, wastewater and stormwater are conveyed through this combined sewer pipe to a wastewater treatment facility. During large storm events, however, the total volume of wastewater and stormwater can sometimes exceed the conveyance and treatment capacity of the combined sewer system. When this occurs, the combined sewer system is designed to overflow through relief points, called CSOs. The CSOs prevent the combined sewer system from backing up and creating flooding problems.

A mixture of untreated municipal/industrial wastewater and stormwater can potentially be discharged through CSOs to the LDW during these storm events. The County's CSOs are administered under the NPDES permit established for the West Point WWTP.

An EOF is a discharge that can occur from either the combined or sanitary sewer systems that is not necessarily related to storm conditions and/or system capacity limitations. EOF discharges typically occur as a result of mechanical issues (e.g., pump station failures) or when transport lines are blocked; pump stations are operated by the County. Pressure relief points are provided in the drainage network to discharge flow to an existing storm drain or CSO pipe under

emergency conditions to prevent sewer backups. EOF events are not covered under the County's existing CSO wastewater permits.

There are 14 CSOs/EOFs in the LDW. The Hamm Creek SD basin is located almost entirely within the 8th Avenue S CSO basin, which discharges to the LDW in the Riverside Drive source control area. Discharges from the CSO are addressed in the Riverside Drive Data Gaps Reports (SAIC 2012). The peninsula between RM 4.7 and 5.8 West is within the East Marginal CSO basin (Figure 3).

Annual stormwater discharge volumes are usually substantially higher than annual CSO discharges because storm drains discharge whenever it rains, while CSOs only occur when storm events exceed the system capacity. Annual stormwater discharges to the LDW have been estimated at approximately 4,000 million gallons per year (mgy) compared to less than 65 mgy from the County CSOs (Windward 2007).

To minimize the frequency and volume of CSO events, the County utilizes different CSO control strategies to maximize system capacity. An automated control system manages flows through the King County interceptor system so that the maximum amount of flow is contained in pipelines and storage facilities until it can be conveyed to a regional WWTP for secondary treatment. In some areas of the system, where flows cannot be conveyed to the plant, the overflows are sent to CSO treatment facilities for primary treatment and disinfection prior to discharge. County CSOs discharge untreated wastewater only when flows exceed the capacity of these systems (King County 2007).

As a result, some areas may overflow to different outfalls at different times, depending on the route that the combined stormwater/wastewater has taken through the County conveyance system. Furthermore, some industrial facilities in the LDW basin may discharge stormwater to a separated system and industrial wastewater to a combined system, or a conveyance that begins as a separated system may discharge to a combined system further downstream along the flow path. Within the CSO system, there are facilities within sanitary sewer service areas that also have stormwater drainage connections to combined sewers. Although there can be specific distinctions whether a given sub-basin or sub-service area is a fully separated, partially separated, or a fully combined sewer system, this document uses "CSO basin" as a generic term to communicate the concept of a CSO system that is tributary to a specified CSO outfall and that includes some portion of identifiable storm drainage conveyance connected to combined sewers.

When preparing a Data Gaps Report for a source control area, all properties that potentially discharge to that source control area (whether through a CSO/EOF or a separated storm drain) are identified to the extent that the boundaries of the stormwater drainage basin are known. However, for areas where drainage basins overlap, a property review is performed only if the property has not already been included in a previously published Data Gaps Report. Exceptions include situations where contaminants may be transported to the current source control area via a transport pathway that was not applicable for the earlier evaluation.

Large spills of hazardous substances and waste materials containing COCs may be transported to a storm drain and therefore have the potential to impact sediment in the LDW. There is a potential for spills of COCs from many of the industrial and commercial businesses in the Hamm

Creek SD basin as well as from trucks transporting hazardous substances and waste materials. Spills that occur in the storm drain basin could enter onsite or public storm drain systems and be discharged to the LDW through the storm drain system. Spill prevention is a major element of the business inspections conducted by King County and Ecology. Many businesses are required to have spill prevention plans. In the event of a spill, Ecology responds to and investigates spill incidents.

2.3.2 Surface Runoff (Sheet Flow)

In areas lacking collection systems, spills or leaks on properties adjacent to the LDW could flow directly over impervious surfaces or through creeks and ditches to the waterway. Current operational practices at adjacent properties may contribute to the movement of contaminants to the LDW via runoff. Surface runoff from properties adjacent to the LDW may be a source of contaminants to sediments associated with the Restoration Areas source control area.

2.3.3 Spills to the LDW

Near-water and over-water activities have the potential to impact adjacent sediment from spills directly to the LDW of material containing COCs. Accidental spills during loading/unloading operations may result in transport of contaminants to sediment. Over-water activities were historically performed by Kenco Marine. No over-water activities are currently performed within the Restoration Areas source control area.

2.3.4 Bank Erosion

The banks of the LDW shoreline are susceptible to erosion by wind and surface water, particularly in areas where banks are steep. Shoreline armoring and the presence of vegetation reduce the potential for bank erosion. Contaminants in soils along the banks of the LDW could be released directly to sediments via erosion. The mud shoreline of the LDW is exposed along the entire bank within the Restoration Areas source control area, except for an approximate 0.1-mile length of riprap offshore of the SCL substation (Windward 2010b).

In May 2011, three bank soil samples were collected at RM 4.4 West, on SCL-owned property near the Hamm Creek Restoration Area (Figure 13a). Soil samples were analyzed for metals, PCBs, PAHs, other SVOCs, total petroleum hydrocarbons (TPHs), TBT, polybrominated diethyl ethers (PBDEs), pesticides, and dioxins/furans. Chemical concentrations did not exceed the SMS criteria or LDW background screening levels (Appendix A, Tables A-3a and A-3b) (Hart Crowser 2012).

2.3.5 Groundwater Discharges

Contaminants in soil resulting from spills and releases to adjacent properties may be transported to groundwater and subsequently be released to the LDW and the Restoration Areas source control area. Groundwater contamination has been documented at the USPS Distribution Center property, but has not been documented at the remaining adjacent or upland properties.

Concentrations of chemicals in soil and groundwater were compared to draft soil-to-sediment or groundwater-to-sediment screening levels (SAIC 2006). These screening levels were initially developed to assist in the identification of upland properties that may pose a potential risk of recontamination of sediments at Slip 4. The screening levels incorporate a number of conservative assumptions, including the absence of contaminant dilution and ample time for contaminant concentrations in soil, sediment, and groundwater to achieve equilibrium. In addition, the screening levels do not address issues of contaminant mass flux from upland media to sediments, nor do they address the area or volume of sediment that might be affected by upland contaminants. Because of these assumptions and uncertainties, these screening levels are most appropriately used for one-sided comparisons. If contaminant concentrations in upland soil or groundwater are below these screening levels, then it is unlikely that they will lead to exceedances of the SMS. However, upland concentrations that exceed these screening levels *may or may not* pose a threat to marine sediments; additional site-specific information must be considered in order to make such an assessment. While not currently considered COCs in sediment, these chemicals may warrant further investigation, depending on site-specific conditions, to evaluate the likelihood that they will lead to exceedances of the SMS.

Four seep locations were identified during the Windward seep reconnaissance survey. The Restoration Areas source control area was identified as an area with higher general seepage levels (Windward 2004). Seep 39 was selected for chemical analysis (Figure 13b). Copper concentrations in unfiltered and filtered samples exceeded the Marine Chronic Water Quality Standard (WQS) of 3.1 µg/L, but did not exceed the draft groundwater-to-sediment screening levels (Appendix A, Table A-4).

2.3.6 Atmospheric Deposition

Atmospheric deposition occurs when air pollutants enter the LDW directly or through stormwater. Air pollutants may be generated from point or non-point sources. Point sources include industrial facilities, and air pollutants may be generated from painting, sandblasting, loading/unloading of raw materials, and other activities, or through industrial smokestacks. Non-point sources include dispersed sources such as vehicle emissions, aircraft exhaust, and off-gassing from common materials such as plastics. Air pollutants may be transported over long distances by wind, and can be deposited to land and water surfaces by precipitation or particle deposition.

Three facilities within the Restoration Areas source control area are currently regulated as a point source of air emissions. These facilities are listed below.

Facility	PSCAA Facility Registration No.
7-Eleven Food Store (7-11 #23931)	13029G
Elliott Paint Company, Inc.	29259
Preet Auto Body (Mike's Aussie Machine)	29308

PSCAA = Puget Sound Clean Air Agency

Elliott Paint Company has not been assigned a Facility/Site ID by Ecology.

Contaminants originating from nearby properties and streets may be transported through the air and deposited in the Restoration Areas source control area or in other areas that drain to the LDW. Although chemical deposition from air directly to the LDW probably occurs, this mechanism is not likely to result in sediment concentrations above local background levels. Secondary impacts of air sources on the stormwater pathway to receiving waters and sediment are not well understood; additional information is needed. Recent and ongoing atmospheric deposition studies in the LDW area are summarized in the LDW Source Control Status Report (Ecology 2007 and subsequent updates). Ecology is currently conducting an air deposition scoping study to inventory known point sources and make recommendations on how to address air deposition for source control.

3.0 Potential for Sediment Recontamination from Outfalls

Storm drains convey stormwater runoff collected from streets, parking lots, roof drains, and residential, commercial, and industrial properties to the LDW. Storm drains entering the LDW carry runoff generated by rain and snow. A wide range of chemicals may become dissolved or suspended in runoff as rainwater flows over the land. Urban areas generally accumulate particulates, dust, oil, asphalt, rust, rubber, metals, pesticides, detergents, or other materials as a result of human activities throughout the drainage basin.

Human activities include landscaping, spills, illegal dumping, vehicle maintenance (fueling, washing), and vehicle use (wear on roads, tires, brakes, fluid leaks, and emissions). These materials can be flushed into storm drains during wet weather and are then conveyed to the waterway, mainly through the stormwater system. In addition, contaminants in soil or groundwater could enter the storm drain system through cracks or gaps in the stormwater piping.

3.1 Public Outfalls

As described in Section 2.3.1, public outfalls include public storm drains, CSOs, and EOFs. Within the Restoration Areas source control area there are nine public outfalls, including six public storm drains, two ditches, and Hamm Creek (Figure 14).

Outfall No.	Outfall Name	Diameter/Material	Outfall Type	Outfall Owner
2205	Hamm Creek	Creek	Public	King County
2099	Duwamish Substation #1	6-inch CMP	Public	Seattle City Light
2098	Duwamish Substation #2	6-inch CMP	Public	Seattle City Light
2200	WSDOT	30-inch CMP	Public	WSDOT
2201	WSDOT	36-inch CMP	Public	WSDOT
NA	Ditch #1	NA	Public	
NA	Ditch #2	NA	Public	
3842	NA	48-inch, unknown	Public	City of Tukwila
3921	NA	24-inch concrete	Public	City of Tukwila

CMP = corrugated metal pipe; WSDOT = Washington State Department of Transportation

Lateral storm drain lines connect several of the surrounding facilities to the main lines in the Hamm Creek SD basin. Outfalls 2098 and 2099 are connected to storm drain lines on the SCL Power Substation. Outfalls 2200 and 2201 appear to convey drainage from SR-99. Stormwater from the northwestern portion of the peninsula appears to discharge at the Turning Basin 3 Restoration Area through Ditch #1. Stormwater from the Boeing Parking Lot property appears to discharge to the LDW at Ditch #2. GIS data from the City of Tukwila and King County did not

identify any storm drain lines that may be connected to Outfall 3842. Stormwater from Thales Avionics, the USPS Distribution Center, West Marginal Place S and 27th Avenue S appears to discharge to the Duwamish through Outfall 3921 (Figure 14).

SPU and EPA have collected storm drain solids samples from storm drain structures within the source control area. The Source Control Work Group⁶ (SCWG) compares analytical results from these samples to the SQS and AET. Petroleum hydrocarbon results are compared to the Model Toxics Control Act (MTCA) Method A cleanup standards. Although these regulatory standards are not applicable to storm drain solids, the SCWG uses these values as a benchmark to describe storm drain solids quality (SPU 2010). In this document, values described above (SQS/CSL, LAET/2LAET, and MTCA Method A) that are used for comparison to storm drain solids data are referred to as “storm drain screening values.” It should be emphasized that none of these values are applied as cleanup levels to storm drain or combined sewer solids. It is important to note that any comparison of this kind is most likely conservative given that sediments discharged from storm drains are highly dispersed in the receiving environment and mixed with the natural sedimentation taking place in storm drain systems.

Storm Drain Sampling

SPU collected storm drain solids samples from storm drain structures within the Hamm Creek SD basin in April 2009, November 2010, and June 2012 from inline sediment trap HC-ST1 and in May 2011 from right-of-way catch basin RCB270. In August 2011, EPA collected storm drain solids samples from a right-of-way catch basin (TUK-06) near the head of the inlet at the Turning Basin 3 Restoration Area (Figure 14). The samples were analyzed for PCBs; total and dissolved metals and mercury; and PAHs, phthalates, and other SVOCs (SPU 2011; KTA 2012). Bis(2-ethylhexyl)phthalate (BEHP) and dimethyl phthalate were detected in sample RCB270 at concentrations exceeding the LAET-based storm drain screening values. These chemicals are COCs for the LDW Superfund site but have not been detected above the SQS or CSL in sediment near the Restoration Areas source control area. Concentrations of arsenic, cPAHs, and the dioxin/furan TEQ slightly exceeded the LDW Natural Background concentrations in one or more storm drain structures, but were significantly below the Remedial Action Levels identified in the Proposed Plan for the LDW Superfund Site (USEPA 2013). The chemical concentrations and exceedance factors are listed in Table 4. Concentrations of all chemicals detected in storm drain solids samples are listed in Appendix A, Table A-5.

Water and Sediment Quality Monitoring Program

In 1993, a water and sediment quality monitoring program was conducted for the S 96th Street SD basin (Herrera 1994). Base flow, storm flow, and creek sediment samples were collected from Hamm Creek South Fork during the investigation.

Base Flow and Storm Flow Water Results

One water quality monitoring station was established to collect grab samples from Hamm Creek South Fork. Water samples were analyzed for TPH, metals, and conventionals (Herrera 1994).

⁶ The SCWG is composed of Ecology, King County, the Cities of Seattle and Tukwila, the Port of Seattle, and EPA.

Concentrations of copper and lead exceeded freshwater acute and chronic water quality standards during base and storm flows. Surface water sample results are summarized in the table below:

Chemicals Detected at Concentrations in Surface Water Samples	Sample Event		Freshwater Acute Water Quality Standards (µg/L) ^a	Freshwater Chronic Water Quality Standards (µg/L)
	Base Flow	Storm Flow		
TPH (µg/L)	ND	ND	-	-
Metals (µg/L)				
Cadmium	ND	ND	0.82	0.37
Chromium	ND	9	-	-
Copper	10	6.4	4.6	3.5
Lead	1.7	7.9	14	0.54
Zinc	16	19	35	32

a – Surface Water ARAR – Aquatic Life – Fresh/Acute – Ch. 173-201A WAC
 b – Surface Water ARAR – Aquatic Life – Fresh/Chronic – Ch. 173-201A WAC
 ND – Not detected above screening levels

Creek Sediment Results

One sediment sample was collected from Hamm Creek South Fork. The sample was analyzed for TPH, PAHs, metals, and conventionals (Herrera 1994). Analytical results were compared to MTCA cleanup levels for soil and the draft soil-to-sediment screening levels for saturated soil (Table 5). Several LDW sediment COCs were detected in the samples at concentrations exceeding MTCA cleanup levels and the draft soil-to-sediment screening levels; these COCs are listed below. Sediment COCs that exceeded the SMS in sediment samples collected near the Restoration Areas source control area are indicated by a check mark.

Chemical	>MTCA Cleanup Levels	>Draft Soil-to-Sediment Screening Levels	Sediment COC?
Metals			
Arsenic	●		✓
Zinc		●	
PAHs			
Acenaphthene		●	✓
Anthracene		●	
Benzo(a)anthracene		●	
Benzo(a)pyrene	●	●	
Benzo(b)fluoranthene	●	●	
Benzo(g,h,i)perylene		●	✓
Benzo(k)fluoranthene		●	
Chrysene		●	
Dibenzo(a,h)anthracene	●	●	✓
Fluoranthene		●	
Fluorene		●	✓

Chemical	>MTCA Cleanup Levels	>Draft Soil-to-Sediment Screening Levels	Sediment COC?
Indeno(1,2,3-cd)pyrene		●	
Phenanthrene		●	
Pyrene		●	

All chemicals listed in the table, with the exception of TPH, are sediment COCs for the LDW Superfund Site. Individual chemical concentrations are provided in Table 5.

Sources of PAHs were attributed to the area upstream of Hamm Creek South Fork at SR 99 (Herrera 1994).

3.1.1 Hamm Creek SD Basin

The Hamm Creek SD basin covers approximately 735 acres, spanning north-to-south from S 96th Street in Seattle to S 146th Street in SeaTac and from west-to-east from 12th Avenue S to Des Moines Memorial Drive S within unincorporated King County, from 12th Avenue S to 22nd Avenue S within Burien city limits and from 18th Avenue S to 29th Avenue S within SeaTac city limits (Figure 14). Land uses within the storm drain basin include industrial and commercial properties.

There are 24 facilities within the Hamm Creek SD basin (Table 1):

- 3 of these facilities, the Moimoi Property, the Jones Property, and Mike’s Aussie Machine Shop, are listed on Ecology’s CSCSL (the Jones Property and Mike’s Aussie Machine Shop have received a No Further Action (NFA) determination from Ecology).
- 1 facility, Aussie Machine, has a Certificate of No Exposure (CNE).
- 1 facility, Glendale Heating & Air Conditioning, has an active EPA ID number.
- 6 facilities are listed on Ecology’s LUST list.
- 10 facilities are listed on Ecology’s UST list.
- 7 facilities have not been assigned Ecology/Facility Site Identification Numbers, but have been subject to regulatory interactions, such as inspections, with Ecology, King County, or PSCAA.

Based on GIS data obtained from King County and the Cities of Burien, SeaTac, and Tukwila, it appears that stormwater from some areas currently thought to be part of the Hamm Creek SD basin, may be conveyed to the combined sewer system and/or may be discharged to the Duwamish through outfalls upstream of RM 5.8, rather than entering the Hamm Creek SD system (Figure 14). The areas to the east and south of the dashed line on Figure 14 may be outside of the Hamm Creek SD system and, if so, should be excluded from the Restoration Areas source control area.

3.1.2 Potential for Sediment Recontamination

Catch basin storm drain solids sampling indicated concentrations of BEHP and dimethyl phthalate exceeding the LAET-based storm drain screening value in a single sample (RCB270)

within the Hamm Creek SD system. These chemicals are COCs for the LDW Superfund site but have not been detected above the SQS or CSL in sediment near the Restoration Areas source control area. Sediment COCs suspended in stormwater, if any, may be conveyed to the LDW; however, any concentrations of sediment COCs are likely to be diluted by mingling with the south fork of Hamm Creek and partitioning to sediments in the creek bed and the Hamm Creek Restoration Area before discharging to the LDW. The potential for sediment recontamination via this pathway is low.

Arsenic concentrations in one storm drain solids sample, TUK-06 exceeded the LDW background concentration of 7 mg/kg. Sediment COCs suspended in stormwater, if any, may be conveyed to the LDW. The potential for sediment recontamination via this pathway is low.

3.1.3 Data Gaps

- Additional information is needed from King County and the Cities of Burien and SeaTac to define the boundaries of the Hamm Creek SD basin in order to determine if the area to the east of Des Moines Memorial Drive between S 116th Way and S 124th Street and the area south of S 124th Street should be included in or excluded from the Restoration Areas source control area.
- Additional information is needed to determine the drainage area associated with Outfall 3842.

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4.0 Potential for Sediment Recontamination from Adjacent Properties

The LDW shoreline spans approximately 1.6 miles of the source control area. Parcels along the shoreline are a mix of restored habitats and industrial properties. Restored areas are described in Section 4.2 and include:

- Hamm Creek Restoration Area
- Muckleshoot Tribe/Kenco Marine Restoration Area
- Turning Basin 3 Restoration Area
- North Wind's Weir
- Point Rediscovery Wetland

The following facilities/properties are adjacent to the LDW and have been identified as potential sources of contaminants to sediments near with the Restoration Areas source control area:

- Seattle City Light Power Substation
- Fremont Property
- Boeing Parking Lot Property
- Thales Avionics
- U.S. Postal Service Distribution Center

Tax parcels in the vicinity of the Restoration Areas source control area are shown in Figure 12, identified by the last four digits of the tax identification number. Additional property information is summarized in Table 6.

The potential for sediment recontamination associated with each of these facilities is discussed in the following sections. Additional information needed to assess the potential for sediment recontamination is also identified.

4.1 Restoration Areas

Habitat restoration within the source control area has occurred under three programs: the Elliott Bay/Duwamish Restoration Program (EB/DRP), the federal Coastal America Program, and the Point Rediscovery wetland pond and stream enhancement project.

4.1.1 Elliott Bay/Duwamish Restoration Program

In 1990, the National Oceanic and Atmospheric Administration (NOAA) filed a lawsuit against the City of Seattle and the Municipality of Metropolitan Seattle (METRO) to recover damages for the loss of natural resources due to the release of hazardous substances into the environment in and near Elliott Bay and the LDW. The City of Seattle and METRO (now King County Department of Natural Resources [DNR]) established a program to help restore and replace the natural resources of Elliott Bay and the LDW, as part of a settlement agreement with NOAA.

The Consent Decree resulted in the EB/DRP. The EB/DRP included sediment remediation, source control, and habitat development. Parties to the settlement include NOAA, the U.S. Fish and Wildlife Service (USFWS), Ecology, and the Muckleshoot Indian Tribe and Suquamish Tribe, as natural resources trustees (USFWS 2000).

The City of Seattle and King County acquired the Hamm Creek and Kenco Marine Restoration Areas for the purpose of habitat restoration (Figure 5). One acre of Cecil Moses Park was made available to establish the North Wind's Weir Restoration Area (Figure 6) (USFWS 2000).

USFWS was given the responsibility of implementing a monitoring program to evaluate the success of the habitat restoration activities at Hamm Creek, Kenco Marine, and North Wind's Weir. The success criteria were as follows (USFWS 2000):

- 1.0 acre of intertidal habitat at Hamm Creek and North Wind's Weir and 0.3 acre of intertidal habitat at Kenco Marine is restored,
- The tidal amplitude is equivalent inside and outside of the project area.
- Restoration areas accumulate fine-grained material and organic matter.⁷
- Marsh and riparian vegetation are established.
- Native and indigenous bird species use the site and juvenile salmonids are present. The production of invertebrate prey important to juvenile salmonids is comparable to reference sites. Prey resource production was used to assess the presence or absence of sediment recontamination in the restored areas.

A small marsh across from the North Wind's Weir Restoration area was used as a reference site for marsh vegetation for the Hamm Creek, Kenco Marine, and North Wind's Weir Restoration Areas. This marsh was used as the macroinvertebrate reference site for the Kenco Marine and North Wind's Weir Restoration Areas. A small fringe marsh located adjacent to the Hamm Creek Restoration Area was used as the macroinvertebrate reference site for the restoration area (USFWS 2008).

Benthic organisms were sampled from the Restoration Areas in April, May, and June 2010. Sediment cores were collected from vegetated areas and mudflats to quantify the benthic invertebrates. Diverse and abundant invertebrate species were observed, suggesting that invertebrate communities are stabilizing (Cordell and Toft 2012). Prey resource production was selected as the criterion to assess the presence or absence of sediment recontamination; the stabilization of benthic communities suggests that sediment recontamination has not occurred. However, no confirmation samples have been collected from sediment within the restored areas to verify that chemical concentrations are below the SQS.

⁷ This criterion was discontinued in 2005 because threshold values of fine-grained material and organic matter had not been established, which made it difficult to statistically determine the success of the restoration projects (USFWS 2012).

Hamm Creek Restoration Area

Facility Summary: Hamm Creek Restoration Area	
Tax Parcel No.	5624200931
Address	10108 West Marginal Place S, Seattle 98108
Property Owner	Seattle City Light
Parcel Size	16.45 acres (716,740 sq ft), 6.2 acres restored

Hamm Creek historically meandered through this property. In the 1950s, the creek was rerouted to an open ditch and culvert that ran parallel to West Marginal Place S. In 2000, King County and USACE completed a 2,000-foot natural channel that redirected the Hamm Creek South Fork to discharge to the LDW via the Hamm Creek outlet, immediately south of Delta Marine (King County 2000a).

The Hamm Creek Restoration Area was historically used for dredged material stockpiling. No industrial or commercial activities have been performed on the property. Between 1928 and 1936, a bulkhead was built along the shoreline. The bulkhead was removed between 1955 and 1956, following the development of the SCL substation to the south (USACE 1997a). Based on the 1956 aerial photograph (Figure B-3, Appendix B), it appears that dredge material may have been placed on the property in 1954, when 220,000 cubic yards of dredge material were placed on the adjacent SCL property to support the construction of the SCL Power Substation.

In 1960, 294,000 cubic yards of dredged material were stockpiled at the property; some of this dredged material was later used to construct Highway 1 (Pacific Coast Highway). In 1968, an additional 375,000 cubic yards of dredged material were stockpiled at the property. This material was used for unspecified projects by the City of Seattle Urban Renewal Department (USACE 1997a) and as fill on the property (Weston 1990). In May 1971, 325,000 cubic yards of dredged material were stockpiled, but this material appears to have been removed from the property within four months (USACE 1997a).

In 1985, dredged material from the Duwamish Yacht Club marina was disposed of at the east-central portion of the property (Weston 1990). A composite soil sample was collected from the area where the dredge spoils were deposited on the Seattle City Light property. PCBs, halogenated hydrocarbons, and metals were either not detected or detected below MTCA regulatory criteria (Laucks 1985). The Seattle-King County Department of Public Health (SKCDPH) and Ecology reviewed the sample results and classified the dredge spoils as an acceptable fill material (SKCDPH 1985).

Prior to the habitat restoration activities, the property was approximately 22 to 26 feet above sea level and covered by a grass field (USACE 1998). King County DNR and USACE created 1,900 feet of new riparian stream bed and channel for Hamm Creek, which included meanders fish pools and large woody debris. The restored area was planted with native trees and shrubs (USFWS 2000). Approximately 60,000 cubic yards of dredged fill material were removed (Cordell and Toft 2012). Restoration activities were completed in 2000 and monitoring began in 2001 (USFWS 2008). Large boulders, cobble, and root wads were placed along the north bank

near the mouth of Hamm Creek to slow the rate of erosion following an erosion event in 2002 (USFWS 2012).

Monitoring data have indicated that the restored habitat at Hamm Creek is stable although winter storm events in 2006/2007 caused major erosion. Beaver dams along Hamm Creek redirected the channel, creating a cut through a berm that separated freshwater and saltwater marshes (USFWS 2008).

Environmental Investigations Performed Prior to Restoration Activities

Boeing Lease Evaluation

In 1990, Boeing evaluated an option to enter an agreement with SCL to lease the property north of the SCL Power Substation, which is now the Hamm Creek Restoration Area (Figure 15). An environmental assessment was performed as part of due diligence to assess soil and groundwater conditions and establish a baseline for the potential lease agreement. Seven soil borings were advanced; three of the borings were converted to groundwater monitoring wells. Five surface soil samples were collected near the substation fence line. Two water-bearing zones were identified; the upper zone was encountered between 3 and 6.5 feet below ground surface (bgs); the lower zone was encountered at 13 bgs and appeared to be tidally influenced. The two water-bearing zones did not appear to be hydraulically connected (Weston 1990).

Soil samples from each boring were composited and analyzed for PAHs and metals. In addition, samples collected from the Duwamish Yacht Club dredged material and near the substation fence line were analyzed for PCBs. Soil samples collected near the fence line were analyzed also for chlorinated pesticides (Weston 1990). Concentrations of arsenic exceeded the MTCA Method B cleanup level. BEHP and mercury concentrations exceeded the draft soil-to-sediment screening level. Benzo(a)pyrene concentrations exceeded the MTCA Method B cleanup level (0.14 mg/kg), the draft soil-to-sediment screening level (0.21 mg/kg), and the LDW Background Level (0.009 mg/kg). Chemical concentrations are listed in Table 7. The contaminated soil may have been removed during the restoration of this area.

Concentrations of the chemicals detected in soil at the site have not been detected above the SMS in LDW surface sediment samples collected near the Hamm Creek Restoration Area.

Concentrations of arsenic and cPAHs have exceeded the LDW Background concentrations in LDW surface sediment samples collected near the Hamm Creek Restoration Area.

Groundwater samples were analyzed for VOCs. Acetone was the only chemical detected in the samples (8 µg/L, MW-1) (Weston 1990).

Sediment Characterization

In 1997, SAIC and USACE performed an assessment of the area prior to the start of habitat restoration activities. Results from the soil and sediment investigation indicated that no hazardous, toxic, or radioactive wastes concerns were present. Bioassay tests indicated that the soil was not suitable for open-water disposal (USACE 1998).

Kenco Marine Restoration Area

Facility Summary: Kenco Marine Restoration Area	
Tax Parcel No.	5624200970
Address	None
Property Owner	Muckleshoot Indian Tribe
Parcel Size	0.83 acre (36,025 sq ft), 0.3 acre restored

The Kenco Marine Restoration Area is south of the SCL Power Substation and north of the Turning Basin 3 Restoration Area (Figure 5). Kenco Marine owned the property until 1997 when it was purchased by the Muckleshoot Indian Tribe. Kenco Marine performed commercial marine operations including moorage and vessel repair. Repair operations included battery replacement, oil lubrication, and minor painting of tugs and barges (USACE 1994 as cited in NOAA 2000). Following the purchase in 1997, barges and other vessels were removed from the property, exposing 16,000 to 18,000 square feet (sq ft) of intertidal and subtidal mudflats (USFWS 2000).

Historical fill material and commercial structures, including a 125-foot-long dock constructed of creosote-treated pilings and several concrete and asphalt pads, were removed from the property as part of the habitat restoration (USFWS 2000). Most of the historical fill was placed after 1950. Benches were excavated at the property to create mudflat, marsh, and riparian habitats. Habitat monitoring project management is provided by the Muckleshoot Indian Tribe Fisheries Department (USFWS 2000). Buildings, concrete foundations, and docks and pilings were removed from the property in 2005 (Cordell and Toft 2012). Restoration activities were completed in 2006 and monitoring began in 2007 (USFWS 2008). Monitoring data have indicated that the restored habitat at Kenco Marine is stable (USFWS 2012).

Environmental Investigations and Cleanups Performed Prior to Restoration Activities

In 1994, USACE collected sediment samples from the property as part of a Phase I Site Assessment. Arsenic and acenaphthylene concentrations exceeded the SMS criteria (USACE 1997b as cited in NOAA 2000).

USACE performed a Phase II Site Assessment in 1997. Hydrocarbon sheens were observed at 5 centimeters below the sediment surface during sampling activities. Chemical concentrations in sediment did not exceed the SMS criteria (USACE 1997b as cited in NOAA 2000).

In 1998, remedial excavations were performed in two areas to remove petroleum hydrocarbon-contaminated soil. The excavation footprints were 40 and 100 sq ft. Following removal of the petroleum-contaminated soil, concentrations of PAHs remained in soil above MTCA Method B cleanup levels (USACE 1997b as cited in NOAA 2000).

North Wind’s Weir

Facility Summary: North Wind’s Weir	
Tax Parcel No.	2843800005
Address	112 th Street and Pacific Highway S, Tukwila 98168

Facility Summary: North Wind's Weir	
Property Owner	King County Parks
Parcel Size	2.64 acres (115,135 sq ft)
Facility/Site ID	5584231

North Wind's Weir is located south of the USPS Distribution Center (Figure 6).

The property was developed in the 1930s and 1940s for single family residential housing (USFWS 2000). Historical fill material and residential structures were removed from the property during habitat restoration activities. Restoration of the property included development of trails, shoreline stabilization, plantings of native trees and shrubs, and development of interpretive features describing the cultural significance of the property to Native Americans (USFWS 2000). Restoration activities were completed in 2002 and monitoring began in 2003 (USFWS 2008). Monitoring data have indicated that the restored habitat at North Wind's Weir is stable (USFWS 2008).

The ISIS database indicates that North Wind's Weir was listed on Ecology's CSCSL in January 2004. Petroleum and PAH concentrations above MTCA cleanup levels were confirmed in soil. Metals concentrations above MTCA cleanup levels were confirmed in groundwater. Analytical data were not available for review. The property was enrolled in the Voluntary Cleanup Program (VCP) between November 2004 and May 2006. The ISIS database lists the current property status as "cleanup started."

4.1.2 Federal Coastal America Program

The Turning Basin 3 Restoration Area was established first through the federal Coastal America Program in 1994 and then expanded by the Port of Seattle in 1999. The Coastal America Program was implemented by the Port of Seattle, USFWS, USACE, and the EPA. Goals of the habitat restoration included the following (Cordell et al. 2001):

- Increase acreage of fine mud and sand flat habitat and associated functional attributes.
- Increase acreage of brackish and salt marsh habitat and associated function attributes.
- Increase riparian habitat in terms of physical structure and biological productivity.
- Increase the length and complexity of the shoreline.
- Restore intertidal habitat in the form of a slough channel.

Turning Basin 3 Restoration Area

Facility Summary: Turning Basin 3 Restoration Area	
Tax Parcel No.	0003400013, 0423049187
Address	0013: 10100 West Marginal Place S, Seattle 98108 9187: 10108 West Marginal Place S, Seattle 98108
Property Owner	Port of Seattle
Parcel Size	0013: 1.28 acres (55,568 sq ft)

Facility Summary: Turning Basin 3 Restoration Area	
	9187: 2.0 acres (86,967 sq ft)
Facility/Site ID No.	96665547
EPA ID No.	WAD988480000 – inactive (Seattle City Light Duwamish TR)

The Turning Basin 3 Restoration Area is southeast of the Kenco Marine Restoration Area and northwest of the Fremont property (Figures 5 and 6). The Turning Basin 3 Restoration Area is composed of two parcels, 0013 and 9187. The majority of parcel 0013 is submerged (Figure 12).

Restoration activities performed through the Coastal America Program in 1994 included removal of fill material and construction of an upland riparian buffer with a small intertidal basin (Cordell et al. 2001). The Port of Seattle purchased the property from the Desimone family in 1996. The Port of Seattle completed approximately 1.3 acres of aquatic restoration at Turning Basin 3 to compensate for pier construction at Terminal 5 (Cordell et al. 2008). In 1998 a derelict ferry was removed, and in 1999 the Port of Seattle restored 2 additional acres (USACE 1998).

Invertebrate monitoring was performed in 1999 and yearly from 2004 to 2007. Results of the monitoring indicate that invertebrate communities were increasing in diversity and density (Cordell et al. 2008). These results suggest that sediment recontamination has not occurred.

4.1.3 Point Rediscovery Wetland Pond and Stream Enhancement Project

The former Rainier Vista Treatment Plant received residential wastewater and some light industrial wastewater. Residential sewage may have been dumped at the northern end of the property from 1984 to 1987. In 1990, a main transmission pipe ruptured and an undetermined amount of wastewater was spilled. Lime was spread on the resulting wastewater ponds (Herrera 1994).

An environmental investigation was performed at the former treatment plant in February 1992. Two soil samples were collected from the suspected sewage dumping area and analyzed for coliform bacteria, nitrite+nitrate nitrogen, metals, pesticides, PCBs, and SVOCs. PCBs, pesticides, and SVOCs were not detected. Barium, chromium, lead, selenium, and silver were detected at concentrations below MTCA cleanup levels and the draft soil-to-sediment screening levels (Table 8) (Herrera 1994).

From 1996 to 1998, the Point Rediscovery wetland pond and stream enhancement project was constructed at the former Rainier Vista treatment plant, located between SR-99 and Des Moines Memorial Drive S (Figure 5). This restoration area is adjacent to the main channel of Hamm Creek South Fork (King County 2000b). Additional information regarding this restoration effort was not available for review.

4.2 Seattle City Light Power Substation

Facility Summary: Seattle City Light Power Substation	
Tax Parcel No.	5624200930, 5624200950, 5624200951

Facility Summary: Seattle City Light Power Substation	
Address	0930: 10000 West Marginal Place S, Seattle 98108 0950: 10030 West Marginal Place S, Seattle 98108 0951: None
Property Owner	Seattle City Light
Parcel Size	0930: 12.09 acres (526,443 sq ft) 0950: 2.69 acres (116,960 sq ft) 0951: 0.21 acre (9,000 sq ft)
Facility/Site ID	NA
SIC Code(s)	NA
EPA ID No.	NA
NPDES Permit No.	NA
UST/LUST ID No.	NA

The SCL Power Substation is adjacent to the LDW between RM 4.4 and 4.5 West (Figure 5). Vacant land, also owned by SCL, is present immediately south of the substation. Hamm Creek Restoration Area is immediately north of the substation. West Marginal Place S is located to west/southwest of the property.

4.2.1 Current and Historical Operations

The property was platted but undeveloped in the late 1920s. Between 1928 and 1936 a bulkhead was built along the shoreline. Development of the substation began in 1954 when 220,000 cubic yards of dredge material were placed at the property (USACE 1997a). The power substation continues to operate at the property. The shoreline of the property is protected by a bulkhead and riprap. Lease documents included in the Desimone Trust’s response to a CERCLA Section 104(e) Request for Information identifies this area as “Mr. Pallet” (BNY Mellon 2009).

Stormwater from the property is discharged to the LDW through Outfalls 2098 and 2099 (Figure 14). Stormwater discharges to the LDW from the property are covered by the city of Seattle municipal stormwater discharge permit.

4.2.2 Regulatory History

No records regarding the regulatory history of this property were identified.

4.2.3 Environmental Investigations and Cleanups

SCL performed several environmental investigations at the property between 1985 and 2006. These include (Crowley 2013):

- January 1985: Duwamish Substation Sampling and Analysis Report, dated March 28, 1985
- March 1985: Duwamish Substation PCB Data, dated March 5, 1985

- June 1988: PCB Testing at Duwamish Substation and Private Residence, dated July 28, 1988
- February 1990: Seattle City Light Work Order #90-A (Contingency): Duwamish Substation Breaker Pads Soil Testing, dated April 20, 1990
- April 2006: Phase II Environmental Site Assessment: Duwamish Substation: Tax Parcel #5624200950, dated May 12, 2006

Copies of the reports were not available for review during the preparation of this Data Gaps Report. Relevant information from the reports will be summarized in the SCAP or a Source Control Status Report.

Boeing performed an investigation at the adjacent property (Hamm Creek Restoration Area) in 1990. Dredge materials appear to have been placed on both properties by USACE in 1954. At the Hamm Creek Restoration Area, concentrations of arsenic exceeded the MTCA Method B cleanup level. BEHP and mercury concentrations exceeded the draft soil-to-sediment screening level. Benzo(a)pyrene concentrations exceeded the MTCA Method B cleanup level (0.14 mg/kg), the draft soil-to-sediment screening level (0.21 mg/kg), and the LDW Background concentration (0.009 mg/kg). Chemical concentrations are listed in Table 7. However, these concentrations may be related to later dredge materials stockpiled at the Hamm Creek Restoration Area and may not be representative of the chemical characteristics of the 1954 dredge materials that were placed on the SCL Power Substation property.

4.2.4 Potential for Sediment Recontamination

The potential for sediment recontamination via this property is summarized below by transport pathway. Concentrations of several sediment COCs exceeded the CSL in surface sediment samples collected near Outfalls 2098 and 2099, including metals, PAHs, phenols, and other SVOCs (Table 3, Figure 13b).

Stormwater and Surface Runoff

Stormwater discharges to the LDW through Outfalls 2098 and 2099. Contaminants in stormwater, if any, may represent a potential source for sediment recontamination. Additional information regarding operations at the facility is needed to determine potential for sediment recontamination via this pathway.

Spills

If a spill occurs at the property, contaminants may infiltrate the ground surface. If a spill occurs during a storm, contaminants may be entrained in stormwater, rather than infiltrate the ground surface. Contaminants that have infiltrated the ground surface may be conveyed to the LDW via groundwater discharge. Cleanup activities in response to past spills appear to have been immediate and thorough, minimizing the potential impacts on the property and the LDW.

Soil and Groundwater

Several environmental investigations have been performed at the property. Reports documenting the investigations were not available for review at the time this Data Gaps Report was prepared.

Results of an environmental investigation at the Hamm Creek Restoration Area, which may also be representative of the environmental conditions beneath the SCL Power Substation, indicate the potential presence of arsenic, mercury, benzo(a)pyrene, and BEHP above MTCAs cleanup levels and/or draft screening levels. Arsenic was detected at a concentration above the CSL in one sediment sample collected near the property in 2011. PCBs, arsenic and cPAHs have been detected at concentrations above the LDW Background concentrations in several samples collected near the property between 1997 and 2011.

Bank Erosion/Leaching

The shoreline of the property is protected by a bulkhead and riprap. The potential for sediment recontamination via the bank erosion/leaching pathway is very low.

4.2.5 Data Gaps

Information needed to assess the potential for sediment recontamination associated with current or historical operations at the property is listed below:

- Additional information is needed from SCL to determine if operations at the property represent a potential source of contaminants to LDW sediments.
- Review of the reports documenting the environmental investigations performed at the property is needed to evaluate the potential for sediment recontamination via the soil and groundwater pathway.

4.3 Fremont Property

Facility Summary: Fremont Property	
Tax Parcel No.	0423049001, 0423049073
Address	9001: None 9073: 10180 West Marginal Place S, Tukwila 98168
Property Owner	Mellon Desimone Trust
Parcel Size	9001: 4.58 acres (199,396 sq ft) 9073: 6.28 acres (273,348 sq ft)
Facility/Site ID	20607: RENU 22587: J&H Express Inc. 34451867: Xtra Lease Seattle Branch 54756774: Graham Trucking
Alternate Names	AJF Trailer Leasing, Bidaboo Auctions, Graham Trucking, J&H Express, McKenna Construction, Ness & Campbell Crane, New Century Transport, Pamco Construction, A Royal Wolf Portable Storage, Xtra Lease Seattle Branch

Facility Summary: Fremont Property	
SIC Code(s)	4212: Local Trucking without Storage (Graham Trucking)
EPA ID No.	WAD982652885 – inactive (Graham Trucking)
NPDES Permit No.	None
UST/LUST ID No.	None

The Fremont property is immediately southeast of the Turning Basin 3 Restoration Area (Figure 6). The Boeing Parking Lot property is located east of the Fremont property. Thales Avionics is located to the southeast. Access to the Fremont property is from West Marginal Place S.

One building is present on parcel 9073, a 4,800 sq ft storage shed, built in 1950.

4.3.1 Current Operations

J&H Express, a trucking company, is the current operator at the property. The company uses 10160 West Marginal Place S, Tukwila, as its operating address. The property is covered with gravel (Ecology 2012b).

The property is located within the East Marginal CSO basin.

4.3.2 Historical Operations

The Fremont property has been used for equipment and trailer storage by various trucking and construction equipment companies since at least 1985, when the property was leased to Fremont Associates/Pamco Construction (BNY Mellon 2009). Historical operators at the property are listed below.

Company Name	Approximate Lease Dates	Operations
AJF Trailer Leasing	1992 to 1996	
Bidaboo Auctions	2010	Construction equipment storage and repair
Boeing	1990 to 1995	Licensed transportation office and parking
Certified Cleaning/Pacific Freight	2004	Truck parking
Dick's Towing & Road Service, Inc.	1996 to 2010	Car impound lot
Eagle Systems, Inc.	2007 to 2010	Trailer staging
Edgmon and Sons Trucking	Pre-2007	
Fremont Associates/Pamco Construction	1985 to 2007	Construction equipment storage
Graham Trucking	1995	
Knight Transportation	2007 to 2010	
The Maust Corporation	1998 to 2002	
McKenna Construction	Unknown	
Nelson Trucking	Unknown	

Company Name	Approximate Lease Dates	Operations
Ness & Campbell Crane	Unknown	
New Century Transport	Unknown	
Nuprecon	2009 to 2010	Construction debris storage
Pacific Northwest Transfer Group	2007 to 2010	Scrap metal and used parts collection
A Royal Wolf Portable Storage	2004	Container staging and repair
Sabey Construction Company	Unknown	
Skyline Mail Carriers	Unknown	
TMS Joint Venture	1995 to 2000	
Xtra Lease Seattle Branch	1990 to 2000	Trailer storage

Sources: BNY Mellon 2009; Ecology 2011b; Geotech Consultants 1995; Maas 2013; Property Solutions 2004

4.3.3 Regulatory History

In 1986, King County fined Pamco Construction for placing unauthorized fill along the shoreline of the property and failure to provide erosion and sedimentation controls. King County ordered Pamco Construction to remove the fill and rehabilitate the shoreline or obtain all required permits for the fill and grading activities (King County 1986). Presumably the fill material was removed either by Pamco or during the restoration of Turning Basin 3 (Section 4.1.2).

Ecology performed an Urban Waters inspection at Bidaboo Auctions on August 26, 2010. The Ecology inspector noted large oil stains on the lot and minor housekeeping issues (Ecology 2011b).

Ecology performed an Urban Waters inspection at J&H Express on May 19, 2011. Ecology identified corrective actions to improve spill response procedures, improve washing procedures by washing trucks in a wash bay with wash water treatment if washing more than five trucks per month or cease trucking washing activities, and improve housekeeping by covering dumpsters, disposing of excess waste and equipment promptly, and cleaning up spills and leaks when they occur (Ecology 2011a). The facility achieved compliance with the corrective actions as of August 1, 2011 (Ecology 2011c).

In April 2009, EPA sent a CERCLA Section 104(e) Request for Information to the Desimone Trust. Parcels 9001 and 9073 were included in the request (USEPA 2009). Relevant information from the response to the CERCLA 104(e) request is included in this Data Gaps Report.

4.3.4 Environmental Investigations and Cleanups

A Phase I Environmental Site Assessment was performed at the Fremont Property in 2004. Four 55-gallon drums containing grease and concrete finishers were present on the property. Four slab-on-grade buildings were present at the property. An oil stain was observed on the gravel-covered ground under a storage shed. No other environmental concerns were identified (Property Solutions 2004).

4.3.5 Potential for Sediment Recontamination

PCB concentrations above the SQS were detected in two sediment samples collected near the Fremont property. Concentrations of PCBs, arsenic, cPAHs and/or dioxins/furans have exceeded the LDW Background concentrations in all LDW sediment samples collected near the property (Figure 13b). The potential for sediment recontamination is summarized below by transport pathway.

Stormwater and Surface Runoff

The property is covered with gravel. No storm drain features appear to be present on the facility. Stormwater likely infiltrates the ground surface. During heavy storms, stormwater may be conveyed to a ditch that runs parallel to the southeastern property line. The ditch discharges to the storm drain line, which discharges to Ditch #1 at the Turning Basin 3 Restoration Area (Figure 14). J&H Express completed corrective actions identified by Ecology in 2011. Stormwater and surface runoff are not considered to be significant pathways for transport of potential contaminants to LDW sediments.

Spills

Spills that occur on the property may leach to soil and groundwater. J&H Express has complied with corrective actions identified by Ecology and improved spill response and washing procedures. The potential for sediment recontamination is low.

Soil and Groundwater

The property was not developed for industrial/commercial use until 1985. Since development, the property has been used for equipment and trailer storage by various trucking and construction equipment companies. Oil stains have been observed on the gravel surface, but there is no evidence of large petroleum spills at the property. While petroleum hydrocarbons are potentially harmful to the LDW environment, these are not contaminants of concern for LDW sediments. The potential for sediment recontamination via this pathway is very low.

Bank Erosion/Leaching

The shoreline adjacent to the property is sloped and covered with vegetation. Contaminants in soil and groundwater, if any, may be a source of contaminants to the LDW. There are no indications that soil and groundwater at the property have been contaminated with LDW sediment COCs.

4.3.6 Data Gaps

J&H Express has complied with corrective actions identified by Ecology in 2011. No data gaps were identified for the Fremont property.

4.4 Boeing Parking Lot Property

Facility Summary: Boeing Parking Lot Property	
Tax Parcel No.	0423049150
Address	2601 S 102 nd Street, Seattle 98168
Property Owner	Desimone Trust Oxbow 2601
Parcel Size	34.53 acres (1,504,264 sq ft)
Facility/Site ID	None
SIC Code(s)	
EPA ID No.	WAD981771017 – inactive
NPDES Permit No.	None
UST/LUST ID No.	None

The Boeing Parking Lot property is located between RM 4.8 and 5.5 West. The property is bordered by the LDW to the northeast and south. The Fremont property and Thales Avionics are west of the property. Turning Basin 3 is located to the northwest (Figure 6).

A 52,500 sq ft fitness center, built in 1987, is present on the southeastern portion of the property.

4.4.1 Current and Historical Operations

Boeing began leasing the property from the Desimone Trust in 1956. Prior to Boeing’s lease, the property was farmland (BNY Mellon 2009). The property was paved in the late 1970s and is for parking by Boeing employees. In recent aerial photographs some storage of equipment is observed. According to the Washington State Corporation website, the building has been used for a variety of Boeing employee clubs such as the Autosports Club, Computing Society, Prospectors Society, Whitewater Touring Club, and Windsurfing Club.

A dirt walking trail is present between the paved area and the LDW shoreline. The shoreline does not appear to be reinforced. Stormwater from the northwestern portion of the property appears to be conveyed to a ditch and discharges to the LDW through Ditch #2 (Figure 14).

The property is located within the East Marginal CSO basin.

4.4.2 Regulatory History

In April 2009, EPA sent a CERCLA Section 104(e) Request for Information to the Mellon Trust. Parcel 9150 was included in the request (USEPA 2009). Relevant information from the response to the CERCLA 104(e) request is included in this Data Gaps Report.

4.4.3 Environmental Investigations and Cleanups

No records of environmental investigation and cleanups were identified for this property.

4.4.4 Potential for Sediment Recontamination

The potential for sediment recontamination via this property is summarized below by transport pathway.

Stormwater and Surface Runoff

Stormwater from the northwestern area of the property is conveyed to the LDW through Ditch #2. Surface runoff from most of the property likely flows from the paved area to the unpaved portions of the property and then infiltrates the ground surface. Industrial activity appears to be limited to outdoor storage of equipment. Contaminants in stormwater runoff, if any, may be conveyed to the LDW.

Spills

Since the property is used for employee parking and equipment storage, spills are not likely to occur at the property.

Soil and Groundwater

The property was not developed for industrial/commercial use until the late 1970s. Since development, the property has been used for equipment storage and Boeing employee parking. The potential for sediment recontamination via this pathway is very low.

4.4.5 Data Gaps

Information needed to assess the potential for sediment recontamination associated with current or historical operations at the property is listed below:

- A facility inspection is needed to determine if current operations at the property, particularly equipment storage, represent a potential source of contaminants to stormwater.

4.5 Thales Avionics

Facility Summary: Thales Avionics	
Tax Parcel No.	0423049190
Address	2811 S 102 nd Street, Tukwila 98168
Property Owner	Mellon Trust of WA
Parcel Size	9.07 acres (395,016 sq ft)
Facility/Site ID	1453860: Thales Avionics 58835952: Boeing Defense & Space Group (D&SG) Oxbow Site
SIC Code(s)	3728: Aircraft Parts and Equipment, Not Elsewhere Classified (Boeing D&SG Oxbow Site) 3812: Search and Navigation Equipment (Thales Avionics)

Facility Summary: Thales Avionics	
EPA ID No.	WAH000029928
NPDES Permit No.	WAR126494 (CNE)
UST/LUST ID No.	None

Thales Avionics operates at the Riverfront Technical Park, which is located between the Fremont property, the Boeing Parking Lot property, and the USPS Distribution Center (Figure 6).

One building is present on the property, a 175,068 sq ft office building, built in 1987.

4.5.1 Current Operations

Thales Avionics provides a variety of systems for the civil and military aircraft operations. The company designs and manufactures onboard electronics and power management systems, radar and sensors, supplies lights and in-flight entertainment systems for aircraft cabins, provides radios, navigation systems, training equipment, and designed automation products to assist air traffic controllers (Thales Group 2013).

All industrial activities appear to be performed indoors. Stormwater from the parking area appears to be conveyed to a ditch that runs parallel to the northwestern property line. The ditch discharges to the storm drain line, which discharges to Ditch #1 at the Turning Basin 3 Restoration Area (Figure 14).

The property is located within the East Marginal CSO basin.

4.5.2 Historical Operations

The property was leased to PACCAR in 1977. PACCAR used the property to test Kenworth trucks (BNY Mellon 2009). The Sabey Corporation began leasing the property in 1987. The Sabey Corporation built and managed the Oxbow Corporate Park. The building is referred to as Building 251. Boeing leased the building from 1987 until 1995.

4.5.3 Regulatory History

In April 2009, EPA sent a CERCLA Section 104(e) Request for Information to the Desimone Trust. Parcel 9190 was included in the request (USEPA 2009). Relevant information from the response to the CERCLA 104(e) request is included in this Data Gaps Report.

Thales Avionics applied for a CNE certificate in December 2010. The CNE certificate was approved in March 2011.

Ecology performed an Urban Waters inspection at Thales Avionics on June 30, 2011. Minor problems related to hazardous waste labeling and storage were identified. Ecology identified the following corrective actions (Ecology 2011d):

- Properly label hazardous wastes.

- Store liquid wastes in covered containers and in an area with secondary containment and that is protected from damage or exposure to the environment.
- The storage area must comply with the fire code for hazardous materials storage.

Ecology also requested that Thales Avionics reassess its generator status to determine if it should report as a medium or small quantity hazardous waste generator. Thales Avionics achieved compliance with the corrective actions on August 30, 2011.

4.5.4 Environmental Investigations and Cleanups

A Phase I Environmental Site Assessment was performed at the property in 1995. No environmental concerns were identified (Geotech Consultants 1995).

4.5.5 Potential for Sediment Recontamination

The potential for sediment recontamination via this property is summarized below by transport pathway.

Stormwater and Surface Runoff

All industrial activities appear to be performed indoors and the facility has received a CNE certificate from Ecology. Stormwater and surface runoff are not considered to be significant pathways for transport of potential contaminants to LDW sediments.

Spills

All industrial activities appear to be performed indoors and the facility has received a CNE certificate from Ecology. Spills are not considered to be significant pathways for transport of potential contaminants to LDW sediments.

Soil and Groundwater

The property was not developed for industrial/commercial use until 1987. Since development, it appears that all industrial operations have been performed indoors. The potential for sediment recontamination via this pathway is very low.

4.5.6 Data Gaps

Thales Avionics has received a CNE certificate and has complied with corrective actions identified by Ecology. No data gaps were identified for this property.

4.6 U.S. Postal Service Seattle Distribution Center

Facility Summary: U.S. Postal Service Seattle Distribution Center	
Tax Parcel No.	0423049057, 0423049130, 0423049186, 0423049189
Address	9057:10800 West Marginal Place S, Tukwila 98168 9130: None

Facility Summary: U.S. Postal Service Seattle Distribution Center	
	9186: 10600 West Marginal Way S, Tukwila 98168 9189: 10600 West Marginal Place S, Tukwila 98168
Property Owner	9130: Seattle City Light 9186: Mellon Trust of WA 9057, 9189: Desimone Irrevocable Trust
Parcel Size	9057: 4.79 acres (208,640 sq ft) 9130: 18.89 acres (822,899 sq ft) 9186: 14.12 acres (615,107 sq ft) 9189: 8.93 acres (388,805 sq ft)
Facility/Site ID	58835952: Boeing D&SG Oxbow Site 76328824: U.S. Postal Service Seattle Distribution Center
Alternate Names	Oxbow Corporate Park
SIC Code(s)	43: United States Postal Service 3728: Aircraft Parts and Equipment, Not Elsewhere Classified
EPA ID No.	WAH000000596
NPDES Permit No.	None
UST/LUST ID No.	None

The USPS Seattle Distribution Center is located adjacent to the Duwamish River between RM 5.5 and 5.7 West. North Wind’s Weir is south of the facility. Thales Avionics and the Boeing Parking Lot property are located to the north. The property is bordered on the west by 27th Avenue S (Figure 6). One building is present on the property, a 325,000 sq ft warehouse/light industrial manufacturing building, built in 1987. The building spans parcels 9186 and 9189. The property is also known as the Oxbow Corporate Park, which is managed by The Sabey Corporation.

4.6.1 Current Operations

The USPS operates a distribution center at the facility on parcels 9186 and 9189, using 10700 27th Avenue S, Tukwila as its operating address. The USPS uses parcels 9057 and 9130 for parking. A neutralizing tank is present at the property. Ink and alcohol are used at the facility (Ecology 2011e). The USPS has leased the property since 1995 or 1996. No additional information regarding historical or current operations was available for review.

Stormwater from the facility appears to discharge to the Duwamish through Outfall 3921 or it may be conveyed to the combined sewer system (Figure 14). A diagram of the private storm drain system on the property was not available for review.

4.6.2 Historical Operations

The property was leased to PACCAR in 1970. PACCAR sublet parcels 9189, 9057, and the eastern portion of parcel 9186 to Atlas Building Wreckers from 1979 to 1986. The western portion of parcel 9186 and parcel 9190 were used by PACCAR to test Kenworth trucks (BNY

Mellon 2009). Future Resources, Inc., a construction debris salvage operation, was also present on areas of parcel 9186 that were not used for the Kenworth test track (ICF Kaiser 1995).

Atlas Building Wreckers stored cement, bricks, and other wrecked building materials at the property. Some materials may have been buried at the property. The company's activities may have encroached on parcel 9130 (the SCL easement) and on property controlled by PACCAR. On August 30, 1985, King County served a Stop Order to Atlas Building Wreckers, disallowing the company's activities at the property (PACCAR 1985). A 1985 site reconnaissance identified limited soil contamination from oil, fuel, lubricants, paint, and unidentifiable fluids spilling from drums, cans, tanks, vats, and machinery (Hart Crowser 1985). The building materials and other debris were removed from the property between 1986 and 1987 (BNY Mellon 2009). No records that documented the removal of potentially contaminated soil were identified during the preparation of this Data Gaps Report.

The Sabey Corporation began leasing the property in 1987. The Sabey Corporation built and managed the Oxbow Corporate Park. The building on parcels 9186 and 9189 was originally constructed in 1987 as two separate buildings. These buildings were referred to as Buildings 250 and 252 and were originally leased by Boeing. Boeing vacated the buildings in 1994 (ICF Kaiser 1995).

Boeing performed tool and metal fabrication, composite aircraft parts fabrication, and painting activities in Building 250. High-tech aircraft parts were manufactured in a "clean room" located within the building. Sealants, solvents, Freon, developers, oils, resin, and potting compounds were used in the building. Building 250 is the larger portion of the present day building and spans parcels 9186 and 9189. Boeing performed tool and metal fabrication, parts painting, and welding activities in Building 252. A paint booth, in-floor utility trench, and air and gas lines were present in the building (ICF Kaiser 1995).

Dove Supply Company, a construction equipment and heavy machinery salvage operation, leased parcel 9130 from SCL in 1983 (Geotech Consultants 1995).

4.6.3 Regulatory History

In 1981, Atlas Building Wreckers was fined by the Puget Sound Air Pollution Control Agency for illegal outdoor burning of materials (PACCAR 1981).

Boeing obtained an EPA ID number in 1991 as a hazardous waste planner, under the name Boeing Defense and Space Group (D&SG). The EPA ID was cancelled in June 1995.

The USPS obtained an EPA ID number in February 1997 as a hazardous waste generator and has reported as a facility that stores hazardous chemicals since February 2002.

In April 2009, EPA sent a CERCLA Section 104(e) Request for Information to the Desimone Trust (USEPA 2009). Relevant information from the response to the CERCLA 104(e) request is included in this Data Gaps Report.

Ecology performed an Urban Waters inspection at the facility on September 7, 2011. Ecology determined that the facility was in compliance, but made two recommendations (Ecology 2011e):

- Test sludge in a neutralizing tank and waste ink/alcohol to verify that they are non-hazardous.
- Increase sweeping of debris and cleanup of oil spots, with a focus on the loading docks.

4.6.4 Environmental Investigations and Cleanups

A Hazardous Materials investigation was performed at the property in 1995 on behalf of the USPS. During the investigation, a groundwater monitoring well was identified inside Building 250. Oxbow Corporate Park and Boeing personnel did not know why the well had been installed. A groundwater sample was collected and analyzed for TPH, VOCs, and metals (ICF Kaiser 1995).

Chemical	Concentration (µg/L)	MTCA Cleanup Level (µg/L)	Groundwater -to-Sediment Screening Level (µg/L)	MTCA Exceedance Factor	Groundwater-to-Sediment Screening Level Exceedance Factor
Cadmium	33	5	3.4	6.6	9.7
Chromium	120	50	320	2.4	<1
Copper	440	640	120	<1	3.7
Lead	120	15	13	8.0	9.2
Nickel	90	NA	NA	--	--
Zinc	420	4,800	76	<1	5.5

4.6.5 Potential for Sediment Recontamination

The potential for sediment recontamination via this property is summarized below by transport pathway.

Stormwater and Surface Runoff

Ecology determined that the facility was in compliance during a 2011 Urban Waters inspection. Stormwater and surface runoff are not considered to be significant pathways for transport of potential contaminants to LDW sediments.

Spills

All industrial activities appear to be performed indoors, except for loading activities. Spills are not considered to be significant pathways for transport of potential contaminants to LDW sediments.

Soil and Groundwater

Atlas Building Wreckers stored a variety of building materials and other equipment at the property between 1979 and 1987. In 1985, limited soil contamination from oil, fuel, lubricants, paint, and unidentifiable fluids was identified at the property. No records that documented the removal of potentially contaminated soil were identified during the preparation of this Data Gaps Report. It is possible that contaminated soil was removed from the property during the construction of Oxbow Corporate Park.

Metals concentrations exceeding MTCA cleanup levels and the draft groundwater-to-sediment screening levels were detected in a single groundwater sample collected in 1995. The detected metals (cadmium, chromium, copper, lead, nickel, and zinc) have not been detected above screening levels in the LDW sediments near the property. The potential for sediment recontamination via this pathway is low.

4.6.6 Data Gaps

Information needed to assess the potential for sediment recontamination associated with current or historical operations at the property is listed below:

- A facility map showing the storm drain system on the property is needed to assess the potential for sediment recontamination via the stormwater pathway.
- Additional information regarding the neutralizing tank and the results from testing the sludge in the tank and waste/ink alcohol are needed to assess the potential for sediment recontamination via the spills pathway.
- Additional data are needed to assess the current concentrations of metals in groundwater beneath the property.

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5.0 Upland Properties: Hamm Creek SD Basin

Upland properties that have been assigned Ecology Facility/Site IDs are within the Hamm Creek SD basin and are listed below:

- The Moimoi Property
- Rainier Golf & Country Club
- Glen Acres Golf Course
- McCall Oil Home Heating (McCall Oil)
- 7-Eleven Food Store
- Puget Sound Plumbing & Heating
- Connect Motorsports (former Chevron 306536)
- Chavez Auto Repair
- Jones Property
- The Aussie Repair & Machine Shop Properties
- Glendale Heating & Air Conditioning
- Pacific Underwriters
- Shell Service Station 129596
- Former Highline School District Warehouse
- Big Picture High School

Publically available information regarding the former Chevron 306536 (currently Connect Motorsports) is presented in this Data Gaps Report. Due to a potential conflict of interest, SAIC did not evaluate historical and current operations at the property or the potential for sediment recontamination associated with the property.

Limited information was available for review regarding the majority of the upland facilities. Information collected from King County Tax Assessor's Records and Ecology's Facility/Site and ISIS databases is summarized in Tables 1, 6, and 9 through 12. Facility inspections are needed at Connect Motorsports, Chavez Auto Repair, and Elliott Paint Company.

5.1 Potential Sediment Recontamination Pathways

The upland properties are not adjacent to the LDW; therefore, surface runoff or spills directly to the waterway and bank erosion are not potential sediment recontamination pathways and will not be discussed in this section. Contaminants from upland properties could be transported to the LDW via stormwater, spills to the storm drain system, and groundwater discharge pathways.

5.1.1 Stormwater and Spills

- Stormwater associated with these properties is conveyed to the sediments adjacent to the Restoration Areas source control area through the Hamm Creek SD system. Sediment COCs suspended in stormwater, if any, may be conveyed to the LDW.

- If spills occur at these properties, the spilled materials may flow directly to storm drain catch basins on or adjacent to the property or become commingled with stormwater and be conveyed to catch basins.
- Contaminants in soil and groundwater beneath these properties, if any, may leach into groundwater and infiltrate the storm drain system. Any concentrations of sediment COCs are likely to be highly diluted, especially when the infiltrating groundwater commingles with stormwater.

Ecology and King County have performed source control inspections at several facilities in the Hamm Creek SD basin, including some facilities that have not been assigned Facility/Site ID numbers. Facilities and inspection information are listed in Table 13. All inspected facilities appear to be in compliance with applicable source control best management practices (BMPs).

5.1.2 Groundwater Discharge

For many of the upland properties within the Hamm Creek SD basin, there is no available information that indicates the presence of soil and/or groundwater contamination. Soil investigations have been performed at the facilities listed below. Groundwater investigations have not been performed at these properties. Additional information regarding environmental investigations and cleanups is included in the facility-specific sections.

- Moimoi Property (Section 5.2)
- Rainier Golf & Country Club (Section 5.3)
- Puget Sound Plumbing & Heating (Section 5.4)
- Jones Property (Section 5.5)
- Aussie Repair & Machine Shop Properties (Section 5.6)

5.2 Moimoi Property

Facility Summary: Moimoi Property	
Tax Parcel No.	5624200760
Address	10118 Des Moines Memorial Drive S, Seattle 98168
Property Owner	10018 LLC
Parcel Size	0.44 acre (14,595 sq ft)
Facility/Site ID	95231135
SIC Code(s)	None
EPA ID No.	None
NPDES Permit No.	None
UST/LUST ID No.	None

The Moimoi Property is a single-family property located approximately 450 feet west of the LDW. Residential properties are located to the north and south of the Moimoi property. A green space is immediately east of the property; West Marginal Place S is located to the east of the green space. Des Moines Memorial Drive is at the western boundary of the property (Figure 5).

According to King County Tax Assessor records, the property is currently vacant. A house was present on the property until at least 2009, but has since been demolished.

5.2.1 Current Operations

The property is currently a vacant lot that is zoned for residential use.

5.2.2 Historical Operations

Based on the aerial photographs reviewed for the Data Gaps Report, the property was developed for residential use between 1936 and 1946. An auto repair shop was operated from the home in the 1990s. Waste oil, used transmission fluid, and used antifreeze were dumped on the ground. Construction debris, wood waste, automotive batteries and other solid wastes were stored on the property (SKCDPH 2000).

5.2.3 Regulatory History

SKCDPH inspected the property on May 20, 1997. During the inspection, the property owner poured used motor oil onto a rock wall, with some oil reaching soil. When referring the property to Ecology, the inspector noted that the property owner was ignoring orders from King County to remove solid waste from the property (Ecology 1997a).

Ecology inspected the Moimoi Property on August 7, 1997, and documented the home auto repair shop operations. Inspectors noted six vehicles in various states of disrepair; soil stained with motor oil and transmission fluid, and large amounts of solid waste including automotive batteries. The extent of stained soil could not be determined because the solid wastes covered the soil (Ecology 1997b). In 1998, Ecology added the property to the CSCSL (Ecology 1998). The ISIS database lists current status of the property as “awaiting cleanup.”

SKCDPH performed a site hazard assessment (SHA) at the Moimoi Property in 2000. At the time of the SHA, the house was vacant and the majority of the solid waste had been removed from the property. SKCDPH assigned a site hazard ranking of 5 to the property, which represents the lowest relative risk to human health and the environment (SKCDPH 2000).

5.2.4 Environmental Investigations and Cleanups

As part of the SHA performed in 2000, three surface soil samples were collected from the property in areas where soil was stained and where batteries had been stockpiled. The samples were analyzed for petroleum hydrocarbons; benzene, toluene, ethylbenzene, and xylenes (BTEX); and total metals. Benzene, ethylbenzene, xylenes, gasoline- and diesel-range hydrocarbons were not detected in the soil samples. Toluene, heavy oil-range hydrocarbons, barium, chromium, and lead were detected in soil (SKCDPH 2000). One detection of heavy oil-range hydrocarbons exceeded the MTCA Method A cleanup level for soil. All other detections were below cleanup levels. Metals concentrations did not exceed the draft soil-to-sediment screening levels (Appendix C-1).

5.2.5 Potential for Sediment Recontamination

The potential for sediment recontamination via this property is summarized below by transport pathway.

Stormwater

The property is a vacant and unpaved residential lot. Stormwater at the property is likely to infiltrate the ground surface. This pathway is currently incomplete.

Groundwater Discharge

Shallow soil contamination has been identified at the property; however, only heavy oil-range hydrocarbons have exceeded cleanup levels. Petroleum hydrocarbons have not been identified as sediment COCs for the LDW. Concentrations of chromium and lead did not exceed MTCA cleanup levels or the draft soil-to-sediment screening levels. The potential for sediment recontamination via this pathway is low.

5.2.6 Data Gaps

No data gaps were identified for the Moimoi Property.

5.3 Rainier Golf & Country Club

Facility Summary: Rainier Golf & Country Club	
Tax Parcel No.	0985000005
Address	1856 S 112 th Street, Seattle 98168 Operating: 11133 Des Moines Memorial Drive S, Seattle 98168
Property Owner	Rainier Golf & Country Club
Parcel Size	107.86 acres (4,698,279 sq ft)
Facility/Site ID	78215825
SIC Code(s)	7997: Membership Sports & Recreation Clubs
EPA ID No.	None
NPDES Permit No.	None
UST/LUST ID No.	2451

Rainier Golf & Country Club is located approximately 1,500 feet southwest of the LDW. The property is bordered by S 107th Street to the north, Des Moines Memorial Drive and 20th Avenue S to the east, Glendale Way S to the south, and 14th Avenue S to the west. Residential properties surround the golf course (Figure 8).

Buildings at the property include:

- A 25,984 sq ft clubhouse, built in 1923,

- A 1,385 sq ft snack bar, built in 1965,
- A 1,422 sq ft locker room/storage building, built in 1957,
- A 2,000 sq ft cart barn, built in 1986, and
- An 8,480 sq ft maintenance building and a 2,240 sq ft maintenance/storage building, both built in 2008.

5.3.1 Current and Historical Operations

Rainier Golf & Country Club has operated at this location since 1920. Two gasoline USTs and one diesel UST were historically present at golf course maintenance facility, which is located in the middle of the course. The USTs were installed in 1987 and removed in 1994 (O'Sullivan Omega 1994). Water is diverted from the South Fork of Hamm Creek to supply an ornamental concrete-lined pond on the golf course (King County 2000b).

Stormwater from the facility is conveyed to Hamm Creek and to the storm drain line that runs parallel to Des Moines Memorial Drive S.

5.3.2 Regulatory History

In January 2012, Ecology issued an NFA regarding soil contamination that was discovered when the gasoline and diesel USTs were removed from the property. The contaminated soil had been removed from the property (Ecology 2012a).

5.3.3 Environmental Investigations and Cleanups

In April 1994, the gasoline and diesel USTs were removed from the property. Soil samples collected from the excavated soil were analyzed for petroleum hydrocarbons and contained diesel and gasoline concentrations of 16,000 mg/kg and 1,030 mg/kg, respectively. Additional excavation of the UST pits was performed to remove contaminated soil. Confirmation samples indicated that all soil with diesel and gasoline concentrations above the 1990 MTCA cleanup level of 200 mg/kg had been removed. Groundwater was not encountered (O'Sullivan Omega 1994). The relevant figure and table from the UST removal report are included in Appendix C-2.

5.3.4 Potential for Sediment Recontamination

The potential for sediment recontamination via this property is summarized below by transport pathway.

Stormwater

Stormwater runoff from the property is conveyed to Hamm Creek South Fork and the storm drain line that runs parallel to Des Moines Memorial Drive S. USACE has identified Rainier Golf & Country Club as a potential source of the pesticides, insecticides, and fungicides in Hamm Creek South Fork (USACE 1998). Pesticides DDD, DDE, and DDT have been detected in LDW sediments adjacent to the Restoration Areas source control area.

Groundwater Discharge

Soil contaminated by petroleum hydrocarbons due to leaking USTs was removed from the property and Ecology has issued an NFA. The golf course has been identified as a potential source of pesticides, insecticides, and fungicides to Hamm Creek South Fork by USACE; these contaminants may be present in soil and groundwater beneath the property. Groundwater beneath the property may discharge to Hamm Creek.

5.3.5 Data Gaps

Information needed to assess the potential for sediment recontamination associated with current or historical operations at the property is listed below:

- Additional information regarding the use of pesticides, insecticides and fungicides at Rainier Golf & Country Club is needed to determine if golf course operations represent a potential source of contaminants to LDW sediments.

5.4 Puget Sound Plumbing & Heating

Facility Summary: Puget Sound Plumbing & Heating	
Tax Parcel No.	0985000400
Address	11803 Des Moines Memorial Drive S, Seattle 98168
Property Owner	WD Buckingham Properties LLC
Parcel Size	0.48 acre (10,752 sq ft)
Facility/Site ID	53457146: Auto Site Automotive
Alternate Names	Benson Property, former Shell Oil Service Station, former Auto Site Automotive
SIC Code(s)	7538: General Automotive Repair
EPA ID No.	WAD988495172 – inactive (Auto Site Automotive)
NPDES Permit No.	None
UST/LUST ID No.	58

Puget Sound Plumbing & Heating currently operates at parcel 0400. The property is bordered by Des Moines Memorial Drive to the east, S 118th Street, a 7-Eleven store and Rainier Golf & Country Club to the north, an apartment building to the west, and a residential property to the south (Figure 9).

A 2,500 sq ft building, built in 1962 is present on the property.

5.4.1 Current Operations

Puget Sound Plumbing & Heating is a heating, ventilation, and air-conditioning (HVAC) and plumbing services company. The company offers services such as drain cleaning, sewer line service, and repair and replacement of water heaters, toilets, and furnaces (Puget Sound

Plumbing 2013). The company does not appear to manufacture any parts or equipment related to the HVAC and plumbing services.

A heating oil aboveground storage tank (AST) is present on the north side of the building (Pinnacle GeoSciences 2008).

5.4.2 Historical Operations

A Shell Oil service station operated at the property from 1962 to 1974. In 1974, the Benson family purchased the property. The property was then leased to several automotive repair businesses (Pinnacle GeoSciences 2008). The Benson family sold the property to the current property owner in March 2010.

The historical service station had fueling islands in the eastern portion of the property and two USTs located at the northeast corner of the property. Features of the historical automotive repair businesses included two underground hydraulic hoists and a floor sump that were installed in the facility building. A waste oil AST was present on the east side of the building. Drums of waste petroleum products were stored on the south side of the building. Two 500-gallon USTs used for waste oil and heating oil were installed at the northwest corner of the building (Pinnacle GeoSciences 2008).

5.4.3 Regulatory History

In January 2009, Ecology entered the property into the VCP. The VCP ID number was NW2113 (Ecology 2009a).

Following environmental cleanup activities, Ecology issued an NFA determination in March 2009 for soil contamination related to former leaking USTs (Ecology 2009b).

5.4.4 Environmental Investigations and Cleanups

Two environmental investigations have been performed at the Puget Sound Plumbing and Heating property. Relevant soil data and figures are provided in Appendix C-3.

Phase II Soil and Groundwater Investigation (February and May 2008)

Sixteen soil borings were advanced at the property between February and May 2008 to evaluate soil conditions near the Shell Oil UST system and the hydraulic hoists. Soil samples were collected from all borings and grab groundwater samples were collected from two borings for laboratory analysis. Samples were analyzed for petroleum hydrocarbons and BTEX. Petroleum hydrocarbons concentrations exceeded MTCA cleanup levels near the former Shell Oil USTs and at the northern hydraulic hoist. One soil sample was analyzed for lead, which was detected at 11 mg/kg. No analytes were detected in the groundwater samples (Pinnacle GeoSciences 2008).

Groundwater is encountered at approximately 12 feet bgs, in discontinuous lenses. Pinnacle GeoSciences speculated that the first significant aquifer is more than 50 feet beneath the property (Pinnacle GeoSciences 2008).

Remedial Excavations (December 2008)

The former Shell Oil UST area was excavated to remove petroleum contaminated soils. Approximately 200 tons of contaminated soil were removed from the property. Ten confirmation soil samples were collected and analyzed for petroleum hydrocarbons and BTEX. Two samples were analyzed for lead and three samples were analyzed for methyl tertiary butyl ether (MTBE). BTEX, MTBE, and lead were not detected in any of the samples. Petroleum hydrocarbon concentrations remaining in soil were below MTCA Method A cleanup levels (Pinnacle GeoSciences 2009).

The hydraulic hoist and floor sump were excavated and removed from the northern service bay in the building. Approximately 63 tons of contaminated soil were removed from the property through this excavation. Eight confirmation samples were collected and analyzed for petroleum hydrocarbons. One sample was analyzed for arsenic, cadmium, chromium, lead, and mercury. Gasoline-range hydrocarbons remained in soil below the MTCA Method A cleanup level. Chromium, lead, and mercury were detected at concentrations below MTCA cleanup levels (Pinnacle GeoSciences 2009).

A test pit was excavated next to the second hydraulic hoist. Two samples were collected from the test pit and analyzed for petroleum hydrocarbons. Gasoline-range hydrocarbons were detected below the MTCA Method A cleanup level of 30 mg/kg. No other analytes were detected (Pinnacle GeoSciences 2009).

The two 500-gallon USTs at the northwest corner of the building were removed. Approximately 30 tons of contaminated soil were removed from the excavation. Six confirmation soil samples were collected and analyzed for diesel- and heavy-oil range hydrocarbons. One sample was analyzed for chlorinated VOCs and cPAHs and one sample was analyzed for PCBs and metals. Petroleum hydrocarbon concentrations were below MTCA Method A cleanup levels. PCBs and cPAHs were not detected. One chlorinated VOC, 1,2-dichloroethane was detected at a concentration of 0.022 mg/kg. Arsenic was detected above the MTCA Method B cleanup level. Chromium, lead, and mercury were detected at concentrations below MTCA cleanup levels (Pinnacle GeoSciences 2009).

5.4.5 Potential for Sediment Recontamination

Stormwater

The current operations performed by Puget Sound Plumbing & Heating have not been evaluated by King County or Ecology for compliance with source control BMPs.

Groundwater Discharge

Previous environmental investigations and cleanups indicate that gasoline-range hydrocarbons and metals remain in soil beneath the property at low concentrations. Groundwater does not appear to be contaminated by petroleum hydrocarbons, but has not been tested for metals. Given the low concentrations of metals in soil, it is unlikely that metals have leached to groundwater. The property is approximately 3,200 feet southwest of the LDW (Pinnacle GeoSciences 2008). The potential for sediment recontamination via this pathway is very low.

5.4.6 Data Gaps

Information needed to assess the potential for sediment recontamination associated with current or historical operations at the property is listed below:

- A facility inspection is needed to determine if current operations at the property represent a potential source of contaminants to stormwater.

5.5 Jones Property

Facility Summary: Jones Property	
Tax Parcel No.	0985001305
Address	12441 20 th Avenue S, Burien 98168
Property Owner	Federal Home Loan Mortgage
Parcel Size	0.37 acre (16,284 sq ft)
Facility/Site ID	2491
SIC Code(s)	7538: General Automotive Repair Shops
EPA ID No.	NA
NPDES Permit No.	NA
UST/LUST ID No.	NA

The Jones Property is a residential property located on 20th Avenue S between S 124th and S 126th Streets in Burien. The property is surrounded by other residential properties. Roseberg Avenue S and several commercial properties are approximately 300 feet west of the property (Figure 10). One building is present on the property, a 960 sq ft single family home, built in 1930.

5.5.1 Current Operations

The Jones Property is currently a private residence. Although the property is located within the Hamm Creek SD basin, stormwater from the property appears to infiltrate the ground surface or is conveyed to the combined sewer system (SKCDPH 1997).

5.5.2 Historical Operations

For approximately one year in the early 1990s, the former property owner, William Jones, stored vehicles at the property for a local car garage (SKCDPH 1997).

5.5.3 Regulatory History

In May 1993, Ecology received a complaint regarding the vehicles stored at the property. Oil sheen had been observed in stormwater runoff from the Jones Property. Due to the slope of the Jones Property, stormwater runoff was conveyed to neighboring residential properties. Ecology attempted to inspect the property but was denied access by the property owner. However, Ecology confirmed that approximately 20 cars were stored on the property. Ecology referred the

property to King County zoning officials (Ecology 1993). Ecology added the property to the CSCSL in August 1994 (Ecology 1994).

In 1996, SKCDPH inspected the property. The property had been abandoned following the death of Mr. Jones. Two vehicles, tires, and solid waste debris were present at the property. Some of the solid waste at the northeastern portion of the property was described as an “orange mass” that contained nails, rope, and metal pieces embedded in a solid, brittle material. The SKCDPH inspector did not observe any evidence of stained soil. Oil sheen was not observed on puddles of standing water at the property (SKCDPH 1997).

5.5.4 Environmental Investigations and Cleanups

During the 1996 SKCDPH inspection, soil samples were collected; one sample was collected from the orange mass, one sample was collected from the soil surrounding the orange mass, and one sample was collected as a background sample. The samples were analyzed for metals. Arsenic, barium, chromium, and lead were detected in soil (SKCDPH 1997). The arsenic concentration exceeded the current MTCA Method B cleanup level; all other chemical concentrations were below MTCA cleanup levels and the draft soil-to-sediment screening levels (Appendix C-4). Based on these results, no further action was recommended for the property. The ISIS database indicates that Ecology issued an NFA for this site in December 1996.

5.5.5 Potential for Sediment Recontamination

The potential for sediment recontamination via this property is summarized below by transport pathway.

Stormwater

Stormwater at the Jones Property infiltrates the ground surface or is conveyed to the combined sewer system. The stormwater discharge pathway is incomplete.

Groundwater Discharge

Low concentrations of metals were detected in surface soil at the property. There are no indications that groundwater beneath the property is contaminated by metals. The potential for sediment recontamination via the groundwater discharge pathway is very low.

5.5.6 Data Gaps

No data gaps were identified for the Jones Property.

5.6 Aussie Repair & Machine Shop Properties

Facility Summary: Aussie Repair & Machine Shop Properties	
Tax Parcel No.	0985001075, 0985001094, 0985001205, 0985001210
Address	1075: 12441 Des Moines Memorial Drive, Burien 98168 1094: 12459 Des Moines Memorial Drive, Burien 98168

Facility Summary: Aussie Repair & Machine Shop Properties	
	1205: 12446 Des Moines Memorial Drive, Burien 98168 1210: 12454 Des Moines Memorial Drive, Burien 98168
Property Owner	1075: Singh Tarlochan & Gill Chamka 1094: Randy Van 1205: Hoefler Des Moines Way Properties LLC 1210: AW Elmer
Parcel Size	1075: 0.53 acre (23,035 sq ft) 1094: 0.43 acre (18,784 sq ft) 1205: 0.26 acre (11,201 sq ft) 1210: 0.25 acre (11,050 sq ft)
Facility/Site ID	2344: Mike's Aussie Machine Shop 7672: Joe's Aussie Repair 20863: Aussie Machine Inc. 54287319: Goldco 64135493: Phyllis E Armijo
Alternate Names	Mike's Aussie Machine Shop: Phyllis E Armijo, Armijo Property, Aussie Machine Shop, Boulevard Auto Parts, Armex, Pacific Truck Repair, Pacific Auto Truck Repair, Preet Auto Body Repair Goldco: Complete Auto Repair, Triple V Auto Repair, Boulevard Auto Service, Joe's Aussie Repair Aussie Machine Shop: Mike's Aussie Machine Shop Joe's Aussie Repair: Cascade Transmission Service
SIC Code(s)	5013: Motor Vehicle Supplies & New Parts 7538: General Automotive Repair Shops
EPA ID No.	WAD988523171: Mike's Aussie Machine Shop (inactive)
NPDES Permit No.	CNE WAR12635: Aussie Machine Shop (active)
UST/LUST ID No.	6967: Mike's Aussie Machine Shop 8142: Goldco

The facilities operated on the Aussie Repair & Machine Shop properties appear to have been historically inter-related facilities. The property known as former Mike's Aussie Machine Shop (parcel 1075) is located on the western side of Des Moines Memorial Drive. The former Goldco property is south of Mike's Aussie Machine Shop. The properties known as Aussie Machine Shop (parcel 1205) and Joe's Aussie Repair (parcel 1210) are on the eastern side of Des Moines Memorial Drive, across the street from the Mike's Aussie Machine Shop and Goldco properties. Glendale Heating & Air Conditioning is immediately south of Joe's Aussie Repair (Figure 10).

According to King County Tax Assessor Records the following buildings are present on the properties:

- A 3,850 sq ft auto parts retail warehouse, built in 1975, is present on parcel 1075 (former Mike's Aussie Machine Shop);
- A 1,016 sq ft service garage, built in 1920, and a 874 sq ft residence, built in 1942, are present on parcel 1094 (former Goldco);

- A 1,650 sq ft garage, built in 1949, and a 2,400 sq ft storage building, built in 1979, are present on parcel 1205 (Aussie Machine Shop); and
- A 3,807 light industrial building, built in 1950, is present on parcel 1210 (Joe's Aussie Repair).

5.6.1 Current Operations

Auto body repair, engine repair and maintenance, and other automotive maintenance activities are performed by the businesses operating at the Aussie Repair & Machine Shop properties.

Pacific Truck Repair and Preet Auto Body Repair currently operate at 12441 Des Moines Memorial Drive (parcel 1075). Triple V Auto Repair currently operates at 12459 Des Moines Memorial Drive (parcel 1094) (Ecology 2012b).

Aussie Machine has operated at 12446 Des Moines Memorial Drive (parcel 1205) since at least the early 1990s and is owned by the same company that operated Mike's Aussie Machine Shop on parcel 1075. The engine repair and maintenance operations performed by Mike's Aussie Machine Shop were moved to this facility in 1998 (SKCDPH 2001).

Joe's Aussie Repair currently operates at 12454 Des Moines Memorial Drive. The beginning date of operation is unknown.

5.6.2 Historical Operations

Mike's Aussie Machine Shop operated an auto repair facility and auto parts retail store at parcel 1075 from the late 1980s until 1998. The retail store was sold to Boulevard Auto Parts in October 1990 (Ecology 1991a) and operated under this name until 1998 (SKCDPH 2001). Armex, a window and door company, began operating at the property in 1998 (SKCDPH 2001). The end date of Armex's operations at the property is unknown.

Boulevard Auto Service, Goldco Building Maintenance, and Joe's Aussie Machine historically operated on parcel 1094. Four USTs were removed from the property in February 1991. Goldco purchased the property in March 1991. Joe's Aussie Machine was operating at the property in November 2000 (Ecology 1991d; SKCDPH 2001).

Historically, auto body repair and other automotive maintenance activities were performed by Aussie Automotive on parcel 1205. According to the State of Washington Business Licensing Service website, historical operations at the Joe's Aussie Repair property (parcel 1210) included Olsen Cabinet & Millwork and K&M Millwork. Cascade Transmission Service historically operated at this property.

5.6.3 Regulatory History

Mike's Aussie Machine Shop (Parcel 1075)

Ecology inspected the former Mike's Aussie Machine Shop on March 5, 1991, following a complaint that workers were dumping solvents onto the ground. During the inspection, Ecology

determined that there were minor housekeeping issues, but found no evidence of dumped solvents. The owner of Mike's Aussie Machine Shop informed Ecology that USTs had been removed from the property, including a waste collection tank that drained to an onsite septic tank and drainfield (Ecology 1991a; SKCDPH 2001). Two 500-gallon USTs were present along the southern side of the building (Geomatrix 2005); the date of the UST removal is unknown.

In February 1991, excavated soil associated with UST removals at the former Goldco property was disposed of on an unpaved section of parcel 1075 (SKCDPH 2001). In March 1991, Ecology notified Mike's Aussie Machine Shop and Boulevard Auto Parts that the property had been added to the CSCSL, due to suspected contamination of soil and groundwater by non-halogenated solvents, petroleum products, and metals associated with the excavated soil and potential contaminants in the septic drainfield (SKCDPH 2001). The property was listed as the Armijo Property (Ecology 1991b, 1991c). The Armijo family owned the property at the time it was added to the CSCSL.

In November 2000, SKCDPH performed an SHA at the property. SKCDPH assigned a site hazard ranking of 5 to the property, which represents the lowest relative risk to human health and the environment (SKCDPH 2000).

Pacific Truck Repair and Preet Auto Body Repair (Parcel 1075)

Ecology performed a source control inspection at Pacific Truck Repair and Preet Auto Body Repair on July 26, 2011. Ecology identified corrective actions related to proper storage of wastes and products, proper disposal of wastes, spill response procedures and housekeeping. Ecology determined that both facilities achieved compliance with the corrective actions on September 28, 2011 (Ecology 2012b).

Triple V Auto Repair (Parcel 1094)

Ecology performed a source control inspection at Triple V Auto Repair on July 19, 2011. Ecology identified corrective actions related to proper storage of waste and products, spill response, housekeeping, and washing procedures. Ecology determined that the facility achieved compliance with the corrective actions on September 28, 2011 (Ecology 2012b).

Aussie Machine (Parcel 1205)

Ecology performed a source control inspection at Aussie Machine on July 19, 2011. Ecology identified corrective actions related to proper storage of waste and products, spill response, and housekeeping. Ecology determined that the facility may require coverage under the Industrial Stormwater General Permit (ISGP) (Ecology 2012b). Ecology performed Revised Site Visit Program inspection at Aussie Machine on August 1, 2011. Aussie Machine obtained a CNE certificate on September 6, 2011. Ecology determined that the facility achieved compliance with the corrective actions on September 28, 2011 (Ecology 2012b).

Joe's Aussie Repair (Parcel 1210)

Ecology performed a source control inspection at Joe's Aussie Repair on July 19, 2011. Ecology identified corrective actions related to proper storage of waste and products, spill preparedness,

housekeeping and washing practices. In addition, Ecology requested that the facility clean the storm drain catch basins on the property. Ecology determined that the facility achieved compliance with the corrective actions on September 28, 2011 (Ecology 2012b).

5.6.4 Environmental Investigations and Cleanups

Three environmental investigations have been performed at the Aussie Repair & Machine Shop properties. Relevant soil data and figures are provided in Appendix C-5.

In February 1991, four USTs were removed from parcel 1094 (Ecology 1991d). Gasoline-range hydrocarbons were detected in soil at concentrations above current MTCA cleanup levels. The laboratory report indicates that diesel-range hydrocarbons were also present. Contaminated soil was removed from the property (Washington Wrecking 1990) and stockpiled on an unpaved area at parcel 1075 (SKCDPH 2001). The excavations were backfilled with clean soil (Washington Wrecking 1991). No additional information regarding the UST removals was available for review. Confirmation samples may not have been collected from the excavations.

As part of the November 2000 SHA, four soil samples were collected from parcel 1075 and analyzed for total petroleum hydrocarbons and total metals. Two soil samples collected near the reported solvent-dumping area and a rusted oil tank were also analyzed for VOCs. Heavy oil-range hydrocarbons, barium, cadmium, chromium, and lead were detected in soil (SKCDPH 2001). Heavy oil-range hydrocarbons were detected at 45,000 mg/kg in the sample collected near the rusted oil tank, which exceeds the current MTCA Method A cleanup level. Cadmium was detected at 2 mg/kg (equal to the current MTCA Method A cleanup level) in a sample collected behind the building. All other concentrations were below MTCA cleanup levels. All metals concentrations were below the draft soil-to-sediment screening levels.

In March 2005, eight soil borings were advanced on parcel 1075. Cadmium and lead were detected in soil at concentrations exceeding the MTCA Method A cleanup level behind the building. Remedial excavations were performed in June 2005 to address the cadmium and lead contamination behind the building and the heavy oil-range hydrocarbons contamination identified by the November 2000 SHA (near the rusted oil tank, which has since been removed). Both excavations extended to 3 feet bgs. Confirmation samples from the excavation to remove lead and cadmium contaminated soil indicated that all contaminated soil had been removed. One confirmation sample from the excavation to remove petroleum hydrocarbon-contaminated soil indicated the presence of heavy oil-range hydrocarbons above the MTCA Method A cleanup level. The area was re-excavated; confirmation samples indicated that all contaminated soil had been removed (Geomatrix 2005). Following the remedial excavations, Ecology determined that no further actions were needed to address soil contamination at the property (Ecology 2005).

5.6.5 Potential for Sediment Recontamination

The potential for sediment recontamination via this property is summarized below by transport pathway.

Stormwater

The facilities currently operating at the Aussie Repair & Machine Shop properties, Pacific Truck Repair and Preet Auto Body Repair (Parcel 1075), Triple V Auto Repair (Parcel 1094), Aussie Machine (Parcel 1205), and Joe's Aussie Repair (Parcel 1210), were inspected by Ecology in 2011. Ecology identified corrective actions to improve source control at all facilities. The facilities complied with Ecology's corrective actions. Provided that appropriate source control BMPs are maintained, the potential for sediment recontamination via the stormwater pathway is low.

Groundwater Discharge

Environmental investigations at parcels 1075 and 1094 indicated that soil was contaminated with petroleum hydrocarbons. Metals contamination was present on parcel 1075. Remedial excavations removed contaminated soil at parcel 1075 and Ecology determined that no further actions were necessary. Metals concentrations were below the current MTCA cleanup levels and the draft soil-to-sediment screening levels. Petroleum hydrocarbons are not COCs for LDW sediments. The potential for sediment recontamination via the groundwater discharge pathway is low.

5.6.6 Data Gaps

Pacific Truck Repair, Preet Auto Body Repair, Triple V Auto Repair, Aussie Machine, and Joe's Aussie Repair appear to maintain appropriate source control BMPs and have complied with corrective actions identified by Ecology. Therefore, no data gaps were identified for these properties.

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6.0 Summary

The Restoration Areas source control area is one of 24 source control areas identified as part of the overall cleanup process for the LDW Superfund Site. Ecology is the lead agency for source control for the LDW site. Source control is the process of finding and eliminating or reducing releases of contaminants to LDW sediments, to the extent practicable. The goal of source control is to prevent sediments from being recontaminated after cleanup has been undertaken. The plan is to identify and manage potential sources of sediment recontamination in coordination with sediment cleanups. Source control will be achieved by using existing administrative and legal authorities to perform inspections and require necessary source control actions.

6.1 COCs in Sediments Near the Restoration Areas Source Control Area

The following chemicals are considered to be COCs for the Restoration Areas source control area with regard to potential sediment recontamination (Section 2.2.2):

- Metals: arsenic, cadmium, and silver;
- PAHs: cPAHs, acenaphthene, benzo(g,h,i)perylene, dibenzo(a,h)anthracene, and fluorene;
- Butyl benzyl phthalate;
- Phenols: 2,4-dimethylphenol, 2-methylphenol, 4-methylphenol, and pentachlorophenol;
- Other SVOCs: 1,2,4-trichlorobenzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene, benzoic acid, benzyl alcohol, dibenzofuran, hexachlorobenzene, hexachlorobutadiene, and n-nitrosodiphenylamine;
- PCBs;
- Pesticides; and
- Dioxins/furans.

6.2 Potential Adjacent or Upland Sources of Contaminants

Within the Restoration Areas source control area, there are nine public outfalls, including six public storm drains, two ditches, and Hamm Creek (Figure 14).

Outfall No.	Outfall Name	Diameter/Material	Outfall Type	Outfall Owner
2205	Hamm Creek	Creek	Public	King County
2099	Duwamish Substation #1	6-inch CMP	Public	Seattle City Light
2098	Duwamish Substation #2	6-inch CMP	Public	Seattle City Light
2200	WSDOT	30-inch CMP	Public	WSDOT
2201	WSDOT	36-inch CMP	Public	WSDOT
NA	Ditch #1	NA	Public	

Outfall No.	Outfall Name	Diameter/Material	Outfall Type	Outfall Owner
NA	Ditch #2	NA	Public	
3842	NA	48-inch, unknown	Public	City of Tukwila
3921	NA	24-inch concrete	Public	City of Tukwila

CMP = corrugated metal pipe; WSDOT = Washington State Department of Transportation

6.2.1 Hamm Creek SD Basin

The Hamm Creek SD basin covers approximately 735 acres, spanning north-to-south from S 96th Street in Seattle to S 146th Street in SeaTac and from west-to-east from 12th Avenue S to Des Moines Memorial Drive S within unincorporated King County, from 12th Avenue S to 22nd Avenue S within Burien city limits and from 18th Avenue S to 29th Avenue S within SeaTac city limits (Figure 14). Land uses within the storm drain basin include industrial and commercial properties.

6.2.2 Adjacent and Upland Properties

The potential for sediment recontamination from the adjacent and upland properties is low. Properties located directly adjacent to the LDW that could affect sediments from RM 4.2 to 5.8 West include (Figures 5 and 6):

- Seattle City Light Power Substation
- Fremont Property
- Boeing Parking Lot Property
- Thales Avionics
- U.S. Postal Service Distribution Center

Upland properties and facilities within the Hamm Creek SD basin that could potentially affect sediments from RM 4.2 to 5.8 West include the following:

- Rainier Golf & Country Club
- Puget Sound Plumbing & Heating
- Connect Motorsports (former Chevron 306536)
- Chavez Auto Repair
- Elliott Paint Company Inc.

Readily available information regarding the outfalls and properties in the Restoration Areas source control area has been summarized in Sections 3.0 through 5.0 of this Data Gaps Report.

6.3 Potential Contaminant Migration Pathways

Potential sources of sediment recontamination associated with the Restoration Areas source control area include storm drains and discharges from adjacent and upland properties. Transport pathways

that could contribute to the recontamination of sediments within the source control area following remedial activities include direct discharges via outfalls, surface runoff (sheet flow) from adjacent properties, bank erosion, groundwater discharges, air deposition, and spills directly to the LDW or to the Hamm Creek SD system. These pathways are described further in Section 2.3.

6.4 Data Gaps

Data gaps have been identified for outfalls and adjacent and upland properties in Sections 3.0 through 5.0.

Data Gaps	Data Gaps Report Section
Hamm Creek Storm Drain Basin	
Additional information is needed from King County and the Cities of Burien and SeaTac to define the boundaries of the Hamm Creek SD basin in order to determine if the area to the east of Des Moines Memorial Drive between S 116 th Way and S 124 th Street and the area south of S 124 th Street should be included in or excluded from the Restoration Areas source control area.	3.1
Outfall 3842	
Additional information is needed to determine the drainage area associated with this outfall.	3.1
Adjacent Properties	
Seattle City Light Power Substation	
Additional information is needed from SCL to determine if operations at the property represent a potential source of contaminants to LDW sediments.	4.2
Review of the reports documenting the environmental investigations performed at the property is needed to evaluate the potential for sediment recontamination via the soil and groundwater pathway.	
Boeing Parking Lot Property	
A facility inspection is needed at the Boeing Parking Lot property to determine if current operations at the property, particularly equipment storage, represent a potential source of contaminants to stormwater.	4.4
USPS Distribution Seattle Distribution Center	
A facility map showing the storm drain system on the property is needed to assess the potential for sediment recontamination via the stormwater pathway.	4.5
Additional information regarding the neutralizing tank and the results from testing the sludge in the tank and waste/ink alcohol are needed to assess the potential for sediment recontamination via the spills pathway.	
Additional data are needed to assess the current concentrations of metals in groundwater beneath the property.	

Data Gaps	Data Gaps Report Section
Facilities in the Hamm Creek SD Basin	
Chavez Auto Repair, Connect Motorsports, Elliott Paint Company Inc., Puget Sound Plumbing & Heating	
A facility inspection is needed at these properties to determine if current operations represent a potential source of contaminants to stormwater.	Table 1 5.4
Rainier Golf & Country Club	
Additional information regarding the use of pesticides, insecticides, and fungicides at Rainier Golf & Country Club is needed to determine if golf course operations represent a potential source of contaminants to LDW sediments.	5.3

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Figures

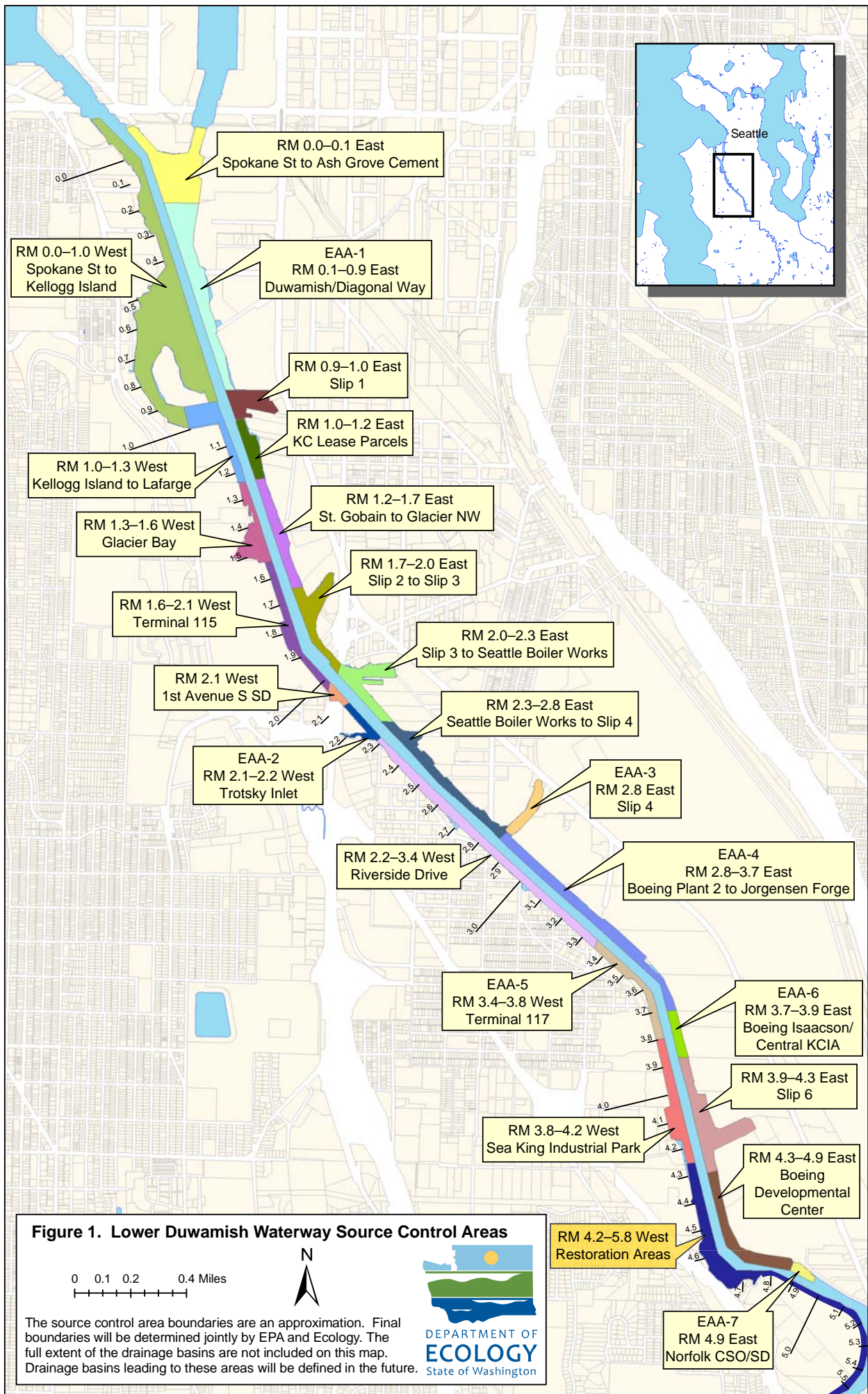


Figure 1. Lower Duwamish Waterway Source Control Areas

The source control area boundaries are an approximation. Final boundaries will be determined jointly by EPA and Ecology. The full extent of the drainage basins are not included on this map. Drainage basins leading to these areas will be defined in the future.

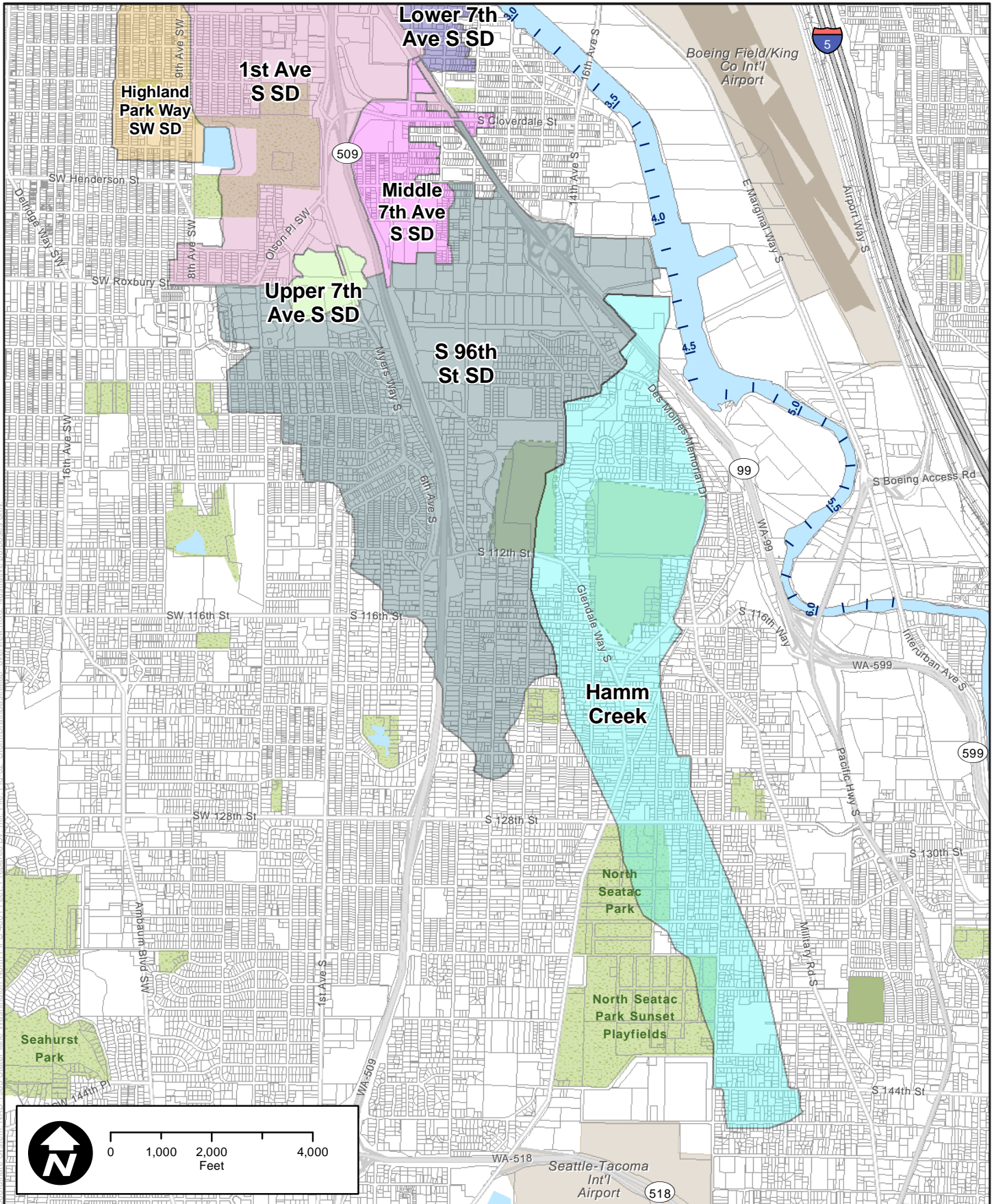
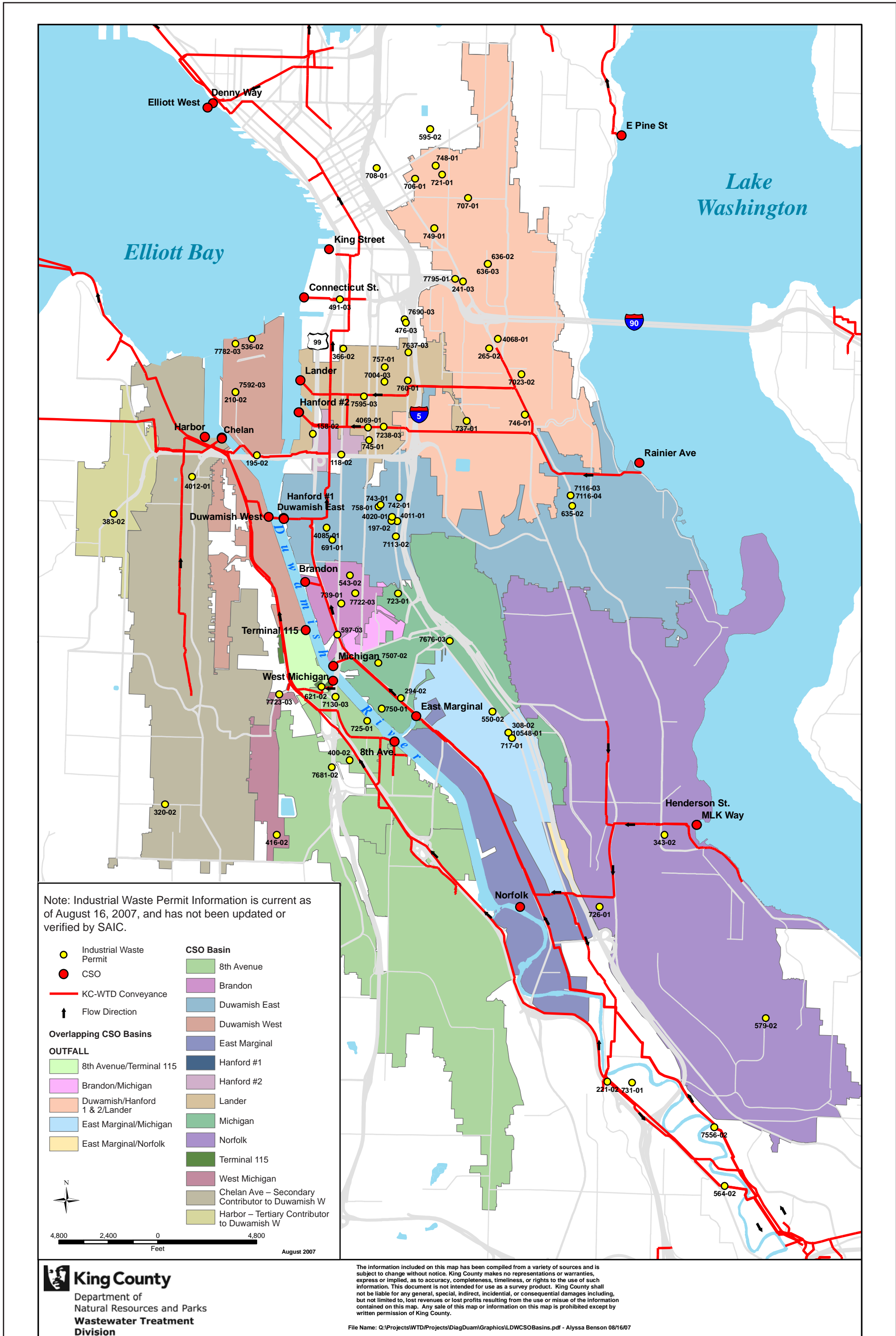


Figure 2. Lower Duwamish Waterway Storm Drain Basins Near the Restoration Areas Source Control Area





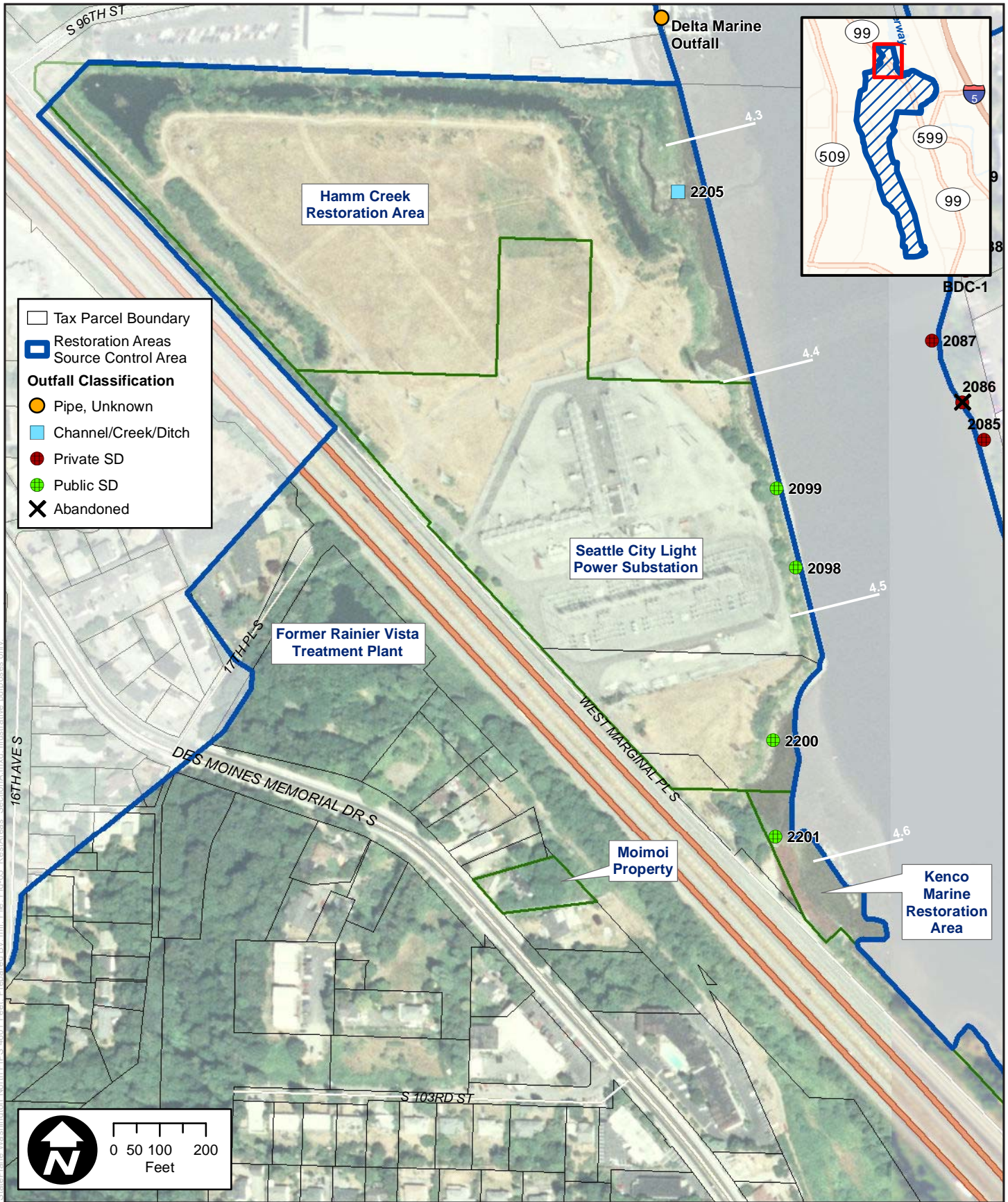


Figure 5. Restoration Areas Source Control Area (Section A)

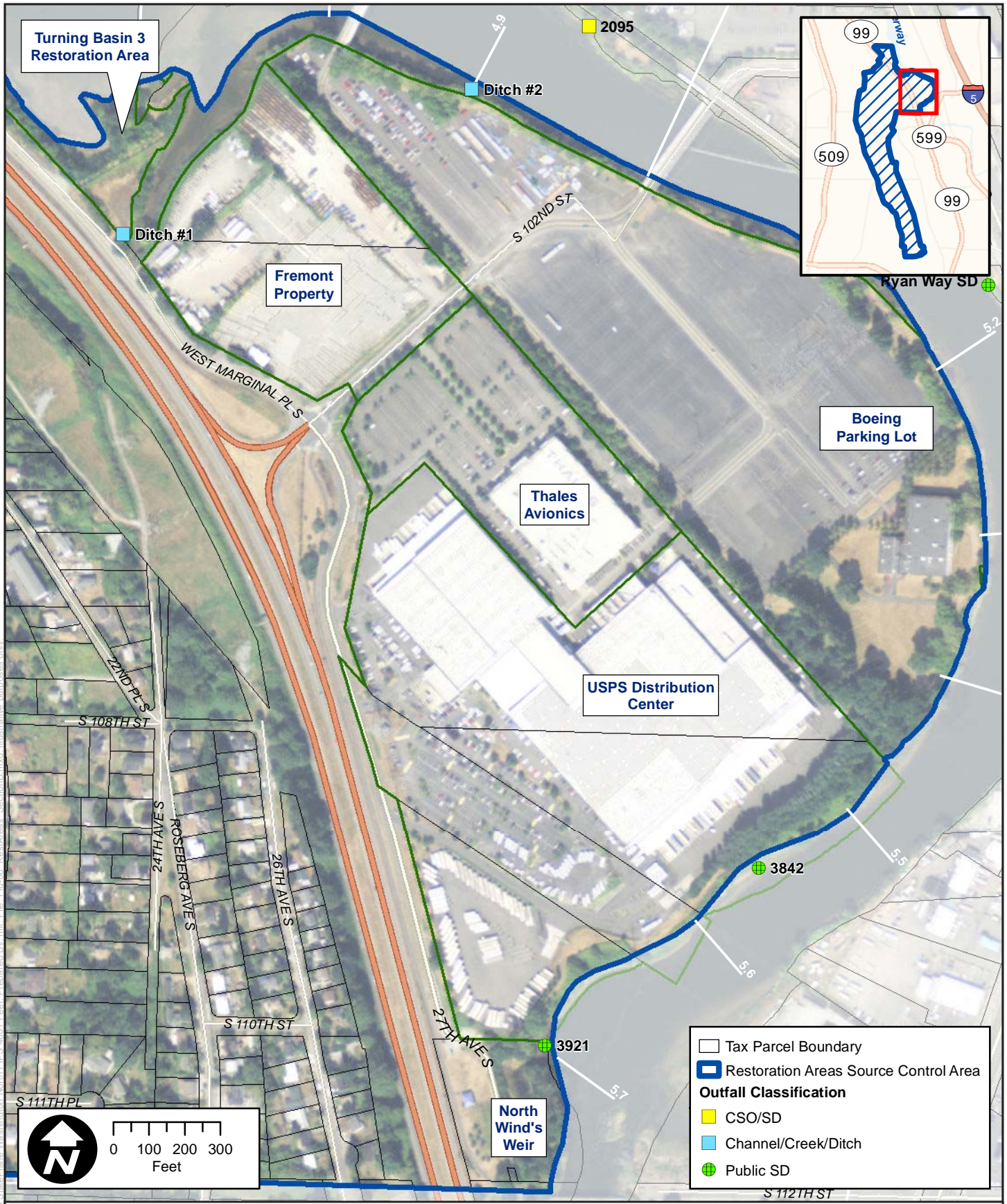


Figure 6. Restoration Areas Source Control Area (Section B)



Coordinate System: NAD_1983_StatePlane_Washington_North_FIPS_4601 Feet; Prepared By: mlf; File: Fig_06_RestAreas_SectionB.mxd; Illustrative purposes only.



Coordinate System: NAD_1983_StatePlane_Washington_North_FIPS_4601 Feet; Prepared By: mlr; File: Fig_07_RestAreas_SectionC.mxd; Illustrative purposes only.

Figure 7. Restoration Areas Source Control Area (Section C)





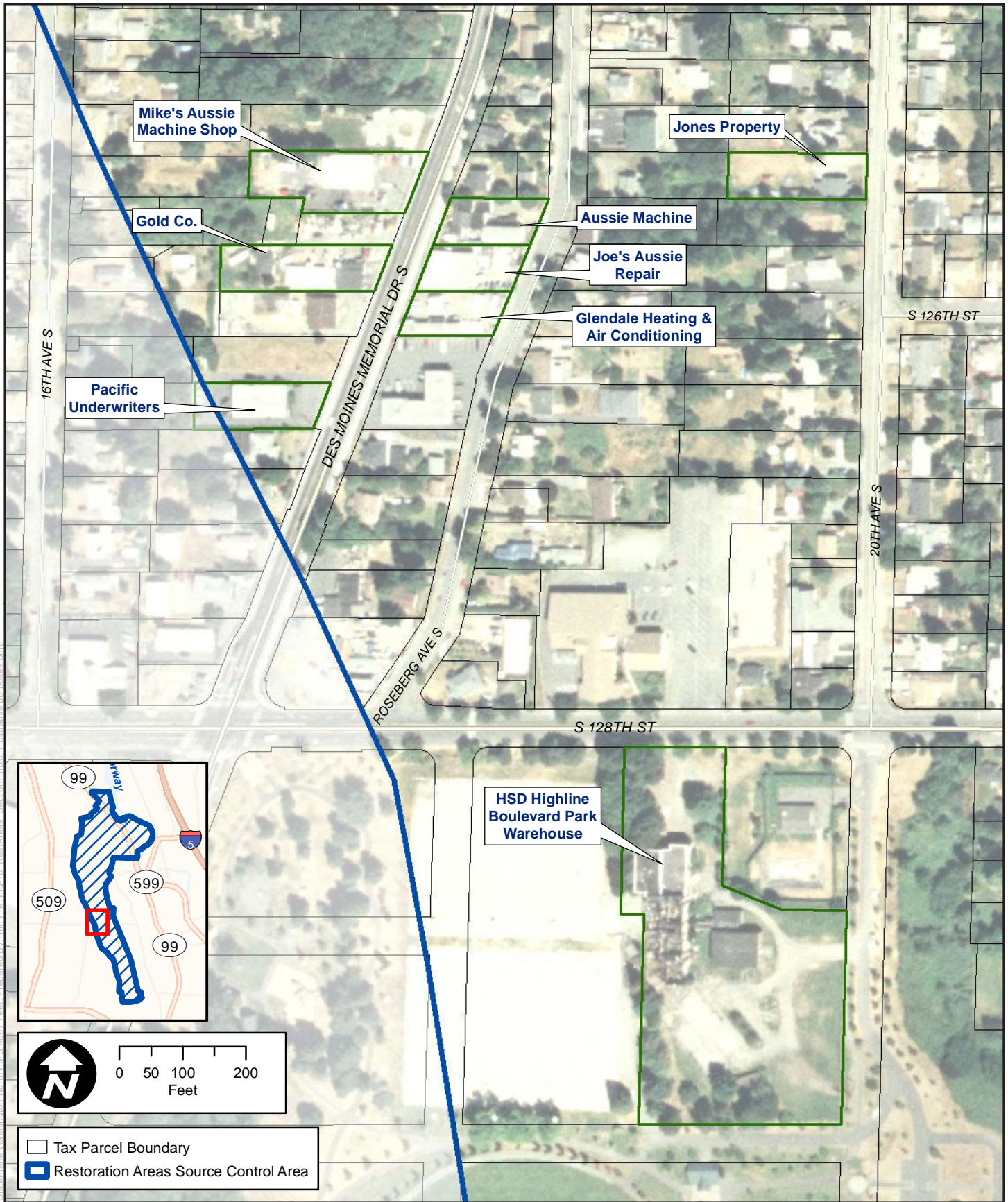
Figure 8. Restoration Areas Source Control Area (Section D)



Coordinate System: NAD_1983_StatePlane_Washington_North_FIPS_4601; Feet; Prepared By: mlf; File: Fic_08_RestAreas_SectionD.mxd; Illustrative purposes only.



Figure 9. Restoration Areas Source Control Area (Section E)

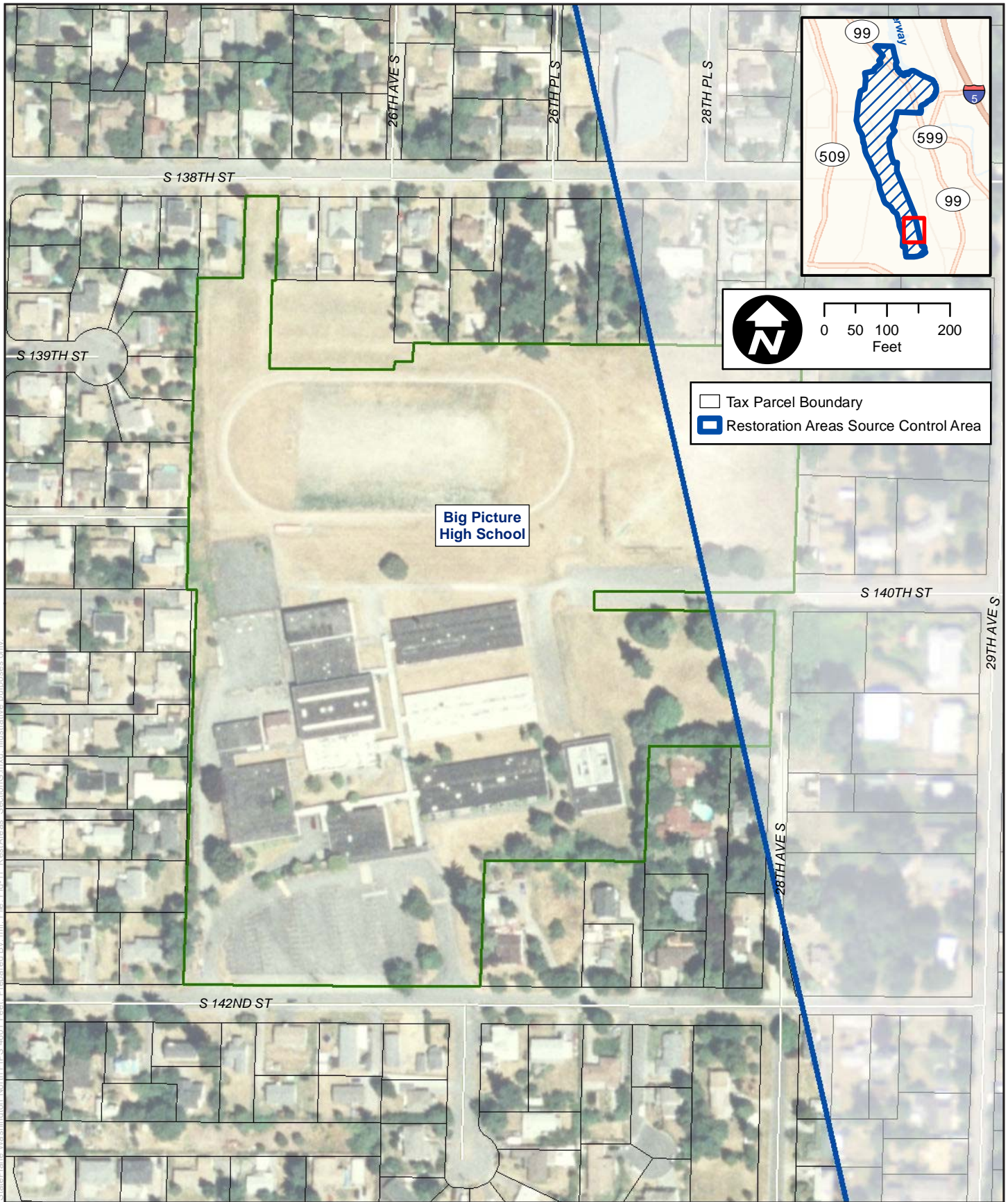


Coordinate System: NAD_1983; StatePlane: Washington North FIPS 4601; Feet; Prepared By: mlr; File: Fig_10_RestAreas_SectionF.mxd; Illustrative purposes only.



Figure 10. Restoration Areas Source Control Area (Section F)





Big Picture High School

- Tax Parcel Boundary
- Restoration Areas Source Control Area

Figure 11. Restoration Areas Source Control Area (Section G)



Coordinate System: NAD_1983_StatePlane_Washington_North_FIPS_4601; East; Prepared By: mlf; File: FIG-11_RestAreas_SectionG.mxd; Illustrative purposes only.

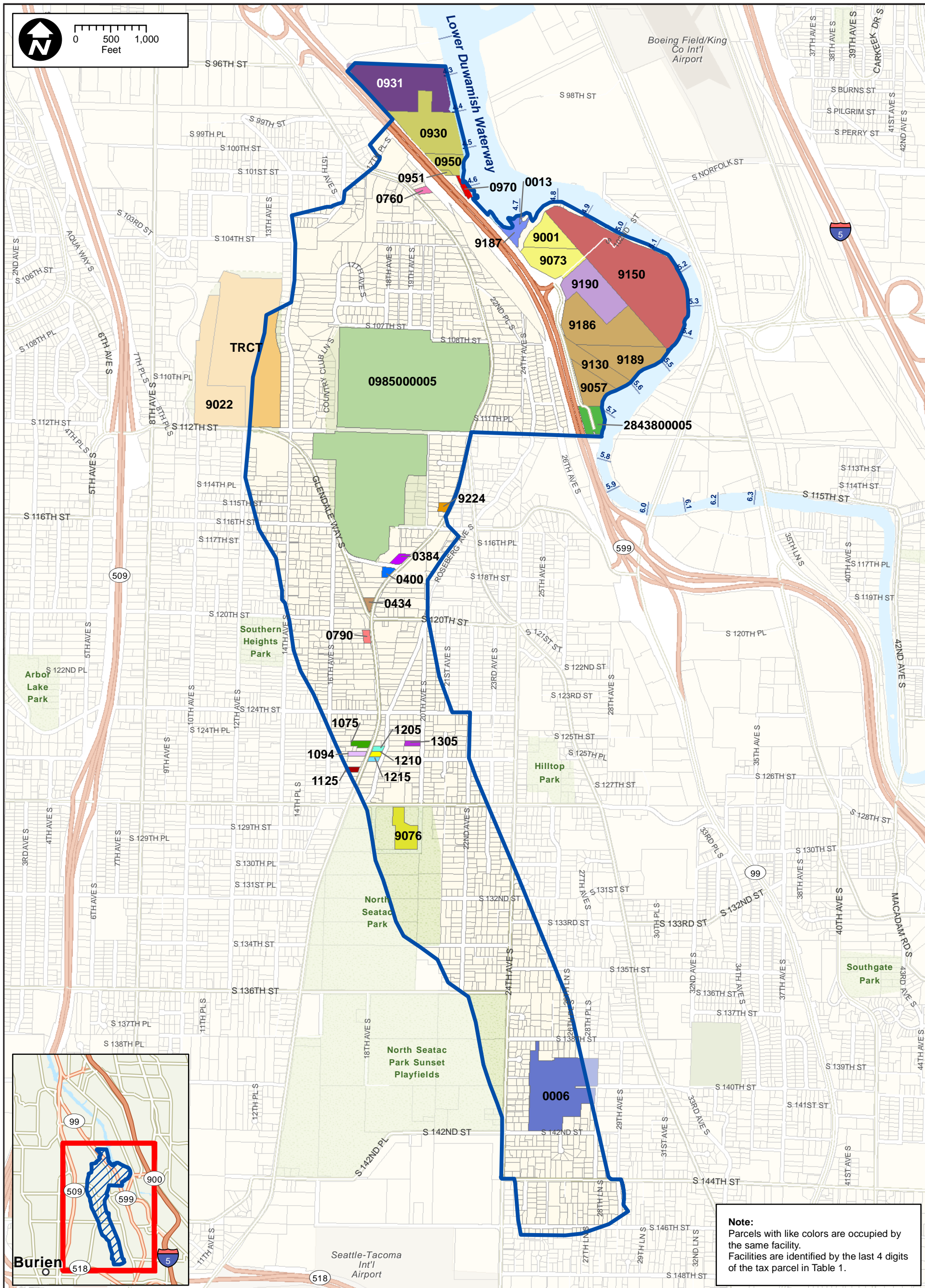


Figure 12. Tax Parcels for Restored Areas and Properties with Ecology Facility/Site Identification Numbers in the Restoration Areas Source Control Area

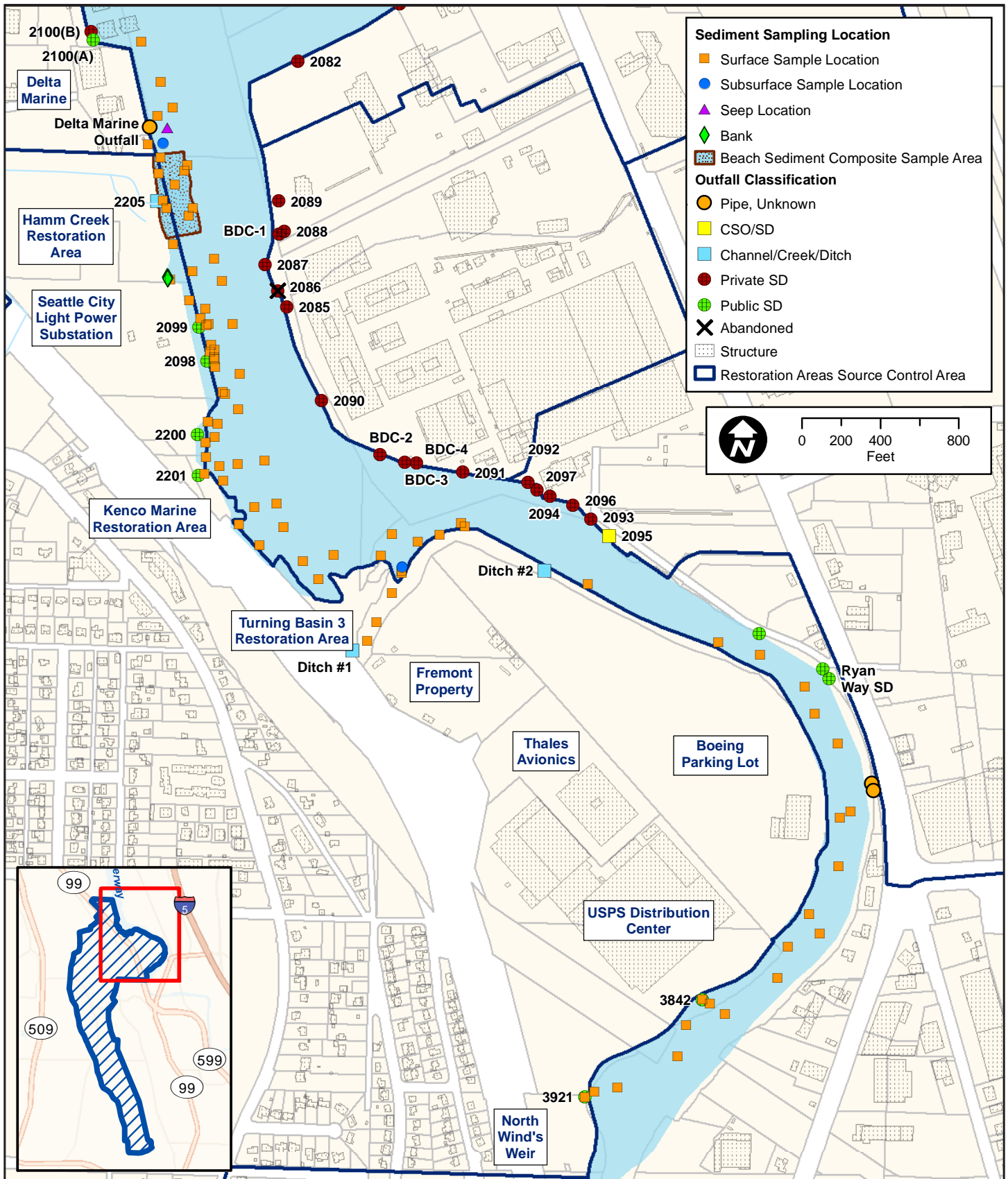


Figure 13a. Sediment, Seep, and Bank Soil Sample Locations Near the Restoration Areas Source Control Area

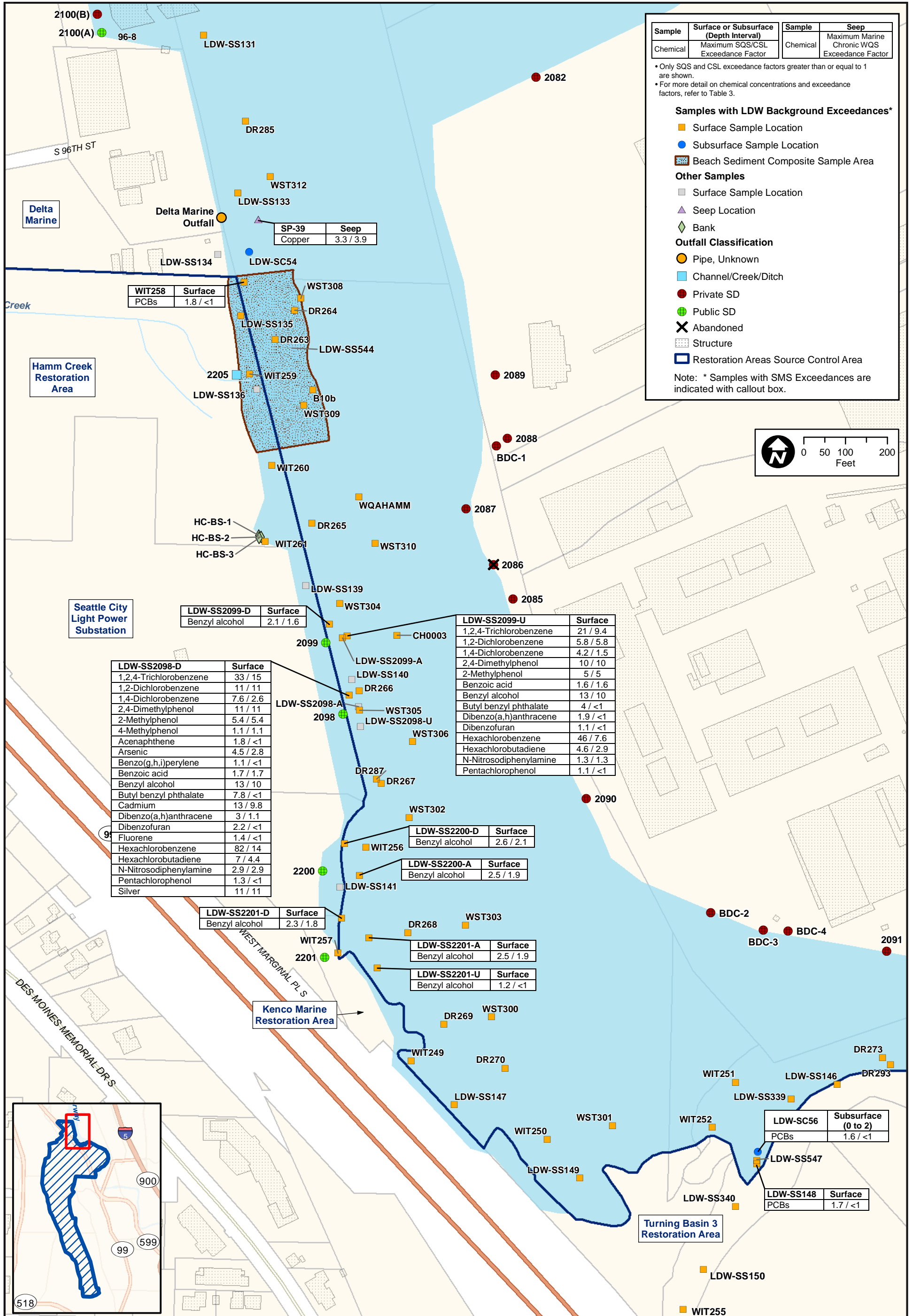


Figure 13b. Sediment, Seep, and Bank Soil Sample Locations Near the Restoration Areas Source Control Area (Northern Portion)

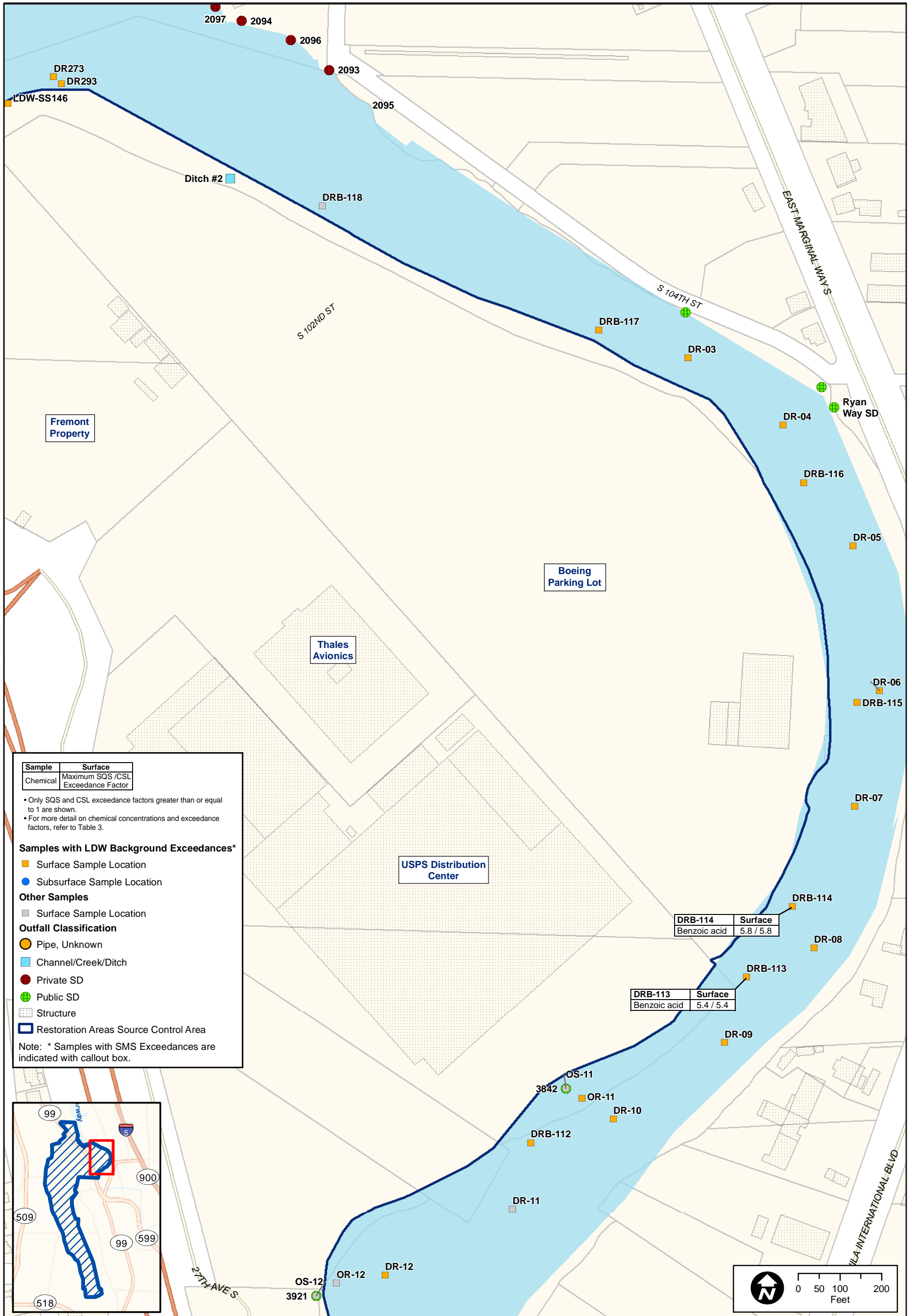


Figure 13c. Sediment, Seep, and Bank Soil Sample Locations Near the Restoration Areas Source Control Area (Southern Portion)

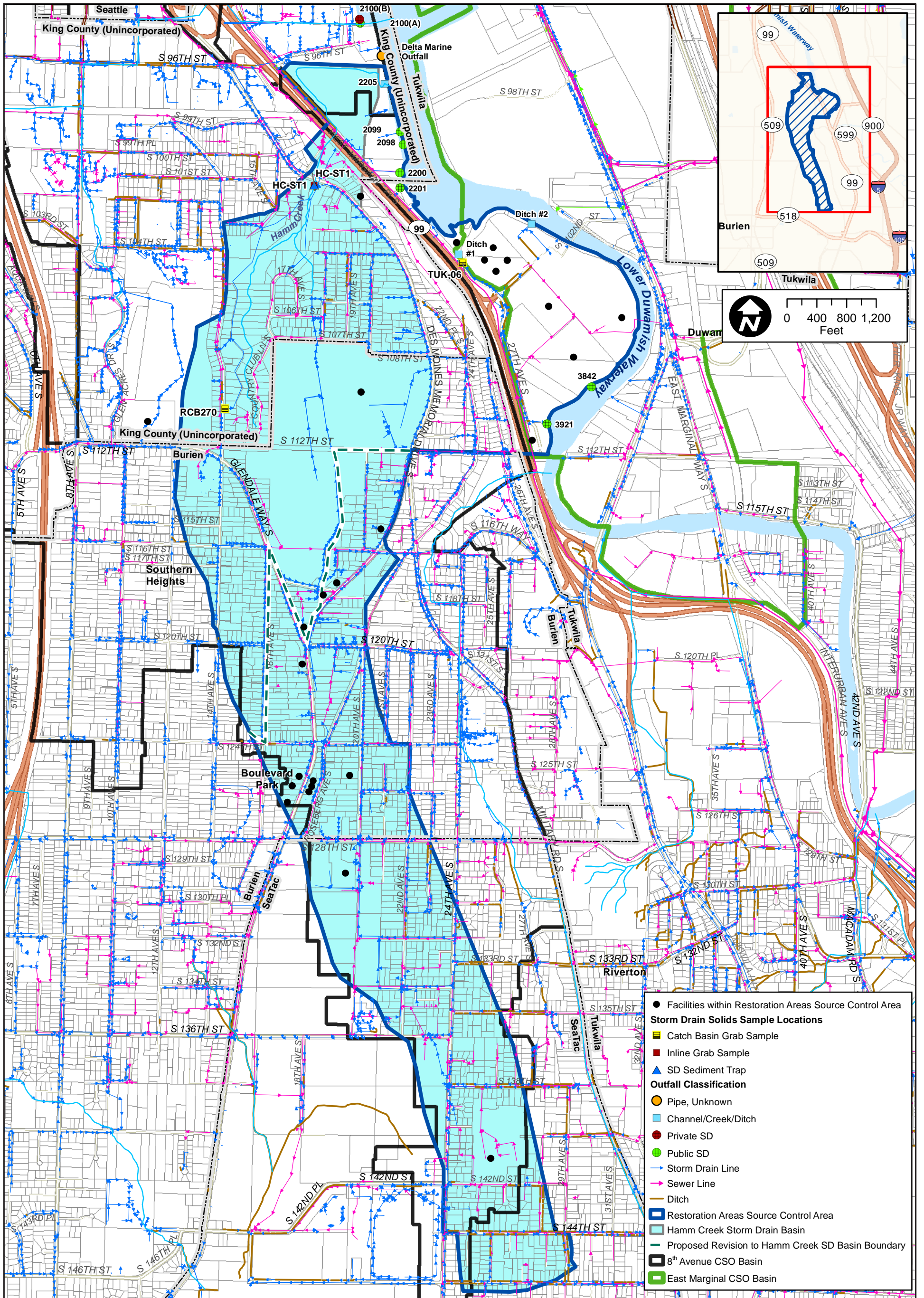
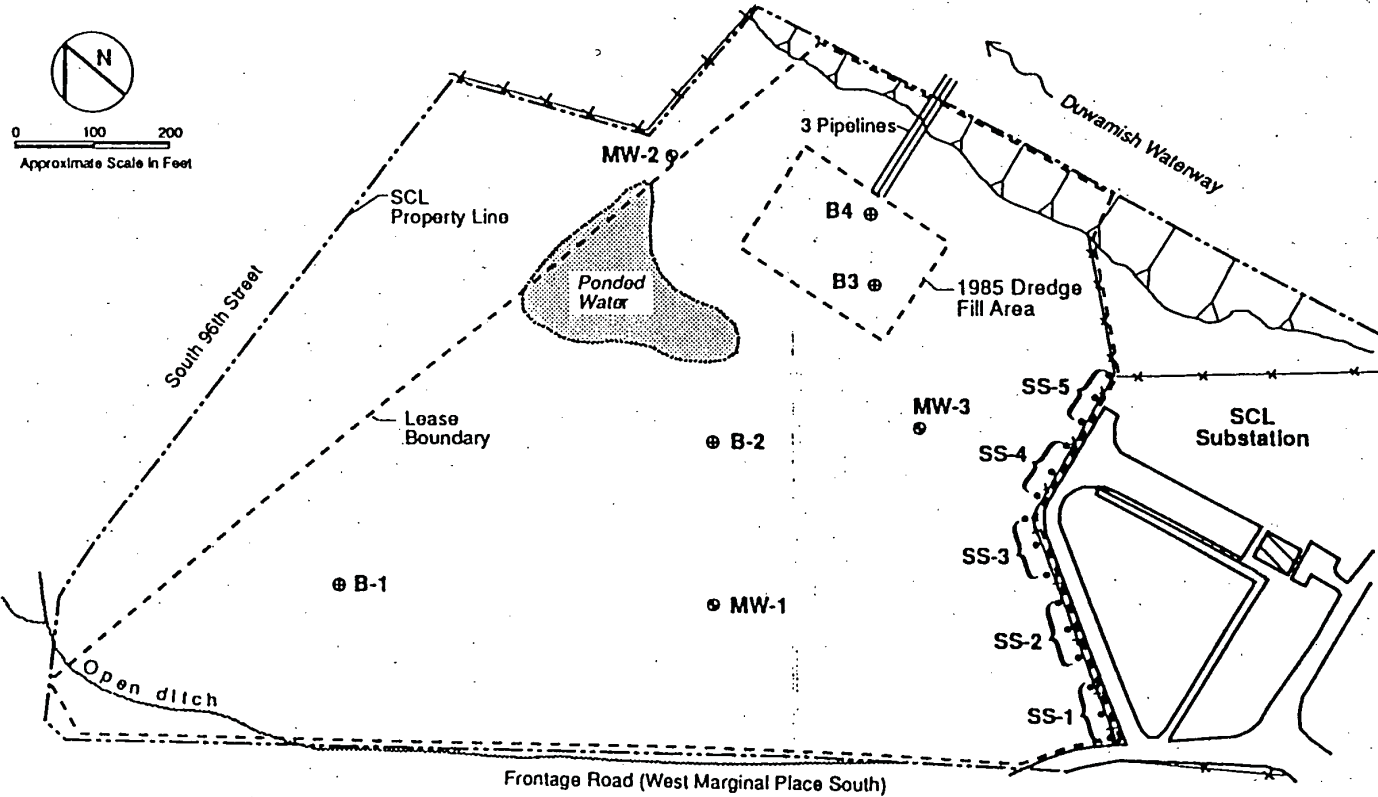


Figure 14. Storm Drain and Sanitary Sewer Lines in the Restoration Areas Source Control Area



Explanation	
⊕ B-1	Hand Auger boring location
● MW-1	Monitoring well location
• SS-1	Surface soil sample location

Site Map and Sampling Locations

FIGURE 2



JOB NUMBER: 3709-04-01

DATE: May 1990



Figure 15. Hamm Creek Restoration Area
1990 Environmental Investigation

Source: Weston 1990 [10188]



Tables

**Table 1
Facilities within the Restoration Areas Source Control Area**

Property Name	Facility Name	FSID	Alternate Names	Address	City	Zip	CSCSL	CNE	LUST	UST	VCP	NFA	EPA ID	Inspected	
Adjacent Properties															
Hamm Creek Restoration Area	Same	None		10108 West Marginal Place S	Seattle	98108									
Seattle City Light Power Substation	Same	None		10000 & 10030 West Marginal Place S	Seattle	98108									
Kenco Marine Restoration Area	Same	None		None											
Turning Basin 3 Restoration Area	Seattle City Light Duwamish TR	96665547		10100 & 10108 West Marginal Place S	Seattle	98168							●		
Fremont Property	Graham Trucking	54756774	AJF Trailer Leasing, Bidaboo Auctions, McKenna Construction, Pamco Construction	10108 West Marginal Place S	Seattle	98108							●		
	J&H Express Inc.	22587		10160 West Marginal Place S	Tukwila	98168									●
	RENU	20607		2876 S 102ND ST	Tukwila	98168									●
	Xtra Lease Seattle Branch	34451867		10180 West Marginal Place S	Seattle	98168								●	
Boeing Parking Lot Property	Same	None		2601 S 102nd Street	Seattle	98168									
Thales Avionics	Same	1453860	Riverfront Technical Park	2811 S 102nd Street	Tukwila	98168		●						●	
U.S. Postal Service Distribution Center	Boeing D&SG Oxbow Site	58835952	Boeing Military Planes Oxbo, Oxbow Corporate Park	10700 West Marginal Way S	Seattle	98168							●		
	USPS Distribution Center	76328824		10700 27 th Avenue S	Tukwila	98168									●
North Wind's Weir	North Wind's Weir Intertidal Restoration	5584231	Cecil Moses Park	112 th Street & Pacific Highway S	Tukwila	98168	●				●				
Hamm Creek Storm Drain Basin															
7-Eleven Food Store	7-Eleven Food Store 230723931L	43565732		11657 Des Moines Way S	Seattle	98168				●			●	●	
Aussie Repair & Machine Shop Properties	Aussie Machine	20863		12446 Des Moines Memorial Drive S	Burien	98168		●						●	
	Goldco	54287319	Boulevard Auto Service, Complete Auto Repair, Joe's Aussie Repair (former location)	12459 Des Moines Way S	Burien	98168			●	●				●	
	Triple V Auto Repair	None		12459 Des Moines Way S	Burien	98168									
	Joes Aussie Repair	7672	Cascade Transmission Service	12454 Des Moines Memorial Drive	Burien	98168									●
	Mike's Aussie Machine Shop	2334	Armex, Phyllis E Armijo, Armijo Property, Aussie Machine Shop,	12441 Des Moines Memorial Drive	Burien	98168	●				●		●	●	
	Pacific Auto Truck Repair	None	Boulevard Auto Parts, Pacific Truck Repair	12441 Des Moines Memorial Drive	Au	98168									
Preet Auto Body	None		12441 Des Moines Memorial Drive	Burien	98168										
Puget Sound Plumbing and Heating	Former Auto Site Automotive	53457146	Benson Property, Former Shell Service Station	11803 Des Moines Memorial Drive S	Seattle	98168			●	●	●		●		
Connect Motosports	Former Chevron 306536	66498524	Glendale Auto Repair, UNOCAL 6248	11845 Des Moines Way S	Seattle	98168			●	●			●		
Glen Acres Golf Course	Glen Acres Home Association	18369741		1000 S 112th Street	Seattle	98168			●	●					
Glendale Heating & Air Conditioning	Same	42321723	Glendale Oil Co Inc.	12462 Des Moines Way S	Seattle	98168				●			●	●	
HSD Highline Boulevard Park Warehouse	Same	82131388		12833 20th Avenue S	Burien	98168							●		
Jones Property	Same	2491		12441 20th Avenue S	Burien	98168	●					●			
Chavez Auto Repair	Joseph B Meder	13389849		12025 Des Moines Way S	Seattle	98168				●					
McCall Oil	McCall Oil Seattle Home Heating	7747737		11441 Des Moines Way	Burien	98168			●	●		●			
Moimoi Property	Same	95231135		10118 Des Moines Memorial Drive S	Seattle	98168	●								
Pacific Underwriters Corp	Same	9386197		12611 Des Moines Memorial Drive	Seattle	98168				●					
Rainier Golf & Country Club	Same	78215825		1856 S 112th Street	Seattle	98168			●	●					
Big Picture High School	US DOJ DEA Kent Training	73123528		2450 S 142nd Street	Burien	98168							●		
Elliott Paint Company, Inc.	Same	None		11206 & 11210 Des Moines Memorial Drive S	Seattle	98168									
India Pentacostal Assembly	Same	None		1443 S 99th Street	Seattle	98108								●	
Light House Ministries	Same	None		9820 Des Moines Memorial Drive S	Seattle	98108								●	
Park Des Moines Apartments	Same	None		10002 Des Moines Memorial Drive S	Seattle	98168								●	
Renacer Youth Treatment Center	Same	None		10001 Des Moines Memorial Drive S	Seattle	98168								●	
Sunrise Terrace Condominiums	Same	None		10455 Des Moines Memorial Drive S	Seattle	98168								●	
Vinh Apartments	Same	None		10007 17th Place S	Seattle	98168								●	

Bold type indicates the name of the facility operating at the parcel(s) as of May 2013.

FSID - Facility/Site Identification Number. The FSID listed in the table is for the facility listed under "Facility Name".

CSCSL - Contaminated and Suspected Contaminated Sites List

CNE - Conditional No Exposure

LUST - Leaking Underground Storage Tank

UST - Underground Storage Tank

VCP - Voluntary Cleanup Program

NFA - No Further Action

EPA - Environmental Protection Agency

**Table 2
Sediment Samples Collected Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Collection Depth (feet)	Analyses						Source	
				PCBs	SVOCs	Metals	Dioxins/ Furans	Organo- metals	Pesticides		VOCs
KC Water Quality Assessment	WQAHAMM	5/15/1997	Surface	●	●	●					Windward 2003
	WQAHAMM	5/20/1997		●	●	●					
	WQAHAMM	5/28/1997		●	●	●					
	WQAHAMM	6/3/1997		●	●	●					
NOAA Site Characterization	CH0003	10/9/1997	Surface	●							Windward 2003
	WIT249	10/1/1997		●							
	WIT250	10/1/1997		●							
	WIT251	9/29/1997		●							
	WIT252	9/29/1997		●							
	WIT255	9/29/1997		●							
	WIT256	11/13/1997		●							
	WIT257	10/2/1997		●							
	WIT258	10/1/1997		●							
	WIT259	10/1/1997		●							
	WIT260	10/1/1997		●							
	WIT261	10/1/1997		●							
	WST300	10/8/1997		●							
	WST301	10/20/1997		●							
	WST302	10/1/1997		●							
	WST303	10/23/1997		●							
	WST304	10/21/1997		●							
WST305	10/21/1997	●									
WST306	10/21/1997	●									
WST308	10/1/1997	●									
WST309	10/1/1997	●									
WST310	11/13/1997	●									
WST312	10/23/1997	●									
EPA Site Inspection	DR263	8/25/1998		●	●	●	●	●			Windward 2003
	DR264	8/26/1998		●	●	●					
	DR265	8/26/1998		●	●	●					
	DR266	8/26/1998		●	●	●		●	●		
	DR267	8/26/1998		●	●	●					
	DR268	8/26/1998		●	●	●					
	DR269	8/26/1998		●	●	●					
	DR270	8/26/1998		●	●	●		●			
	DR273	8/26/1998		●	●	●		●			
	DR285	8/25/1998		●	●	●					
	DR287	8/26/1998		●	●	●					
	DR293	9/14/1998		●	●	●					

**Table 2
Sediment Samples Collected Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Collection Depth (feet)	Analyses						Source	
				PCBs	SVOCs	Metals	Dioxins/ Furans	Organo- metals	Pesticides		VOCs
LDWRI-Benthic	B10b	8/19/2004	Surface	●	●	●		●	●		Windward 2010b
LDWRI-Surface Sediment Round 1	LDW-SS134	1/24/2005	Surface	●	●	●			●		Windward 2010b
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Surface	●	●	●	●	●	●		Windward 2010b
	LDW-SS133	3/9/2005		●	●	●		●	●		
	LDW-SS135	3/15/2005		●	●	●					
	LDW-SS136	3/15/2005		●	●	●					
	LDW-SS139	3/9/2005		●	●	●					
	LDW-SS140	3/8/2005		●	●	●			●		
	LDW-SS141	3/15/2005		●	●	●					
	LDW-SS146	3/9/2005		●	●	●					
	LDW-SS147	3/9/2005		●	●	●					
	LDW-SS148	3/9/2005		●	●	●					
	LDW-SS149	3/9/2005		●	●	●					
LDW-SS150	3/9/2005	●	●	●			●				
LDW Subsurface Sediment 2006	LDW-SC54	2/23/2006	0-2	●	●	●			●		Windward 2007
	LDW-SC54	2/23/2006	2-4	●	●	●			●		
	LDW-SC56	2/7/2006	0-2	●	●	●					
	LDW-SC56	2/7/2006	2-4	●	●	●					
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Surface	●	●	●					Windward 2010b
	LDW-SS340	10/3/2006		●	●	●					
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Surface	●	●	●	●				E&E 2009
	DR-04	4/28/2008		●	●	●	●				
	DR-05	4/28/2008		●	●	●	●				
	DR-06	4/28/2008		●	●	●	●				
	DR-07	4/28/2008		●	●	●	●				
	DR-09	4/28/2008		●	●	●	●				
	DR-10	4/28/2008		●	●	●	●				
	DR-11	4/28/2008		●	●	●	●				
	DR-12	4/28/2008		●	●	●	●				
	DRB-112	5/9/2008		●	● ^a	● ^b	●				
	DRB-113	5/9/2008		●	●	●	●				
	DRB-114	5/9/2008		●	●	●	●				
	DRB-115	5/9/2008		●	● ^a	● ^b	●				
	DRB-116	5/9/2008		●	● ^a	● ^b	●				
	DRB-117	5/9/2008		●	● ^a	● ^b	●				
	DRB-118 ^c	5/9/2008		●	●	●	●				
	OR-11	May-08		●	●	●	●				
OR-12	May-08	●	●	●	●						
OS-11	5/2/2008										
OS-12 ^c	5/2/2008										

Table 2
Sediment Samples Collected Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Collection Depth (feet)	Analyses						Source	
				PCBs	SVOCs	Metals	Dioxins/ Furans	Organo- metals	Pesticides		VOCs
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	Surface	●	● ^a	● ^b	●				Windward 2010a
	LDW-SS547	1/11/2010	Surface	●	● ^a	● ^b	●				
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Surface	●	●	●	●		●		SAIC 2011
	LDW-SS2098-D	3/4/2011		●	●	●			●		
	LDW-SS2098-U	3/4/2011		●	●	●			●		
	LDW-SS2099-A	3/3/2011		●	●	●	●		●		
	LDW-SS2099-D	3/3/2011		●	●	●			●		
	LDW-SS2099-U	3/3/2011		●	●	●			●		
	LDW-SS2200-A	3/18/2011		●	●	●	●		●		
	LDW-SS2200-D	3/18/2011		●	●	●			●		
	LDW-SS2201-A	3/18/2011		●	●	●	●		●		
	LDW-SS2201-D	3/18/2011		●	●	●			●		
LDW-SS2201-U	3/18/2011	●	●	●			●				

a - PAHs were the only SVOCs analyzed in this sample.

b -Arsenic was the only metal analyzed in this sample.

c- This sample was analyzed only for total organic carbon and grain size.

PCBs - Polychlorinated biphenyls

SVOCs - Semi-volatile organic compounds

VOCs - Volatile organic compounds

Table 3
Chemicals Detected Above Screening Levels in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Metals											
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Arsenic	2.58E+02	1.16		57	93	mg/kg DW	4.5	2.8
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Cadmium	6.57E+01	1.16		5.1	6.7	mg/kg DW	13	9.8
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Silver	6.42E+01	1.16		6.1	6.1	mg/kg DW	11	11
PAHs											
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Acenaphthene	3.34E-01	1.16	2.88E+01	16	57	mg/kg OC	1.8	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Benzo(g,h,i)perylene	4.06E-01	1.16	3.50E+01	31	78	mg/kg OC	1.1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Dibenzo(a,h)anthracene	4.24E-01	1.16	3.66E+01	12	33	mg/kg OC	3.0	1.1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Dibenzo(a,h)anthracene	4.21E-01	1.86	2.26E+01	12	33	mg/kg OC	1.9	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Fluorene	3.78E-01	1.16	3.26E+01	23	79	mg/kg OC	1.4	<1
Phthalates											
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Butyl benzyl phthalate	4.46E-01 J	1.16	3.84E+01	4.9	64	mg/kg OC	7.8	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Butyl benzyl phthalate	3.67E-01	1.86	1.97E+01	4.9	64	mg/kg OC	4.0	<1
Phenols											
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	2,4-Dimethylphenol	3.05E-01	1.16	2.63E+01	29	29	ug/kg DW	11	11
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	2,4-Dimethylphenol	2.92E-01	1.86	1.57E+01	29	29	ug/kg DW	10	10
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	2-Methylphenol	3.38E-01	1.16	2.91E+01	63	63	ug/kg DW	5.4	5.4
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	2-Methylphenol	3.14E-01	1.86	1.69E+01	63	63	ug/kg DW	5.0	5.0
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	4-Methylphenol	7.09E-01	1.16	6.11E+01	670	670	ug/kg DW	1.1	1.1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Pentachlorophenol	4.81E-01	1.16	4.15E+01	360	690	ug/kg DW	1.3	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Pentachlorophenol	3.99E-01	1.86	2.15E+01	360	690	ug/kg DW	1.1	<1
Other SVOCs											
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	1,2,4-Trichlorobenzene	3.17E-01	1.86	1.70E+01	0.81	1.8	mg/kg OC	21	9.5
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	1,2,4-Trichlorobenzene	3.10E-01	1.16	2.67E+01	0.81	1.8	mg/kg OC	33	15
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	1,2-Dichlorobenzene	2.90E-01	1.16	2.50E+01	2.3	2.3	mg/kg OC	11	11
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	1,2-Dichlorobenzene	2.48E-01	1.86	1.33E+01	2.3	2.3	mg/kg OC	5.8	5.8
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	1,4-Dichlorobenzene	2.74E-01	1.16	2.36E+01	3.1	9	mg/kg OC	7.6	2.6
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	1,4-Dichlorobenzene	2.45E-01	1.86	1.32E+01	3.1	9	mg/kg OC	4.2	1.5
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Benzoic acid	3.80E+00 JB	2.18	1.74E+02	650	650	ug/kg DW	5.8	5.8
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Benzoic acid	3.50E+00 JB	1.9	1.84E+02	650	650	ug/kg DW	5.4	5.4
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Benzoic acid	1.10E+00	1.16	9.48E+01	650	650	ug/kg DW	1.7	1.7
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Benzoic acid	1.04E+00	1.86	5.59E+01	650	650	ug/kg DW	1.6	1.6
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Benzyl alcohol	7.52E-01	1.86	4.04E+01	57	73	ug/kg DW	13	10
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Benzyl alcohol	7.48E-01	1.16	6.45E+01	57	73	ug/kg DW	13	10
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Benzyl alcohol	1.50E-01	2.38	6.30E+00	57	73	ug/kg DW	2.6	2.1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Benzyl alcohol	1.40E-01	1.7	8.24E+00	57	73	ug/kg DW	2.5	1.9
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Benzyl alcohol	1.40E-01	2.33	6.01E+00	57	73	ug/kg DW	2.5	1.9
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Benzyl alcohol	1.30E-01	2.58	5.04E+00	57	73	ug/kg DW	2.3	1.8

Table 3
Chemicals Detected Above Screening Levels in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	Benzyl alcohol	1.20E-01 J	4.01	2.99E+00	57	73	ug/kg DW	2.1	1.6
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Benzyl alcohol	6.90E-02	1.69	4.08E+00	57	73	ug/kg DW	1.2	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Dibenzofuran	3.86E-01	1.16	3.33E+01	15	58	mg/kg OC	2.2	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Dibenzofuran	2.97E-01	1.86	1.60E+01	15	58	mg/kg OC	1.1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Hexachlorobenzene	3.63E-01	1.16	3.13E+01	0.38	2.3	mg/kg OC	82	14
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Hexachlorobenzene	3.27E-01	1.86	1.76E+01	0.38	2.3	mg/kg OC	46	7.6
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Hexachlorobutadiene	3.35E-01	1.86	1.80E+01	3.9	6.2	mg/kg OC	4.6	2.9
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Hexachlorobutadiene	3.15E-01	1.16	2.72E+01	3.9	6.2	mg/kg OC	7.0	4.4
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	N-Nitrosodiphenylamine	3.71E-01	1.16	3.20E+01	11	11	mg/kg OC	2.9	2.9
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	N-Nitrosodiphenylamine	2.73E-01	1.86	1.47E+01	11	11	mg/kg OC	1.3	1.3
PCBs											
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	PCBs (total calc'd)	5.20E-01	2.55	2.04E+01	12	65	mg/kg OC	1.7	<1
NOAA Site Characterization	WIT258	10/1/1997	PCBs (total-calc'd)	3.40E-01	1.59	2.14E+01	12	65	mg/kg OC	1.8	<1

mg/kg - Milligram per kilogram
ug/kg - Microgram per kilogram
DW - Dry weight
TOC - Total Organic Carbon
OC - Organic carbon normalized
SQS - SMS Sediment Quality Standard
CSL - SMS Cleanup Screening Level

SMS - Sediment Management Standard (Washington Administrative Code 173-204)
PAHs - Polycyclic aromatic hydrocarbons
SVOCs - Semi-volatile organic compounds
PCB - Polychlorinated biphenyl
J - Estimated value between the method detection limit and the laboratory reporting limit
LDW - Lower Duwamish Waterway
TEQ - Toxic Equivalency

Table presents detected chemicals only.

Exceedance factors are the ratio of the detected concentrations to the CSL or SQS; exceedance factors are shown only if they are greater than 1.

Sampling events are listed in Table 2.

**Table 4
Chemicals Detected Above Screening Levels in Storm Drain Samples
Restoration Areas Source Control Area**

Source	Location ID	Collection Date	Grab Type	Parameter	Result	SQS/ LAET	CSL/ 2LAET	Units	Exceedance Factors	
									SQS	CSL
SPU 2011	RCB270	8/23/2011	ROW Catch Basin	bis(2-Ethylhexyl)phthalate	1.5	1.3	1.9	mg/kg	1.2	<1
SPU 2011	RCB270	8/23/2011	ROW Catch Basin	Dimethyl phthalate	0.097	0.071	0.16	mg/kg	1.4	<1

Source	Location ID	Collection Date	Grab Type	Parameter	Result	LDW Background	LDW RAL	Units	Exceedance Factors	
									Background	RAL
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Arsenic ²	10	7	57	mg/kg	1.4	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Carcinogenic PAHs (calc'd)	0.11	0.009	1	mg/kg	12	<1
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	Carcinogenic PAHs (calc'd)	0.08	0.009	1	mg/kg	9.3	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Carcinogenic PAHs (calc'd)	0.02	0.009	1	mg/kg	2.3	<1
SPU 2010	HC-ST1	11/4/2010	Inline	Carcinogenic PAHs (calc'd)	0.02	0.009	1	mg/kg	2.0	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Total Dioxin/Furan TEQ	2.99 J	2	25	ng/kg	1.5	<1

mg/kg - milligram per kilogram

ng/kg - nanogram per kilogram

SQS - Sediment Quality Standard

CSL - Cleanup Screening Level

LAET - lowest apparent effects threshold

2LAET - second lowest apparent effects threshold

RAL - Remedial Action Level

PAH - polycyclic aromatic hydrocarbon

TEQ - toxic equivalence quotient

J - Estimated value between the method detection limit and the laboratory reporting limit

Table presents chemicals that exceed a screening level in at least one sample.

Exceedance factors are the ratio of the detected concentration to the SQS or CSL; exceedance factors are shown only if they are greater than 1.

All concentrations are as dry weight concentrations. Dry weight concentrations for non-polar organics were compared to the LAET and 2LAET values, which are functionally equivalent to the SQS and CSL.


**Table 5
Chemicals Detected in Creek Sediment
Hamm Creek South Fork (1993)**

Source	Sample Date	Sample Location	Chemical	Conc'n (mg/kg DW)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level ^b (mg/kg)	MTCA Exceedance Factor	Soil-to-Sediment Screening Level Exceedance Factor
Herrera 1994	4/5/1993	Station 7	Acenaphthene	6.1 J	4,800	0.06	<1	102
Herrera 1994	4/5/1993	Station 7	Anthracene	1.3	24,000	1.2	<1	1.1
Herrera 1994	4/5/1993	Station 7	Arsenic	4.6	0.67	590	6.9	<1
Herrera 1994	4/5/1993	Station 7	Benzo(a)anthracene	1.3	1.4	0.27	<1	4.8
Herrera 1994	4/5/1993	Station 7	Benzo(a)pyrene	1.6	0.14	0.21	11	7.6
Herrera 1994	4/5/1993	Station 7	Benzo(b)fluoranthene	1.5	1.4	0.45	1.1	3.3
Herrera 1994	4/5/1993	Station 7	Benzo(g,h,i)perylene	1.1		0.078		14
Herrera 1994	4/5/1993	Station 7	Benzo(k)fluoranthene	0.94	14	0.45	<1	2.1
Herrera 1994	4/5/1993	Station 7	Beryllium	0.2				
Herrera 1994	4/5/1993	Station 7	Cadmium	0.6	2	1.7	<1	<1
Herrera 1994	4/5/1993	Station 7	Carcinogenic PAHs	9.64				
Herrera 1994	4/5/1993	Station 7	Chromium	27.8	3,200	270	<1	<1
Herrera 1994	4/5/1993	Station 7	Chrysene	1.8	140	0.46	<1	3.9
Herrera 1994	4/5/1993	Station 7	Copper	16	3,200	39	<1	<1
Herrera 1994	4/5/1993	Station 7	Dibenzo(a,h)anthracene	1.2	0.14	0.033	8.6	36
Herrera 1994	4/5/1993	Station 7	Fluoranthene	8.1	3,200	1.2	<1	6.8
Herrera 1994	4/5/1993	Station 7	Fluorene	1.3	3,200	0.081	<1	16
Herrera 1994	4/5/1993	Station 7	HPAHs, total	22.74				
Herrera 1994	4/5/1993	Station 7	Indeno(1,2,3-cd)pyrene	1.3	1.4	0.088	<1	15
Herrera 1994	4/5/1993	Station 7	Lead	24.3	250	67	<1	<1
Herrera 1994	4/5/1993	Station 7	LPAHs, total	14.42 L				
Herrera 1994	4/5/1993	Station 7	Nickel	48				
Herrera 1994	4/5/1993	Station 7	Phenanthrene	4.2		0.49		8.6
Herrera 1994	4/5/1993	Station 7	Pyrene	3.9	2,400	1.4	<1	2.8
Herrera 1994	4/5/1993	Station 7	Total petroleum hydrocarbons	370	2,000		<1	
Herrera 1994	4/5/1993	Station 7	Zinc	92.7	24,000	38	<1	2.4

**Table 5
Chemicals Detected in Creek Sediment
Hamm Creek South Fork (1993)**

Source	Sample Date	Sample Location	Chemical	Conc'n (mg/kg DW)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level ^b (mg/kg)	MTCA Exceedance Factor	Soil-to-Sediment Screening Level Exceedance Factor
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mg/kg - milligrams per kilogram
 DW - dry weight
 MTCA - Model Toxics Control Act

J - Estimated value
 L - Undetected values (added as analytical detection limits) included in sum.
 Concentration exceeds MTCA Cleanup Level and/or Soil-to-Sediment Screening Level

a - The lower of MTCA Method A or B cleanup levels was selected, from CLARC database.
 b - Based on CSL. Where two screening levels are listed for a single chemical, the higher screening levels are for soil samples collected from the vadose zone and the lower screening levels are for soil samples collected from the saturated zone (SAIC 2006).
 Table presents detected chemicals only.
 Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or Soil-to-Sediment Screening Level.

**Table 6
Properties, Facilities, and Parcel Numbers
Within the Restoration Areas Source Control Area**

Facility Name	Parcel	Address	City	Zip	Acreage (acres, sq ft)	Buildings (year built, sq ft)	Property Owner
Adjacent Properties							
Hamm Creek Restoration Area	5624200931	10108 West Marginal Place S	Seattle	98108	16.45 acres (716,740 sq ft)	None	Seattle City Light
Seattle City Light Power Substation	5624200930	10000 West Marginal Place S	Seattle	98108	12.09 acres (526,443 sq ft)	Substation (1955, 1,500 sq ft)	Seattle City Light
	5624200950	10030 West Marginal Place S	Seattle	98108	2.69 acres (116,960 sq ft)	None	
	5624200951	None	Seattle	98108	0.21 acre (9,000 sq ft)	None	
Kenco Marine Restoration Area	5624200970	None	Seattle	98108	0.83 acre (36,025 sq ft)	None	Muckleshoot Indian Tribe
Turning Basin 3 Restoration Area	0003400013	None	Seattle	98168	1.28 acres (55,568 sq ft)	None	Port of Seattle
	0423049187	None	Seattle	98168	2.0 acres (86,967 sq ft)	None	
Fremont Property	0423049001	None	Tukwila	98168	4.58 acres (199,396 sq ft)	None	Mellon Desimone Trust
	0423049073	10180 West Marginal Place S	Tukwila	98108	6.28 acres (273,348 sq ft)	Storage Shed (1950, 4,800 sq ft)	
Boeing Parking Lot Property	0423049150	2601 S 102nd Street	Seattle	98168	34.53 acres (1,504,264 sq ft)	Fitness Center (1987, 52,500 sq ft)	Desimone Trust Oxbow 2601
Thales Avionics	0423049190	2811 S 102nd Street	Tukwila	98168	9.07 acres (395,016 sq ft)	Office Building (1987, 175,068 sq ft)	Mellon Trust of WA
U.S. Postal Service Distribution Center	0423049057	10800 West Marginal Place S	Tukwila	98168	9057: 4.79 acres (208,640 sq ft)	None	Desimone Irrevocable Trust
	0423049130	None	Tukwila	98168	18.89 acres (822,899 sq ft)	None	Seattle City Light
	0423049186	10600 West Marginal Way S	Tukwila	98168	14.12 acres (615, 107 sq ft)	Light Industrial Warehouse (1987, 325,000 sq ft)	Mellon Trust of WA
	0423049189	10600 West Marginal Way S	Tukwila	98168	8.93 acres (388,805 sq ft)		Desimone Irrevocable Trust
North Wind's Weir	2843800005	112 th Street and Pacific Highway S	Tukwila	98168	2.64 acres (115,135 sq ft)	None	King County Parks
Upland Properties							
7-Eleven Food Store	0985000384	11657 Des Moines Way S	Seattle	98168	0.56 acre (24,589 sq ft)	Convenience Market (1980, 2,560 sq ft)	The Southland Corporation

**Table 6
Properties, Facilities, and Parcel Numbers
Within the Restoration Areas Source Control Area**

Facility Name	Parcel	Address	City	Zip	Acreage (acres, sq ft)	Buildings (year built, sq ft)	Property Owner
Aussie Repair & Machine Shop Properties	0985001075	12441 Des Moines Memorial Drive	Burien	98168	0.53 acre (23,035 sq ft)	Auto Parts Retail/Warehouse (1975, 3,850 sq ft)	Singh Tarlochan & Gill Chamka
	0985001094	12459 Des Moines WAY S	Burien	98168	0.43 acre (18,784 sq ft)	Garage Service Repair (1920, 1,016 sq ft) Residence (1942, 874 sq ft)	Randy Van
	0985001205	12446 Des Moines Memorial Drive	Burien	98168	0.26 acre (11,201 sq ft)	Garage (1949, 1,650 sq ft) Storage Bldg (1979, 2,400 sq ft)	Hoefler Des Moines Way Properties LLC
	0985001210	12454 Des Moines Memorial Drive	Burien	98168	0.25 acre (11,050 sq ft)	Light Industrial Bldg (1950, 3,807 sq ft)	AW Elmer
Big Picture High School	3598600006	2450 S 142nd Street	Seattle	98168	19.22 acres (837,308 sqft)	Elementary School (1975, 2,840 sq ft) Elementary School (1966, 6,900 sq ft) Elementary School/Auditorium (1960, 76,922 sq ft)	Highline School District 401
Chavez Auto Repair	0985000790	12025 Des Moines Way S	Seattle	98168	0.43 acre (18,830 sq ft)	Garage (1960, 1,032 sq ft)	Joseph B Medler, Jr.
Connect Motorsports	0985000434	11845 Des Moines Way S	Seattle	98166	17,300 sq.ft., 0.40 acres	Service Garage (1970, 1,624 sq ft)	Balbir Shingh & Jaswinder K Gill
Elliott Paint Company, Inc.	0923049070	11206 Des Moines Memorial Drive S	Seattle	98168	0.39 acre (16,870 sq ft)	Apartments (1967, 7,256 sq ft)	EPM LLC
	0923049205	11210 Des Moines Memorial Drive S	Seattle	98168	0.19 acre (8,327 sq ft)	Garage (1946, 5,128 sq ft)	
Glen Acres Golf Course	0523049022	1000 S 112th Street	Seattle	98168	13.39 acres (583,268 sq ft)	Clubhouse (1926, 19,088 sq ft) Equipment Shop Bldg (1963, 1,798 sq ft) Retail Store (1968, 2,683 sq ft) Restroom Bldg (1963, 693 sq ft)	Glen Acres Homeowners Association
Glendale Heating & Air Conditioning	0985001215	12462 Des Moines Way S	Seattle	98168	0.25 acre (10,866 sq ft)	Office/Garage (1957, 1,670 sq ft)	Glendale Oil Co Inc.
HSD Highline Boulevard Park Warehouse	1623049076	12833 20th Avenue S	Seattle	98168	3.96 acres (172,349 sq ft)	None	Highline School District 401
India Pentacostal Assembly	5624200452	1443 S 99th Street	Seattle	98108	0.33 acre (14,200 sq ft)	Office Building (1990, 3,160 sq.ft.)	India Pentecostal Assembly of Seattle
Jones Property	0985001305	12441 20th Avenue S	Burien	98168	0.37 acre (16,284 sq ft)	Single Family Residence (1930, 960 sq ft)	Federal Home Loan Mortgage
Light House Ministries	5624200431	9820 Des Moines Memorial Drive S	Seattle	98108	0.62 acre (27,000 sq ft)	Vacant	Union Gospel Mission

**Table 6
Properties, Facilities, and Parcel Numbers
Within the Restoration Areas Source Control Area**

Facility Name	Parcel	Address	City	Zip	Acreage (acres, sq ft)	Buildings (year built, sq ft)	Property Owner
McCall Oil Seattle Home Heating	0923049224	11441 Des Moines Way S	Burien	98168	0.40 acre (17,415 sq ft)	Vacant	James H & Pamela Thomson
Moimoi Property	5624200760	10118 Des Moines Memorial Drive S	Seattle	98168	0.44 acre (18,974 sq ft)	Vacant	10118 LLC
Pacific Underwriters Corp	0985001125	12611 Des Moines Memorial Drive S	Seattle	98168	0.34 acre (14,595 sq ft)	Office Building (1979, 4,730 sq ft)	Pacific Underwriters Corp
Park Des Moines Apartments	5624200436	10002 Des Moines Memorial Drive S	Seattle	98168	0.70 acre (30,580 sq ft)	Apartment Bldg (1967, 23,700 sq ft)	Yaota Teung
Puget Sound Plumbing and Heating	0985000400	11803 Des Moines Memorial Drive S	Seattle	98168	0.48 acre (10,752 sq ft)	Garage, Service Repair (1962, 2,500 sq ft)	WD Buckingham Properties LLC
Rainier Golf & Country Club	0985000005	1856 S 112th Street	Seattle	98168	107.86 acres (4,698,279 sq ft)	Clubhouse/Storage (1923, 25,984 sq ft) Snack Bar (1965, 1,385 sq ft) Maintenance Bldg (2008, 8,480 sq ft) Locker Rooms/Storage (1957, 1,422 sq ft) Cart Barn (1986, 2,000 sq ft) Maintenance/Storage Bldg (2008, 2,240 sq ft)	Rainier Golf & Country Club
Renacer Youth Treatment Center	5624200415	10001 Des Moines Memorial Drive S	Seattle	98168	2.80 acre (121,912 sq ft)	Rehab Center (1980, 17,200 sq ft)	Sea-Mar Community Health Center
Sunrise Terrace Condominiums	8123900000	10455 Des Moines Memorial Drive S	Seattle	98168	3.64 acres (158,730 sq ft)	3 Condominium Bldgs (1969, sq ft not listed)	Sunrise Terrace Condominiums
Vinh Apartments	5624200774	10007 17th Place S	Seattle	98168	0.28 acre (12,308 sq ft)	Apartment Bldg (1967, 5,576 sq ft)	& Thi Ngu Mychi

**Table 7
Chemicals Detected in Soil
Hamm Creek Restoration Area**

Source	Sample Date	Sample Location	Sample Depth (ft bgs)	Chemical	Soil Conc'n (mg/kg)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level ^b (mg/kg)	MTCA Exceedance Factor	Soil-to-Sediment Screening Level Exceedance Factor
Weston 1990	Apr-90	B-3		Arsenic	8.7	0.67	590	13	<1
Weston 1990	Apr-90	MW-3		Arsenic	7.5	0.67	590	11	<1
Weston 1990	Apr-90	B-1		Arsenic	5.9	0.67	590	8.8	<1
Weston 1990	Apr-90	B-4		Arsenic	5.6	0.67	590	8.4	<1
Weston 1990	Apr-90	MW-1		Arsenic	4.9	0.67	590	7.3	<1
Weston 1990	Apr-90	B-2		Arsenic	4.8	0.67	590	7.2	<1
Weston 1990	Apr-90	MW-2		Arsenic	4.2	0.67	590	6.3	<1
Weston 1990	Apr-90	MW-2		Barium	76.0				
Weston 1990	Apr-90	B-3		Barium	74.0				
Weston 1990	Apr-90	MW-3		Barium	67.0				
Weston 1990	Apr-90	B-1		Barium	56.0				
Weston 1990	Apr-90	MW-1		Barium	50.0				
Weston 1990	Apr-90	B-4		Barium	50.0				
Weston 1990	Apr-90	B-2		Barium	42.0				
Weston 1990	Apr-90	MW-3		Benzo(a)pyrene	0.34	0.14	0.21	2.4	1.6
Weston 1990	Apr-90	B-3		Benzo(a)pyrene	0.25	0.14	0.21	1.8	1.2
Weston 1990	Apr-90	B-1		Benzo(a)pyrene	0.14	0.14	0.21	1.0	<1
Weston 1990	Apr-90	MW-1		Benzo(a)pyrene	0.096	0.14	0.21	<1	<1
Weston 1990	Apr-90	B-2		Bis(2-ethylhexyl)phthalate	0.49	71	0.078	<1	6.3
Weston 1990	Apr-90	B-3		Bis(2-ethylhexyl)phthalate	0.44	71	0.078	<1	5.6
Weston 1990	Apr-90	B-1		Bis(2-ethylhexyl)phthalate	0.39	71	0.078	<1	5.0
Weston 1990	Apr-90	B-4		Bis(2-ethylhexyl)phthalate	0.4	71	0.078	<1	4.9
Weston 1990	Apr-90	MW-3		Bis(2-ethylhexyl)phthalate	0.34	71	0.078	<1	4.4
Weston 1990	Apr-90	MW-2		Bis(2-ethylhexyl)phthalate	0.16	71	0.078	<1	2.1
Weston 1990	Apr-90	MW-1		Bis(2-ethylhexyl)phthalate	0.087	71	0.078	<1	1.1
Weston 1990	Apr-90	MW-2		Cadmium	1.3	2	1.7	<1	<1
Weston 1990	Apr-90	MW-3		Cadmium	1.3	2	1.7	<1	<1
Weston 1990	Apr-90	B-3		Cadmium	1.2	2	1.7	<1	<1
Weston 1990	Apr-90	MW-1		Cadmium	1.0	2	1.7	<1	<1
Weston 1990	Apr-90	B-1		Cadmium	0.9	2	1.7	<1	<1
Weston 1990	Apr-90	B-4		Cadmium	0.6	2	1.7	<1	<1
Weston 1990	Apr-90	MW-3		Chromium	20.0		270		<1
Weston 1990	Apr-90	B-3		Chromium	18.0		270		<1
Weston 1990	Apr-90	MW-2		Chromium	17.0		270		<1
Weston 1990	Apr-90	MW-1		Chromium	15.0		270		<1

**Table 7
Chemicals Detected in Soil
Hamm Creek Restoration Area**

Source	Sample Date	Sample Location	Sample Depth (ft bgs)	Chemical	Soil Conc'n (mg/kg)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level ^b (mg/kg)	MTCA Exceedance Factor	Soil-to-Sediment Screening Level Exceedance Factor
Weston 1990	Apr-90	B-1		Chromium	13.0		270		<1
Weston 1990	Apr-90	B-4		Chromium	13.0		270		<1
Weston 1990	Apr-90	B-2		Chromium	12.0		270		<1
Weston 1990	Apr-90	MW-2		Copper	36.0	3,200	39	<1	<1
Weston 1990	Apr-90	MW-3		Copper	36.0	3,200	39	<1	<1
Weston 1990	Apr-90	B-3		Copper	33.0	3,200	39	<1	<1
Weston 1990	Apr-90	MW-1		Copper	20.0	3,200	39	<1	<1
Weston 1990	Apr-90	B-4		Copper	20.0	3,200	39	<1	<1
Weston 1990	Apr-90	B-1		Copper	19.0	3,200	39	<1	<1
Weston 1990	Apr-90	B-2		Copper	17.0	3,200	39	<1	<1
Weston 1990	Apr-90	B-3		Fluoranthene	0.07	3,200	1.2	<1	<1
Weston 1990	Apr-90	B-3		Lead	17.0	250	67	<1	<1
Weston 1990	Apr-90	MW-3		Lead	16.0	250	67	<1	<1
Weston 1990	Apr-90	MW-2		Lead	15.0	250	67	<1	<1
Weston 1990	Apr-90	B-1		Lead	8.7	250	67	<1	<1
Weston 1990	Apr-90	B-2		Lead	8.2	250	67	<1	<1
Weston 1990	Apr-90	B-4		Lead	7.4	250	67	<1	<1
Weston 1990	Apr-90	MW-1		Lead	7.3	250	67	<1	<1
Weston 1990	Apr-90	B-3		Mercury	0.51	2	0.03	<1	17
Weston 1990	Apr-90	MW-3		Mercury	0.24	2	0.03	<1	8.0
Weston 1990	Apr-90	B-3		Pyrene	0.09	2,400	1.4	<1	<1
Weston 1990	Apr-90	MW-3		Selenium	0.8				
Weston 1990	Apr-90	B-1		Selenium	0.5				
Weston 1990	Apr-90	B-3		Tin	50.0				

ft bgs - Feet below ground surface

mg/kg - Milligrams per kilogram

MTCA - Model Toxics Control Act

CSL - Cleanup Screening Level from Washington Sediment Management Standards

Concentration exceeds MTCA Cleanup Level and/or Soil-to-Sediment Screening Level

a - The lower of MTCA Method A or B cleanup levels was selected, from CLARC database.

b - Based on CSL. Where two screening levels are listed for a single chemical, the higher screening levels are for soil samples collected from the vadose zone and the lower screening levels are for soil samples collected from the saturated zone (SAIC 2006).

Table presents detected chemicals only.

Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or Soil-to-Sediment Screening Level.

Contaminated soil was likely removed from the property as part of the habitat restoration activities.

**Table 8
Chemicals Detected in Soil
Former Rainier Vista Treatment Plant**

Source	Sample Date	Sample Location	Chemical	Soil Conc'n (mg/kg)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level ^b (mg/kg)	MTCA Exceedance Factor	Soil-to-Sediment Screening Level Exceedance Factor
Herrera 1994	Feb-92	SS2	Barium	98.8				
Herrera 1994	Feb-92	SS1	Barium	27.1				
Herrera 1994	Feb-92	SS2	Chromium	27.1	3,200	270	<1	<1
Herrera 1994	Feb-92	SS1	Chromium	26.9	3,200	270	<1	<1
Herrera 1994	Feb-92	SS2	Lead	16	250	67	<1	<1
Herrera 1994	Feb-92	SS1	Selenium	6	400		<1	
Herrera 1994	Feb-92	SS1	Silver	0.5	400	0.61	<1	<1

ft bgs - Feet below ground surface

mg/kg - Milligrams per kilogram

MTCA - Model Toxics Control Act

CSL - Cleanup Screening Level from Washington Sediment Management Standards

a - The lower of MTCA Method A or B cleanup levels was selected, from CLARC database.

b - Based on CSL. Where two screening levels are listed for a single chemical, the higher screening levels are for soil samples collected from the vadose zone and the lower screening levels are for soil samples collected from the saturated zone (SAIC 2006).

Table presents detected chemicals only.

Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or Soil-to-Sediment Screening Level, whichever is lower.

Contaminated soil was likely removed from the property as part of the habitat restoration activities.

**Table 9
Underground Storage Tank Facilities
Restoration Areas Source Control Area**

Facility/ Site ID	Facility Name	UST ID	Tank ID	Size (gallons)	Contents	Status	LUST Site	Notes
43565732	7-Eleven Food Store	8678	NOL	11,000	Unleaded Gasoline	Operational		Tanks installed in November 1980 and upgraded in February 1998.
			REG	11,000	Unleaded Gasoline	Operational		
			SNL	6,000	Unleaded Gasoline	Operational		
53457146	Former Auto Site Automotive (current Puget Sound Heating & Plumbing)	58	1	500	Used oil/ Waste Oil	Removed	✓	Tanks removed December 2008
			2	500	Heating Fuel	Removed		
66498524	Former Chevron 306536 (current Connect Motorsports)	8501	1	Not Listed	Unleaded Gasoline	Removed	✓	Tanks removed August 1996
			2	Not Listed	Leaded Gasoline	Removed		
			3	Not Listed	Used oil/ Waste Oil	Removed		
18369741	Glen Acres Home Association (Glen Acres Golf Course)	100897	1	111-1,100	Leaded Gasoline	Removed		
			2	111-1,100	Unleaded Gasoline	Removed		
			3	111-1,100	Not Listed	Removed		
			4	111-1,100	Leaded Gasoline	Removed		
42321723	Glendale Heating & Air Conditioning	3722	8	Not Listed	Leaded Gasoline	Closed in Place		Closure date not listed in ISIS
			1	20,000	Heating Fuel	Operational		Tanks upgraded in April 1998
			2	10,000	Heating Fuel	Operational		
			3	20,000	Heating Fuel	Operational		
54287319	Goldco (current Triple V Auto Repair)	8142	1	Not Listed	Leaded Gasoline	Removed	✓	Tanks removed February 1991
			2	Not Listed	Unleaded Gasoline	Removed		
			3	Not Listed	Used oil/ Waste Oil	Removed		

**Table 9
Underground Storage Tank Facilities
Restoration Areas Source Control Area**

Facility/ Site ID	Facility Name	UST ID	Tank ID	Size (gallons)	Contents	Status	LUST Site	Notes
13389849	Joseph B Meder (current Chavez Auto Repair)	9215	1	Not Listed	Unleaded Gasoline	Removed		Removal date not listed in ISIS
			2	12,000	Leaded Gasoline	Removed		
			3	Not Listed	Leaded Gasoline	Removed		
			4	5,000	Unleaded Gasoline	Removed		
			5	Not Listed	Unleaded Gasoline	Removed		
			6	500	Used oil/ Waste Oil	Removed		
7747737	McCall Oil Seattle Home Heating	3802	1	Not Listed	Not Listed	Removed		Removal date not listed in ISIS
			2	Not Listed	Not Listed	Removed		
			3	Not Listed	Not Listed	Removed		
			4	Not Listed	Not Listed	Removed		
			5	Not Listed	Not Listed	Removed		
			6	Not Listed	Not Listed	Removed		
2334 64135493	Mike's Aussie Machine Shop (current Pacific Auto Truck Repair & Preet Auto Body)	6967	1	500	Leaded Gasoline	Removed		Removal date not listed in ISIS
			2	500	Unleaded Gasoline	Removed		
9386197	Pacific Underwriters Corp	6954	1	Not Listed	Unleaded Gasoline	Removed		Removal date not listed in ISIS
78215825	Rainier Golf & Country Club	2451	3 Gas	300	Unleaded Gasoline	Removed	✓	Tanks removed April 1994
			2 Diesel	110	Diesel	Removed		
			1 Gas	300	Leaded Gasoline	Removed		

UST - Underground Storage Tank

LUST - Leaking Underground Storage Tank

ISIS - Integrated Site Information System

Table 10
Leaking Underground Storage Tank Facilities
Restoration Areas Source Control Area

Facility/ Site ID	Facility Name	UST ID	LUST Release ID	Affected Media	Release Status	Contaminants	Release Status Change Date
53457146	Former Auto Site Automotive (current Puget Sound Plumbing & Heating)	58	LUST details were not found in the ISIS database.				
66498524	Former Chevron 306536 (current Connect Motorsports)	8501	678	Soil Groundwater	Monitoring	Petroleum	7/8/1996
18369741	Glen Acres Home Association (Glen Acres Golf Course)	1000897	1410	Soil	Cleanup Started	Petroleum	10/3/2011
54287319	Goldco (current Triple V Auto Repair)	8142	747	Soil	Cleanup Started	Benzene, Lead, Petroleum	7/1/2011
78215825	Rainier Golf & Country Club	2451	5184	Soil	Cleanup Started	Petroleum, BTEX	1/11/2012

UST - Underground Storage Tank

LUST - Leaking Underground Storage Tank

ISIS - Integrated Site Information System

**Table 11
Facilities with EPA Site Identification Numbers
Restoration Areas Source Control Area**

Facility Name	Facility/ Site ID	EPA Site ID	HWG	HWM	HWP	Tier 2	TRI
Adjacent Properties							
Boeing D & SG Oxbow Site (former tenant, U.S. Postal Service Distribution Center)	58835952	WAD981771017	01/22/88- 05/31/95		01/01/91- 06/20/95		01/01/90- 10/08/02
Graham Trucking (former tenant, Fremont Property)	54756774	WAD982652885	06/17/88- 09/30/88				
Seattle City Light Duwamish TR (Turning Basin 3 Restoration Area)	96665547	WAD988480000	10/31/90- 03/04/91				
Xtra Lease Seattle Branch (former tenant, Fremont Property)	34451867	WA0000016220	09/30/93- 12/31/01				
Upland Properties							
7-Eleven Food Store	43565732	CRK000012520				01/01/88- 7/4/1776	
Former Auto Site Automotive (current Puget Sound Plumbing & Heating)	53457146	WAD988495172	10/17/91- 03/07/09				
Former Chevron 306536 (current Connect Motorsports)	66498524	WAD988515854	12/16/92- 02/03/11	12/31/03- 10/08/09		01/01/88- 7/4/1776	
Glendale Heating & Air Conditioning	42321723	CRK000022010				01/01/89	
HSD Highline Boulevard Park Warehouse	82131388	WAD988523007	07/20/93- 12/31/01				
Mike's Aussie Machine Shop (current Pacific Auto Truck Repair & Preet Auto Body)	2334 64135493	WAD988523171	07/20/93- 08/31/95				
US DOJ DEA Kent Training (current Big Picture High School)	73123528	WAD988499786	09/01/92- 09/04/92				

EPA - United States Environmental Protection Agency

HWG - Facilities that generate any quantity of hazardous waste

HWM - Facilities that are required to have an EPA Site ID, but who do not generate and/or manage hazardous waste (XQG generator status).

This includes transporters, used oil recyclers, and dangerous waste fuel marketers and burners.

HWP - Facilities that report under Section 313 of the Emergency Planning/Community Right-To-Know Act or that generate more than 2,640 pounds of hazardous waste per year.

Tier2 - Businesses that store 10,000 pounds or more of a hazardous chemical or 500 pounds or less, depending on the chemical, of an extremely hazardous chemical at any time must report annually.

TRI - Facilities in specific industries that manufacture, process or use more than the threshold amount of one or more of 600 listed toxic chemicals.

Yellow shading indicates that the EPA Site ID is active.

Table 12
SIC and NAICS Codes for Facilities Within the Restoration Areas Source Control Area

Property Name	Facility Name	FSID	SIC Code(s)	Description	NAICS Code(s)	Description
Adjacent Properties						
Hamm Creek Restoration Area	Same	None	NA	NA	NA	NA
Seattle City Light Power Substation	Same	None	491	Electric Services	221121	Electric Bulk Power Transmission & Control
Kenco Marine Restoration Area	Same	None	NA	NA	NA	NA
Turning Basin 3 Restoration Area	Seattle City Light Duwamish TR	96665547	NA	NA	NA	NA
Fremont Property	Graham Trucking	54756774	4212	Local Trucking, Without Storage		
	J&H Express Inc.	22587	4212	Local Trucking, Without Storage	484121	Trucking, General Freight, Long Distance
	RENU	20607	4953	Refuse Systems	562111	Solid Waste Collection
	Xtra Lease Seattle Branch	34451867	751	Automotive Rental & Leasing, without Drivers	532112	Passenger Car Leasing
Thales Avionics	Same	1453860	3812	Search & Navigation Equipment	488190	Transportation
U.S. Postal Service Distribution Center	Boeing D & SG Oxbow Site	58835952	3728	Aircraft Parts & Equipment, NEC		
	USPS Distribution Center	76328824	43	United States Postal Service	49111	Postal Service
North Wind's Weir	North Wind's Weir Intertidal Restoration	5584231	5015	Motor Vehicle Parts, Used		
Upland Properties						
7-Eleven Food Store	7-Eleven Food Store 230723931L	43565732	5541	Gasoline Service Stations	447110	Gasoline Stations with Convenience Stores
Aussie Repair & Machine Shop Properties	Aussie Machine	20863	3599	Industrial Machinery, NEC	811310	Industrial Equipment & Machinery Repair & Maintenance
	Goldco	54287319	9999	Nonclassifiable Establishments		
	Triple V Auto Repair	None	7538	General Automotive Repair Shops	811111	General Automotive Repair
	Joes Aussie Repair	7672	7538	General Automotive Repair Shops	811111	General Automotive Repair
	Mike's Aussie Machine Shop	2334 64135493	5013 7538	Motor Vehicle Supplies & New Parts General Automotive Repair Shops		
	Pacific Auto Truck Repair	None	7538	General Automotive Repair Shops	811111	General Automotive Repair
	Preet Auto Body	None	7538	General Automotive Repair Shops	811111	General Automotive Repair
Puget Sound Plumbing and Heating	Former Auto Site Automotive	53457146	171	Plumbing, Heating, & Air Conditioning	238220	Plumbing & Heating Contractors
			7538	General Automotive Repair Shops	811111	General Automotive Repair
Connect Motosports	Former Chevron 306536	66498524	551	Motor Vehicle Dealers	42272	Petroleum & Petroleum Products Wholesalers
			5541	Gasoline Service Stations	42472	Petroleum and Petroleum Products Merchandise
			7549	Automotive Services, NEC	447110	Gasoline Stations with Convenience Stores
			88	Private Households		
Glen Acres Golf Course	Glen Acres Home Association	18369741	7997	Membership Sports & Recreation Clubs	713910	Golf & Country Clubs
Glendale Heating & Air Conditioning	Same	42321723	171	Plumbing, Heating, & Air Conditioning	238220	Plumbing & Heating Contractors
			5171	Petroleum Bulk Stations & Terminals		
HSD Highline Boulevard Park Warehouse	Same	82131388	9999	Nonclassifiable Establishments	49311 61111	General Warehousing and Storage Elementary & Secondary Schools

Table 12
SIC and NAICS Codes for Facilities Within the Restoration Areas Source Control Area

Property Name	Facility Name	FSID	SIC Code(s)	Description	NAICS Code(s)	Description
Jones Property	Same	2491	88 7538	Private Households General Automotive Repair Shops		
Chavez Auto Repair	Joseph B Meder	13389849	7538	General Automotive Repair Shops	811111	General Automotive Repair
McCall Oil	McCall Oil Seattle Home Heating	7747737	5172	Petroleum & Petroleum Products Wholesalers		
Moimoi Property	Same	95231135	88	Private Households		
Pacific Underwriters Corp	Same	9386197	64	Insurance Agents, Brokers, & Service	524210	Insurance Brokerages
Rainier Golf & Country Club	Same	78215825	7997	Membership Sports & Recreation Clubs	713910	Golf & Country Clubs
Big Picture High School	US DOJ DEA Kent Training	73123528	821 9999	Elementary & Secondary Schools Nonclassifiable Establishments	61111	Elementary & Secondary Schools
Elliott Paint Company, Inc.	Same	None	172	Painting and Paper Hanging	238320	Painting Contractors
India Pentacostal Assembly	Same	None	866	Religious Organizations	813110	Religious Organizations
Light House Ministries	Same	None	866	Religious Organizations	813110	Religious Organizations
Park Des Moines Apartments	Same	None	651	Operators of Apartment Buildings	531110	Apartment Building Rental or Leasing
Renacer Youth Treatment Center	Same	None	8069	Speciality Hospitals	622210	Rehabilitation Hospitals
Sunrise Terrace Condominiums	Same	None	651	Operators of Apartment Buildings	531110	Apartment Building Rental or Leasing
Vinh Apartments	Same	None	651	Operators of Apartment Buildings	531110	Apartment Building Rental or Leasing

Bold type indicates the name of the facility operating at the parcel(s) and associated SIC/NAICS codes as of May 2013.

SIC - Standard Industrial Classification

NAICS - North American Industry Classification System

NEC - Not Elsewhere Classified

Table 13
Facility Inspections Restoration Areas Source Control Area
Restoration Areas Source Control Area

Facility Name	Address	City	Zip	Agency	Parcel No.	Date Inspected	Notes
Adjacent Facilities							
Bidadoo Auctions	9605 West Marginal Place S	Seattle	98108	Ecology	0423049001, 0423049073	August 26, 2010	Construction equipment repair and auction company. Minor housekeeping issues. Large concrete wash bay; washwater is filtered and discharged to sanitary sewer. Large oil stains on gravel lot. (Evanson-KC/Gray)
J & H Express	10160 West Marginal Place S, Tukwila	Seattle	98108	Ecology	0423049001, 0423049073	May 19, 2011	Issues include: spill response procedures, proper washing practices, housekeeping. Compliance achieved letter sent 8/1/2011.
Thales Avionics	2811 S 102nd Street	Tukwila	98168	Ecology	0423049190	June 30, 2011	Issues include: hazardous waste labelling and storage. Compliance achieved letter sent 8/30/2011.
USPS Distribution Center	10700 27 th Avenue S	Tukwila	98168	Ecology	0423049057, 0423049130, 0423049186, 0423049189	September 7, 2011	In compliance. Recommended testing of sludge in neutralizing tank and waste ink/alcohol to verify that they are non-hazardous and increase sweeping with a focus on the loading docks.
Facilities in the Hamm Creek Storm Drain Basin							
Aussie Machine Inc	12446 Des Moines Memorial Drive	Seattle	98168	Ecology	0985001205	July 19, 2011	Issues include: proper storage of waste and product, spill response, housekeeping, may need ISGP. Compliance achieved letter sent 9/28/2011.
Glendale Heating & Air Conditioning Co	12462 Des Moines Way S	Seattle	98168	Ecology	0985001215	July 26, 2011	Issues include: proper storage of waste/product, improve spill response procedures, implement proper washing practices, storm drain needs outlet trap. Compliance achieved letter sent 9/28/2011.
India Pentacostal Assembly	1443 S 99th Street	Seattle	98168	King County	5624200452	2011	
Joe's Aussie Repair	12454 Des Moines Memorial Drive S	Burien	98168	Ecology	0985001210	July 19, 2011	Issues include: properly store product and waste, spill preparedness, housekeeping, washing practices, clean storm drains. Compliance achieved letter sent 9/28/2011.
Light House Ministries	9820 Des Moines Memorial Drive S			King County	5624200431	2011	
Pacific Truck Repair	12441 Des Moines Memorial Drive S	Burien	98168	Ecology	0985001075	July 26, 2011	Issues include: properly store waste/product, properly dispose of waste, improve spill response procedures, improve housekeeping. Compliance achieved letter sent 9/28/2011.
Park Des Moines Apartments	10002 Des Moines Memorial Drive S	Seattle	98168	King County	5624200436	2011	Initial and two follow-up inspections.
Park Des Moines Apartments	10002 Des Moines Memorial Drive S	Seattle	98168	King County	5624200436	2012	
Preet Auto Body Repair	12441 Des Moines Memorial Drive S	Burien	98168	Ecology	0985001075	July 26, 2011	Issues include: properly store waste/product, properly dispose of waste, improve spill response procedures, improve housekeeping. Compliance achieved letter sent 9/28/2011.
Renacer Youth Treatment Center	10010 Des Moines Memorial Drive S	Seattle	98168	King County	5624200415	2011	
Sunrise Terrace Condominiums	10455 Des Moines Memorial Drive S	Seattle	98168	King County	8123900000	2012	
Triple V Auto Repair	12459 Des Moines Way S #A	Seattle	98168	Ecology	0985001094	July 19, 2011	Issues include: properly store product/waste, improve spill response procedures, implement proper housekeeping, proper washing procedures. Compliance achieved letter sent 9/28/2011.
Vinh Apartments	10007 17th Place S	Seattle	98168	King County	5624200774	2011	

Sources: Adapted from Ecology 2011d; Hickey 2012, 2013

Appendix A

**Sediment, Seep, Bank Soil, and
Storm Drain Solids Sampling Data
RM 4.2–5.8 West (Restoration Areas)**

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	1,2,3,4,6,7,8-HpCDD	2.83E-04	2.98	9.50E-03					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	1,2,3,4,6,7,8-HpCDD	7.65E-05	2.04	3.75E-03					
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	1,2,3,4,6,7,8-HpCDD	6.90E-05	2.18	3.17E-03					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	1,2,3,4,6,7,8-HpCDD	6.01E-05	1.88	3.20E-03					
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	1,2,3,4,6,7,8-HpCDD	5.40E-05	1.9	2.84E-03					
EPA Site Inspection	DR264	8/26/1998	1,2,3,4,6,7,8-HpCDD	5.30E-05	1.48	3.58E-03					
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	1,2,3,4,6,7,8-HpCDD	3.40E-05	1.75	1.94E-03					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	1,2,3,4,6,7,8-HpCDD	3.10E-05	1.7	1.82E-03					
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	1,2,3,4,6,7,8-HpCDD	2.90E-05	1.28	2.27E-03					
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	1,2,3,4,6,7,8-HpCDD	2.60E-05	2.36	1.10E-03					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	1,2,3,4,6,7,8-HpCDD	2.30E-05	2.33	9.87E-04					
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	1,2,3,4,6,7,8-HpCDD	1.70E-05	1.32	1.29E-03					
Duwamish River RM 4.9 to 7.4	OR-11	May-08	1,2,3,4,6,7,8-HpCDD	1.70E-05	1.58	1.08E-03					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	1,2,3,4,6,7,8-HpCDD	1.62E-05	2.2	7.36E-04					
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	1,2,3,4,6,7,8-HpCDD	1.00E-05	1.12	8.93E-04					
LDW Outfall Sampling	LDW-SS2098-A	4/4/2011	1,2,3,4,6,7,8-HpCDD	7.68E-06	1.25	6.14E-04					
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	1,2,3,4,6,7,8-HpCDD	3.20E-06 J	0.3	1.07E-03					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	1,2,3,4,6,7,8-HpCDF	3.68E-05	2.98	1.23E-03					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	1,2,3,4,6,7,8-HpCDF	1.40E-05	1.88	7.45E-04					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	1,2,3,4,6,7,8-HpCDF	1.40E-05	2.04	6.86E-04					
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	1,2,3,4,6,7,8-HpCDF	1.30E-05 J	2.18	5.96E-04					
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	1,2,3,4,6,7,8-HpCDF	1.10E-05	1.9	5.79E-04					
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	1,2,3,4,6,7,8-HpCDF	6.20E-06 J	1.75	3.54E-04					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	1,2,3,4,6,7,8-HpCDF	6.13E-06	1.7	3.61E-04					
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	1,2,3,4,6,7,8-HpCDF	5.00E-06 J	1.28	3.91E-04					
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	1,2,3,4,6,7,8-HpCDF	4.60E-06 J	2.36	1.95E-04					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	1,2,3,4,6,7,8-HpCDF	4.28E-06 J	2.2	1.95E-04					
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	1,2,3,4,6,7,8-HpCDF	4.10E-06 J	1.32	3.11E-04					
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	1,2,3,4,6,7,8-HpCDF	1.32E-06 J	1.25	1.06E-04					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	1,2,3,4,7,8,9-HpCDF	2.54E-06 J	2.98	8.52E-05					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	1,2,3,4,7,8,9-HpCDF	1.15E-06	1.88	6.12E-05					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	1,2,3,4,7,8,9-HpCDF	9.31E-07	2.04	4.56E-05					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	1,2,3,4,7,8,9-HpCDF	4.73E-07 J	1.7	2.78E-05					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	1,2,3,4,7,8,9-HpCDF	4.40E-07 J	2.2	2.00E-05					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	1,2,3,4,7,8,9-HpCDF	3.43E-07 J	2.33	1.47E-05					
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	1,2,3,4,7,8,9-HpCDF	1.26E-07 J	1.25	1.01E-05					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	1,2,3,4,7,8-HxCDD	3.63E-06 J	2.98	1.22E-04					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	1,2,3,4,7,8-HxCDD	1.21E-06	2.04	5.93E-05					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	1,2,3,4,7,8-HxCDD	9.11E-07 J	1.88	4.85E-05					

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	1,2,3,4,7,8-HxCDD	6.50E-07 J	1.7	3.82E-05					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	1,2,3,4,7,8-HxCDD	4.66E-07 J	2.33	2.00E-05					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	1,2,3,4,7,8-HxCDD	1.78E-07 J	2.2	8.09E-06					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	1,2,3,4,7,8-HxCDF	5.15E-06 J	2.98	1.73E-04					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	1,2,3,4,7,8-HxCDF	2.60E-06	1.88	1.38E-04					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	1,2,3,4,7,8-HxCDF	1.64E-06	2.04	8.04E-05					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	1,2,3,4,7,8-HxCDF	8.29E-07 J	2.2	3.77E-05					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	1,2,3,4,7,8-HxCDF	6.43E-07 J	1.7	3.78E-05					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	1,2,3,4,7,8-HxCDF	4.52E-07 J	2.33	1.94E-05					
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	1,2,3,4,7,8-HxCDF	1.36E-07 J	1.25	1.09E-05					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	1,2,3,6,7,8-HxCDD	1.60E-05	2.98	5.37E-04					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	1,2,3,6,7,8-HxCDD	3.61E-06	2.04	1.77E-04					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	1,2,3,6,7,8-HxCDD	2.87E-06	1.88	1.53E-04					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	1,2,3,6,7,8-HxCDD	1.63E-06 J	1.7	9.59E-05					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	1,2,3,6,7,8-HxCDD	1.34E-06 J	2.33	5.75E-05					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	1,2,3,6,7,8-HxCDD	8.70E-07 J	2.2	3.95E-05					
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	1,2,3,6,7,8-HxCDD	3.96E-07 J	1.25	3.17E-05					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	1,2,3,6,7,8-HxCDF	2.13E-06 J	2.98	7.15E-05					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	1,2,3,6,7,8-HxCDF	1.16E-06	1.88	6.17E-05					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	1,2,3,6,7,8-HxCDF	8.97E-07	2.04	4.40E-05					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	1,2,3,6,7,8-HxCDF	3.64E-07 J	1.7	2.14E-05					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	1,2,3,6,7,8-HxCDF	2.75E-07 J	2.33	1.18E-05					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	1,2,3,6,7,8-HxCDF	2.29E-07 J	2.2	1.04E-05					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	1,2,3,7,8,9-HxCDD	1.47E-05	2.98	4.93E-04					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	1,2,3,7,8,9-HxCDD	3.81E-06	2.04	1.87E-04					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	1,2,3,7,8,9-HxCDD	2.73E-06	1.88	1.45E-04					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	1,2,3,7,8,9-HxCDD	1.60E-06 J	1.7	9.41E-05					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	1,2,3,7,8,9-HxCDD	1.39E-06 J	2.33	5.97E-05					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	1,2,3,7,8,9-HxCDD	6.16E-07 J	2.2	2.80E-05					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	1,2,3,7,8,9-HxCDF	3.49E-07 J	2.98	1.17E-05					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	1,2,3,7,8,9-HxCDF	7.10E-08 J	2.04	3.48E-06					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	1,2,3,7,8-PeCDD	5.18E-06 J	2.98	1.74E-04					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	1,2,3,7,8-PeCDD	9.42E-07 J	2.04	4.62E-05					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	1,2,3,7,8-PeCDD	6.90E-07 J	1.88	3.67E-05					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	1,2,3,7,8-PeCDD	3.83E-07 J	1.7	2.25E-05					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	1,2,3,7,8-PeCDD	3.17E-07 J	2.33	1.36E-05					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	1,2,3,7,8-PeCDD	1.38E-07 J	2.2	6.27E-06					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	1,2,3,7,8-PeCDF	4.69E-07 J	2.98	1.57E-05					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	1,2,3,7,8-PeCDF	3.50E-07 J	2.04	1.72E-05					

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	1,2,4-Trichlorobenzene	3.17E-01	1.86	1.70E+01	0.81	1.8	mg/kg OC	21	9.5
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	1,2,4-Trichlorobenzene	3.10E-01	1.16	2.67E+01	0.81	1.8	mg/kg OC	33	15
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	1,2-Dichlorobenzene	2.90E-01	1.16	2.50E+01	2.3	2.3	mg/kg OC	11	11
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	1,2-Dichlorobenzene	2.48E-01	1.86	1.33E+01	2.3	2.3	mg/kg OC	5.8	5.8
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	1,3-Dichlorobenzene	2.79E-01	1.16	2.41E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	1,3-Dichlorobenzene	2.52E-01	1.86	1.35E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	1,4-Dichlorobenzene	2.74E-01	1.16	2.36E+01	3.1	9	mg/kg OC	7.6	2.6
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	1,4-Dichlorobenzene	2.45E-01	1.86	1.32E+01	3.1	9	mg/kg OC	4.2	1.5
KC Water Quality Assessment	WQAHAMM	6/3/1997	1,4-Dichlorobenzene	1.70E-03 J	1.95	8.72E-02	3.1	9	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	1-Methylnaphthalene	3.24E-01	1.16	2.79E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	1-Methylnaphthalene	3.00E-01	1.86	1.61E+01					
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	1-Methylnaphthalene	9.40E-03 J	1.69	5.56E-01					
LDWRI-Benthic	B10b	8/19/2004	1-Methylnaphthalene	1.90E-03 J	1.09	1.74E-01					
Duwamish River RM 4.9 to 7.4	OR-11	May-08	1-Methylnaphthalene	1.60E-03 J	1.58	1.01E-01					
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	1-Methylnaphthalene	1.10E-03 J	1.75	6.29E-02					
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	1-Methylnaphthalene	5.80E-04	1.28	4.53E-02					
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	1-Methylnaphthalene	4.80E-04 J	1.32	3.64E-02					
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	1-Methylnaphthalene	3.70E-04 J	2.36	1.57E-02					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	2,3,4,6,7,8-HxCDF	1.39E-06 J	2.98	4.66E-05					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	2,3,4,6,7,8-HxCDF	8.43E-07 J	1.88	4.48E-05					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	2,3,4,6,7,8-HxCDF	8.43E-07 J	2.04	4.13E-05					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	2,3,4,6,7,8-HxCDF	2.94E-07 J	1.7	1.73E-05					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	2,3,4,6,7,8-HxCDF	2.55E-07 J	2.33	1.09E-05					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	2,3,4,6,7,8-HxCDF	1.59E-07 J	2.2	7.23E-06					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	2,3,4,7,8-PeCDF	1.41E-06 J	2.98	4.73E-05					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	2,3,4,7,8-PeCDF	9.48E-07	1.88	5.04E-05					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	2,3,4,7,8-PeCDF	7.95E-07 J	2.04	3.90E-05					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	2,3,4,7,8-PeCDF	2.66E-07 J	1.7	1.56E-05					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	2,3,4,7,8-PeCDF	1.93E-07 J	2.2	8.77E-06					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	2,3,4,7,8-PeCDF	1.69E-07 J	2.33	7.25E-06					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	2,3,7,8-TCDD	1.74E-06	2.98	5.84E-05					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	2,3,7,8-TCDD	6.06E-07	1.88	3.22E-05					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	2,3,7,8-TCDF	9.27E-07 J	1.88	4.93E-05					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	2,3,7,8-TCDF	8.59E-07 J	2.04	4.21E-05					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	2,3,7,8-TCDF	6.71E-07 J	2.98	2.25E-05					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	2,3,7,8-TCDF	1.70E-07 J	2.33	7.30E-06					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	2,4,5-Trichlorophenol	4.30E-01	1.16	3.71E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	2,4,5-Trichlorophenol	3.57E-01	1.86	1.92E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	2,4,6-Trichlorophenol	4.06E-01	1.16	3.50E+01					

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	2,4,6-Trichlorophenol	3.57E-01	1.86	1.92E+01					
LDWRI-Benthic	B10b	8/19/2004	2,4'-DDT	6.50E-04 J	1.09	5.96E-02					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	2,4-Dichlorophenol	3.49E-01	1.16	3.01E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	2,4-Dichlorophenol	3.23E-01	1.86	1.74E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	2,4-Dimethylphenol	3.05E-01	1.16	2.63E+01	29	29	ug/kg DW	11	11
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	2,4-Dimethylphenol	2.92E-01	1.86	1.57E+01	29	29	ug/kg DW	10	10
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	2,4-Dinitrophenol	1.75E+00	1.16	1.51E+02					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	2,4-Dinitrophenol	7.70E-01 J	1.86	4.14E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	2,4-Dinitrotoluene	4.10E-01	1.16	3.53E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	2,4-Dinitrotoluene	3.55E-01	1.86	1.91E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	2,6-Dinitrotoluene	3.34E-01	1.86	1.80E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	2,6-Dinitrotoluene	3.31E-01	1.16	2.85E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	2-Chloronaphthalene	3.28E-01	1.86	1.76E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	2-Chloronaphthalene	3.14E-01	1.16	2.71E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	2-Chlorophenol	3.29E-01	1.16	2.84E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	2-Chlorophenol	2.62E-01	1.86	1.41E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	2-Methylnaphthalene	3.18E-01	1.16	2.74E+01	38	64	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	2-Methylnaphthalene	2.94E-01	1.86	1.58E+01	38	64	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	2-Methylnaphthalene	2.30E-03 J	1.09	2.11E-01	38	64	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	2-Methylnaphthalene	2.00E-03 J	1.58	1.27E-01	38	64	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	2-Methylnaphthalene	9.50E-04 J	0.892	1.07E-01	38	64	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	2-Methylnaphthalene	8.20E-04 J	1.75	4.69E-02	38	64	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	2-Methylnaphthalene	8.10E-04 J	1.12	7.23E-02	38	64	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	2-Methylnaphthalene	7.50E-04	1.28	5.86E-02	38	64	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	2-Methylnaphthalene	5.10E-04 J	2.36	2.16E-02	38	64	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	2-Methylnaphthalene	5.00E-04 J	1.32	3.79E-02	38	64	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12	May-08	2-Methylnaphthalene	4.50E-04 J	0.413	1.09E-01	0.67	1.4	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	2-Methylnaphthalene	4.10E-04 J	2.75	1.49E-02	38	64	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	2-Methylnaphthalene	3.80E-04 J	0.643	5.91E-02	38	64	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	2-Methylphenol	3.38E-01	1.16	2.91E+01	63	63	ug/kg DW	5.4	5.4
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	2-Methylphenol	3.14E-01	1.86	1.69E+01	63	63	ug/kg DW	5.0	5.0
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	2-Nitroaniline	4.27E-01	1.86	2.30E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	2-Nitroaniline	3.77E-01	1.16	3.25E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	2-Nitrophenol	3.73E-01	1.86	2.01E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	2-Nitrophenol	3.12E-01	1.16	2.69E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	3,3'-Dichlorobenzidine	4.56E-01	1.86	2.45E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	3,3'-Dichlorobenzidine	1.37E-01	1.16	1.18E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	3-Nitroaniline	6.62E-01	1.86	3.56E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	3-Nitroaniline	5.33E-01	1.16	4.59E+01					

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDWRI-Benthic	B10b	8/19/2004	4,4'-DDD	3.90E-04 J	1.09	3.58E-02					
LDWRI-Benthic	B10b	8/19/2004	4,4'-DDE	2.80E-04 J	1.09	2.57E-02					
LDWRI-Benthic	B10b	8/19/2004	4,4'-DDT	1.40E-03 J	1.09	1.28E-01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	4,6-Dinitro-2-methylphenol	1.39E+00	1.16	1.20E+02					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	4,6-Dinitro-2-methylphenol	1.39E+00 J	1.86	7.47E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	4-Bromophenyl phenyl ether	3.72E-01	1.16	3.21E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	4-Bromophenyl phenyl ether	3.27E-01	1.86	1.76E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	4-Chloro-3-methylphenol	3.94E-01	1.16	3.40E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	4-Chloro-3-methylphenol	3.23E-01	1.86	1.74E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	4-Chloroaniline	4.20E-01	1.86	2.26E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	4-Chloroaniline	3.02E-01	1.16	2.60E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	4-Chlorophenyl-phenylether	3.52E-01	1.16	3.03E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	4-Chlorophenyl-phenylether	3.37E-01	1.86	1.81E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	4-Methylphenol	7.09E-01	1.16	6.11E+01	670	670	ug/kg DW	1.1	1.1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	4-Methylphenol	6.40E-01	1.86	3.44E+01	670	670	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	4-Methylphenol	2.20E-02	2.2	1.00E+00	670	670	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	4-Methylphenol	2.10E-02	4.01	5.24E-01	670	670	ug/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	4-Methylphenol	2.00E-02	2.55	7.84E-01	670	670	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	4-Methylphenol	1.60E-02 J	2.33	6.87E-01	670	670	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	4-Methylphenol	1.50E-02 J	2.58	5.81E-01	670	670	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	4-Methylphenol	1.40E-02 J	1.7	8.24E-01	670	670	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	4-Methylphenol	1.20E-02 J	2.38	5.04E-01	670	670	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	4-Nitroaniline	2.65E-01	1.86	1.42E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	4-Nitroaniline	2.10E-01	1.16	1.81E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	4-Nitrophenol	3.89E-01	1.16	3.35E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	4-Nitrophenol	3.63E-01	1.86	1.95E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Acenaphthene	3.34E-01	1.16	2.88E+01	16	57	mg/kg OC	1.8	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Acenaphthene	2.95E-01	1.86	1.59E+01	16	57	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Acenaphthene	8.10E-02	2.08	3.89E+00	16	57	mg/kg OC	<1	<1
EPA Site Inspection	DR265	8/26/1998	Acenaphthene	4.00E-02	1.03	3.88E+00	16	57	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Acenaphthene	3.80E-02	1.69	2.25E+00	16	57	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Acenaphthene	2.90E-03	0.892	3.25E-01	16	57	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Acenaphthene	1.30E-03 J	1.58	8.23E-02	16	57	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Acenaphthene	1.00E-03 J	1.09	9.17E-02	16	57	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Acenaphthene	7.00E-04	1.28	5.47E-02	16	57	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Acenaphthene	5.50E-04 J	1.32	4.17E-02	16	57	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Acenaphthylene	3.68E-01	1.16	3.17E+01	66	66	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Acenaphthylene	3.23E-01	1.86	1.74E+01	66	66	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Acenaphthylene	2.30E-02	2.12	1.08E+00	66	66	mg/kg OC	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDWRI-Benthic	B10b	8/19/2004	Acenaphthylene	1.50E-03 J	1.09	1.38E-01	66	66	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Aluminum	2.40E+04	3.39	7.08E+05					
EPA Site Inspection	DR263	8/25/1998	Aluminum	2.27E+04	2.9	7.83E+05					
EPA Site Inspection	DR268	8/26/1998	Aluminum	1.82E+04	2.1	8.67E+05					
EPA Site Inspection	DR287	8/26/1998	Aluminum	1.78E+04	1.31	1.36E+06					
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Aluminum	1.70E+04	1.9	8.95E+05					
EPA Site Inspection	DR293	9/14/1998	Aluminum	1.68E+04	1.74	9.66E+05					
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Aluminum	1.60E+04	2.18	7.34E+05					
EPA Site Inspection	DR266	8/26/1998	Aluminum	1.57E+04	1.38	1.14E+06					
KC Water Quality Assessment	WQAHAMM	6/3/1997	Aluminum	1.50E+04 J	1.95	7.69E+05					
KC Water Quality Assessment	WQAHAMM	5/15/1997	Aluminum	1.50E+04 J	1.75	8.57E+05					
EPA Site Inspection	DR269	8/26/1998	Aluminum	1.46E+04	0.9	1.62E+06					
EPA Site Inspection	DR264	8/26/1998	Aluminum	1.45E+04	1.48	9.80E+05					
EPA Site Inspection	DR273	8/26/1998	Aluminum	1.43E+04	1.66	8.61E+05					
KC Water Quality Assessment	WQAHAMM	5/20/1997	Aluminum	1.40E+04 J	1.77	7.91E+05					
KC Water Quality Assessment	WQAHAMM	5/28/1997	Aluminum	1.40E+04 J	1.56	8.97E+05					
EPA Site Inspection	DR267	8/26/1998	Aluminum	1.37E+04	0.85	1.61E+06					
EPA Site Inspection	DR265	8/26/1998	Aluminum	1.31E+04	1.03	1.27E+06					
EPA Site Inspection	DR270	8/26/1998	Aluminum	1.27E+04	1.32	9.62E+05					
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Aluminum	9.30E+03	1.58	5.89E+05					
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Aluminum	7.20E+03	0.296	2.43E+06					
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Aluminum	6.80E+03	0.643	1.06E+06					
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	Aluminum	6.70E+03	0.455	1.47E+06					
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Aluminum	6.50E+03	0.413	1.57E+06					
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Aluminum	6.40E+03	0.216	2.96E+06					
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Aluminum	6.40E+03	0.394	1.62E+06					
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	Aluminum	6.40E+03	0.3	2.13E+06					
Duwamish River RM 4.9 to 7.4	DR-06	4/28/2008	Aluminum	5.80E+03	0.392	1.48E+06					
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Aluminum	5.80E+03	0.892	6.50E+05					
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Aluminum	4.40E+03	1.12	3.93E+05					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Aniline	3.23E-01	1.86	1.74E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Aniline	1.36E-01	1.16	1.17E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Anthracene	3.85E-01	1.16	3.32E+01	220	1200	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Anthracene	2.84E-01	1.86	1.53E+01	220	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Anthracene	1.20E-01	2.08	5.77E+00	220	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Anthracene	6.10E-02	2.59	2.36E+00	220	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR268	8/26/1998	Anthracene	5.00E-02	2.1	2.38E+00	220	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Anthracene	4.90E-02	2.12	2.31E+00	220	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Anthracene	3.60E-02	2.98	1.21E+00	220	1200	mg/kg OC	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR265	8/26/1998	Anthracene	3.00E-02	1.03	2.91E+00	220	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Anthracene	3.00E-02	1.74	1.72E+00	220	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Anthracene	2.70E-02	2.4	1.13E+00	220	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Anthracene	2.20E-02	2.55	8.63E-01	220	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR273	8/26/1998	Anthracene	2.00E-02	1.66	1.20E+00	220	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Anthracene	2.00E-02	3.39	5.90E-01	220	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Anthracene	1.60E-02 J	2.18	7.34E-01	220	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Anthracene	1.20E-02 J	1.9	6.32E-01	220	1200	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Anthracene	1.10E-02	2.04	5.39E-01	220	1200	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Anthracene	4.80E-03	1.88	2.55E-01	220	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Anthracene	4.60E-03	0.892	5.16E-01	220	1200	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Anthracene	4.20E-03 J	1.09	3.85E-01	220	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Anthracene	3.30E-03	1.58	2.09E-01	220	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Anthracene	1.80E-03 J	1.28	1.41E-01	220	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Anthracene	1.30E-03 J	1.75	7.43E-02	220	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Anthracene	1.20E-03 J	1.32	9.09E-02	220	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Anthracene	9.20E-04 J	2.36	3.90E-02	220	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Antimony	7.00E+00 J	1.74	4.02E+02					
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	Antimony	9.90E-01 JB	0.3	3.30E+02					
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Antimony	5.20E-01 B	2.18	2.39E+01					
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Antimony	4.90E-01 B	1.9	2.58E+01					
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Antimony	4.60E-01 B	0.394	1.17E+02					
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Antimony	2.40E-01 JB	1.58	1.52E+01					
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Antimony	1.30E-01 JB	0.216	6.02E+01					
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Antimony	1.30E-01 JB	0.296	4.39E+01					
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	Antimony	1.20E-01 JB	0.455	2.64E+01					
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Antimony	1.20E-01 JB	0.413	2.91E+01					
Duwamish River RM 4.9 to 7.4	DR-06	4/28/2008	Antimony	1.10E-01 JB	0.392	2.81E+01					
LDWRI-Benthic	B10b	8/19/2004	Antimony	9.00E-02 J	1.09	8.26E+00					
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Antimony	8.60E-02 JB	0.892	9.64E+00					
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Antimony	8.40E-02 JB	1.12	7.50E+00					
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Antimony	8.30E-02 JB	0.643	1.29E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Aroclor 1016	5.98E-02	1.16	5.16E+00					
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Aroclor 1248	5.40E-02	2.08	2.60E+00					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Aroclor 1248	3.10E-02	1.88	1.65E+00					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Aroclor 1248	7.30E-03	1.86	3.92E-01					
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	Aroclor 1248	7.00E-03	4.01	1.75E-01					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Aroclor 1248	6.00E-03	2.2	2.73E-01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Aroclor 1248	5.10E-03	1.16	4.40E-01					

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Aroclor 1254	5.20E-01	2.55	2.04E+01					
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Aroclor 1254	1.70E-01	2.28	7.46E+00					
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Aroclor 1254	6.40E-02	1.8	3.56E+00					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Aroclor 1254	5.50E-02	1.88	2.93E+00					
EPA Site Inspection	DR273	8/26/1998	Aroclor 1254	4.50E-02	1.66	2.71E+00					
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Aroclor 1254	4.40E-02	2.08	2.12E+00					
EPA Site Inspection	DR268	8/26/1998	Aroclor 1254	3.40E-02	2.1	1.62E+00					
EPA Site Inspection	DR285	8/25/1998	Aroclor 1254	2.90E-02	3.39	8.55E-01					
EPA Site Inspection	DR263	8/25/1998	Aroclor 1254	2.80E-02	2.9	9.66E-01					
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Aroclor 1254	2.60E-02	1.69	1.54E+00					
EPA Site Inspection	DR264	8/26/1998	Aroclor 1254	2.50E-02	1.48	1.69E+00					
EPA Site Inspection	DR287	8/26/1998	Aroclor 1254	2.50E-02	1.31	1.91E+00					
EPA Site Inspection	DR266	8/26/1998	Aroclor 1254	2.40E-02	1.38	1.74E+00					
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Aroclor 1254	2.40E-02	1.79	1.34E+00					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Aroclor 1254	2.20E-02 J	2.98	7.38E-01					
EPA Site Inspection	DR267	8/26/1998	Aroclor 1254	2.10E-02	0.85	2.47E+00					
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Aroclor 1254	2.00E-02	2.04	9.80E-01					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Aroclor 1254	1.80E-02	2.04	8.82E-01					
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Aroclor 1254	1.70E-02 J	2.59	6.56E-01					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Aroclor 1254	1.30E-02	2.33	5.58E-01					
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Aroclor 1254	1.20E-02	2.38	5.04E-01					
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	Aroclor 1254	7.10E-03	4.01	1.77E-01					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Aroclor 1254	6.20E-03	2.2	2.82E-01					
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Aroclor 1254	5.00E-03 J	2.58	1.94E-01					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Aroclor 1254	4.70E-03	1.7	2.76E-01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Aroclor 1254	4.00E-03	1.16	3.45E-01					
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Aroclor 1254	2.10E-03 J	1.28	1.64E-01					
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Aroclor 1254	1.90E-03	1.75	1.09E-01					
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Aroclor 1254	1.70E-03 J	2.36	7.20E-02					
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Aroclor 1254	8.60E-04 J	1.32	6.52E-02					
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Aroclor 1260	7.00E-02	2.28	3.07E+00					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Aroclor 1260	6.56E-02	1.16	5.66E+00					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Aroclor 1260	4.10E-02	1.88	2.18E+00					
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Aroclor 1260	4.00E-02	2.04	1.96E+00					
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Aroclor 1260	3.00E-02	1.79	1.68E+00					
EPA Site Inspection	DR266	8/26/1998	Aroclor 1260	2.70E-02	1.38	1.96E+00					
EPA Site Inspection	DR264	8/26/1998	Aroclor 1260	2.60E-02	1.48	1.76E+00					
EPA Site Inspection	DR285	8/25/1998	Aroclor 1260	2.40E-02 J	3.39	7.08E-01					
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Aroclor 1260	2.40E-02 J	1.8	1.33E+00					

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR263	8/25/1998	Aroclor 1260	2.20E-02 J	2.9	7.59E-01					
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Aroclor 1260	1.90E-02 J	2.59	7.34E-01					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Aroclor 1260	1.20E-02	2.04	5.88E-01					
LDWRI-Benthic	B10b	8/19/2004	Aroclor 1260	9.80E-03 J	1.09	8.99E-01					
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Aroclor 1260	7.90E-03	1.69	4.67E-01					
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	Aroclor 1260	5.30E-03	4.01	1.32E-01					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Aroclor 1260	3.80E-03 J	1.7	2.24E-01					
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Aroclor 1260	3.40E-03 J	0.216	1.57E+00					
Duwamish River RM 4.9 to 7.4	DR-06	4/28/2008	Aroclor 1260	3.00E-03 J	0.392	7.65E-01					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Aroclor 1260	3.00E-03 J	2.33	1.29E-01					
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Aroclor 1260	3.00E-03 J	2.58	1.16E-01					
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	Aroclor 1260	2.90E-03 J	0.455	6.37E-01					
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	Aroclor 1260	2.70E-03 J	0.3	9.00E-01					
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Aroclor 1260	2.70E-03 J	1.12	2.41E-01					
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Aroclor 1260	2.60E-03 J	0.394	6.60E-01					
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	Aroclor 1260	2.60E-03 J	2.75	9.45E-02					
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Aroclor 1260	2.50E-03 J	0.643	3.89E-01					
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Aroclor 1260	2.30E-03 J	0.892	2.58E-01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Arsenic	2.58E+02	1.16	2.22E+04	57	93	mg/kg DW	4.5	2.8
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Arsenic	1.56E+01	2.55	6.12E+02	57	93	mg/kg DW	<1	<1
EPA Site Inspection	DR263	8/25/1998	Arsenic	1.38E+01	2.9	4.76E+02	57	93	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Arsenic	1.30E+01	1.95	6.67E+02	57	93	mg/kg DW	<1	<1
EPA Site Inspection	DR285	8/25/1998	Arsenic	1.23E+01	3.39	3.63E+02	57	93	mg/kg DW	<1	<1
EPA Site Inspection	DR266	8/26/1998	Arsenic	1.20E+01	1.38	8.70E+02	57	93	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Arsenic	1.20E+01	2.33	5.15E+02	57	93	mg/kg DW	<1	<1
EPA Site Inspection	DR265	8/26/1998	Arsenic	1.15E+01	1.03	1.12E+03	57	93	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Arsenic	1.10E+01	1.69	6.51E+02	57	93	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/20/1997	Arsenic	1.10E+01	1.77	6.21E+02	57	93	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Arsenic	1.10E+01	1.75	6.29E+02	57	93	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/28/1997	Arsenic	1.10E+01	1.56	7.05E+02	57	93	mg/kg DW	<1	<1
EPA Site Inspection	DR273	8/26/1998	Arsenic	1.07E+01	1.66	6.45E+02	57	93	mg/kg DW	<1	<1
EPA Site Inspection	DR270	8/26/1998	Arsenic	1.06E+01	1.32	8.03E+02	57	93	mg/kg DW	<1	<1
EPA Site Inspection	DR264	8/26/1998	Arsenic	1.00E+01	1.48	6.76E+02	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Arsenic	1.00E+01 B	1.75	5.71E+02	57	93	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Arsenic	1.00E+01	2.98	3.36E+02	57	93	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Arsenic	1.00E+01	2.59	3.86E+02	57	93	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Arsenic	1.00E+01	2.38	4.20E+02	57	93	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Arsenic	1.00E+01	1.7	5.88E+02	57	93	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Arsenic	1.00E+01	2.58	3.88E+02	57	93	mg/kg DW	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Arsenic	9.80E+00	2.28	4.30E+02	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Arsenic	9.70E+00	2.18	4.45E+02	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Arsenic	9.50E+00	1.9	5.00E+02	57	93	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Arsenic	8.70E+00	2.12	4.10E+02	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Arsenic	8.60E+00	0.394	2.18E+03	57	93	mg/kg DW	<1	<1
EPA Site Inspection	DR287	8/26/1998	Arsenic	8.50E+00	1.31	6.49E+02	57	93	mg/kg DW	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Arsenic	8.30E+00	2.04	4.07E+02	57	93	mg/kg DW	<1	<1
EPA Site Inspection	DR268	8/26/1998	Arsenic	8.00E+00	2.1	3.81E+02	57	93	mg/kg DW	<1	<1
EPA Site Inspection	DR269	8/26/1998	Arsenic	8.00E+00	0.9	8.89E+02	57	93	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Arsenic	8.00E+00	1.86	4.30E+02	57	93	mg/kg DW	<1	<1
EPA Site Inspection	DR267	8/26/1998	Arsenic	7.20E+00	0.85	8.47E+02	57	93	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Arsenic	7.10E+00	2.4	2.96E+02	57	93	mg/kg DW	<1	<1
EPA Site Inspection	DR293	9/14/1998	Arsenic	7.00E+00	1.74	4.02E+02	57	93	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Arsenic	7.00E+00	1.25	5.60E+02	57	93	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Arsenic	7.00E+00	2.2	3.18E+02	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Arsenic	6.90E+00 B	2.36	2.92E+02	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Arsenic	6.80E+00 B	1.28	5.31E+02	57	93	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Arsenic	6.80E+00	1.67	4.07E+02	57	93	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Arsenic	6.70E+00	2.82	2.38E+02	57	93	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Arsenic	6.60E+00	1.8	3.67E+02	57	93	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Arsenic	6.40E+00	2.08	3.08E+02	57	93	mg/kg DW	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Arsenic	6.40E+00			57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Arsenic	6.30E+00	1.58	3.99E+02	57	93	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Arsenic	6.20E+00	2.04	3.04E+02	57	93	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Arsenic	5.80E+00	1.79	3.24E+02	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Arsenic	5.70E+00	0.643	8.86E+02	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Arsenic	5.60E+00	0.892	6.28E+02	57	93	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Arsenic	5.60E+00	1.56	3.59E+02	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Arsenic	5.50E+00 B	1.32	4.17E+02	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Arsenic	5.10E+00	0.216	2.36E+03	57	93	mg/kg DW	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Arsenic	5.05E+00 J	1.09	4.63E+02	57	93	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Arsenic	5.00E+00	1.52	3.29E+02	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	Arsenic	4.90E+00	0.455	1.08E+03	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Arsenic	4.90E+00	0.413	1.19E+03	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	Arsenic	4.80E+00	0.3	1.60E+03	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-06	4/28/2008	Arsenic	4.70E+00	0.392	1.20E+03	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Arsenic	4.70E+00	0.296	1.59E+03	57	93	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Arsenic	3.70E+00	1.12	3.30E+02	57	93	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 1	LDW-SS134	1/24/2005	Arsenic	3.50E+00	0.39	8.97E+02	57	93	mg/kg DW	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR285	8/25/1998	Barium	7.60E+01	3.39	2.24E+03					
EPA Site Inspection	DR263	8/25/1998	Barium	7.20E+01	2.9	2.48E+03					
EPA Site Inspection	DR268	8/26/1998	Barium	7.00E+01	2.1	3.33E+03					
EPA Site Inspection	DR293	9/14/1998	Barium	5.80E+01	1.74	3.33E+03					
EPA Site Inspection	DR287	8/26/1998	Barium	5.50E+01	1.31	4.20E+03					
EPA Site Inspection	DR266	8/26/1998	Barium	5.00E+01	1.38	3.62E+03					
EPA Site Inspection	DR273	8/26/1998	Barium	5.00E+01	1.66	3.01E+03					
EPA Site Inspection	DR269	8/26/1998	Barium	4.80E+01	0.9	5.33E+03					
EPA Site Inspection	DR267	8/26/1998	Barium	4.60E+01	0.85	5.41E+03					
EPA Site Inspection	DR270	8/26/1998	Barium	4.60E+01	1.32	3.48E+03					
EPA Site Inspection	DR264	8/26/1998	Barium	4.40E+01	1.48	2.97E+03					
EPA Site Inspection	DR265	8/26/1998	Barium	4.20E+01	1.03	4.08E+03					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Benzo(a)anthracene	4.44E-01	1.16	3.83E+01	110	270	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Benzo(a)anthracene	3.60E-01	2.08	1.73E+01	110	270	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Benzo(a)anthracene	3.41E-01	1.86	1.83E+01	110	270	mg/kg OC	<1	<1
EPA Site Inspection	DR268	8/26/1998	Benzo(a)anthracene	2.00E-01	2.1	9.52E+00	110	270	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Benzo(a)anthracene	1.60E-01	2.12	7.55E+00	110	270	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Benzo(a)anthracene	1.40E-01	1.74	8.05E+00	110	270	mg/kg OC	<1	<1
EPA Site Inspection	DR273	8/26/1998	Benzo(a)anthracene	1.30E-01	1.66	7.83E+00	110	270	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Benzo(a)anthracene	1.30E-01	3.39	3.83E+00	110	270	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Benzo(a)anthracene	1.30E-01	2.4	5.42E+00	110	270	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Benzo(a)anthracene	1.20E-01	2.98	4.03E+00	110	270	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Benzo(a)anthracene	1.10E-01	2.59	4.25E+00	110	270	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Benzo(a)anthracene	1.10E-01	2.55	4.31E+00	110	270	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	Benzo(a)anthracene	8.00E-02	2.9	2.76E+00	110	270	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Benzo(a)anthracene	7.20E-02	1.67	4.31E+00	110	270	mg/kg OC	<1	<1
EPA Site Inspection	DR264	8/26/1998	Benzo(a)anthracene	7.00E-02	1.48	4.73E+00	110	270	mg/kg OC	<1	<1
EPA Site Inspection	DR265	8/26/1998	Benzo(a)anthracene	7.00E-02	1.03	6.80E+00	110	270	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Benzo(a)anthracene	6.20E-02	2.04	3.04E+00	110	270	mg/kg OC	<1	<1
EPA Site Inspection	DR269	8/26/1998	Benzo(a)anthracene	6.00E-02	0.9	6.67E+00	110	270	mg/kg OC	<1	<1
EPA Site Inspection	DR287	8/26/1998	Benzo(a)anthracene	6.00E-02	1.31	4.58E+00	110	270	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Benzo(a)anthracene	5.80E-02	2.18	2.66E+00	110	270	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Benzo(a)anthracene	5.80E-02 J	1.95	2.97E+00	110	270	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Benzo(a)anthracene	5.60E-02 J	1.8	3.11E+00	110	270	mg/kg OC	<1	<1
EPA Site Inspection	DR266	8/26/1998	Benzo(a)anthracene	5.00E-02	1.38	3.62E+00	110	270	mg/kg OC	<1	<1
EPA Site Inspection	DR267	8/26/1998	Benzo(a)anthracene	5.00E-02	0.85	5.88E+00	110	270	mg/kg OC	<1	<1
EPA Site Inspection	DR270	8/26/1998	Benzo(a)anthracene	5.00E-02	1.32	3.79E+00	110	270	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Benzo(a)anthracene	4.40E-02 J	1.75	2.51E+00	110	270	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Benzo(a)anthracene	3.90E-02 J	1.9	2.05E+00	110	270	mg/kg OC	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
KC Water Quality Assessment	WQAHAMM	5/28/1997	Benzo(a)anthracene	3.70E-02 J	1.56	2.37E+00	110	270	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Benzo(a)anthracene	3.50E-02 J	2.82	1.24E+00	110	270	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/20/1997	Benzo(a)anthracene	3.20E-02 J	1.77	1.81E+00	110	270	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Benzo(a)anthracene	2.80E-02	1.79	1.56E+00	110	270	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Benzo(a)anthracene	2.70E-02	2.38	1.13E+00	110	270	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	Benzo(a)anthracene	2.40E-02	4.01	5.99E-01	1300	1600	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Benzo(a)anthracene	1.70E-02 J	1.69	1.01E+00	110	270	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Benzo(a)anthracene	1.70E-02	1.58	1.08E+00	110	270	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Benzo(a)anthracene	1.60E-02	1.88	8.51E-01	110	270	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Benzo(a)anthracene	1.30E-02	1.09	1.19E+00	110	270	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Benzo(a)anthracene	1.30E-02 J	2.2	5.91E-01	110	270	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Benzo(a)anthracene	1.30E-02 J	2.33	5.58E-01	110	270	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Benzo(a)anthracene	1.30E-02 J	1.7	7.65E-01	110	270	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Benzo(a)anthracene	1.20E-02	1.56	7.69E-01	110	270	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Benzo(a)anthracene	9.20E-03	1.28	7.19E-01	110	270	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Benzo(a)anthracene	9.20E-03	1.52	6.05E-01	110	270	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Benzo(a)anthracene	7.50E-03	1.32	5.68E-01	110	270	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Benzo(a)anthracene	7.40E-03	0.892	8.30E-01	110	270	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Benzo(a)anthracene	6.80E-03	1.75	3.89E-01	110	270	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Benzo(a)anthracene	4.30E-03 J	2.36	1.82E-01	110	270	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12 ^a	May-08	Benzo(a)anthracene	8.70E-04 J	0.413	2.11E-01	1300	1600	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-04 ^a	4/28/2008	Benzo(a)anthracene	8.60E-04 J	0.455	1.89E-01	1300	1600	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Benzo(a)pyrene	3.37E-01	1.16	2.91E+01	99	210	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Benzo(a)pyrene	2.89E-01	1.86	1.55E+01	99	210	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Benzo(a)pyrene	2.60E-01	2.08	1.25E+01	99	210	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Benzo(a)pyrene	1.80E-01	1.74	1.03E+01	99	210	mg/kg OC	<1	<1
EPA Site Inspection	DR273	8/26/1998	Benzo(a)pyrene	1.60E-01	1.66	9.64E+00	99	210	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Benzo(a)pyrene	1.60E-01	2.55	6.27E+00	99	210	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Benzo(a)pyrene	1.50E-01	2.4	6.25E+00	99	210	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Benzo(a)pyrene	1.50E-01	2.12	7.08E+00	99	210	mg/kg OC	<1	<1
EPA Site Inspection	DR268	8/26/1998	Benzo(a)pyrene	1.20E-01	2.1	5.71E+00	99	210	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Benzo(a)pyrene	1.20E-01	3.39	3.54E+00	99	210	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Benzo(a)pyrene	1.00E-01	2.59	3.86E+00	99	210	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Benzo(a)pyrene	9.50E-02	2.98	3.19E+00	99	210	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	Benzo(a)pyrene	9.00E-02	2.9	3.10E+00	99	210	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Benzo(a)pyrene	8.30E-02	1.67	4.97E+00	99	210	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Benzo(a)pyrene	7.70E-02	2.04	3.77E+00	99	210	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Benzo(a)pyrene	7.10E-02	1.8	3.94E+00	99	210	mg/kg OC	<1	<1
EPA Site Inspection	DR264	8/26/1998	Benzo(a)pyrene	7.00E-02	1.48	4.73E+00	99	210	mg/kg OC	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR266	8/26/1998	Benzo(a)pyrene	7.00E-02	1.38	5.07E+00	99	210	mg/kg OC	<1	<1
EPA Site Inspection	DR269	8/26/1998	Benzo(a)pyrene	7.00E-02	0.9	7.78E+00	99	210	mg/kg OC	<1	<1
EPA Site Inspection	DR287	8/26/1998	Benzo(a)pyrene	7.00E-02	1.31	5.34E+00	99	210	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Benzo(a)pyrene	6.30E-02	2.18	2.89E+00	99	210	mg/kg OC	<1	<1
EPA Site Inspection	DR265	8/26/1998	Benzo(a)pyrene	6.00E-02	1.03	5.83E+00	99	210	mg/kg OC	<1	<1
EPA Site Inspection	DR267	8/26/1998	Benzo(a)pyrene	6.00E-02	0.85	7.06E+00	99	210	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Benzo(a)pyrene	5.20E-02 J	1.9	2.74E+00	99	210	mg/kg OC	<1	<1
EPA Site Inspection	DR270	8/26/1998	Benzo(a)pyrene	5.00E-02	1.32	3.79E+00	99	210	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Benzo(a)pyrene	3.30E-02	1.79	1.84E+00	99	210	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	Benzo(a)pyrene	2.50E-02	4.01	6.23E-01	1600	3000	ug/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Benzo(a)pyrene	2.30E-02	1.56	1.47E+00	99	210	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Benzo(a)pyrene	2.30E-02	2.38	9.66E-01	99	210	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Benzo(a)pyrene	2.10E-02	1.58	1.33E+00	99	210	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Benzo(a)pyrene	1.90E-02	1.88	1.01E+00	99	210	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Benzo(a)pyrene	1.60E-02	1.09	1.47E+00	99	210	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Benzo(a)pyrene	1.60E-02 J	1.69	9.47E-01	99	210	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Benzo(a)pyrene	1.30E-02 J	2.33	5.58E-01	99	210	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Benzo(a)pyrene	1.20E-02 J	1.7	7.06E-01	99	210	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Benzo(a)pyrene	1.20E-02 J	2.58	4.65E-01	99	210	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Benzo(a)pyrene	1.10E-02	1.28	8.59E-01	99	210	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Benzo(a)pyrene	1.10E-02 J	2.2	5.00E-01	99	210	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Benzo(a)pyrene	1.00E-02	1.32	7.58E-01	99	210	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Benzo(a)pyrene	1.00E-02	1.52	6.58E-01	99	210	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Benzo(a)pyrene	8.80E-03	1.75	5.03E-01	99	210	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Benzo(a)pyrene	7.30E-03	0.892	8.18E-01	99	210	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Benzo(a)pyrene	7.20E-03	2.36	3.05E-01	99	210	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Benzo(a)pyrene	7.10E-03	2.82	2.52E-01	99	210	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Benzo(a)pyrene	1.80E-03 J	1.12	1.61E-01	99	210	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03 ^a	4/28/2008	Benzo(a)pyrene	1.70E-03 J	0.216	7.87E-01	1600	3000	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05 ^a	4/28/2008	Benzo(a)pyrene	1.70E-03 J	0.394	4.31E-01	1600	3000	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11 ^a	4/28/2008	Benzo(a)pyrene	1.70E-03 J	0.296	5.74E-01	1600	3000	ug/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Benzo(b)fluoranthene	2.50E-01	2.08	1.20E+01	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Benzo(b)fluoranthene	2.10E-01	2.55	8.24E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Benzo(b)fluoranthene	1.90E-01	1.74	1.09E+01	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR268	8/26/1998	Benzo(b)fluoranthene	1.80E-01	2.1	8.57E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Benzo(b)fluoranthene	1.80E-01	2.98	6.04E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Benzo(b)fluoranthene	1.80E-01	2.4	7.50E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Benzo(b)fluoranthene	1.80E-01	2.12	8.49E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR273	8/26/1998	Benzo(b)fluoranthene	1.70E-01	1.66	1.02E+01	230	450	mg/kg OC	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR285	8/25/1998	Benzo(b)fluoranthene	1.60E-01	3.39	4.72E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	Benzo(b)fluoranthene	1.30E-01	2.9	4.48E+00	230	450	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Benzo(b)fluoranthene	1.30E-01	1.95	6.67E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Benzo(b)fluoranthene	1.20E-01	2.59	4.63E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Benzo(b)fluoranthene	1.20E-01	1.67	7.19E+00	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Benzo(b)fluoranthene	1.00E-01	2.18	4.59E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Benzo(b)fluoranthene	1.00E-01	1.8	5.56E+00	230	450	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Benzo(b)fluoranthene	9.20E-02	1.75	5.26E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR269	8/26/1998	Benzo(b)fluoranthene	9.00E-02	0.9	1.00E+01	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR287	8/26/1998	Benzo(b)fluoranthene	9.00E-02	1.31	6.87E+00	230	450	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Benzo(b)fluoranthene	7.10E-02 J	2.04	3.48E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR264	8/26/1998	Benzo(b)fluoranthene	7.00E-02	1.48	4.73E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR266	8/26/1998	Benzo(b)fluoranthene	7.00E-02	1.38	5.07E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR267	8/26/1998	Benzo(b)fluoranthene	7.00E-02	0.85	8.24E+00	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Benzo(b)fluoranthene	6.70E-02	1.9	3.53E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR265	8/26/1998	Benzo(b)fluoranthene	6.00E-02	1.03	5.83E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR270	8/26/1998	Benzo(b)fluoranthene	6.00E-02	1.32	4.55E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Benzo(b)fluoranthene	3.60E-02	1.79	2.01E+00	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Benzo(b)fluoranthene	3.50E-02	1.58	2.22E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Benzo(b)fluoranthene	2.90E-02	1.56	1.86E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Benzo(b)fluoranthene	2.90E-02	1.52	1.91E+00	230	450	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Benzo(b)fluoranthene	2.10E-02	1.09	1.93E+00	230	450	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Benzo(b)fluoranthene	2.00E-02 J	1.88	1.06E+00	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Benzo(b)fluoranthene	1.40E-02	1.28	1.09E+00	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Benzo(b)fluoranthene	1.40E-02	1.32	1.06E+00	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Benzo(b)fluoranthene	1.10E-02	1.75	6.29E-01	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Benzo(b)fluoranthene	8.80E-03	2.36	3.73E-01	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Benzo(b)fluoranthene	7.70E-03	0.892	8.63E-01	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Benzo(b)fluoranthene	7.10E-03	2.82	2.52E-01	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	Benzo(b)fluoranthene	8.70E-04 J	2.75	3.16E-02	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Benzo(b)fluoranthene	7.60E-04 J	0.643	1.18E-01	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Benzo(b)fluoranthene	6.80E-04 J	1.12	6.07E-02	230	450	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Benzo(e)pyrene	1.70E-02	1.09	1.56E+00					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Benzo(g,h,i)perylene	4.06E-01	1.16	3.50E+01	31	78	mg/kg OC	1.1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Benzo(g,h,i)perylene	4.02E-01	1.86	2.16E+01	31	78	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Benzo(g,h,i)perylene	1.20E-01	1.74	6.90E+00	31	78	mg/kg OC	<1	<1
EPA Site Inspection	DR273	8/26/1998	Benzo(g,h,i)perylene	1.10E-01	1.66	6.63E+00	31	78	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	Benzo(g,h,i)perylene	8.00E-02	2.9	2.76E+00	31	78	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Benzo(g,h,i)perylene	8.00E-02	3.39	2.36E+00	31	78	mg/kg OC	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR268	8/26/1998	Benzo(g,h,i)perylene	7.00E-02	2.1	3.33E+00	31	78	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Benzo(g,h,i)perylene	6.30E-02	2.18	2.89E+00	31	78	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Benzo(g,h,i)perylene	6.30E-02	2.04	3.09E+00	31	78	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Benzo(g,h,i)perylene	6.10E-02 J	1.95	3.13E+00	31	78	mg/kg OC	<1	<1
EPA Site Inspection	DR287	8/26/1998	Benzo(g,h,i)perylene	6.00E-02	1.31	4.58E+00	31	78	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Benzo(g,h,i)perylene	6.00E-02 J	1.8	3.33E+00	31	78	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Benzo(g,h,i)perylene	5.90E-02	2.55	2.31E+00	31	78	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Benzo(g,h,i)perylene	5.70E-02	2.4	2.38E+00	31	78	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Benzo(g,h,i)perylene	5.20E-02	2.12	2.45E+00	31	78	mg/kg OC	<1	<1
EPA Site Inspection	DR264	8/26/1998	Benzo(g,h,i)perylene	5.00E-02	1.48	3.38E+00	31	78	mg/kg OC	<1	<1
EPA Site Inspection	DR265	8/26/1998	Benzo(g,h,i)perylene	5.00E-02	1.03	4.85E+00	31	78	mg/kg OC	<1	<1
EPA Site Inspection	DR266	8/26/1998	Benzo(g,h,i)perylene	5.00E-02	1.38	3.62E+00	31	78	mg/kg OC	<1	<1
EPA Site Inspection	DR269	8/26/1998	Benzo(g,h,i)perylene	5.00E-02	0.9	5.56E+00	31	78	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Benzo(g,h,i)perylene	4.80E-02 J	2.08	2.31E+00	31	78	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Benzo(g,h,i)perylene	4.40E-02 J	1.9	2.32E+00	31	78	mg/kg OC	<1	<1
EPA Site Inspection	DR267	8/26/1998	Benzo(g,h,i)perylene	4.00E-02	0.85	4.71E+00	31	78	mg/kg OC	<1	<1
EPA Site Inspection	DR270	8/26/1998	Benzo(g,h,i)perylene	4.00E-02	1.32	3.03E+00	31	78	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Benzo(g,h,i)perylene	3.70E-02	2.59	1.43E+00	31	78	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Benzo(g,h,i)perylene	3.40E-02	2.98	1.14E+00	31	78	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Benzo(g,h,i)perylene	3.30E-02	1.67	1.98E+00	31	78	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	Benzo(g,h,i)perylene	2.50E-02	4.01	6.23E-01	670	720	ug/kg DW	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Benzo(g,h,i)perylene	2.00E-02	1.88	1.06E+00	31	78	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Benzo(g,h,i)perylene	1.90E-02	2.38	7.98E-01	31	78	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Benzo(g,h,i)perylene	1.70E-02	1.09	1.56E+00	31	78	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Benzo(g,h,i)perylene	1.70E-02	1.58	1.08E+00	31	78	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Benzo(g,h,i)perylene	1.50E-02 J	1.7	8.82E-01	31	78	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Benzo(g,h,i)perylene	1.50E-02 J	1.69	8.88E-01	31	78	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Benzo(g,h,i)perylene	1.30E-02 J	2.33	5.58E-01	31	78	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Benzo(g,h,i)perylene	1.20E-02 J	2.58	4.65E-01	31	78	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Benzo(g,h,i)perylene	1.10E-02 J	2.2	5.00E-01	31	78	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Benzo(g,h,i)perylene	8.50E-03	1.75	4.86E-01	31	78	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Benzo(g,h,i)perylene	7.80E-03	1.28	6.09E-01	31	78	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Benzo(g,h,i)perylene	5.70E-03	1.32	4.32E-01	31	78	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Benzo(g,h,i)perylene	3.10E-03	0.892	3.48E-01	31	78	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Benzo(k)fluoranthene	3.20E-01	2.08	1.54E+01	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Benzo(k)fluoranthene	2.80E-01	2.4	1.17E+01	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Benzo(k)fluoranthene	2.30E-01	2.55	9.02E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR268	8/26/1998	Benzo(k)fluoranthene	2.10E-01	2.1	1.00E+01	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Benzo(k)fluoranthene	2.10E-01	2.12	9.91E+00	230	450	mg/kg OC	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR273	8/26/1998	Benzo(k)fluoranthene	1.80E-01	1.66	1.08E+01	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Benzo(k)fluoranthene	1.80E-01	1.74	1.03E+01	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Benzo(k)fluoranthene	1.70E-01	2.59	6.56E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Benzo(k)fluoranthene	1.60E-01	3.39	4.72E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Benzo(k)fluoranthene	1.30E-01	1.67	7.78E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	Benzo(k)fluoranthene	1.20E-01	2.9	4.14E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Benzo(k)fluoranthene	1.20E-01	2.98	4.03E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR287	8/26/1998	Benzo(k)fluoranthene	1.00E-01	1.31	7.63E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR265	8/26/1998	Benzo(k)fluoranthene	9.00E-02	1.03	8.74E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR266	8/26/1998	Benzo(k)fluoranthene	9.00E-02	1.38	6.52E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR269	8/26/1998	Benzo(k)fluoranthene	8.00E-02	0.9	8.89E+00	230	450	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Benzo(k)fluoranthene	7.10E-02 J	2.04	3.48E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR264	8/26/1998	Benzo(k)fluoranthene	7.00E-02	1.48	4.73E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR267	8/26/1998	Benzo(k)fluoranthene	7.00E-02	0.85	8.24E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR270	8/26/1998	Benzo(k)fluoranthene	7.00E-02	1.32	5.30E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Benzo(k)fluoranthene	6.20E-02	2.82	2.20E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Benzo(k)fluoranthene	5.20E-02 J	1.8	2.89E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Benzo(k)fluoranthene	4.10E-02	1.79	2.29E+00	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Benzo(k)fluoranthene	3.30E-02 J	2.18	1.51E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Benzo(k)fluoranthene	3.10E-02	1.56	1.99E+00	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Benzo(k)fluoranthene	2.20E-02 J	1.9	1.16E+00	230	450	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Benzo(k)fluoranthene	2.00E-02 J	1.88	1.06E+00	230	450	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Benzo(k)fluoranthene	1.80E-02	1.09	1.65E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Benzo(k)fluoranthene	1.60E-02 J	1.52	1.05E+00	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Benzo(k)fluoranthene	1.10E-02	1.58	6.96E-01	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Benzo(k)fluoranthene	5.40E-03	1.28	4.22E-01	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Benzo(k)fluoranthene	5.00E-03	1.32	3.79E-01	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Benzo(k)fluoranthene	4.40E-03 J	1.75	2.51E-01	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Benzo(k)fluoranthene	3.30E-03 J	2.36	1.40E-01	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Benzo(k)fluoranthene	2.50E-03 J	0.892	2.80E-01	230	450	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Benzofluoranthenes (total-calc'd)	6.87E-01	1.16	5.92E+01	230	450	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Benzofluoranthenes (total-calc'd)	6.41E-01	1.86	3.45E+01	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Benzofluoranthenes (total-calc'd)	5.70E-01	2.08	2.74E+01	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Benzofluoranthenes (total-calc'd)	4.60E-01	2.4	1.92E+01	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Benzofluoranthenes (total-calc'd)	4.40E-01	2.55	1.73E+01	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR268	8/26/1998	Benzofluoranthenes (total-calc'd)	3.90E-01	2.1	1.86E+01	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Benzofluoranthenes (total-calc'd)	3.90E-01	2.12	1.84E+01	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Benzofluoranthenes (total-calc'd)	3.70E-01	1.74	2.13E+01	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR273	8/26/1998	Benzofluoranthenes (total-calc'd)	3.50E-01	1.66	2.11E+01	230	450	mg/kg OC	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR285	8/25/1998	Benzofluoranthenes (total-calc'd)	3.20E-01	3.39	9.44E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Benzofluoranthenes (total-calc'd)	3.00E-01	2.98	1.01E+01	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Benzofluoranthenes (total-calc'd)	2.90E-01	2.59	1.12E+01	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	Benzofluoranthenes (total-calc'd)	2.50E-01	2.9	8.62E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Benzofluoranthenes (total-calc'd)	2.50E-01	1.67	1.50E+01	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR287	8/26/1998	Benzofluoranthenes (total-calc'd)	1.90E-01	1.31	1.45E+01	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR269	8/26/1998	Benzofluoranthenes (total-calc'd)	1.70E-01	0.9	1.89E+01	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR266	8/26/1998	Benzofluoranthenes (total-calc'd)	1.60E-01	1.38	1.16E+01	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR265	8/26/1998	Benzofluoranthenes (total-calc'd)	1.50E-01	1.03	1.46E+01	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Benzofluoranthenes (total-calc'd)	1.50E-01 J	1.8	8.33E+00	230	450	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Benzofluoranthenes (total-calc'd)	1.42E-01 J	2.04	6.96E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR264	8/26/1998	Benzofluoranthenes (total-calc'd)	1.40E-01	1.48	9.46E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR267	8/26/1998	Benzofluoranthenes (total-calc'd)	1.40E-01	0.85	1.65E+01	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Benzofluoranthenes (total-calc'd)	1.33E-01 J	2.18	6.10E+00	230	450	mg/kg OC	<1	<1
EPA Site Inspection	DR270	8/26/1998	Benzofluoranthenes (total-calc'd)	1.30E-01	1.32	9.85E+00	230	450	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Benzofluoranthenes (total-calc'd)	1.30E-01	1.95	6.67E+00	230	450	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Benzofluoranthenes (total-calc'd)	9.20E-02	1.75	5.26E+00	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Benzofluoranthenes (total-calc'd)	8.90E-02 J	1.9	4.68E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Benzofluoranthenes (total-calc'd)	7.70E-02	1.79	4.30E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Benzofluoranthenes (total-calc'd)	6.90E-02	2.82	2.45E+00	230	450	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	Benzofluoranthenes (total-calc'd)	6.10E-02	4.01	1.52E+00	3200	3600	ug/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Benzofluoranthenes (total-calc'd)	6.00E-02	1.56	3.85E+00	230	450	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Benzofluoranthenes (total-calc'd)	5.00E-02	2.38	2.10E+00	230	450	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Benzofluoranthenes (total-calc'd)	4.60E-02	1.69	2.72E+00	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Benzofluoranthenes (total-calc'd)	4.60E-02	1.58	2.91E+00	230	450	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Benzofluoranthenes (total-calc'd)	4.50E-02 J	1.52	2.96E+00	230	450	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Benzofluoranthenes (total-calc'd)	4.00E-02 J	1.88	2.13E+00	230	450	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Benzofluoranthenes (total-calc'd)	3.90E-02	1.09	3.58E+00	230	450	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Benzofluoranthenes (total-calc'd)	3.10E-02	1.7	1.82E+00	230	450	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Benzofluoranthenes (total-calc'd)	3.00E-02	2.33	1.29E+00	230	450	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Benzofluoranthenes (total-calc'd)	2.90E-02	2.58	1.12E+00	230	450	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Benzofluoranthenes (total-calc'd)	2.60E-02	2.2	1.18E+00	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Benzofluoranthenes (total-calc'd)	1.94E-02	1.28	1.52E+00	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Benzofluoranthenes (total-calc'd)	1.90E-02	1.32	1.44E+00	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Benzofluoranthenes (total-calc'd)	1.54E-02 J	1.75	8.80E-01	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Benzofluoranthenes (total-calc'd)	1.21E-02 J	2.36	5.13E-01	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Benzofluoranthenes (total-calc'd)	1.02E-02 J	0.892	1.14E+00	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	Benzofluoranthenes (total-calc'd)	8.70E-04 J	2.75	3.16E-02	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Benzofluoranthenes (total-calc'd)	7.60E-04 J	0.643	1.18E-01	230	450	mg/kg OC	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Benzo(a)fluoranthenes (total-calc'd)	6.80E-04 J	1.12	6.07E-02	230	450	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Benzoic acid	3.80E+00 JB	2.18	1.74E+02	650	650	ug/kg DW	5.8	5.8
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Benzoic acid	3.50E+00 JB	1.9	1.84E+02	650	650	ug/kg DW	5.4	5.4
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Benzoic acid	1.10E+00	1.16	9.48E+01	650	650	ug/kg DW	1.7	1.7
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Benzoic acid	1.04E+00	1.86	5.59E+01	650	650	ug/kg DW	1.6	1.6
LDWRI-Benthic	B10b	8/19/2004	Benzoic acid	3.00E-01	1.09	2.75E+01	650	650	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Benzoic acid	2.90E-01 J	1.58	1.84E+01	650	650	ug/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Benzoic acid	2.10E-01	2.4	8.75E+00	650	650	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	Benzoic acid	1.90E-01	4.01	4.74E+00	650	650	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Benzoic acid	1.90E-01 J	2.58	7.36E+00	650	650	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Benzoic acid	1.80E-01 J	2.38	7.56E+00	650	650	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Benzoic acid	1.70E-01 J	1.7	1.00E+01	650	650	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Benzoic acid	1.40E-01 J	2.33	6.01E+00	650	650	ug/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Benzoic acid	1.10E-01	2.98	3.69E+00	650	650	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Benzoic acid	1.10E-01 J	1.69	6.51E+00	650	650	ug/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Benzoic acid	7.10E-02	1.67	4.25E+00	650	650	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Benzoic acid	3.50E-02 J	1.25	2.80E+00	650	650	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Benzyl alcohol	7.52E-01	1.86	4.04E+01	57	73	ug/kg DW	13	10
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Benzyl alcohol	7.48E-01	1.16	6.45E+01	57	73	ug/kg DW	13	10
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Benzyl alcohol	1.50E-01	2.38	6.30E+00	57	73	ug/kg DW	2.6	2.1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Benzyl alcohol	1.40E-01	2.33	6.01E+00	57	73	ug/kg DW	2.5	1.9
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Benzyl alcohol	1.40E-01	1.7	8.24E+00	57	73	ug/kg DW	2.5	1.9
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Benzyl alcohol	1.30E-01	2.58	5.04E+00	57	73	ug/kg DW	2.3	1.8
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	Benzyl alcohol	1.20E-01 J	4.01	2.99E+00	57	73	ug/kg DW	2.1	1.6
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Benzyl alcohol	6.90E-02	1.69	4.08E+00	57	73	ug/kg DW	1.2	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Benzyl alcohol	2.00E-02	2.59	7.72E-01	57	73	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Benzyl alcohol	1.50E-02 J	2.2	6.82E-01	57	73	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Benzyl alcohol	1.00E-02	1.25	8.00E-01	57	73	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-U	3/4/2011	Benzyl alcohol	5.40E-03	0.844	6.40E-01	57	73	ug/kg DW	<1	<1
EPA Site Inspection	DR285	8/25/1998	Beryllium	4.30E-01	3.39	1.27E+01					
EPA Site Inspection	DR263	8/25/1998	Beryllium	4.10E-01	2.9	1.41E+01					
EPA Site Inspection	DR268	8/26/1998	Beryllium	3.80E-01	2.1	1.81E+01					
KC Water Quality Assessment	WQAHAMM	6/3/1997	Beryllium	3.80E-01	1.95	1.95E+01					
KC Water Quality Assessment	WQAHAMM	5/15/1997	Beryllium	3.50E-01	1.75	2.00E+01					
KC Water Quality Assessment	WQAHAMM	5/20/1997	Beryllium	3.40E-01	1.77	1.92E+01					
KC Water Quality Assessment	WQAHAMM	5/28/1997	Beryllium	3.40E-01	1.56	2.18E+01					
EPA Site Inspection	DR287	8/26/1998	Beryllium	3.30E-01	1.31	2.52E+01					
EPA Site Inspection	DR293	9/14/1998	Beryllium	3.20E-01 J	1.74	1.84E+01					
EPA Site Inspection	DR264	8/26/1998	Beryllium	3.10E-01	1.48	2.09E+01					

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR266	8/26/1998	Beryllium	3.10E-01	1.38	2.25E+01					
EPA Site Inspection	DR269	8/26/1998	Beryllium	3.00E-01	0.9	3.33E+01					
EPA Site Inspection	DR267	8/26/1998	Beryllium	2.80E-01	0.85	3.29E+01					
EPA Site Inspection	DR265	8/26/1998	Beryllium	2.70E-01	1.03	2.62E+01					
EPA Site Inspection	DR270	8/26/1998	Beryllium	2.50E-01	1.32	1.89E+01					
EPA Site Inspection	DR273	8/26/1998	Beryllium	2.50E-01	1.66	1.51E+01					
LDWRI-Benthic	B10b	8/19/2004	Biphenyl	8.60E-04 J	1.09	7.89E-02					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Bis(2-chloro-1-methylethyl)ether	3.06E-01	1.16	2.64E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Bis(2-chloro-1-methylethyl)ether	2.93E-01	1.86	1.58E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Bis(2-Chloroethoxy)methane	3.08E-01	1.16	2.66E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Bis(2-Chloroethoxy)methane	3.01E-01	1.86	1.62E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Bis(2-Chloroethyl)ether	3.22E-01	1.86	1.73E+01					
EPA Site Inspection	DR285	8/25/1998	Bis(2-ethylhexyl)phthalate	4.50E-01	3.39	1.33E+01	47	78	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Bis(2-ethylhexyl)phthalate	4.08E-01	1.16	3.52E+01	47	78	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Bis(2-ethylhexyl)phthalate	3.12E-01	1.86	1.68E+01	47	78	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Bis(2-ethylhexyl)phthalate	2.87E-01	1.95	1.47E+01	47	78	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	Bis(2-ethylhexyl)phthalate	2.80E-01	2.9	9.66E+00	47	78	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Bis(2-ethylhexyl)phthalate	2.70E-01	2.98	9.06E+00	47	78	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Bis(2-ethylhexyl)phthalate	2.02E-01	1.75	1.15E+01	47	78	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Bis(2-ethylhexyl)phthalate	1.30E-01 J	1.58	8.23E+00	47	78	mg/kg OC	<1	<1
EPA Site Inspection	DR270	8/26/1998	Bis(2-ethylhexyl)phthalate	1.20E-01	1.32	9.09E+00	47	78	mg/kg OC	<1	<1
EPA Site Inspection	DR273	8/26/1998	Bis(2-ethylhexyl)phthalate	1.20E-01	1.66	7.23E+00	47	78	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/20/1997	Bis(2-ethylhexyl)phthalate	1.16E-01	1.77	6.55E+00	47	78	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/28/1997	Bis(2-ethylhexyl)phthalate	1.06E-01	1.56	6.79E+00	47	78	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Bis(2-ethylhexyl)phthalate	1.00E-01	2.82	3.55E+00	47	78	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Bis(2-ethylhexyl)phthalate	1.00E-01	1.8	5.56E+00	47	78	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Bis(2-ethylhexyl)phthalate	4.10E-02 J	2.04	2.01E+00	47	78	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Bis(2-ethylhexyl)phthalate	3.50E-02 J	1.09	3.21E+00	47	78	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Bis(2-ethylhexyl)phthalate	3.40E-02	2.28	1.49E+00	47	78	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Bis(2-ethylhexyl)phthalate	2.50E-02	1.56	1.60E+00	47	78	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Butyl benzyl phthalate	4.46E-01 J	1.16	3.84E+01	4.9	64	mg/kg OC	7.8	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Butyl benzyl phthalate	3.67E-01	1.86	1.97E+01	4.9	64	mg/kg OC	4.0	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Butyl benzyl phthalate	4.60E-02 B	1.58	2.91E+00	4.9	64	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Butyl benzyl phthalate	3.50E-02	2.98	1.17E+00	4.9	64	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	Butyl benzyl phthalate	3.00E-02	2.9	1.03E+00	4.9	64	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Butyl benzyl phthalate	3.00E-02	3.39	8.85E-01	4.9	64	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12 ³	May-08	Butyl benzyl phthalate	2.80E-02 B	0.413	6.78E+00	63	900	ug/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Butyl benzyl phthalate	2.70E-02	2.59	1.04E+00	4.9	64	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Butyl benzyl phthalate	2.40E-02	2.55	9.41E-01	4.9	64	mg/kg OC	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR293	9/14/1998	Butyl benzyl phthalate	2.00E-02	1.74	1.15E+00	4.9	64	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Butyl benzyl phthalate	2.00E-02	1.67	1.20E+00	4.9	64	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11 ^a	4/28/2008	Butyl benzyl phthalate	1.50E-02	0.296	5.07E+00	63	900	ug/kg DW	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Butyl benzyl phthalate	1.30E-02	1.8	7.22E-01	4.9	64	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	Butyl benzyl phthalate	9.90E-03	4.01	2.47E-01	63	900	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Butyl benzyl phthalate	8.30E-03 J	1.12	7.41E-01	4.9	64	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-09 ^a	4/28/2008	Butyl benzyl phthalate	5.40E-03 J	0.3	1.80E+00	63	900	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05 ^a	4/28/2008	Butyl benzyl phthalate	4.80E-03 J	0.394	1.22E+00	63	900	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-04 ^a	4/28/2008	Butyl benzyl phthalate	4.60E-03 J	0.455	1.01E+00	63	900	ug/kg DW	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Butyl benzyl phthalate	4.40E-03 J	1.09	4.04E-01	4.9	64	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03 ^a	4/28/2008	Butyl benzyl phthalate	4.40E-03 J	0.216	2.04E+00	63	900	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	Butyl benzyl phthalate	4.40E-03 J	2.75	1.60E-01	4.9	64	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Butyl benzyl phthalate	4.40E-03 J	2.33	1.89E-01	4.9	64	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-06 ^a	4/28/2008	Butyl benzyl phthalate	4.30E-03 J	0.392	1.10E+00	63	900	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Butyl benzyl phthalate	3.90E-03 J	2.38	1.64E-01	4.9	64	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Butyl benzyl phthalate	3.80E-03 J	1.7	2.24E-01	4.9	64	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Butyl benzyl phthalate	3.80E-03 J	2.58	1.47E-01	4.9	64	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Butyl benzyl phthalate	3.50E-03 J	0.892	3.92E-01	4.9	64	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Butyl benzyl phthalate	3.40E-03 J	1.69	2.01E-01	4.9	64	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Cadmium	6.57E+01	1.16	5.66E+03	5.1	6.7	mg/kg DW	13	9.8
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Cadmium	8.00E-01	2.28	3.51E+01	5.1	6.7	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	Cadmium	6.00E-01	4.01	1.50E+01	5.1	6.7	mg/kg DW	<1	<1
EPA Site Inspection	DR285	8/25/1998	Cadmium	4.00E-01	3.39	1.18E+01	5.1	6.7	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Cadmium	3.50E-01	1.9	1.84E+01	5.1	6.7	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Cadmium	3.40E-01 J	2.18	1.56E+01	5.1	6.7	mg/kg DW	<1	<1
EPA Site Inspection	DR263	8/25/1998	Cadmium	3.20E-01	2.9	1.10E+01	5.1	6.7	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Cadmium	3.00E-01	1.25	2.40E+01	5.1	6.7	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Cadmium	3.00E-01	2.2	1.36E+01	5.1	6.7	mg/kg DW	<1	<1
EPA Site Inspection	DR268	8/26/1998	Cadmium	1.90E-01	2.1	9.05E+00	5.1	6.7	mg/kg DW	<1	<1
EPA Site Inspection	DR273	8/26/1998	Cadmium	1.80E-01	1.66	1.08E+01	5.1	6.7	mg/kg DW	<1	<1
EPA Site Inspection	DR264	8/26/1998	Cadmium	1.70E-01	1.48	1.15E+01	5.1	6.7	mg/kg DW	<1	<1
EPA Site Inspection	DR266	8/26/1998	Cadmium	1.60E-01	1.38	1.16E+01	5.1	6.7	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Cadmium	1.50E-01 J	1.12	1.34E+01	5.1	6.7	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Cadmium	1.50E-01 JB	1.58	9.49E+00	5.1	6.7	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Cadmium	1.40E-01 J	0.296	4.73E+01	5.1	6.7	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Cadmium	1.30E-01 J	0.394	3.30E+01	5.1	6.7	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Cadmium	1.30E-01 J	0.643	2.02E+01	5.1	6.7	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Cadmium	1.20E-01 J	0.892	1.35E+01	5.1	6.7	mg/kg DW	<1	<1
EPA Site Inspection	DR265	8/26/1998	Cadmium	1.20E-01	1.03	1.17E+01	5.1	6.7	mg/kg DW	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR267	8/26/1998	Cadmium	1.20E-01	0.85	1.41E+01	5.1	6.7	mg/kg DW	<1	<1
EPA Site Inspection	DR269	8/26/1998	Cadmium	1.20E-01	0.9	1.33E+01	5.1	6.7	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Cadmium	1.20E-01 JB	0.413	2.91E+01	5.1	6.7	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Cadmium	1.10E-01 J	0.216	5.09E+01	5.1	6.7	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	Cadmium	1.10E-01 J	0.455	2.42E+01	5.1	6.7	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	Cadmium	1.10E-01 J	0.3	3.67E+01	5.1	6.7	mg/kg DW	<1	<1
EPA Site Inspection	DR270	8/26/1998	Cadmium	1.10E-01	1.32	8.33E+00	5.1	6.7	mg/kg DW	<1	<1
EPA Site Inspection	DR287	8/26/1998	Cadmium	1.10E-01	1.31	8.40E+00	5.1	6.7	mg/kg DW	<1	<1
EPA Site Inspection	DR293	9/14/1998	Cadmium	1.00E-01 J	1.74	5.75E+00	5.1	6.7	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-06	4/28/2008	Cadmium	9.60E-02 J	0.392	2.45E+01	5.1	6.7	mg/kg DW	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Cadmium	6.80E-02	1.09	6.24E+00	5.1	6.7	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Carbazole	4.17E-01	1.16	3.59E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Carbazole	2.89E-01	1.86	1.55E+01					
EPA Site Inspection	DR273	8/26/1998	Carbazole	4.00E-02	1.66	2.41E+00					
EPA Site Inspection	DR293	9/14/1998	Carbazole	4.00E-02	1.74	2.30E+00					
EPA Site Inspection	DR268	8/26/1998	Carbazole	3.00E-02	2.1	1.43E+00					
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Carbazole	3.00E-02	2.4	1.25E+00					
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Carbazole	2.90E-02	2.59	1.12E+00					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Carbazole	2.40E-02	2.98	8.05E-01					
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Carbazole	2.00E-02	1.67	1.20E+00					
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Carbazole	2.00E-02	2.12	9.43E-01					
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Carbazole	6.40E-03 J	1.58	4.05E-01					
LDWRI-Benthic	B10b	8/19/2004	Carbazole	3.20E-03 J	1.09	2.94E-01					
EPA Site Inspection	DR268	8/26/1998	Carcinogenic PAHs (calc'd)	1.21E+00	2.1	5.76E+01					
EPA Site Inspection	DR293	9/14/1998	Carcinogenic PAHs (calc'd)	1.07E+00	1.74	6.15E+01					
EPA Site Inspection	DR273	8/26/1998	Carcinogenic PAHs (calc'd)	9.80E-01	1.66	5.90E+01					
EPA Site Inspection	DR285	8/25/1998	Carcinogenic PAHs (calc'd)	8.50E-01	3.39	2.51E+01					
EPA Site Inspection	DR263	8/25/1998	Carcinogenic PAHs (calc'd)	6.60E-01	2.9	2.28E+01					
EPA Site Inspection	DR287	8/26/1998	Carcinogenic PAHs (calc'd)	4.80E-01	1.31	3.66E+01					
EPA Site Inspection	DR269	8/26/1998	Carcinogenic PAHs (calc'd)	4.60E-01	0.9	5.11E+01					
EPA Site Inspection	DR264	8/26/1998	Carcinogenic PAHs (calc'd)	4.30E-01	1.48	2.91E+01					
EPA Site Inspection	DR265	8/26/1998	Carcinogenic PAHs (calc'd)	4.20E-01	1.03	4.08E+01					
EPA Site Inspection	DR266	8/26/1998	Carcinogenic PAHs (calc'd)	4.20E-01	1.38	3.04E+01					
EPA Site Inspection	DR267	8/26/1998	Carcinogenic PAHs (calc'd)	3.80E-01	0.85	4.47E+01					
EPA Site Inspection	DR270	8/26/1998	Carcinogenic PAHs (calc'd)	3.50E-01	1.32	2.65E+01					
KC Water Quality Assessment	WQAHAMM	6/3/1997	Carcinogenic PAHs (calc'd)	3.45E-01	1.95	1.77E+01					
KC Water Quality Assessment	WQAHAMM	5/15/1997	Carcinogenic PAHs (calc'd)	1.93E-01	1.75	1.11E+01					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Carcinogenic PAHs (calc'd)	1.10E-01 J	2.04	5.39E+00					
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Carcinogenic PAHs (calc'd)	8.99E-02 J	2.18	4.12E+00					

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
KC Water Quality Assessment	WQAHAMM	5/28/1997	Carcinogenic PAHs (calc'd)	8.97E-02	1.56	5.75E+00					
KC Water Quality Assessment	WQAHAMM	5/20/1997	Carcinogenic PAHs (calc'd)	7.70E-02	1.77	4.35E+00					
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Carcinogenic PAHs (calc'd)	7.05E-02 J	1.9	3.71E+00					
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	Carcinogenic PAHs (calc'd)	3.90E-02	4.01	9.73E-01					
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Carcinogenic PAHs (calc'd)	3.50E-02 J	2.38	1.47E+00					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Carcinogenic PAHs (calc'd)	3.10E-02 J	1.16	2.67E+00					
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Carcinogenic PAHs (calc'd)	2.94E-02 J	1.58	1.86E+00					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Carcinogenic PAHs (calc'd)	2.90E-02 J	1.88	1.54E+00					
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Carcinogenic PAHs (calc'd)	2.60E-02 J	1.69	1.54E+00					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Carcinogenic PAHs (calc'd)	2.00E-02 J	2.33	8.58E-01					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Carcinogenic PAHs (calc'd)	1.90E-02 J	1.7	1.12E+00					
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Carcinogenic PAHs (calc'd)	1.90E-02 J	2.58	7.36E-01					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Carcinogenic PAHs (calc'd)	1.70E-02 J	2.2	7.73E-01					
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Carcinogenic PAHs (calc'd)	1.48E-02	1.28	1.16E+00					
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Carcinogenic PAHs (calc'd)	1.35E-02	1.32	1.02E+00					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Carcinogenic PAHs (calc'd)	1.30E-02 J	1.86	6.99E-01					
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Carcinogenic PAHs (calc'd)	1.24E-02 J	1.75	7.11E-01					
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Carcinogenic PAHs (calc'd)	9.73E-03 J	0.892	1.09E+00					
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Carcinogenic PAHs (calc'd)	9.45E-03 J	2.36	4.00E-01					
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Carcinogenic PAHs (calc'd)	2.08E-03 J	0.296	7.03E-01					
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Carcinogenic PAHs (calc'd)	2.08E-03 J	0.394	5.27E-01					
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Carcinogenic PAHs (calc'd)	2.08E-03 J	1.12	1.85E-01					
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Carcinogenic PAHs (calc'd)	1.99E-03 J	0.216	9.20E-01					
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	Carcinogenic PAHs (calc'd)	8.80E-04 J	0.455	1.93E-01					
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Carcinogenic PAHs (calc'd)	8.71E-04 J	0.413	2.11E-01					
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	Carcinogenic PAHs (calc'd)	8.24E-04 J	2.75	3.00E-02					
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Carcinogenic PAHs (calc'd)	8.00E-04 J	0.643	1.24E-01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Chromium	8.05E+01	1.16	6.94E+03	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Chromium	3.10E+01	2.98	1.04E+03	260	270	mg/kg DW	<1	<1
EPA Site Inspection	DR263	8/25/1998	Chromium	2.80E+01	2.9	9.66E+02	260	270	mg/kg DW	<1	<1
EPA Site Inspection	DR285	8/25/1998	Chromium	2.80E+01	3.39	8.26E+02	260	270	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Chromium	2.80E+01	2.58	1.09E+03	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Chromium	2.70E+01	2.59	1.04E+03	260	270	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	Chromium	2.70E+01	4.01	6.73E+02	260	270	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Chromium	2.70E+01	2.38	1.13E+03	260	270	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Chromium	2.70E+01	1.7	1.59E+03	260	270	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Chromium	2.65E+01	1.69	1.57E+03	260	270	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Chromium	2.64E+01	2.33	1.13E+03	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Chromium	2.63E+01	2.28	1.15E+03	260	270	mg/kg DW	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Chromium	2.60E+01	2.18	1.19E+03	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Chromium	2.60E+01	2.55	1.02E+03	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Chromium	2.50E+01	1.79	1.40E+03	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Chromium	2.44E+01	1.67	1.46E+03	260	270	mg/kg DW	<1	<1
EPA Site Inspection	DR268	8/26/1998	Chromium	2.40E+01	2.1	1.14E+03	260	270	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Chromium	2.40E+01	1.9	1.26E+03	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Chromium	2.40E+01	2.12	1.13E+03	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Chromium	2.34E+01	2.08	1.13E+03	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Chromium	2.30E+01	2.82	8.16E+02	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Chromium	2.30E+01	2.4	9.58E+02	260	270	mg/kg DW	<1	<1
EPA Site Inspection	DR287	8/26/1998	Chromium	2.20E+01	1.31	1.68E+03	260	270	mg/kg DW	<1	<1
EPA Site Inspection	DR293	9/14/1998	Chromium	2.20E+01	1.74	1.26E+03	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Chromium	2.11E+01	1.56	1.35E+03	260	270	mg/kg DW	<1	<1
EPA Site Inspection	DR266	8/26/1998	Chromium	2.10E+01	1.38	1.52E+03	260	270	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Chromium	2.08E+01	1.95	1.07E+03	260	270	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Chromium	2.04E+01	1.75	1.17E+03	260	270	mg/kg DW	<1	<1
EPA Site Inspection	DR273	8/26/1998	Chromium	2.00E+01	1.66	1.20E+03	260	270	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/20/1997	Chromium	1.95E+01	1.77	1.10E+03	260	270	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/28/1997	Chromium	1.94E+01	1.56	1.24E+03	260	270	mg/kg DW	<1	<1
EPA Site Inspection	DR264	8/26/1998	Chromium	1.90E+01	1.48	1.28E+03	260	270	mg/kg DW	<1	<1
EPA Site Inspection	DR265	8/26/1998	Chromium	1.90E+01	1.03	1.84E+03	260	270	mg/kg DW	<1	<1
EPA Site Inspection	DR269	8/26/1998	Chromium	1.90E+01	0.9	2.11E+03	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Chromium	1.85E+01	1.8	1.03E+03	260	270	mg/kg DW	<1	<1
EPA Site Inspection	DR267	8/26/1998	Chromium	1.80E+01	0.85	2.12E+03	260	270	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Chromium	1.80E+01 B	1.58	1.14E+03	260	270	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Chromium	1.78E+01	1.25	1.42E+03	260	270	mg/kg DW	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Chromium	1.61E+01	1.09	1.48E+03	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Chromium	1.61E+01	1.52	1.06E+03	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Chromium	1.59E+01	2.04	7.79E+02	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 1	LDW-SS134	1/24/2005	Chromium	1.57E+01	0.39	4.03E+03	260	270	mg/kg DW	<1	<1
EPA Site Inspection	DR270	8/26/1998	Chromium	1.50E+01	1.32	1.14E+03	260	270	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-U	3/4/2011	Chromium	1.42E+01	0.844	1.68E+03	260	270	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Chromium	1.41E+01	1.86	7.58E+02	260	270	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Chromium	1.40E+01	0.296	4.73E+03	260	270	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Chromium	1.31E+01	2.2	5.95E+02	260	270	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Chromium	1.30E+01 B	0.413	3.15E+03	260	270	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Chromium	1.20E+01	0.394	3.05E+03	260	270	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Chromium	1.10E+01	0.216	5.09E+03	260	270	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Chromium	1.10E+01	0.643	1.71E+03	260	270	mg/kg DW	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Duamish River RM 4.9 to 7.4	DR-04	4/28/2008	Chromium	9.60E+00	0.455	2.11E+03	260	270	mg/kg DW	<1	<1
Duamish River RM 4.9 to 7.4	DR-09	4/28/2008	Chromium	9.30E+00	0.3	3.10E+03	260	270	mg/kg DW	<1	<1
Duamish River RM 4.9 to 7.4	DR-06	4/28/2008	Chromium	8.90E+00	0.392	2.27E+03	260	270	mg/kg DW	<1	<1
Duamish River RM 4.9 to 7.4	DR-07	4/28/2008	Chromium	6.90E+00	0.892	7.74E+02	260	270	mg/kg DW	<1	<1
Duamish River RM 4.9 to 7.4	DR-12	4/28/2008	Chromium	6.20E+00	1.12	5.54E+02	260	270	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Chrysene	4.30E-01	2.08	2.07E+01	110	460	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Chrysene	4.13E-01	1.16	3.56E+01	110	460	mg/kg OC	<1	<1
EPA Site Inspection	DR268	8/26/1998	Chrysene	4.00E-01	2.1	1.90E+01	110	460	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Chrysene	3.42E-01	1.86	1.84E+01	110	460	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Chrysene	2.40E-01	2.12	1.13E+01	110	460	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Chrysene	2.10E-01	1.74	1.21E+01	110	460	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Chrysene	2.10E-01	2.4	8.75E+00	110	460	mg/kg OC	<1	<1
EPA Site Inspection	DR273	8/26/1998	Chrysene	1.90E-01	1.66	1.14E+01	110	460	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Chrysene	1.90E-01	3.39	5.60E+00	110	460	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Chrysene	1.90E-01	2.98	6.38E+00	110	460	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	Chrysene	1.60E-01	2.9	5.52E+00	110	460	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Chrysene	1.60E-01	2.55	6.27E+00	110	460	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Chrysene	1.50E-01	2.59	5.79E+00	110	460	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Chrysene	1.30E-01	1.67	7.78E+00	110	460	mg/kg OC	<1	<1
EPA Site Inspection	DR269	8/26/1998	Chrysene	1.10E-01	0.9	1.22E+01	110	460	mg/kg OC	<1	<1
EPA Site Inspection	DR264	8/26/1998	Chrysene	1.00E-01	1.48	6.76E+00	110	460	mg/kg OC	<1	<1
EPA Site Inspection	DR265	8/26/1998	Chrysene	1.00E-01	1.03	9.71E+00	110	460	mg/kg OC	<1	<1
EPA Site Inspection	DR287	8/26/1998	Chrysene	1.00E-01	1.31	7.63E+00	110	460	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Chrysene	9.62E-02	1.95	4.93E+00	110	460	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Chrysene	9.40E-02	1.8	5.22E+00	110	460	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Chrysene	9.20E-02	2.04	4.51E+00	110	460	mg/kg OC	<1	<1
EPA Site Inspection	DR266	8/26/1998	Chrysene	9.00E-02	1.38	6.52E+00	110	460	mg/kg OC	<1	<1
EPA Site Inspection	DR267	8/26/1998	Chrysene	9.00E-02	0.85	1.06E+01	110	460	mg/kg OC	<1	<1
EPA Site Inspection	DR270	8/26/1998	Chrysene	8.00E-02	1.32	6.06E+00	110	460	mg/kg OC	<1	<1
Duamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Chrysene	7.70E-02	2.18	3.53E+00	110	460	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Chrysene	5.74E-02	1.75	3.28E+00	110	460	mg/kg OC	<1	<1
Duamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Chrysene	5.50E-02	1.9	2.89E+00	110	460	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Chrysene	5.40E-02 J	2.82	1.91E+00	110	460	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/28/1997	Chrysene	5.27E-02	1.56	3.38E+00	110	460	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/20/1997	Chrysene	4.50E-02	1.77	2.54E+00	110	460	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Chrysene	4.40E-02	1.69	2.60E+00	110	460	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Chrysene	4.10E-02	1.79	2.29E+00	110	460	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	Chrysene	4.00E-02	4.01	9.98E-01	1400	1800	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Chrysene	3.90E-02	2.38	1.64E+00	110	460	mg/kg OC	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Chrysene	2.70E-02	1.56	1.73E+00	110	460	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Chrysene	2.60E-02	1.58	1.65E+00	110	460	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Chrysene	2.30E-02	1.09	2.11E+00	110	460	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Chrysene	2.30E-02	1.88	1.22E+00	110	460	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Chrysene	2.10E-02	1.52	1.38E+00	110	460	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Chrysene	2.00E-02	2.33	8.58E-01	110	460	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Chrysene	1.90E-02 J	1.7	1.12E+00	110	460	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Chrysene	1.90E-02	2.58	7.36E-01	110	460	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Chrysene	1.60E-02 J	2.2	7.27E-01	110	460	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Chrysene	1.20E-02	1.28	9.38E-01	110	460	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Chrysene	9.60E-03	1.32	7.27E-01	110	460	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Chrysene	8.50E-03	1.75	4.86E-01	110	460	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Chrysene	7.60E-03	0.892	8.52E-01	110	460	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Chrysene	6.40E-03	2.36	2.71E-01	110	460	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Cobalt	1.10E+01	3.39	3.24E+02					
EPA Site Inspection	DR263	8/25/1998	Cobalt	1.00E+01	2.9	3.45E+02					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Cobalt	9.90E+00	2.98	3.32E+02					
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Cobalt	9.60E+00	2.59	3.71E+02					
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Cobalt	9.30E+00	2.12	4.39E+02					
EPA Site Inspection	DR266	8/26/1998	Cobalt	9.00E+00	1.38	6.52E+02					
EPA Site Inspection	DR268	8/26/1998	Cobalt	9.00E+00	2.1	4.29E+02					
EPA Site Inspection	DR269	8/26/1998	Cobalt	9.00E+00	0.9	1.00E+03					
EPA Site Inspection	DR273	8/26/1998	Cobalt	9.00E+00	1.66	5.42E+02					
EPA Site Inspection	DR287	8/26/1998	Cobalt	9.00E+00	1.31	6.87E+02					
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Cobalt	9.00E+00	2.4	3.75E+02					
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Cobalt	8.80E+00	2.28	3.86E+02					
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Cobalt	8.30E+00	2.82	2.94E+02					
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Cobalt	8.20E+00	1.67	4.91E+02					
EPA Site Inspection	DR264	8/26/1998	Cobalt	8.00E+00	1.48	5.41E+02					
EPA Site Inspection	DR267	8/26/1998	Cobalt	8.00E+00	0.85	9.41E+02					
EPA Site Inspection	DR293	9/14/1998	Cobalt	8.00E+00	1.74	4.60E+02					
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Cobalt	8.00E+00	1.56	5.13E+02					
EPA Site Inspection	DR265	8/26/1998	Cobalt	7.00E+00	1.03	6.80E+02					
EPA Site Inspection	DR270	8/26/1998	Cobalt	7.00E+00	1.32	5.30E+02					
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Cobalt	7.00E+00	2.08	3.37E+02					
LDWRI-Benthic	B10b	8/19/2004	Cobalt	6.90E+00	1.09	6.33E+02					
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Cobalt	6.60E+00	1.52	4.34E+02					
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Cobalt	6.60E+00	2.55	2.59E+02					
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Cobalt	6.40E+00	1.79	3.58E+02					

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Cobalt	6.40E+00	1.8	3.56E+02					
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Cobalt	5.90E+00	2.04	2.89E+02					
LDWRI-Surface Sediment Round 1	LDW-SS134	1/24/2005	Cobalt	4.70E+00	0.39	1.21E+03					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Copper	7.99E+01	1.16	6.89E+03	390	390	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Copper	4.94E+01	2.59	1.91E+03	390	390	mg/kg DW	<1	<1
EPA Site Inspection	DR285	8/25/1998	Copper	4.70E+01	3.39	1.39E+03	390	390	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Copper	4.67E+01	2.98	1.57E+03	390	390	mg/kg DW	<1	<1
EPA Site Inspection	DR263	8/25/1998	Copper	4.40E+01	2.9	1.52E+03	390	390	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	Copper	3.98E+01 J	4.01	9.93E+02	390	390	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Copper	3.88E+01	2.28	1.70E+03	390	390	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Copper	3.67E+01	2.58	1.42E+03	390	390	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Copper	3.60E+01	2.55	1.41E+03	390	390	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Copper	3.58E+01	2.12	1.69E+03	390	390	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Copper	3.49E+01	2.4	1.45E+03	390	390	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Copper	3.33E+01	2.38	1.40E+03	390	390	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Copper	3.32E+01	1.7	1.95E+03	390	390	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Copper	3.30E+01 B	1.9	1.74E+03	390	390	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Copper	3.30E+01 B	2.18	1.51E+03	390	390	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Copper	3.24E+01	1.69	1.92E+03	390	390	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Copper	3.15E+01	2.33	1.35E+03	390	390	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Copper	3.09E+01	2.82	1.10E+03	390	390	mg/kg DW	<1	<1
EPA Site Inspection	DR268	8/26/1998	Copper	3.00E+01	2.1	1.43E+03	390	390	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Copper	2.97E+01	1.67	1.78E+03	390	390	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Copper	2.82E+01	2.08	1.36E+03	390	390	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Copper	2.81E+01	1.95	1.44E+03	390	390	mg/kg DW	<1	<1
EPA Site Inspection	DR266	8/26/1998	Copper	2.70E+01	1.38	1.96E+03	390	390	mg/kg DW	<1	<1
EPA Site Inspection	DR287	8/26/1998	Copper	2.70E+01	1.31	2.06E+03	390	390	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Copper	2.69E+01	1.8	1.49E+03	390	390	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Copper	2.63E+01	1.56	1.69E+03	390	390	mg/kg DW	<1	<1
EPA Site Inspection	DR264	8/26/1998	Copper	2.60E+01	1.48	1.76E+03	390	390	mg/kg DW	<1	<1
EPA Site Inspection	DR293	9/14/1998	Copper	2.60E+01	1.74	1.49E+03	390	390	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Copper	2.53E+01	1.75	1.45E+03	390	390	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 1	LDW-SS134	1/24/2005	Copper	2.50E+01	0.39	6.41E+03	390	390	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Copper	2.49E+01	1.79	1.39E+03	390	390	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/20/1997	Copper	2.43E+01	1.77	1.37E+03	390	390	mg/kg DW	<1	<1
EPA Site Inspection	DR273	8/26/1998	Copper	2.40E+01	1.66	1.45E+03	390	390	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/28/1997	Copper	2.38E+01	1.56	1.53E+03	390	390	mg/kg DW	<1	<1
EPA Site Inspection	DR265	8/26/1998	Copper	2.20E+01	1.03	2.14E+03	390	390	mg/kg DW	<1	<1
EPA Site Inspection	DR267	8/26/1998	Copper	2.20E+01	0.85	2.59E+03	390	390	mg/kg DW	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR269	8/26/1998	Copper	2.20E+01	0.9	2.44E+03	390	390	mg/kg DW	<1	<1
EPA Site Inspection	DR270	8/26/1998	Copper	2.20E+01	1.32	1.67E+03	390	390	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Copper	1.93E+01 J	2.2	8.77E+02	390	390	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Copper	1.90E+01	1.58	1.20E+03	390	390	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Copper	1.79E+01	2.04	8.77E+02	390	390	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Copper	1.74E+01	1.52	1.14E+03	390	390	mg/kg DW	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Copper	1.72E+01	1.09	1.58E+03	390	390	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Copper	1.59E+01 J	1.86	8.55E+02	390	390	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Copper	1.50E+01 B	0.394	3.81E+03	390	390	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Copper	1.50E+01	1.25	1.20E+03	390	390	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Copper	1.40E+01	0.892	1.57E+03	390	390	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Copper	1.30E+01 B	0.643	2.02E+03	390	390	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-U	3/4/2011	Copper	1.22E+01	0.844	1.45E+03	390	390	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	Copper	1.20E+01 B	0.455	2.64E+03	390	390	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	Copper	1.20E+01 B	0.3	4.00E+03	390	390	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Copper	1.20E+01 B	0.296	4.05E+03	390	390	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Copper	1.10E+01 B	0.216	5.09E+03	390	390	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-06	4/28/2008	Copper	1.10E+01 B	0.392	2.81E+03	390	390	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Copper	1.10E+01	0.413	2.66E+03	390	390	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Copper	1.00E+01 B	1.12	8.93E+02	390	390	mg/kg DW	<1	<1
LDWRI-Benthic	B10b	8/19/2004	DDTs (total-calc'd)	2.70E-03 J	1.09	2.48E-01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Dibenzo(a,h)anthracene	4.24E-01	1.16	3.66E+01	12	33	mg/kg OC	3.0	1.1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Dibenzo(a,h)anthracene	4.21E-01	1.86	2.26E+01	12	33	mg/kg OC	1.9	<1
EPA Site Inspection	DR273	8/26/1998	Dibenzo(a,h)anthracene	3.00E-02	1.66	1.81E+00	12	33	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Dibenzo(a,h)anthracene	3.00E-02	1.74	1.72E+00	12	33	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Dibenzo(a,h)anthracene	2.50E-02	2.04	1.23E+00	12	33	mg/kg OC	<1	<1
EPA Site Inspection	DR268	8/26/1998	Dibenzo(a,h)anthracene	2.00E-02	2.1	9.52E-01	12	33	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Dibenzo(a,h)anthracene	7.30E-03	1.8	4.06E-01	12	33	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	Dibenzo(a,h)anthracene	6.80E-03	4.01	1.70E-01	230	540	ug/kg DW	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Dibenzo(a,h)anthracene	5.70E-03	1.88	3.03E-01	12	33	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Dibenzo(a,h)anthracene	4.80E-03	2.38	2.02E-01	12	33	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Dibenzo(a,h)anthracene	4.70E-03 J	1.58	2.97E-01	12	33	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Dibenzo(a,h)anthracene	4.60E-03 J	1.75	2.63E-01	12	33	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Dibenzo(a,h)anthracene	3.70E-03 J	2.33	1.59E-01	12	33	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Dibenzo(a,h)anthracene	3.70E-03 J	1.69	2.19E-01	12	33	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Dibenzo(a,h)anthracene	3.50E-03 J	2.58	1.36E-01	12	33	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Dibenzo(a,h)anthracene	3.30E-03 J	1.7	1.94E-01	12	33	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Dibenzo(a,h)anthracene	2.40E-03 J	1.09	2.20E-01	12	33	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Dibenzo(a,h)anthracene	1.90E-03 J	0.892	2.13E-01	12	33	mg/kg OC	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Dibenzofuran	3.86E-01	1.16	3.33E+01	15	58	mg/kg OC	2.2	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Dibenzofuran	2.97E-01	1.86	1.60E+01	15	58	mg/kg OC	1.1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Dibenzofuran	4.30E-02 J	2.08	2.07E+00	15	58	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Dibenzofuran	1.00E-02 J	2.4	4.17E-01	15	58	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Dibenzofuran	1.50E-03 J	1.09	1.38E-01	15	58	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Dibenzothiophene	8.10E-04 J	1.09	7.43E-02					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Dibutyltin as ion	4.80E-03 J	2.98	1.61E-01					
EPA Site Inspection	DR273	8/26/1998	Dibutyltin as ion	2.00E-03 J	1.66	1.20E-01					
LDWRI-Benthic	B10b	8/19/2004	Dibutyltin as ion	1.70E-03 J	1.09	1.56E-01					
EPA Site Inspection	DR264	8/26/1998	Dibutyltin as ion	1.00E-03 J	1.48	6.76E-02					
EPA Site Inspection	DR270	8/26/1998	Dibutyltin as ion	1.00E-03 J	1.32	7.58E-02					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Diethyl phthalate	4.18E-01	1.16	3.60E+01	61	110	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Diethyl phthalate	3.49E-01	1.86	1.88E+01	61	110	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Diethyl phthalate	8.10E-02	1.25	6.48E+00	61	110	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	Diethyl phthalate	9.40E-03 J	4.01	2.34E-01	200	1200	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Diethyl phthalate	3.40E-03 JB	1.58	2.15E-01	61	110	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12 ^a	May-08	Diethyl phthalate	3.00E-03 JB	0.413	7.26E-01	200	1200	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11 ^a	4/28/2008	Diethyl phthalate	2.60E-03 JB	0.296	8.78E-01	200	1200	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03 ^a	4/28/2008	Diethyl phthalate	2.20E-03 JB	0.216	1.02E+00	200	1200	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	Diethyl phthalate	2.10E-03 JB	2.75	7.64E-02	61	110	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Diethyl phthalate	2.00E-03 JB	0.643	3.11E-01	61	110	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05 ^a	4/28/2008	Diethyl phthalate	1.90E-03 JB	0.394	4.82E-01	200	1200	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-04 ^a	4/28/2008	Diethyl phthalate	1.80E-03 JB	0.455	3.96E-01	200	1200	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-06 ^a	4/28/2008	Diethyl phthalate	1.80E-03 JB	0.392	4.59E-01	200	1200	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-09 ^a	4/28/2008	Diethyl phthalate	1.70E-03 JB	0.3	5.67E-01	200	1200	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Diethyl phthalate	1.60E-03 JB	0.892	1.79E-01	61	110	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Dimethyl phthalate	3.81E-01	1.16	3.28E+01	53	53	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Dimethyl phthalate	3.56E-01	1.86	1.91E+01	53	53	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Dimethyl phthalate	8.00E-02	3.39	2.36E+00	53	53	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Dimethyl phthalate	5.00E-02	2.98	1.68E+00	53	53	mg/kg OC	<1	<1
EPA Site Inspection	DR264	8/26/1998	Dimethyl phthalate	4.00E-02	1.48	2.70E+00	53	53	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Dimethyl phthalate	3.30E-02	2.59	1.27E+00	53	53	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Dimethyl phthalate	8.60E-03	2.04	4.22E-01	53	53	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Dimethyl phthalate	6.70E-03	2.2	3.05E-01	53	53	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	Dimethyl phthalate	5.60E-03	4.01	1.40E-01	71	160	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Di-n-butyl phthalate	3.87E-01	1.16	3.34E+01	220	1700	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Di-n-butyl phthalate	2.40E-01	1.86	1.29E+01	220	1700	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Di-n-butyl phthalate	2.00E-02 JB	1.12	1.79E+00	220	1700	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Di-n-butyl phthalate	2.00E-02	3.39	5.90E-01	220	1700	mg/kg OC	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Di-n-butyl phthalate	1.60E-02 JB	1.58	1.01E+00	220	1700	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Di-n-butyl phthalate	1.50E-02 JB	0.892	1.68E+00	220	1700	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11 ^a	4/28/2008	Di-n-butyl phthalate	1.30E-02 JB	0.296	4.39E+00	1400	5100	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12 ^a	May-08	Di-n-butyl phthalate	1.10E-02 JB	0.413	2.66E+00	1400	5100	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03 ^a	4/28/2008	Di-n-butyl phthalate	7.50E-03 JB	0.216	3.47E+00	1400	5100	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05 ^a	4/28/2008	Di-n-butyl phthalate	7.40E-03 JB	0.394	1.88E+00	1400	5100	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-09 ^a	4/28/2008	Di-n-butyl phthalate	7.40E-03 JB	0.3	2.47E+00	1400	5100	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-04 ^a	4/28/2008	Di-n-butyl phthalate	7.30E-03 JB	0.455	1.60E+00	1400	5100	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	Di-n-butyl phthalate	7.30E-03 JB	2.75	2.65E-01	220	1700	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-06 ^a	4/28/2008	Di-n-butyl phthalate	7.00E-03 JB	0.392	1.79E+00	1400	5100	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Di-n-butyl phthalate	6.80E-03 JB	0.643	1.06E+00	220	1700	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Di-n-octyl phthalate	5.20E-01	2.18	2.39E+01	58	4500	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Di-n-octyl phthalate	4.70E-01	1.9	2.47E+01	58	4500	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Di-n-octyl phthalate	3.46E-01	1.16	2.98E+01	58	4500	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Di-n-octyl phthalate	1.99E-01	1.86	1.07E+01	58	4500	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Dioxin/Furan TEQ	1.54E-05 J	2.98	5.17E-04					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Dioxin/Furan TEQ	3.79E-06 J	2.04	1.86E-04					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Dioxin/Furan TEQ	3.73E-06 J	1.88	1.98E-04					
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Dioxin/Furan TEQ	2.25E-06 J	2.18	1.03E-04					
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Dioxin/Furan TEQ	1.78E-06	1.9	9.39E-05					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Dioxin/Furan TEQ	1.57E-06 J	1.7	9.24E-05					
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Dioxin/Furan TEQ	1.32E-06 J	1.32	1.00E-04					
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Dioxin/Furan TEQ	1.24E-06 J	1.75	7.09E-05					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Dioxin/Furan TEQ	1.22E-06 J	2.33	5.24E-05					
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Dioxin/Furan TEQ	1.12E-06 J	1.28	8.74E-05					
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Dioxin/Furan TEQ	1.00E-06 J	2.36	4.25E-05					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Dioxin/Furan TEQ	8.00E-07 J	2.2	3.64E-05					
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Dioxin/Furan TEQ	6.11E-07 J	1.58	3.87E-05					
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Dioxin/Furan TEQ	2.94E-07 J	1.25	2.35E-05					
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Dioxin/Furan TEQ	2.62E-07	1.12	2.34E-05					
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Dioxin/Furan TEQ	1.80E-07 J	0.413	4.36E-05					
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Dioxin/Furan TEQ	1.57E-07 J	0.643	2.44E-05					
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	Dioxin/Furan TEQ	1.35E-07 J	0.3	4.50E-05					
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Dioxin/Furan TEQ	1.14E-07 J	0.296	3.84E-05					
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	Dioxin/Furan TEQ	8.41E-08 J	2.75	3.06E-06					
EPA Site Inspection	DR268	8/26/1998	Fluoranthene	1.70E+00	2.1	8.10E+01	160	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Fluoranthene	1.60E+00	2.08	7.69E+01	160	1200	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Fluoranthene	4.91E-01	1.16	4.23E+01	160	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Fluoranthene	4.80E-01	2.4	2.00E+01	160	1200	mg/kg OC	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Fluoranthene	4.70E-01	2.12	2.22E+01	160	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Fluoranthene	4.50E-01	2.98	1.51E+01	160	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Fluoranthene	4.30E-01	1.74	2.47E+01	160	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Fluoranthene	4.10E-01	3.39	1.21E+01	160	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Fluoranthene	4.00E-01	2.59	1.54E+01	160	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	Fluoranthene	3.90E-01	2.9	1.34E+01	160	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR273	8/26/1998	Fluoranthene	3.90E-01	1.66	2.35E+01	160	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Fluoranthene	3.30E-01	2.55	1.29E+01	160	1200	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Fluoranthene	2.98E-01	1.86	1.60E+01	160	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR265	8/26/1998	Fluoranthene	2.90E-01	1.03	2.82E+01	160	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Fluoranthene	2.60E-01	1.67	1.56E+01	160	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR264	8/26/1998	Fluoranthene	2.10E-01	1.48	1.42E+01	160	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR287	8/26/1998	Fluoranthene	1.80E-01	1.31	1.37E+01	160	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR266	8/26/1998	Fluoranthene	1.70E-01	1.38	1.23E+01	160	1200	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Fluoranthene	1.70E-01	2.04	8.33E+00	160	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR267	8/26/1998	Fluoranthene	1.50E-01	0.85	1.76E+01	160	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR269	8/26/1998	Fluoranthene	1.50E-01	0.9	1.67E+01	160	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Fluoranthene	1.50E-01	2.18	6.88E+00	160	1200	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Fluoranthene	1.50E-01 J	1.95	7.69E+00	160	1200	mg/kg OC	<1	<1
EPA Site Inspection	DR270	8/26/1998	Fluoranthene	1.40E-01	1.32	1.06E+01	160	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Fluoranthene	1.40E-01	1.8	7.78E+00	160	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Fluoranthene	1.10E-01	2.82	3.90E+00	160	1200	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Fluoranthene	1.10E-01 J	1.75	6.29E+00	160	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Fluoranthene	1.00E-01	1.9	5.26E+00	160	1200	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/28/1997	Fluoranthene	9.20E-02 J	1.56	5.90E+00	160	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Fluoranthene	8.30E-02	1.79	4.64E+00	160	1200	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/20/1997	Fluoranthene	8.00E-02 J	1.77	4.52E+00	160	1200	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Fluoranthene	7.10E-02	2.38	2.98E+00	160	1200	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	Fluoranthene	6.30E-02	4.01	1.57E+00	1700	2500	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Fluoranthene	6.00E-02	1.69	3.55E+00	160	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Fluoranthene	4.80E-02	1.56	3.08E+00	160	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Fluoranthene	4.60E-02	1.58	2.91E+00	160	1200	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Fluoranthene	4.40E-02	1.88	2.34E+00	160	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Fluoranthene	4.20E-02	1.52	2.76E+00	160	1200	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Fluoranthene	3.60E-02	2.33	1.55E+00	160	1200	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Fluoranthene	3.50E-02	1.09	3.21E+00	160	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Fluoranthene	3.20E-02 J	2.04	1.57E+00	160	1200	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Fluoranthene	3.00E-02	1.7	1.76E+00	160	1200	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Fluoranthene	3.00E-02	2.58	1.16E+00	160	1200	mg/kg OC	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Fluoranthene	2.60E-02	1.32	1.97E+00	160	1200	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Fluoranthene	2.60E-02	2.2	1.18E+00	160	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Fluoranthene	2.40E-02	1.28	1.88E+00	160	1200	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Fluoranthene	2.10E-02	2.28	9.21E-01	160	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Fluoranthene	1.90E-02	0.892	2.13E+00	160	1200	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Fluoranthene	1.70E-02 J	1.25	1.36E+00	160	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Fluoranthene	1.50E-02	1.75	8.57E-01	160	1200	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-U	3/4/2011	Fluoranthene	1.40E-02 J	0.844	1.66E+00	160	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Fluoranthene	1.10E-02	2.36	4.66E-01	160	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Fluoranthene	1.50E-03 J	0.643	2.33E-01	160	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-09 ^a	4/28/2008	Fluoranthene	1.10E-03 J	0.3	3.67E-01	1700	2500	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	Fluoranthene	1.00E-03 J	2.75	3.64E-02	160	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-04 ^a	4/28/2008	Fluoranthene	9.30E-04 J	0.455	2.04E-01	1700	2500	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Fluoranthene	9.00E-04 J	1.12	8.04E-02	160	1200	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12 ^a	May-08	Fluoranthene	8.20E-04 J	0.413	1.99E-01	1700	2500	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11 ^a	4/28/2008	Fluoranthene	5.50E-04 J	0.296	1.86E-01	1700	2500	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03 ^a	4/28/2008	Fluoranthene	5.00E-04 J	0.216	2.31E-01	1700	2500	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05 ^a	4/28/2008	Fluoranthene	4.60E-04 J	0.394	1.17E-01	1700	2500	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Fluorene	3.78E-01	1.16	3.26E+01	23	79	mg/kg OC	1.4	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Fluorene	3.50E-01	1.86	1.88E+01	23	79	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Fluorene	5.80E-02 J	2.08	2.79E+00	23	79	mg/kg OC	<1	<1
EPA Site Inspection	DR265	8/26/1998	Fluorene	2.00E-02	1.03	1.94E+00	23	79	mg/kg OC	<1	<1
EPA Site Inspection	DR268	8/26/1998	Fluorene	2.00E-02	2.1	9.52E-01	23	79	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Fluorene	2.00E-02	3.39	5.90E-01	23	79	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Fluorene	3.00E-03	0.892	3.36E-01	23	79	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Fluorene	1.40E-03 J	1.09	1.28E-01	23	79	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Fluorene	1.00E-03 J	1.32	7.58E-02	23	79	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Hexachlorobenzene	3.63E-01	1.16	3.13E+01	0.38	2.3	mg/kg OC	82	14
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Hexachlorobenzene	3.27E-01	1.86	1.76E+01	0.38	2.3	mg/kg OC	46	7.6
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Hexachlorobenzene	1.60E-03	2.98	5.37E-02	0.38	2.3	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Hexachlorobutadiene	3.35E-01	1.86	1.80E+01	3.9	6.2	mg/kg OC	4.6	2.9
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Hexachlorobutadiene	3.15E-01	1.16	2.72E+01	3.9	6.2	mg/kg OC	7.0	4.4
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Hexachlorocyclopentadiene	4.07E-01 J	1.86	2.19E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Hexachlorocyclopentadiene	2.70E-01	1.16	2.33E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Hexachloroethane	2.98E-01	1.16	2.57E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Hexachloroethane	2.73E-01	1.86	1.47E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Indeno(1,2,3-cd)pyrene	4.21E-01	1.86	2.26E+01	34	88	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Indeno(1,2,3-cd)pyrene	3.86E-01	1.16	3.33E+01	34	88	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Indeno(1,2,3-cd)pyrene	1.40E-01	1.74	8.05E+00	34	88	mg/kg OC	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Indeno(1,2,3-cd)pyrene	1.40E-01	2.08	6.73E+00	34	88	mg/kg OC	<1	<1
EPA Site Inspection	DR273	8/26/1998	Indeno(1,2,3-cd)pyrene	1.20E-01	1.66	7.23E+00	34	88	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Indeno(1,2,3-cd)pyrene	9.00E-02	3.39	2.65E+00	34	88	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	Indeno(1,2,3-cd)pyrene	8.00E-02	2.9	2.76E+00	34	88	mg/kg OC	<1	<1
EPA Site Inspection	DR268	8/26/1998	Indeno(1,2,3-cd)pyrene	8.00E-02	2.1	3.81E+00	34	88	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Indeno(1,2,3-cd)pyrene	6.70E-02	2.4	2.79E+00	34	88	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Indeno(1,2,3-cd)pyrene	6.70E-02	2.55	2.63E+00	34	88	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Indeno(1,2,3-cd)pyrene	6.50E-02	2.12	3.07E+00	34	88	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Indeno(1,2,3-cd)pyrene	6.10E-02 J	1.95	3.13E+00	34	88	mg/kg OC	<1	<1
EPA Site Inspection	DR287	8/26/1998	Indeno(1,2,3-cd)pyrene	6.00E-02	1.31	4.58E+00	34	88	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Indeno(1,2,3-cd)pyrene	5.80E-02 J	2.18	2.66E+00	34	88	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Indeno(1,2,3-cd)pyrene	5.20E-02 J	1.8	2.89E+00	34	88	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Indeno(1,2,3-cd)pyrene	5.10E-02	2.04	2.50E+00	34	88	mg/kg OC	<1	<1
EPA Site Inspection	DR264	8/26/1998	Indeno(1,2,3-cd)pyrene	5.00E-02	1.48	3.38E+00	34	88	mg/kg OC	<1	<1
EPA Site Inspection	DR266	8/26/1998	Indeno(1,2,3-cd)pyrene	5.00E-02	1.38	3.62E+00	34	88	mg/kg OC	<1	<1
EPA Site Inspection	DR269	8/26/1998	Indeno(1,2,3-cd)pyrene	5.00E-02	0.9	5.56E+00	34	88	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Indeno(1,2,3-cd)pyrene	4.60E-02	2.98	1.54E+00	34	88	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Indeno(1,2,3-cd)pyrene	4.60E-02	2.59	1.78E+00	34	88	mg/kg OC	<1	<1
EPA Site Inspection	DR265	8/26/1998	Indeno(1,2,3-cd)pyrene	4.00E-02	1.03	3.88E+00	34	88	mg/kg OC	<1	<1
EPA Site Inspection	DR267	8/26/1998	Indeno(1,2,3-cd)pyrene	4.00E-02	0.85	4.71E+00	34	88	mg/kg OC	<1	<1
EPA Site Inspection	DR270	8/26/1998	Indeno(1,2,3-cd)pyrene	4.00E-02	1.32	3.03E+00	34	88	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Indeno(1,2,3-cd)pyrene	4.00E-02 J	1.9	2.11E+00	34	88	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Indeno(1,2,3-cd)pyrene	3.90E-02	1.67	2.34E+00	34	88	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	Indeno(1,2,3-cd)pyrene	2.10E-02	4.01	5.24E-01	600	690	ug/kg DW	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Indeno(1,2,3-cd)pyrene	1.50E-02	1.09	1.38E+00	34	88	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Indeno(1,2,3-cd)pyrene	1.50E-02 J	2.38	6.30E-01	34	88	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Indeno(1,2,3-cd)pyrene	1.40E-02 J	1.69	8.28E-01	34	88	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Indeno(1,2,3-cd)pyrene	1.40E-02	1.88	7.45E-01	34	88	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Indeno(1,2,3-cd)pyrene	1.40E-02	1.58	8.86E-01	34	88	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Indeno(1,2,3-cd)pyrene	1.20E-02	1.56	7.69E-01	34	88	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Indeno(1,2,3-cd)pyrene	1.20E-02	1.79	6.70E-01	34	88	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Indeno(1,2,3-cd)pyrene	1.10E-02 J	1.7	6.47E-01	34	88	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Indeno(1,2,3-cd)pyrene	1.10E-02 J	2.58	4.26E-01	34	88	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Indeno(1,2,3-cd)pyrene	1.00E-02 J	2.33	4.29E-01	34	88	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Indeno(1,2,3-cd)pyrene	9.90E-03	1.52	6.51E-01	34	88	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Indeno(1,2,3-cd)pyrene	8.80E-03	1.75	5.03E-01	34	88	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Indeno(1,2,3-cd)pyrene	8.20E-03	1.28	6.41E-01	34	88	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Indeno(1,2,3-cd)pyrene	7.00E-03	1.32	5.30E-01	34	88	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Indeno(1,2,3-cd)pyrene	6.50E-03	2.82	2.30E-01	34	88	mg/kg OC	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Indeno(1,2,3-cd)pyrene	5.20E-03 J	2.36	2.20E-01	34	88	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Indeno(1,2,3-cd)pyrene	4.00E-03 J	0.892	4.48E-01	34	88	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11 ^a	4/28/2008	Indeno(1,2,3-cd)pyrene	1.70E-03 J	0.296	5.74E-01	600	690	ug/kg DW	<1	<1
EPA Site Inspection	DR285	8/25/1998	Iron	3.13E+04	3.39	9.23E+05					
EPA Site Inspection	DR263	8/25/1998	Iron	3.10E+04	2.9	1.07E+06					
EPA Site Inspection	DR266	8/26/1998	Iron	2.59E+04	1.38	1.88E+06					
EPA Site Inspection	DR287	8/26/1998	Iron	2.58E+04	1.31	1.97E+06					
EPA Site Inspection	DR269	8/26/1998	Iron	2.57E+04	0.9	2.86E+06					
EPA Site Inspection	DR268	8/26/1998	Iron	2.48E+04	2.1	1.18E+06					
EPA Site Inspection	DR293	9/14/1998	Iron	2.47E+04	1.74	1.42E+06					
EPA Site Inspection	DR265	8/26/1998	Iron	2.43E+04	1.03	2.36E+06					
EPA Site Inspection	DR273	8/26/1998	Iron	2.34E+04	1.66	1.41E+06					
KC Water Quality Assessment	WQAHAMM	6/3/1997	Iron	2.30E+04 J	1.95	1.18E+06					
EPA Site Inspection	DR264	8/26/1998	Iron	2.23E+04	1.48	1.51E+06					
EPA Site Inspection	DR270	8/26/1998	Iron	2.18E+04	1.32	1.65E+06					
EPA Site Inspection	DR267	8/26/1998	Iron	2.16E+04	0.85	2.54E+06					
KC Water Quality Assessment	WQAHAMM	5/15/1997	Iron	2.10E+04 J	1.75	1.20E+06					
KC Water Quality Assessment	WQAHAMM	5/28/1997	Iron	2.10E+04 J	1.56	1.35E+06					
KC Water Quality Assessment	WQAHAMM	5/20/1997	Iron	2.00E+04 J	1.77	1.13E+06					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Isophorone	3.64E-01	1.16	3.14E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Isophorone	3.52E-01	1.86	1.89E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Lead	2.52E+02	1.16	2.17E+04	450	530	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Lead	9.50E+01	2.55	3.73E+03	450	530	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Lead	2.80E+01	2.12	1.32E+03	450	530	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Lead	2.80E+01	1.79	1.56E+03	450	530	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Lead	2.60E+01	1.8	1.44E+03	450	530	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Lead	2.10E+01	2.98	7.05E+02	450	530	mg/kg DW	<1	<1
EPA Site Inspection	DR285	8/25/1998	Lead	2.03E+01	3.39	5.99E+02	450	530	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Lead	2.00E+01	2.08	9.62E+02	450	530	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Lead	1.90E+01	2.59	7.34E+02	450	530	mg/kg DW	<1	<1
EPA Site Inspection	DR263	8/25/1998	Lead	1.86E+01	2.9	6.41E+02	450	530	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Lead	1.80E+01	2.28	7.89E+02	450	530	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Lead	1.50E+01	2.04	7.35E+02	450	530	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Lead	1.40E+01	2.4	5.83E+02	450	530	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Lead	1.30E+01 B	2.18	5.96E+02	450	530	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Lead	1.30E+01	1.67	7.78E+02	450	530	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Lead	1.30E+01	2.82	4.61E+02	450	530	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	Lead	1.30E+01 J	4.01	3.24E+02	450	530	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Lead	1.30E+01	1.69	7.69E+02	450	530	mg/kg DW	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR273	8/26/1998	Lead	1.29E+01	1.66	7.77E+02	450	530	mg/kg DW	<1	<1
EPA Site Inspection	DR265	8/26/1998	Lead	1.27E+01 J	1.03	1.23E+03	450	530	mg/kg DW	<1	<1
EPA Site Inspection	DR293	9/14/1998	Lead	1.25E+01 J	1.74	7.18E+02	450	530	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Lead	1.20E+01 B	1.9	6.32E+02	450	530	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Lead	1.20E+01	2.58	4.65E+02	450	530	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Lead	1.20E+01	1.95	6.15E+02	450	530	mg/kg DW	<1	<1
EPA Site Inspection	DR266	8/26/1998	Lead	1.18E+01 J	1.38	8.55E+02	450	530	mg/kg DW	<1	<1
EPA Site Inspection	DR264	8/26/1998	Lead	1.15E+01 J	1.48	7.77E+02	450	530	mg/kg DW	<1	<1
EPA Site Inspection	DR269	8/26/1998	Lead	1.15E+01 J	0.9	1.28E+03	450	530	mg/kg DW	<1	<1
EPA Site Inspection	DR287	8/26/1998	Lead	1.13E+01 J	1.31	8.63E+02	450	530	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Lead	1.10E+01	1.56	7.05E+02	450	530	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/20/1997	Lead	1.10E+01	1.77	6.21E+02	450	530	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Lead	1.10E+01	1.75	6.29E+02	450	530	mg/kg DW	<1	<1
EPA Site Inspection	DR268	8/26/1998	Lead	1.05E+01 J	2.1	5.00E+02	450	530	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Lead	1.00E+01	1.7	5.88E+02	450	530	mg/kg DW	<1	<1
EPA Site Inspection	DR270	8/26/1998	Lead	9.29E+00	1.32	7.04E+02	450	530	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Lead	9.00E+00	2.33	3.86E+02	450	530	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Lead	9.00E+00	2.38	3.78E+02	450	530	mg/kg DW	<1	<1
EPA Site Inspection	DR267	8/26/1998	Lead	8.93E+00 J	0.85	1.05E+03	450	530	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/28/1997	Lead	8.50E+00	1.56	5.45E+02	450	530	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Lead	7.80E+00 B	1.58	4.94E+02	450	530	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Lead	7.00E+00	1.52	4.61E+02	450	530	mg/kg DW	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Lead	6.40E+00 J	1.09	5.87E+02	450	530	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Lead	6.10E+00 B	1.12	5.45E+02	450	530	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Lead	6.00E+00	1.25	4.80E+02	450	530	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Lead	6.00E+00 J	2.2	2.73E+02	450	530	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Lead	4.50E+00 B	0.394	1.14E+03	450	530	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 1	LDW-SS134	1/24/2005	Lead	4.00E+00	0.39	1.03E+03	450	530	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Lead	4.00E+00 J	1.86	2.15E+02	450	530	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Lead	3.80E+00 B	0.892	4.26E+02	450	530	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	Lead	3.80E+00 B	0.3	1.27E+03	450	530	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Lead	3.70E+00 B	0.216	1.71E+03	450	530	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Lead	3.60E+00 B	0.296	1.22E+03	450	530	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	Lead	3.50E+00 B	0.455	7.69E+02	450	530	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Lead	3.40E+00 B	0.643	5.29E+02	450	530	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Lead	3.20E+00 B	0.413	7.75E+02	450	530	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-06	4/28/2008	Lead	3.10E+00 B	0.392	7.91E+02	450	530	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-U	3/4/2011	Lead	3.00E+00	0.844	3.55E+02	450	530	mg/kg DW	<1	<1
EPA Site Inspection	DR273	8/26/1998	Manganese	7.79E+02	1.66	4.69E+04					

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR287	8/26/1998	Manganese	4.89E+02	1.31	3.73E+04					
EPA Site Inspection	DR269	8/26/1998	Manganese	4.53E+02	0.9	5.03E+04					
EPA Site Inspection	DR266	8/26/1998	Manganese	4.41E+02	1.38	3.20E+04					
EPA Site Inspection	DR265	8/26/1998	Manganese	4.32E+02	1.03	4.19E+04					
EPA Site Inspection	DR267	8/26/1998	Manganese	4.05E+02	0.85	4.76E+04					
EPA Site Inspection	DR264	8/26/1998	Manganese	3.66E+02	1.48	2.47E+04					
EPA Site Inspection	DR293	9/14/1998	Manganese	3.58E+02	1.74	2.06E+04					
EPA Site Inspection	DR270	8/26/1998	Manganese	3.34E+02	1.32	2.53E+04					
EPA Site Inspection	DR285	8/25/1998	Manganese	3.34E+02	3.39	9.85E+03					
EPA Site Inspection	DR263	8/25/1998	Manganese	3.29E+02	2.9	1.13E+04					
EPA Site Inspection	DR268	8/26/1998	Manganese	2.77E+02	2.1	1.32E+04					
EPA Site Inspection	DR267	8/26/1998	Mercury	3.90E-01	0.85	4.59E+01	0.41	0.59	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Mercury	3.20E-01	1.16	2.76E+01	0.41	0.59	mg/kg DW	<1	<1
EPA Site Inspection	DR293	9/14/1998	Mercury	2.10E-01	1.74	1.21E+01	0.41	0.59	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Mercury	1.60E-01	2.28	7.02E+00	0.41	0.59	mg/kg DW	<1	<1
EPA Site Inspection	DR266	8/26/1998	Mercury	1.40E-01	1.38	1.01E+01	0.41	0.59	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Mercury	1.30E-01 H	1.9	6.84E+00	0.41	0.59	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Mercury	1.30E-01	2.12	6.13E+00	0.41	0.59	mg/kg DW	<1	<1
EPA Site Inspection	DR263	8/25/1998	Mercury	1.20E-01	2.9	4.14E+00	0.41	0.59	mg/kg DW	<1	<1
EPA Site Inspection	DR264	8/26/1998	Mercury	1.20E-01	1.48	8.11E+00	0.41	0.59	mg/kg DW	<1	<1
EPA Site Inspection	DR273	8/26/1998	Mercury	1.20E-01	1.66	7.23E+00	0.41	0.59	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Mercury	1.20E-01	2.38	5.04E+00	0.41	0.59	mg/kg DW	<1	<1
EPA Site Inspection	DR285	8/25/1998	Mercury	1.10E-01	3.39	3.24E+00	0.41	0.59	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Mercury	1.10E-01	1.79	6.15E+00	0.41	0.59	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Mercury	1.00E-01	2.98	3.36E+00	0.41	0.59	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Mercury	1.00E-01	2.59	3.86E+00	0.41	0.59	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	Mercury	1.00E-01	4.01	2.49E+00	0.41	0.59	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Mercury	9.80E-02 H	2.18	4.50E+00	0.41	0.59	mg/kg DW	<1	<1
EPA Site Inspection	DR270	8/26/1998	Mercury	9.00E-02	1.32	6.82E+00	0.41	0.59	mg/kg DW	<1	<1
EPA Site Inspection	DR287	8/26/1998	Mercury	9.00E-02	1.31	6.87E+00	0.41	0.59	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Mercury	9.00E-02	1.7	5.29E+00	0.41	0.59	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Mercury	9.00E-02	1.95	4.62E+00	0.41	0.59	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Mercury	8.00E-02	2.58	3.10E+00	0.41	0.59	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Mercury	8.00E-02	2.04	3.92E+00	0.41	0.59	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/28/1997	Mercury	8.00E-02	1.56	5.13E+00	0.41	0.59	mg/kg DW	<1	<1
EPA Site Inspection	DR268	8/26/1998	Mercury	7.00E-02	2.1	3.33E+00	0.41	0.59	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Mercury	7.00E-02	1.56	4.49E+00	0.41	0.59	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Mercury	7.00E-02	2.33	3.00E+00	0.41	0.59	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Mercury	7.00E-02	1.69	4.14E+00	0.41	0.59	mg/kg DW	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Mercury	7.00E-02	1.8	3.89E+00	0.41	0.59	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Mercury	7.00E-02	1.75	4.00E+00	0.41	0.59	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/20/1997	Mercury	6.00E-02	1.77	3.39E+00	0.41	0.59	mg/kg DW	<1	<1
EPA Site Inspection	DR265	8/26/1998	Mercury	5.00E-02	1.03	4.85E+00	0.41	0.59	mg/kg DW	<1	<1
EPA Site Inspection	DR269	8/26/1998	Mercury	5.00E-02	0.9	5.56E+00	0.41	0.59	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Mercury	3.10E-02	0.643	4.82E+00	0.41	0.59	mg/kg DW	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Mercury	3.00E-02	1.09	2.75E+00	0.41	0.59	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Mercury	2.90E-02	1.58	1.84E+00	0.41	0.59	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Mercury	1.90E-02 J	0.216	8.80E+00	0.41	0.59	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Mercury	1.70E-02 J	0.296	5.74E+00	0.41	0.59	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	Mercury	1.50E-02 J	0.455	3.30E+00	0.41	0.59	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Mercury	1.20E-02 J	0.394	3.05E+00	0.41	0.59	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Mercury	8.90E-03 J	1.12	7.95E-01	0.41	0.59	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Methylmercury	2.35E-03	1.95	1.21E-01					
KC Water Quality Assessment	WQAHAMM	5/28/1997	Methylmercury	2.29E-03	1.56	1.47E-01					
KC Water Quality Assessment	WQAHAMM	5/15/1997	Methylmercury	2.18E-03	1.75	1.25E-01					
KC Water Quality Assessment	WQAHAMM	5/20/1997	Methylmercury	2.11E-03	1.77	1.19E-01					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Molybdenum	2.00E+00	2.98	6.71E+01					
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Molybdenum	2.00E+00	2.4	8.33E+01					
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Molybdenum	2.00E+00	2.12	9.43E+01					
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Molybdenum	2.00E+00	2.55	7.84E+01					
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Molybdenum	1.40E+00	2.28	6.14E+01					
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Molybdenum	1.20E+00	1.56	7.69E+01					
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Molybdenum	1.20E+00	1.67	7.19E+01					
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Molybdenum	1.00E+00	2.59	3.86E+01					
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Molybdenum	1.00E+00	1.52	6.58E+01					
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Molybdenum	1.00E+00	2.82	3.55E+01					
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Molybdenum	1.00E+00	2.08	4.81E+01					
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Molybdenum	9.00E-01	1.79	5.03E+01					
LDWRI-Surface Sediment Round 1	LDW-SS134	1/24/2005	Molybdenum	8.00E-01	0.39	2.05E+02					
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Molybdenum	5.00E-01	1.8	2.78E+01					
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Molybdenum	4.00E-01	2.04	1.96E+01					
LDWRI-Benthic	B10b	8/19/2004	Molybdenum	3.99E-01	1.09	3.66E+01					
LDWRI-Benthic	B10b	8/19/2004	Monobutyltin as ion	4.60E-04 J	1.09	4.22E-02					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Naphthalene	2.95E-01	1.16	2.54E+01	99	170	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Naphthalene	2.86E-01	1.86	1.54E+01	99	170	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Naphthalene	2.20E-02	1.69	1.30E+00	99	170	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Naphthalene	1.40E-03 J	1.58	8.86E-02	99	170	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Naphthalene	6.80E-04 J	0.892	7.62E-02	99	170	mg/kg OC	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR266	8/26/1998	n-Butyltin	3.00E-03 J	1.38	2.17E-01					
EPA Site Inspection	DR273	8/26/1998	n-Butyltin	2.00E-03 J	1.66	1.20E-01					
EPA Site Inspection	DR270	8/26/1998	n-Butyltin	1.00E-03 J	1.32	7.58E-02					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Nickel	2.30E+01	2.98	7.72E+02					
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Nickel	2.30E+01	2.08	1.11E+03					
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Nickel	2.10E+01 B	2.18	9.63E+02					
KC Water Quality Assessment	WQAHAMM	6/3/1997	Nickel	2.02E+01	1.95	1.04E+03					
EPA Site Inspection	DR285	8/25/1998	Nickel	2.01E+01	3.39	5.93E+02					
EPA Site Inspection	DR263	8/25/1998	Nickel	2.00E+01	2.9	6.90E+02					
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Nickel	2.00E+01 B	1.9	1.05E+03					
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Nickel	2.00E+01	2.59	7.72E+02					
KC Water Quality Assessment	WQAHAMM	5/15/1997	Nickel	1.91E+01	1.75	1.09E+03					
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Nickel	1.90E+01	2.28	8.33E+02					
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Nickel	1.90E+01	2.12	8.96E+02					
KC Water Quality Assessment	WQAHAMM	5/28/1997	Nickel	1.87E+01	1.56	1.20E+03					
EPA Site Inspection	DR268	8/26/1998	Nickel	1.84E+01 J	2.1	8.76E+02					
KC Water Quality Assessment	WQAHAMM	5/20/1997	Nickel	1.81E+01	1.77	1.02E+03					
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Nickel	1.80E+01	1.56	1.15E+03					
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Nickel	1.80E+01	1.67	1.08E+03					
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Nickel	1.80E+01	2.82	6.38E+02					
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Nickel	1.80E+01	2.4	7.50E+02					
EPA Site Inspection	DR293	9/14/1998	Nickel	1.76E+01	1.74	1.01E+03					
EPA Site Inspection	DR287	8/26/1998	Nickel	1.67E+01 J	1.31	1.27E+03					
EPA Site Inspection	DR269	8/26/1998	Nickel	1.63E+01 J	0.9	1.81E+03					
EPA Site Inspection	DR266	8/26/1998	Nickel	1.60E+01 J	1.38	1.16E+03					
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Nickel	1.60E+01	1.79	8.94E+02					
EPA Site Inspection	DR264	8/26/1998	Nickel	1.59E+01 J	1.48	1.07E+03					
EPA Site Inspection	DR273	8/26/1998	Nickel	1.50E+01	1.66	9.04E+02					
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Nickel	1.50E+01	2.55	5.88E+02					
EPA Site Inspection	DR267	8/26/1998	Nickel	1.47E+01 J	0.85	1.73E+03					
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Nickel	1.45E+01	1.8	8.06E+02					
EPA Site Inspection	DR265	8/26/1998	Nickel	1.43E+01 J	1.03	1.39E+03					
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Nickel	1.40E+01 B	0.296	4.73E+03					
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Nickel	1.40E+01	1.52	9.21E+02					
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Nickel	1.40E+01	1.58	8.86E+02					
EPA Site Inspection	DR270	8/26/1998	Nickel	1.34E+01	1.32	1.02E+03					
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	Nickel	1.20E+01 B	0.455	2.64E+03					
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Nickel	1.20E+01 B	0.394	3.05E+03					
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Nickel	1.20E+01 B	0.643	1.87E+03					

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Nickel	1.20E+01	0.413	2.91E+03					
LDWRI-Benthic	B10b	8/19/2004	Nickel	1.14E+01	1.09	1.05E+03					
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Nickel	1.14E+01	2.04	5.59E+02					
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Nickel	1.10E+01 B	0.216	5.09E+03					
Duwamish River RM 4.9 to 7.4	DR-06	4/28/2008	Nickel	1.10E+01 B	0.392	2.81E+03					
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	Nickel	1.10E+01 B	0.3	3.67E+03					
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Nickel	9.70E+00 B	0.892	1.09E+03					
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Nickel	8.10E+00 B	1.12	7.23E+02					
LDWRI-Surface Sediment Round 1	LDW-SS134	1/24/2005	Nickel	8.00E+00	0.39	2.05E+03					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Nitrobenzene	3.47E-01	1.86	1.87E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Nitrobenzene	3.24E-01	1.16	2.79E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	N-Nitrosodimethylamine	2.98E-01	1.86	1.60E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	N-Nitrosodimethylamine	2.85E-01	1.16	2.46E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	N-Nitrosodimethylamine	2.68E-01	1.16	2.31E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	N-Nitrosodi-n-propylamine	3.25E-01	1.86	1.75E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	N-Nitrosodi-n-propylamine	3.18E-01	1.86	1.71E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	N-Nitrosodi-n-propylamine	3.14E-01	1.16	2.71E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	N-Nitrosodi-n-propylamine	3.04E-01	1.86	1.63E+01					
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	N-Nitrosodi-n-propylamine	2.97E-01	1.86	1.60E+01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	N-Nitrosodiphenylamine	3.71E-01	1.16	3.20E+01	11	11	mg/kg OC	2.9	2.9
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	N-Nitrosodiphenylamine	2.73E-01	1.86	1.47E+01	11	11	mg/kg OC	1.3	1.3
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	N-Nitrosodiphenylamine	8.00E-03	2.28	3.51E-01	11	11	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	OCDD	1.61E-03	2.98	5.40E-02					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	OCDD	7.54E-04	2.04	3.70E-02					
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	OCDD	5.60E-04	2.18	2.57E-02					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	OCDD	5.48E-04	1.88	2.91E-02					
EPA Site Inspection	DR264	8/26/1998	OCDD	5.30E-04	1.48	3.58E-02					
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	OCDD	4.30E-04	1.9	2.26E-02					
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	OCDD	2.60E-04	1.75	1.49E-02					
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	OCDD	2.50E-04	1.28	1.95E-02					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	OCDD	2.41E-04	1.7	1.42E-02					
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	OCDD	2.00E-04	2.36	8.47E-03					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	OCDD	1.90E-04	2.33	8.15E-03					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	OCDD	1.32E-04	2.2	6.00E-03					
Duwamish River RM 4.9 to 7.4	OR-11	May-08	OCDD	1.30E-04	1.58	8.23E-03					
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	OCDD	1.20E-04	1.32	9.09E-03					
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	OCDD	8.00E-05	1.12	7.14E-03					
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	OCDD	5.96E-05	1.25	4.77E-03					
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	OCDD	3.50E-05	0.3	1.17E-02					

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Duwamish River RM 4.9 to 7.4	OR-12	May-08	OCDD	9.90E-06 J	0.413	2.40E-03					
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	OCDD	7.50E-06 J	2.75	2.73E-04					
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	OCDD	6.90E-06 J	0.296	2.33E-03					
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	OCDD	6.40E-06 J	0.643	9.95E-04					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	OCDF	6.36E-05	2.98	2.13E-03					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	OCDF	5.37E-05	2.04	2.63E-03					
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	OCDF	4.60E-05	1.88	2.45E-03					
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	OCDF	3.40E-05	2.18	1.56E-03					
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	OCDF	2.70E-05	1.9	1.42E-03					
EPA Site Inspection	DR264	8/26/1998	OCDF	2.20E-05	1.48	1.49E-03					
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	OCDF	1.70E-05	1.75	9.71E-04					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	OCDF	1.51E-05	1.7	8.88E-04					
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	OCDF	1.30E-05 J	1.28	1.02E-03					
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	OCDF	1.20E-05 J	2.36	5.08E-04					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	OCDF	1.16E-05	2.2	5.27E-04					
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	OCDF	9.20E-06 J	1.32	6.97E-04					
Duwamish River RM 4.9 to 7.4	OR-11	May-08	OCDF	8.30E-06 J	1.58	5.25E-04					
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	OCDF	2.69E-06 J	1.25	2.15E-04					
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	PCBs (total calc'd)	5.20E-01	2.55	2.04E+01	12	65	mg/kg OC	1.7	<1
NOAA Site Characterization	WIT258	10/1/1997	PCBs (total calc'd)	3.40E-01	1.59	2.14E+01	12	65	mg/kg OC	1.8	<1
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	PCBs (total calc'd)	2.40E-01	2.28	1.05E+01	12	65	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	PCBs (total calc'd)	1.27E-01	1.88	6.76E+00	12	65	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	PCBs (total calc'd)	9.80E-02	2.08	4.71E+00	12	65	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	PCBs (total calc'd)	8.80E-02 J	1.8	4.89E+00	12	65	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	PCBs (total calc'd)	6.00E-02	2.04	2.94E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WST303	10/23/1997	PCBs (total calc'd)	6.00E-02	2.54	2.36E+00	12	65	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	PCBs (total calc'd)	5.40E-02	1.79	3.02E+00	12	65	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	PCBs (total calc'd)	5.30E-02	3.39	1.56E+00	12	65	mg/kg OC	<1	<1
EPA Site Inspection	DR264	8/26/1998	PCBs (total calc'd)	5.10E-02	1.48	3.45E+00	12	65	mg/kg OC	<1	<1
EPA Site Inspection	DR266	8/26/1998	PCBs (total calc'd)	5.10E-02	1.38	3.70E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WIT259	10/1/1997	PCBs (total calc'd)	5.10E-02	0.67	7.61E+00	12	65	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	PCBs (total calc'd)	5.00E-02	2.9	1.72E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WIT257	10/2/1997	PCBs (total calc'd)	4.60E-02	1.33	3.46E+00	12	65	mg/kg OC	<1	<1
EPA Site Inspection	DR273	8/26/1998	PCBs (total calc'd)	4.50E-02	1.66	2.71E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WIT252	9/29/1997	PCBs (total calc'd)	4.30E-02	0.8	5.38E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WIT252	9/29/1997	PCBs (total calc'd)	4.30E-02	0.8	5.38E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WST306	10/21/1997	PCBs (total calc'd)	3.90E-02	1.52	2.57E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	CH0003	10/9/1997	PCBs (total calc'd)	3.70E-02	2.33	1.59E+00	12	65	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	PCBs (total calc'd)	3.60E-02 J	2.59	1.39E+00	12	65	mg/kg OC	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
NOAA Site Characterization	WST306	10/21/1997	PCBs (total calc'd)	3.50E-02	1.52	2.30E+00	12	65	mg/kg OC	<1	<1
EPA Site Inspection	DR268	8/26/1998	PCBs (total calc'd)	3.40E-02	2.1	1.62E+00	12	65	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	PCBs (total calc'd)	3.40E-02	1.69	2.01E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WIT249	10/1/1997	PCBs (total calc'd)	3.40E-02	1.72	1.98E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WST301	10/20/2007	PCBs (total calc'd)	3.20E-02	1.63	1.96E+00	12	65	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	PCBs (total calc'd)	3.00E-02	2.04	1.47E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WST310	11/13/1997	PCBs (total calc'd)	2.90E-02	1.39	2.09E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WST304	10/21/1997	PCBs (total calc'd)	2.60E-02	0.89	2.92E+00	12	65	mg/kg OC	<1	<1
EPA Site Inspection	DR287	8/26/1998	PCBs (total calc'd)	2.50E-02	1.31	1.91E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WIT255	9/29/1997	PCBs (total calc'd)	2.50E-02	2.11	1.18E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WST308	10/1/1997	PCBs (total calc'd)	2.30E-02	0.9	2.56E+00	12	65	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	PCBs (total calc'd)	2.20E-02 J	2.98	7.38E-01	12	65	mg/kg OC	<1	<1
EPA Site Inspection	DR267	8/26/1998	PCBs (total calc'd)	2.10E-02	0.85	2.47E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WST305	10/21/1997	PCBs (total calc'd)	2.10E-02	0.93	2.26E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WST312	10/23/1997	PCBs (total calc'd)	2.10E-02	1.74	1.21E+00	12	65	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	PCBs (total calc'd)	1.90E-02	4.01	4.74E-01	130	1000	ug/kg DW	<1	<1
NOAA Site Characterization	WST300	10/8/1997	PCBs (total calc'd)	1.70E-02	1.31	1.30E+00	12	65	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	PCBs (total calc'd)	1.60E-02 J	2.33	6.87E-01	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WIT250	10/1/1997	PCBs (total calc'd)	1.60E-02	1.3	1.23E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WIT260	10/1/1997	PCBs (total calc'd)	1.60E-02	0.93	1.72E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WST309	10/1/1997	PCBs (total calc'd)	1.60E-02	0.93	1.72E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WIT256	11/13/1997	PCBs (total calc'd)	1.30E-02	1.96	6.63E-01	12	65	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	PCBs (total calc'd)	1.20E-02	2.2	5.45E-01	12	65	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	PCBs (total calc'd)	1.20E-02	2.38	5.04E-01	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WIT261	10/1/1997	PCBs (total calc'd)	1.10E-02	0.67	1.64E+00	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WST302 ^a	10/1/1997	PCBs (total calc'd)	1.10E-02	0.36	3.06E+00	130	1000	ug/kg DW	<1	<1
LDWRI-Benthic	B10b	8/19/2004	PCBs (total calc'd)	9.80E-03 J	1.09	8.99E-01	12	65	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	PCBs (total calc'd)	9.10E-03	1.16	7.84E-01	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WIT251	9/29/1997	PCBs (total calc'd)	8.70E-03	0.95	9.16E-01	12	65	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	PCBs (total calc'd)	8.50E-03 J	1.7	5.00E-01	12	65	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	PCBs (total calc'd)	8.00E-03 J	2.58	3.10E-01	12	65	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	PCBs (total calc'd)	7.30E-03	1.86	3.92E-01	12	65	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03 ^a	4/28/2008	PCBs (total calc'd)	3.40E-03 J	0.216	1.57E+00	130	1000	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-06 ^a	4/28/2008	PCBs (total calc'd)	3.00E-03 J	0.392	7.65E-01	130	1000	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-04 ^a	4/28/2008	PCBs (total calc'd)	2.90E-03 J	0.455	6.37E-01	130	1000	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-09 ^a	4/28/2008	PCBs (total calc'd)	2.70E-03 J	0.3	9.00E-01	130	1000	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	PCBs (total calc'd)	2.70E-03 J	1.12	2.41E-01	12	65	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05 ^a	4/28/2008	PCBs (total calc'd)	2.60E-03 J	0.394	6.60E-01	130	1000	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	PCBs (total calc'd)	2.60E-03 J	2.75	9.45E-02	12	65	mg/kg OC	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	PCBs (total calc'd)	2.50E-03 J	0.643	3.89E-01	12	65	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	PCBs (total calc'd)	2.30E-03 J	0.892	2.58E-01	12	65	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	PCBs (total calc'd)	2.10E-03 J	1.28	1.64E-01	12	65	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	PCBs (total calc'd)	1.90E-03	1.75	1.09E-01	12	65	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	PCBs (total calc'd)	1.70E-03 J	2.36	7.20E-02	12	65	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	PCBs (total calc'd)	8.60E-04 J	1.32	6.52E-02	12	65	mg/kg OC	<1	<1
NOAA Site Characterization	WIT252	9/29/1997	PCTs (total)	3.20E-02	0.8	4.00E+00					
NOAA Site Characterization	WIT258	10/1/1997	PCTs (total)	1.80E-02	1.59	1.13E+00					
NOAA Site Characterization	CH0003	10/9/1997	PCTs (total)	8.40E-03	2.33	3.61E-01					
NOAA Site Characterization	WIT249	10/1/1997	PCTs (total)	8.10E-03 J	1.72	4.71E-01					
NOAA Site Characterization	WST301	10/20/2007	PCTs (total)	7.90E-03 J	1.63	4.85E-01					
NOAA Site Characterization	WST308	10/1/1997	PCTs (total)	7.90E-03 J	0.9	8.78E-01					
NOAA Site Characterization	WST303	10/23/1997	PCTs (total)	7.50E-03 J	2.54	2.95E-01					
NOAA Site Characterization	WST306	10/21/1997	PCTs (total)	6.50E-03 J	1.52	4.28E-01					
NOAA Site Characterization	WIT255	9/29/1997	PCTs (total)	6.30E-03 J	2.11	2.99E-01					
NOAA Site Characterization	WST312	10/23/1997	PCTs (total)	5.80E-03 J	1.74	3.33E-01					
NOAA Site Characterization	WIT256	11/13/1997	PCTs (total)	5.70E-03 J	1.96	2.91E-01					
NOAA Site Characterization	WST310	11/13/1997	PCTs (total)	5.50E-03 J	1.39	3.96E-01					
NOAA Site Characterization	WIT251	9/29/1997	PCTs (total)	4.30E-03 J	0.95	4.53E-01					
NOAA Site Characterization	WST300	10/8/1997	PCTs (total)	4.20E-03 J	1.31	3.21E-01					
NOAA Site Characterization	WIT250	10/1/1997	PCTs (total)	3.90E-03 J	1.3	3.00E-01					
NOAA Site Characterization	WST304	10/21/1997	PCTs (total)	3.90E-03 J	0.89	4.38E-01					
NOAA Site Characterization	WST305	10/21/1997	PCTs (total)	3.10E-03 J	0.93	3.33E-01					
NOAA Site Characterization	WIT260	10/1/1997	PCTs (total)	2.60E-03 J	0.93	2.80E-01					
NOAA Site Characterization	WIT259	10/1/1997	PCTs (total)	2.20E-03 J	0.67	3.28E-01					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Pentachlorophenol	4.81E-01	1.16	4.15E+01	360	690	ug/kg DW	1.3	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Pentachlorophenol	3.99E-01	1.86	2.15E+01	360	690	ug/kg DW	1.1	<1
LDWRI-Benthic	B10b	8/19/2004	Perylene	1.50E-02	1.09	1.38E+00					
EPA Site Inspection	DR268	8/26/1998	Phenanthrene	4.60E-01	2.1	2.19E+01	100	480	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Phenanthrene	4.03E-01	1.16	3.47E+01	100	480	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Phenanthrene	3.26E-01	1.86	1.75E+01	100	480	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Phenanthrene	2.10E-01	1.74	1.21E+01	100	480	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Phenanthrene	1.90E-01	2.12	8.96E+00	100	480	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Phenanthrene	1.90E-01	2.08	9.13E+00	100	480	mg/kg OC	<1	<1
EPA Site Inspection	DR273	8/26/1998	Phenanthrene	1.80E-01	1.66	1.08E+01	100	480	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	Phenanthrene	1.60E-01	2.9	5.52E+00	100	480	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Phenanthrene	1.50E-01	3.39	4.42E+00	100	480	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Phenanthrene	1.50E-01	2.4	6.25E+00	100	480	mg/kg OC	<1	<1
EPA Site Inspection	DR265	8/26/1998	Phenanthrene	1.10E-01	1.03	1.07E+01	100	480	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Phenanthrene	9.40E-02	1.67	5.63E+00	100	480	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Phenanthrene	9.40E-02 J	1.95	4.82E+00	100	480	mg/kg OC	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Phenanthrene	9.10E-02	2.59	3.51E+00	100	480	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Phenanthrene	9.00E-02	2.98	3.02E+00	100	480	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Phenanthrene	9.00E-02	2.55	3.53E+00	100	480	mg/kg OC	<1	<1
EPA Site Inspection	DR287	8/26/1998	Phenanthrene	8.00E-02	1.31	6.11E+00	100	480	mg/kg OC	<1	<1
EPA Site Inspection	DR264	8/26/1998	Phenanthrene	7.00E-02	1.48	4.73E+00	100	480	mg/kg OC	<1	<1
EPA Site Inspection	DR266	8/26/1998	Phenanthrene	7.00E-02	1.38	5.07E+00	100	480	mg/kg OC	<1	<1
EPA Site Inspection	DR267	8/26/1998	Phenanthrene	7.00E-02	0.85	8.24E+00	100	480	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Phenanthrene	6.80E-02	1.79	3.80E+00	100	480	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Phenanthrene	6.30E-02 J	1.75	3.60E+00	100	480	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Phenanthrene	6.10E-02	2.18	2.80E+00	100	480	mg/kg OC	<1	<1
EPA Site Inspection	DR269	8/26/1998	Phenanthrene	6.00E-02	0.9	6.67E+00	100	480	mg/kg OC	<1	<1
EPA Site Inspection	DR270	8/26/1998	Phenanthrene	6.00E-02	1.32	4.55E+00	100	480	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/28/1997	Phenanthrene	6.00E-02 J	1.56	3.85E+00	100	480	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Phenanthrene	5.80E-02	2.38	2.44E+00	100	480	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Phenanthrene	5.20E-02	1.9	2.74E+00	100	480	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Phenanthrene	5.20E-02 J	1.8	2.89E+00	100	480	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/20/1997	Phenanthrene	5.20E-02 J	1.77	2.94E+00	100	480	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Phenanthrene	5.00E-02	2.04	2.45E+00	100	480	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Phenanthrene	4.00E-02 J	2.82	1.42E+00	100	480	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Phenanthrene	3.10E-02	1.69	1.83E+00	100	480	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	Phenanthrene	2.80E-02	4.01	6.98E-01	1500	5400	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Phenanthrene	2.50E-02	2.33	1.07E+00	100	480	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Phenanthrene	2.20E-02	1.7	1.29E+00	100	480	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Phenanthrene	2.10E-02	2.2	9.55E-01	100	480	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Phenanthrene	2.00E-02	1.56	1.28E+00	100	480	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Phenanthrene	1.90E-02	1.58	1.20E+00	100	480	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Phenanthrene	1.70E-02	0.892	1.91E+00	100	480	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Phenanthrene	1.70E-02 J	2.58	6.59E-01	100	480	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	Phenanthrene	1.70E-02	1.88	9.04E-01	100	480	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Phenanthrene	1.50E-02	1.09	1.38E+00	100	480	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Phenanthrene	1.20E-02	1.32	9.09E-01	100	480	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Phenanthrene	1.10E-02	1.28	8.59E-01	100	480	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Phenanthrene	1.00E-02 J	1.25	8.00E-01	100	480	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Phenanthrene	6.00E-03	1.75	3.43E-01	100	480	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Phenanthrene	5.50E-03	2.36	2.33E-01	100	480	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Phenanthrene	1.80E-03 J	0.643	2.80E-01	100	480	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	Phenanthrene	1.50E-03 J	2.75	5.45E-02	100	480	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Phenanthrene	1.00E-03 J	1.12	8.93E-02	100	480	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12 ^a	May-08	Phenanthrene	9.80E-04 J	0.413	2.37E-01	1500	5400	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-09 ^a	4/28/2008	Phenanthrene	5.30E-04 J	0.3	1.77E-01	1500	5400	ug/kg DW	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Phenol	3.45E-01	1.16	2.97E+01	420	1200	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Phenol	3.45E-01	1.86	1.85E+01	420	1200	ug/kg DW	<1	<1
EPA Site Inspection	DR270	8/26/1998	Phenol	1.20E-01 J	1.32	9.09E+00	420	1200	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Phenol	9.90E-02 J	1.9	5.21E+00	420	1200	ug/kg DW	<1	<1
EPA Site Inspection	DR265	8/26/1998	Phenol	9.00E-02	1.03	8.74E+00	420	1200	ug/kg DW	<1	<1
EPA Site Inspection	DR273	8/26/1998	Phenol	6.00E-02 J	1.66	3.61E+00	420	1200	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Phenol	5.90E-02 J	2.18	2.71E+00	420	1200	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Phenol	3.20E-02	1.7	1.88E+00	420	1200	ug/kg DW	<1	<1
EPA Site Inspection	DR269	8/26/1998	Phenol	3.00E-02	0.9	3.33E+00	420	1200	ug/kg DW	<1	<1
EPA Site Inspection	DR287	8/26/1998	Phenol	3.00E-02	1.31	2.29E+00	420	1200	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Phenol	2.50E-02	1.69	1.48E+00	420	1200	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	Phenol	1.60E-02 J	4.01	3.99E-01	420	1200	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Phenol	1.40E-02 J	2.38	5.88E-01	420	1200	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Phenol	1.20E-02 J	2.33	5.15E-01	420	1200	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Phenol	1.20E-02 J	2.58	4.65E-01	420	1200	ug/kg DW	<1	<1
EPA Site Inspection	DR268	8/26/1998	Pyrene	1.60E+00	2.1	7.62E+01	1000	1400	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Pyrene	7.60E-01	2.08	3.65E+01	1000	1400	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Pyrene	5.00E-01	1.16	4.31E+01	1000	1400	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Pyrene	3.64E-01	1.86	1.96E+01	1000	1400	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Pyrene	3.60E-01	2.12	1.70E+01	1000	1400	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Pyrene	3.50E-01	1.74	2.01E+01	1000	1400	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Pyrene	3.30E-01	3.39	9.73E+00	1000	1400	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Pyrene	3.20E-01	2.4	1.33E+01	1000	1400	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	Pyrene	3.00E-01	2.9	1.03E+01	1000	1400	mg/kg OC	<1	<1
EPA Site Inspection	DR273	8/26/1998	Pyrene	3.00E-01	1.66	1.81E+01	1000	1400	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Pyrene	2.70E-01	2.98	9.06E+00	1000	1400	mg/kg OC	<1	<1
EPA Site Inspection	DR265	8/26/1998	Pyrene	2.60E-01	1.03	2.52E+01	1000	1400	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Pyrene	2.30E-01	2.55	9.02E+00	1000	1400	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Pyrene	2.20E-01	2.59	8.49E+00	1000	1400	mg/kg OC	<1	<1
EPA Site Inspection	DR264	8/26/1998	Pyrene	1.80E-01	1.48	1.22E+01	1000	1400	mg/kg OC	<1	<1
EPA Site Inspection	DR287	8/26/1998	Pyrene	1.70E-01	1.31	1.30E+01	1000	1400	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Pyrene	1.70E-01 J	1.95	8.72E+00	1000	1400	mg/kg OC	<1	<1
EPA Site Inspection	DR269	8/26/1998	Pyrene	1.60E-01	0.9	1.78E+01	1000	1400	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Pyrene	1.60E-01	1.67	9.58E+00	1000	1400	mg/kg OC	<1	<1
EPA Site Inspection	DR266	8/26/1998	Pyrene	1.50E-01	1.38	1.09E+01	1000	1400	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Pyrene	1.30E-01	2.18	5.96E+00	1000	1400	mg/kg OC	<1	<1
EPA Site Inspection	DR267	8/26/1998	Pyrene	1.20E-01	0.85	1.41E+01	1000	1400	mg/kg OC	<1	<1
EPA Site Inspection	DR270	8/26/1998	Pyrene	1.20E-01	1.32	9.09E+00	1000	1400	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Pyrene	1.20E-01	1.8	6.67E+00	1000	1400	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Pyrene	1.20E-01	2.04	5.88E+00	1000	1400	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Pyrene	1.10E-01 J	1.75	6.29E+00	1000	1400	mg/kg OC	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Pyrene	9.40E-02	1.9	4.95E+00	1000	1400	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/28/1997	Pyrene	8.90E-02 J	1.56	5.71E+00	1000	1400	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Pyrene	8.70E-02	2.82	3.09E+00	1000	1400	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Pyrene	7.30E-02	2.38	3.07E+00	1000	1400	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/20/1997	Pyrene	7.30E-02 J	1.77	4.12E+00	1000	1400	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Pyrene	6.40E-02	1.79	3.58E+00	1000	1400	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	Pyrene	6.40E-02	4.01	1.60E+00	2600	3300	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Pyrene	5.10E-02	1.69	3.02E+00	1000	1400	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Pyrene	4.30E-02	1.56	2.76E+00	1000	1400	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Pyrene	3.70E-02	1.58	2.34E+00	1000	1400	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Pyrene	3.40E-02	2.33	1.46E+00	1000	1400	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Pyrene	3.30E-02	2.2	1.50E+00	1000	1400	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Pyrene	3.20E-02	1.09	2.94E+00	1000	1400	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	Pyrene	3.20E-02	1.88	1.70E+00	1000	1400	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Pyrene	3.10E-02	1.52	2.04E+00	1000	1400	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Pyrene	2.80E-02	1.7	1.65E+00	1000	1400	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Pyrene	2.80E-02	2.58	1.09E+00	1000	1400	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Pyrene	2.50E-02	2.28	1.10E+00	1000	1400	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Pyrene	1.90E-02	1.28	1.48E+00	1000	1400	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Pyrene	1.90E-02	1.32	1.44E+00	1000	1400	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Pyrene	1.80E-02 J	1.25	1.44E+00	1000	1400	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Pyrene	1.60E-02	0.892	1.79E+00	1000	1400	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-U	3/4/2011	Pyrene	1.40E-02 J	0.844	1.66E+00	1000	1400	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Pyrene	1.30E-02	1.75	7.43E-01	1000	1400	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Pyrene	8.80E-03	2.36	3.73E-01	1000	1400	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Pyrene	1.30E-03 J	0.643	2.02E-01	1000	1400	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Pyrene	1.00E-03 J	1.12	8.93E-02	1000	1400	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	Pyrene	8.40E-04 J	2.75	3.05E-02	1000	1400	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-04 ^a	4/28/2008	Pyrene	8.20E-04 J	0.455	1.80E-01	2600	3300	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-09 ^a	4/28/2008	Pyrene	8.20E-04 J	0.3	2.73E-01	2600	3300	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12 ^a	May-08	Pyrene	7.90E-04 J	0.413	1.91E-01	2600	3300	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05 ^a	4/28/2008	Pyrene	6.10E-04 J	0.394	1.55E-01	2600	3300	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11 ^a	4/28/2008	Pyrene	5.60E-04 J	0.296	1.89E-01	2600	3300	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03 ^a	4/28/2008	Pyrene	4.90E-04 J	0.216	2.27E-01	2600	3300	ug/kg DW	<1	<1
EPA Site Inspection	DR268	8/26/1998	Selenium	1.10E+01	2.1	5.24E+02					
EPA Site Inspection	DR285	8/25/1998	Selenium	1.10E+01	3.39	3.24E+02					
EPA Site Inspection	DR263	8/25/1998	Selenium	1.00E+01	2.9	3.45E+02					
EPA Site Inspection	DR264	8/26/1998	Selenium	1.00E+01	1.48	6.76E+02					
EPA Site Inspection	DR266	8/26/1998	Selenium	1.00E+01	1.38	7.25E+02					
EPA Site Inspection	DR265	8/26/1998	Selenium	9.00E+00	1.03	8.74E+02					

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR267	8/26/1998	Selenium	9.00E+00	0.85	1.06E+03					
EPA Site Inspection	DR269	8/26/1998	Selenium	9.00E+00	0.9	1.00E+03					
EPA Site Inspection	DR287	8/26/1998	Selenium	9.00E+00	1.31	6.87E+02					
EPA Site Inspection	DR270	8/26/1998	Selenium	8.00E+00 J	1.32	6.06E+02					
EPA Site Inspection	DR273	8/26/1998	Selenium	8.00E+00 J	1.66	4.82E+02					
LDWRI-Benthic	B10b	8/19/2004	Selenium	7.00E-01 J	1.09	6.42E+01					
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Selenium	3.40E-01 J	2.18	1.56E+01					
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Selenium	3.20E-01 J	1.9	1.68E+01					
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Selenium	1.60E-01 J	0.216	7.41E+01					
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Selenium	1.50E-01 J	1.58	9.49E+00					
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Selenium	7.30E-02 J	0.892	8.18E+00					
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Selenium	6.50E-02 J	0.643	1.01E+01					
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Selenium	6.50E-02 J	0.296	2.20E+01					
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	Selenium	6.20E-02 J	0.455	1.36E+01					
Duwamish River RM 4.9 to 7.4	DR-06	4/28/2008	Selenium	5.90E-02 J	0.392	1.51E+01					
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Selenium	5.70E-02 J	0.394	1.45E+01					
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	Selenium	5.10E-02 J	0.3	1.70E+01					
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Selenium	4.30E-02 J	0.413	1.04E+01					
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Selenium	3.70E-02 J	1.12	3.30E+00					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Silver	6.42E+01	1.16	5.53E+03	6.1	6.1	mg/kg DW	11	11
EPA Site Inspection	DR285	8/25/1998	Silver	2.20E-01	3.39	6.49E+00	6.1	6.1	mg/kg DW	<1	<1
EPA Site Inspection	DR263	8/25/1998	Silver	2.10E-01	2.9	7.24E+00	6.1	6.1	mg/kg DW	<1	<1
EPA Site Inspection	DR273	8/26/1998	Silver	1.20E-01	1.66	7.23E+00	6.1	6.1	mg/kg DW	<1	<1
EPA Site Inspection	DR268	8/26/1998	Silver	1.10E-01	2.1	5.24E+00	6.1	6.1	mg/kg DW	<1	<1
EPA Site Inspection	DR270	8/26/1998	Silver	1.10E-01	1.32	8.33E+00	6.1	6.1	mg/kg DW	<1	<1
EPA Site Inspection	DR266	8/26/1998	Silver	1.00E-01	1.38	7.25E+00	6.1	6.1	mg/kg DW	<1	<1
EPA Site Inspection	DR293	9/14/1998	Silver	1.00E-01	1.74	5.75E+00	6.1	6.1	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Silver	9.60E-02 JB	2.18	4.40E+00	6.1	6.1	mg/kg DW	<1	<1
EPA Site Inspection	DR265	8/26/1998	Silver	9.00E-02	1.03	8.74E+00	6.1	6.1	mg/kg DW	<1	<1
EPA Site Inspection	DR287	8/26/1998	Silver	9.00E-02	1.31	6.87E+00	6.1	6.1	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Silver	8.20E-02 JB	1.9	4.32E+00	6.1	6.1	mg/kg DW	<1	<1
EPA Site Inspection	DR267	8/26/1998	Silver	8.00E-02	0.85	9.41E+00	6.1	6.1	mg/kg DW	<1	<1
EPA Site Inspection	DR264	8/26/1998	Silver	7.00E-02	1.48	4.73E+00	6.1	6.1	mg/kg DW	<1	<1
EPA Site Inspection	DR269	8/26/1998	Silver	6.00E-02	0.9	6.67E+00	6.1	6.1	mg/kg DW	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Silver	5.50E-02	1.09	5.05E+00	6.1	6.1	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Silver	3.90E-02 JB	1.58	2.47E+00	6.1	6.1	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Silver	1.90E-02 JB	0.413	4.60E+00	6.1	6.1	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Silver	1.80E-02 JB	0.394	4.57E+00	6.1	6.1	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Silver	1.70E-02 JB	0.296	5.74E+00	6.1	6.1	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Silver	1.50E-02 JB	0.643	2.33E+00	6.1	6.1	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Silver	1.40E-02 JB	0.216	6.48E+00	6.1	6.1	mg/kg DW	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	Silver	1.30E-02 JB	0.455	2.86E+00	6.1	6.1	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-06	4/28/2008	Silver	1.30E-02 JB	0.392	3.32E+00	6.1	6.1	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Silver	1.30E-02 JB	0.892	1.46E+00	6.1	6.1	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	Silver	1.20E-02 JB	0.3	4.00E+00	6.1	6.1	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Silver	1.20E-02 JB	1.12	1.07E+00	6.1	6.1	mg/kg DW	<1	<1
EPA Site Inspection	DR270	8/26/1998	Tetrabutyltin as ion	2.00E-03 J	1.32	1.52E-01					
EPA Site Inspection	DR268	8/26/1998	Thallium	1.00E-01	2.1	4.76E+00					
EPA Site Inspection	DR285	8/25/1998	Thallium	1.00E-01	3.39	2.95E+00					
EPA Site Inspection	DR263	8/25/1998	Thallium	8.00E-02	2.9	2.76E+00					
EPA Site Inspection	DR269	8/26/1998	Thallium	7.00E-02	0.9	7.78E+00					
EPA Site Inspection	DR266	8/26/1998	Thallium	6.00E-02	1.38	4.35E+00					
EPA Site Inspection	DR267	8/26/1998	Thallium	6.00E-02	0.85	7.06E+00					
EPA Site Inspection	DR287	8/26/1998	Thallium	6.00E-02	1.31	4.58E+00					
EPA Site Inspection	DR264	8/26/1998	Thallium	5.00E-02	1.48	3.38E+00					
EPA Site Inspection	DR293	9/14/1998	Thallium	5.00E-02 J	1.74	2.87E+00					
LDWRI-Benthic	B10b	8/19/2004	Thallium	4.00E-02	1.09	3.67E+00					
EPA Site Inspection	DR265	8/26/1998	Thallium	4.00E-02	1.03	3.88E+00					
EPA Site Inspection	DR270	8/26/1998	Thallium	4.00E-02	1.32	3.03E+00					
EPA Site Inspection	DR273	8/26/1998	Thallium	4.00E-02	1.66	2.41E+00					
EPA Site Inspection	DR268	8/26/1998	Total HPAH (calc'd)	4.58E+00	2.1	2.18E+02	960	5300	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Total HPAH (calc'd)	4.20E+00 J	2.08	2.02E+02	960	5300	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Total HPAH (calc'd)	1.97E+00	1.74	1.13E+02	960	5300	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Total HPAH (calc'd)	1.89E+00	2.12	8.92E+01	960	5300	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Total HPAH (calc'd)	1.87E+00	2.4	7.79E+01	960	5300	mg/kg OC	<1	<1
EPA Site Inspection	DR273	8/26/1998	Total HPAH (calc'd)	1.78E+00	1.66	1.07E+02	960	5300	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Total HPAH (calc'd)	1.67E+00	3.39	4.93E+01	960	5300	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Total HPAH (calc'd)	1.56E+00	2.55	6.12E+01	960	5300	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Total HPAH (calc'd)	1.51E+00	2.98	5.07E+01	960	5300	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	Total HPAH (calc'd)	1.43E+00	2.9	4.93E+01	960	5300	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Total HPAH (calc'd)	1.35E+00	2.59	5.21E+01	960	5300	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Total HPAH (calc'd)	1.03E+00	1.67	6.17E+01	960	5300	mg/kg OC	<1	<1
EPA Site Inspection	DR265	8/26/1998	Total HPAH (calc'd)	1.02E+00	1.03	9.90E+01	960	5300	mg/kg OC	<1	<1
EPA Site Inspection	DR287	8/26/1998	Total HPAH (calc'd)	8.90E-01	1.31	6.79E+01	960	5300	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Total HPAH (calc'd)	8.72E-01 J	2.18	4.00E+01	960	5300	mg/kg OC	<1	<1
EPA Site Inspection	DR264	8/26/1998	Total HPAH (calc'd)	8.70E-01	1.48	5.88E+01	960	5300	mg/kg OC	<1	<1
EPA Site Inspection	DR269	8/26/1998	Total HPAH (calc'd)	8.20E-01	0.9	9.11E+01	960	5300	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Total HPAH (calc'd)	8.00E-01 J	2.04	3.92E+01	960	5300	mg/kg OC	<1	<1
EPA Site Inspection	DR266	8/26/1998	Total HPAH (calc'd)	7.90E-01	1.38	5.72E+01	960	5300	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Total HPAH (calc'd)	7.50E-01 J	1.8	4.17E+01	960	5300	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Total HPAH (calc'd)	7.26E-01	1.95	3.72E+01	960	5300	mg/kg OC	<1	<1
EPA Site Inspection	DR267	8/26/1998	Total HPAH (calc'd)	6.90E-01	0.85	8.12E+01	960	5300	mg/kg OC	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR270	8/26/1998	Total HPAH (calc'd)	6.50E-01	1.32	4.92E+01	960	5300	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Total HPAH (calc'd)	6.07E-01 J	1.9	3.19E+01	960	5300	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Total HPAH (calc'd)	4.13E-01	1.75	2.36E+01	960	5300	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Total HPAH (calc'd)	3.70E-01 J	2.82	1.31E+01	960	5300	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Total HPAH (calc'd)	3.38E-01	1.79	1.89E+01	960	5300	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	Total HPAH (calc'd)	3.30E-01	4.01	8.23E+00	12000	17000	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Total HPAH (calc'd)	3.20E-01 J	2.38	1.34E+01	960	5300	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Total HPAH (calc'd)	3.00E-01 J	1.16	2.59E+01	960	5300	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Total HPAH (calc'd)	2.78E-01 J	1.58	1.76E+01	960	5300	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/28/1997	Total HPAH (calc'd)	2.71E-01	1.56	1.74E+01	960	5300	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Total HPAH (calc'd)	2.70E-01 J	1.69	1.60E+01	960	5300	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/20/1997	Total HPAH (calc'd)	2.30E-01	1.77	1.30E+01	960	5300	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Total HPAH (calc'd)	2.25E-01	1.56	1.44E+01	960	5300	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	Total HPAH (calc'd)	2.14E-01 J	1.88	1.14E+01	960	5300	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Total HPAH (calc'd)	1.92E-01 J	1.09	1.76E+01	960	5300	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Total HPAH (calc'd)	1.70E-01 J	2.33	7.30E+00	960	5300	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Total HPAH (calc'd)	1.68E-01 J	1.52	1.11E+01	960	5300	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Total HPAH (calc'd)	1.60E-01 J	1.7	9.41E+00	960	5300	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Total HPAH (calc'd)	1.40E-01 J	2.2	6.36E+00	960	5300	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Total HPAH (calc'd)	1.40E-01 J	2.58	5.43E+00	960	5300	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Total HPAH (calc'd)	1.11E-01	1.28	8.64E+00	960	5300	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Total HPAH (calc'd)	1.04E-01	1.32	7.86E+00	960	5300	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Total HPAH (calc'd)	8.94E-02 J	1.75	5.11E+00	960	5300	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Total HPAH (calc'd)	8.85E-02 J	0.892	9.92E+00	960	5300	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Total HPAH (calc'd)	5.50E-02 J	2.36	2.33E+00	960	5300	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Total HPAH (calc'd)	4.60E-02	2.28	2.02E+00	960	5300	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Total HPAH (calc'd)	3.50E-02 J	1.25	2.80E+00	960	5300	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Total HPAH (calc'd)	3.30E-02 J	1.86	1.77E+00	960	5300	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Total HPAH (calc'd)	3.20E-02 J	2.04	1.57E+00	960	5300	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-U	3/4/2011	Total HPAH (calc'd)	2.80E-02 J	0.844	3.32E+00	960	5300	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11 ^a	4/28/2008	Total HPAH (calc'd)	4.51E-03 J	0.296	1.52E+00	12000	17000	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05 ^a	4/28/2008	Total HPAH (calc'd)	4.47E-03 J	0.394	1.13E+00	12000	17000	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Total HPAH (calc'd)	4.38E-03 J	1.12	3.91E-01	960	5300	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Total HPAH (calc'd)	3.56E-03 J	0.643	5.54E-01	960	5300	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	Total HPAH (calc'd)	2.71E-03 J	2.75	9.85E-02	960	5300	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03 ^a	4/28/2008	Total HPAH (calc'd)	2.69E-03 J	0.216	1.25E+00	12000	17000	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-04 ^a	4/28/2008	Total HPAH (calc'd)	2.61E-03 J	0.455	5.74E-01	12000	17000	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12 ^a	May-08	Total HPAH (calc'd)	2.48E-03 J	0.413	6.00E-01	12000	17000	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-09 ^a	4/28/2008	Total HPAH (calc'd)	1.92E-03 J	0.3	6.40E-01	12000	17000	ug/kg DW	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Total HpCDD	1.75E-04	2.04	8.58E-03					

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Total HpCDD	1.40E-04	2.18	6.42E-03					
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	Total HpCDD	1.34E-04	1.88	7.13E-03					
EPA Site Inspection	DR264	8/26/1998	Total HpCDD	1.20E-04	1.48	8.11E-03					
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Total HpCDD	1.10E-04	1.9	5.79E-03					
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Total HpCDD	6.80E-05	1.75	3.89E-03					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Total HpCDD	6.54E-05	1.7	3.85E-03					
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Total HpCDD	6.20E-05	1.28	4.84E-03					
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Total HpCDD	5.30E-05	2.36	2.25E-03					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Total HpCDD	5.10E-05	2.33	2.19E-03					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Total HpCDD	3.62E-05	2.2	1.65E-03					
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Total HpCDD	3.60E-05	1.58	2.28E-03					
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Total HpCDD	3.10E-05	1.32	2.35E-03					
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Total HpCDD	1.80E-05	1.12	1.61E-03					
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Total HpCDD	1.67E-05	1.25	1.34E-03					
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	Total HpCDD	3.20E-06	0.3	1.07E-03					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Total HpCDF	5.01E-05	2.04	2.46E-03					
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	Total HpCDF	4.60E-05	1.88	2.45E-03					
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Total HpCDF	4.10E-05	2.18	1.88E-03					
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Total HpCDF	3.30E-05	1.9	1.74E-03					
EPA Site Inspection	DR264	8/26/1998	Total HpCDF	1.80E-05	1.48	1.22E-03					
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Total HpCDF	1.80E-05	1.75	1.03E-03					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Total HpCDF	1.70E-05	1.7	1.00E-03					
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Total HpCDF	1.50E-05	1.28	1.17E-03					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Total HpCDF	1.48E-05	2.2	6.73E-04					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Total HpCDF	1.31E-05	2.33	5.62E-04					
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Total HpCDF	8.90E-06	1.32	6.74E-04					
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Total HpCDF	7.80E-06	1.58	4.94E-04					
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Total HpCDF	4.60E-06	2.36	1.95E-04					
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Total HpCDF	3.45E-06	1.25	2.76E-04					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Total HxCDD	3.42E-05	2.04	1.68E-03					
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	Total HxCDD	2.67E-05	1.88	1.42E-03					
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Total HxCDD	1.40E-05	2.18	6.42E-04					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Total HxCDD	1.33E-05	1.7	7.82E-04					
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Total HxCDD	1.30E-05	1.9	6.84E-04					
EPA Site Inspection	DR264	8/26/1998	Total HxCDD	1.20E-05	1.48	8.11E-04					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Total HxCDD	1.18E-05	2.33	5.06E-04					
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Total HxCDD	1.10E-05	1.28	8.59E-04					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Total HxCDD	7.06E-06	2.2	3.21E-04					

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Total HxCDD	4.40E-06	1.75	2.51E-04					
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Total HxCDD	2.51E-06	1.25	2.01E-04					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Total HxCDF	2.82E-05	2.04	1.38E-03					
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	Total HxCDF	2.71E-05	1.88	1.44E-03					
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Total HxCDF	1.30E-05	2.18	5.96E-04					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Total HxCDF	1.01E-05	1.7	5.94E-04					
EPA Site Inspection	DR264	8/26/1998	Total HxCDF	9.70E-06	1.48	6.55E-04					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Total HxCDF	8.16E-06	2.2	3.71E-04					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Total HxCDF	6.95E-06	2.33	2.98E-04					
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Total HxCDF	4.00E-06	1.28	3.13E-04					
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Total HxCDF	1.87E-06	1.25	1.50E-04					
EPA Site Inspection	DR268	8/26/1998	Total LPAH (calc'd)	5.30E-01	2.1	2.52E+01	370	780	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Total LPAH (calc'd)	4.50E-01 J	2.08	2.16E+01	370	780	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Total LPAH (calc'd)	2.60E-01	2.12	1.23E+01	370	780	mg/kg OC	<1	<1
EPA Site Inspection	DR293	9/14/1998	Total LPAH (calc'd)	2.40E-01	1.74	1.38E+01	370	780	mg/kg OC	<1	<1
EPA Site Inspection	DR265	8/26/1998	Total LPAH (calc'd)	2.00E-01	1.03	1.94E+01	370	780	mg/kg OC	<1	<1
EPA Site Inspection	DR273	8/26/1998	Total LPAH (calc'd)	2.00E-01	1.66	1.20E+01	370	780	mg/kg OC	<1	<1
EPA Site Inspection	DR285	8/25/1998	Total LPAH (calc'd)	1.90E-01	3.39	5.60E+00	370	780	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Total LPAH (calc'd)	1.80E-01	2.4	7.50E+00	370	780	mg/kg OC	<1	<1
EPA Site Inspection	DR263	8/25/1998	Total LPAH (calc'd)	1.60E-01	2.9	5.52E+00	370	780	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Total LPAH (calc'd)	1.52E-01	2.59	5.87E+00	370	780	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Total LPAH (calc'd)	1.26E-01	2.98	4.23E+00	370	780	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Total LPAH (calc'd)	1.12E-01	2.55	4.39E+00	370	780	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Total LPAH (calc'd)	9.40E-02	1.67	5.63E+00	370	780	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Total LPAH (calc'd)	9.40E-02	1.95	4.82E+00	370	780	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Total LPAH (calc'd)	9.10E-02	1.69	5.38E+00	370	780	mg/kg OC	<1	<1
EPA Site Inspection	DR287	8/26/1998	Total LPAH (calc'd)	8.00E-02	1.31	6.11E+00	370	780	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Total LPAH (calc'd)	7.70E-02 J	2.18	3.53E+00	370	780	mg/kg OC	<1	<1
EPA Site Inspection	DR264	8/26/1998	Total LPAH (calc'd)	7.00E-02	1.48	4.73E+00	370	780	mg/kg OC	<1	<1
EPA Site Inspection	DR266	8/26/1998	Total LPAH (calc'd)	7.00E-02	1.38	5.07E+00	370	780	mg/kg OC	<1	<1
EPA Site Inspection	DR267	8/26/1998	Total LPAH (calc'd)	7.00E-02	0.85	8.24E+00	370	780	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Total LPAH (calc'd)	6.80E-02	1.79	3.80E+00	370	780	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Total LPAH (calc'd)	6.40E-02 J	1.9	3.37E+00	370	780	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Total LPAH (calc'd)	6.30E-02	1.75	3.60E+00	370	780	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Total LPAH (calc'd)	6.10E-02	2.04	2.99E+00	370	780	mg/kg OC	<1	<1
EPA Site Inspection	DR269	8/26/1998	Total LPAH (calc'd)	6.00E-02	0.9	6.67E+00	370	780	mg/kg OC	<1	<1
EPA Site Inspection	DR270	8/26/1998	Total LPAH (calc'd)	6.00E-02	1.32	4.55E+00	370	780	mg/kg OC	<1	<1
KC Water Quality Assessment	WQAHAMM	5/28/1997	Total LPAH (calc'd)	6.00E-02	1.56	3.85E+00	370	780	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Total LPAH (calc'd)	5.80E-02	2.38	2.44E+00	370	780	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Total LPAH (calc'd)	5.20E-02 J	1.8	2.89E+00	370	780	mg/kg OC	<1	<1

Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
KC Water Quality Assessment	WQAHAMM	5/20/1997	Total LPAH (calc'd)	5.20E-02	1.77	2.94E+00	370	780	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Total LPAH (calc'd)	4.00E-02 J	2.82	1.42E+00	370	780	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Total LPAH (calc'd)	3.80E-02	1.16	3.28E+00	370	780	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Total LPAH (calc'd)	2.82E-02 J	0.892	3.16E+00	370	780	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-D ^a	3/3/2011	Total LPAH (calc'd)	2.80E-02	4.01	6.98E-01	5200	13000	ug/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Total LPAH (calc'd)	2.50E-02	2.33	1.07E+00	370	780	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Total LPAH (calc'd)	2.50E-02 J	1.58	1.58E+00	370	780	mg/kg OC	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Total LPAH (calc'd)	2.30E-02 J	1.09	2.11E+00	370	780	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Total LPAH (calc'd)	2.20E-02	1.7	1.29E+00	370	780	mg/kg OC	<1	<1
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	Total LPAH (calc'd)	2.20E-02	1.88	1.17E+00	370	780	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Total LPAH (calc'd)	2.10E-02	2.2	9.55E-01	370	780	mg/kg OC	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Total LPAH (calc'd)	2.00E-02	1.56	1.28E+00	370	780	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Total LPAH (calc'd)	1.70E-02 J	2.58	6.59E-01	370	780	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Total LPAH (calc'd)	1.48E-02 J	1.32	1.12E+00	370	780	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Total LPAH (calc'd)	1.35E-02 J	1.28	1.05E+00	370	780	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Total LPAH (calc'd)	1.00E-02 J	1.25	8.00E-01	370	780	mg/kg OC	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Total LPAH (calc'd)	7.70E-03 J	1.86	4.14E-01	370	780	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Total LPAH (calc'd)	7.30E-03 J	1.75	4.17E-01	370	780	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Total LPAH (calc'd)	6.42E-03 J	2.36	2.72E-01	370	780	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Total LPAH (calc'd)	1.80E-03 J	0.643	2.80E-01	370	780	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	Total LPAH (calc'd)	1.50E-03 J	2.75	5.45E-02	370	780	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Total LPAH (calc'd)	1.00E-03 J	1.12	8.93E-02	370	780	mg/kg OC	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12 ^a	May-08	Total LPAH (calc'd)	9.80E-04 J	0.413	2.37E-01	5200	13000	ug/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-09 ^a	4/28/2008	Total LPAH (calc'd)	5.30E-04 J	0.3	1.77E-01	5200	13000	ug/kg DW	<1	<1
EPA Site Inspection	DR268	8/26/1998	Total PAH (calc'd)	5.11E+00	2.1	2.43E+02					
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Total PAH (calc'd)	4.60E+00 J	2.08	2.21E+02					
EPA Site Inspection	DR293	9/14/1998	Total PAH (calc'd)	2.21E+00	1.74	1.27E+02					
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Total PAH (calc'd)	2.15E+00	2.12	1.01E+02					
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Total PAH (calc'd)	2.05E+00	2.4	8.54E+01					
EPA Site Inspection	DR273	8/26/1998	Total PAH (calc'd)	1.98E+00	1.66	1.19E+02					
EPA Site Inspection	DR285	8/25/1998	Total PAH (calc'd)	1.86E+00	3.39	5.49E+01					
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Total PAH (calc'd)	1.67E+00	2.55	6.55E+01					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Total PAH (calc'd)	1.63E+00	2.98	5.47E+01					
EPA Site Inspection	DR263	8/25/1998	Total PAH (calc'd)	1.59E+00	2.9	5.48E+01					
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Total PAH (calc'd)	1.51E+00	2.59	5.83E+01					
EPA Site Inspection	DR265	8/26/1998	Total PAH (calc'd)	1.22E+00	1.03	1.18E+02					
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Total PAH (calc'd)	1.12E+00	1.67	6.71E+01					
EPA Site Inspection	DR287	8/26/1998	Total PAH (calc'd)	9.70E-01	1.31	7.40E+01					
EPA Site Inspection	DR264	8/26/1998	Total PAH (calc'd)	9.40E-01	1.48	6.35E+01					
EPA Site Inspection	DR269	8/26/1998	Total PAH (calc'd)	8.80E-01	0.9	9.78E+01					

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
EPA Site Inspection	DR266	8/26/1998	Total PAH (calc'd)	8.60E-01	1.38	6.23E+01					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Total PAH (calc'd)	8.60E-01 J	2.04	4.22E+01					
KC Water Quality Assessment	WQAHAMM	6/3/1997	Total PAH (calc'd)	8.20E-01	1.95	4.21E+01					
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Total PAH (calc'd)	8.00E-01 J	1.8	4.44E+01					
EPA Site Inspection	DR267	8/26/1998	Total PAH (calc'd)	7.60E-01	0.85	8.94E+01					
EPA Site Inspection	DR270	8/26/1998	Total PAH (calc'd)	7.10E-01	1.32	5.38E+01					
KC Water Quality Assessment	WQAHAMM	5/15/1997	Total PAH (calc'd)	4.76E-01	1.75	2.72E+01					
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Total PAH (calc'd)	4.10E-01 J	2.82	1.45E+01					
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Total PAH (calc'd)	4.06E-01	1.79	2.27E+01					
KC Water Quality Assessment	WQAHAMM	5/28/1997	Total PAH (calc'd)	3.31E-01	1.56	2.12E+01					
KC Water Quality Assessment	WQAHAMM	5/20/1997	Total PAH (calc'd)	2.82E-01	1.77	1.59E+01					
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Total PAH (calc'd)	2.45E-01	1.56	1.57E+01					
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	Total PAH (calc'd)	2.36E-01 J	1.88	1.26E+01					
LDWRI-Benthic	B10b	8/19/2004	Total PAH (calc'd)	2.16E-01 J	1.09	1.98E+01					
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Total PAH (calc'd)	1.68E-01 J	1.52	1.11E+01					
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Total PAH (calc'd)	4.60E-02	2.28	2.02E+00					
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Total PAH (calc'd)	3.20E-02 J	2.04	1.57E+00					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Total PeCDD	7.69E-06	2.04	3.77E-04					
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	Total PeCDD	5.70E-06	1.88	3.03E-04					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Total PeCDD	3.24E-06	1.7	1.91E-04					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Total PeCDD	2.48E-06	2.33	1.06E-04					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Total PeCDD	1.53E-06	2.2	6.95E-05					
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Total PeCDD	2.82E-07	1.25	2.26E-05					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Total PeCDF	2.45E-05	2.04	1.20E-03					
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	Total PeCDF	1.81E-05	1.88	9.63E-04					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Total PeCDF	4.78E-06	1.7	2.81E-04					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Total PeCDF	3.24E-06	2.33	1.39E-04					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Total PeCDF	2.78E-06	2.2	1.26E-04					
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Total PeCDF	9.08E-07	1.25	7.26E-05					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Total TCDD	5.48E-06	2.04	2.69E-04					
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	Total TCDD	4.78E-06	1.88	2.54E-04					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Total TCDD	2.03E-06	1.7	1.19E-04					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Total TCDD	1.58E-06	2.33	6.78E-05					
EPA Site Inspection	DR264	8/26/1998	Total TCDD	9.50E-07	1.48	6.42E-05					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Total TCDD	9.00E-07	2.2	4.09E-05					
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Total TCDD	3.45E-07	1.25	2.76E-05					

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	Total TCDF	1.94E-05	1.88	1.03E-03					
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Total TCDF	1.61E-05	2.04	7.89E-04					
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Total TCDF	5.28E-06	1.7	3.11E-04					
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Total TCDF	3.64E-06	2.33	1.56E-04					
EPA Site Inspection	DR264	8/26/1998	Total TCDF	3.00E-06	1.48	2.03E-04					
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Total TCDF	2.32E-06	2.2	1.05E-04					
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Total TCDF	1.70E-06	2.18	7.80E-05					
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Total TCDF	1.10E-06	1.9	5.79E-05					
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Total TCDF	9.40E-07	1.28	7.34E-05					
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Total TCDF	9.35E-07	1.25	7.48E-05					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Tributyltin as ion	5.30E-02	2.98	1.78E+00					
EPA Site Inspection	DR264	8/26/1998	Tributyltin as ion	4.00E-03 J	1.48	2.70E-01					
EPA Site Inspection	DR273	8/26/1998	Tributyltin as ion	4.00E-03 J	1.66	2.41E-01					
EPA Site Inspection	DR266	8/26/1998	Tributyltin as ion	3.00E-03 J	1.38	2.17E-01					
LDWRI-Benthic	B10b	8/19/2004	Tributyltin as ion	2.30E-03	1.09	2.11E-01					
EPA Site Inspection	DR270	8/26/1998	Tributyltin as ion	2.00E-03 J	1.32	1.52E-01					
EPA Site Inspection	DR285	8/25/1998	Vanadium	7.00E+01	3.39	2.06E+03					
EPA Site Inspection	DR263	8/25/1998	Vanadium	6.90E+01	2.9	2.38E+03					
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Vanadium	6.84E+01	2.98	2.30E+03					
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Vanadium	6.84E+01	2.59	2.64E+03					
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Vanadium	6.59E+01	2.28	2.89E+03					
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Vanadium	6.54E+01	2.4	2.73E+03					
EPA Site Inspection	DR268	8/26/1998	Vanadium	6.10E+01	2.1	2.90E+03					
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Vanadium	6.10E+01	2.12	2.88E+03					
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Vanadium	6.08E+01	1.67	3.64E+03					
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Vanadium	6.01E+01	2.82	2.13E+03					
EPA Site Inspection	DR287	8/26/1998	Vanadium	5.90E+01	1.31	4.50E+03					
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Vanadium	5.61E+01	1.56	3.60E+03					
EPA Site Inspection	DR293	9/14/1998	Vanadium	5.60E+01	1.74	3.22E+03					
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Vanadium	5.60E+01	2.55	2.20E+03					
EPA Site Inspection	DR266	8/26/1998	Vanadium	5.40E+01	1.38	3.91E+03					
EPA Site Inspection	DR269	8/26/1998	Vanadium	5.40E+01	0.9	6.00E+03					
EPA Site Inspection	DR273	8/26/1998	Vanadium	5.20E+01	1.66	3.13E+03					
LDWRI-Surface Sediment Round 1	LDW-SS134	1/24/2005	Vanadium	5.17E+01	0.39	1.33E+04					
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Vanadium	4.99E+01	1.8	2.77E+03					
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Vanadium	4.94E+01	2.08	2.38E+03					
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Vanadium	4.91E+01	1.52	3.23E+03					
EPA Site Inspection	DR265	8/26/1998	Vanadium	4.90E+01	1.03	4.76E+03					
EPA Site Inspection	DR267	8/26/1998	Vanadium	4.70E+01	0.85	5.53E+03					
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Vanadium	4.66E+01	1.79	2.60E+03					

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDWRI-Benthic	B10b	8/19/2004	Vanadium	4.61E+01	1.09	4.23E+03					
EPA Site Inspection	DR264	8/26/1998	Vanadium	4.60E+01	1.48	3.11E+03					
EPA Site Inspection	DR270	8/26/1998	Vanadium	4.10E+01	1.32	3.11E+03					
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Vanadium	4.07E+01	2.04	2.00E+03					
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Zinc	1.16E+02	1.16	1.00E+04	410	960	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Zinc	1.13E+02	2.98	3.79E+03	410	960	mg/kg DW	<1	<1
EPA Site Inspection	DR285	8/25/1998	Zinc	1.05E+02	3.39	3.10E+03	410	960	mg/kg DW	<1	<1
EPA Site Inspection	DR263	8/25/1998	Zinc	9.90E+01	2.9	3.41E+03	410	960	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Zinc	9.90E+01	2.59	3.82E+03	410	960	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Zinc	9.70E+01	2.55	3.80E+03	410	960	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	Zinc	8.90E+01 J	4.01	2.22E+03	410	960	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Zinc	8.60E+01	2.12	4.06E+03	410	960	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Zinc	8.20E+01 B	2.18	3.76E+03	410	960	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Zinc	8.01E+01	2.28	3.51E+03	410	960	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Zinc	8.00E+01	2.4	3.33E+03	410	960	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Zinc	7.90E+01	2.58	3.06E+03	410	960	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Zinc	7.80E+01 B	1.9	4.11E+03	410	960	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Zinc	7.60E+01	1.8	4.22E+03	410	960	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Zinc	7.50E+01	1.7	4.41E+03	410	960	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Zinc	7.40E+01	1.69	4.38E+03	410	960	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Zinc	7.10E+01	1.67	4.25E+03	410	960	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Zinc	7.10E+01	2.82	2.52E+03	410	960	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Zinc	7.10E+01	2.33	3.05E+03	410	960	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Zinc	7.10E+01	2.38	2.98E+03	410	960	mg/kg DW	<1	<1
EPA Site Inspection	DR287	8/26/1998	Zinc	6.90E+01	1.31	5.27E+03	410	960	mg/kg DW	<1	<1
EPA Site Inspection	DR266	8/26/1998	Zinc	6.70E+01	1.38	4.86E+03	410	960	mg/kg DW	<1	<1
EPA Site Inspection	DR269	8/26/1998	Zinc	6.70E+01	0.9	7.44E+03	410	960	mg/kg DW	<1	<1
EPA Site Inspection	DR273	8/26/1998	Zinc	6.70E+01	1.66	4.04E+03	410	960	mg/kg DW	<1	<1
EPA Site Inspection	DR293	9/14/1998	Zinc	6.60E+01	1.74	3.79E+03	410	960	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Zinc	6.59E+01	1.56	4.22E+03	410	960	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Zinc	6.50E+01	2.08	3.13E+03	410	960	mg/kg DW	<1	<1
EPA Site Inspection	DR268	8/26/1998	Zinc	6.40E+01	2.1	3.05E+03	410	960	mg/kg DW	<1	<1
EPA Site Inspection	DR264	8/26/1998	Zinc	6.10E+01	1.48	4.12E+03	410	960	mg/kg DW	<1	<1
EPA Site Inspection	DR265	8/26/1998	Zinc	6.10E+01	1.03	5.92E+03	410	960	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Zinc	5.97E+01	1.79	3.34E+03	410	960	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	6/3/1997	Zinc	5.91E+01	1.95	3.03E+03	410	960	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Zinc	5.80E+01 B	0.394	1.47E+04	410	960	mg/kg DW	<1	<1
EPA Site Inspection	DR267	8/26/1998	Zinc	5.70E+01	0.85	6.71E+03	410	960	mg/kg DW	<1	<1
EPA Site Inspection	DR270	8/26/1998	Zinc	5.60E+01	1.32	4.24E+03	410	960	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Zinc	5.40E+01 B	1.58	3.42E+03	410	960	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/15/1997	Zinc	5.25E+01	1.75	3.00E+03	410	960	mg/kg DW	<1	<1

**Table A-1a
Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Zinc	5.20E+01	1.25	4.16E+03	410	960	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Zinc	5.20E+01 J	2.2	2.36E+03	410	960	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Zinc	5.19E+01	1.52	3.41E+03	410	960	mg/kg DW	<1	<1
LDWRI-Benthic	B10b	8/19/2004	Zinc	5.14E+01	1.09	4.72E+03	410	960	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Zinc	5.10E+01	2.04	2.50E+03	410	960	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/20/1997	Zinc	4.99E+01	1.77	2.82E+03	410	960	mg/kg DW	<1	<1
KC Water Quality Assessment	WQAHAMM	5/28/1997	Zinc	4.89E+01	1.56	3.13E+03	410	960	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Zinc	4.70E+01 B	0.296	1.59E+04	410	960	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Zinc	4.70E+01 J	1.86	2.53E+03	410	960	mg/kg DW	<1	<1
LDW Outfall Sampling	LDW-SS2098-U	3/4/2011	Zinc	4.50E+01	0.844	5.33E+03	410	960	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Zinc	4.30E+01 B	0.216	1.99E+04	410	960	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	Zinc	4.30E+01 B	0.455	9.45E+03	410	960	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	Zinc	4.30E+01 B	0.3	1.43E+04	410	960	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Zinc	4.30E+01 B	0.643	6.69E+03	410	960	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Zinc	4.20E+01 B	0.413	1.02E+04	410	960	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-06	4/28/2008	Zinc	4.10E+01 B	0.392	1.05E+04	410	960	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Zinc	4.10E+01 B	0.892	4.60E+03	410	960	mg/kg DW	<1	<1
LDWRI-Surface Sediment Round 1	LDW-SS134	1/24/2005	Zinc	3.82E+01	0.39	9.79E+03	410	960	mg/kg DW	<1	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Zinc	2.70E+01 B	1.12	2.41E+03	410	960	mg/kg DW	<1	<1

mg/kg - Milligram per kilogram

ug/kg - Microgram per kilogram

DW - Dry weight

TOC - Total Organic Carbon

OC - Organic carbon normalized

SQS - SMS Sediment Quality Standard

CSL - SMS Cleanup Screening Level

SMS - Sediment Management Standard (Washington Administrative Code 173-204)

PAHs - Polycyclic aromatic hydrocarbons

SVOCs - Semi-volatile organic compounds

PCB - Polychlorinated biphenyl

J - Estimated value between the method detection limit and the laboratory reporting limit

LDW - Lower Duwamish Waterway

TEQ - Toxic Equivalency

Table presents detected chemicals only.

Exceedance factors are the ratio of the detected concentrations to the CSL or SQS; exceedance factors are shown only if they are greater than 1.

Sampling events are listed in Table 2.

^a Due to the TOC in this sample, results were compared to the Lowest Apparent Effects Threshold (LAET) or the second LAET (2LAET) value rather than the SQS and/or CSL. The LAET is functionally equivalent to the SQS and the 2LAET is functionally equivalent to the CSL. OC-normalization is not considered to be appropriate for when TOC concentrations are less than or equal to 0.5 percent or greater than or equal to 4.0 percent.

Table A-1b
Comparison of Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area
to Lower Duwamish Waterway Background Concentrations

Event Name	Location Name	Date Collected	Chemical	Conc'n	Units	LDW Background	Units	Exceedance Factor
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Arsenic	258	mg/kg DW	7	mg/kg DW	37
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	Arsenic	15.6	mg/kg DW	7	mg/kg DW	2.2
EPA Site Inspection	DR263	8/25/1998	Arsenic	13.8	mg/kg DW	7	mg/kg DW	2.0
KC Water Quality Assessment	WQAHAMM	6/3/1997	Arsenic	13	mg/kg DW	7	mg/kg DW	1.9
EPA Site Inspection	DR285	8/25/1998	Arsenic	12.3	mg/kg DW	7	mg/kg DW	1.8
EPA Site Inspection	DR266	8/26/1998	Arsenic	12	mg/kg DW	7	mg/kg DW	1.7
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Arsenic	12	mg/kg DW	7	mg/kg DW	1.7
EPA Site Inspection	DR265	8/26/1998	Arsenic	11.5	mg/kg DW	7	mg/kg DW	1.6
KC Water Quality Assessment	WQAHAMM	5/28/1997	Arsenic	11	mg/kg DW	7	mg/kg DW	1.6
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Arsenic	11	mg/kg DW	7	mg/kg DW	1.6
KC Water Quality Assessment	WQAHAMM	5/15/1997	Arsenic	11	mg/kg DW	7	mg/kg DW	1.6
KC Water Quality Assessment	WQAHAMM	5/20/1997	Arsenic	11	mg/kg DW	7	mg/kg DW	1.6
EPA Site Inspection	DR273	8/26/1998	Arsenic	10.7	mg/kg DW	7	mg/kg DW	1.5
EPA Site Inspection	DR270	8/26/1998	Arsenic	10.6	mg/kg DW	7	mg/kg DW	1.5
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Arsenic	10 B	mg/kg dw	7	mg/kg DW	1.4
EPA Site Inspection	DR264	8/26/1998	Arsenic	10	mg/kg DW	7	mg/kg DW	1.4
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Arsenic	10	mg/kg DW	7	mg/kg DW	1.4
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Arsenic	10	mg/kg DW	7	mg/kg DW	1.4
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Arsenic	10	mg/kg DW	7	mg/kg DW	1.4
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	Arsenic	10	mg/kg DW	7	mg/kg DW	1.4
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Arsenic	10	mg/kg DW	7	mg/kg DW	1.4
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	Arsenic	9.8	mg/kg DW	7	mg/kg DW	1.4
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Arsenic	9.7	mg/kg dw	7	mg/kg DW	1.4
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Arsenic	9.5	mg/kg dw	7	mg/kg DW	1.4
LDWRI-Surface Sediment Round 2	LDW-SS147	3/9/2005	Arsenic	8.7	mg/kg DW	7	mg/kg DW	1.2
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Arsenic	8.6	mg/kg dw	7	mg/kg DW	1.2
EPA Site Inspection	DR287	8/26/1998	Arsenic	8.5	mg/kg DW	7	mg/kg DW	1.2
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Arsenic	8.3	mg/kg DW	7	mg/kg DW	1.2
EPA Site Inspection	DR269	8/26/1998	Arsenic	8	mg/kg DW	7	mg/kg DW	1.1
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Arsenic	8	mg/kg DW	7	mg/kg DW	1.1
EPA Site Inspection	DR268	8/26/1998	Arsenic	8	mg/kg DW	7	mg/kg DW	1.1
EPA Site Inspection	DR267	8/26/1998	Arsenic	7.2	mg/kg DW	7	mg/kg DW	1.0
LDWRI-Surface Sediment Round 2	LDW-SS146	3/9/2005	Arsenic	7.1	mg/kg DW	7	mg/kg DW	1.0
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Arsenic	7	mg/kg DW	7	mg/kg DW	1.0
EPA Site Inspection	DR293	9/14/1998	Arsenic	7	mg/kg DW	7	mg/kg DW	1.0
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Arsenic	7	mg/kg DW	7	mg/kg DW	1.0
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Arsenic	6.9 B	mg/kg dw	7	mg/kg DW	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Arsenic	6.8 B	mg/kg dw	7	mg/kg DW	<1
LDWRI-Surface Sediment Round 2	LDW-SS139	3/9/2005	Arsenic	6.8	mg/kg DW	7	mg/kg DW	<1

Table A-1b
Comparison of Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area
to Lower Duwamish Waterway Background Concentrations

Event Name	Location Name	Date Collected	Chemical	Conc'n	Units	LDW Background	Units	Exceedance Factor
LDWRI-Surface Sediment Round 2	LDW-SS141	3/15/2005	Arsenic	6.7	mg/kg DW	7	mg/kg DW	<1
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	Arsenic	6.6	mg/kg DW	7	mg/kg DW	<1
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Arsenic	6.4	mg/kg DW	7	mg/kg DW	<1
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	Arsenic	6.4	mg/kg DW	7	mg/kg DW	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Arsenic	6.3	mg/kg dw	7	mg/kg DW	<1
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	Arsenic	6.2	mg/kg DW	7	mg/kg DW	<1
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	Arsenic	5.8	mg/kg DW	7	mg/kg DW	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Arsenic	5.7	mg/kg dw	7	mg/kg DW	<1
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Arsenic	5.6	mg/kg dw	7	mg/kg DW	<1
LDWRI-Surface Sediment Round 2	LDW-SS136	3/15/2005	Arsenic	5.6	mg/kg DW	7	mg/kg DW	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Arsenic	5.5 B	mg/kg dw	7	mg/kg DW	<1
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Arsenic	5.1	mg/kg dw	7	mg/kg DW	<1
LDWRI-Benthic	B10b	8/19/2004	Arsenic	5.05 J	mg/kg DW	7	mg/kg DW	<1
LDWRI-Surface Sediment Round 2	LDW-SS140	3/8/2005	Arsenic	5	mg/kg DW	7	mg/kg DW	<1
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	Arsenic	4.9	mg/kg dw	7	mg/kg DW	<1
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Arsenic	4.9	mg/kg dw	7	mg/kg DW	<1
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	Arsenic	4.8	mg/kg dw	7	mg/kg DW	<1
Duwamish River RM 4.9 to 7.4	DR-06	4/28/2008	Arsenic	4.7	mg/kg dw	7	mg/kg DW	<1
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Arsenic	4.7	mg/kg dw	7	mg/kg DW	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Arsenic	3.7	mg/kg dw	7	mg/kg DW	<1
LDWRI-Surface Sediment Round 1	LDW-SS134	1/24/2005	Arsenic	3.5	mg/kg DW	7	mg/kg DW	<1
EPA Site Inspection	DR268	8/26/1998	Carcinogenic PAHs (calc'd)	1,210	ug/kg DW	9	ug/kg DW	134
EPA Site Inspection	DR293	9/14/1998	Carcinogenic PAHs (calc'd)	1,070	ug/kg DW	9	ug/kg DW	119
EPA Site Inspection	DR273	8/26/1998	Carcinogenic PAHs (calc'd)	980	ug/kg DW	9	ug/kg DW	109
EPA Site Inspection	DR285	8/25/1998	Carcinogenic PAHs (calc'd)	850	ug/kg DW	9	ug/kg DW	94
EPA Site Inspection	DR263	8/25/1998	Carcinogenic PAHs (calc'd)	660	ug/kg DW	9	ug/kg DW	73
EPA Site Inspection	DR287	8/26/1998	Carcinogenic PAHs (calc'd)	480	ug/kg DW	9	ug/kg DW	53
EPA Site Inspection	DR269	8/26/1998	Carcinogenic PAHs (calc'd)	460	ug/kg DW	9	ug/kg DW	51
EPA Site Inspection	DR264	8/26/1998	Carcinogenic PAHs (calc'd)	430	ug/kg DW	9	ug/kg DW	48
EPA Site Inspection	DR265	8/26/1998	Carcinogenic PAHs (calc'd)	420	ug/kg DW	9	ug/kg DW	47
EPA Site Inspection	DR266	8/26/1998	Carcinogenic PAHs (calc'd)	420	ug/kg DW	9	ug/kg DW	47
EPA Site Inspection	DR267	8/26/1998	Carcinogenic PAHs (calc'd)	380	ug/kg DW	9	ug/kg DW	42
EPA Site Inspection	DR270	8/26/1998	Carcinogenic PAHs (calc'd)	350	ug/kg DW	9	ug/kg DW	39
KC Water Quality Assessment	WQAHAMM	6/3/1997	Carcinogenic PAHs (calc'd)	345.2	ug/kg DW	9	ug/kg DW	38
KC Water Quality Assessment	WQAHAMM	5/15/1997	Carcinogenic PAHs (calc'd)	193.4	ug/kg DW	9	ug/kg DW	21
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Carcinogenic PAHs (calc'd)	110 J	ug/kg DW	9	ug/kg DW	12
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Carcinogenic PAHs (calc'd)	89.87 J	ug/kg dw	9	ug/kg DW	10
KC Water Quality Assessment	WQAHAMM	5/28/1997	Carcinogenic PAHs (calc'd)	89.7	ug/kg DW	9	ug/kg DW	10
KC Water Quality Assessment	WQAHAMM	5/20/1997	Carcinogenic PAHs (calc'd)	77	ug/kg DW	9	ug/kg DW	8.6

Table A-1b
Comparison of Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area
to Lower Duwamish Waterway Background Concentrations

Event Name	Location Name	Date Collected	Chemical	Conc'n	Units	LDW Background	Units	Exceedance Factor
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Carcinogenic PAHs (calc'd)	70.45 J	ug/kg dw	9	ug/kg DW	8
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	Carcinogenic PAHs (calc'd)	39	ug/kg DW	9	ug/kg DW	4.3
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	Carcinogenic PAHs (calc'd)	35 J	ug/kg DW	9	ug/kg DW	3.9
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	Carcinogenic PAHs (calc'd)	31 J	ug/kg DW	9	ug/kg DW	3.4
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Carcinogenic PAHs (calc'd)	29.43 J	ug/kg dw	9	ug/kg DW	3
LDWRI-Dioxin Sampling	LDW-SS544-	1/12/2010	Carcinogenic PAHs (calc'd)	29 J	ug/kg DW	9	ug/kg DW	3.2
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	Carcinogenic PAHs (calc'd)	26 J	ug/kg DW	9	ug/kg DW	2.9
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Carcinogenic PAHs (calc'd)	20 J	ug/kg DW	9	ug/kg DW	2.2
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Carcinogenic PAHs (calc'd)	19 J	ug/kg DW	9	ug/kg DW	2.1
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	Carcinogenic PAHs (calc'd)	19 J	ug/kg DW	9	ug/kg DW	2.1
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Carcinogenic PAHs (calc'd)	17 J	ug/kg DW	9	ug/kg DW	1.9
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Carcinogenic PAHs (calc'd)	14.818	ug/kg dw	9	ug/kg DW	1.6
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Carcinogenic PAHs (calc'd)	13.462	ug/kg dw	9	ug/kg DW	1.5
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	Carcinogenic PAHs (calc'd)	13 J	ug/kg DW	9	ug/kg DW	1.4
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Carcinogenic PAHs (calc'd)	12.445 J	ug/kg dw	9	ug/kg DW	1.4
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	Carcinogenic PAHs (calc'd)	9.726 J	ug/kg dw	9	ug/kg DW	1.1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Carcinogenic PAHs (calc'd)	9.445 J	ug/kg dw	9	ug/kg DW	1.0
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Carcinogenic PAHs (calc'd)	2.082 J	ug/kg dw	9	ug/kg DW	<1
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	Carcinogenic PAHs (calc'd)	2.0774 J	ug/kg dw	9	ug/kg DW	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Carcinogenic PAHs (calc'd)	2.0751 J	ug/kg dw	9	ug/kg DW	<1
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	Carcinogenic PAHs (calc'd)	1.9879 J	ug/kg dw	9	ug/kg DW	<1
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	Carcinogenic PAHs (calc'd)	0.8804 J	ug/kg dw	9	ug/kg DW	<1
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Carcinogenic PAHs (calc'd)	0.8714 J	ug/kg dw	9	ug/kg DW	<1
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	Carcinogenic PAHs (calc'd)	0.8242 J	ug/kg dw	9	ug/kg DW	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Carcinogenic PAHs (calc'd)	0.8 J	ug/kg dw	9	ug/kg DW	<1
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	Dioxin/Furan TEQ	15.4 J	ng/kg	2	ng/kg	7.7
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	Dioxin/Furan TEQ	3.79 J	ng/kg	2	ng/kg	1.9
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	Dioxin/Furan TEQ	3.73 J	ng/kg	2	ng/kg	1.9
Duwamish River RM 4.9 to 7.4	DRB-114	5/9/2008	Dioxin/Furan TEQ	2.2482 J	ng/kg	2	ng/kg	1.1
Duwamish River RM 4.9 to 7.4	DRB-113	5/9/2008	Dioxin/Furan TEQ	1.7842	ng/kg	2	ng/kg	<1
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	Dioxin/Furan TEQ	1.57 J	ng/kg	2	ng/kg	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	Dioxin/Furan TEQ	1.323 J	ng/kg	2	ng/kg	<1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	Dioxin/Furan TEQ	1.2414 J	ng/kg	2	ng/kg	<1
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	Dioxin/Furan TEQ	1.22 J	ng/kg	2	ng/kg	<1
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	Dioxin/Furan TEQ	1.1182 J	ng/kg	2	ng/kg	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	Dioxin/Furan TEQ	1.0033 J	ng/kg	2	ng/kg	<1

Table A-1b
Comparison of Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area
to Lower Duwamish Waterway Background Concentrations

Event Name	Location Name	Date Collected	Chemical	Conc'n	Units	LDW Background	Units	Exceedance Factor
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	Dioxin/Furan TEQ	0.800 J	ng/kg	2	ng/kg	<1
Duwamish River RM 4.9 to 7.4	OR-11	May-08	Dioxin/Furan TEQ	0.6111 J	ng/kg	2	ng/kg	<1
LDW Outfall Sampling	LDW-SS2098-A	3/4/2011	Dioxin/Furan TEQ	0.294 J	ng/kg	2	ng/kg	<1
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	Dioxin/Furan TEQ	0.2619	ng/kg	2	ng/kg	<1
Duwamish River RM 4.9 to 7.4	OR-12	May-08	Dioxin/Furan TEQ	0.1803 J	ng/kg	2	ng/kg	<1
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	Dioxin/Furan TEQ	0.1569 J	ng/kg	2	ng/kg	<1
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	Dioxin/Furan TEQ	0.1351 J	ng/kg	2	ng/kg	<1
Duwamish River RM 4.9 to 7.4	DR-11	4/28/2008	Dioxin/Furan TEQ	0.1136 J	ng/kg	2	ng/kg	<1
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	Dioxin/Furan TEQ	0.0841 J	ng/kg	2	ng/kg	<1
LDWRI-Surface Sediment Round 2	LDW-SS148	3/9/2005	PCBs (total calc'd)	520	ug/kg DW	2	ug/kg DW	260
NOAA Site Characterization	WIT258	10/1/1997	PCBs (total calc'd)	340	ug/kg DW	2	ug/kg DW	170
LDWRI-Surface Sediment Round 2	LDW-SS135	3/15/2005	PCBs (total calc'd)	240	ug/kg DW	2	ug/kg DW	120
LDWRI-Dioxin Sampling	LDW-SS544-comp	1/12/2010	PCBs (total calc'd)	127	ug/kg DW	2	ug/kg DW	64
LDWRI-Surface Sediment Round 2	LDW-SS149	3/9/2005	PCBs (total calc'd)	98	ug/kg DW	2	ug/kg DW	49
LDWRI-Surface Sediment Round 3	LDW-SS340	10/3/2006	PCBs (total calc'd)	88 J	ug/kg DW	2	ug/kg DW	44
LDWRI-Surface Sediment Round 3	LDW-SS339	10/3/2006	PCBs (total calc'd)	60	ug/kg DW	2	ug/kg DW	30
NOAA Site Characterization	WST303	10/23/1997	PCBs (total calc'd)	60	ug/kg DW	2	ug/kg DW	30
LDWRI-Surface Sediment Round 2	LDW-SS150	3/9/2005	PCBs (total calc'd)	54	ug/kg DW	2	ug/kg DW	27
EPA Site Inspection	DR285	8/25/1998	PCBs (total calc'd)	53	ug/kg DW	2	ug/kg DW	27
NOAA Site Characterization	WIT259	10/1/1997	PCBs (total calc'd)	51	ug/kg DW	2	ug/kg DW	26
EPA Site Inspection	DR266	8/26/1998	PCBs (total calc'd)	51	ug/kg DW	2	ug/kg DW	26
EPA Site Inspection	DR264	8/26/1998	PCBs (total calc'd)	51	ug/kg DW	2	ug/kg DW	26
EPA Site Inspection	DR263	8/25/1998	PCBs (total calc'd)	50	ug/kg DW	2	ug/kg DW	25
NOAA Site Characterization	WIT257	10/2/1997	PCBs (total calc'd)	46	ug/kg DW	2	ug/kg DW	23
EPA Site Inspection	DR273	8/26/1998	PCBs (total calc'd)	45	ug/kg DW	2	ug/kg DW	23
NOAA Site Characterization	WIT252	9/29/1997	PCBs (total calc'd)	43	ug/kg DW	2	ug/kg DW	22
NOAA Site Characterization	WIT252	9/29/1997	PCBs (total calc'd)	43	ug/kg DW	2	ug/kg DW	22
NOAA Site Characterization	WST306	10/21/1997	PCBs (total calc'd)	39	ug/kg DW	2	ug/kg DW	20
NOAA Site Characterization	CH0003	10/9/1997	PCBs (total calc'd)	37	ug/kg DW	2	ug/kg DW	19
LDWRI-Surface Sediment Round 2	LDW-SS133	3/9/2005	PCBs (total calc'd)	36 J	ug/kg DW	2	ug/kg DW	18
NOAA Site Characterization	WST306	10/21/1997	PCBs (total calc'd)	35	ug/kg DW	2	ug/kg DW	18
LDW Outfall Sampling	LDW-SS2201-U	3/18/2011	PCBs (total calc'd)	34	ug/kg DW	2	ug/kg DW	17
NOAA Site Characterization	WIT249	10/1/1997	PCBs (total calc'd)	34	ug/kg DW	2	ug/kg DW	17
EPA Site Inspection	DR268	8/26/1998	PCBs (total calc'd)	34	ug/kg DW	2	ug/kg DW	17
NOAA Site Characterization	WST301	10/20/2007	PCBs (total calc'd)	32	ug/kg DW	2	ug/kg DW	16
LDWRI-Dioxin Sampling	LDW-SS547	1/11/2010	PCBs (total calc'd)	30	ug/kg DW	2	ug/kg DW	15
NOAA Site Characterization	WST310	11/13/1997	PCBs (total calc'd)	29	ug/kg DW	2	ug/kg DW	15

Table A-1b
Comparison of Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area
to Lower Duwamish Waterway Background Concentrations

Event Name	Location Name	Date Collected	Chemical	Conc'n	Units	LDW Background	Units	Exceedance Factor
NOAA Site Characterization	WST304	10/21/1997	PCBs (total calc'd)	26	ug/kg DW	2	ug/kg DW	13
EPA Site Inspection	DR287	8/26/1998	PCBs (total calc'd)	25	ug/kg DW	2	ug/kg DW	13
NOAA Site Characterization	WIT255	9/29/1997	PCBs (total calc'd)	25	ug/kg DW	2	ug/kg DW	13
NOAA Site Characterization	WST308	10/1/1997	PCBs (total calc'd)	23	ug/kg DW	2	ug/kg DW	12
LDWRI-Surface Sediment Round 2	LDW-SS131	3/8/2005	PCBs (total calc'd)	22 J	ug/kg DW	2	ug/kg DW	11
EPA Site Inspection	DR267	8/26/1998	PCBs (total calc'd)	21	ug/kg DW	2	ug/kg DW	11
NOAA Site Characterization	WST305	10/21/1997	PCBs (total calc'd)	21	ug/kg DW	2	ug/kg DW	11
NOAA Site Characterization	WST312	10/23/1997	PCBs (total calc'd)	21	ug/kg DW	2	ug/kg DW	11
LDW Outfall Sampling	LDW-SS2099-D	3/3/2011	PCBs (total calc'd)	19	ug/kg DW	2	ug/kg DW	9.5
NOAA Site Characterization	WST300	10/8/1997	PCBs (total calc'd)	17	ug/kg DW	2	ug/kg DW	8.5
NOAA Site Characterization	WIT260	10/1/1997	PCBs (total calc'd)	16	ug/kg DW	2	ug/kg DW	8.0
NOAA Site Characterization	WST309	10/1/1997	PCBs (total calc'd)	16	ug/kg DW	2	ug/kg DW	8.0
NOAA Site Characterization	WIT250	10/1/1997	PCBs (total calc'd)	16	ug/kg DW	2	ug/kg DW	8.0
LDW Outfall Sampling	LDW-SS2200-A	3/18/2011	PCBs (total calc'd)	16 J	ug/kg DW	2	ug/kg DW	8.0
NOAA Site Characterization	WIT256	11/13/1997	PCBs (total calc'd)	13	ug/kg DW	2	ug/kg DW	6.5
LDW Outfall Sampling	LDW-SS2099-A	3/3/2011	PCBs (total calc'd)	12	ug/kg DW	2	ug/kg DW	6.0
LDW Outfall Sampling	LDW-SS2200-D	3/18/2011	PCBs (total calc'd)	12	ug/kg DW	2	ug/kg DW	6.0
NOAA Site Characterization	WST302	10/1/1997	PCBs (total calc'd)	11	ug/kg DW	2	ug/kg DW	5.5
NOAA Site Characterization	WIT261	10/1/1997	PCBs (total calc'd)	11	ug/kg DW	2	ug/kg DW	5.5
LDWRI-Benthic	B10b	8/19/2004	PCBs (total calc'd)	9.8 J	ug/kg DW	2	ug/kg DW	4.9
LDW Outfall Sampling	LDW-SS2098-D	3/4/2011	PCBs (total calc'd)	9.1	ug/kg DW	2	ug/kg DW	4.6
NOAA Site Characterization	WIT251	9/29/1997	PCBs (total calc'd)	8.7	ug/kg DW	2	ug/kg DW	4.4
LDW Outfall Sampling	LDW-SS2201-A	3/18/2011	PCBs (total calc'd)	8.5 J	ug/kg DW	2	ug/kg DW	4.3
LDW Outfall Sampling	LDW-SS2201-D	3/18/2011	PCBs (total calc'd)	8 J	ug/kg DW	2	ug/kg DW	4.0
LDW Outfall Sampling	LDW-SS2099-U	3/3/2011	PCBs (total calc'd)	7.3	ug/kg DW	2	ug/kg DW	3.7
Duwamish River RM 4.9 to 7.4	DR-03	4/28/2008	PCBs (total calc'd)	3.4 J	ug/kg DW	2	ug/kg DW	1.7
Duwamish River RM 4.9 to 7.4	DR-06	4/28/2008	PCBs (total calc'd)	3 J	ug/kg DW	2	ug/kg DW	1.5
Duwamish River RM 4.9 to 7.4	DR-04	4/28/2008	PCBs (total calc'd)	2.9 J	ug/kg DW	2	ug/kg DW	1.5
Duwamish River RM 4.9 to 7.4	DR-09	4/28/2008	PCBs (total calc'd)	2.7 J	ug/kg DW	2	ug/kg DW	1.4
Duwamish River RM 4.9 to 7.4	DR-12	4/28/2008	PCBs (total calc'd)	2.7 J	ug/kg DW	2	ug/kg DW	1.4
Duwamish River RM 4.9 to 7.4	DR-05	4/28/2008	PCBs (total calc'd)	2.6 J	ug/kg DW	2	ug/kg DW	1.3
Duwamish River RM 4.9 to 7.4	DR-08	4/28/2008	PCBs (total calc'd)	2.6 J	ug/kg DW	2	ug/kg DW	1.3
Duwamish River RM 4.9 to 7.4	DR-10	4/28/2008	PCBs (total calc'd)	2.5 J	ug/kg DW	2	ug/kg DW	1.3
Duwamish River RM 4.9 to 7.4	DR-07	4/28/2008	PCBs (total calc'd)	2.3 J	ug/kg DW	2	ug/kg DW	1.2
Duwamish River RM 4.9 to 7.4	DRB-115	5/9/2008	PCBs (total calc'd)	2.1 J	ug/kg DW	2	ug/kg DW	1.1
Duwamish River RM 4.9 to 7.4	DRB-112	5/9/2008	PCBs (total calc'd)	1.9	ug/kg DW	2	ug/kg DW	<1
Duwamish River RM 4.9 to 7.4	DRB-116	5/9/2008	PCBs (total calc'd)	1.7 J	ug/kg DW	2	ug/kg DW	<1
Duwamish River RM 4.9 to 7.4	DRB-117	5/9/2008	PCBs (total calc'd)	0.86 J	ug/kg DW	2	ug/kg DW	<1

Table A-1b
Comparison of Chemicals Detected in Surface Sediment Samples
Near the Restoration Areas Source Control Area
to Lower Duwamish Waterway Background Concentrations

Event Name	Location Name	Date Collected	Chemical	Conc'n	Units	LDW Background	Units	Exceedance Factor
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mg/kg - Milligram per kilogram

ug/kg - Microgram per kilogram

ng/kg - nanogram per kilogram

DW - Dry weight

PAHs - Polycyclic aromatic hydrocarbons

PCB - Polychlorinated biphenyl

J - Estimated value between the method detection limit and the laboratory reporting limit

LDW - Lower Duwamish Waterway

TEQ - Toxic Equivalency

Table presents detected chemicals only.

Exceedance factors are the ratio of the detected concentrations to the LDW Background Level (AECOM 2010 [0030]); exceedance factors are shown only if they are greater than 1.

Sampling events are listed in Table 2.

Table A-2a
Chemicals Detected in Subsurface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Sample Depth (feet)	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
											SQS	CSL
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Acenaphthene	1.60E-02 J	1.67	9.58E-01	16	57	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Anthracene	3.50E-02	1.67	2.10E+00	220	1200	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Aroclor 1248	4.10E-02	1.51	2.72E+00					
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Aroclor 1248	3.30E-02	1.55	2.13E+00					
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Aroclor 1254	3.30E-01	1.67	1.98E+01					
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Aroclor 1254	5.00E-02	1.55	3.23E+00					
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Aroclor 1254	4.40E-02	1.51	2.91E+00					
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Aroclor 1260	2.80E-02	1.55	1.81E+00					
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Aroclor 1260	2.40E-02	1.51	1.59E+00					
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Arsenic	1.20E+01	1.51	7.95E+02	57	93	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Arsenic	1.10E+01	1.55	7.10E+02	57	93	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Arsenic	7.00E+00	1.67	4.19E+02	57	93	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	2 - 4	Arsenic	6.00E+00	0.303	1.98E+03	57	93	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Benzo(a)anthracene	1.10E-01	1.67	6.59E+00	110	270	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Benzo(a)anthracene	8.60E-02	1.55	5.55E+00	110	270	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Benzo(a)anthracene	8.30E-02	1.51	5.50E+00	110	270	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Benzo(a)pyrene	1.40E-01	1.67	8.38E+00	99	210	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Benzo(a)pyrene	9.90E-02	1.55	6.39E+00	99	210	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Benzo(a)pyrene	7.60E-02	1.51	5.03E+00	99	210	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Benzo(b)fluoranthene	1.50E-01	1.55	9.68E+00	230	450	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Benzo(b)fluoranthene	1.50E-01	1.67	8.98E+00	31	78	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Benzo(b)fluoranthene	1.40E-01	1.51	9.27E+00	230	450	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Benzo(g,h,i)perylene	2.90E-02	1.67	1.74E+00	31	78	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Benzo(k)fluoranthene	1.60E-01	1.55	1.03E+01	230	450	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Benzo(k)fluoranthene	1.50E-01	1.51	9.93E+00	230	450	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Benzo(k)fluoranthene	1.40E-01	1.67	8.38E+00	230	450	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Benzo(a)fluoranthenes (total-calc'd)	3.10E-01	1.55	2.00E+01	230	450	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Benzo(a)fluoranthenes (total-calc'd)	2.90E-01	1.51	1.92E+01	230	450	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Benzo(a)fluoranthenes (total-calc'd)	2.90E-01	1.67	1.74E+01	230	450	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Benzoic acid	2.80E-01 J	1.51	1.85E+01	650	650	ug/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Benzoic acid	1.20E-01 J	1.55	7.74E+00	650	650	ug/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Benzoic acid	9.00E-02	1.67	5.39E+00	650	650	ug/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	2 - 4	Benzoic acid	5.40E-02 J	0.303	1.78E+01	650	650	ug/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Bis(2-ethylhexyl)phthalate	1.30E-01	1.55	8.39E+00	47	78	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Bis(2-ethylhexyl)phthalate	1.00E-01	1.51	6.62E+00	47	78	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Bis(2-ethylhexyl)phthalate	2.30E-02	1.67	1.38E+00	47	78	mg/kg OC	<1	<1

Table A-2a
Chemicals Detected in Subsurface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Sample Depth (feet)	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
											SQS	CSL
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Butyl benzyl phthalate	2.20E-02	1.51	1.46E+00	4.9	64	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Butyl benzyl phthalate	1.60E-02	1.55	1.03E+00	4.9	64	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Carcinogenic PAHs (calc'd)	1.85E+02							
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Carcinogenic PAHs (calc'd)	2.80E+02							
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Carcinogenic PAHs (calc'd)	3.42E+02							
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Chromium	2.44E+01	1.55	1.57E+03	260	270	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Chromium	2.38E+01	1.51	1.58E+03	260	270	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Chromium	1.61E+01	1.67	9.64E+02	260	270	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	2 - 4	Chromium	1.16E+01	0.303	3.83E+03	260	270	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Chrysene	1.30E-01	1.67	7.78E+00	110	460	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Chrysene	1.10E-01	1.51	7.28E+00	110	460	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Chrysene	1.10E-01	1.55	7.10E+00	110	460	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Cobalt	8.50E+00	1.51	5.63E+02					
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Cobalt	8.50E+00	1.55	5.48E+02					
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	2 - 4	Cobalt	5.30E+00	0.303	1.75E+03					
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Cobalt	5.30E+00	1.67	3.17E+02					
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Copper	3.65E+01	1.51	2.42E+03	390	390	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Copper	3.59E+01	1.55	2.32E+03	390	390	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Copper	2.18E+01	1.67	1.31E+03	390	390	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	2 - 4	Copper	1.18E+01	0.303	3.89E+03	390	390	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Di-n-butyl phthalate	1.60E-02 J	1.67	9.58E-01	220	1700	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56 ^a	02/07/06	2 - 4	Di-n-butyl phthalate	1.00E-02 J	0.303	3.30E+00	1400	5100	ug/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Fluoranthene	3.10E-01	1.67	1.86E+01	160	1200	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Fluoranthene	2.10E-01	1.55	1.35E+01	160	1200	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Fluoranthene	2.00E-01	1.51	1.32E+01	160	1200	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Fluorene	1.50E-02 J	1.67	8.98E-01	23	79	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Indeno(1,2,3-cd)pyrene	3.20E-02	1.67	1.92E+00	34	88	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Lead	4.00E+01 J	1.67	2.40E+03	450	530	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Lead	1.80E+01	1.55	1.16E+03	450	530	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Lead	1.70E+01	1.51	1.13E+03	450	530	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Mercury	1.30E-01	1.55	8.39E+00	0.41	0.59	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Mercury	1.00E-01	1.51	6.62E+00	0.41	0.59	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Mercury	5.00E-02	1.67	2.99E+00	0.41	0.59	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Molybdenum	1.20E+00	1.55	7.74E+01					
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Molybdenum	6.00E-01	1.67	3.59E+01					

Table A-2a
Chemicals Detected in Subsurface Sediment Samples
Near the Restoration Areas Source Control Area

Event Name	Location Name	Date Collected	Sample Depth (feet)	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
											SQS	CSL
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Nickel	2.00E+01	1.55	1.29E+03					
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Nickel	1.80E+01	1.51	1.19E+03					
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Nickel	1.20E+01	1.67	7.19E+02					
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	2 - 4	Nickel	1.00E+01	0.303	3.30E+03					
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	PCBs (total calc'd)	3.30E-01	1.67	1.98E+01	12	65	mg/kg OC	1.6	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	PCBs (total calc'd)	1.11E-01	1.55	7.16E+00	12	65	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	PCBs (total calc'd)	1.09E-01	1.51	7.22E+00	12	65	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Phenanthrene	1.70E-01	1.67	1.02E+01	100	480	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Phenanthrene	7.60E-02	1.55	4.90E+00	100	480	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Phenanthrene	5.90E-02	1.51	3.91E+00	100	480	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Pyrene	2.20E-01	1.55	1.42E+01	1000	1400	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Pyrene	2.20E-01	1.67	1.32E+01	1000	1400	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Pyrene	1.70E-01	1.51	1.13E+01	1000	1400	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Total HPAH (calc'd)	1.26E+00	1.67	7.54E+01	960	5300	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Total HPAH (calc'd)	1.04E+00	1.55	6.71E+01	960	5300	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Total HPAH (calc'd)	9.30E-01	1.51	6.16E+01	960	5300	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Total LPAH (calc'd)	2.40E-01 J	1.67	1.44E+01	370	780	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Total LPAH (calc'd)	7.60E-02	1.55	4.90E+00	370	780	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Total LPAH (calc'd)	5.90E-02	1.51	3.91E+00	370	780	mg/kg OC	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Total PAH (calc'd)	1.50E+00 J	1.67	8.98E+01					
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Total PAH (calc'd)	1.11E+00	1.55	7.16E+01					
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Total PAH (calc'd)	9.90E-01	1.51	6.56E+01					
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Vanadium	6.27E+01	1.55	4.05E+03					
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Vanadium	6.10E+01	1.51	4.04E+03					
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Vanadium	5.01E+01	1.67	3.00E+03					
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	2 - 4	Vanadium	4.78E+01	0.303	1.58E+04					
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Zinc	8.10E+01	1.51	5.36E+03	410	960	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Zinc	8.00E+01	1.55	5.16E+03	410	960	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Zinc	6.85E+01 J	1.67	4.10E+03	410	960	mg/kg DW	<1	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	2 - 4	Zinc	2.99E+01 J	0.303	9.87E+03	410	960	mg/kg DW	<1	<1

**Table A-2a
Chemicals Detected in Subsurface Sediment Samples
Near the Restoration Areas Source Control Area**

Event Name	Location Name	Date Collected	Sample Depth (feet)	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
											SQS	CSL

mg/kg - Milligram per kilogram
 ug/kg - Microgram per kilogram
 ng/kg - nanogram per kilogram
 DW - Dry weight
 TOC - Total Organic Carbon
 OC - Organic carbon normalized
 SQS - SMS Sediment Quality Standard
 CSL - SMS Cleanup Screening Level

SMS - Sediment Management Standard (Washington Administrative Code 173-204)
 PAHs - Polycyclic aromatic hydrocarbons
 SVOCs - Semi-volatile organic compounds
 PCB - Polychlorinated biphenyl
 J - Estimated value between the method detection limit and the laboratory reporting limit
 LDW - Lower Duwamish Waterway
 TEQ - Toxic Equivalency

Table presents detected chemicals only.

Exceedance factors are the ratio of the detected concentrations to the CSL or SQS; exceedance factors are shown only if they are greater than 1.

Sampling events are listed in Table 2.

^a Due to the TOC in this sample, results were compared to the Lowest Apparent Effects Threshold (LAET) or the second LAET (2LAET) value rather than the SQS and/or CSL. The LAET is functionally equivalent to the SQS and the 2LAET is functionally equivalent to the CSL. OC-normalization is not considered to be appropriate for when TOC concentrations are less than or equal to 0.5 percent or greater than or equal to 4.0 percent.

Table A-2b
Comparison of Chemicals Detected in Subsurface Sediment Samples
Near the Restoration Areas Source Control Area
to Lower Duwamish Waterway Background Concentrations

Event Name	Location Name	Date Collected	Sample Depth (feet)	Chemical	Conc'n	Units	LDW Background	Units	Exceedance Factor
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Arsenic	12	mg/kg dw	7	mg/kg DW	1.7
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Arsenic	11	mg/kg dw	7	mg/kg DW	1.6
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Arsenic	7	mg/kg dw	7	mg/kg DW	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	2 - 4	Arsenic	6	mg/kg dw	7	mg/kg DW	<1
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	Carcinogenic PAHs (calc'd)	185	ug/kg DW	9	ug/kg DW	21
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	Carcinogenic PAHs (calc'd)	140	ug/kg DW	9	ug/kg DW	16
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	Carcinogenic PAHs (calc'd)	114	ug/kg DW	9	ug/kg DW	13
LDW Subsurface Sediment 2006	LDW-SC56	02/07/06	0 - 2	PCBs (total calc'd)	330	ug/kg dw	2	ug/kg DW	165
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	2 - 4	PCBs (total calc'd)	111	ug/kg dw	2	ug/kg DW	56
LDW Subsurface Sediment 2006	LDW-SC54	02/23/06	0 - 2	PCBs (total calc'd)	109	ug/kg dw	2	ug/kg DW	55

mg/kg - Milligram per kilogram
ug/kg - Microgram per kilogram
DW - Dry weight
PCB - Polychlorinated biphenyl
LDW - Lower Duwamish Waterway

Table presents detected chemicals only.
Exceedance factors are the ratio of the detected concentrations to the CSL or SQS; exceedance factors are shown only if they are greater than 1.
Sampling events are listed in Table 2.

Table A-3a
Comparison of Chemicals Detected in Bank Soil Samples
Near the Restoration Areas Source Control Area
to Sediment Management Standards

Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
									SQS	CSL
HC-BS-3	5/10/2011	1,2,3,4,6,7,8-HpCDD	2.20E-05							
HC-BS-2	5/10/2011	1,2,3,4,6,7,8-HpCDD	1.50E-05							
HC-BS-1	5/10/2011	1,2,3,4,6,7,8-HpCDD	1.38E-05							
HC-BS-3	5/10/2011	1,2,3,4,6,7,8-HpCDF	3.99E-06							
HC-BS-2	5/10/2011	1,2,3,4,6,7,8-HpCDF	3.35E-06							
HC-BS-1	5/10/2011	1,2,3,4,6,7,8-HpCDF	2.61E-06							
HC-BS-3	5/10/2011	1,2,3,4,7,8,9-HpCDF	3.82E-07 T							
HC-BS-3	5/10/2011	1,2,3,4,7,8-HxCDD	8.21E-07 T							
HC-BS-2	5/10/2011	1,2,3,4,7,8-HxCDD	4.74E-07 T							
HC-BS-1	5/10/2011	1,2,3,4,7,8-HxCDD	3.88E-07 T							
HC-BS-3	5/10/2011	1,2,3,4,7,8-HxCDF	1.07E-06 T							
HC-BS-2	5/10/2011	1,2,3,4,7,8-HxCDF	8.33E-07 T							
HC-BS-1	5/10/2011	1,2,3,4,7,8-HxCDF	3.78E-07 T							
HC-BS-3	5/10/2011	1,2,3,6,7,8-HxCDD	1.42E-06 T							
HC-BS-2	5/10/2011	1,2,3,6,7,8-HxCDD	9.49E-07 T							
HC-BS-3	5/10/2011	1,2,3,6,7,8-HxCDF	4.64E-07 T							
HC-BS-2	5/10/2011	1,2,3,6,7,8-HxCDF	2.99E-07 T							
HC-BS-3	5/10/2011	1,2,3,7,8,9-HxCDD	1.29E-06 T							
HC-BS-2	5/10/2011	1,2,3,7,8,9-HxCDD	7.83E-07 T							
HC-BS-2	5/10/2011	1,2,3,7,8,9-HxCDF	2.07E-07 T							
HC-BS-3	5/10/2011	1,2,3,7,8-PeCDD	8.18E-07 T							
HC-BS-2	5/10/2011	1,2,3,7,8-PeCDD	4.80E-07 T							
HC-BS-1	5/10/2011	1,2,3,7,8-PeCDD	4.06E-07 T							
HC-BS-2	5/10/2011	1,2,3,7,8-PeCDF	1.93E-07 T							
HC-BS-3	5/10/2011	1-Methylnaphthalene	3.90E-03 T	0.554	7.04E-01					
HC-BS-2	5/10/2011	1-Methylnaphthalene	3.30E-03 T	0.711	4.64E-01					
HC-BS-3	5/10/2011	2,3,4,6,7,8-HxCDF	4.94E-07 T							
HC-BS-2	5/10/2011	2,3,4,6,7,8-HxCDF	3.54E-07 T							
HC-BS-2	5/10/2011	2,3,4,7,8-PeCDF	2.19E-07 T							
HC-BS-1	5/10/2011	2,3,4,7,8-PeCDF	2.07E-07 T							
HC-BS-2	5/10/2011	2,3,7,8-TCDF	2.34E-07 T							
HC-BS-3	5/10/2011	2-Methylnaphthalene	4.00E-03 T	0.554	7.22E-01	38	64	mg/kg OC	<1	<1
HC-BS-2	5/10/2011	2-Methylnaphthalene	3.70E-03 T	0.711	5.20E-01	38	64	mg/kg OC	<1	<1
HC-BS-2	5/10/2011	Arsenic	6.40E+00	0.711	9.00E+02	57	93	mg/kg DW	<1	<1
HC-BS-3	5/10/2011	Arsenic	6.10E+00	0.554	1.10E+03	57	93	mg/kg DW	<1	<1
HC-BS-1	5/10/2011	Benzo(a)anthracene	2.90E-03 T	1.28	2.27E-01	110	270	mg/kg OC	<1	<1
HC-BS-2	5/10/2011	Benzo(a)anthracene	2.90E-03 T	0.711	4.08E-01	110	270	mg/kg OC	<1	<1
HC-BS-3	5/10/2011	Benzo(a)pyrene	3.30E-03 T	0.554	5.96E-01	99	210	mg/kg OC	<1	<1
HC-BS-1	5/10/2011	Benzo(a)pyrene	3.10E-03 T	1.28	2.42E-01	99	210	mg/kg OC	<1	<1
HC-BS-1	5/10/2011	Benzo(g,h,i)perylene	3.90E-03 T	1.28	3.05E-01	31	78	mg/kg OC	<1	<1

Table A-3a
Comparison of Chemicals Detected in Bank Soil Samples
Near the Restoration Areas Source Control Area
to Sediment Management Standards

Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
									SQS	CSL
HC-BS-1	5/10/2011	Benzofluoranthenes (total-calc'd)	7.90E-03	1.28	6.17E-01	230	450	mg/kg OC	<1	<1
HC-BS-2	5/10/2011	Benzofluoranthenes (total-calc'd)	7.70E-03	0.711	1.08E+00	230	450	mg/kg OC	<1	<1
HC-BS-3	5/10/2011	Benzofluoranthenes (total-calc'd)	6.70E-03	0.554	1.21E+00	230	450	mg/kg OC	<1	<1
HC-BS-2	5/10/2011	Cadmium	2.00E-01	0.711	2.81E+01	5.1	6.7	mg/kg DW	<1	<1
HC-BS-3	5/10/2011	Cadmium	2.00E-01	0.554	3.61E+01	5.1	6.7	mg/kg DW	<1	<1
HC-BS-2	5/10/2011	Chromium	1.21E+01	0.711	1.70E+03	260	270	mg/kg DW	<1	<1
HC-BS-3	5/10/2011	Chromium	1.18E+01	0.554	2.13E+03	260	270	mg/kg DW	<1	<1
HC-BS-1	5/10/2011	Chromium	1.17E+01	1.28	9.14E+02	260	270	mg/kg DW	<1	<1
HC-BS-2	5/10/2011	Chrysene	5.20E-03	0.711	7.31E-01	110	460	mg/kg OC	<1	<1
HC-BS-3	5/10/2011	Chrysene	4.80E-03	0.554	8.66E-01	110	460	mg/kg OC	<1	<1
HC-BS-1	5/10/2011	Chrysene	4.50E-03 T	1.28	3.52E-01	110	460	mg/kg OC	<1	<1
HC-BS-2	5/10/2011	Copper	1.11E+01	0.711	1.56E+03	390	390	mg/kg DW	<1	<1
HC-BS-3	5/10/2011	Copper	1.06E+01	0.554	1.91E+03	390	390	mg/kg DW	<1	<1
HC-BS-1	5/10/2011	Copper	9.90E+00	1.28	7.73E+02	390	390	mg/kg DW	<1	<1
HC-BS-1	5/10/2011	Diethyl phthalate	1.50E-02 T	1.28	1.17E+00	61	110	mg/kg OC	<1	<1
HC-BS-2	5/10/2011	Diethyl phthalate	1.20E-02 T	0.711	1.69E+00	61	110	mg/kg OC	<1	<1
HC-BS-2	5/10/2011	Fluoranthene	5.60E-03	0.711	7.88E-01	160	1200	mg/kg OC	<1	<1
HC-BS-1	5/10/2011	Fluoranthene	4.90E-03	1.28	3.83E-01	160	1200	mg/kg OC	<1	<1
HC-BS-3	5/10/2011	Fluoranthene	4.90E-03	0.554	8.84E-01	160	1200	mg/kg OC	<1	<1
HC-BS-1	5/10/2011	Fluorene	3.40E-03 T	1.28	2.66E-01	23	79	mg/kg OC	<1	<1
HC-BS-1	5/10/2011	Indeno(1,2,3-cd)pyrene	2.80E-03 T	1.28	2.19E-01	34	88	mg/kg OC	<1	<1
HC-BS-2	5/10/2011	Lead	3.00E+00	0.711	4.22E+02	450	530	mg/kg DW	<1	<1
HC-BS-3	5/10/2011	Lead	3.00E+00	0.554	5.42E+02	450	530	mg/kg DW	<1	<1
HC-BS-3	5/10/2011	OCDD	1.18E-04							
HC-BS-1	5/10/2011	OCDD	9.59E-05							
HC-BS-2	5/10/2011	OCDD	9.23E-05							
HC-BS-2	5/10/2011	OCDF	5.39E-06							
HC-BS-3	5/10/2011	OCDF	4.86E-06 T							
HC-BS-1	5/10/2011	OCDF	3.78E-06 T							
HC-BS-2	5/10/2011	o-Xylene	7.80E-01	0.711	1.10E+02					
HC-BS-1	5/10/2011	o-Xylene	2.30E-01	1.28	1.80E+01					
HC-BS-3	5/10/2011	o-Xylene	4.20E-02	0.554	7.58E+00					
HC-BS-3	5/10/2011	Phenanthrene	8.70E-03	0.554	1.57E+00	100	480	mg/kg OC	<1	<1
HC-BS-1	5/10/2011	Phenanthrene	8.20E-03	1.28	6.41E-01	100	480	mg/kg OC	<1	<1
HC-BS-2	5/10/2011	Phenanthrene	7.90E-03	0.711	1.11E+00	100	480	mg/kg OC	<1	<1
HC-BS-1	5/10/2011	Phenol	1.80E-02 T	1.28	1.41E+00	420	1200	ug/kg DW	<1	<1
HC-BS-2	5/10/2011	Pyrene	6.20E-03	0.711	8.72E-01	1000	1400	mg/kg OC	<1	<1
HC-BS-1	5/10/2011	Pyrene	5.50E-03	1.28	4.30E-01	1000	1400	mg/kg OC	<1	<1
HC-BS-3	5/10/2011	Pyrene	5.00E-03	0.554	9.03E-01	1000	1400	mg/kg OC	<1	<1
HC-BS-3	5/10/2011	Total HpCDD	4.32E-05							

Table A-3a
Comparison of Chemicals Detected in Bank Soil Samples
Near the Restoration Areas Source Control Area
to Sediment Management Standards

Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
									SQS	CSL
HC-BS-1	5/10/2011	Total HpCDD	3.54E-05							
HC-BS-2	5/10/2011	Total HpCDD	3.00E-05							
HC-BS-3	5/10/2011	Total HpCDF	9.26E-06							
HC-BS-2	5/10/2011	Total HpCDF	7.91E-06							
HC-BS-1	5/10/2011	Total HpCDF	5.51E-06							
HC-BS-3	5/10/2011	Total HxCDD	1.57E-05							
HC-BS-2	5/10/2011	Total HxCDD	9.10E-06							
HC-BS-1	5/10/2011	Total HxCDD	3.63E-06							
HC-BS-3	5/10/2011	Total HxCDF	1.03E-05							
HC-BS-2	5/10/2011	Total HxCDF	6.77E-06							
HC-BS-1	5/10/2011	Total HxCDF	4.32E-06							
HC-BS-3	5/10/2011	Total PeCDD	7.55E-06							
HC-BS-2	5/10/2011	Total PeCDD	2.53E-06							
HC-BS-1	5/10/2011	Total PeCDD	1.91E-06							
HC-BS-3	5/10/2011	Total PeCDF	7.09E-06							
HC-BS-2	5/10/2011	Total PeCDF	4.70E-06							
HC-BS-1	5/10/2011	Total PeCDF	2.08E-06							
HC-BS-3	5/10/2011	Total TCDD	4.05E-06							
HC-BS-2	5/10/2011	Total TCDD	3.31E-06							
HC-BS-1	5/10/2011	Total TCDD	3.05E-06							
HC-BS-3	5/10/2011	Total TCDF	3.67E-06							
HC-BS-2	5/10/2011	Total TCDF	2.96E-06							
HC-BS-1	5/10/2011	Total TCDF	1.32E-06							
HC-BS-2	5/10/2011	Zinc	3.80E+01	0.711	5.34E+03	410	960	mg/kg DW	<1	<1
HC-BS-3	5/10/2011	Zinc	3.80E+01	0.554	6.86E+03	410	960	mg/kg DW	<1	<1
HC-BS-1	5/10/2011	Zinc	3.30E+01	1.28	2.58E+03	410	960	mg/kg DW	<1	<1

mg/kg - Milligram per kilogram
ug/kg - Microgram per kilogram
DW - Dry weight
TOC - Total Organic Carbon
OC - Organic carbon normalized

SQS - SMS Sediment Quality Standard
CSL - SMS Cleanup Screening Level
SMS - Sediment Management Standard (Washington Administrative Code 173-204)
J - Estimated value between the method detection limit and the laboratory reporting limit
T - Value is between the method detection limit and the laboratory reporting limit

Table presents detected chemicals only.
Exceedance factors are the ratio of the detected concentrations to the CSL or SQS; exceedance factors are shown only if they are greater than 1.

Table A-3b
Comparison of Chemicals Detected in Bank Soil Samples
Near the Restoration Areas Source Control Area
to Lower Duwamish Waterway Background Concentrations

Location Name	Date Collected	Chemical	Conc'n	Units	LDW Background	Units	Exceedance Factor
HC-BS-2	5/10/2011	Arsenic	6.4	mg/kg	7	mg/kg	<1
HC-BS-3	5/10/2011	Arsenic	6.1	mg/kg	7	mg/kg	<1

mg/kg - Milligram per kilogram

LDW - Lower Duwamish Waterway

Table presents detected chemicals only.

Exceedance factors are the ratio of the detected concentrations to the LDW Background Level (AECOM 2010 [0030]);
exceedance factors are shown only if they are greater than 1.

**Table A-4
Chemicals Detected in Seep Samples
Near the Restoration Areas Source Control Area**

Source	Sample Location	Date Sampled	Chemical	Conc'n	Units	Marine Chronic WQS	Marine Acute WQS	Chronic WQS Exceedance Factor	GW-to-Sediment Screening Level ^a	Exceedance Factor
Filtered Sample										
LDWRI-Seep	SP-39	7/1/2004	Arsenic	0.054	ug/L	36	69	<1	370	<1
LDWRI-Seep	SP-39	7/1/2004	Cadmium	0.206	ug/L	9.3	42	<1	3.4	<1
LDWRI-Seep	SP-39	7/1/2004	Copper	10.1 J	ug/L	3.1	4.8	3.3	120	<1
LDWRI-Seep	SP-39	7/1/2004	Lead	0.051	ug/L	8.1	210	<1	13	<1
LDWRI-Seep	SP-39	7/1/2004	Mercury	0.00087	ug/L	0.025	1.8	<1	0.0074	<1
LDWRI-Seep	SP-39	7/1/2004	Nickel	2.78	ug/L	8.2	74	<1	--	--
LDWRI-Seep	SP-39	7/1/2004	Silver	0.028	ug/L	--	1.9	--	1.5	<1
LDWRI-Seep	SP-39	7/1/2004	Zinc	8.3	ug/L	81	90	<1	76	<1
LDWRI-Seep	SP-39	7/1/2004	Heptachlor epoxide	0.009	ug/L	--	--	--	--	--
Unfiltered Sample										
LDWRI-Seep	SP-39	7/1/2004	Arsenic	0.058	ug/L	36	69	<1	370	<1
LDWRI-Seep	SP-39	7/1/2004	Cadmium	0.272	ug/L	9.3	42	<1	3.4	<1
LDWRI-Seep	SP-39	7/1/2004	Copper	12.2 J	ug/L	3.1	4.8	3.9	120	<1
LDWRI-Seep	SP-39	7/1/2004	Lead	0.161	ug/L	8.1	210	<1	13	<1
LDWRI-Seep	SP-39	7/1/2004	Mercury	0.00095	ug/L	0.025	1.8	<1	0.0074	<1
LDWRI-Seep	SP-39	7/1/2004	Nickel	6.43	ug/L	8.2	74	<1	--	--
LDWRI-Seep	SP-39	7/1/2004	Silver	0.025	ug/L	--	1.9	--	1.5	<1
LDWRI-Seep	SP-39	7/1/2004	Zinc	9.9	ug/L	81	90	<1	76	<1
LDWRI-Seep	SP-39	7/1/2004	Heptachlor epoxide	0.0076	ug/L	--	--	--	--	--
LDWRI-Seep	SP-39	7/1/2004	Total Suspended Solids	5.8 J	mg/L	--	--	--	--	--

ug/L - micrograms per Liter

mg/L - milligrams per Liter

WQS - Water Quality Standards

CSL - Sediment Management Standards Cleanup Screening Level

a - Groundwater to sediment screening level, based on sediment CSLs. From SAIC 2006

J - Estimated value between the method detection limit and the laboratory reporting limit

Exceedance factors are the ratio of the detected concentration to the screening level; exceedance factors are shown only if they are greater than or equal to 1.

**Table A-5
Chemicals Detected in Storm Drain Samples
Restoration Areas Source Control Area**

Source	LocationID	Collection Date	Grab Type	Parameter	Result	Units	SQS/ LAET ¹	CSL/ 2LAET	Exceedance Factors	
									SQS	CSL
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	4-Methylphenol	0.11	mg/kg	0.67	0.67	<1	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Arsenic ²	10	mg/kg	57	93	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	Arsenic	6 J	mg/kg	57	93	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	Arsenic	6	mg/kg	57	93	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Benzo(a)anthracene	0.068 J	mg/kg	1.3	1.6	<1	<1
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	Benzo(a)anthracene	0.051 J	mg/kg	1.3	1.6	<1	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Benzo(a)anthracene	0.026	mg/kg	1.3	1.6	<1	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Benzo(a)anthracene	0.015 J	mg/kg	1.3	1.6	<1	<1
SPU 2010	HC-ST1	11/4/2010	Inline	Benzo(a)anthracene	0.01 J	mg/kg	1.3	1.6	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Benzo(a)pyrene	0.082 J	mg/kg	1.6	3.0	<1	<1
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	Benzo(a)pyrene	0.054 J	mg/kg	1.6	3.0	<1	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Benzo(a)pyrene	0.029	mg/kg	1.6	3.0	<1	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Benzo(a)pyrene	0.016 J	mg/kg	1.6	3.0	<1	<1
SPU 2010	HC-ST1	11/4/2010	Inline	Benzo(a)pyrene	0.014 J	mg/kg	1.6	3.0	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Benzo(g,h,i)perylene	0.17	mg/kg	0.67	0.72	<1	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Benzo(g,h,i)perylene	0.027	mg/kg	0.67	0.72	<1	<1
SPU 2010	HC-ST1	11/4/2010	Inline	Benzo(g,h,i)perylene	0.027	mg/kg	0.67	0.72	<1	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Benzo(g,h,i)perylene	0.019 J	mg/kg	0.67	0.72	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	bis(2-Ethylhexyl)phthalate	1.5	mg/kg	1.3	1.9	1.2	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	bis(2-Ethylhexyl)phthalate	0.19 B	mg/kg	1.3	1.9	<1	<1
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	bis(2-Ethylhexyl)phthalate	0.16	mg/kg	1.3	1.9	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	bis(2-Ethylhexyl)phthalate	0.082	mg/kg	1.3	1.9	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	bis(2-Ethylhexyl)phthalate	0.072	mg/kg	1.3	1.9	<1	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Butyl benzyl phthalate	0.029	mg/kg	0.063	0.9	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Carcinogenic PAHs (calc'd)	0.11225	mg/kg	0.009		12	
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	Carcinogenic PAHs (calc'd)	0.08338	mg/kg	0.009		9.3	
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Carcinogenic PAHs (calc'd)	0.02071	mg/kg	0.009		2.3	
SPU 2010	HC-ST1	11/4/2010	Inline	Carcinogenic PAHs (calc'd)	0.01816	mg/kg	0.009		2.0	
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Chrysene	0.18	mg/kg	1.4	2.8	<1	<1
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	Chrysene	0.063	mg/kg	1.4	2.8	<1	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Chrysene	0.047	mg/kg	1.4	2.8	<1	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Chrysene	0.021	mg/kg	1.4	2.8	<1	<1
SPU 2010	HC-ST1	11/4/2010	Inline	Chrysene	0.016 J	mg/kg	1.4	2.8	<1	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Copper	50.2	mg/kg	390	390	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Copper	23.9	mg/kg	390	390	<1	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Copper	22.6	mg/kg	390	390	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	Copper	18.7	mg/kg	390	390	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	Copper	15.8 J	mg/kg	390	390	<1	<1
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	Copper	14.7	mg/kg	390	390	<1	<1
SPU 2010	HC-ST1	11/21/2008	Inline	Copper	12.6	mg/kg	390	390	<1	<1
SPU 2010	HC-ST1	11/4/2010	Inline	Copper	12	mg/kg	390	390	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Dibutyl phthalate	0.1	mg/kg	1.4	5.1	<1	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Diethyl phthalate	0.017 J	mg/kg	0.2	1.2	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Dimethyl phthalate	0.097	mg/kg	0.071	0.16	1.4	<1

**Table A-5
Chemicals Detected in Storm Drain Samples
Restoration Areas Source Control Area**

Source	LocationID	Collection Date	Grab Type	Parameter	Result	Units	SQS/ LAET ¹	CSL/ 2LAET	Exceedance Factors	
									SQS	CSL
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Di-n-octyl phthalate	0.015 J	mg/kg	6.2		<1	
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	Fluoranthene	0.18	mg/kg	1.7	2.5	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Fluoranthene	0.17	mg/kg	1.7	2.5	<1	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Fluoranthene	0.075	mg/kg	1.7	2.5	<1	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Fluoranthene	0.034	mg/kg	1.7	2.5	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	Fluoranthene	0.031	mg/kg	1.7	2.5	<1	<1
SPU 2010	HC-ST1	11/4/2010	Inline	Fluoranthene	0.03	mg/kg	1.7	2.5	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Indeno(1,2,3-cd)pyrene	0.058 J	mg/kg	0.6	0.69	<1	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Indeno(1,2,3-cd)pyrene	0.019 J	mg/kg	0.6	0.69	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Lead	34	mg/kg	450	530	<1	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Lead	30	mg/kg	450	530	<1	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Lead	18	mg/kg	450	530	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	Lead	12 J	mg/kg	450	530	<1	<1
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	Lead	9	mg/kg	450	530	<1	<1
SPU 2010	HC-ST1	11/21/2008	Inline	Lead	8	mg/kg	450	530	<1	<1
SPU 2010	HC-ST1	11/4/2010	Inline	Lead	8	mg/kg	450	530	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	Lead	7	mg/kg	450	530	<1	<1
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	Mercury	0.28	mg/kg	0.41	0.59	<1	<1
SPU 2010	HC-ST1	11/4/2010	Inline	Mercury	0.11	mg/kg	0.41	0.59	<1	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Mercury	0.04	mg/kg	0.41	0.59	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	Mercury	0.03 J	mg/kg	0.41	0.59	<1	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Mercury	0.02	mg/kg	0.41	0.59	<1	<1
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	Phenanthrene	0.13	mg/kg	1.5	5.4	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Phenanthrene	0.12	mg/kg	1.5	5.4	<1	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Phenanthrene	0.035	mg/kg	1.5	5.4	<1	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Phenanthrene	0.025	mg/kg	1.5	5.4	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	Phenanthrene	0.021	mg/kg	1.5	5.4	<1	<1
SPU 2010	HC-ST1	11/4/2010	Inline	Phenanthrene	0.017 J	mg/kg	1.5	5.4	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Phenol	0.058 J	mg/kg	0.42	1.2	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Pyrene	0.18	mg/kg	2.6	3.3	<1	<1
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	Pyrene	0.13	mg/kg	2.6	3.3	<1	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Pyrene	0.058	mg/kg	2.6	3.3	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	Pyrene	0.036	mg/kg	2.6	3.3	<1	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Pyrene	0.035	mg/kg	2.6	3.3	<1	<1
SPU 2010	HC-ST1	11/4/2010	Inline	Pyrene	0.024	mg/kg	2.6	3.3	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Total benzofluoranthenes	0.11	mg/kg	3.2	3.6	<1	<1
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	Total benzofluoranthenes	0.094 J	mg/kg	3.2	3.6	<1	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Total benzofluoranthenes	0.071	mg/kg	3.2	3.6	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Total Dioxin/Furan TEQ	2.99 J	ng/kg	2		1.5	
SPU 2010	HC-ST1	11/4/2010	Inline	Total Dioxin/Furan TEQ	0.614 J	ng/kg	2		<1	
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Total Dioxin/Furan TEQ	0.592 J	ng/kg	2		<1	
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Total HPAHs	1.018	mg/kg	12	17	<1	<1
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	Total HPAHs	0.572 J	mg/kg	12	17	<1	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Total HPAHs	0.148	mg/kg	12	17	<1	<1

**Table A-5
Chemicals Detected in Storm Drain Samples
Restoration Areas Source Control Area**

Source	LocationID	Collection Date	Grab Type	Parameter	Result	Units	SQS/ LAET ¹	CSL/ 2LAET	Exceedance Factors	
									SQS	CSL
SPU 2010	HC-ST1	11/4/2010	Inline	Total HPAHs	0.121	mg/kg	12	17	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	Total HPAHs	0.067	mg/kg	12	17	<1	<1
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	Total LPAHs	0.13	mg/kg	5.2	13	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Total LPAHs	0.12	mg/kg	5.2	13	<1	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Total LPAHs	0.025	mg/kg	5.2	13	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	Total LPAHs	0.021	mg/kg	5.2	13	<1	<1
SPU 2010	HC-ST1	11/4/2010	Inline	Total LPAHs	0.017	mg/kg	5.2	13	<1	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Total PCBs	0.11	mg/kg	0.13	1.0	<1	<1
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	TPH - Diesel range	250	mg/kg	2,000		<1	
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	TPH - Diesel range	9.2	mg/kg	2,000		<1	
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	TPH - Diesel range	0.17	mg/kg	2,000		<1	
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	TPH - Motor oil range	56	mg/kg	2,000		<1	
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	TPH - Motor oil range	0.81	mg/kg	2,000		<1	
KTA 2012	TUK-06	8/23/2011	ROW Catch Basin	Zinc	199	mg/kg	410	960	<1	<1
SPU 2010	HC-ST1	11/21/2008	Inline	Zinc	72	mg/kg	410	960	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	Zinc	72 J	mg/kg	410	960	<1	<1
Ecology 2013	HC-ST1	6/14/2012	Sediment Trap	Zinc	71	mg/kg	410	960	<1	<1
SPU 2010	HC-ST1	11/4/2010	Sediment Trap	Zinc	65	mg/kg	410	960	<1	<1
SPU 2011	RCB270	5/13/2011	ROW Catch Basin	Zinc	65	mg/kg	410	960	<1	<1
SPU 2010	HC-ST1	4/15/2009	Inline	Zinc	62	mg/kg	410	960	<1	<1
SPU 2010	HC-ST1	11/4/2010	Inline	Zinc	60	mg/kg	410	960	<1	<1

mg/kg - milligram per kilogram

ng/kg - nanogram per kilogram

SQS - Sediment Quality Standard

CSL - Cleanup Screening Level

LAET - lowest apparent effects threshold

2LAET - second lowest apparent effects threshold

J - Estimated value between the method detection limit and the laboratory reporting limit

B - Analyte was detected in the associated method blank

PCB - polychlorinated biphenyl

TPH - total petroleum hydrocarbons

PAH - polycyclic aromatic hydrocarbon

TEQ - toxic equivalence quotient

1 - Total cPAHs and Total Dioxin/Furan TEQ were compared to the LDW Natural Background concentrations. TPH results were compared to MTCA Method A cleanup levels for unrestricted land use.

2 - Concentration exceeds the LDW Natural Background concentration: Arsenic (7 mg/kg)

Table presents chemicals that exceed a screening level in at least one sample.

Exceedance factors are the ratio of the detected concentration to the SQS or CSL; exceedance factors are shown only if they are greater than 1.

Appendix B

Historical Aerial Photographs

1936 Aero-Metric/Seattle



Figure B-1. Restoration Areas
Source Control Area, 1936



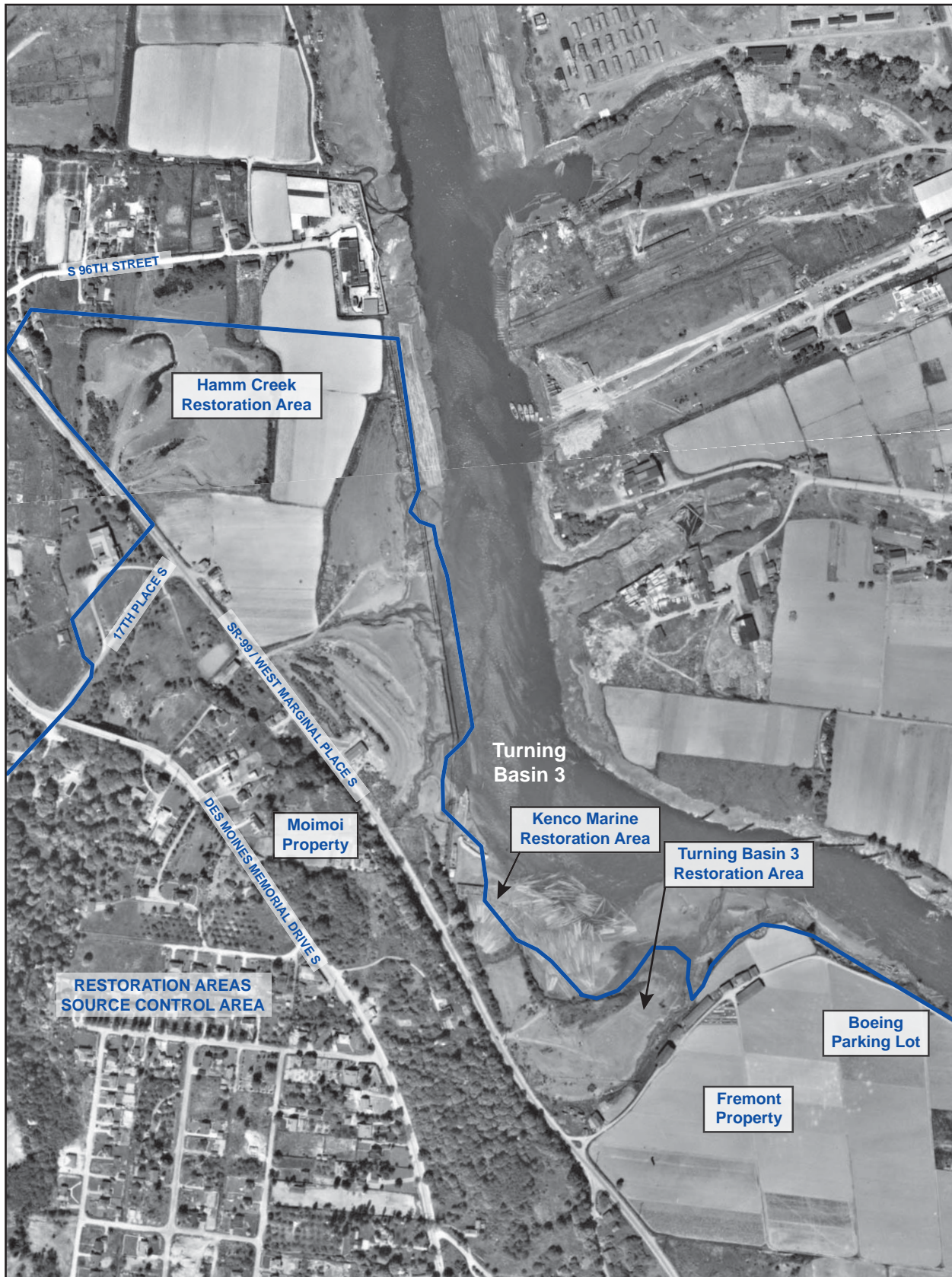


Figure B-2. Restoration Areas
Source Control Area, 1946



1956 Aero-Metric/Seattle(F)



Figure B-3. Restoration Areas Source Control Area, 1956





Figure B-4. Restoration Areas
Source Control Area, 1960





**Figure B-5. Restoration Areas
Source Control Area, 1969**



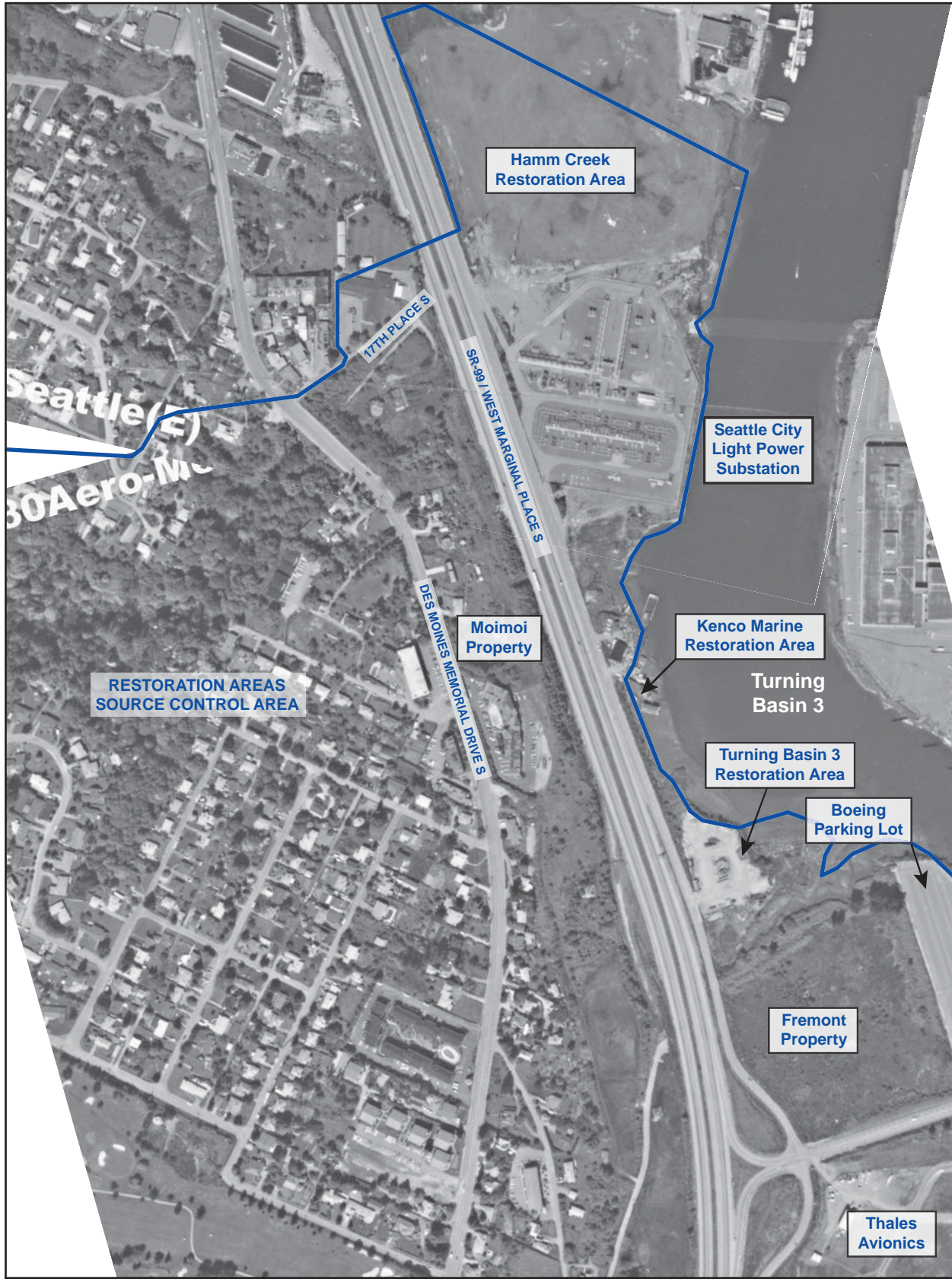
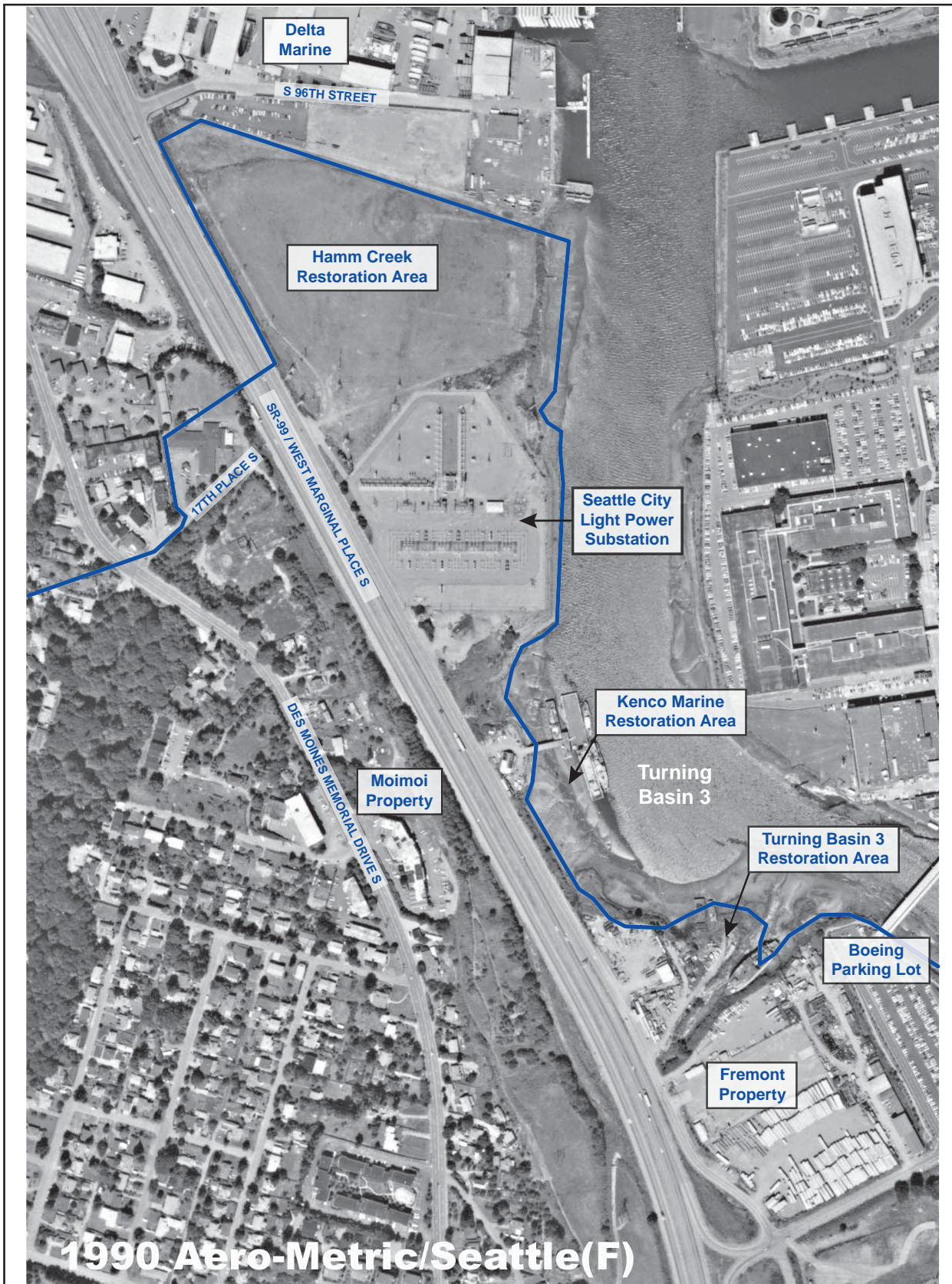


Figure B-6. Restoration Areas Source Control Area, 1980







**Figure B-8. Restoration Areas
Source Control Area, 2004**



Appendix C

Environmental Investigations Upland Properties

Appendix C-1
Moimoi Property

**Table C-1
Chemicals Detected in Soil
Moimoi Property**

Source	Sample Date	Sample Location	Sample Depth (ft bgs)	Chemical	Soil Conc'n (mg/kg)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level ^b (mg/kg)	MTCA Exceedance Factor	Soil-to-Sediment Screening Level Exceedance Factor
SKCDPH 2000	6/1/2000	MP-1	Surface	Barium	190				
SKCDPH 2000	6/1/2000	MP-2	Surface	Barium	65				
SKCDPH 2000	6/1/2000	MP-3	Surface	Barium	59				
SKCDPH 2000	6/1/2000	MP-1	Surface	Chromium	17		5,400		<1
SKCDPH 2000	6/1/2000	MP-2	Surface	Chromium	18		5,400		<1
SKCDPH 2000	6/1/2000	MP-3	Surface	Chromium	18		5,400		<1
SKCDPH 2000	6/1/2000	MP-1	Surface	Heavy-oil range hydrocarbons	1,500	2,000		<1	
SKCDPH 2000	6/1/2000	MP-2	Surface	Heavy-oil range hydrocarbons	3,400	2,000		1.7	
SKCDPH 2000	6/1/2000	MP-3	Surface	Heavy-oil range hydrocarbons	730	2,000		<1	
SKCDPH 2000	6/1/2000	MP-1	Surface	Lead	81	250	1,300	<1	<1
SKCDPH 2000	6/1/2000	MP-2	Surface	Lead	43	250	1,300	<1	<1
SKCDPH 2000	6/1/2000	MP-3	Surface	Lead	15	250	1,300	<1	<1
SKCDPH 2000	6/1/2000	MP-1	Surface	Toluene	0.11	7		<1	
SKCDPH 2000	6/1/2000	MP-2	Surface	Toluene	0.06	7		<1	
SKCDPH 2000	6/1/2000	MP-3	Surface	Toluene	0.063	7		<1	

ft bgs - Feet below ground surface

mg/kg - Milligrams per kilogram

MTCA - Model Toxics Control Act

CSL - Cleanup Screening Level from Washington Sediment Management Standards

Concentration exceeds MTCA Cleanup Level and/or Soil-to-Sediment Screening Level

a - The lower of MTCA Method A or B cleanup levels was selected, from CLARC database.

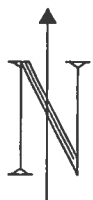
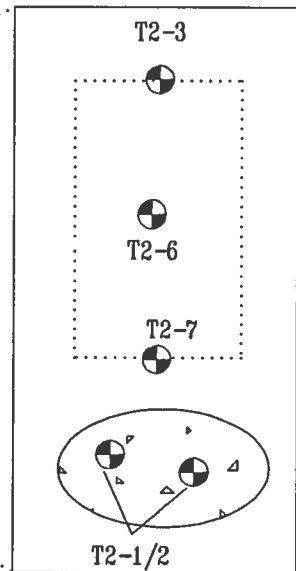
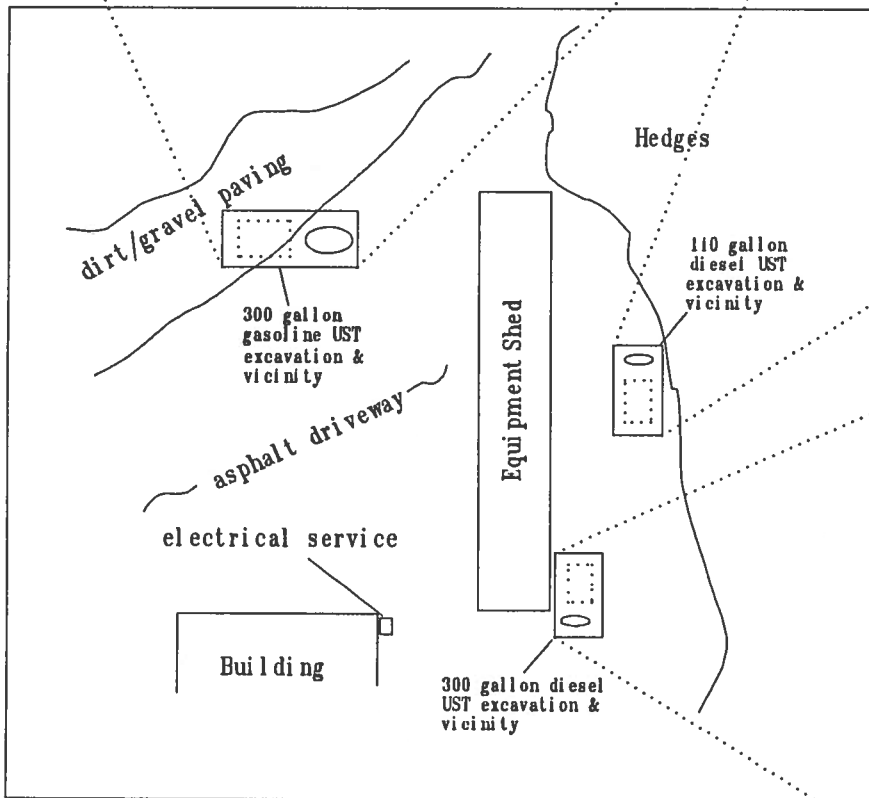
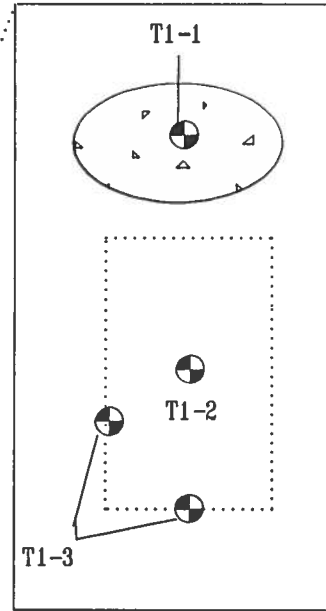
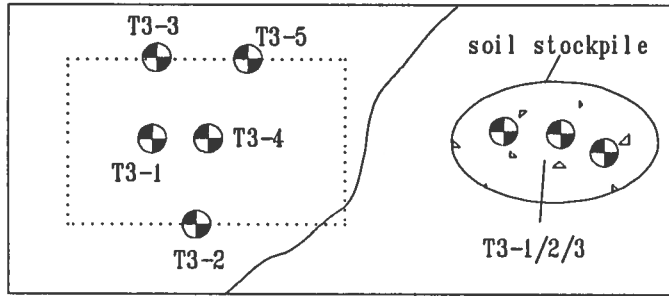
b - Based on CSL. Where two screening levels are listed for a single chemical, the higher screening levels are for soil samples collected from the vadose zone and the lower screening levels are for soil samples collected from the saturated zone (SAIC 2006).

Table presents detected chemicals only.



Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or Soil-to-Sediment Screening Level, whichever is lower.

Appendix C-2
Rainier Golf & Country Club

Rainier Golf & Country Club Soil Sampling Plan



KEY

-  soil sample location
- T1-1 sample number
-  limits of UST excavation

samples collected on 4/15/1994

O'Sullivan Omega, Inc.
 Geologists, Environmental
 Specialists & General Contractor
 3214 - 16th Avenue SW
 Seattle, WA 98134

Table 1. Summary of Analytical Results for Rainier Golf and Country Club

Sample Number	Sample Type	Sample Location	Sample Method	Sample Depth	WTPH-HCID/TPH Results		
					Gasoline	Diesel	Heavy Oils
<i>UST # 1 (110 gallon diesel)</i>							
RGC-T1-1	soil/composite	stockpile	grab	NA	NA	16,000**	NA
RGC-T1-2	soil/discrete	bottom	grab	2	ND	trace	ND
RGC-T1-3	soil/composite	sidewalls	grab	2	ND	ND	ND
<i>UST # 2 (300 gallon gasoline)</i>							
RGC-T2-1/T2-2	soil/composite	stockpile	grab	3	ND*	NA	NA
RGC-T2-3	soil/discrete	north sidewall	grab	3	ND	ND	trace
RGC-T2-6	soil/discrete	bottom	grab	3	ND	ND	ND
RGC-T2-7	soil/discrete	south sidewall	grab	3	ND	ND	ND
<i>UST # 3 (300 gallon gasoline)</i>							
RGC-T3-1/3-2/3-3	soil/discrete	stockpile	grab		1030*	ND	ND
RGC-T3-4	soil/discrete	bottom	grab	8	ND	ND	ND
RGC-T3-5	soil/discrete	north sidewall	grab	6	ND	ND	ND
MTCA	---	---	---	---	100	200	200

All samples collected by O'Sullivan Omega on April 15, 1994.

Sample depth given in feet below ground surface.

All samples analyzed by semi-quantitative Washington State Test Method WTPH-HCID to determine the presence and type of total petroleum hydrocarbons (TPHs) as gasoline, diesel and/or heavy oils.

*, gasoline TPHs quantified using Washington State Test Method WTPH-G.

** , diesel TPHs quantified using Washington State Test Method WTPH-D.

TPH concentrations given in ppm, parts per million (mg/kg).

ND not detected

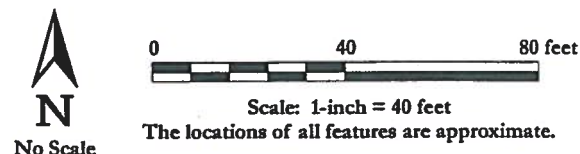
NA not analyzed

MTCA, Ecology's Model Toxics Control Act Method A Soil Cleanup Level for gasoline and diesel TPH in residential and industrial soil (WAC 173-340).

Appendix C-3
Puget Sound Plumbing & Heating



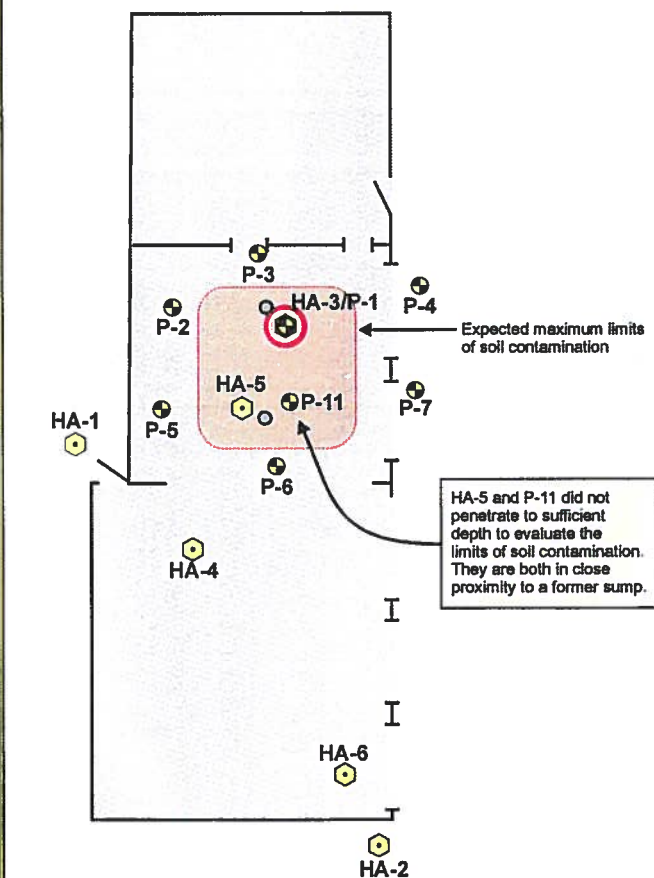
Image Source: Google Earth (2002)



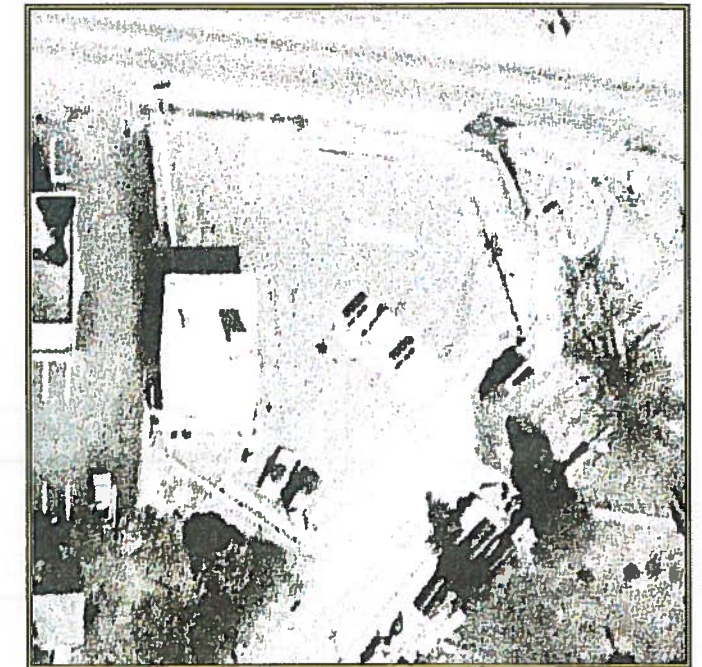
Legend

- Likely location for former UST nest
- Former Service Island Locations
- UST locations confirmed by Ground Penetrating Radar
- AST Locations
- Boring Location
- B-1 P-3
- HA-1 Hand Auger Exploration Location
- Exploration location symbols are circled in red where MTCA Method A Cleanup Levels are exceeded

Explorations In and Near the Building



Scale: 1-inch = 20 feet
The locations of all features are approximate.



1969 (no scale)



1980 (no scale)

Figure 2
Exploration Locations
Benson Property
11803 Des Moines Memorial
Drive South
Seattle, Washington

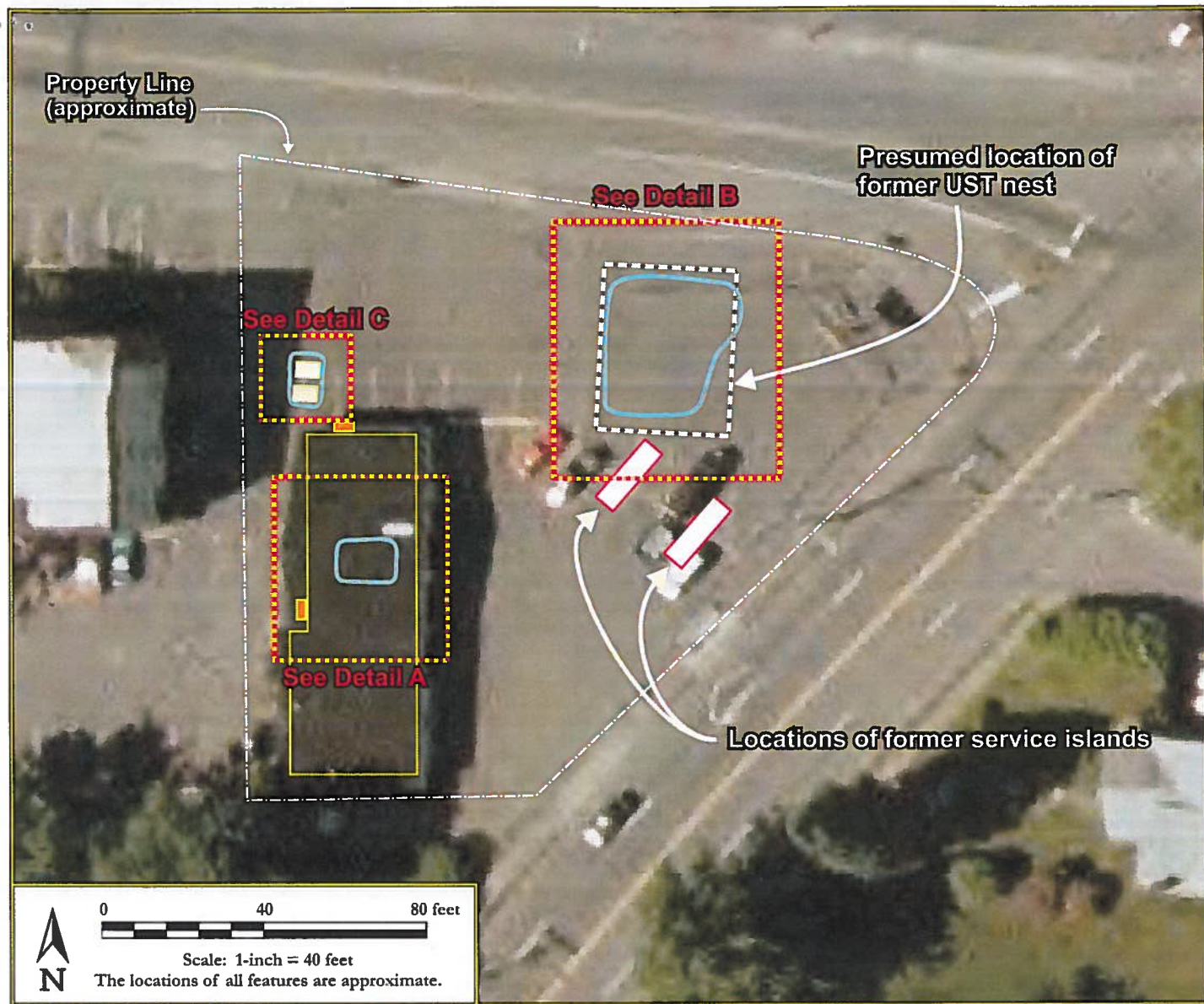
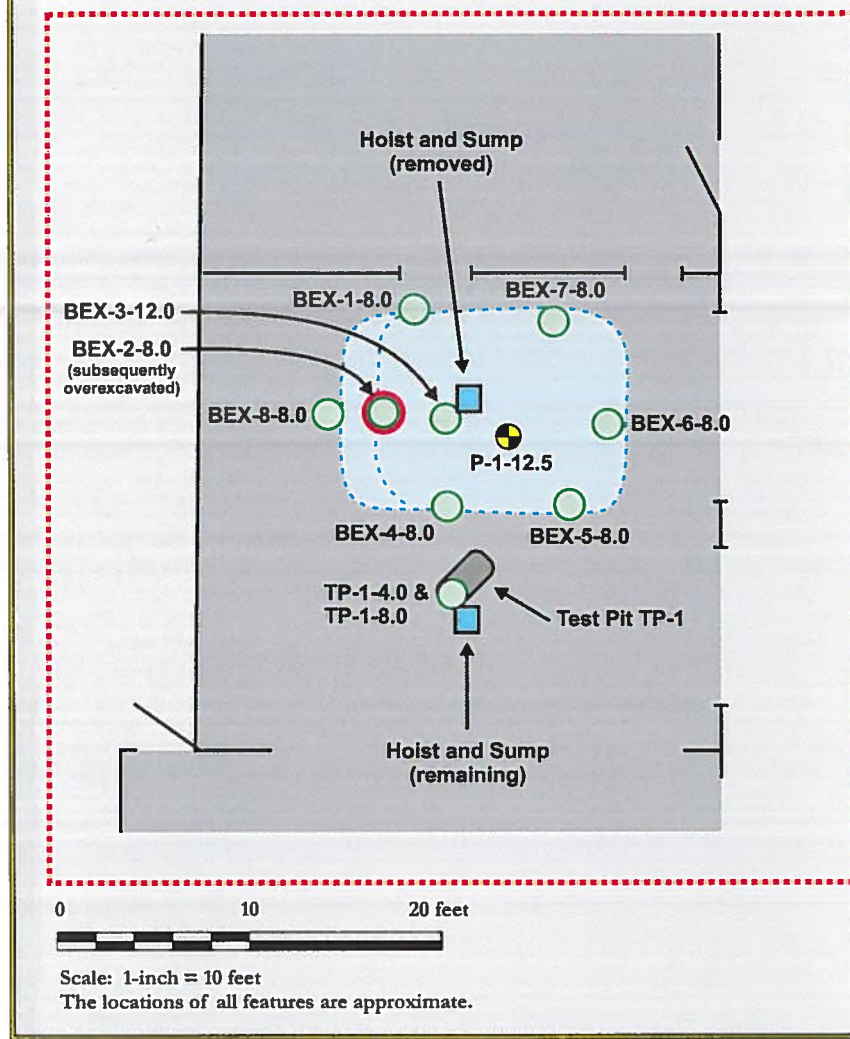
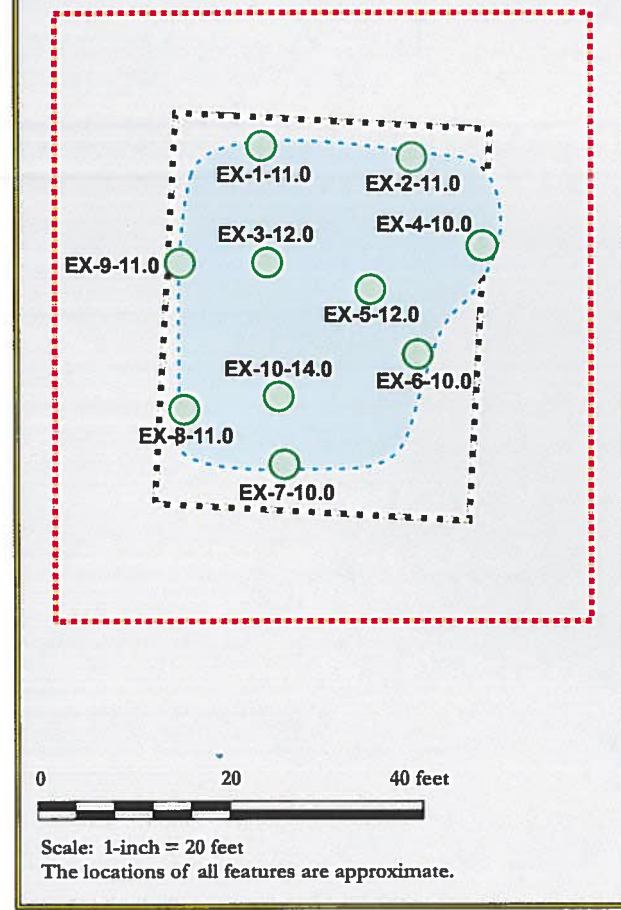


Image Source: Google Earth (2002)

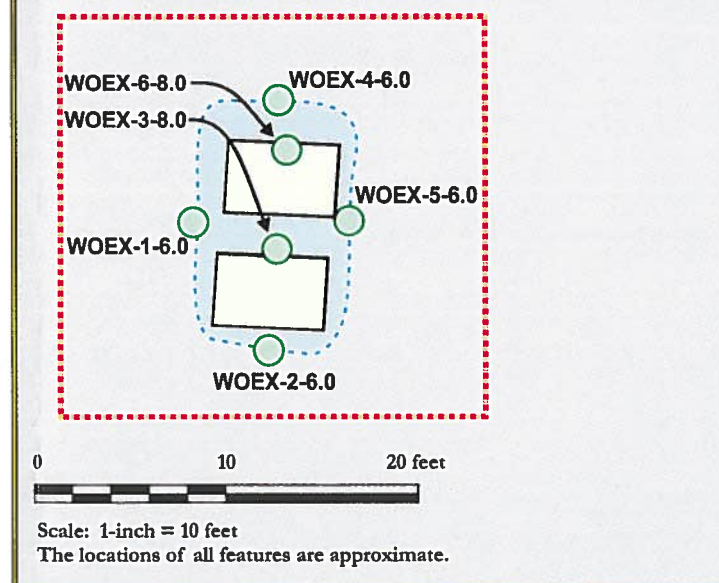
Detail A Service Bay Excavation and Test Pit



Detail B Former Fuel USTs Excavation



Detail C Waste Oil and Heating Oil UST Excavation



Legend

- Presumed location for former UST nest
- Former Service Island Locations
- UST locations confirmed by Ground Penetrating Radar
- AST Locations
- Hoists and Sumps
- Limit of Excavation - (primary map)
- Limits of Excavation (inset maps)

Key to Sample Symbols

- Sample from prior study
WOEX-1-6.0
- Sample location and number
P-1-12.5
- Sample symbols are circled in red where MTCA Method A Cleanup Levels are exceeded (sample and surrounding soil was subsequently removed)

Figure 2
Excavation and Sample Locations
Benson Property
11803 Des Moines Memorial
Drive South
Seattle, Washington

**Table C-3
Chemicals Detected in Soil
Puget Sound Plumbing & Heating**

Source	Sample Date	Sample Location	Sample Depth (ft bgs)	Chemical	Soil Conc'n (mg/kg)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level ^b (mg/kg)	MTCA Exceedance Factor	Soil-to-Sediment Screening Level Exceedance Factor
Pinnacle GeoSciences 2009		WOEX-6	8	Arsenic	14	0.67	590	21	<1
Pinnacle GeoSciences 2009		WOEX-6	8	Chromium	40		5,400		<1
Pinnacle GeoSciences 2009		BEX-7	8	Chromium	34		5,400		<1
Pinnacle GeoSciences 2008		HA-3	8	Diesel-range hydrocarbons	1,400	2,000		<1	
Pinnacle GeoSciences 2008		P-1	10	Diesel-range hydrocarbons	140	2,000		<1	
Pinnacle GeoSciences 2009		EX-7	10	Diesel-range hydrocarbons	140	2,000		<1	
Pinnacle GeoSciences 2009		WOEX-6	8	Diesel-range hydrocarbons	37	2,000		<1	
Pinnacle GeoSciences 2009		WOEX-2	6	Diesel-range hydrocarbons	35	2,000		<1	
Pinnacle GeoSciences 2008		P-10	9.5	Ethylbenzene	36	6		6.0	
Pinnacle GeoSciences 2008		P-8	12	Ethylbenzene	2.0	6		<1	
Pinnacle GeoSciences 2008		B-3	8.5	Ethylbenzene	0.8	6		<1	
Pinnacle GeoSciences 2009		BEX-2	8	Ethylbenzene	0.1	6		<1	
Pinnacle GeoSciences 2008		HA-3	8	Gasoline-range hydrocarbons	1,500	30		50	
Pinnacle GeoSciences 2008		P-10	9.5	Gasoline-range hydrocarbons	1,100	30		37	
Pinnacle GeoSciences 2008		P-8	12	Gasoline-range hydrocarbons	570	30		19	
Pinnacle GeoSciences 2008		B-3	8.5	Gasoline-range hydrocarbons	530	30		18	
Pinnacle GeoSciences 2008		P-1	10	Gasoline-range hydrocarbons	510	30		17	
Pinnacle GeoSciences 2009		BEX-2	8	Gasoline-range hydrocarbons	64	30		2.1	
Pinnacle GeoSciences 2009		BEX-1	8	Gasoline-range hydrocarbons	18	30		<1	
Pinnacle GeoSciences 2009		EX-4	10	Gasoline-range hydrocarbons	15	30		<1	
Pinnacle GeoSciences 2009		BEX-7	8	Gasoline-range hydrocarbons	12	30		<1	
Pinnacle GeoSciences 2009		EX-7	10	Gasoline-range hydrocarbons	11	30		<1	
Pinnacle GeoSciences 2009		BEX-6	8	Gasoline-range hydrocarbons	10	30		<1	
Pinnacle GeoSciences 2009		BEX-5	8	Gasoline-range hydrocarbons	6	30		<1	
Pinnacle GeoSciences 2009		EX-3	12	Gasoline-range hydrocarbons	5.0	30		<1	
Pinnacle GeoSciences 2009		BEX-8	8	Gasoline-range hydrocarbons	4	30		<1	
Pinnacle GeoSciences 2009		TP-1	8	Gasoline-range hydrocarbons	4	30		<1	
Pinnacle GeoSciences 2009		TP-1	4	Gasoline-range hydrocarbons	3	30		<1	
Pinnacle GeoSciences 2008		HA-3	8	Heavy oil-range hydrocarbons	670	2,000		<1	
Pinnacle GeoSciences 2009		EX-7	10	Heavy oil-range hydrocarbons	290	2,000		<1	
Pinnacle GeoSciences 2009		WOEX-6	8	Heavy oil-range hydrocarbons	140	2,000		<1	
Pinnacle GeoSciences 2009		WOEX-5	6	Heavy oil-range hydrocarbons	97	2,000		<1	
Pinnacle GeoSciences 2008		HA-1	3	Heavy oil-range hydrocarbons	84	2,000		<1	
Pinnacle GeoSciences 2009		WOEX-2	6	Heavy oil-range hydrocarbons	83	2,000		<1	
Pinnacle GeoSciences 2009		BEX-2	8	Heavy oil-range hydrocarbons	81	2,000		<1	
Pinnacle GeoSciences 2009		WOEX-4	6	Heavy oil-range hydrocarbons	78	2,000		<1	
Pinnacle GeoSciences 2008		P-1	10	Heavy oil-range hydrocarbons	69	2,000		<1	

**Table C-3
Chemicals Detected in Soil
Puget Sound Plumbing & Heating**

Source	Sample Date	Sample Location	Sample Depth (ft bgs)	Chemical	Soil Conc'n (mg/kg)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level ^b (mg/kg)	MTCA Exceedance Factor	Soil-to-Sediment Screening Level Exceedance Factor
Pinnacle GeoSciences 2008		B-3	8.5	Heavy oil-range hydrocarbons	58	2,000		<1	
Pinnacle GeoSciences 2009		WOEX-6	8	Lead	140	250	1,300	<1	<1
Pinnacle GeoSciences 2008		B-3	8.5	Lead	11	250	1,300	<1	<1
Pinnacle GeoSciences 2009		BEX-7	8	Lead	8	250	1,300	<1	<1
Pinnacle GeoSciences 2009		WOEX-6	8	Mercury	0.11	2	0.41	<1	<1
Pinnacle GeoSciences 2009		BEX-7	8	Mercury	0.06	2	0.41	<1	<1
Pinnacle GeoSciences 2008		P-10	9.5	Toluene	1.6	7		<1	
Pinnacle GeoSciences 2008		B-3	8.5	Toluene	1.4	7		<1	
Pinnacle GeoSciences 2008		P-10	9.5	Xylenes, total	18	9		2.0	
Pinnacle GeoSciences 2008		B-3	8.5	Xylenes, total	2.5	9		<1	
Pinnacle GeoSciences 2008		P-8	12	Xylenes, total	2.4	9		<1	

ft bgs - Feet below ground surface

mg/kg - Milligrams per kilogram

MTCA - Model Toxics Control Act


CSL - Cleanup Screening Level from Washington Sediment Management Standards

a - The lower of MTCA Method A or B cleanup levels was selected, from CLARC database.

b - Based on CSL. Where two screening levels are listed for a single chemical, the higher screening levels are for soil samples collected from the vadose zone and the lower screening levels are for soil samples collected from the saturated zone (SAIC 2006).

Table presents detected chemicals only.

Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or Soil-to-Sediment Screening Level, whichever is lower.

 Soil removed through remedial excavation

**Appendix C-4
Jones Property**

**Table C-4
Chemicals Detected in Soil
Jones Property**

Source	Sample Date	Sample Location	Sample Depth (ft bgs)	Chemical	Soil Conc'n (mg/kg)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level ^b (mg/kg)	MTCA Exceedance Factor	Soil-to-Sediment Screening Level Exceedance Factor
SKCDPH 1997	10/11/1996	JOP-2s	Surface	Arsenic	22	0.67	590	33	<1
SKCDPH 1997	10/11/1996	JOP-2s	Surface	Barium	130				
SKCDPH 1997	10/11/1996	JOP-3s	Surface	Barium	42				
SKCDPH 1997	10/11/1996	JOP-2s	Surface	Chromium	24		5,400		<1
SKCDPH 1997	10/11/1996	JOP-3s	Surface	Chromium	14		5,400		<1
SKCDPH 1997	10/11/1996	JOP-2s	Surface	Lead	54	250	1,300	<1	<1
SKCDPH 1997	10/11/1996	JOP-3s	Surface	Lead	22	250	1,300	<1	<1

ft bgs - Feet below ground surface

mg/kg - Milligrams per kilogram

MTCA - Model Toxics Control Act

CSL - Cleanup Screening Level from Washington Sediment Management Standards

Concentration exceeds MTCA Cleanup Level and/or Soil-to-Sediment Screening Level

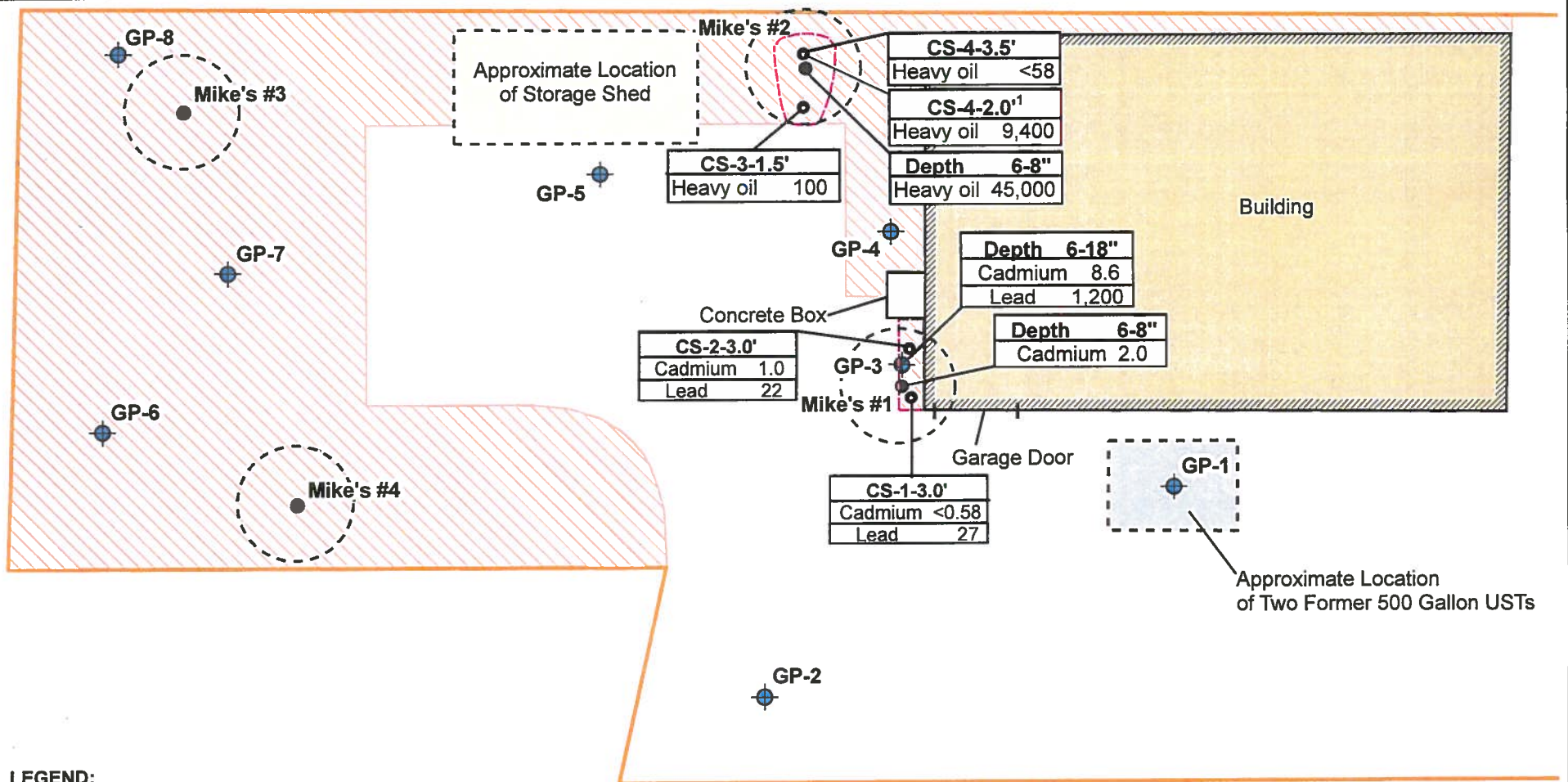
a - The lower of MTCA Method A or B cleanup levels was selected, from CLARC database.

b - Based on CSL. Where two screening levels are listed for a single chemical, the higher screening levels are for soil samples collected from the vadose zone and the lower screening levels are for soil samples collected from the saturated zone (SAIC 2006).

Table presents detected chemicals only.

Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or Soil-to-Sediment Screening Level, whichever is lower.

Appendix C-5
Aussie Repair & Machine Shop Properties



LEGEND:

- Confirmation Sample Location, Geomatrix Consultants, June 9 and 20, 2005
- GP-1 ● Direct Push Location, Geomatrix Consultants, April 2005
- Mike's #1 ● Approximate Surface Sample Location, King County Health Department, November 2000 (Dashed Circle Indicates Estimated Location)

- Extent of Excavation, June 2005
- Unpaved Area
- Quiroga Property

NOTES:

1. Sample area was re-excavated and re-sampled.
2. Results are in milligrams per kilogram (mg/kg).
3. < = not detected below detection limit.



EXCAVATION LOCATION MAP WITH CONFIRMATION SAMPLE SOIL RESULTS
 QUIROGA PROPERTY
 12441 Des Moines Memorial Drive
 Seattle, Washington

Project No.
10559

Figure
2

**Table C-5
Chemicals Detected in Soil
Former Mike's Aussie Machine Shop and Goldco Properties**

Source	Sample Date	Sample Location	Sample Depth (ft bgs)	Chemical	Soil Conc'n (mg/kg)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level ^b (mg/kg)	MTCA Exceedance Factor	Soil-to-Sediment Screening Level Exceedance Factor
SKCDPH 2001	11/3/2000	Mike's #2	0.5	Barium	140				
SKCDPH 2001	11/3/2000	Mike's #3	0.5	Barium	110				
SKCDPH 2001	11/3/2000	Mike's #1	0.5	Barium	80				
SKCDPH 2001	11/3/2000	Mike's #4	0.5	Barium	66				
SKCDPH 2001	11/3/2000	Mike's #1	0.5	Cadmium	2.0	2	34	1.0	<1
Geomatrix 2005	6/9/2005	CS-2	3.0	Cadmium	1.0	2	34	<1	<1
SKCDPH 2001	11/3/2000	Mike's #2	0.5	Cadmium	0.62	2	34	<1	<1
SKCDPH 2001	11/3/2000	Mike's #3	0.5	Chromium	28		5,400		<1
SKCDPH 2001	11/3/2000	Mike's #2	0.5	Chromium	23		5,400		<1
SKCDPH 2001	11/3/2000	Mike's #4	0.5	Chromium	22		5,400		<1
SKCDPH 2001	11/3/2000	Mike's #1	0.5	Chromium	20		5,400		<1
Washington Wrecking 1990	12/10/1990	Tank #2		Gasoline-range hydrocarbons	1,100	30		37	
Washington Wrecking 1990	12/10/1990	Tank #1		Gasoline-range hydrocarbons	500	30		17	
Washington Wrecking 1990	12/10/1990	Tank #3		Gasoline-range hydrocarbons	25	30		<1	
SKCDPH 2001	11/3/2000	Mike's #2	0.5	Heavy oil-range hydrocarbons	45,000	2,000		23	
Geomatrix 2005	6/9/2005	CS-4	2.0	Heavy oil-range hydrocarbons	9,400	2,000		4.7	
SKCDPH 2001	11/3/2000	Mike's #1	0.5	Heavy oil-range hydrocarbons	760	2,000		<1	
SKCDPH 2001	11/3/2000	Mike's #3	0.5	Heavy oil-range hydrocarbons	290	2,000		<1	
Geomatrix 2005	6/9/2005	CS-3	1.5	Heavy oil-range hydrocarbons	100	2,000		<1	
SKCDPH 2001	11/3/2000	Mike's #2	0.5	Lead	140	250	1,300	<1	<1
SKCDPH 2001	11/3/2000	Mike's #1	0.5	Lead	96	250	1,300	<1	<1
SKCDPH 2001	11/3/2000	Mike's #3	0.5	Lead	52	250	1,300	<1	<1
Geomatrix 2005	6/9/2005	CS-1	3.0	Lead	27	250	1,300	<1	<1
Geomatrix 2005	6/9/2005	CS-2	3.0	Lead	22	250	1,300	<1	<1
SKCDPH 2001	11/3/2000	Mike's #4	0.5	Lead	6.3	250	1,300	<1	<1

ft bgs - Feet below ground surface

mg/kg - Milligrams per kilogram

MTCA - Model Toxics Control Act

CSL - Cleanup Screening Level from Washington Sediment Management Standards

a - The lower of MTCA Method A or B cleanup levels was selected, from CLARC database.

b - Based on CSL. Where two screening levels are listed for a single chemical, the higher screening levels are for soil samples collected from the vadose zone and the lower screening levels are for soil samples collected from the saturated zone (SAIC 2006).

Table presents detected chemicals only.

Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or Soil-to-Sediment Screening Level, whichever is lower.

	Soil removed through remedial excavation
	Concentration exceeds MTCA Cleanup Level and/or Soil-to-Sediment Screening Level